beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Another New Toy

In another topic in this forum, I mentioned that I had to rearrange the shop for a Series 60/61 16 X 78 lathe. The lathe is a little short of 13' long and about 4' deep and weighs approx 9200 LBS. I looked at the lathe approx 2-3 months ago, before it was listed on ebay, and had to decide if I could live without it, but most importantly, where to put it. While I was making my decision, I called my rigger to see if he could lift it, and he also quoted me a price, which was extremely reasonable. By the time I made my decision, the seller had listed it on ebay, it didn't sell, and then it went into his stores category. I contacted him a couple of times, and apparently he an offer, but the buyer didn't pick it up. One of my friend's is the seller's former employer, we all keep in contact and communicate and he told me the seller's bottom line, which was a tad bit more than I was thinking, but not unreasonable, and definitely not any where near the ebay price. I paid the bottom line, apparently I'm not the thief the seller thought I was.
Today was moving in day. Last Saturday the re-arrangement began. 2 surface grinders were relocated to the front of the shop, and several other pieces were shoved here and there, really making the shop barely usuable for a week. Fortunately it was light workload this week.
The tooling that came with the lathe; 15" 4 jaw, 12" 3 jaw, original 17" faceplate, steady rest, and a #18 Jacobs drill chuck, misc. wrenches. I have purchased on ebay a Dorian CA toolpost, and a CA 1-1/4" boring bar holder, and I'll make several other toolholders, but use the ones from the CY in the meantime.
Yesterday I finished learing a path to the lathe's new home, mainly moving the automatic bandsaw teporarily to the front of the shop where I normally park the 5000 LB Cat forklift.
The seller delivered the lathe this morning, and the rigger had it in place 45 minutes later, most of the time fine tuning the location. He spotted the lathe at approx 60* to the inal location, his forklift was too long to make the cut in the tight confines. He used my forklift to lift the lathe, via a webbed strap through the bed webbing on the tailstock end to spin the lathe to its final orientation. Then he used his forklift to pull the lathe about 2-1/2 feet closer to the front of the shop. No pictures of this part were taken, as I was otherwise occupied.

Pictures.
View of the shop from the office. A path was cleared from the overhead door, it's 14' X 14', to the rear of the shop. The oil spot, left of center, is approx where the headstock will be. There are paint lines at the upper right corner of the oil spot, and to the upper right corner of the UPS shipping table, for the tailstock end. The electrical cabinet for the #3 W&S is in the lower left corner, and the bar feeder has been removed(which is a story in itself).

All the stuff in the shop had to go somewhere. Believe or not there are 2 turret lathes in there-somewhere.

A better view of where the lathe is going. In this spot there 3 grinders, a 10 X 20 Landis Universal, accounts for the oil spot,and surface grinders, a Hardinge DV 59 and a couple shop tables. The Hardinge was several feet to the right of the window.

The surface grinders have been relocated to the front SW corner of the shop. This was the original location for the blue Norton when I moved here 16 years ago. The green #5 B&S was added later.

More pictures in the next post.
Harry

Like this post | **Reply** | **Reply With Quote**

treebasher liked this post

08-16-2008, 04:39 AM #2

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The automatic bandsaw had to go somewhere, temporarily, along with more stuff. This is the SE corner of the shop, and the Cat forklift is normally parked here.

The lathe is in place.

Another view, and the automatic bandsaw is where it belongs.

The bar feeder for the #3 W&S on the left, has been reattached, the bar feeder to the right of the vertical bandsaw, belongs to the the #5 J&L.
The vertical bandsaw is not staying there, and I a location in mind, will decide tomorrow.

Harry

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08-16-2008, 10:05 AM #3

quasi
Stainless

Join Date	Dec 2003
Location	Calgary, Alberta, Canada
Posts	1,374
Post Thanks / Like	
Likes (Given)	2
Likes (Received)	75

thanks for the update, does that lathe really have a footprint width of 5 feet? It doesn't look that wide in the pictures. How many HP does it have? Can you keep all your other machines, or do you have to do the one in and one out shuffle?

Actually, with the mass of the 61, it might have to be one in and two out!

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08-17-2008, 02:00 AM #4

Cal Haines
Titanium

Join Date	Sep 2002
Country	UNITED STATES
State/Province	Arizona
Posts	3,149
Post Thanks / Like	
Likes (Given)	585
Likes (Received)	308

Great post Harry. A lot of work moving all the stuff around to make room. My back is hurting just reading about it!

Cal

Like this post | Reply | Reply With Quote

smokeymic liked this post

08-17-2008, 06:59 AM #5

beckley23
Titanium

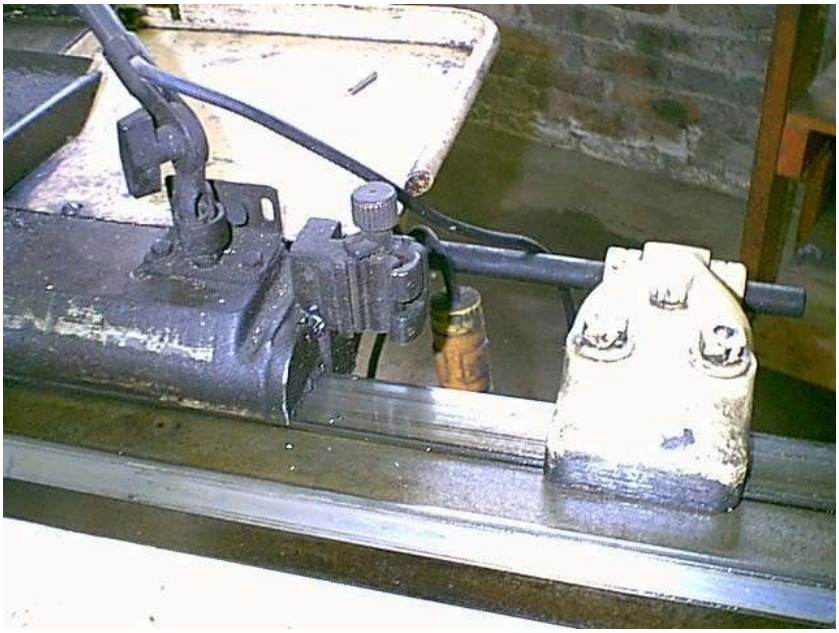
Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

To answer a few questions first. The motor is a U. S. Electric Motor 10 HP, 230/460 3 phase, 1800 RPM, 27+ amps, frame size is 324. The starter is Allen Bradley with low voltage control. The footprint is as I stated in the first post is 4' X 13'-, actully the pedestals are slightly smaller in width, but with the TA and handles it is just under 48". There are no machines that are leaving the shop, or are being replaced, at the present time. This may change in the future, but it is unlikely, unless somebody makes me an offer that I can't refuse. I bought this lathe because I wanted it, I also have potential jobs for it, one of which I'll being starting for the 3rd run on Monday. I'm getting tired of pulling and pushing the TS on the CY to load and unload parts about 2-1/2' each time. 120 times in a day and a half is getting to me, and the TS crank on the Series 60 looks pretty handy.

I've had a bit of time to start a detailed examination of the lathe, and I'm beginning to understand the late Jim Kizale's description "Super Lathe". I may have more comments on this later, but this model is not simply a newer version of the C series. It has been beefed up, significantly. For example, the bed is heavier built than the CY's, the TS is definitely heavier, etc.
I will make some changes to the machine, mostly in the electrical controls. I'm looking for a size 2 reversing starter, adding a coolant pump, and I'm going to have to something about changing chucks. The drive belts are in dire need of replacement, and the machine needs a detailed clean up.
The main concerns now are to get the lathe leveled, and running, so that I can do a more thorough inspection, and to finish getting the shop back together.

I've taken some more pictures today.
The cross slide on the this lathe is just an 1" or 2 shorter than the ways, compared to the CY's which is several inches shorter, (think a feature of "Super Lathe"). The cross slide and compound have had a run in or two with the chuck. The T nut for the Dorian toolpost needs a bit bit of fitting, it was too small for the CY. I don't what lathe the South Bend style cross slide stop fits, or why it's with this machine, all the Monarchs I've seen have the stop built into the dial assembly, and it won't clamp to the dovetail.

The bracket attached to the left rear saddle wing, I can only guess at its use. It's coming off, as is the bracket/adjuster attached to the right rear wing. In the second picture notice the TA bed bracket. First one I've seen that's not broken, and I do have the little rod, that is called appropriately "Bed Bracket Rod". I've always seen the little hole, but never the rod. Two firsts here.



Cable reel for the work light, they're both coming off.

Harry

Harry

Like this post | Reply | Reply With Quote

08-17-2008, 08:58 AM #6

rke[pler
Diamond

Join Date	Feb 2002
Location	Peralta, NM USA
Posts	5,286
Post Thanks / Like	
Likes (Given)	35
Likes (Received)	271

That bracket on the right rear is for a Trav-a-dial. I've got a trav-a-dial if you want to check it out, if not you could flog the bracket on eBay for pocket change (or sell it to me, I can always stash another spare away somewhere).

Like this post | Reply | Reply With Quote

08-17-2008, 06:44 PM #7

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Russ,
I thought the bracket was for a Trav-A-Dial, but wasn't quite sure mainly due to the orientation. I think the little spring in the TA cover belongs to it, found it in the chip pan. It's a bad way to mount the Trav-A-Dial. It can get wiped out by the TA bed bracket,or the quick lock lever on the tailstock.

Here's Jim Kizale's discussion of "Super Lathes"
On Heavy Duty Lathes
Harry

Like this post | Reply | Reply With Quote

08-31-2008, 07:45 PM #8

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

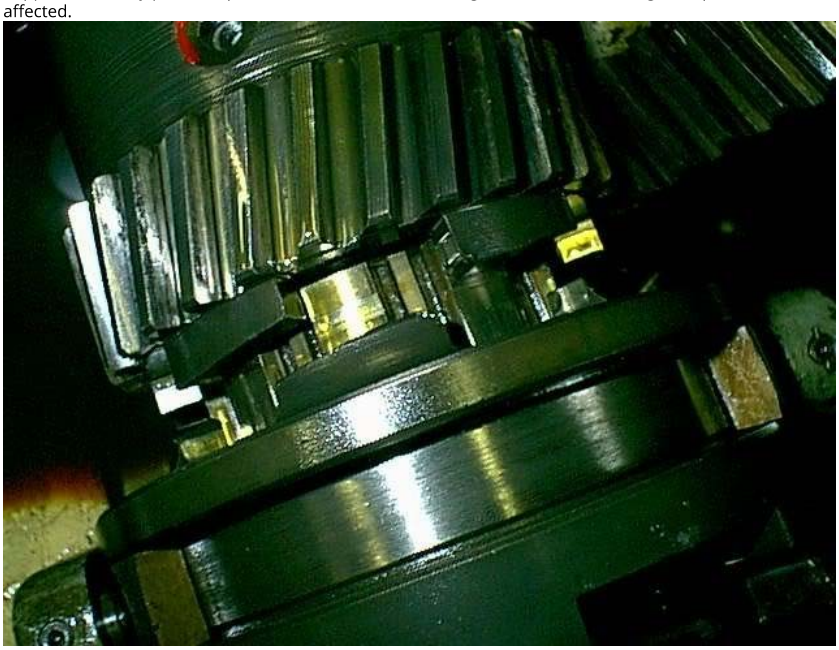
An Update

The lathe has been rough leveled, actually, I thought it was pretty good until the sun came through the window behind it and did its number. I've purchased a venetian blind for the window in hopes of eliminating this problem. As long I as don't use the lathe in the late afternoon, I'm OK, and as the seasons change so does late afternoon. All I've to do is get the blind installed.
There have been some minor relocations in the shop since the initial post, the vertical bandsaw was relocated to the front next to the grinders, a terrible location , and has since been relocated to the rear, behind the lathe, with the Hardinge being relocated under the window.
Surprisingly the shop seems a bit roomier now than before, although I'm still in the process of rearranging things. More stuff seems to find its way to the dumpster.

The process of getting the lathe up and running has begun. I've located a NOS(supposedly) GE #2 size 2 speed starter that can be wired for reversing, heaters have been ordered and the conduit, wiring and the misc necessaries for the electrics will be ordered next week. I've got the necessary transformers for the low voltage coils, coolant pump and the eventual DRO in stock. The electrics will be spliced into the circuit that feeds my #5 J&L 15 HP turret lathe.
The motor has been pulled, and is off to the motor shop next week for rehab. I was going to put new bearings in and clean it up, but when I saw missing insulation on the motor leads, off to the motor shop. The motor was easier to get out than the one's on the EE's. On the EE's I had to get the forks of my small forklift under the motor mounting plate, lift it up and back the forklift out, not an easy job given the confined spaces in the EE. On the SE 60, just remove the bolts, put 2 4's next to the base topped with sheet metal and pull it out, then get the forklift. Fortunately, Monarch installed very long leads to do this, as there is no pecker head on the motor, there isn't room inside the base for one. I'll have to get a picture of the motor.
For once I didn't have to fight the motor sheave getting it off, although I was ready. Loosed one set screw, tried to put the hub puller on, it kept slipping off, the jaws need to be reworked slightly, got a wrecking bar gave it a nudge and it almost shot across the floor. Didn't see any fretting on the motor shaft.
Checked the MSC catalog for belt pricing, B-94's, and was staggered by their pricing. The cheapest I saw was about 30.00. Called my bearing supplier and got belts for approx 13.00, much more reasonable, but they may get me on frieght.
The disassembly and clean up of the drive compartment have started. After removal of the motor, the clutch and drive sheave have to be removed. So far I've gotten the clutch out and the sheave is next. This is a little more time consuming than I anticipated, the dried grease and belt detritus had to be removed from the clutch before the clutch plates could be removed. The pressure plate may have to be replaced, it has about 1/16" wear, which I think was caused by excessive dried grease preventing proper separation of the plates, but the jury is still out on this one.
Pictures
The section of the headstock cover you don't see. I was surpised by the amount of cross bracing cast into it. There is a 1/2-13 tapped hole at the X intersection for an eye bolt, which is how I lifted it off with my small forklift. The reason I took the cover off was to see where the oil level was, the sight glass on the rear of the headstock had been painted over. Although I cleaned it off, I couldn't tell if I was looking at oil or staining. The oil was/is over overfilled by about a gallon.

The inside of the headstock. It is 26" long approx. The bull has a 2" wide face, to give some perspective.

This is the clutch between the bull gear and the "Large and small spindle drive gear", with small one showing in the picture. It's hard to see but the corners of the clutch teeth are a bit chewed, probably from inadvertent shifts on the fly. I know I try avoid this, but every now and then it happens. The only potential problem I see here, is that this gear is used in the 8 highest speeds, and the load carrying capability may be affected.



The end gears. The gearbox has its own pump, and the sump is filled to overflowing, which explains the oil spot on the floor, before I rough leveled the lathe and got this end up.

Harry

Like this post | Reply | Reply With Quote

08-31-2008, 07:54 PM #9

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

One more picture.
The spindle drive sheave and clutch. If you can't see details, that's for 2 reasons; one my camera isn't the best nor am I the best photographer, and two, most importantly, that's how dirty it is. The insides are painted, I beleive yellow, and that should show up.

Harry

Like this post | Reply | Reply With Quote

09-02-2008, 03:44 AM #10

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Went in to the shop today with the express purpose of getting the drive and electrical compartments cleaned up, which was accomplished. It

Went in to the shop today with the express purpose of getting the drive and electrical compartments cleaned up, which was accomplished. It took about 5 hours. It's not an eat off your floor clean, but it is clean enough that I won't get filthy working on the machine in the future, but my wife can always tell when I've been cleaning a machine.
I basically clean my machines by scraping the scrapable dirt/grunge off, followed by preliminary brush down with a solvent, usually kerosene or mineral spirits followed by a water soluble cleaning solution. I use Castrol Kleen 3625, it's the best of the cleaners I've found, and it is expensive, but it gives the best bang for the buck, IMO. This is some strong stuff, so be aware.
Due to the size of the project, there is a lot of surface area, I also sprayed(read compressed air, and this is the only time I ever use compressed air to clean a machine) the Castrol with a syphon gun to speed things up, in conjunction with a fan to blow the spray away from me. The only place I had use to exercise extreme caution, was around the exposed bearings of the input shaft.
All the parts of the clutch and sheave assemblies have been cleaned, and would be reassembled, except for the replacement of a missing snap ring.

A couple more pictures.
What the parts sheet doesn't show are the 2 pipes on the left, of the "Bearing sleeve" and the 4 screws attaching the sleeve to the headstock. The lower pipe has a grease fitting, and the upper pipe has a relief valve. The sheave assembly slides over the sleeve and is held in place with a snap ring. The missing snap ring holds the pulley shaft, in the center of the sleeve, in place and goes next the bearing inside the sleeve.

The motor did have a peckerhead, you can tell by the shadow of the outline, but it had to be removed. There is no way the motor would go into the compartment with it mounted. The wire connections are made underneath the middle cover. The cover is held on by 4 screws on each side, and I made the mistake of taking it off. The 5 digit number that you see is the lathe's serial number,; whether Monarch put the number on, or the original owner replaced the motor, I couldn't tell.

Harry

Like this post | Reply | Reply With Quote

09-02-2008, 04:03 AM #11

j king
Stainless

Join Date	Oct 2003
Location	ohio
Posts	1,342
Post Thanks / Like	
Likes (Given)	55
Likes (Received)	132

Thats going to be a nice machine Harry.

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09-05-2008, 04:37 AM #12

09-05-2008, 04:37 AM #12

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

J King, I'm pushing to get this lathe running so I can find out what I've got. Everything I've seen so far is good, nothing really major is wrong or unexpected for a lathe that's 54 years old.

Well, the snap ring I thought was missing is missing, but it doesn't go where I said it did. That groove is a relief groove, with a radiused bottom about 1/8" wide. The snap ring goes in a groove behind the bearing, I guess to keep the bearing from getting jammed on a slightly larger diameter directly behind it. Put a snap ring on and tried to slide the bearing sleeve on, but it was a no go. Off comes the snap ring, and then I fully assembled the rest of the parts. I had to relocate a spacer from the inside of the cone ring to the outside to get the clutch to operate correctly. That's the way it came apart, and I thought that the original owners had misassembled the parts, but now I understand.
All of the electrical switch gear has been mounted, and the other electricals have been picked up. I think it time to call my electrican friends and get this lathe wired up. Oh yes, I still need to get the motor back and installed.
Harry

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09-05-2008, 05:01 AM #13

qualitymachinetools
Stainless

Join Date Nov 2004
Location McDonald, Pennsylvania
Posts 1,573
Post Thanks / Like
Likes (Given) 2
Likes (Received) 27

Harry,
Looks like you are moving along with it. Hope you get it running soon!
I had one of those exact machines one time, same exact color and everything, and it was a beast.
Its down in South Carolina now. It was originally in a John Deere plant.
I am sure you will like that machine, they are really a nice heavy lathe.

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09-14-2008, 12:53 AM #14

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Well, the week started off with a call from the motor shop. To make a long story short, the motor that went to the shop is not the motor that came back. It seems the motor leads, with the cracked and missing insulation, went too deep into the windings for the shop to easily get to them without a complete rewind. The shop offered me some alternative motors, none of which seemed attractive after checking the frame and shaft sizes in the motor book, shaft diameter and length play a major part here. The original had a 1-5/8" D shaft 5-1/2" long. This necessiated a call to Monarch and I wound up talking to Scott. I explained the situation, and asked what was the largest horsepower motor I could put in the lathe. Scott explained that they normally put 10 HP in the machine, but if I could get a larger motor in there it would handle it. I'm thinking a 15 HP, because thats the size motor in the #5 J&L, and the lathe is being wired into that circuit. The motor book shows a 254T frame motor that comes pretty close to matching what I need without too much trouble or extra expense. Called the motor shop and 10 minutes later I had 15 HP 254T frame motor. All I needed to do was make some adaptor rails and install the motor.

The new motor and one of the adaptor rails. Notice the clearance cut out in the motor foot, it's there so I can get a socket wrench on the screw, after everything is in place. It's still pretty tight in the motor compartment. The second picture is the compartment, the original motor almost totally filled the compartment.

While I had Scott on the phone, I asked about the "missing snap ring". I explained that I tried to slip the bearing sleeve over the snap ring with a no go, and asked if they used a different ring. Scott pulled the assembly drawing(s) and explained to me that the snap ring went on after the sleeve was attached to the headstock, then the bearing was pressed in. He then went on to say that the part print didn't say what type of retaining ring was used, it could be the type we're used to seeing or a 2 piece retaining ring, which was easy to get on, but getting it off was a different story. After hearing this, the question I didn't ask was the most important: how do you get the bearing out to get to the retaining ring to get it out; because if you can't get the bearing out you aren't going to get the bearing sleeve off, etc., etc. This may all be academic, as you shall soon see; but I think I know how they get the bearing out.

Bearing sleeve with the 88508 bearing removed, and snap ring in place.

88508 bearing against the snap ring as it's supposed to be. Keep the hole to the left in mind, it's going to present a problem and questions. Also notice the first groove, to the left of the inner race, is barely visible.

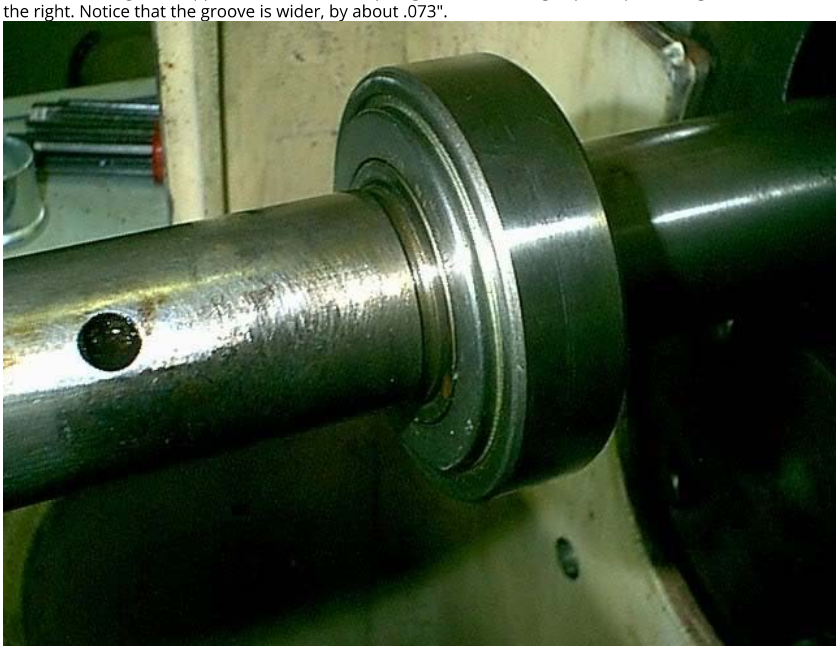
Continued in next post.
Harry

09-14-2008, 01:27 AM #15

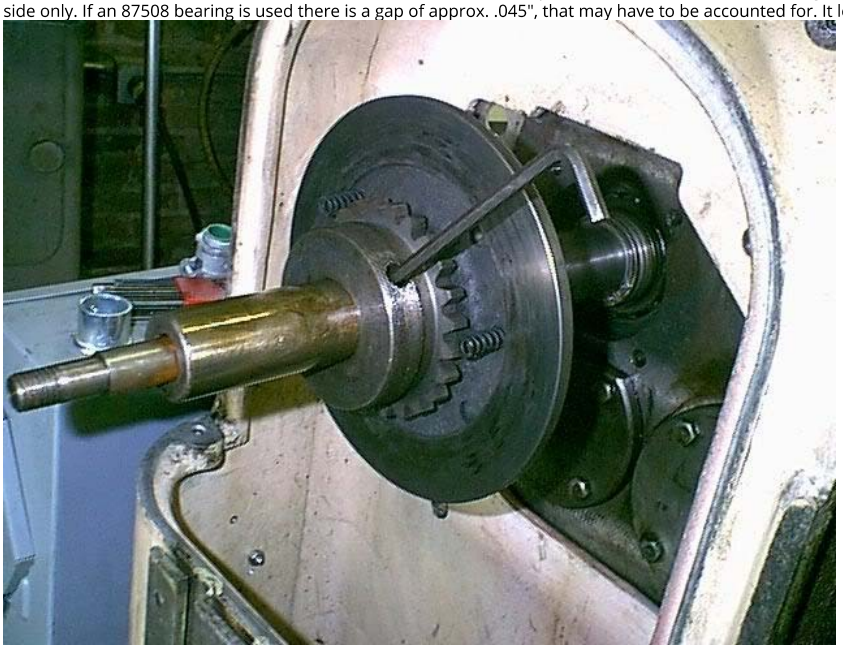
beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

This is how the groove appears without the snap ring, but the bearing in place, pushed against the shoulder formed by the larger diameter to the right. Notice that the groove is wider, by about .073".



The "clutch hub and backplate" in place. The Allen wrench is in the set screw, which is firmly seated in the hole in the shaft, as it's supposed to be; but, and this is very important, the snap ring had to be removed in order to seat the set screw. With the snap ring in place, the hub was .073" further to the left, and the set screw wouldn't seat. This presents a question; is the 88508 bearing the right bearing? 88xxx bearings have the inner race extended on both sides, on the 88508 it 3MM (.1181")per side. Switch to an 87xxx bearing, the inner race is extended on one side only. If an 87508 bearing is used there is a gap of approx. .045", that may have to be accounted for. It looks like another call is needed.



The bearing sleeve with the 88508 bearing removed. Notice the brass plugs on each side of the hole. These plugs are sealing the holes drilled into the casting that connect to the lubrication pipes on the left. The grease comes in the lower pipe, circulates around a groove on the OD of the sleeve and exits through the relief valve in the upper pipe. I think the 88508 bearing is removed by hydraulic pressure if the OD groove is sealed up, and the relief valve blocked off, it just depends on tight the plugs are.

I don't normally do this, but I am impressed with some snap ring pliers I bought, and will eventually add to the inventory. I've used the cheapies in the past, and for the most part they were/are barely usuable. A few months ago, I got a job that I just didn't feel like fighting and cursing the tool, so I bought I Knipex brand snap ring pliers, and I've been adding to my collection as the need arises. This lathe has some very large snap rings, and I wanted a decent tool. The 3 in the lower left arethe Knipex.

Harry

Like this post **Reply** **Reply With Quote**

09-14-2008, 03:37 AM #16

yoyo
Hot Rolled

Join Date	Oct 2004
Location	netherlands
Posts	501
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	3

I agree on the Knipex as a nice quality brand. I started with the wire cutters for two decades ago and almost all of my pliers are Knipex since then.
For the snap rings I bought a universal tool with interchangeable beaks first but these are not sturdy enough, snap rings flying around etc.
The knipex are very good, although the full set uses up quite some place on my toolboard.

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09-14-2008, 05:29 AM #17

Steve in SoCal
Titanium

Join Date	Oct 2006
Location	Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts	2,083
Post Thanks / Like	
Likes (Given)	4
Likes (Received)	379

Regarding snap-ring tools, I have a tool for larger snap-rings that is a real pleasure to use. It is available from McMaster and I highly recommend it.

Looking good Harry; that motor hole reminds me of the K&T, that one is stuffed tightly too.

Steve

Like this post **Reply** **Reply With Quote**

09-14-2008, 06:48 AM #18

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Likes (Received) 146

Steve,
I've got 2 K&T's and have serviced several others, believe me when I tell you that the K&T motor compartments are wide open compared to this lathe with a 324-4 frame motor installed.

To the others reading this topic;
Monarch's parts manual regarding the retaining ring discussed above is very bad. There is no way that anybody could determine, from looking at the manual, that the installation of the bearing sleeve was done in the manner I described. One would need the assembly drawing that Scott was looking at. I was fortunate that I was able to remove the sleeve as easily as I did because the snap/retaining ring wasn't there, I'm afraid others may not be so fortunate.
Harry

Like this post **Reply** **Reply With Quote**

09-16-2008, 06:22 AM #19

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Talked to Scott at Monarch today, and he confirmed the 88508 bearing is the correct bearing and that the set screw in the clutch hub seats in the hole. After a bit of discussion, he suggested that the lathe may have left Monarch without the retaining ring. I proposed that the only reason for the retaining ring was to keep the bearing and hub from moving towards the tailstock when the clutch was engaged, a redundancy when the set screw is considered. I also asked about removal of the bearing with hydraulic pressure , concentrating on how tight the brass plugs were in their holes. He responded that the plugs were very tightly driven in, and doubted that hydraulics would be successful in forcing them out.
With the above in mind, I decided to put the assembly back together the way it came apart. It ran for 54 years like that, it'll run another 54 years. Now it's back to the electricals. I also have to get some longer belts, the B-94's are too short, and B-96's should work, if not, I'll put some risers under the rails to make them work.(I go this every time I change a motor, I can never get the belts right on the first go around.)
Harry

Like this post **Reply** **Reply With Quote**

10-05-2008, 06:23 PM #20

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Finally got to run the lathe yesterday. Although the top speed is 1000 RPM, I only took it up to 600, I'm still a little nervous with the 15-1/2" 4 jaw on the spindle. This a quiet running lathe, and I was surprised that it got quieter as the speed increased, which is directly opposite of the noise level on the 16" CY. You could hold a conversation without to much trouble. I suspect that after the oil is changed, this will change. I don't think the oil that was in the headstock was correct; I think it was way oil with a higher viscosity.
The main issue I've been considering lately is the chuck changing system, which is proving to be a little more involved that I expected. There have been a few suggestions made, the most interesting being an articulated arm, which definitely beats the way I conjured up. All it needs is a little refinement.
Sorry, no pictures at this time.
Harry

Like this post **Reply** **Reply With Quote**

10-05-2008, 09:48 PM #21

9100
Diamond

Join Date Nov 2004
Location Webster Groves, MO
Posts 5,996
Post Thanks / Like
Likes (Given) 1417
Likes (Received) 2317

Chuck and work changing

Here is the jib crane I use for chucks and heavy work on my Sheldon lathe. It is made of 4" I beam, the hinges are blocks bolted to an I beam column and the 500 pound electric winch is on a trolley. I haven't repaired the plaster around the hinge mounts because I want to change them to allow a wider travel. The reel is a standard drop cord reel with the ratchet removed so it pays out and takes up cord as the trolley moves. The only complaint I have is that the lock on the crane that stops motion when the power is off is too coarse and I wind up jogging the chuck up and down trying to line it up. In case someone wonders, I don't use two chucks at once. I didn't want to take the 4 jaw off right now, so I picked up the 3 jaw to illustrate.

Bill

Attached Thumbnails

beckley23
Titanium

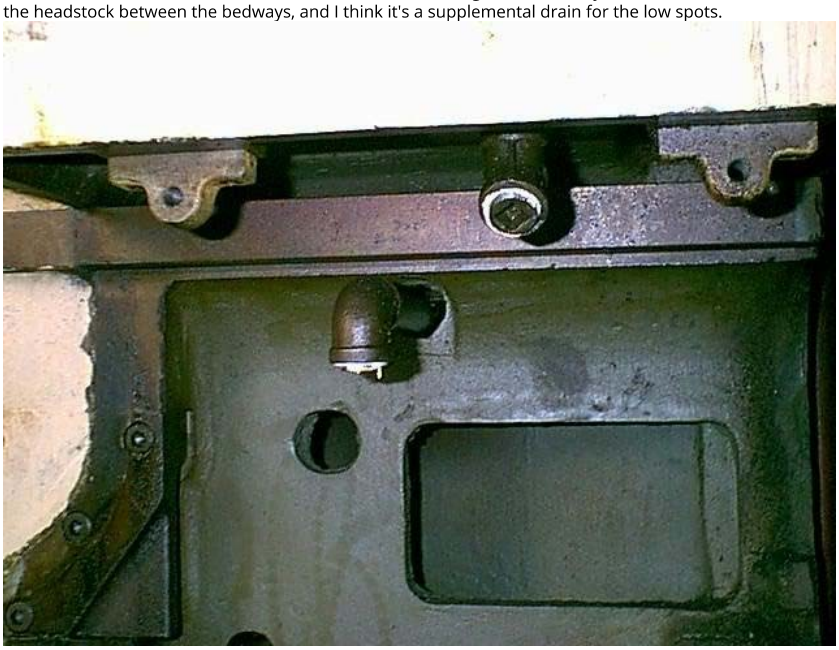
Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Bill,
I would like to have a set up like that, but right now I can't justify it with the type of work I do.

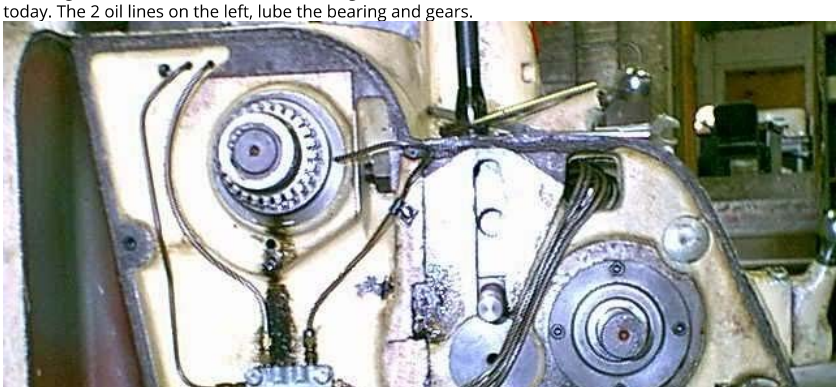
The servicing of the lathe began today. This is best told with pictures.

The 15 HP Baldor motor in its new home. Notice all the extra room with the smaller frame size.

The 2 drains on the rear of the headstock. The one on the right is at the very rear, and I think it's the main drain, the one on the left connects to the headstock between the bedways, and I think it's a supplemental drain for the low spots.



The end gearing has been removed to more effectively expose the oiling system. There are 2 manifolds feeeding a total of 7 meter units for the gearbox. 6 of the meter units are visible, and I'll show the 7th in the next photo. Notice the black oil slick under the spindle stud gear. There are 2 other gears on the other side of the casting, which forms a bowl next to the headstock. I couldn't find the drain hole last week, but I found it today. The 2 oil lines on the left, lube the bearing and gears.



The 7th meter unit. To replace it, I would have to remove the shifter housing castings on the front of the headstock. It lubricates the right bearing of the C-D-E shaft.

The front of the gearbox with the cover and rack plate removed.

The rack plate with the tumbler attached on the right, and the backside of the front cover on the left.

The meter uunit manifold in the headstock. Thr front tube on the left needs to be redirected towards the rear between the clutch yoke and the casting for oiling the brake fingers. BTW, the brake works great.

Another view of the headstock. All 4 soeed clutches are in neutral. It's pretty dry in there, after the kerosene flush.

Harry

Like this post **Reply** **Reply With Quote**

10-07-2008, 04:07 AM #23

quasi
Stainless

Join Date	Dec 2003
Location	Calgary, Alberta, Canada
Posts	1,374
Post Thanks / Like	
Likes (Given)	2
Likes (Received)	75

Harry, regarding the Kerosene flush, did you run the lathe to do it?

Like this post **Reply** **Reply With Quote**

10-07-2008, 04:34 AM #24

peterh5322
Diamond

Join Date	Dec 2002
Location	Monterey Bay, California
Posts	10,260
Post Thanks / Like	
Likes (Given)	27
Likes (Received)	193

"The 15 HP Baldor motor in its new home. Notice all the extra room with the smaller frame size"

AND, you got the connection box (pecker-head) in it, too.

My reading of the electrical prints says the machine was designed for 5, 7.5, 10 and 15 HP, with the one or two higher powers being 460 only, and the lower two powers being 230/460 at the customer's choice.

The limitation, of course, is the "Size" of the NEMA reversing magnetic motor starter.

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10-07-2008, 04:40 AM #25

Steve in SoCal
Titanium

Join Date Oct 2006
Location Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts 2,083
Post Thanks / Like
Likes (Given) 4
Likes (Received) 379

Harry,

That looks really good inside, you have done a half century's cleaning. Do you have anymore issues with the lathe or is the end in sight?

Steve

Like this post | Reply | Reply With Quote

10-07-2008, 04:45 AM #26

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Yes, at slow speeds. Didn't go over 250, but very briefly. Prior to the flush the inside was cleaned pretty good.
It's a risky decision, but the other option was just as bad. I could have set up an external pump and washed it down with the recirculating kerosene, which I consider riskier. The only effective way to clean the inside is to totally take it apart.
I've cleaned several headstocks this way, but not the EE's, with no problems.
Harry

Like this post | Reply | Reply With Quote

10-07-2008, 07:18 AM #27

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The motor is rated 36A at full load. I'm using a 2 speed size 2 starter wired for reversing, and the heaters have been sized accordingly. I have to install a guard on the reserve button, to avoid the accidental push on it, as I found out last Saturday when we were testing the contactors, with the motor disconnected, for proper function. I want to go between high and low without going through stop on the #3 W&S, but I don't want to that on an engine lathe. I can only think of bad things happening. The 2 Bob's(Bob B and Bob G) gave me my options, last Saturday, and the guard is the easiest to implement.
Bob B amp clamped all 3 legs, reading 23 amps, each, at 600 RPM with just the 4 jaw chuck.

Other issues with lathe; won't know till I get there. I do know all the bearings in the TA need replacing.

I do need to get this lathe up and running though. I just got done with the 4th production run of some rollers I make for a customer. I'm getting tired of pulling and pushing the TS on the CY, at least the TS crank on this one will make that part a lot easier.

I never heard the term "peckerhead" used in the context of the motor connection box, which is what I always called them, until about 20 years ago. This "friend", who is as straight laced as they come, never used bad language in my hearing, etc, reeled off the term. I looked at him and asked, "just what are you talking about". He explained that was what electricians called it. I didn't believe him until about 8 years ago when I was in my electrical supplier's office, and I inappropiately used the term in front of his wife. Leo turned red, shaking his head while trying to hide his laughter. He knew exactly what I was talking about, and to make it worse, so did his wife; she was laughing also.
Harry

Like this post | Reply | Reply With Quote

10-07-2008, 07:44 AM #28

peterh5322
Diamond

Join Date Dec 2002
Location Monterey Bay, California
Posts 10,260
Post Thanks / Like
Likes (Given) 27
Likes (Received) 193

"... I never heard the term "peckerhead" used in the context of the motor connection box, which is what I always called them ..."

"... I never heard the term "peckerhead" used in the context of the motor connection box, which is what I always called them ..."

The electric utility folks (from which I got my yearly experience as a newly-minted EE) also call the service entrance "weatherhead" a peckerhead.

The functional relationship with the slang terms "box" and "pecker" is all too obvious.

My take on this is the "--- head" (whether weather-head or that other head, the male appendage one, or any other one, too) soon became peckerhead, as a unique "word of art".

Like this post | Reply | Reply With Quote

10-08-2008, 09:45 AM #29

zeo
Aluminum

Join Date	May 2007
Location	Council Bluffs
Posts	221
Post Thanks / Like	
Likes (Given)	8
Likes (Received)	4

Harry I am currently redoing a model 61X30 regrinding the bed etc. Now that you have the top cover off you might want to check the dog ears on the leadscrew reversing gear train to see if they have also been round off from using it to change the driveshaft direction instead of the leadscrew. It is located under and toward the front of the head. There are only to ears on each side forward and reverse and the sliding coller is the same, so when changing direction there is a lot of slack before engagment and it's easy to round off the ears. Once that happens the driveshaft and leadscrew are now in neutral or they will not stay engaged when under a load.
There is a second oil pump located in the head stock on the back side. It resides behind that L shaped cover next to the oil fill hole, it's driven by a concentric cam which is part of the large on the rightside of the head. The pump is the same style as the other in the head with felt filter in the pickup. It is serviceable with the L cover removed.
That other drain for the headstock drains oil from a small resevior that sits below the brake holds about pint of fluid.
I use a Sky Hook crane to change chucks my old back can't quit handle them anymore. It mounts to an Aloris tool post works slick it will pick up #500. G'day Zeo

Like this post | Reply | Reply With Quote

10-09-2008, 03:40 AM #30

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The single tooth dog clutch is good. The headstock and gearbox pumps are off the machine for servicing, and while I'm at it, the meter units will be replaced.
I've pretty much got the crane details worked out, and will start cutting parts tomorrow.
Harry

Like this post | Reply | Reply With Quote

10-10-2008, 04:20 AM #31

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

A couple days ago I checked prices on the filters and meter units with 2 sources. One quoted prices and the other never got back to me. I was expecting the $14 price on the meters, but I had a very hard time with 21.00 for the filters. In all fairness I don't know if the filter price was for the entire assembly, or just the felt. I decided to go a different way, and ordered the meter units from McMaster-Carr at approx a 40% savings and make my own filters. I think MMC is supplying the Trico brand, at least they look some others I ordered several years ago for my Cincinnati mill, which needed 20+ meters for the manifold in the saddle.

In the pictures that follow, the piece of tubing on the right is the felt cutter. It's made from a piece of 1-5/16 tubing. The ID was bored to about 1.290 and the cutting edge was put on with a file, while spinning in the lathe, on the OD. The tool is twisted/rotated back and forth to cut the felt. It goes pretty quick, but the cutting edge does take a beating, and I was able to get 3 pieces cut. Could probably cut more befrore resharpening, but I only need 3.

The gearbox pump is on the left, the headstock's on the right. The original filters are in front of their respective pumps. I used the cup of oil to bench test the pumps after reassembly. The meter unit on the left is Bijur and the one on the right, I think is a Trico. The casting is from the headstock, and has to be removed to get to the pump. It also has the oil filler port for the headstock. The felt cutter is on the right.

A close up of the pumps and meter units.

A close up of the felt cutter.

The pumps have been reinstalled and the headstock filled with oil. I used Shell Turbo T68, their equavalent of Mobil Vactra Heavy Medium. I tested the headstock, and surprisingly it runs quieter, in all the speeds up to 600. The only problem I have with the oil; it is almost clear, and I have a hard time seeing if it's flowing. The oil that came out of the machine was a dark brown, and definitely of a heavier weight. Who know's what the original owners put in it. I haven't filled the gearbox yet due to future work I need to do, but the pump was tested after installation, to make sure the everything was/is working, by manually working the pump.
Harry

Like this post **Reply** **Reply With Quote**

10-10-2008, 05:07 AM #32

zeo
Aluminum

Join Date	May 2007
Location	Council Bluffs
Posts	221
Post Thanks / Like	
Likes (Given)	8
Likes (Received)	4

Harry what size and weight felt did you use? I had gasket punch of the correct diameter to cut mine.
On the sight glass you could clean the white background with some brake cleaner makes a big difference. There are some cork gaskets which seal the sight glass probable will fall apart on diassembly they are not to pricey from Monarch. G'day zeo

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beleg liked this post

10-10-2008, 06:29 AM #33

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

I used a F5 grade of wool felt, about 3/16" thick. I think the felt should have been a little thinner, it was a bear getting the retaining ring under the keepers.
The problem with seeing the oil is the trickle in the flow view port on the front of the headstock. The only way I can tell if the oil is flowing, is to watch the discharge point too see the drop forming. The level port on the rear isn't too bad. If the oil had some color, this would be a different story.
Harry

Like this post Reply Reply With Quote

10-10-2008, 07:06 AM #34

zeo
Aluminum

Join Date May 2007
Location Council Bluffs
Posts 221
Post Thanks / Like
Likes (Given) 8
Likes (Received) 4

Harry, on my 20" series 61 the oil is pumping hard and fast at max speed about 1000 rpms. I increased the motor pulley size and added a VFD and can run it up to 80hz. At lower speeds I can see it pulsing the oil out with constant flow. I remove the line to the front roller bearing a cleaned with carb cleaner. You may have a restriction in the line is why you are not seeing much oil. G'day zeo

Like this post Reply Reply With Quote

10-10-2008, 07:17 AM #35

Steve in SoCal
Titanium

Join Date Oct 2006
Location Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts 2,083
Post Thanks / Like
Likes (Given) 4
Likes (Received) 379

Harry,

You may recall the fit I had with my K&T with the oil flow sight glass, the line was broken and oil was dripping into it at high speed only. Have you confirmed that the line is good?

Regarding color; put a few drops of ATF in the oil.

Steve

Like this post Reply Reply With Quote

10-10-2008, 07:24 AM #36

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

At 600, which is the highest speed I've run so far, the oil flows good, it doesn't empty out too fast, and builds up in the port. Once I get the feel for the characteristics of the port, I won't be checking very often.
All the lines are clear, that is one thing I make a point of checking.
Harry

Like this post Reply Reply With Quote

10-10-2008, 08:52 PM #37

Cal Haines
Titanium

Join Date Sep 2002
Country UNITED STATES
State/Province Arizona
Posts 3,149
Post Thanks / Like
Likes (Given) 585
Likes (Received) 308

> Originally Posted by **beckley23**
>
> ... ordered the meter units from McMaster-Carr at approx a 40% savings and make my own filters.
> ...

Hi Harry,

I did the same thing for my 10EE, I get over 60 PSI out of the pump with the homemade filter.

I got my meter units from MSC. They look just like yours, and seem to want a ferrule on the input end, where they screw into the manifold. I solved that problem by cutting a short piece of tubing (about .25" if memory serves) and used a ferrule. Were you able to get yours to seal up without the ferrule?

Cal

Like this post **Reply** **Reply With Quote**

10-11-2008, 03:08 AM #38

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The meter units may be leaking at the manifold, but it's pretty hard to tell. They are passing oil at a respectable rate, at least the ones I could see. I did have to change one from a 00 to a 0, today, on the gearbox system. There are 2 lines that go into the "bowl", one oils a bearing and the other is for the gears. I could see some tell tale traces from the bearing, but wasn't getting anything out of the gear tube. That unit got changed, and things are better. I was able to get the suction end of the pump covered without totally filling the gearbox.
The Bijur meter unit has a radiused end on the inout, that I think acts as the compression seal, the "Trico's" don't and I think that may be the cause of the leakage problem. I think an easier solution to that leakage problem would be to put some pipe dope on the threads.
I think I've got seal a problem on the pump on top of the piston. IIRC, there is a very small O ring in there. I may investigate later.
Harry

Like this post **Reply** **Reply With Quote**

10-12-2008, 09:01 PM #39

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Need some ideas

On the pedastal under the bed and headstock, there are 3 doors, 2 on the front and 1 on the back. There is a gap of approx 1/8" between the doors and the pedastal that appear to have some type of sealing material that is bascillay gone. In one spot I was able to get small piece off and it appeared to have some sort of fibers in it. All around the borders of where the material was/is attached, it appears that the adhesive has run, much like Permatex #2 runs, but more freely. These seals need to be replaced. Keep in mind that I do use flood coolant, and these machines will leak oil, so the material and adhesive must stand up to the coolants and oils. I've looked in the MMC catalog, and there are some likely candidates, but I'm not sold yet.
Harry

Like this post **Reply** **Reply With Quote**

10-12-2008, 09:11 PM #40

rke[pler
Diamond

Join Date	Feb 2002
Location	Peralta, NM USA
Posts	5,286
Post Thanks / Like	
Likes (Given)	35
Likes (Received)	271

> Originally Posted by **beckley23**
>
> These seals need to be replaced. Keep in mind that I do use flood coolant, and these machines will leak oil, so the material and adhesive must stand up to the coolants and oils. I've looked in the MMC catalog, and there are some likely candidates, but I'm not sold yet.

I guess that you could go "traditional" and pound oakum in there and seal with hot tar, but I'd just clean it up and run a bead of silicone caulk. Latex caulk might work but silicone definitely will as long as it makes contact with clean sides.

10-13-2008, 01:01 AM #41

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Oops, I forgot to mention that there is no channel, like on the EE, to hold a bead type seal. One edge has to be glued on. These doors do control the access to the leveling screws and the electrical compartment.
Harry

Like this post **Reply** **Reply With Quote**

10-13-2008, 01:26 AM #42

rke[pler
Diamond

Join Date Feb 2002
Location Peralta, NM USA
Posts 5,286
Post Thanks / Like
Likes (Given) 35
Likes (Received) 271

Well, heck, you should've mentioned that you wanted to open these doors afterwards...

In that case I've be tempted to use something like a foam backed with adhesive. The right thickness and hardness would have the doors very well sealed on closing. A lot of the foams available, however, are resistant to either oil or water but not both. A rubber seal could be used if there's enough room behind the door (but not too much) - Buna or Viton are both pretty good for something like this.

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10-13-2008, 01:43 AM #43

Steve in SoCal
Titanium

Join Date Oct 2006
Location Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts 2,083
Post Thanks / Like
Likes (Given) 4
Likes (Received) 379

I think the rectangular cross section closed cell weather strip type material would work, neoprene IIRC is both oil and water resistant.
Something like MMC 90125K31 to 35

Steve

Like this post **Reply** **Reply With Quote**

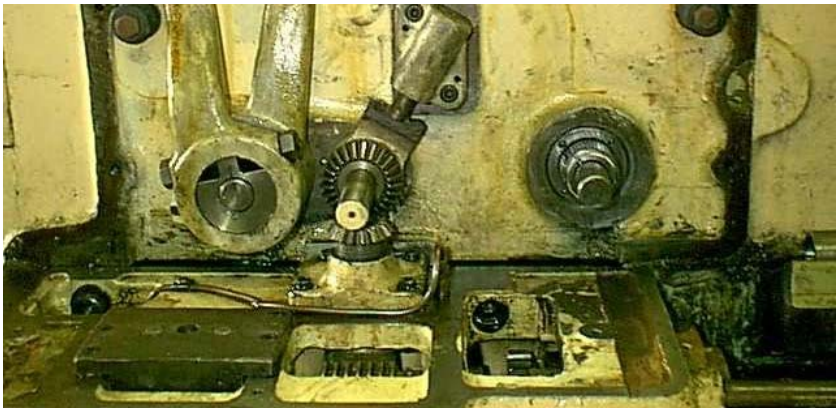
10-15-2008, 03:50 AM #44

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

I've had the top cover off the gearbox for several days, and kept wiping oil off the right front area. Today the puddle was a little larger, and I decided to do some investigating. The speed shifting mechanisn that you don't see is under the covers, and after looking at the manual I found that the covers just pulled off. The shifter shafts exit the headstock under the oil level, and sealed with gland nuts, and what looks like Oakem packing. Never could get the leaks to stop on my 16" CY or the 12" CK, but I significantly reduced the rate. I think John Oder knows exactly what I'm talking about here.
The majority of the problem, on this lathe, is that the gland nuts kept loosening every time the the speed was changed. The question is how to keep the nuts from loosening. I didn't care for the use of Loctite in this application, nor did I like the idea of upsetting part of the threads. The solution I arrived at was to wrap several layers of Teflon tape around the gland nuts in an attempt to increase the pitch diameter of the threads. It seems to have worked, for now.
Some pictures;

Covers removed, and right side tube levers(shifters) removed. The bevel gear set, in the middle, is part of the leadscrew reverse mechanism.
The 6 bumoers, I couldn't find them in the parts manual, apparently limit the travels of the tube levers.



The leaking gland nuts. The are 2 of them, the small one threads into the large splined shifter tube, and the larger one threads into the headstock. The Teflon tape has already been apllied.

A better view of the leadscrew reverse mechanism, and for those of you who aren't familiar with this, I'm going to attempt to explain this.
The large bevel gear is pinned to the shaft, which goes inside the headstock, and is pinned to the single dog clutch shifter yoke. Also pinned to this shaft is a three position detent, which is above the bevel gear. The small bevel gear is attached to the gear segment inside the gearbox, which meshes with the circular gear rack, which is pinned to the reverse rod, that runs the full length of the bed. The motion, left and right, of the rod, comes from the worm which inside the nut casting to the left. The rod's motion is imparted by the lever mounted on the apron; up, neutral, and down, which gives the feed direction.
The gear inside the gearbox, on the right, is attached to the leadscrew.

Harry

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Time for the TA to come off. The tool post, compound rest, cross feed handle assembly, and cross slide come off first, followed by the TA's rear drawbar clamp cover with stud. Then the drawbar and cross feed screw are teased out as one unit. The slide gibs, the 2 flat bars that go on each side of the slide to keep it from rising, and finally the slide and swivel are removed. The TA's bed bracket and draw rod had been removed previously.

There are 6 screws and 2 dowel pins attaching the TA's carriage bracket to the carriage, the 2 dowel pins and 4 of the screws are plainly visible with the TA assembled, but there are 2 screws that are buried, requiring the above disassembly. The screws and dowel pins are marked in white. There are 2 errant marks, they are the 3rd from each end on the top row.

The slide, swivel and shoe came off as one unit.

The cross feed screw and TA drawbar, compound rest and cross feed handle assembly.

Harry

Like this post | Reply | Reply With Quote

10-30-2008, 04:25 AM #46

beckley23
Titanium

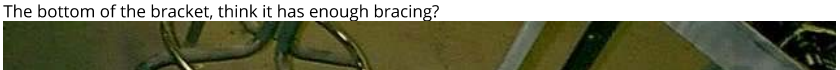
Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

I've been working on the TA, as you will soon see. That puppy is heavy, the carriage bracket weighs a 119 LBS stripped, the slide and swivel are a combined 83 LBS. There is a magnifier and cover in the swivel, sorry no picture, that I used Simichrome polish to remove the oil staining and clear these pieces up. Didn't remove the scratches, but at least I can read the degree scale very easily.
The rest of this post is best told with pictures.
The paint color is Sherwin-Williams Safety Blue. It is a lot darker than the pictures show.

TA carriage bracket ready for reinstallation, but that's aways off. The carriage and apron have to come first.
The little bag in the middle contains misc parts. The horizontal double row ball bearings form the vertical ways for the slide, and the vertical single row bearings form the horizontal ways. Each bearing is adjusted by an eccentric stud, with approx .025" offset(I had to make one).

A close up of one ofthe "hidden" screw holes to the left of the right double row bearing.

The bottom of the bracket, think it has enough bracing?



The shoe, swivel, slide TA draw rod, and gibs. The large holes in the gibs are for the eccentric studs.

The fixed end of the cross feed screw. The top row of parts are in the order they came apart. The previous owners did a very "iffy" repair job. From L to R; The Nyloc nut, to the left below the retainer plate, has a set screw hole one of the faces. Very difficult to find and take apart. The retainer plate is a hack job, the seal was used as a spacer, and was ruined by the nut and should have been on the other end. The spacer as a result is about 3/16" to short, and the 4 sealed ball bearings should angular contact bearings.
The lower row: The new bearing retainer, new spacer, not shown are the 4 7202 angular contact bearings, they're still packed as I'm not to assemble yet. The bearing housing and a new seal.
When I took this apart, the cross feed screw threads were flush with the end of the housing, definitely not the Monarch way, and should be about 1/4" from the housing.

Harry

10-30-2008, 04:50 AM #47

quasi
Stainless

Join Date	Dec 2003
Location	Calgary, Alberta, Canada
Posts	1,374
Post Thanks / Like	
Likes (Given)	2
Likes (Received)	75

the construction and design of Monarch lathes is really something. They never seem to have made a half-assed part , assembly or machine.

Like this post **Reply** **Reply With Quote**

11-04-2008, 03:57 AM #48

beckley23
Titanium

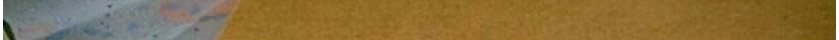
Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

I thought the details of the cross feed handwheel assembly were interesting enough to post this information. For the Monarch people this is "old hat", but there is a twist, at least on the SE60, as I found out.

Details of the thread cutting stop. The top piece is the "cross feed bushing" which attaches to the carriage. Notice the screw in the left side, the end of which can be seen in the bushing's bore, the is the engaged position. The lower piece is the cross feed dial; the 3 plates in the center is the "lock collar assembly", the 2 outer collars heve L shaped tabs opposing each other, and the center collar's tab is flat. There are 2 pins, 180* apart, one of which is visible, which stop the movement. This set up allows allows 2 revolutions of the cross feed screw, and from my experience is very repeatable. When the stop screw is backed out, the cross slide returns to regular operation.

The piece in the upper left is the "cross feed bushing" The piece in the top right is the "cross feed knob". In the knob, the "dial lock screw" is top center, and the 2 pins, 180* apart, extend about 1/8". The ring, center right, I'm calling it a wobble ring (it's not in the SE 61 manual I have), and this is the "twist", rests on the pins, and is between the knob, and the "dial lock ring" on the bottom right. The "dial lock ring" has a tapered OD, and is in the tapered ID of the dial (this is the other side).

A better illustration of the above explanation, partially assembled.



All of the above assembled, and ready for installation to the carriage.

Harry

Like this post **Reply** **Reply With Quote**

11-04-2008, 08:04 AM #49

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

Harry, thanks for posting the pictures. Even though I don't own anything larger than a 10EE, its quite interesting. The dial assembly parts look identical to the square dial dial assembly, just larger.

-Dave

Like this post **Reply** **Reply With Quote**

11-05-2008, 03:02 AM #50

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Dave,
You're about the dial assembly looking just like the EE's. It has been several years since I got into one, although that's eventually coming up on the "Wreck", and I forgot what the internals were like. I'll put the assembly on a scale tomorrow to what it weighs, just out of curiousity.
Harry

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11-14-2008, 06:44 AM #51

single phase
Aluminum

Join Date	Feb 2006
Location	Pennsburg PA USA
Posts	105
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	1

Harry,

I sure have enjoyed your post and all the pictures. Thanks, makes me wish I had time to rebuild more of my 1965 610 monarch.

This is an easy if slightly expensive way to change the chucks. I have found it to do the job very well.

Cheers
SF

Like this post | Reply | Reply With Quote

11-14-2008, 01:21 PM #52

collector
Hot Rolled

Join Date	Nov 2007
Location	Port Coquitlam BC Canada
Posts	648
Post Thanks / Like	
Likes (Given)	11
Likes (Received)	218

Harry you are doing a very good job.When I took my croos feed dial apart I found hair inside the parts I thought it may have been there to hold oil any one know .And on the the cross feed screw bearings .On mine it has thrust bearing stacked up 4 sets .So I thought I would go get some new ones untill I found out that they are high persion bearings at 500 bucks so thats were your sealed ball bearing may have replaced the trust bearings at one time. Know you can see how these machines cost so much in there day .A import lathe only uses a brass bushing to do that job.

Like this post | Reply | Reply With Quote

11-15-2008, 05:17 AM #53

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Thanks for the compliments an encouragement.
I don't have any pictures of the progress this week, as I'm in the process of stripping, actually scraping, the old paint off, and prepping the headstock, bed and pedestals for painting. It's not a task I enjoy, there is a reason my wife doesn't want me anywhere near a paint brush, but I couldn't stand that color.
I did get the jib crane finished and mounted to remove the chuck, and I did find the source of the oil leak on the spindle end. I thought the labyrinth seal was clogged, but it's a bearing cover plate behind the spindle. Should be an easy fix, but I'm going to have drain the headstock oil a little to get below the plate.
Regarding the bearing stack for the cross feed screw, the bearings cost approx 88.00 total. I thought about radial bearings for the stack, but ruled that out, as thrust has to accounted for in this application. Obvisously these aren't high precision, but they should be OK.
The double row bearings in the TA are angular contact bearings. The catalog prices, MSC & MMC for reference, got me calling the local bearing supplier for a more economical solution, which also proved very interesting. He priced the bearings from approx 8.50 to 40.00+ each depending on manufacturer and country of origin. I asked what the difference was, and the answer was "not much". Considering that the TA doesn't move at high speed, a crawl is more like it, and it doesn't get used much, I opted for the cheapies.
I'll keep you posted on progress.
Harry

Like this post | Reply | Reply With Quote

12-21-2008, 12:33 PM #54

M. Moore
Stainless

Join Date	Jun 2007
Location	Vancouver Island, B.C. Canada
Posts	1,547
Post Thanks / Like	
Likes (Given)	32
Likes (Received)	133

> Originally Posted by **beckley23**

The headstock and gearbox pumps are off the machine for servicing, and while I'm at it, the meter units will be replaced.
Harry

Harry, great job on the lathe.
I am wondering why you need to replace these meter units?
Are they faulty? Do they wear out?
It's also very nice to know that there are others out there who are just as crazy(?) as I am. When I was knee deep cleaing up my DSG I wondered about my sanity at times, and then it was done and how sweet it is to turn on the old girl and cut some metal, smooth and precise. I've just finished the oiler and will be posting pics on the DSG thread soon.
Michael

Like this post **Reply** **Reply With Quote**

12-21-2008, 07:49 PM #55

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

When I go through a machine, replacing the meter units is SOP. I don't know if the originals are good or bad, but the machine, in this case, is 54 years old, and I ask myself this question "How much of a gambler are you?" Admittedly, the meter units that have been replaced are relatively easy to get to, but the ones in the carriage and apron aren't, so I convince myself that replacement is cheap insurance.

Not much progress has been made on the lathe since my last post, and I don't expect to get back to it for another 2-3 weeks, at the present time. The next order of work is to get the carriage and apron off, complete the paint prep work on the bed, headstock, pans, pedestals, and then brush some paint.
Harry

Like this post **Reply** **Reply With Quote**

01-28-2009, 05:44 AM #56

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The first 3 pictures were taken shortly after my last progress post in Novenber.
There was and still is an oil seepage problem around the spindle bearing cap and the front intermediate shaft cap. I thought the seepage was coming from the later, but the intervening time has proved me wrong, so I think the leak is coming from the spindle bearing cap.

Another oil seepage spot on the rear of the headstock. I removed the cover, cleaned the surfaces and applied Loctite 515 Gasket Eliminator. Thus far everything is OK.

The rear of the bed where I've been scaping the old nasty "yellow" paint off, Comes off rather easily, there wasn't much prep work done by the original owners. One curiousity I noticed is that the most of the bed sheer has been planed.

It is now time to start the removal of the carriage and apron. The first order of business is to get the leadscrew, feedrod and the clutch shaft removed and/or separated from the apron. IIRC when I did the same thing to the CY 19+ years ago, I removed the right end bracket, and the right plate from the gearbox, wrapped a strap around the reverse shaft, and removed the screws from the carriage/apron assembly and dropped it down and out from the bed. This time I'm removing as much of the shafting as possible in the interest of machine safety, I don't want to break or damage anything. My procedure this time is to remove the 3 shafts while the apron is still attached to the carriage, I'm leaving the reverse shaft in as a lifting point. The leadscrew and feedrod have been removed, and I'm working on getting the reverse shaft out of the gearbox. I will have to remove the right end plate of the gearbox and drop the clutch bracket from the bottom of the carriage, before removal of the apron. I also found out that the threading dial has to removed so that the leadscrew can pulled out of the apron, the thread dial gear isn't going to pass the straight section of the leadscrew.
Incidently my old cameras died, so I'm in the process of learning a new camera(something about old dogs and new tricks)

Harry

Like this post | Reply | Reply With Quote

01-30-2009, 05:35 AM #57

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Getting the feed reverse shaft extracted from the gearbox proved to be a challenge, or I had a case of the stupids(most likely). The shaft is actually a 2 pieces on is short and extends about 1" out of the gearbox and the balance runs the bed length. They are held together by a

coupling with a taper oin in each part. As is usual, the accessible taper pin didn't want to out, mainly because I couldn't get a straight shot at the small end. I removed the dowel pins, you'll see them soon, and then the stupids set in. This shaft is a tight sliding fit in the worm and circular rack gear and usually very easy to pull free, but not the other day. So I clamped channellock on the shaft, I have a channellock just for this purpose, and proceded to work it with a hammer. After a few hits and making marginal progress, I called it quits for the day. Actually I think I was worried about the freezing rain, sleet, and snow storm we were just starting to get. Yesterday was spent digging out. Anyway, while shoveling the driveway, I got the smarts and figured out how to get the shaft extracted from the gearbox.

The feed stop on the reverse shaft locked in place hard against the carriage, and used the carraige to do the extraction, very easy. The scarring on the shaft can be filed off, but I'll always have a reminder.

The thread dial housing in back and the feed reverse nut with the worm partially exposed. The nut and worm give the reverse shaft its axial action and move the reverse gearing in the headstock. The nut is a cast iron housing with a babbit center with threads.

The feed reverse nut is on the left, the circular gear rack on right. The wire is on the gear to keep it from falling into the gearbox when the shaft is fully extracted. The 2 pins are for securing the the worm and gear rack to the shaft. The shaft has been partially extracted and the holes are for the pins. The pins are threaded on one and have an hex broached in the other for a wrench. The shaft was fully extracted afterwards.

I have tried to get the right end gearbox plate off, but I don't I'm think going to be successful. I'll take another look at it, soon.

I have tried to get the right end gearbox plate off, but I don't I'm think going to be successful. I'll take another look at it, soon.
Harry

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01-31-2009, 03:12 AM #58

DaveE907
Titanium

Join Date	Sep 2007
Location	Spanish Springs, NV
Posts	2,367
Post Thanks / Like	
Likes (Given)	155
Likes (Received)	278

If the gearbox design shares much with the square dial 10EE design the right hand gearbox plate can't be removed without removing the gearbox from the lathe. On the 10EE there is a plate screwed onto the rear of the gearbox and it has screws going into the right hand gearbox plate.

It has been fascinating to look over your shoulder as you work on this lathe. Thanks for taking the time to post your progress.

Like this post | Reply | Reply With Quote

01-31-2009, 04:58 AM #59

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Dave, I think you're correct. The parts list shows 10 screws, and I could only find 8, the others are behind the leadscrew and feed rod bearing cartridges, hidden by the bed sheer. Unless something comes up, the gearbox is staying put.

The leadscrew, top, and the feed rod, bottom, bearing cartridges. For the curious, the gears are 8 DP.

The apron is ready for removal. The long shaft on the floor is the apron clutch shaft.

Harry

Like this post | Reply | Reply With Quote

02-10-2009, 05:11 AM #60

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

In my post of 1-27, I mentioned that the spindle bearing cap was leaking, actually it was a seepage problem, a very small one, but aggravating. I'm also in the process of painting, more like slopping paint on, the lathe, and I want to get this seepage problem corrected. The seepage was not coming from the spindle, but from the lower side or bottom of the cap, next to the front intermediate cap(see the picture in 1-27's post). Removing the cap is not as easy as it seems, it's just like the cap on the EE, there's a flange behind the D1-6 end which means that the spindle has to come out. If I had to do that, I would have lived with the seepage, I'm not pulling a spindle unless I absolutely have to.
I came up with the "what if" question: If I removed the 5 screws attaching the cap to the headstock, how much could I move the cap forward in order to get in there and clean the surfaces and apply some sealant and reattach. The net result of this long story is that I called Monarch and spoke to Scott about this issue. Scott suggested that I loosen the bearing preload nuts on the back end of the spindle and move it towards the tailstock. The only problem is that he didn't know how much clearance I would gain, with the bull gear being the biggest problem. I thought of one other potential problem concerning the clutches and how much movement they would allow. There was only one way to find out.
I proceded to loosen the nuts, and remove the screws, I and then I got out the soft face hammer. That didn't work, so I got I my gentle persuader, and an aluminum block, and a few whacks later the spindle was moved about 3/16". I would have liked a bit more room, but I wasn't going to tempt the fates.
The next issue was cleaning the mating surfaces, and there are 4 of them; both sides of the gasket, and the iron faces of the headstock and the bearing cap. I tried a bit carburerator cleaner followed by acetone, and finally blew it out with canned air, the type that is used to clean keyboards. I wanted something gentle and not a blast from an air compressor, which I figured would do some damage to the gasket and no telling what else. The next issue was applying the sealant. I rotated the cap 360*, the intermediate has to be removed to totate the spindle bearing cap, applying the sealant to the bearing cap side of the gasket, pressed it against the cap, and repeated for the headstock surface. This sealant I chose for this application is Loctite 515 Gasket Eliminator.
I next coated the cap screws, under the heads, with RTV. I then drove the screws in and tightened the preload nuts and refilled the headstock with oil. So far, it's been about 6 hours, there are no leaks. I'll see how I did tomorrow, and if no leaks, I'll be slopping some more paint.
I think the original ownershad the spindle out; the spindle bearing cap screws holes were loaded with Permatex, as were the screws. I don't think Monarch used Permatex, at least I've never seen it when I'm the first one to remove a screw.
The pictures don't need an explanation.

Harry

Last edited by beckley23; 02-10-2009 at 07:38 AM. **Reason:** Additional info

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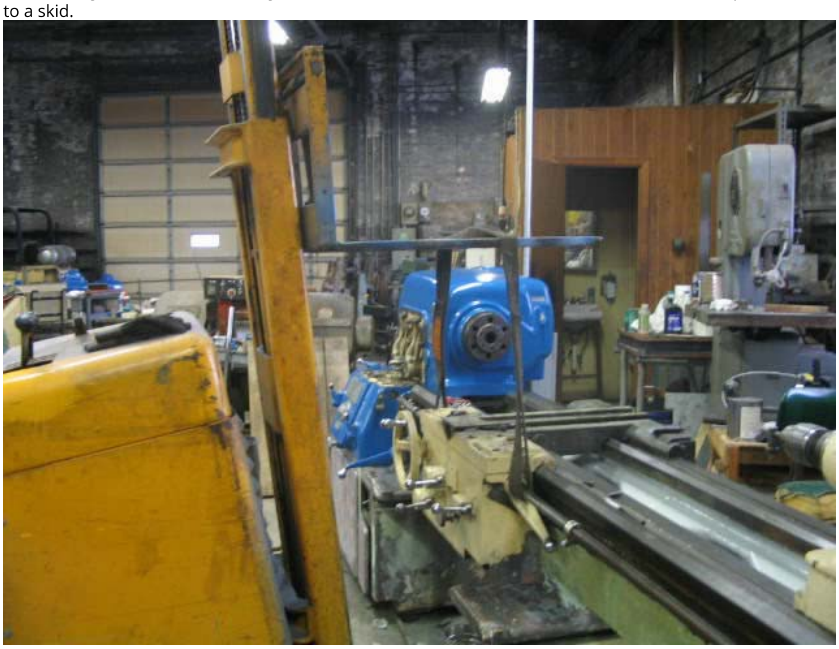
02-12-2009, 04:17 AM #61

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The leak/seepage repair seems to have worked. All that I have noticed is an occassional extremely small bead of what I think is excess Loctite working it's way out.

Today the apron and carriage came off.
The apron rigged for removal. There are 8 screws attaching the apron to the carriage, 4 have totally removed, and the other 4 have been loosen. I put some tension on the strap, and then removed the other 4 screws, then the apron was lowered enough to get clearance for the cross feed gear to clear the carriage, and the forklift was backed out, and moved to the front part of the shop, where the apron was transferred to a skid.



If you've ever wondered why a Monarch's apron has to removed before the carriage can be removed, here's the reason. The gib on the left can only be accessed by removing the apron.

This attempt at removing the carriage had to be rethought. There was no way something bad wasn't going to happen.

Not perfect, but at least the carriage wasn't out of control. You can barely see the second strap, actually it's one of my truck binder straps. The front strap was relocated to the intersection of the bridge and the wings, that's the reason for the 2X's.

Harry

Harry

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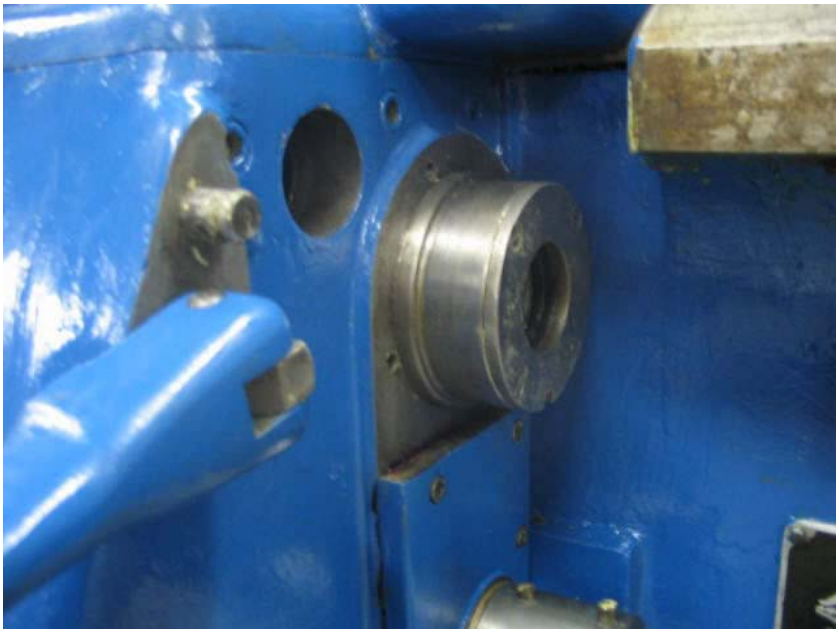
02-17-2009, 04:09 AM #62

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

There is a bearing cartridge for the leadscrew that goes into the gearbox and is retained by a cap. There was so much paint and dirt is this area when I took it apart that I never saw the gap between the cap and the gearbox, but I saw it today. Checked the manual and there is supposed to be "Linear O ring" between the gearbox and the cap. The question of the day is this a special type of O ring, or just a 50 year old name for an O ring? The gap is about .050", and the ID of the O ring would be about 3-7/16".



Overall view of the bottom of the carriage. There are 8 meter units that I've found, so far.3 are in the apron section and 5 are in the bridge section. The bridge was almost a solid mass of grundge. I excavated most of the junk out, being about as delicate as a dentist excavating an impacted tooth. There still a lot more cleaning to do.

I'm not to encouraged by what I've found so far, I do believe there is more to do than I hoped for; maybe a little Multifil 426. I'll be running some checks over the next day or so.
Harry

Like this post | Reply | Reply With Quote

02-17-2009, 05:41 AM #63

cobalt blue
Aluminum

Join Date	Sep 2006
Location	Texas
Posts	81
Post Thanks / Like	
Likes (Given)	1
Likes (Received)	2

Linear O-ring

Linear is indeed a brand: Linear Incorporated State Rd. & Levick (sp) Philadelphia Penna

They put out dimensional data for installation of std sizes of Linear O-ring packings in 1944. Don't know if they are still around. Drawing no 1821.

With a .050 gap you probably want an .070 cross section O-ring. I dont see the exact installation gland in the pics.

Size 043, 3 1/2 Nom ID, actual ID 3.489
Size 042, 3 1/4 Nom ID, actual ID 3.239

O-rings are generally sized to stretch if installed in an OD gland,
and conversely to compress slightly if installed in an ID gland,
this aids during assembly to prevent damage as the O-ring is compressed as the parts mate during assembly.

This application appears to be a face type seal from your information so you select a size that will stay in place while you assemble the parts.

Stan

Like this post | Reply | Reply With Quote

02-17-2009, 05:47 AM #64

cobalt blue
Aluminum

Join Date	Sep 2006
Location	Texas
Posts	81
Post Thanks / Like	
Likes (Given)	1
Likes (Received)	2

O-ring elastomer

You will want oil resistance and whatever else it sees, probably 70 Durometer, Nitrile. Viton should work also. Just tell the guy or gal at the seal supply house what the fluids are and they should be able to fix you up.

Stan

Like this post | Reply | Reply With Quote

02-17-2009, 06:31 AM #65

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Stan,
Thanks for the information. This shouldn't be hard to find.
Harry

Like this post | Reply | Reply With Quote

02-18-2009, 04:49 AM #66

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Rechecked the leveling I did shortly after moving the lathe in. I was pleasantly surprised to find that nothing had changed, either longitudinally or transversely. The leveling was done using the flat ways. The recheck was done in preparation for a more thourough assessment of the carriage. In an attempt to determine the amount of wear on the inside face of the front V way, I set up the loaner King Way Alignment Tool (KWAT), using the inside ways as the datum plain. Either I'm using the KWAT wrong, or this tool is highly overrated. I could not get any repeatability checking levelness, when double checking the reading. I did not have any problems using the Master Precision Level, although it did take a bit longer. I finally set up an indicator on the TS using a mag base and cranking the TS back and forth. One has to be careful about cranking, there are some pitfalls. I finally disconnected the crank and just pushed the TS about 7', which wasn't easy on a dry bed. The results are approx .007" wear on the inside front face, and about .003" on the outside face. It's a little more than I expected, and hopefully this won't be too much of a problem.
This was prompted by the condition of the carriage. I think most of the oil lines are clogged, and there is, visibly, what appears to be a lot of wear on the V slide. I do believe there is going to be a problem with the oil pump.
I did get the carriage a lot cleaner today, and there are 8 meter units, all 00 size. If I have to replace the 3/32 brass tubing for the lube lines, I've got quite a bit on hand. I bought about 100' 20 years ago when I was working on a B&S mill, and stashed it away and forgot about it, until I saw those tiny lines. All I need are the compression sleeves.
Anyway a couple of pictures. The first one is the KWAT and the MPL. And for the member who was giving me a hard time about the brightness of the blue, it's the flourescent lighting. I darkened it up a bit, but not quite enough, to get the color a bit closer to the way I see it.

Bridge area of the carriage is a lot cleaner. Notice the oil hole in the inside flat slide. If I understand Monarch's design the inside flat slide is not supposed to bear on the way. Maybe they were anticipating the carriage wear.

Harry

Like this post | Reply | Reply With Quote

02-19-2009, 05:13 AM #67

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

I am attempting to determine the amount of wear in the carriage, and not meeting with much success, so far. The carriage was put back on the bed and moved towards the TS end, where the least worn portion of the bed is. The leadscrew was also re-installed along with the carrier bracket, to support the screw, and get most of the sag out. I then used a height gauge to measure from the bottom of the carriage to the bottom of the screw, and repeated the process on the headstock end. So far, I'm good. Next the screw was placed in the apron and the half nuts closed, locking the screw in position. Measurement was taken from the top of the apron to the top of the screw, and knowing Monarch, this should be a nice round number, in 1/16th's, 1/8th's, etc. and it was. Now the troubles began. After subtracting the screw diameter from the first measurement, the dimension should have been less than the second dimension. It wasn't, it was more, by about .012", definitely not what I was expecting. These measurements were repeated a couple times, in case I goofed, I hadn't. Next I placed a V block on the unworn sections of the bed by the headstock and the tailstock, and measured the screw distances again. What an eye opener, there was approx a .012" difference. Keep in mind that the gearbox and the end bracket are keyed to the bed. I next took the same measurements on my CY, a lathe I've

difference. Keep in mind that the gearbox and the end bracket are keyed to the bed. I next took the same measurements on my CY, a lathe I've had for 20 years, you guessed it the same discrepancy, only the ends are reversed. For a sanity check, I called another forum member and explained the problem. He suggested that I check using the feed rod as the reference, which I'll do tomorrow.
Anyway some more pictures, the first and last ones have already been described.

Notice the amount of clearance between theinside bed way and the carriage, approx .003"
on the TS end, which decreases at the headstock end. The inside flat way exhibited the same type of clearances. The white denote the strap position for balance, I also stabilized the carriage front to back to keep things "safe". The carriage weighs 212 LBS.

Harry

Like this post | Reply | Reply With Quote

02-19-2009, 06:30 AM #68

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

Harry, do you have access to an autocollimator?

For a long bed like this my inclination would be to set up an autocollimator on the spindle axis, then use the tailstock base as a platform to measure the bed alignment and twist.

-Dave

Like this post | Reply | Reply With Quote

02-19-2009, 07:50 AM #69

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Dave,
No access to an autocollinator. The bed was checked in several spots, in both directions. It is as level as I can reasonably get it. The only thing I haven't done, and probably won't, is spot the bed.
Harry

Like this post | Reply | Reply With Quote

02-19-2009, 12:07 PM #70

M. Moore
Stainless

Join Date	Jun 2007
Location	Vancouver Island, B.C. Canada
Posts	1,547
Post Thanks / Like	
Likes (Given)	32
Likes (Received)	133

Just to make sure I got it right, I had to put my own dimensions into your problem. So for simplicity the carriage to bottom screw measurement = 5", the leadscrew = 2" diameter, which equals 3" of theoretical space from apron to top of leadscrew.
While you say that the apron to top of leadscrew = 3.012?
If I have got that right then why should it be less than 3"?
Wouldn't the wear in the leadscrew and the halfnuts account for this?
Sorry for the dumb questions but I would like to understand this and maybe do the measurements on my lathe.
Nice job on the paint as well.

Regards,
Michael

Like this post | Reply | Reply With Quote

02-19-2009, 02:59 PM #71

macona
Diamond

Join Date	Jun 2006
Location	Beaverton, OR
Posts	5,459
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	50

The wear on the lead screw should be all on the faces and very little on the OD.

My EE's saddle was very worn. Worn so much that the flanks of the v way were not even touching the bed. The head end of the saddle was riding on the rounded top of the v way. Guess thats why there was almost no wear on the ways since it had been rebuilt. If I remember the head end of the saddle was sitting about .025 lower than the back.

Like this post | Reply | Reply With Quote

02-20-2009, 05:21 AM #72

beckley23

Join Date	Feb 2003

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The location of the leadscrew is a constant. On this lathe, the leadscrew is 1-1/2" D, the measurement from the top of the apron to the top of the screw is 2-1/2", from the bottom of the carriage to the bottom of the screw should measure 4". Yesterday it measured 4.012", and should have been 4", or less. The additional .012" means I was making an error somewhere in my procedure, or else the cast iron is growing somewhere, which is highly unlikely. I was expecting less due to wear in the bed and/or carriage. When I found what I wasn't expecting, I was very perplexed.
What I didn't factor in yesterday was sag in the leadscrew over a short distance. I learned a good lesson.
Today's adventure;
Yesterday I hadn't cleaned the screw, today it got cleaned. I got tired of handling that filthy screw. While I had it in my CY, I took the opportunity to do a run out check on the OD of the threads with an indicator, which was prompted by the fact that my hand was going all over the place while I was running a paper towel over the threads to get the majority of the WD 40 off. That screw is definitely not straight, in the last 46" of length the travel indicator showed a .030-.040" movement.
I mounted the screw in the lathe, and marked the screw in 2 places 180* apart. I next used a V block and established a dimension at the headstock and tailstock ends for the screw, top of V block to bottom of screw. I also took 2 measurements 180* apart, mostly to check for consistency. I next took the same dimensions next to the carriage, on each side, to establish the amount of sag in the screw. I next took dimensions from the the bottom of the carriage to the bottom of the screw, and factored in the sag. After doing the arithmetic, I arrived at the 2-1/2" dimension. At least there was no growing iron, but I could not come up with any wear either, which is very strange. This machine is 55 years old, it's got to have wear. I can see and feel it in the carriage slides, I can see it in the level readings, but I can't actually measure it. I tried twisting the carriage on the bed, 0 movement, the indicator didn't even give a hint of moving. I'm missing something very simple, what, I don't know. These checks were run at both ends, I simply can't find any carriage drop checking the screw, and it should show up. I can find it checking the inside flat way off the carriage.
Take a close look at the bottom side carriage picture. The paint is worn off the carriage where the inside V way passes underneath, probably from chips getting caught, but it extremely close to contacting the way.
After all this, I have decided that going after this "phantom" wear has got to stop, and I can get my sanity back. I not going to do any major work on the slides, fortunately.
Harry

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02-20-2009, 11:27 AM #73

M. Moore
Stainless

Join Date Jun 2007
Location Vancouver Island, B.C. Canada
Posts 1,547
Post Thanks / Like
Likes (Given) 32
Likes (Received) 133

Oh yes, now I see the problem. The stanley 25' tape measure you are using just isn't accurate enough!
Good luck with the phantoms.
Michael

Like this post **Reply** **Reply With Quote**

02-20-2009, 02:59 PM #74

DaveE907
Titanium

Join Date Sep 2007
Location Spanish Springs, NV
Posts 2,367
Post Thanks / Like
Likes (Given) 155
Likes (Received) 278

Have you checked using the bottom underside of the front and rear ways as references? Don't know about your model but on many precision lathes (for sure on a 10EE) those surfaces were produced to the same alignment and precision standards as the original top way surfaces. It's rare to find them worn or messed up, they are a golden source of datum. Take a look, if they're ground, they're the standard on an old machine, a true unworn artifact of origin.

Hope this isn't a "rebuilt" lathe, seen both scraped and ground where the relationship between the upper and lower bed surfaces was ignored. Not good.

Like this post **Reply** **Reply With Quote**

02-21-2009, 08:02 AM #75

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The whole purpose of the above exercise was to establish the relationship of the carriage to the leadscrew and the feed rod. I was looking for excessive wear in the carriage slides, which I haven't found. If need be, I was prepared to set the carriage up on my #4 Cincinnati and take a cut on the slides, then epoxy Garlock Multifil 426 to the slides followed by scraping. I would need to determine how deep to cut and to allow enough scraping stock on the Multifil so that the 2-1/2" dimension would be restored. As it stands now, and unless I find something to change my mind in the next few days, I don't have to do the above, fortunately.
There simply is not enough definitive information that I can rely upon.
There have been no prior rebuilds on this lathe, a few repairs yes. I can definitely tell that this lathe has had a few problems that were attended to.
Harry

Like this post | Reply | Reply With Quote

02-21-2009, 03:02 PM #76

DaveE907
Titanium

Join Date	Sep 2007
Location	Spanish Springs, NV
Posts	2,367
Post Thanks / Like	
Likes (Given)	155
Likes (Received)	278

If I understand correctly you were trying to to make measurements to the lead screw to determine how much the carriage has dropped from its original height due to wear on the carriage way surfaces. And also wondering if you're missing something.

"The location of the leadscrew is a constant."

True but the lead screw is not positioned with enough precision at manufacture to use it for a datum for your purpose. Its gearbox end location is established through a considerable tolerance stackup of machined interfaces, for instance: bed attachment surfaces, gearbox location surfaces, bore location in end plate and gearbox. Same kind of deal for the tail bearing location although it was simply bolted to some probably gaged vertical postion and pinned. It's simply not necessary to align it to precise small limits because they're quite flexible and as any operator of an old and worn machine can attest to, they still work.

Consider the bracket on your carriage to support the feed rod and lead screw, they're quite whippy.

Your measurements have verified the current carriage altitude will play nicely with the leadscrew alignment so no problem there.

No idea what the original carriage height was from those measurements however. I suspect Monarch did the logical thing and planned on the carriage dropping as the lathe wore and fitted the leadscrew versus half nut heights accordingly. Fit it so the half nuts start a bit high and drop through a long life sweet zone. Similar to the practice of fitting a tailstock axis high at manufacture. The side shot of the carriage on the ways gives me the impression the carriage has dropped a fair amount, the tailstock vee way looks almost in contact with the carriage.

"I don't have to do the above, fortunately."

I'd come to the same conclusion and put it back to work. It's still in the sweet zone and will do nice work.

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02-22-2009, 04:13 AM #77

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Dave,
I'm not quite sure of the meaning of your last post. While I will agree with a few of the statements, I disagree with the rest, mainly the section on manufacturing tolerances. It has been my experience, in rebuilding 2 Monarchs, with a 3rd in progress, and this current rehab job, that Monarch paid attention to the tolerances and alignments of the various components that went into their machines.

Today I put my #4 Cincinnati to work, along with the first use of the vertical head that I've been tripping over for a number of years. I increased the clearances in the V slide groove and inside flat slide by approx .015- .020", and the bed's inside V way clearance by about .040". The milling took 2 set up, the first to get the V slide and flat way and the second rotating the carriage 180* to get the bed's V way clearance.
The V slide completed and the flat slide in process.

The milling completed.

Harry

Like this post | Reply | Reply With Quote

02-26-2009, 08:58 AM #78

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

Harry,
did you see Forrest's post in the General New forum regarding wire sag tables? If not here is a link.

Wire sag table (for the retro aligners)

You can check the bed for wear and leadscrew alignment directly using those tables, you just need a spool of .016" wire and a 30 pound weight.

It would make a great article for HSM...

-Dave

Like this post | Reply | Reply With Quote

03-04-2009, 05:20 AM #79

beckley23
Titanium

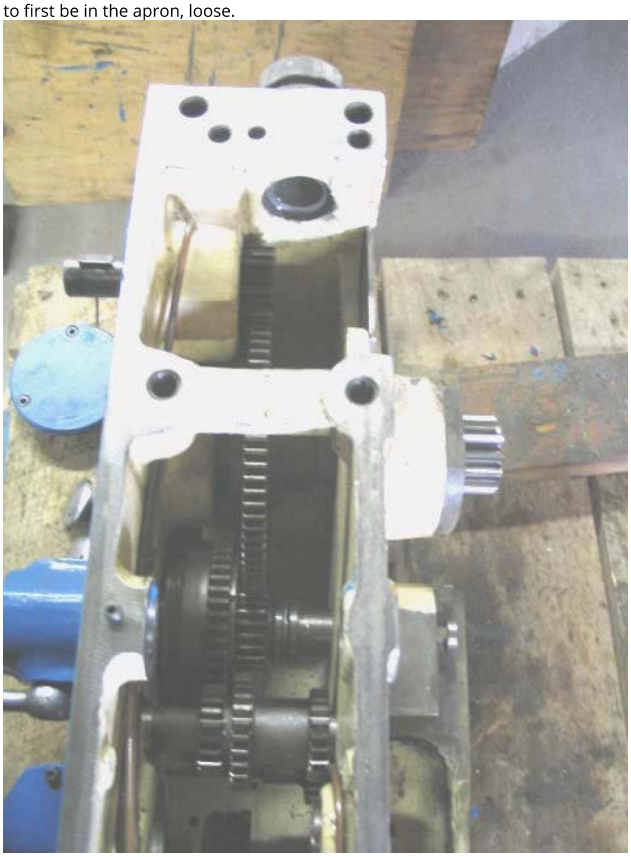
Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Dave,
I saw Forrest's post on the wire sag tables. I saw one of those set ups in a book years ago, and I'm not inclined to go in that direction at this time.
I submitted an article to HSM 3 or 4 years ago. From the response I've had to the project from those that have seen it, and a few that followed through by contacting me, I think it has some real possibilities. I've yet to see the article published, and it's a lot effort that goes into an article.

After milling the clearances in the carriage, I performed the same indicator checks as before, and for the most part nothing changed except the reading from the carriage to the inside flat way. The amount of drop decreased .002-.003", for a net change of .005",an improvement. It also tells me that the inside V way was most likely making contact with the carriage as it neared the headstock.
I have replaced 3 of the steel oil lines with copper lines. These were located under the bridge, and lubricated the rear flat way, 2 lines, and 1 for the cross slide. This carriage has oil lines for the right and left sides for each of the outer ways.

The apron has been disassembled, cleaned up, painted and is in the process of being put back together. I keep forgeting how challenging these are, especially the clutches. There are some strong springs in the feed clutches, and not much room to work with.
One of the 2 chrome plated retaining screws, below, was found when I removed the rack pinion shaft's cover. A nice touch, but I need that screw for the tailstock handwheel, so I substituted a thick washer and a socket head screw. The manual shows a screw with the spanner holes, but I don't think it was chrome plated.

The handwheel pinion shaft has to be installed first. The traversing clutch has to be assembled in the apron, but the large rack pinion gear has to first be in the apron, loose.



The apron's worm with thrust bearings, on right, the drive plate, center, and the driver, left. The respective bushing are behind, with the right side bushing still in the apron.
The driver and the bushing need to be reworked to account for a lot of wear. I'll turn the driver, bore and sleeve the bushing, and then rebore to fit the driver. There is some wear on the drive dogs, that still I'm deciding what the best way to approach them is.
Overall, the apron is in very good condition. There appears to be minimal wear on the worm, worm gear and half nuts. There are a couple of bearings, ordered, that need replacing on the worm gear shaft.
For the curious the worm is a triple start.

Business end of the driver.

Another view of the drive plate and worm.

Harry

Like this post | Reply | Reply With Quote

03-04-2009, 07:35 AM #80

zeo
Aluminum

Join Date	May 2007
Location	Council Bluffs
Posts	221
Post Thanks / Like	
Likes (Given)	8
Likes (Received)	4

Dave I am currently rebuilding(slowly) a model 61. I found a simple method to deal with the clutch reassembly. What I did was to use a 20" Bessey L clamp, short piece of aluminum 1" with a 3/4" id 1" od and compressed the sleeve into it's bore until you can see the tapered pin holes you can align them with a tapered punch. I marked the shaft and sleeve so I could get the taper holes close before the installation, made a tuff job very easy.
G'day zeo

03-08-2009, 05:09 AM #81

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

I assembled the clutch in the apron , except for the sleeve, had the taper pin hole in proper alignment. I then used a wrecking bar and a piece of scrap wood and compressed the clutch, installed the sleeve and inserted the taper pin.

There is a machined flat with 2 tapped holes on the rear of the apron, to the right and lower than the rack pinion gear. Does anybody know what this flat is for? I have my ideas, mainly that it was mount for a supplementary rod carrier, but I'm not sure.
I came up with this idea due to the wear patterns in the worm drive assembly. The bore in the worm appears to be 1.0625", with caliper measurements of 1.065" on one end to 1.090" on the other. The bore in the drive plate is 1.065" to 1.080", and the bore in the driver is 1.010" to 1.020". The feed rod is 1.000" D. The drive assembly does not turn independently on the rod, but does move linearly and turns with the rod. From what I can deduce from the construction, the drive plate and worm were designed with the 1.0625" bore and were not intended to come into contact with the feed rod, but the driver was designed with minimal clearance and to be the feed rod's support in the apron. Due to the length of the rod and the sag, the direction of the wear in the driver's bushing is very indicative of this, my thoughts led to the question. Am I on tract, or is this a wild idea?

A question for Zeo
Did you happen to notice the dimension of the keys in the driver versus the keyways in the feed rod. My driver; the keys are approx 5/32" wide at the base with tapered sides, yet the keyways are 1/4" The driver keys do not look unusally worn.

Harry

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03-08-2009, 05:57 AM #82

pbungum
Hot Rolled

Join Date Feb 2008
Location Oregon
Posts 562
Post Thanks / Like
Likes (Given) 117
Likes (Received) 71

What method are you using to paint your lathe? That blue color looks fantastic.

Like this post **Reply** **Reply With Quote**

03-26-2009, 04:51 AM #83

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The worm drive parts have been rebuilt. A friend has a tenant that specializes in microscopic welding, and I thought that had some possibilities. He used, IIRC, H13 rod to build up the worn areas in the dog teeth of the drive parts. I considered setting the parts in the mill and lathe, but decided to see how I was at free style die grinding. It may not be pretty, but it was a lot faster. The bushing for the driver was bored, a sleeve made and pressed in and then bored to a .002-.003" clearance for the resurfaced driver. I also made a spacer for the bushing, to replace the lost material from wear and refacing, to get rid of the axial slop. The bushing has a locating pin for the spacer, and to prevent the spacer from turning with the driver. Think of it as a bronze thrust washer for a bronze bushing. I'll reassemble the drive in the apron in the next few days to

test everything out, and make the necessary adjustments. I haven't decided what to do about the tapered bores in the worm and the drive plate, but I think this problem should be addressed in order to delay the inevitable wear that will occur.

RE: the paint job. I don't much care for painting, to me it's a necessary evil that I dispense with all due speed. The machine was sanded, stripped, cleaned and painted with a brush. It may look good in the pictures, but I can assure you that a close inspection will reveal how bad a painter I am.
Harry

Like this post | Reply | Reply With Quote

03-26-2009, 08:22 AM #84

Steve in SoCal
Titanium

Join Date	Oct 2006
Location	Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts	2,083
Post Thanks / Like	
Likes (Given)	4
Likes (Received)	379

Making progress Harry; is that the proverbial "porch paint"

Steve

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03-27-2009, 03:57 AM #85

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

No "porch paint" if price is any basis. Besides, I detest painting so much, that it's worth to pay a little more for decent paint, just so I don't have to it again any time soon. It's Sherwin-Williams industrial enamel. Hopefully it will fully cure soon, and stay on the lathe a long time. Hopefully the switch to a semi-synthetic coolant will help. I think the only things left to paint are the pans and tailstock.
Harry

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03-27-2009, 09:22 AM #86

tiptop
Aluminum

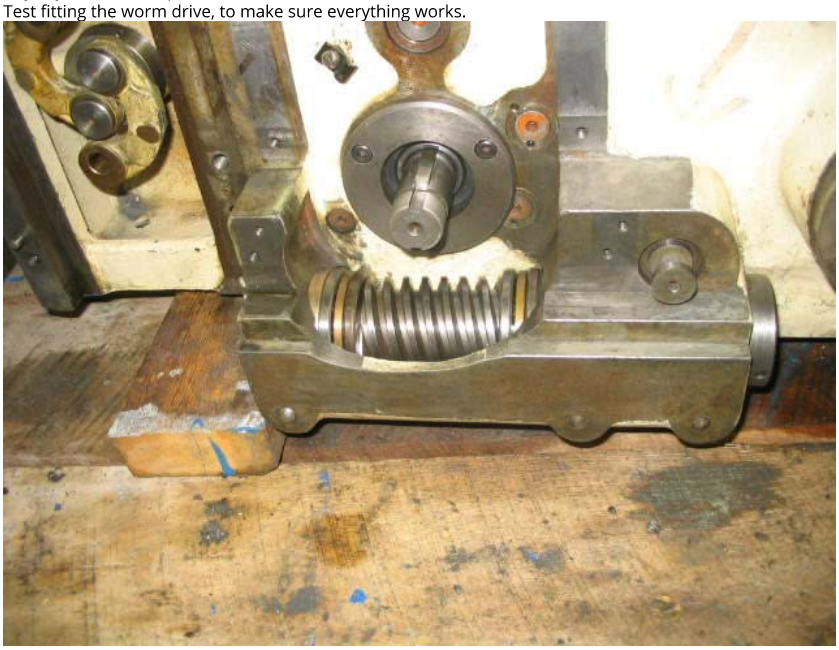
Join Date	Nov 2006
Location	Newport, Oregon
Posts	172
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	0

Harry, If I had known you liked painting so much I would have invitedyou up to help me. I love reading your posts. Jay

beckley23
Titanium

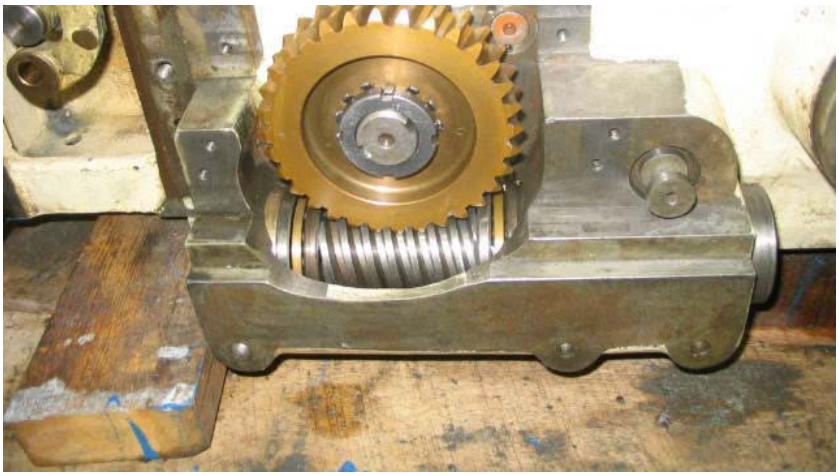
Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Yesterday, I assembled the drive parts in the apron to make sure all was correct. I was checking for freedom of worm rotation and axial movement of the drive components. Rotation was good, however I found approx. .020" axial slop in the worm. Couldn't figure out where that came from, maybe I missed it on initial inspection. I also found a bit of radial slop on the TS end of the worm, approx .010", not enough to worry about, but I got the apron off and apart, might as well tend to it.
I ordered an assortment of 1-1/2" mill arbor shims, with the intention of using the .015" shim to take care of the axial slop(you have to consider how the .020" was measured using a feeler gage on one side, which will skew the amount a bit) and some bronze tube stock.
Remember, that was yesterday.
Today, I bored the worm bushing in the same manner as the first bushing, for the same type of repair, and turned the end of the worm for a good surface, allowing for .002-.003" clearance in the assembly. Once the machine work was done, I tried to assemble the worm, thrust bearings and bushings in the apron. I did "permanently" assemble the TS bushing in the apron. Then I tried to insert the worm, in the bushing. It would barely start, and go no further. I screwed around with this for next hour to no avail. Finally, took the TS bushing out, and removed about .003" from the bore, and polished off approx .003" on the worm. Reassembled the drive, and it finally worked like it should, only this time the .020" slop was gone. The only thing I can figure, is that yesterday I didn't have the taper driven home, and today I did. So, I've got an assortment of arbor shims for my 1-1/2" arbor, that I'll probably never use. Gee, I wonder how we come up with so much stuff, that we never use.
Anyway, some more pictures.
Test fitting the worm drive, to make sure everything works.



Each of the 3 bushings has 2 10-24 tapped holes in the headstock end. I assume the holes are for withdrawal purposes, but I used them with screws inserted for rotating the bushing for the taper pin slot alignment with the taper pin hole. You can see 2 taper pins in the apron, already driven home.

The worm drive is finally assembled.



Harry

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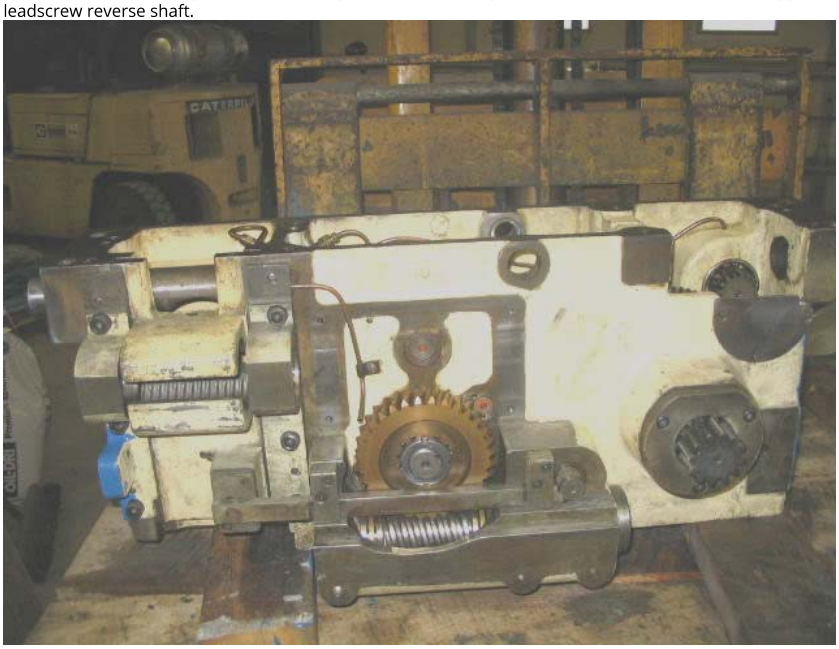
03-28-2009, 11:40 PM #88

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The back of the apron less the cover for the worm gear. The horizontal bar is the half nut/longitudnal feed interlock. Notice the oil drip line over the worm gear coming from the right half nut bracket. Both half nut brackets have wear bushings for the leadscrew. I made new ones from 4140PH, as the originals were severely worn from the sag of the leadscrew. The tube, in the upper left, over the half nuts is for the leadscrew reverse shaft.



Inside view of the apron. Notice the oil distribution lines. There are 2 cams, in there, that work the oil pump. One is on the rack pinion gear shaft, and the other is on the longitudnal feed clutch.. If the worm is turning, the oil pump is pumping. The only gear and shaft not installed yet is the idler for the cross feed. Notice how roomy it is compared to the EE's apron.

Bottom of the apron showing the oil pump and the distribution manifold.

Harry

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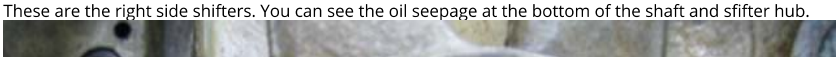
04-02-2009, 04:21 AM #89

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The apron went back on yesterday, a whole easier than it came off. The procedure was the reverse of the removal, using the strap looped on the reverse shaft, lifted by the forklift and manuevered into place under the carriage and raised up, and the screws quickly inserted and tightened. Prior to mounting the apron was filled with way oil. I'm going to try out the Mobil Vacuoline 1409. I better like it, there's still 4-1/2+ gallons left. All the other shafts, leadscrew first, then feed rod, followed by the clutch shaft were then mounted. Power was then applied and the carriage ran back and forth for about 3/4 hour to get the oil pump pumping oil out of the visible openings, the cross slide and cross feed ports, and there was a nice pool under the ways. I'm satisfied with that part of the overhaul.
The leadscrew was the most difficult to remount, it wasn't easy getting it off either. The bearing nut, a new one, did present problems. I do believe the threads on the screw were a bit messed up. I had to move the bearing housing partially out of the gearbox, so that I get my fingers in there to start the nut on the screw, then used 2 channellocks to tighten it. I did manage to get my finger into a pinch point when I was putting the gear onto the leadscrew. Fortunately it's just sore, and not crushed. Just a suggestion; get rid of the sharp edge on the gear's bore, so that it has a starting chamfer to go on the leadscrew, and don't get over eager moving the carriage with the half nuts closed while doing this, a hurt finger results.
In order to do the above, I had to take the front covers off the headstock and the top of the gearbox, and I just happened to notice an oil seepage problem around the speed shifters. This is not an unusual problem with older Monarchs, I think every one I've had has leaked around the shifters, it's just harder to find when the shifters are covered up, as they are on the SE60's &61's. On the C series it's easy to spot, just look under the shifters for the oil seepage.
Left side speed shifter shaft and shifter tube. The center shaft shifts one pair of speeds, the ring on the OD with 2 spanner grooves is a packing nut and screws into the shifter tube, it's the ring around the nut, for the other pair of speeds. The ring with 4 spanner holes is the other packing nut and screws into the headstock casting. The tube and shaft have splines for the shifter hubs. If these nuts are loose, and they can and do work loose, oil seepage will result. The same set up on the right hand side shifters, as well as the leadscrew reverse shaft(with the bevel gear). All of these shafts are below the headstock's oil level. I toyed with the idea of using Loctite on the nuts, but I'm using pipe dope. I think that it will give the correct amount of adhesion, without being so permanent as Loctite. Time will tell.

These are the right side shifters. You can see the oil seepage at the bottom of the shaft and sfifter hub.



Starting to look like a lathe.

Another view. The TA will be mounted after the cross slide is scraped.

The cross slide ways. Both have scoring but the headstock side is worse.

The cross slide has had a couple of run-ins with the chuck.

A better view of the run-ins.

And the cross slide's slides.

Harry

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04-02-2009, 08:46 AM #90

tiptop
Aluminum

Join Date	Nov 2006
Location	Newport, Oregon
Posts	172
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	0

Harry,
I am interested to see how you set up the saddle and cross slide for scraping and fitting. Are you going to move some of that metal back into place from the crash?
Jay

Like this post | Reply | Reply With Quote

04-03-2009, 03:51 AM #91

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Jay, As for the first part of your question, read along, as for the second part, the metal is gone, and I'm not going to make any attempt to replace it.

A few definitions first, for those not famialiar with machine terminology. Ways are the unmovable bearing surfaces such as bed ways, cross slide ways, tailstock ways, that's the top of the bottom of the tailstock assembly. Slides are the bearing surfaces that move across the ways, such as tailstock slides, that's the bottom of the tailstock's bottom, cross slide's slides are on the bottom of the cross slide. Confused, it get worse, there are the guiding and guided slides.The guided slide has the gib, the guiding slide doesn't.

Got the surface plates out today, the 24 X 36 to survey the cross slide and the 18 X 24 to spot with. The cross slide measures 8-3/4 X 23 OAL, and the cross slide ways are 25" long. The survey revealed that this is a very strange cross slide. The slides have some wear, approx .003" as a WAG, but the top when checked with a surface gauge was arched about .005-.008" depending on the side. I did run the BIAX across both surfaces prior to the survey, basically to get the errant high spots from the dings, and other irregularities reduced, or eliminated. My plan is to use the cross slide's slides as a template for the cross slide ways, due to the small difference in length, and an angled straight edge as a cross reference.

The first picture is the 2nd spotting of the slides. The spotting on the lower left side was not there in the 1st spotting.
The 2nd picture is about 12 cycles later. I did 3 more after this, and this section is almost done.

Harry

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04-03-2009, 06:23 AM #92

pbungum
Hot Rolled

Join Date	Feb 2008
Location	Oregon
Posts	562
Post Thanks / Like	
Likes (Given)	117
Likes (Received)	71

Do you have any more pictures of scraping those ways? I'd love to see them, as well as what you are using for a scraper.

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04-03-2009, 10:20 AM #93

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

> Do you have any more pictures of scraping those ways?

C'mon Harry, get the wife to take some pictures of you in action!

Dave

Like this post | Reply | Reply With Quote

04-04-2009, 02:13 AM #94

rke[pler
Diamond

Join Date	Feb 2002
Location	Peralta, NM USA
Posts	5,286
Post Thanks / Like	
Likes (Given)	35
Likes (Received)	271

> Originally Posted by **rimcanyon**
> C'mon Harry, get the wife to take some pictures of you in action!

I don't think Harry's wife has seen the inside of his shop. Not in the past 5-10 years, anyway.

Like this post | Reply | Reply With Quote

04-04-2009, 02:36 AM #95

Knguyen
Cast Iron

Join Date	Jun 2003
Location	Bergen, NJ.
Posts	444
Post Thanks / Like	
Likes (Given)	4
Likes (Received)	1

Some of us may prefer that arrangement!

Like this post | Reply | Reply With Quote

04-04-2009, 06:53 AM #96

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The last time my wife was in the shop was approx 4 years ago, for 15 seconds. At my request, she brought me my wallet, needless to say she wasn't a "happy camper". Took one look around, I guess she laid eyes on the radial arm drill and the #4 Cincinnati mill, they do have a commanding presence, and said you've got a lot more machines in here than I remember. Her previous visit was approx 6 or 7 years prior to that. Nope, I don't think there's going to be a video. It does help that the shop and house are separated by 19 miles.

More pictures of scraping are in the "Wreck Update" topic in this forum.
I'm using a BIAX power scraper, the variable speed, variable stroke model.

Harry

Like this post | Reply | Reply With Quote

04-04-2009, 06:53 AM #97

PDW

Join Date	Jul 2006
Location	Australia (Hobart)

PDW
Titanium

Location Australia (Hobart)
Posts 3,018
Post Thanks / Like
Likes (Given) 421
Likes (Received) 1927

> Originally Posted by **rke[pler**
> I don't think Harry's wife has seen the inside of his shop. Not in the past 5-10 years, anyway.

I KNOW mine hasn't seen even the outside of mine except in a photo, and that's just the way I like it. She doesn't even know that I bought that CY - or a whole range of other stuff...

PDW

Like this post | Reply | Reply With Quote

04-05-2009, 02:23 AM #98

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The post today is primarily pictures of the scraping cycles. I don't like posting these pictures because detail is not very discernible and the changes, for the most part are very minute. The cross slide will be sent out to have the top ground, my grinder is to small for the width, and then I'll reverify the slides for flatness.
The last picture shows the "arch", and I have no explanation for its existense.
This is the last spotting from yesterday. Still not what I'm looking for, even the surfaces are well within .0005" from what I could tell from an unsatisfactory DTI set-up. You'll see what I mean in the today's last picture. The bare areas kept moving around all afternoon. I decided last night to clean the surface plate and apply new medium in as thin a coat as I could.

This is the 1st spotting today. This was lightly scraped as the medium was still a bit to heavy.

This was the 4th spotting, and was not scraped. Instead the medium was wiped off and the surfaces stoned.

This is the stoned surface spotted.

Same as above with the medium cleaned off. These are the surfaces I will as a template to spot the cross slide ways.

These are the indicator readings of the top of the cross slide, the numbers are thousandths of an inch.

Harry

Like this post | Reply | Reply With Quote

04-05-2009, 03:24 AM #99

tiptop
Aluminum

Join Date	Nov 2006
Location	Newport, Oregon
Posts	172
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	0

Harry,

Looks like you have a little work on your cross slide, but it must feel nice to be getting to this stage of the game. I along with the rest of the group really appreciate you taking the time to show all of these process'.

Thanks, Jay

Like this post | Reply | Reply With Quote

04-07-2009, 04:53 AM #100

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The next part of the scraping is getting the angled straight edge tuned up. This one is 23" long, and I don't remember ever using it.(A friend gave me 6 or 8 straight edges years ago, that he absolutely no use for. IIRC, he knew they were machine shop stuff, but not quite what they were used for. He bought them at auction in a lot with other stuff.)
I knew something was wrong with the pictures last Saturday. This is the way the camera sees it.

This is very close to the way I see it, after doctoring the above picture.

Surveying the cross slide ways. The ways were checked longitudinally and transversely. They are high in the right rear and low on the left front, the left side is lower than the right side. The objective is scrape the cross slide ways so that the level reads the same as it does for the bed, in both directions.

Harry

Like this post | Reply | Reply With Quote

04-07-2009, 09:12 AM #101

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

> The cross slide will be sent out to have the top ground, my grinder is to small for the width, and then I'll reverify the slides for flatness.

I had the table ground on my Hardinge mill a few years ago, after scraping the bottom flat to within .0002". The table warped .002". I was not happy. the grinder claimed he used coolant, but somehow I doubt he used enough... It took me another two weekends to rescrape top and bottom. That table is about the size as the cross slide on your 61. Its strange how grinders say "its the natural stresses in the iron relieving themselves", but I find that when I scrape metal off, even .010", I see absolutely no change in the overall geometry of the part. I think its the heat.

-Dave

Like this post | Reply | Reply With Quote

04-08-2009, 03:38 AM #102

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Dave- Thanks for the warning/heads up. I'll ask the grinder about that, especially since I just scraped the guiding dovetail slide. I ground the cross slide of my '62 EE, and several other pieces of CI, wet and not had that problem.

Set up for scraping the cross slide's guiding dovetail slide. Needed to get the slide in such position that I could see it, and not stand on my head.

The 3 holes on the right are for the cross feed nut. The 2 outer are for the screws, the center is an oil galley that oils the nut and screw. There is a hole on the headstock side, that is visible in an earlier picture, with a grease fitting. The hole to the left of the 3, is for the TA's drawbar clamping screw.

Different style of scraper blade. I tried a short straight blade, but there was interference between the cross slide, the BIAX and my knuckles. Probably a good thing, the scraping seemed to go a lot easier.

Harry

Last edited by beckley23; 04-08-2009 at 06:36 AM.

Like this post | Reply | Reply With Quote

04-08-2009, 05:22 AM #103

Steve in SoCal
Titanium

Join Date	Oct 2006
Location	Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts	2,083
Post Thanks / Like	
Likes (Given)	4
Likes (Received)	379

Harry,

Do you see light at the end of the tunnel or is that just a train Was, is this, more than you expected or did you go off on a tangent with getting this "tuned up"?

Steve

Like this post | Reply | Reply With Quote

04-08-2009, 05:26 AM #104

pbungum
Hot Rolled

Join Date	Feb 2008
Location	Oregon
Posts	562
Post Thanks / Like	
Likes (Given)	117
Likes (Received)	71

I am absolutely loving these pictures! Even if you're not excited about posting them, I sure am excited to see them. I find watching someone else work on their projects is almost better than me working on mine. It would be no contest if I could eliminate the guilt I feel taking up so much time on the computer when I could be working.

And as far as MY wife is concerned, she is in the shop regularly, and is a great pair of extra hands. Last week, she spent several hours cleaning old grease/tar our of the saddle of my lathe, while I scraped paint. She almost acts as an enabler at times, though mostly through her neutrality on the subject of me buying tools/machines.

Like this post | Reply | Reply With Quote

04-08-2009, 06:59 AM #105

beckley23

Join Date	Feb 2003
Location	Louisville, KY, USA

Titanium

Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Steve,
I see light at the end of the tunnel, but it seems like it's taking forever. Right now I'm at a section that eats time, scraping always does, but it needs to be done. This is SOP, in my shop, when a lathe is a keeper, from a lesson I learned 30 something years ago. I'll elaborate on this, in a few days, when I get the verbage correct.
The straight edge proved to be a little more difficult than I was expecting, and the dovetail a little easier.
Harry

Like this post | Reply | Reply With Quote

04-10-2009, 06:58 AM #106

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

In my post of 4-6, the caption for the last picture with the level checking the cross slide ways needs to be qualified. The last part about being parallel to the bed ways in both directions would apply if this were a full reconditioning job, ie; the bed scraped or ground, the carriage slides reconditioned, etc, etc. THIS IS NOT A FULL RECONDITIONING JOB.
I started then stopped, scraping the cross slide ways today, and reconducted the survey. The results are the same, what has changed is that I determined that the level readings are mostly the result of wear in the carriage slides. Yes, there is wear in the cross slide ways, and that also contributes to the level readings, but I also checked the height from the top of the dovetails to the cross slide flat ways, and those readings were fairly constant. The different readings I got, did not jump out a say this is excessive, in fact they showed very little difference from side to side or front to back. They basically agreed across the board, so to speak. This caused me to stop and re-evaluate my earlier objective, and to consider the results had I persued that course. My conclusion was that I would be making things much worse, especially in regards to the cross feed screw alignment, plus a lot of additional scraping, not counting the problems with fitting the gib.
I will still use the level as a rough control, but I will not rely on it as the sole arbiter. I will use the cross slide, and the height from the top of the dovetail to the flat ways, as the primary arbiter.
Fortunately, I had only done about 3 scraping cycles, so no great harm was done.
Harry

Like this post | Reply | Reply With Quote

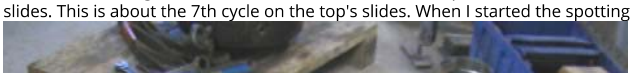
04-12-2009, 02:01 AM #107

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

After consulting with the grinder about the issues that Dave(rimcanyon) raised, about warpage, I decided that it was still in my best interests to get the cross slide ground. I concluded that it was far easier to correct a minor warp rather than scraping .006-.008" off the top. Yesterday he picked it up, today it came back, and the bill was a little over half of the original quote(surprise, surprise, that's never happened before). I conducted 2 tests on each side, the swivel test on the surface plate, and with the DTI. The ground side did not swivel, and the DTI was within .0002", the slide side had a bit of swivel, but the DTI was still .0002". I found the high spot approx in the middle of both sslides and scraped them out. The high spots showed up as bright spots on the scraped surface, and it was relatively easy to see them and pin point scrape them off.
The ground top of the cross slide. I don't particularly care for the feed stripes, but they will less noticable in a few months. The grinder followed my instructions to the letter. I told him to clean it up until the compound rest area way area way good. If the ends don't clean up, don't worry about it. It is flat, there is no warping, bowing, etc.

While I was waiting for the return of the cross slide, I scraped the the swivel slide of the compound rest, and got started on the compound top's slides. This is about the 7th cycle on the top's slides. When I started the spotting was only on the 4 corners.



Harry

Like this post | Reply | Reply With Quote

04-12-2009, 08:02 PM #108

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

30 Something Years Ago

30 something years ago when this was still a hobby, I learned a valuable lesson that has stayed with me, in fact it is SOP in my shop. Whenever I buy a "new" lathe, the carriage and cross slide gets checked out and scraped if necessary. This is all about the ability to cut/part off successfully.
When I was young and dumb, I was trying to cut off in an Atlas 6" lathe, which was essentually brand new. I wasn't having any success at all. I asked a machinist friend if he could help. He took one look at the lathe, used it a bit, and said it needed scraping in. I asked about scraping, and he gave me a very brief description. It went over my head. A while later I bought a 9" South Bend and Connelly's book "Machine Tool Reconditioning". I didn't know what MTR was about, but I read and reread the book and various sections several times until I felt that this was something I could do. I reworked the carriage on the SB, fortunately it wasn't in bad shape, made a square tool post for it, and tried cutting off. What an eye opener, no problems. I quickly found the limits of the SB, and as long as I worked within those limits, no problems. I then took another look at the Atlas, and noticed as I was in feeding, there were oil drops/bubbles coming from under the cross slide. I took the cross slide apart and spotted it on the surface plate, and only 3 corners barely had any blueing. I scraped the entire cross slide assembly as well as the carriage slides, reassembled the lathe, made a square toolpost and tried cutting off. Another eye opener.
I had tried all the remedies that we've read about here and on HSM. Not one of them worked, and yet I keep reading the same crap, all these years later. I guess nobody has investigated the root cause of the problem, rigidity, nor cares too. Scraping is not the total answer to the cutting off problems, but it is the biggest contributor to success, IMO. I have never been able to consistently grind a cut off blade, and still can't, which is the next biggest problem, but I solved that problem with inserts.
I've told a modified version of this story a couple of times in the BBS's, but I guess it's not the easy way.
My friends get on me about my workup procedures, and I explain my reasoning, but all I get are rolled eyes, and "hell, just put it back together and make chips". One of them is/was a machine shop owner, he told me his machinists couldn't cut off, so they just cut the parts long on the saw, and go from there. He came into my shop one day while I cutting off, and was amazed to see the results. I told him the same story. He had bought all new machines, and his machinists couldn't cut off. Go figure.
I've moved on since the Atlas and South Bend, and these Monarchs, Pacemakers, L&S's, etc, etc., are in a different class. I don't think I would have to many problems using the machines as recieved, but I'm not interested in problems after the machine is up and running.
Harry

Like this post | Reply | Reply With Quote

TheOldCar liked this post

04-12-2009, 11:24 PM #109

quasi
Stainless

Join Date	Dec 2003
Location	Calgary, Alberta, Canada
Posts	1,374
Post Thanks / Like	
Likes (Given)	2
Likes (Received)	75

Harry, regarding your compound. On all of the used lathes I have owned, both near to new condition to heavily worn, the compounds have not shown any sign of much use at all. There has been almost no backlash, no grooves worn in the slides, gibs not worn at all or adjustments showing any tightening.

I have never tried spotting the compounds slide surfaces in , so don't know if this would be possible or not.

Is it possible Monarch machined your compounds slides so they would "wear in" before they "wear out", thus increasing the life span of the

slides and the machine?

I have noticed this on the slide surfaces of the carriage on my Harrison L6. I.E. the wings of the saddle and the oil grooves in the slide surfaces show contact wear in the ends of the saddle, both headstock and tailstock ends, but none in the middle 2'3 rds of the slide surfaces.

This makes me wonder if it was not fitted this way at the factory?

Like this post | Reply | Reply With Quote

04-13-2009, 12:44 AM #110

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Quasi,
I've heard those claims for years. They are akin to the tailstocks being left high to allow for wear. I'm not familiar with the manufacturers practices regarding this, but it reminds me of a line from the Brit-Com "Are You Being Served"- it'll ride up with wear. IMO, it's a croc. I had a Harrison L-6 and did not notice the carriage slides having partial contact like yours. I have noticed on Monarchs, South Bends and some others that there is not 100% carriage slide contact, the area under the bridge being non-bearing, but the rest of the slide bearing. The Harrison has a very short carriage bearing on the bed, compared to the SB, and definitely the Monarchs; maybe this is what you're observing.

With regard to what I'm seeing on this compound, I don't think what I started with can be totally attributed to wear, perhaps there is a bit of age related stress relieving, or maybe there was a lot short movements. I'm just dealing with what I find. I wasn't planning on doing the swivel or the compound, it's already been painted, but I had a little free time, and thought I'd check it out. Now, I got a little extra to do. Go looking for trouble, and I'll find it.

With regard to the screw backlash, there is a lot in these Monarch compounds. Almost has to be, considering that the nut is part of the casting. This is not something that has bothered me with the CK, or the CY.
Harry

Like this post | Reply | Reply With Quote

04-13-2009, 02:47 AM #111

9100
Diamond

Join Date	Nov 2004
Location	Webster Groves, MO
Posts	5,996
Post Thanks / Like	
Likes (Given)	1417
Likes (Received)	2317

Harry,

As I have said before in this forum, I spent my teen years wondering why I couldn't do a decent cutoff with my 9" Logan, bought new. An old timer said the same thing about my Logan that you said about your lathe, that it looked like there was sufficient area in the slides, but the fit was poor. With my R15 Sheldon, also bought new, I just make sure the cutting oil is going the right place, hit the power feed and let 'er rip. The only problem I have had is a tendency to bend the cutoff blade toward the chuck a little, maybe .030" cutting off a 4.5" 6061T6 bar. I get the same effect with a HSS blade or an insert. If you really want to chogie with a HSS blade, grind a step in each side, just enough that you get three narrow chips, so they don't jam in the groove. I grind them on a two axis sine chuck on a surface grinder. You have to put in the clearances just like any other tool, so it takes a while, but it pays off in production.

Bill

Like this post | Reply | Reply With Quote

04-15-2009, 03:59 AM #112

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Bill,
I find far more productive to use carbide inserts, I don't have to grind them. I don't do much cutting off on the engine lathes anymore, but I do run these inserts hard in the turret lathes. I can always tell when the insert is getting dull, the cut starts curving. Really gets interesting when you're cutting off 2-1/2" D 1018 at 734 RPM and the inserts starts acting up. Those Manchester inserts ain't cheap.

Spotting the top slide ways, about the 7th cycle. When I started the spotting closely matched the bare area in the 2nd picture of my 4-11 post. Every so often I will check the parallelism on the surface plate. The spotting sequence used the the top slide's slide for 2 cycles, then an angled straight edge for 2 cycles, to get ubder the dovetail. This spoting was done with the top slide. You can see where the tapered gib goes on the left side. It was finished about cycles later.

Checking the parallelism of the guided dovetail way to the guiding dovetail way, which was scraped earlier. I made the dovetail block that the mag base is on, when I did the same check on the 12" CK 6 years ago. The dovetail has 2 raised pads that contact the dovetail face. Notice the nut that is partially obscured by the knob.

I forgot that I took this picture of the raised pads. I used a die grinder to get rid of the excess material after I cut the dovetail.

About the 4th cycle, also a better view of the integral nut. The left side needs approx .0015" scraped off to obtain parallelism. As this prgresses the spotting will start increasing to the right.

Spotting the tapered gib, the gib is held in postion with the block and 3 nails. The big punch is used to seat the gib, firmly, in the assembled compound rest. The smaller punch is used to remove the gib after spotting. The gib was finished about 3 cycles later.

The compound rest is ready for the cross slide. The last operation was surface grinding the top for the toolpost. Size is a little decieving, the top slide is approx 12" long, the swivel base is approx 8-1/4" D X 10"+ long. The compound rest assembly weighs 49 LBS and the cross slide weighs 55 LBS.

Harry

Like this post | Reply | Reply With Quote

04-15-2009, 04:10 AM #113

tiptop
Aluminum

Join Date	Nov 2006
Location	Newport, Oregon
Posts	172
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	0

Harry,

This is a nice charter to a book here. I realize that it is not a full reconditioning but it is certainly a lot farther than I will have time to do to my Monarch. I really enjoy this thread and want to thank you for it.

Monarch. I really enjoy this thread and want to thank you for it.

Jay

Like this post | Reply | Reply With Quote

04-16-2009, 04:26 AM #114

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Jay,
I have searched for words in the past when presented with your situation, and I just don't know what to say except to wish the best.
I'm glad you are enjoying this topic, and I think you will really enjoy your Monarch. When they are "tuned up", there's not much that can touch them.

Todays post is a bit complicated. I'll start by saying that Monarch works with some very tight clearances, where you least expect them, at least on this particular lathe.
The original clearance between the cross slide and the carriage in the area between the dovetails must have been no more than .003". The cross slide was in contact with the top of the dovetail ways. In addition the wear difference between the headstock way side and the tailstock way side, was about .002", as measured from the top of the dovetails to the ways with a dial depth gauge, and very consistent. I know I didn't scrape off very much on the cross slide's slide to get them flat, the time was spent in getting them into shape to use as straight edges.
Once I discovered the that above contact was being made, the hard part was deciding which way to attack this problem. One avenue was to remove the material, about .015" from the top of the carriage, but that would have necessiatated the removal the carriage, or scraping it off, and reworking the TA drawbar, none of which I was not interested in doing. The other avenue was to remove the material from the inside of the cross slide, which is the avenue I chose.

The first spotting of the cross slide ways with the cross slide. This is definitely not what I expected to see. There was no spotting on the headstock side of the ways. This was when I discovered the contact between the cross slide and the carriage, and was not scraped.

The cross slide set up on the #4 Cincinnati for removing approx .015" from the interior to provide the clearance. This will require 3 passes, and one reset of the cross slide for the tapered gib side. There is a fly cutter in the holder, that cuts a 3"D approx.

The center cut has been made, and this is getting the guiding dovetail side. The cross slide was reset for the guided side to account for the tapered gib.

This is the first spotting with the reworked cross slide. Notice the big difference in the spotting pattern on the guided side, from today's first picture. There is some spotting on the guiding side, mostly under the dovetail. I've darkened the picture some, and you've really got to look for the spotting. It's mostly next to the dovetail's edge.

The picture is a little blurred, but this is how I get the cross slide on the ways to spot without cutting off fingers. It ain't easy.

Progress is being made. This is about the 9th cycle. To speed things up a bit, I used the angled straight edge for several spottings on the tailstock side to get the bulk of the material off and to equalize the heights between the 2 sides. The rest of the spottings will be to improve the bearing surface, and will mostly be done using the cross slide. Checking with the depth gauge, it's closer than it looks.

Harry

Like this post **Reply** **Reply With Quote**

04-16-2009, 06:46 AM #115

Steve in SoCal
Titanium

Join Date	Oct 2006
Location	Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts	2,083
Post Thanks / Like	
Likes (Given)	4
Likes (Received)	379

Harry,

I know this is a loaded question but, how long would it take somebody who has good bench work skills ie filing and such to feel comfortable scraping in a productive manner?

Steve

Like this post **Reply** **Reply With Quote**

04-16-2009, 07:29 AM #116

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Steve,
You're right, that is a loaded question. Don't know.
I don't consider myself to be a particularly productive scraper, I don't have any deadlines to meet. I don't think my scraping is particularly pretty, but I manage to get very accurate machines when I'm done. I think coming up with a sequence of events is very important, and having the necessary tools is also high on the list. Ad libbing something, or getting in a "hurry", can be costly in time wasted. That's happened a time, or two.
Harry

Like this post **Reply** **Reply With Quote**

04-17-2009, 04:36 AM #117

beckley23
Titanium

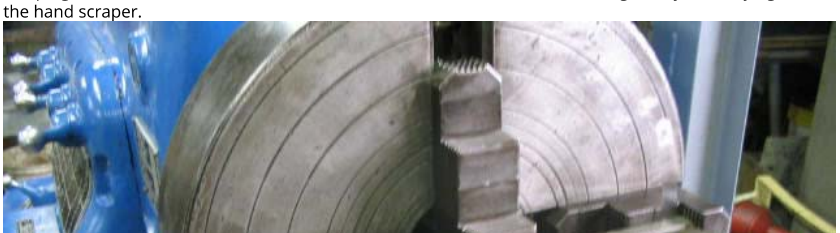
Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

One thing I forgot to mention about scraping gibs, is to make sure both sides are checked. There can be slight changes in the dovetail angles, after they have been scraped.

Got the flat ways finished up today, sorry no picture, the spotting was too faint to show up. I could hardly see it, but it was there. The cross slide is out of parallel to the bed ways by about .0015" longitudinally and .005" transversely, from what I could determine using the level
The next step is to take care of the guiding dovetail way, which has to be square to the spindle to .0005" concave/12". This necessiated the mounting of the 4 jaw, and indicating a parallel to be square. This is done by rotating the chuck 180*, and making any necessary adjustments so that a 0-0 reading is obtained. This is also means I have to mount the job crane to mount the chuck.
Don't laugh at my crane, I'm not exactly tickled with it, and I do need to remount the winch so that I can get rid of the bucket to stand on.

Indicating the parallel. I had to put a .0015" shim under the parallel to get the 0-0 reading.
I also made sure the parallel's face was square, you will get false readings if it isn't.

The test is done by starting the cross slide in the above position and moving it to the rea in this picture. It's convex about .005". I've got a lot of scraping to do. The BIAX isn't the easiest tool for me to use when I half standing on my head trying to see what I'm doing. I just may have to use the hand scraper.



Harry

Like this post | Reply | Reply With Quote

04-17-2009, 07:38 AM #118

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

Harry, I've been enjoying this series a lot. Especially since your progress is so rapid. By comparison, I started on my fp2 about 6 weeks ago, and have only got the column and one of the headstock ways done - I still have the knee and saddle to go. For me, it will be a 4 month project to recondition a machine, but I only get to work on average one day each weekend. If I am lucky. Another thing I have enjoyed seeing in your pictures is something it has taken me a long time to learn: the right amount of spotting compound. I tend to use too little, and it makes the scraping take much longer, since I am working only the highest spots. Thanks for all the pictures and progress reports.

-Dave

Like this post | Reply | Reply With Quote

04-19-2009, 07:59 PM #119

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Dave,
It's taken me a long time to learn the right amount of marking compound to use, and I have to relearn it every time I do a machine. I use the Canode product, and I learned not to apply too much, I only get smeared spottings, so I use less and recharge the surface plate, straight edge, or template more often. I become very stingy on the recharge as I get nearer to the finish, don't need any oops.

The scraping of the dovetails is very difficult, physically. It's very hard to see what I'm doing, and I'm twisted like a pretzel. I'm not able to do this for long periods with out taking some breaks, and letting my back relax. Don't need any back spasms, and I came dangerously close yesterday while moving the cross slide from the lathe to the bench. The BIAX is more a hindrance than a help; I have a very hard time controlling it, so I'm using the hand scraper to do these dovetails.
The progress is very slow for the time spent. I've checked and rechecked my clearances, thinking I'm getting some interference somewhere, I've tried the red Canode, hoping to see the spotting better, which was less visible, so back to the blue. I've checked the guiding slide of the cross slide, which I'm using to spot the dovetail way, and improved it's bearing surface, etc., etc.
I did do one check of parallelism/squareness from the guided dovetail way which was very revealing, and truly surprising. That way needs some attention, but I did get what appears to be a 0-0 reading for squareness. The tapered surface for the gib in the cross slide appeared to have a crown in it when I indicated it in on the mill the other day, that will be rechecked soon.

This is about the 7th spotting of the guiding dovetail way. At this point about .003" of material has been removed from the 1st 18" or so. After this spotting the progress gets extremely slow.

This is about 5 cycles later, and the spotting is mostly staying on the end and very sparse isolated high spots. This is one of the exceptions. There is still about .0015" to go.

The first 2 pictures were taken Friday, this is from late Saturday morning just before I called it quits for the day. This is about 10 or so cycles later, after a fresh coating of spotting compound was applied. It looks encouraging, but is a bit to heavy to be reliable. It was very lightly scraped, and probably shouldn't have been. The very next spotting showed very few high spots, which are mostly on the end. At this point the way is only few tenths from 0-0 and I should start woking on bearing surface(as if I haven't).

Harry

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04-23-2009, 06:11 AM #120

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

After my last post, I figured getting this CS scraped in would be a "piece of cake", how wrong I was.
I fell into the trap the Dave(rimcanyon) mentioned, not using enough marking compound on the tool. When I'm very close to finishing way, or slide, I don't want a lot of compound on the spotting tool, and the nearer I get, the less I want. When circumstances require, I do recharge the tool, but I'm stingy. As this worked out, I had 0-0 readings on Monday using the CS as the spotting tool, however if I used the small dovetail block things were a little different. The block showed what I think were 0-0 readings but the needle was bouncing all over the place from -1, -2, +2, etc, etc, in no particular order. What I determined was happening was that the block was reacting to all the surface irregularities, and needed further improvement. In addition when I recharged the tool, I would get some questionable spotting, with one basic result. I would get spotting like you see in the picture below, but on the next cycle, the spotting would mostly be on the rear half, behind the oil slot, with a very few spots on the front half. Being the optimist, I continued this routine for some time thinking that the next spotting would be it, after all I very close. Eventually I figured out that I was victim of my own optimism. There were a couple of factors that contributed to this; I was scraping in a very awkward position and could not see to full advantage what I was doing, the lighting was not the best, and I had to take breaks and give my back a rest.(I was contorting myself in ways I thought had vanished years ago, old dogs relearning old tricks). Once I figured out what was going on, I took corrective actions and things improved.
As I progressed, the indicators readings using the small block settled down to a stable +- .0005" or less, and very stable 0-0 readings. The readings with the CS stayed at 0-0 through out. Once I was satisfied that the guiding way as good as I could get it, without spending a great deal of additional time, I turned my attention to the guided dovetail way. The small block indicator reading were a surprise, they were basically 0-0, with a few minor glitches, 3 scraping cycles and all was good.

04-23-2009, 10:04 AM #121

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

> There were a couple of factors that contributed to this; I was scraping in a very awkward position and could not see to full advantage what I was doing, the lighting was not the best, and I had to take breaks and give my back a rest.(I was contorting myself in ways I thought had vanished years ago, old dogs relearning old tricks). Once I figured out what was going on, I took corrective actions and things improved.

Harry, nice description of the problem. I keep thinking, I know what I'm doing, and scraping has a way of fooling me every time. It's a very humbling experience, takes a lot of persistence to recognize errors and avoid shortcuts, and often it is tired muscles and bad lighting or difficult positioning that make it near impossible.

I've learned a few tricks that help me get around problems though: when I use the straight edge I take pains to set it down flat, with a bit of weight at one end so it won't rock. When I mark the high spots I only slide the straightedge once, about 1/4" - 3/8", pushing from one side with a bit of downward pressure to keep it from rocking. If I slide it back and forth, it will likely rock on the high spots and give a false reading. I also find that putting a dial indicator on the straightedge and trying to rock it from all four corners will pick up even the slightest high spot.

-Dave

Like this post **Reply** **Reply With Quote**

04-24-2009, 02:30 AM #122

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Dave,
I think we now know why we don't do this for a living, we would starve to death.
I tried all your suggestions, but nothing helped. I did most of the spotting with the CS, because I was not able to get the straight edge to seat right, most of the time. It was hitting on part of the relief groove, I ground it out with a small cut off wheel and a die grinder, but I could never pin down where the problem was with it. The guided side good with the straight edge, go figure. The only solution was to hold the straight edge a little higher instead of resting it against the groove. It was a real PITA, but it also proved out the CS's spotting.
Harry

Like this post **Reply** **Reply With Quote**

04-26-2009, 05:19 AM #123

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

With the scraping completed on the cross slide ways, it was time to remount the taper attachment, and get a another skid off the floor. Getting 16 ball bearings all aligned and turning is no easy trick, and I sure don't remember the CY, or the CK, being as onnery as this one was. Maybe I pulled out one too many goals, such as getting the slide level with the bed. Not so difficult, until you have to lower the slide to keep the keeper plates, Monarch calls them "slide gibs", from clamping the slide to the bracket. There went the perfect alignment, well maybe not. The slide has barely enough clearance under the gibs to not bind, and if Monarch did their job right, I should be OK. The next alignment was the swivel slide. I set the swivel on the 0 taper mark and indicated it in, by moving the carriage back and forth checking the indicator readings. The 1st 2 pictures need no further comment. I did find out that the little line under the magnifier is pretty wide, and not to be relied upon too closely, when I ran out of eccentric adjustment on the one of the inside bearings.

Before I can fit the cross slide gib, which has had apiece of Multifil 426, similar to Turcite, epoxied on, I had to straighten the guided dovetail slide in the cross slide. It had approx a .003-.005" bow. This surface will be scraped before the gib fitting. Back on the Cincinnati for the machining and while the cross slide was on the table, I reset it, and increased the depth the dust cover slot to account for the material removed from the interior. I'll most likely make a new dust cover, as the original is pretty beat up and has approx a .030" bow lengthwise. The picture is of the second cut of the dust cover slot.

While I was in the process of reassembling the TA, I took the time to take a few measurements to see if it is feasible to add a worm gear type adjustment, like on the EE, to ease the fine adjustment, which is pretty much hit or miss. The gear segment on the slide is part of 446 tooth gear and the adjusting pinion is 18 teeth, and they are 16 DP. So far I haven't come up with anything, and may resort to some other type of adjustment.
Harry

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04-28-2009, 02:36 AM #124

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

As I mentioned earlier , Multifil 426 as been epoxied to the movable side of the gib. The Multifil is a Teflon material that has been impregnated with what appears to be bronze, one side has been etched for the adhesive. It is the side that wets with water. I assume this is very similar to the way Turcite is prepped. I heavily scored/roughed up the side of the gib that the Multifil will be epoxied to, and throroughly cleaned it with Acetone. I laid a piece of wax paper on the surface plate, put the Multifil on the paper and spread the epoxy, then laid the gib on, covered it with wax paper then set a 2' long parallel, about 20 LBS, on top for clamping pressure, and there it sat since last Thursday. The epoxy, if mixed correctly, will cure in 24 hours, and sometimes I don't quite get it right, and it takes a while longer. I also keep the container that I mix the epoxy in around, to test for curing. If a scriber penetrates and leaves a mark, it's not ready.
The remachined dovetail needed to be scraped for flatness, which was taken care of in a couple of hours. This is about the 3 rd spotting of the CS's gib dovetail, and was finished up in about 8 more cycles. The spotting, even with some recharges on the straight edge, was so faint, that I was having a hard time seeing the marks.

The next 2 pictures are the 2nd spotting of the gib. The red side is the Multifil side, and as soon as that side is sufficiently developed, I will concentrate on the blue side, for a much more even spotting distribution. From the picture the other day, the gib needs to be moved to the front approx 3". It is currently sticking out the front about 1", or about 1-1/4" to far. It needs to be completely inside the cross slide, so that the gib srews are effective.


Harry

Like this post | Reply | Reply With Quote

04-30-2009, 03:24 AM #125

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

I finally got done with the gib, and assembled the cross slide on the carriage with the screw and did a few indicator checks. The squareness was within .0005"/12" concave in both directions, with the middle 8" being 0-0, apparently the guiding dovetail way is little less than perfect. I also tried to shake/twist each end of the cross slide to see if the indicator moved. On the front no movement, on the rear, maybe .0001". I checked backlash on the screw and nut, and came up with .040", which was invalid because I didn't have the TA's drawbar clamp in place. I also checked for binding in the screw through out the full 11-3/4" travel, the CS wiper is not on so the actual travel will be slightly less, and couldn't detect any. I found that interesting as I was expecting some due to the scraping. I'll have to play with the adjustments a little more, or maybe there is enough wear in the screw and nut that allowed this.
Anyway, I've got to tend to some odds and ends, and then on to the TS.
Again just seeing what lies ahead. From what I saw, it needs a bit of work.

Harry

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05-01-2009, 03:25 AM #126

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Yesterday I tried to transfer a close up picture of the left end of the dynamic side of the gib to my Photobucket acct. For whatever reason the computer wouldn't let me transfer the close up, all I have is the original. Here is the picture. I can assure that there is more than adequate spotting on the left end. The heavy red in the center is most likely from an inadequate distribution of compound on my part, from an earlier recharge.


At some time during the work on the tailstock, I'm going to have to make a #4MT test bar. Today was as good a time as any. It took me two tries, the first one I scrapped out, because I set the TA to cut half the included angle. The second time was successful.
Here's testing the fit, it was blued and the small diameter was a little large. A little work with a file and emory paper quickly solved the problem.
The bar is made from 1018, not the best choice, but it's what was available, a better choice is Stressproof, but that's the one that scrapped out.
The only help I need is figuring the sag at the outer end of a 1.340 D X 15"(sticking out of the spindle). Any volunteers.

This TS definitely needs some work. It's pointing down at the gearbox approx .010". I did check the truth of the bar by rotating it 90* and checking the horizontal and vertical readings on both sides and the top and bottom. They were identical.

Harry

rke[pler
Diamond

Join Date Feb 2002
Location Peralta, NM USA
Posts 5,286
Post Thanks / Like
Likes (Given) 35
Likes (Received) 271

> Originally Posted by **beckley23**
> The only help I need is figuring the sag at the outer end of a 1.340 D X 15"(sticking out of the spindle). Any volunteers.

I get a deflection at the end of .0007"

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05-01-2009, 05:18 AM #128

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Russ,
Thanks
Now, all I have to do is get the TS off the bed. That should be be a real adventure.
Harry

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05-01-2009, 12:32 PM #129

DaveE907
Titanium

Join Date Sep 2007
Location Spanish Springs, NV
Posts 2,367
Post Thanks / Like
Likes (Given) 155
Likes (Received) 278

I get .00053 deflection at the end, same ballpark as Russ. Isn't it interesting how flexible and noodley the objects we regard as rigid really are?

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05-01-2009, 06:03 PM #130

rke[pler
Diamond

Join Date Feb 2002
Location Peralta, NM USA
Posts 5,286
Post Thanks / Like
Likes (Given) 35
Likes (Received) 271

> Originally Posted by **DaveE907**
> I get .00053 deflection at the end, same ballpark as Russ. Isn't it interesting how flexible and noodley the objects we regard as rigid really are?

I wonder where the difference was - I modeled it as a solid round beam with a 6 pound load evenly distributed across the top (using an online calculator came up with 5.99 pounds for 1.34" diameter (just ran the numbers again by hand, 5.9992)).

And the whole universe is made from pink gum eraser, so far as I can tell. I might be looking at too small a scale, though.

Like this post **Reply** **Reply With Quote**

05-02-2009, 03:51 AM #131

DaveE907
Titanium

Join Date Sep 2007
Location Spanish Springs, NV
Posts 2,367
Post Thanks / Like
Likes (Given) 155
Likes (Received) 278

Russ, FWIW here are my quick and dirty calculations for the deflection. I'm not a fan of on-line calculators, too many of them have not been properly vetted and they very often don't let the user know all the assumptions and limiting conditions for which they apply. Deflection calculations can be a nasty minefield.

If you have a copy of Roark handy read the first two paragraphs of the Chapter "Beams; Flexure of Straight Bars" to get a taste of the limitations for such simple calculation methods.

Harry, thanks for your good work posting your progress, lots of us are enjoying it.

Attached Thumbnails

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05-02-2009, 04:35 AM #132

rke[pler
Diamond

Join Date Feb 2002
Location Peralta, NM USA
Posts 5,286
Post Thanks / Like
Likes (Given) 35
Likes (Received) 271

> Originally Posted by **DaveE907**
>
> Russ, FWIW here are my quick and dirty calculations for the deflection. I'm not a fan of on-line calculators, too many of them have not been properly vetted and they very often don't let the user know all the assumptions and limiting conditions for which they apply. Deflection calculations can be a nasty minefield.

I think your number is right, I didn't have the moment of inertia right. Sorry, Harry, you might have to adjust the scraping for the .0002 difference.

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05-02-2009, 06:16 AM #133

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Thanks Dave and Russ.
I'll have to check the test card, but IIRC the tolerance is 0 to +.0005" high at end of test bar, so I'll add .00053" to that and I should be good.
I've got the TS off the lathe, and as soon as I get the bottom cleaned up I'll run some indicator readings and get started. There is definitely wear on the TS's slides that I can see and feel.
Harry

Like this post | Reply | Reply With Quote

05-02-2009, 11:28 PM #134

Cal Haines
Titanium

Join Date Sep 2002
Country UNITED STATES
State/Province Arizona
Posts 3,149
Post Thanks / Like
Likes (Given) 585
Likes (Received) 308

Harry,

I'm really enjoying this thread and learning a lot.

How well does the test bar repeat when you pop it out and reseat it?

Cal

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05-02-2009, 11:35 PM #135

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247

Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The test bar repeats very well. I had to pop it out and rotate it 90* to run the truth tests.
Harry

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05-03-2009, 06:02 PM #136

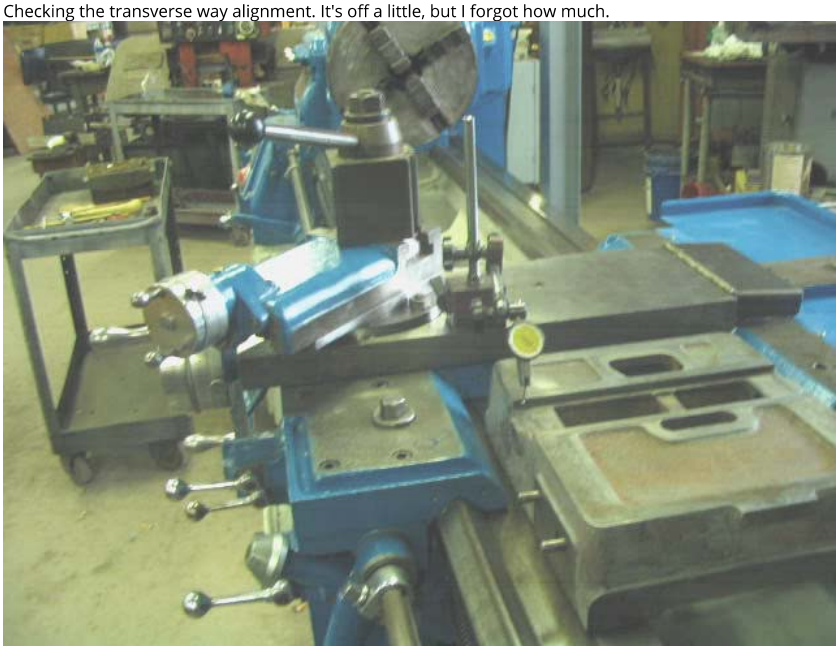
beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Things aren't as bad as the initial test bar checks indicated. I got the TS off the bed by disassembling it on the bed, removing the taper adjusting screws and the clamping screws, then lifting the top off with a strap looped around the spindle and the back end. The way(s) and slide(s) were quite dirty, which indicates that these pieces have been separated before and not properly cleaned before reassembly.
The bottom has been thoroughly cleaned, and then checked on the surface plate and the bed.
Checking the V slide on the bottom. The left/right indicator reading was off-maybe .0005", as was the flat slide. I can definitely see where the ways are contacting the slides. In fact on the flat slide the surface is wider than the way by about 1/4" on each side, with scraping marks visible. I ran the indicator across this surface, and the way contact area showed a .005" dip, approx. I also continued this check to the V slide edges, with basically a 0-0 reading.

Checking the transverse level. It is high in the front by .008", approx., on both ends. Level was also checked longitudinally, and hig on the headstock end by maybe .0005" on front and back.

Checking the transverse way alignment. It's off a little, but I forgot how much.



The TS top's slide(s). This piece has not been cleaned, and the darker areas may hold the answers for the preliminary test bar readings I got.

Harry

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05-05-2009, 02:16 AM #137

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Got the TS top cleaned up, and reran the tests with the test bar. The results did change, it is vertically low approx .0025" and horizontally front approx .006-.009" depending on which way I push the TS before clamping. I also rechecked the transverse way of the bottom, and it is out approx .0035" towards the front. I also rechecked the level readings, I must have had a piece of dirt under the bottom last Saturday. It seems that the readings are confirming each other. I'm very tempted to set the bottom up on the mill and take a couple of cuts to reduce the amount of scraping

of scraping.
I also cleaned up some scoring in the top's spindle bore, and on the spindle. I had to gently persuade it out of the top.
This isn't a light weight. The spindle weighs 28 LBS, the top 118 LBS, and the bottom 58 LBS.
TS spindle. That's a very healthy key, on the left, and keyway in the spindle. I don't think I'm going to worry about damaging the key or keyway.

This is looking down the top's spindle bore. There is scoring at 7:00, that I hit with a file, and some at 11:00. The spindle key goes in the hole at 9:00 behind the clamp. The dust in the bottom is from the aluminum lifting bar.

Harry

05-10-2009, 06:40 AM #138

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

I finally got done scraping the TS. It was not as easy, or straight forward, as I thought it would be. The final arbiter in all tests is what the test bar readings show. It doesn't make any difference what the indicator or level tests in other areas show, nor should one rely on them without confirmation from the test bar. I may have been partially at fault for not interpreting what I was reading properly. Part of my problem was not running enough test bar checks early in the scraping, and I wound up overcorrecting. The corrections didn't take that long, but I was very annoyed with myself. A lot of this has to do with the logistics of setting up the test bar checks, as I have to use a forklift to put the TS top on the TS bottom.
Another, and quite possibly bigger problem, is the age of the machine and possible stress relieving in the castings over the years. I should have remembered my experience with the CK, I had similar problems what that TS. There are/were certain alignments I was expecting that simply weren't there. 2 examples; the transverse way in the bottom is not square to the centerline, and I expected that once I had it square, that the horizontal alignment would be there, it wasn't. I also scraped the bottom to be level with the bed and the vertical alignment would be taken care of, it wasn't. As the bottom finished out the transverse way would point the TS spindle .009" towards the rear of the headstock under my above assumptions, and the vertical alignment would point the spindle skywards about .012". The actual measurements are; the transverse is intentionally out of square by +.002", pointing to the rear of the headstock, and the bottom is .004" thicker on the headstock end than the

intentionally out of square by .003", pointing to the rear of the headstock, and the bottom is .004" thicker on the headstock end than the tailstock end. I think you can begin seeing my frustration when I discovered the best laid plans go astray. In the end the vertical and horizontal alignments are where they should be, and to get the spindles aligned I'm going to need a .005" shim between the TS's top and bottom.
This is very close to the start of scraping on the bottom.

The V slide has been scraped You can see very faint blueing on the upper left face and lower right face of the V slide. This is intentionally left unscraped as I'm trying to correct horizontal alignment.

Ckecking the transverse alignment. You can see the bed section I used for spotting the bottom slides.

Doing a test bar check. This is the horizontal check, the vertical has been done previously. This particular check was the final check, and the readings are where they should be, and vertical sag has been allowed for. The bar was also rotated to verify its truth.
, and the tests rerun.

Checking the spindle alignments. I'm going to need a .005 shim between the TS's top and bottom.

Harry

Last edited by beckley23; 05-10-2009 at 03:49 PM. **Reason:** Clarification of alignment dimensions

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05-13-2009, 02:45 AM #139

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Looking for some help, or ideas;
Multiple Coolant Tank Hook-up
Harry

Like this post **Reply** **Reply With Quote**

05-13-2009, 04:47 AM #140

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

So how much difference would it make if the test bar was tubular rather than solid? Would it cut the sag by 50% due to the lower moment of inertia?

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05-13-2009, 08:53 AM #141

rklopp
Diamond

Join Date	Feb 2001
Location	Redwood City, CA USA
Posts	4,385
Post Thanks / Like	
Likes (Given)	102
Likes (Received)	592

For a tubular test bar sagging under its own weight, I get deflection

y = (-2 * density * g * length^4)/(E * (OD^2 + ID^2))

where g is the acceleration of gravity and E is Young's modulus. The equation shows that, for fixed OD, the magnitude of the deflection decreases as the tube's ID increases (because the denominator increases), so thinnest wall is best. The plus sign comes about because there is a (OD^2 - ID^2) in the numerator from the weight per unit length and an (OD^4 - ID^4) in the denominator from the moment of inertia. (OD^4 - ID^4) = (OD^2 - ID^2)*(OD^2 + ID^2), which leads to some algebraic cancellation.

By the way, this shows the best improvement you can get with a straight tube versus a solid bar is to reduce the sag by a factor of two, since the ID can never exceed the OD :-). I think a tube with a tapered bore can do even better, but I've not worked it out.

Last edited by rklopp; 05-13-2009 at 07:25 PM.

Like this post | Reply | Reply With Quote

05-14-2009, 03:22 AM #142

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

I think Connelly mentions test bar sag in MTR. I'll leave it to the engineers to figure it out, all I need is the number that I can compensate with. I have also recall reading the same thing about the tapered bore.

I assembled the TS with a .006" shim between the top and bottom (I've learned every time I shim a TS, I had better add .001" to the number that the indicator shows), and ran the center alignment test. Oops, .017" to high, and the test bar was pointing down. After I settled down, I remembered I had used the wrong indicator for the original test.Ran these tests with the good DTI and it showed approx .011" high, and the same test bar drop. I should have pitched the old DTI a while ago, but it's still functional in certain situations, but not this one. Pointing down was something else, where did that come from. Nothing to do but take it all apart, and see if I had dirt or a crumpled shim. Shims were OK but I did find a glob of paint on the right side under the shim, that explained the test bar dropping. Got rid of the shim(s), and reassembled and ran new tests. I must have gotten lucky in the scraping, because the centers were aligned within .0005" high TS, and the test bar was pointing up approx .0005". I'm going to keep my eye on this for awhile.

This is before I discovered the problem with the DTI. The .006" shims are place ready for the top to be lowered.

The TS spindle with the nut and key. On my other Monarchs I can get useful overtravel on the spindle, but on the SE 60 there is a hard stop due to the way the nut is mounted, and the very large key. I'm entertaining the idea of cutting out a section of the nut's flange to allow overtravel, to give another 1" or so, but I'll wait on that for awhile.

Harry

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05-16-2009, 02:41 AM #143

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Took care of several nuisance issues; new wipers on the carriage and tailstock made from F-5 grade felt, 3/8' thick for the carriage wings and 3/16 for the tailstock and the cross slide. I also decided to use the original dust cover for the cross slide, instead of making a new one. I've done that before, it's a challenge to keep from stress relief warping when cutting the groove for the stop screw.
Cleaned the TS handwheel, this is the 1st Monarch handwheel I've seen that wasn't chrome plated. The patina will return in short order.

Ans I couldn't resist temptation, had to try a cut today. The mat'l is 2-1/2"D 1018, 600 RPM .0088" IPR. The 1st 3/4" is a 2nd pass, the next 3/8" is a .150" DOC. The insert is a well used TNMG 432, no coolant, and all things considered I'm satisfied. The real tests are yet to come, I was just getting a feel for the lathe.

Harry

Harry

Like this post | Reply | Reply With Quote

05-22-2009, 02:26 AM #144

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The end of this project is getting very near. Got the DRO mounted, pretty standard fare, except I did put a hard stop on the carriage to keep the TS from hitting the reader head, etc.
The square head set screw is the hard stop. Part of the TS's wiper holder had to be cut away, so that the screw would hit the TS bottom.

That's as close as the TS can get to the carriage.

I was a little concerned about the relationship between the TS's spindle at fulll extension and the toolpost. This should be a doable situation, except for one recurring job I have, and there is a workaround for that.

The last major piece of this puzzle are the coolant/chip pans. I've got the details worked out, and that should go quickly.
Harry

Like this post | Reply | Reply With Quote

05-22-2009, 03:38 AM #145

tiptop
Aluminum

Join Date Nov 2006
Location Newport, Oregon
Posts 172
Post Thanks / Like
Likes (Given) 0
Likes (Received) 0

Harry,

It's looking real nice. As I am sure you are aware, this posting has been an inspiration for many of us. Thanks for documenting it so well, I myself have learned a lot and appreciate it. By the way I got mine online and am very happy with the choice I made with the Monarch.

Jay

Like this post | Reply | Reply With Quote

05-23-2009, 05:00 PM #146

kvom01
Hot Rolled

Join Date May 2008
Location Cumming, GA
Posts 514
Post Thanks / Like
Likes (Given) 0
Likes (Received) 8

My 10EE has the same type of stop on the carriage to keep the TS from hitting the DRO scale. An excellent idea.

Like this post | Reply | Reply With Quote

05-27-2009, 03:21 AM #147

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Well, one would think that setting up the coolant would be a quick and dirty job. I decided to make this one a neat job, compared to my usual plumbing jobs. My friends were in Saturday and they didn't help much, with suggestions about getting it done. One of them saw the strainer, and said you've got to be kidding. I don't think he's ever cleaned a coolant tank, but he would be surprised by what ends up there.
Anyway, the right side tank was totally closed off, with a drain on the left end to return the coolant to the left side tank. The plumbing could have been better thought out, but once the covers are on, who's going to know. The left side tank has been reduced to approx 2/3's its original capacity.
The pictures need no comment.
Right side pan.

Left side pan.

From the pump to the carriage.

For all intents and purposes I'm done with the major work on the lathe. I still have to make toolholders, a follower rest, and run the accuracy tests, but before that get done, this lathe is going to start earning it keep later this week.
Harry

Like this post | Reply | Reply With Quote

05-27-2009, 06:43 AM #148

Cal Haines
Titanium

Join Date	Sep 2002
Country	UNITED STATES
State/Province	Arizona
Posts	3,149
Post Thanks / Like	
Likes (Given)	585
Likes (Received)	308

Harry,

I'm sad to see this project coming to an end. I've enjoyed it a lot.

Do you have an idea how many hours you have in the recon?

Cal

Like this post | Reply | Reply With Quote

05-28-2009, 05:30 AM #149

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

I didn't keep track of the time, but AWG would be 200+ hours. It's a hour here, a couple there, and on a few occassions days at a time. You can pretty much see when I had the time by when I posted.
I think the biggest surprise, and it's always a surprise, is how much this costs. These things nickle-dime you to death, except it's 50.00 here, 200.00 there etc. I don't think too much about the cost at the time, but in the end it really starts adding up. Take the meter units as an example. I could have tried to clean and test them, put them back in the machine, and then I consider how many years they've been in the machine and how much labor it's going to be to go back in there if they crap out in a couple of months. The answer is easy, replace them, it's a no brainer. If this was an EE, maybe I would get tempted, they're easy to take apart. The larger gearheads are a different story, there's nothing light weight and everything seems to be interlocked like a jig saw puzzle. It's these decisions that start adding up.
The big question is; Would I do this again? The answer is; in a heartbeat- if I've got a need for it and the room. The only exception is "The Wreck", I don't need it, but it's not leaving either.
Harry

Like this post | Reply | Reply With Quote

05-29-2009, 05:32 AM #150

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

It seems only fitting that these 2 pictures of the finished project should be included. This is the third attempt at taking these pictures, the first 2 had a very greenish tint that I couldn't get rid of, maybe it was the overcast days, today was sunny, and success at last.

Harry

Like this post | **Reply** | **Reply With Quote**

thomasutley liked this post

05-29-2009, 05:40 AM #151

pbungum
Hot Rolled

Join Date	Feb 2008
Location	Oregon
Posts	562
Post Thanks / Like	
Likes (Given)	117
Likes (Received)	71

WHOA. Just ------ wwwwwhoa.

Like this post | **Reply** | **Reply With Quote**

05-29-2009, 05:42 AM #152

pbungum
Hot Rolled

Join Date	Feb 2008
Location	Oregon
Posts	562
Post Thanks / Like	
Likes (Given)	117
Likes (Received)	71

Okay - one more thing - would you mind if I just lived in the chip tray? I won't make no noise or nuthin' - I promise (well maybe the occaional giggle).

Like this post | **Reply** | **Reply With Quote**

05-29-2009, 06:27 AM #153

quasi
Stainless

Join Date	Dec 2003
Location	Calgary, Alberta, Canada
Posts	1,374
Post Thanks / Like	
Likes (Given)	2
Likes (Received)	75

Likes (Received) 75

looks great, how many Monarchs do you have , Harry? I count at least 5, and there is a Hardinge in behind the 61.!

Like this post | Reply | Reply With Quote

05-29-2009, 07:44 PM #154

kvom01
Hot Rolled

Join Date	May 2008
Location	Cumming, GA
Posts	514
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	8

Looks like that little Hardinge is set up for parting off. ??

Like this post | Reply | Reply With Quote

05-31-2009, 01:00 AM #155

shapeaholic
Stainless

Join Date	Oct 2003
Country	CANADA
State/Province	Ontario
Posts	1,126
Post Thanks / Like	
Likes (Given)	41
Likes (Received)	101

OK what's next???

Harry,
I have been watching this thread with "GREAT" interest! I have been "refurbing my W-I 847 mill over the last year and You have been a wonderful inspiration. Many Thanks for sharing.

I was sort of wondering if we all should get together to pitch in and and buy you a worn Bridgeport or similar (I'd love a wells index) so we could watch you fix one up!

Pete

Like this post | Reply | Reply With Quote

06-03-2009, 06:01 AM #156

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

pgunbum-You'll find the chip pans a hostile enviroment. Blue, hot chips and coolant.

quasi-5 engine lathes, 4 of them operational

kvom01- That particular Hardinge is a real POS. It is set for a propietary operation I do to one of my products.

Pete- What's next? It's back to "the Wreck".

There is always doubt in my mind when I buy a machine, and go through the rehab process, if my gamble will pay off, without having ever run or used the machine before. The past 2 days have proved that my gamble has paid off, better than expected. I don't know if it's the 9000 LBS and 15 HP vs 5400 LBS and 7-1/2 HP, or an improperly adjusted TA on the smaller lathe, but the overall machining time has been significantly decreased. A lot of the time savings can be attributed to the crank on the TS, and the overall easier handling of the lathe. The rigger who moved the machine in, told me I would hate the TS crank and remove it, well Dave, if you're reading this, you're wrong.
I'm still learning the oddities of this lathe, but it is a "hot" runner. I stuck a thermometer in the rear end of the spindle yesterday after 3-1/2 hours run time, and the temperature was 118*, but the headstock felt a little hotter. The hottest part of the headstock was the cover over the clutch, that was a bit uncomfortable. I thought about calling Monarch and asking about this, but after thinking this over, there's not a thing I can do. If you look at the headstock end, the only vents are 3 slits under the clutch cover, otherwise this is a very closed up headstock. Make a good heater in the winter, may have to open some doors in the summer.
Harry

Like this post | Reply | Reply With Quote

06-03-2009, 08:01 AM #157

Steve in SoCal
Titanium

Join Date	Oct 2006
Location	Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts	2,083
Post Thanks / Like	
Likes (Given)	4
Likes (Received)	379

Harry,

Nice to see the finished project. I am glad to hear it is better than your expectations, there is something to be said for sheer mass and power

Nice to see the finished project. I am glad to hear it is better than your expectations, there is something to be said for sheer mass and power

Steve

Like this post | Reply | Reply With Quote

06-03-2009, 10:25 AM #158

rimcanyon
Titanium

Join Date	Sep 2002
Location	Salinas, CA USA
Posts	3,852
Post Thanks / Like	
Likes (Given)	183
Likes (Received)	164

> after thinking this over, there's not a thing I can do

Harry, what about going to the next lighter grade of DTE oil in the headstock? What are you using, and what does Monarch call for?

Like this post | Reply | Reply With Quote

06-03-2009, 08:59 PM #159

M. Moore
Stainless

Join Date	Jun 2007
Location	Vancouver Island, B.C. Canada
Posts	1,547
Post Thanks / Like	
Likes (Given)	32
Likes (Received)	133

This is from left field, but what about running the oil through a cooler? A small tranny rad would be about right, with fan.
Michael

Like this post | Reply | Reply With Quote

06-03-2009, 09:26 PM #160

rklopp
Diamond

Join Date	Feb 2001
Location	Redwood City, CA USA
Posts	4,385
Post Thanks / Like	
Likes (Given)	102
Likes (Received)	592

If you can hold your hand on it for several seconds, it's not too hot.

06-04-2009, 02:42 AM #161

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Thank you for the suggestions, but I was more surprised by the heat than anything else. I was comparing my experience running the CY at approx the same speed, 762 RPM on the SE 60, for sustained periods, but I never really paid any attention to it. I know it got warm, but how hot I can't say. Never gave it any mind.
The only thing that really worried me, was that I had the spindle bearings to tight. Remember I had to bump the spindle out to fix the leak on the cap, and then readjust the spindle nuts. A couple weeks ago when I ran the "unresistable" test cuts, the next day I took a pass at .005" DOC and the finish was less than desirable, even for 1018, so I tightened up the bearings, and this is really a guessing game, and got a much improved finish for the same DOC. I started on the job at 600 RPM, which is about what I running the same job on the CY. After about 5 pieces I decided to try the next speed up which is 762. The headstock was already warm, but the temperature definitely increased, as expected, and then stabilized at approx a very warm cup of coffee. I also backed the preload a very little bit, with no effect on finish. At no time did the lathe get so hot that I couldn't keep my hand for sustained periods. As a comparison, when I adjusted the spindle on my #4 Cincinnati, the maximum temperature per Cincinnati is 145*, that temperature I can't keep my hand on the column for longer than a few seconds. The SE 60 never got that hot.
It's just learning the "nature of the beast".
I'm using Shell Turbo T-68, IIRC, in the headstock. According to Shell it's the equivalent of Mobil Heavy-Medium, which is Monarch's recommendation.
Harry

Like this post **Reply** **Reply With Quote**

06-05-2009, 07:35 AM #162

macona
Diamond

Join Date Jun 2006
Location Beaverton, OR
Posts 5,459
Post Thanks / Like
Likes (Given) 0
Likes (Received) 50

I never have gotten around to playing with the headstock bearing on our 60 after I yanked the spindle. Will have to check it out.

I just noticed how small the taper is in your tailstock. Ours has a MT5 in it.

Like this post **Reply** **Reply With Quote**

06-05-2009, 10:59 PM #163

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Headstock has a #5MT, tailstock a #4MT.
The only time I needed a #5 was on my #5 J&L, core drilling a 2" hole 10-1/2" deep in aluminum tube. 734 RPM, .100" feed. Makes a lot chips fast. 24,000+ parts over 3 years.
Harry

Like this post **Reply** **Reply With Quote**

06-06-2009, 05:48 AM #164

Newman109
Titanium

Join Date Sep 2006
Location Sacramento County, California
Posts 3,123
Post Thanks / Like
Likes (Given) 1632
Likes (Received) 848

You did a great job and provided a wonderful piece of technical exposition and photos. I'm in the process of refurbishing a 1987 Webb 4VH Mill and your thread has been an inspiration. Seeing how this machine was built shows why Monarch is so highly thought of by machinists in general.

Thanks!

Like this post **Reply** **Reply With Quote**

06-24-2009, 06:09 AM #165

collector
Hot Rolled

Join Date Nov 2007
Location Port Coquitlam BC Canada
Posts 648
Post Thanks / Like
Likes (Given) 11
Likes (Received) 218

Scraping

Harry great job on your machine and lots off good info I am tearing my Lodge & shipley carraige down on your post 77 after you milled clearance in the two places did you on the other two ways with zigzag oil groves did you scrape those surfaces to allow better oil flow.I have ordered the Richerd King dvd on scraping and the Connley book on machine work I will read and watch befor I do any scraping .Cant find any one up here that can show me the skill of scraping.Had a man come to my shop 12 years ago Dennis D from Saint Paul Minn. had a scraping class at my shop for a day .How the years go by then you come back to wear you started.Wanting to learn about scraping and I have a lot of stuff to learn on.

Like this post **Reply** **Reply With Quote**

06-25-2009, 12:25 AM #166

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The 2 areas on the carriage that got milled are not bearing surfaces, however there was enough wear in the carriage slides(those are the surfaces with the oil grooves) that those surfaces were making contact. It's my opinion that Monarch really cut the clearances on the close side in the section that goes over the inside V way. The inside flat slide of the carriage is not supposed to bear on the inside flat way, even though the carriage has wipers at that position. In conversations with Monarch, I've heard of clearances from .004" to .030", in that section. You can imagine what happens as these non bearing surfaces start bearing. I will probably have more to say on this in the near future.

I haven't touched the V and flat slides on the carriage.

I haven't seen the scraping video, but I've read MTR, and continually refer back to it. You'll get your money's worth.
I've been keeping up with your L&S posts. Looks like a nice lathe. In case you don't know Monarch and L&S have the same address.
Harry

Like this post **Reply** **Reply With Quote**

06-27-2009, 08:16 PM #167

quasi
Stainless

Join Date Dec 2003
Location Calgary, Alberta, Canada
Posts 1,374
Post Thanks / Like
Likes (Given) 2
Likes (Received) 75

Moderator, I believe this thread deserves a "sticky"

Like this post **Reply** **Reply With Quote**

onecut liked this post

06-27-2009, 09:46 PM #168

peterh5322
Diamond

Join Date Dec 2002
Location Monterey Bay, California
Posts 10,260
Post Thanks / Like
Likes (Given) 27
Likes (Received) 193

It's now stuck.

Peter

Like this post **Reply** **Reply With Quote**

07-26-2009, 02:51 AM #169

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Likes (Received) 146

Sometime in the middle of June I ran some cutting accuracy checks. The results were not what I was expecting to see. I messed with this problem off and on for 2 weeks. I rechecked, and readjusted the leveling, even went so far as to put the bed in a severe twist to correct the problem. Nothing seemed to work, except I did get better results with the severe twist for the 35" length I was turning. I then decided I wasn't going to accept the severe twist, because that wasn't going to solve any problems on longer lengths, in fact it would have most likely caused other problems. About that time my uncle stopped in for a visit, saw me looking at the lathe, asked what I was doing. Bear in mind, he dosen't know a lathe from a drill press, and from what I've seen is fairly inept with hand tools, and he works in a hardware store! I explained what I was doing and the nature of the problem, got a travel indicator, set it on the TS, cranked the carriage as far forward as possible, and proceeded to indicate the inside face of the front V way. Told him to watch the needle, and started cranking the TS forward. It was 0 until I got to the middle leg, and from then on the needle started moving. Uncle got a little excited seeing the needle move and let me know about it, of course I was also watching the needle, and all I had was a look of disgust, after I saw the amount. It was at this time that I realized what was going on with my new toy, and the corrective actions necessary. I explained to uncle that there were 3 options to correct the problem, none of of them attractive. The first was regrinding the bed, all the work necessary for this and an estimated cost. The second was to make a sled and rough plane/shape the inside face, followed by scraping, and the procedures necessary, and the third was to do nothing and deal with the inaccuracies when they occurred. Option 1 was immediately rejected, and option 3 was not attractive.
One other factor that I have to consider is that I still need to use the lathe for the job I purchased it for, which isn't affected by the worn the area. All I need is an estimated window of 2 weeks, I hope, to get this work done.
I did need to do some extensive preporatory work before actual work could proceed. First, I had to do an extensive survey of the bed, especially the inside ways, for their accuracy, to see if the results would be acceptable; second I had to build a sled, and third I had to figure out the sequence of operations.
First, I need to explain the nature of the problem. The best way to do this is with the test bar cut. The bar was originally 2-1/2" D 1018, it is now approx 2.3XXX. The XXX readings from left to right are 205, 235, 240, 230, 205, 190, 200, 225 over a 35" length.

As you can see there a approx .005" bulge in the middle, and as you move to the left there is a slight taper, that will continue right into the chuck jaws. Unfortunately, this is where 95% of the work is done, if I want to make full use of the lathe. It's been said the mark of a good machinist is dealing with these problems. That's fine if you're the employee, but I'm the owner, and in my view that is not economical. I've got enough problems, and don't need to deal with these, if at all possible. When I'm working on a job, all I want to do is get it out the door as quickly as possible, and invoiced.
Subsequent checks have revealed that the wear on the inside face of the front V way very closely matches the above readings in their location. What has happened is obvious. Most of the work done on this lathe in the past has been in this area, coupled with an apparent lack of lubrication, this wear was accelerated. This was not apparent from my initial inspection, the only check I did, was to measure the inside flat way from the carriage. It dropped vertically approx. .005", and considering prior experience with my 16" CY and it's .004" drop with the same test, I felt justified in assuming I could expect the same level of accuracy with this lathe. What happens is as the carriage drops vertically from wear on the inside face it is also pushed away from the centerline by cutting pressure. In the case of the SE 60 the wear was concentrated in a realitively short length, whereas on the CY the wear seems to be spread out over a longer distance. I've never had a problem holding a tolerance with the CY. What I didn't count on was the inside flat way making contact with the carriage in this area, hiding the full nature of the wear. It was my error in not catching this when I noticed a bit of difficulty when I checked with .002" feeler gauge, in inserting the gauge between the carriage and flat way. The gauge went in, and I didn't think anything more of it, until now. I got caught.
Over the next few days, I'm going make a few more posts detailing this part of the adventure.
Harry

Last edited by beckley23; 07-26-2009 at 09:50 PM. **Reason:** to correct an error

Like this post **Reply** **Reply With Quote**

07-26-2009, 03:24 AM #170

jockofthelowveld
Hot Rolled

Join Date Jan 2008
Location Blythewood, S.C.
Posts 622
Post Thanks / Like
Likes (Given) 0
Likes (Received) 35

Rough plane inside front V

Harry;

If you were to make a sled to rough plane the inside of the front V, what would you use as the control/reference surface for the length of the inside V?

Regards;
Steve

Like this post | Reply | Reply With Quote

07-26-2009, 04:08 AM #171

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

All will be explained, have patience.
Harry

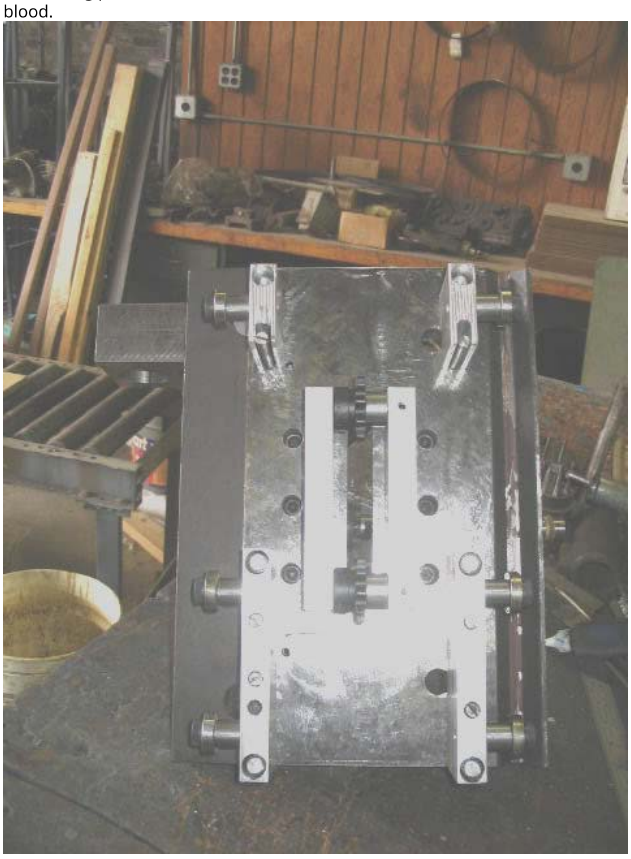
Like this post | Reply | Reply With Quote

07-26-2009, 04:02 PM #172

beckley23
Titanium

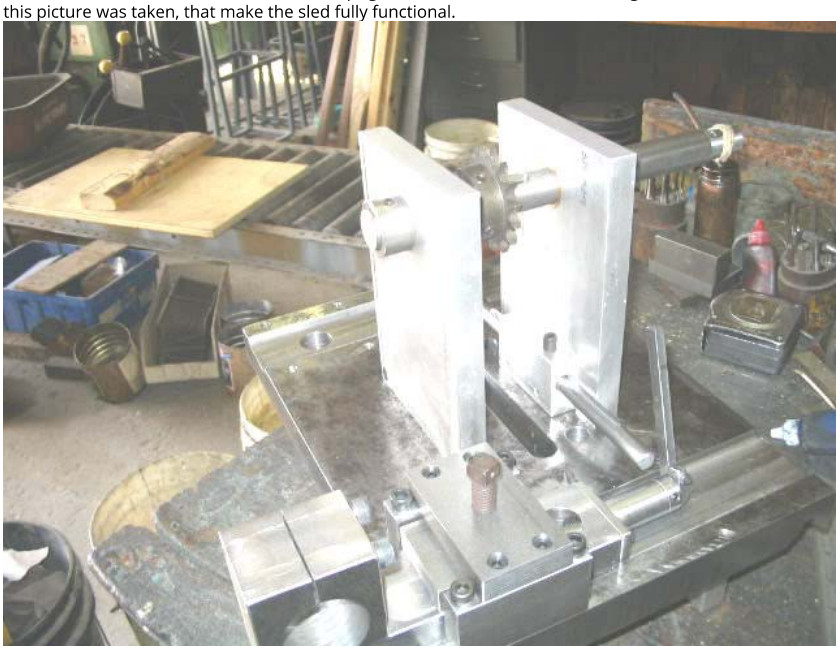
Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

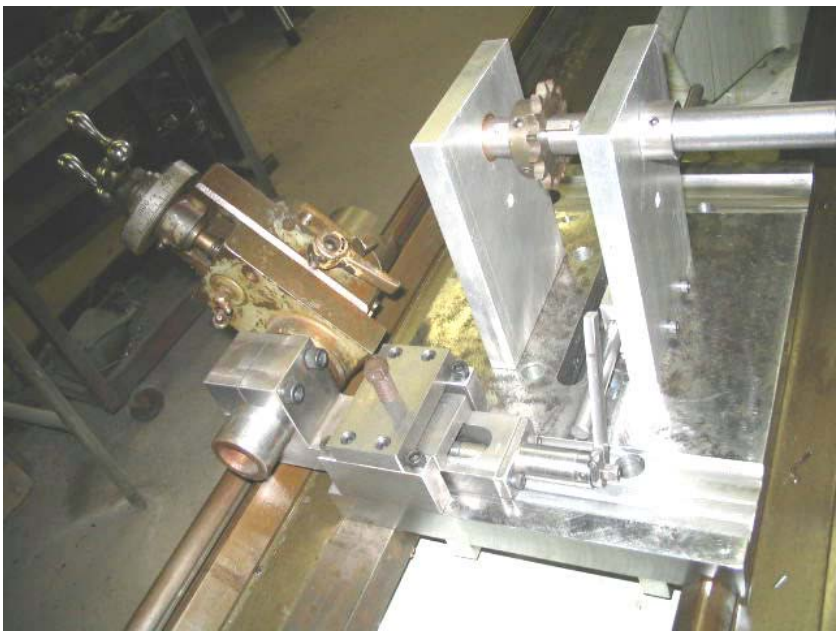
The only way I can use a sled to plane/shape the inside face of the front V way is to use the inside ways as the reference surface. The ways were verified with the level in both directions as to their condition. There are condition issues with the ways, but not so much so as to render them useless. I will post a chart of the level readings later that will demonstrate this. I will say this, for a lathe that's 55 years old, the condition is very good. I've seen a lot worse, for example the inside ways of the "Wreck" with its "Great Rift Valley". I initially thought the inside ways were in worse shape than what I found after tweaking the leveling last Thursday. This procedure is risky, and has to be carefully planned out before taking the first cut. The first cuts have been taken, and I'm now irrevocably committed to finish it. I can't use the lathe otherwise.
The procedure is thus; I'm not going to remove the carriage unless I absolutely have to; ie: problems with the shafts on the front of the apron. As it is now, the carriage is easier to move in the worn section than the unworn section. Because the carriage isn't going to be removed, it will parked next to the headstock. The remaining 7' of bed will planed/shaped and then scraped for flatness and alignment. Only after this first part is completed, will the sled be removed, the carriage moved to the TS end, the sled replaced and same procedure repeated on the remainder of the inside face.
Because of the procedure being as it is, there are certain design considerations for the sled in the placement of the cross slide slots. There are 2 slots, one on each end, and I'm going to have make another toolholder with extended reach when I do the headstock end. I've incorporated several other features in the sled, mainly from lessons learned on the sled I made for the "Wreck".
It's time for pictures.
Bottom of the sled. The slides have had Multifil 426 epoxied and then scraped. The idler sprockets are in the center, and the gib rollers are inside of the slides. The gib blocks are not directly connected to the base. The slotted screws are guides to keep the roller blocks from tilting. The hex head screws have die springs under them to keep the blocks tight against the base. The gibs also keep the sled on the bed when it is in the starting position on the TS end. I almost lost the "Wreck's" sled because I was pushing to hard and it went off the bed. That incident drew blood.



Another view of the bottom.

The top side. The #40 chain will be attached at the headstock's bed clamp, routed under the carriage, through the sled and attached on an extension bracket at the TS end. The TS's handwheel will be used on the drive shaft. The cross slide's feed screw has an arm attached that will retract the cross slide when the rod in the upright makes contact with the carriage. There are some details that have been attended to since this picture was taken, that make the sled fully functional.





The white numbers are for the inside face, the yellow are for the outside face. I don't know how well they'll show up, but they are the indicator readings from the inside ways, of the wear on the outside way. They should be regarded with skepticism as they don't quite correspond with the test bar or the indicator from the carriage of the inside flat way. Never the less the wear is there, as evidensed by the test bar.

I've also been busy making tool holders. The material is 4140PH.

More later.
Harry

Like this post **Reply** **Reply With Quote**

07-26-2009, 05:27 PM #173

Join Date Feb 2003

beckley23
Titanium

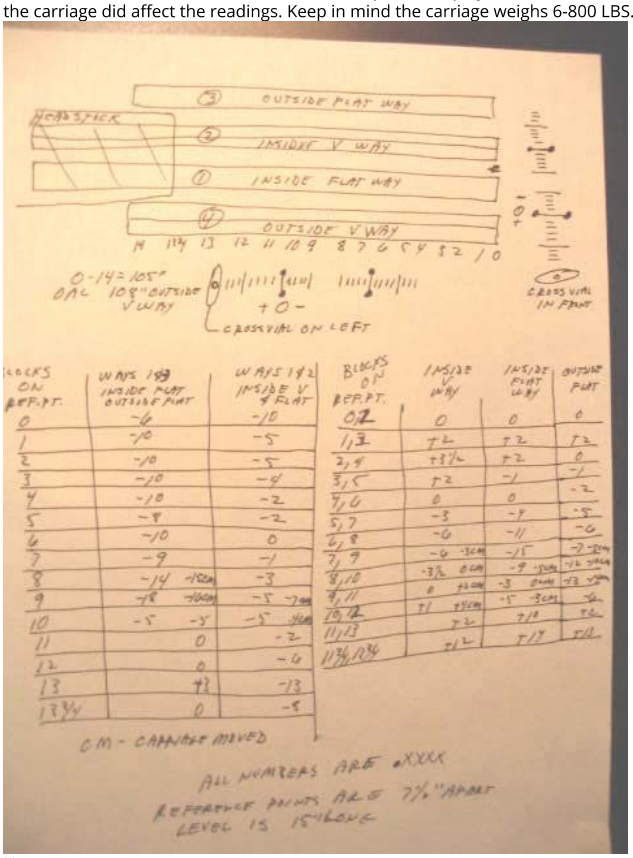
Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Checking transverse level at 14 positions. This was done for the inside flat way/inside V way and the inside flat way/outside flat way.

Checking the outside flat way at 13 positions. The inside flat way has already been checked, and the V way was next.

Checking the wear on the inside face of the outside V way. The outside face was checked in the same manner, as was the outside flat way.
From position 0-8 the wear is 0, from 8-11 the wear is approx .007", from 11- 13-3/4 the wear is approx .002" going to 0.
The outside flat way;
from 0-8 0, from 8-11 +.002", actually I think this is 0, but there is a bit of wear on the inside V way at this point, so I get this reading. There was a bit rocking in the V block in this area of the V way. 10-11 0, 11-12 -.003", 12- 13-3/4 -.0025. I think thiese readings are due to a bit of wear on the inside flat from the carriage. The carriage marks are plainly visible.
These numbers have to be viewed with caution. There is definitely a wear factor to be considered in the reference surfaces. Also I was using a travel indicator and wasn't attempting to get exactness, just a good idea of what I'm dealing with and looking for confirmation of the test bar readings. I also ran the check from the carriage to the inside flat way which showed .006" movement in the affected area.

The chart. All the numbers are the 4th decimal point. I hope you can read it. I did have to move the carriage to get readings in that area, and the carriage did affect the readings. Keep in mind the carriage weighs 6-800 LBS.



Harry

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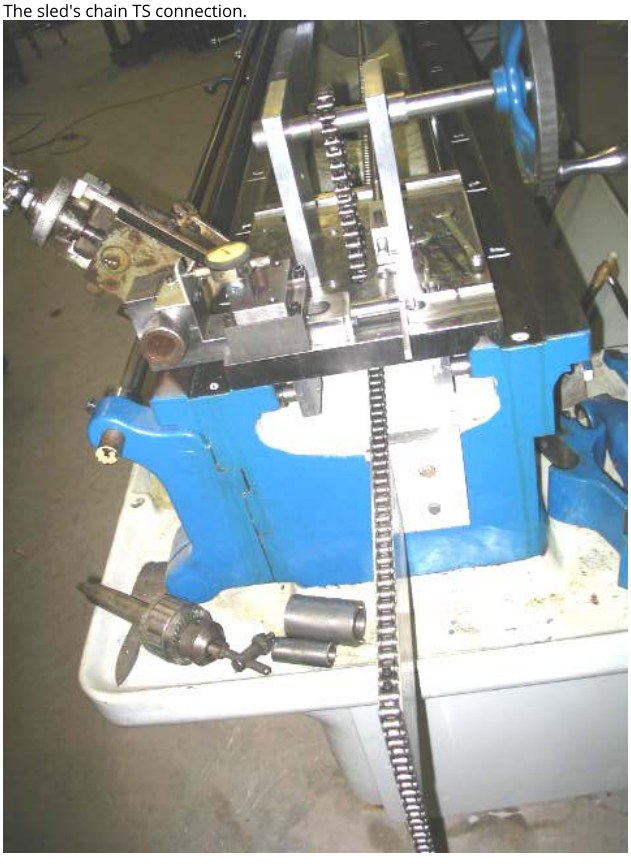
07-26-2009, 05:42 PM #174

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The sled's chain TS connection.



The relief actuating bar is lais across the carriage wings to protect the DRO reader and spar. Barely visible spacers put about 1-1/4" away from the cross slide.

The chain's headstock connection. Just a piece of angle attached to the headstock clamp.

The setting indicator is firmly attached to the gib bracket. No magnetic base that can be easliy or accidently moved. I had that experiece with the 'Wreck's" sled.

There is approx 11-1/2' of #40 chain used. I tried it a bit tighter, but it gave a bumpy ride. The non-tensioned side simply lays on the cross bracing.

Harry

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07-26-2009, 08:43 PM #175

Cal Haines
Titanium

Join Date	Sep 2002
Country	UNITED STATES
State/Province	Arizona
Posts	3,149
Post Thanks / Like	
Likes (Given)	585
Likes (Received)	308

Wow Harry, you've really outdone yourself on this one! I'm looking forward to your next report.

How do you monitor the sled to make sure it's not lifting off of the reference surfaces when cutting pressure is applied?

Cal

Like this post | Reply | Reply With Quote

07-28-2009, 11:29 PM #176

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

After I planed/shaped about 3/8", I checked with an indicator, it was basically reading 0, considering the surface texture. I did have issues with the ceramic insert cratering, and chipping, went through 3 of them real fast, thinking this was going to be an expensive proposition, but I solved the problem after tightening the gib a little on the slide tool.

A word of advice to anybody considering a sled with a chain drive-don't. The sprockets are transmitting to the surface, and causing me to spend a little more time scraping than I anticipated. I had thought about a cable drive, but I had the drive sprocket and 20' of #40 chain from a discountinued product line, and decided to use it. Live and learn. Just to be sure, I checked the outside face of the front V way on the "Wreck", it's been planed/shaped and still needs scraping. That surface is very smooth compared to what I did on the SE 60. The sled for the "Wreck" is manually pushed, but it is a lot lighter and the lathe is a lot smaller.
Harry

Like this post | Reply | Reply With Quote

07-30-2009, 03:47 PM #177

jockofthelowveld
Hot Rolled

Join Date	Jan 2008
Location	Blythewood, S.C.
Posts	622
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	35

Harry;

Seems like this sled application could use a long screw drive for smoothness in lieu of the chain. A screw drive, where the screw is allowed to

rotate through two or more large nuts on the sled, and driven by the lathe feed screw at very low speed. The screw could be attached with a bracket near the headstock, that allowed the screw to rotate in a bushing. The rotating of the sled screw could be done by attaching an extension to the tailstock end of the feed screw and a pulley with drive belt to the sled screw/pulley. There would be two brackets of course, one at headstock another at tailstock, both of which would need to be adjustable to center sled/screw for movement without binding. just a thought.

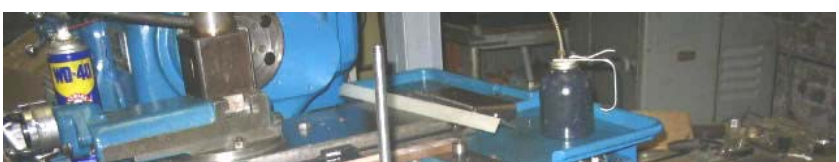
Like this post | Reply | Reply With Quote

08-02-2009, 04:11 PM #178

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

I was able to get the first 75" or so of the bed planed/shaped using the sled. That section was then scraped for flatness and straightness, which worked out quite well. The sled was removed, the carriage moved to the TS end and the sled remounted, less the gib rollers, and I attempted to repeat the process with an extended tool holder, but was unable to get the cutter to cut, it just rubbed. The ceramic insert showed no signs of chipping or cratering. I worked on this problem for several hours, but was unable to find a cause or cure. Deflection was checked in more ways than one, nada nothing. I decided that I could scrape the remainder faster than screwing around with the sled. There are approx 37" that remain to scraped, but in reality it is approx 18" or so. This is the area that has the majority of the wear. The only hard area to scrape is the 5" or so beside the headstock, and I may have to resort to unconventional means to get the excess off. The last 3" or so, the carriage will never see, but the first 2" it is quite possible.
There is a major problem that presented its ugly head. The carriage is extremely hard to move over the newly scraped section, due to the vertical drop of approx .012". I was hoping that its removal wouldn't be necessary, but it is. The V and flat slides will get milled, and Multifil 426 epoxied on, and then scraped. The last sentence is the easy part, its all the logistics necessary, that's the hard part.
Anyway some pictures.
The shaped/planed section is the top half, and glitter are chips, in the first picture. The second picture, the entire face has been shaped/planed for the first 75" or so. The yellow line is a 4' marker for the straight edge.
The surface is quite rough, currently, but after scraping itis very smooth The DTI barely moved when I was checking in the third picture.



Harry

Like this post | Reply | Reply With Quote

08-14-2009, 12:35 AM #179

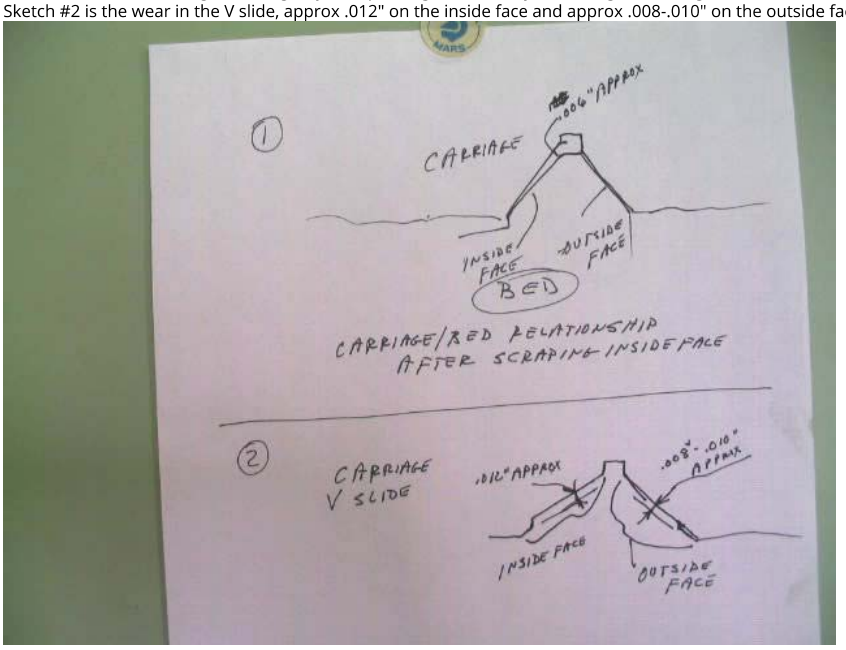
beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The scraping of the inside has been finished with the exception of the last 2-3"'s next to the headstock. I simply couldn't get the scraper in there without removing the headstock. That area is a good parking spot for the carriage stop. I did manage to get the rest of that area suitably scraped, not the prettiest looking, but you're going to have to use a mirror to see it.
I also took a test cut on the 35" bar, to see if my efforts paid off. The last 6 or so inches need some more work, about another thou or so, but the rest of it turned very nicely. I'll fine tune this after I get the carriage slides redone.
The biggest problem I have with the carriage is logistical, getting it on and off the bed and turned over. An A frame or jib boom would be great, but at present of limited use afterwards. The solution I came up with is a chain fall hung from my small forklift with a bracket connected to the carriage. This is best told with pictures.
The lifting/rotating frame. There is a 1" D bar going through the CS screw hole and out through a bracket on the backside. Once the carriage is off the bed, the forklift is backed up, the scraping table cart is moved underneath, the carriage turned over, and then lowered onto the table.

The backside bracket is attached using 2 of the TA/s mounting holes.

Sketch #1 is the carriage's V slide's relationship the V way of the bed after the inside was scraped. There is approx a .006" gap at the top of the inside face, which I think goes a long way to explaining the difficulty of moving the carriage.
Sketch #2 is the wear in the V slide, approx .012" on the inside face and approx .008-.010" on the outside face.



2 different of checking the amount of wear. Remember, these are approximations.

Harry

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08-14-2009, 02:18 AM #180

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

There is another problem that I've been wrestling with for the past couple of days. I can't reconcile 2 sets of numbers, namely the amount of vertical drop ie; the .012" of wear plus the .007" approx removed from the inside face of the front V way for a total of .019" multiplied by 1.414 for a total vertical drop of .027" approx, to what I'm measuring from the bottom of the carriage to the leadscrew which shows approx .010" difference from the top of the apron to the leadscrew. I can't seem to find the .017". The .010" difference does agree with the total vertical drop of the bed's V way(.007 X 1.414= .009898). I'll check my measurements again, before I take the first cuts on the carriage slides in preparation for the Multifil 426. The .017" may, or may not, be important in the apron's shafts alignments, but I would definitely feel more comfortable explaining this anomally.
When I originally discovered the accuracy problem and its solution, I considered just doing the carriage's inside V slide face with Multifil, but after some consideration and discussion with another member, I decided that both V slide faces as well as the flat slide would be done, in other words do the complete job and do it right. The reasoning for the first consideration was simplicity with cross slide alignment, but then I considered bearing area contact in the other surfaces, and that thought line was tossed. Doing it right is a little more involved, but in the long run it is best.
Harry

Like this post | Reply | Reply With Quote

08-14-2009, 11:00 AM #181

DWRoller
Plastic

Join Date Feb 2009
Location South East USA
Posts 3
Post Thanks / Like
Likes (Given) 0
Likes (Received) 0

.019 / 1.414 = 0.0134 ?

Just guessing, but it doesn't look like it would drop more than the amount of metal removed. With the angle it moves some laterally and some vertically so it would move less vertically than the amount of metal removed... wouldn't it?

Danny

Like this post | Reply | Reply With Quote

08-14-2009, 12:43 PM #182

strokersix
Cast Iron

Join Date Jul 2009
Location NW Illlinois USA
Posts 321
Post Thanks / Like
Likes (Given) 34
Likes (Received) 88

Noob here reading this thread with great interest! I have a 1954 11" Sheldon 56" bed that is in need of repair. It looks like someone attempted to fill craters from dropping chucks on the ways with electric arc welder and a grinder. I wish they had just left it alone. Fortunately its the inner ways near the headstock so it mostly looks bad but is not much of a functional problem. I'd like to do a proper repair someday.

Suggestion to address sled drive smoothness: You could drive the sled with a long strip of synchronous belting and timing sheave instead of roller chain.

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08-14-2009, 02:13 PM #183

rke[pler
Diamond

Join Date Feb 2002
Location Peralta, NM USA
Posts 5,286
Post Thanks / Like
Likes (Given) 35
Likes (Received) 271

I'm not sure if you remember, but your suggestion when I did my 10EE was to use the leadscrew as a reference to the base of the saddle. That allowed me to use the unworn portions of the saddle where it connected to the apron and the cross slide ways to get the height and level right (for some definition of 'right', anyway). From there I was able to estimate the wear with feeler gages, but not really do much in the way of

(for some definition of "right", anyway). From there I was able to estimate the wear with feeler gages, but not really do much in the way of figuring if one side of the V dominated the wear picture since there's really no alignment front to back.

You might be able to do something of the same with shim stock and such on the flat and Vs until the saddle is the right height over the leadscrew. That would give you the cut at the ends of the saddle and let you set it up on the mill.

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08-14-2009, 11:08 PM #184

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Russ,
That's how I've been checking the saddle/leadscrew relationship..
Anyway, I got my act together this morning. The most plausible explanation for why I wasn't able to reconcile the numbers was in the leadscrew thrust bearings. I had to pull the leadscrew in order to get the apron off, and instead of reattaching the leadscrew the way it's supposed to be, I just inserted the leadscrew in the bearings so that I could get the saddle/screw relationship. Then it dawns on me that those bearings are either taper roller or angular contact, and need to be preloaded, thus the readings I got yesterday and much earlier when I ran the same check. Maybe a minor dope slap was earned, but I'm now satisfied that I've explained some, if not all of the .017", even though I still didn't preload the bearings. I did find .008-.010" elsewhere.
Harry

Like this post | Reply | Reply With Quote

08-15-2009, 02:37 AM #185

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Did a little math today to figure how much to remove from each face before epoxing the Multifil. I'll clean up the sketch and post a picture tomorrow, in order to lessen the confusion of the next paragraph.
The Multifil is .030" thick, I'm allowing .005" for the epoxy, and .006" for scraping stock. For the inside face; .006" stock + .012" wear in face + .007" for amount scraped off bed + .005 filler= .030" Multifil thickness. .005" epoxy + .005" filler= .010" to machine off the face, or .01414" straight down(this is the number I really need due to the way I'm setting it up on the mill). For the outside face I need to remove .021" from the face, or .029694 straight down, using .008" wear factor for the slide face. I'm not figuring any wear factor for the outside face of the V way. For the rear flat slide, I'm not figuring any wear factor on the slide or the way, so a .030" material removal will used.
Since the vertical head is still on the mill, I'll machine the flat slide first, then remove the head, not an easy task, it weighs 300 LBS approx. The V slide will be done with the horizontal spindle. The #4 Cincinnati was chosen because of the 18" wide table, and the carriage is a 25" square.
Harry

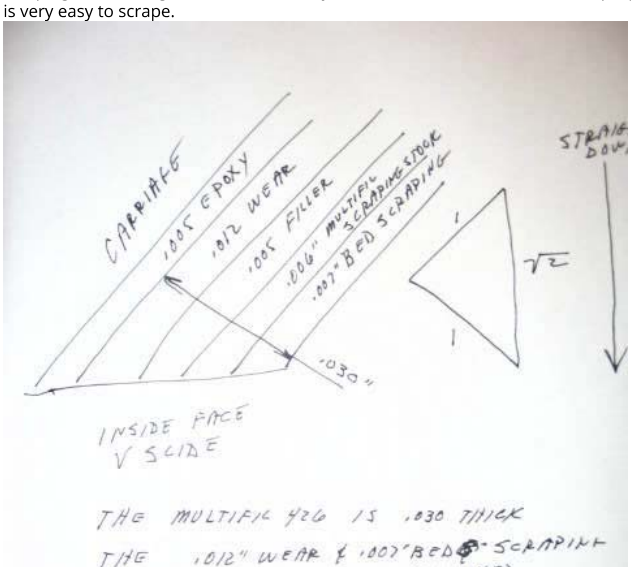
Like this post | Reply | Reply With Quote

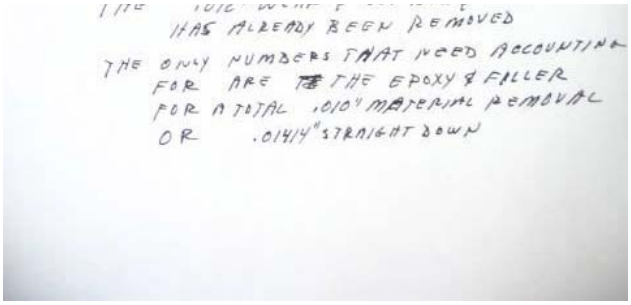
08-16-2009, 02:39 AM #186

beckley23
Titanium

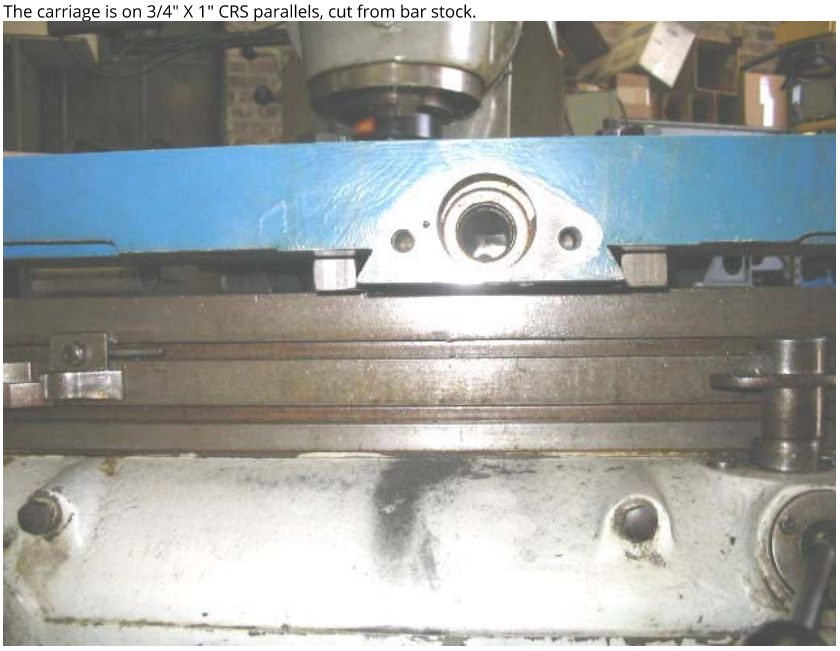
Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Here is the sketch for the inside face of the V slide. A sketch for the outside face would look the same, but with some changes there is no bed scraping, and the amount of wear in the face is different. One term may be a bit confusing, "filler". You can call it gap filler, but it is Multifil 426, and it's there to account for the .030" thickness of the material. I could eliminate it, but that's an extra .005" to scrape off. If you're wondering about the amount of scraping stock, it's there because it is very hard to get all the bumps out in the application, and I need some of the scraping stock to align the cross slide ways. This stuff is not CI, it is Teflon impregnated with bronze and etched on one side for adhesive, and it is very easy to scrape.





The carriage is on 3/4" X 1" CRS parallels, cut from bar stock.



Sorry, the camera batteries need charging. The cutter is in the cut on the rear flat slide. The carriage bridge is approx 8-1/2" wide, and from measurements I took after the cut was completed, there was no deflection. The carriage was indicated in using the rear vertical face, where the TA mounts and the bottom surface, where the rear gibs attach, and there were no shims used for alignment. I was pretty much stuck with this set-up, in order avoid interference between the clamps and the spindle.

Harry

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08-18-2009, 11:35 PM #187

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Milling the outside face with a 45* cutter. The inside face has been previously done. I made the extended mandrel so I wouldn't be butting up next to the column. I've got a pair of these cutters that I use in gang set up on an in house job.

The Multifil has been epoxied, now it's watching the epoxy cure. Thankfully it's the end of the day, and this should ready in the AM.

There are 3 sections of weights on each slide, here's the reason. I put lightly greased tubes in each of the oil holes to keep the epoxy out.

The Multifil hasn't been trimmed yet. I use a wood chisel, pushing against the CI base to trim. This is the V slide and you can see the 4 tubes sticking out of the oil holes. The last time I did this, on the CK in 2003, I didn't grease the tubes, and had a bit of trouble getting the tubes out. The grease seems to have done the trick, all the tubes came out easily.

The last trimming operation is done on the mill, cleaning out the V slide's groove. 20 HP mill is bit of overkill, but it was the easiest to set up, including remounting the vertical head, which goes on a whole lot easier than it comes off.

The 3rd spotting cycle. The red medium is being used because it's easier to see on the black Multifil as the scraping progresses. After this was scraped, I did an alignment test with the cross slide, and it's time to start some selective scraping in the V slide. As it is now the CS is about .004" convex.

Harry

08-19-2009, 12:18 PM #188

strokersix
Cast Iron

Join Date Jul 2009
Location NW Illlinois USA
Posts 321
Post Thanks / Like
Likes (Given) 34
Likes (Received) 88

Thank you so much for posting these photos. Fascinating! Please continue.

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08-22-2009, 02:35 AM #189

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

A small progress report.
The picture below is about the 20th spotting, as you can see a lot of progress has been made. I now have a 0-0 reading on the cross slide, actually it's been fluctuating between 0-0 and .0003" concave for the past 8 or so cycles. The balance of the cycles have been to improve the bearing area, and I'm trying to the drop front approx .002" for cross slide parallelism to the bed. I did a couple more cycles after the picture and the bearing area has been further improved, especially on the flat slide. Also consider that the total bearing area of the slides has been increased approx 20%, due to the continous surfaces of the slides. Originally, there was a gap, in the surfaces, under the bridge.
If you look at the V slide, there are 2 yellow dots. These are reference markers I used to tell me which end of that surface got scraped to turn the carriage for the cross slide alignment. It gets very confusing when the carriage gets turned over, remembering which end to scrape. Each of those faces got scraped from the dot to a couple of inches past the bridge.

Harry

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08-22-2009, 07:57 PM #190

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

3 more scraping cycles on the V slide resulted in the lowering of the front approx .0015". I ran the accuracy checks on cross slide alignment, 0-0, transverse level .0005"/12", high in front, L-R level, low L approx .001"/12" and carriage/leadscrew relationship is 3.250" +- .002", this is the dimension I was looking for earlier. I can try to improve the L-R level readings, but everything else is good to go. The next thing I have to do, is cut the oil grooves in the slide faces, then this carriage is going back together, and I take some test cuts.
The carriage/leadscrew check. This is the method Russ and I were discussing earlier.I found out the problem I was having earlier was caused by the gear key riding up the keyway slot, not allowing the leadscrew to seat properly in the angular contact bearings, removed the key and the problem was solved.

Rechecking the cross slide alignment. You can also the area where I was spotting the carriage.

Harry

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09-05-2009, 02:42 AM #191

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

At Last

The lathe has been completely reassembled and test bars cut. Considering the machine is 55 years old, and what I just finished on the inside face is far from a complete reconditioning, the results are very pleasing. What follows is what has happened since my last post, in the order it happened.
The oil grooves have been cut using the end of a round file ground flush. The cutting action bears a very strong resemblance to the scraping motion. The patterns of the grooves were measured, recorded prior to the milling of the slide faces, and then drawn out on the Multifil after scraping. The machine was then reassembled.

35" and 14" test bar cuts after the reassembly. Unfortunately, I have lost my notes on the recorded dimensions, but for the 35" bar there was .0014" differential between the high and low. IIRC, the biggest difference was on the TS end, with the middle being relatively constant, and a minor variation on the HS end. I could have worked withese results, but I decided to do a modified "2 collars test" on the 14" bar. A .004" difference, small at the HS, convinced me otherwise.

Before I could get to the scraping, I had to use the lathe for a job, turning a 10" D X 22" long piece of aluminum. I was the only lathe I could load the piece in, I can't get my little forklift in position to load the 16" CY. Please note the small piece of plywood C clamped to the TA guard in an attempt to contain the coolant. At the speed I was running, it was mostly successful. The turning accuracy was very encouraging, the diameter didn't vary over .0005" the entire length.

The 14" test bar mounted, and the inside face has been spotted. I'm concentrating my efforts on the section(s) nearest the HS. At this point, I'm very close to being finished.

This is the same spotting as above, from a different view. The spotting may look like I'm hust starting, but it's due to the way I'm recharging the medium on the straight edge. The is spotting in the nearest "bare" area, but it is extremely faint.

The final 14" test bar results. The results from yesterday afternoon are; HS 2.2016", 4"- 2.2015", 7"- 2.2018", 10"- 2.2022, 12"- 2.2024", 14"- 2.203". Remeasured this AM the only changes are; 10"- 2.2018", and 14"- 2.2028". Maybe there is a reason the 2 collars test is only 12" long.

The final 35" test bar results. The results from late yesterday afternoon are; HS 2.2427", 6"- 2.2425", 12"- 2.2423", 18" 2.2427", 24"- 2.2427", 30"- 2.2426", 35"- 2.2427". Remeasured this AM; HS 2.2423", 6"- 2.2423", 12"- 2.2423", 18"- 2.2422", 24"- 2.2424", 30"- 2.2426", 35"- 2.2425".

Keep in mind the remeasurement points are not the same as the first points, but very close approximations. I could move the micrometer in between and get slightly different measurements.
There are still a few minor things to be done to the lathe, an oil seal replaced on the gearbox, a rear splash guard, etc., etc., but for all intents and purposes I'm done, and ready to get back to the "Wreck".
Harry

Like this post **Reply** **Reply With Quote**

09-05-2009, 07:44 AM #192

Steve in SoCal
Titanium

Join Date	Oct 2006
Location	Woodland Hills, Ca. and some times Hutchinson, Ks.
Posts	2,083
Post Thanks / Like	
Likes (Given)	4
Likes (Received)	379

Harry,

This has been a epic saga, I guess you don't need a gym membership after all that. The wreck may seem like a small project after this?

Steve

Like this post **Reply** **Reply With Quote**

09-05-2009, 05:02 PM #193

Cal Haines
Titanium

Join Date	Sep 2002
Country	UNITED STATES
State/Province	Arizona
Posts	3,149
Post Thanks / Like	
Likes (Given)	585
Likes (Received)	308

Excellent results Harry! Do you have any idea how much time you put in to the whole project, from the time you brought the lathe into the shop?

Cal

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09-05-2009, 06:38 PM #194

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Cal,
A WAG would be approx 300 hours. I don't keep track of time on these projects, I use these projects as filler in between the paying jobs.

Steve,
In many respects the "Wreck" is, or will be, more difficult. The only saving grace about the "Wreck" is the physical size, the SE 60 was pushing my limits, weightwise. I'm not really set-up to easily do what I did.
Harry

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09-24-2009, 12:08 AM #195

Pete F
Titanium

Join Date Jul 2008
Location Sydney, Australia
Posts 3,753
Post Thanks / Like
Likes (Given) 2054
Likes (Received) 1279

Another Noob question for you Harry. The Multifill you're using for the slides, how does this compare to the original material in terms of wear? Also, I'm assuming that there is a minimum thickness in its application, so you couldn't, for example use it instead of shims in the TS? Or maybe you could if you machined the TS base down to provide the minimum thickness, built it up with Multifill, then scraped that flat again.

I can only agree with everyone else here this has been a terrific read and thanks for taking the time to put it up here. Makes my little "project" look like a bit of a joke you'd knock off on a quiet afternoon

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09-24-2009, 02:38 AM #196

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Multifil 426 is a Teflon way material that has been impregnated with what appears to bronze particles. One side has been chemically etched to accept epoxy adhesive for attachment to other materials. It is available in thicknesses from .015" - .125".
It is very similar to Turcite and one grade of Rulon.
http://www.garlockbearings.com/produ...up=19&LangID=2
One definitely does not want to put this stuff on the bottom of a tailstock, don't ask how I found out. For shimming tailstocks, I use sheet shim stock placed between the top and bottom castings, as I did to this lathe's tailstock.
Harry

Like this post | Reply | Reply With Quote

09-24-2009, 03:48 AM #197

Pete F
Titanium

Join Date Jul 2008
Location Sydney, Australia
Posts 3,753
Post Thanks / Like
Likes (Given) 2054
Likes (Received) 1279

> Originally Posted by **beckley23**
> One definitely does not want to put this stuff on the bottom of a tailstock, don't ask how I found out. For shimming tailstocks, I use sheet shim stock placed between the top and bottom castings, as I did to this lathe's tailstock.
> Harry

Thanks Harry, I was thinking more along the lines of using the material between the TS base and TS top, in other words where you're presently using the shim rather than on the TS slides. If the multifill is too thick, machining the top of the base down slightly.

I've read comments from people here that say that shims are the work of the devil himself (which of course wasn't going to stop me using them), and the only "proper" way to get a low TS on centre was to scrape the HS down. Absolutely zero chance of me scraping the HS down so just wondered if a fill material like you use could be a compromise?

Like this post | Reply | Reply With Quote

09-24-2009, 11:27 PM #198

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

Any of these bearing materials would have to be scraped. Personnally I would not use this stuff for the TS application to build height. I have successfully used steel shim stock in this application. I've got shim stock in my 16" CY's TS, which I've had for 20 years, and haven't ever had a problem. I attempt to figure how much I have to raise the TS to match the headstock, and order the appropiate thickness. Generally I like to get my TS's about .0005" to .001" high.
I know what Connelly, and others, say about shim stock, but I'm not about to scrape a headstock if I don't have to. I think where people get into trouble is using multible layers, and improper/sloppy fitting. In all the years I've been a member here, I've only seen one comment about the heresy of using shim stock, and that was last week.
Harry

Like this post | Reply | Reply With Quote

09-25-2009, 06:37 AM #199

DWRoller
Plastic

Join Date	Feb 2009
Location	South East USA
Posts	3
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	0

I have two lathes that I added laminated shim stock between the top and bottom of the tail stock and it seems to work okay.

http://tinyurl.com/ye7ft6o

I like it because you can buy it a little thicker than you need and peel it down in .002-.003 increments to the exact thickness you need. I would like to know what people who actually know what they're doing think of this fix but for my purposes it worked really well. It cured some huge problems. (When you start with 1/8" shim stock you have huge problems, right?)

One lathe had the bed scraped in 1986 and something akin to Multifil 426 glued to the bottom of the tailstock. I wasn't used very much before it wore thin and started breaking off and folding up on itself. After I cleaned up the mess the tailstock was almost 1/8" low.

Like this post **Reply** **Reply With Quote**

10-06-2009, 04:13 AM #200

jockofthelowveld
Hot Rolled

Join Date	Jan 2008
Location	Blythewood, S.C.
Posts	622
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	35

36 inch test bar

Harry;

re: the 36inch test bar in post #191 above. Did you turn the test bar with or without a follow rest?

Best Regards;
Steve

10-06-2009, 10:52 PM #201

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Don't have a follow rest for this lathe, yet.
Harry

Like this post **Reply** **Reply With Quote**

09-01-2010, 12:05 AM #202

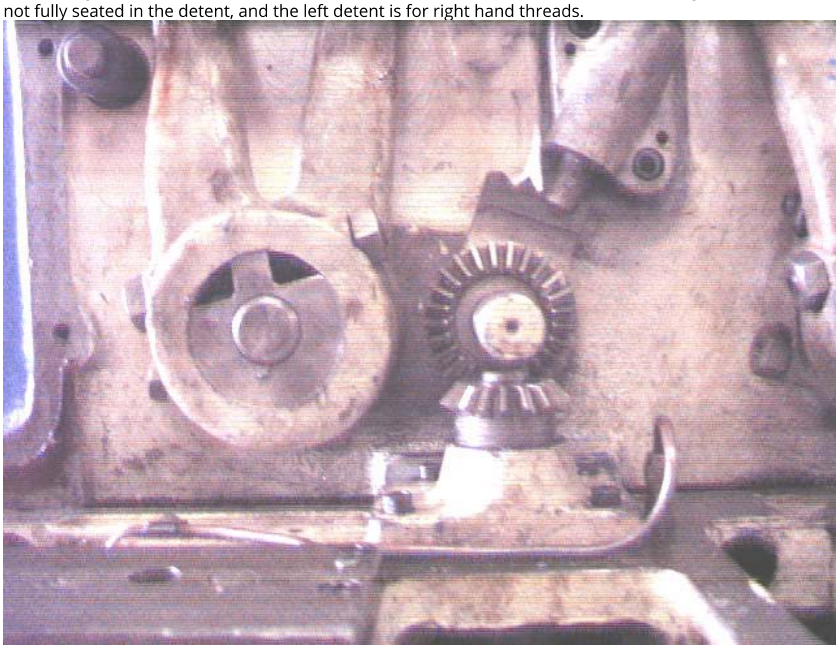
beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

Fixing the Leadscrew Reverse

After almost a year of thinking I had all the problems with lathe taken care of, a new one cropped up last week.
As is my habit with the CK and CY, the only way to reverse the feed and leadscrew is to shift the lever on the right side of the apron, I employed that method last week on the SE 60, for a facing operation. Much to my surprise, all I got was the dog clutch clicking, but not engaging. Completely forgot about the push-pull reverse knob lower down on the apron, until after I finished the facing. In between jobs, I investigated the problem, and Saturday morning I got into it. Pulled the covers on top of the gearbox and the lower headstock cover with the speed chart to expose the "external" parts. Couldn't get the reverse function to not work. I did find a spongy gear segment by forcing further movement and the small bevel gear not moving in relationship, it's pinned the same shaft. The big question, is how to get the gear segment and shaft out without taking the whole gearbox off. Save that problem for Monday.
Finally got back to the lathe yesterday afternoon, and figured out how to get the segment out without to much trouble. Take the snap ring off the top of the shaft over the smalll bevel gear, and get the taper pin out of the bevel gear, which is a lot easier said than done, and co-erse the shaft straight down into the gearbox, and hopefully not drop it, again a lot easier said than done. Finally teased it out. I was expecting to find a loose taper pin, pinning the segment to the shaft, but found a Woodruff ket and a set screw. There was a bit of movement, but not enough to account for what I saw earlier. Looked at the taper pin hole in the bevel gear, and it was oval, an ah-ha moment. Ream the taper pin hole in the gear and shaft to a larger size, for a properly fitted taper pin, and while I was at it, add a taper pin to the gear segment on the bottom, to really get this assembly nice and tight. Reassembled the gear segment in the gearbox, and the reverse shaft and gave it a test run. I still got the problem. I could force the gear segment a bit further, and the reverse function would work, but I'm not about to stand there with a screwdriver and the gearbox top off, while trying to run the lathe. Obviously, I'm missing something here.
Thought about for awhile, and decided to check the reverse gearing inside the headstock, to see if the shifter shoes were excessively worn. Off came the headstock cover, with the forklift's help, and all was good inside. So what could it be? I did find the limits of the segment's travel, by looking at the dog teeth engagement inside. Tried different positioning of the detent bracket, and of the circular gear rack engaging the gear segment, and several other ideas, all to no avail. The only conclusion I could come to, was that the worm was a bit to long on one end, it's travel is limited by either the dog clutch inside the headstock, or the sides of the gearbox, and I couldn't tell which one it was, as I had already reinstalled the headstock cover. I opted to shorten the worm 1/16" on each end, and hope it works. It did, I can't force the gear segment in either direction.

The bevel gear and detent for the leadscrew reverse. The center detent is neutral, the right detent is for left hand threads, and the plunger is not fully seated in the detent, and the left detent is for right hand threads.



The ball driver is on the gear segment, that is compounded to the small bevel gear in the previous picture. The circular rack is pinned the reverse shaft, and on the left is the nut block, in which is the 4 start worm pinned to the shaft. In case you are wondering, when the reverse shaft is in neutral the worm can be freed from the reverse shaft by unscrewing the threaded dowel and teasing it out.

The gear segment and the bevel gear. The taper pin on the table is for the bevel gear.

The nut block and 4 start worm. You can see the pin hole for attaching the worm to the reverse shaft. In this picture, the worm has alredy been shortened. The worm gives axial movement to the reverse shaft.

Harry

Like this post **Reply** **Reply With Quote**

10-30-2010, 06:14 PM #203

rotarySMP
Aluminum

Join Date	Mar 2008
Location	Vienna Austria
Posts	219
Post Thanks / Like	
Likes (Given)	64
Likes (Received)	44

Now that you have had a year of use of the scraped surfaces, could you please post some photos of how they now look?

Do you find that the Multifil has a rapid initial wear in on freshly scraped ways, or does it all stay pretty stable.

Do you find that the Multimil has a rapid initial wear in on freshly scraped ways, or does it all stay pretty stable.

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10-31-2010, 03:16 PM #204

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The wear rates on the scraped surfaces, or any other surface, will be dependent on; how much use the machine gets, the lubrication, and the cleaniliness. The SE 60 in this topic has not seen much use, although I am slowly working it into flow of work. This does not give much information about the questions you asked; however, I do have long term experience with other lathes in my shop that have had the same procedures applied to them. I have not noticed anything that suggests investigation, or gives me cause to think of changing the procedures used.
Monarch lathes have a built in automatic lubrication pump in the apron, which, IMO, is a very large plus in reducing the amount of wear in all of the bearing surfaces that are serviced by this pump. In other lathes, that I've reconditioned, that don't have the pump, the story is a little different, especially over a period of years.
Harry

Like this post | Reply | Reply With Quote

10-31-2010, 04:42 PM #205

rotarySMP
Aluminum

Join Date Mar 2008
Location Vienna Austria
Posts 219
Post Thanks / Like
Likes (Given) 64
Likes (Received) 44

Thanks for the prompt reply Harry. You reconditioning threads are inspirational.

You make it sound easy to scrape in a saddle while controlling front to back and side to side tilt, and the cross slide perpendicularity.
Mark

Like this post | Reply | Reply With Quote

11-30-2010, 06:03 AM #206

BrianB
Cast Iron

Join Date Aug 2006
Location Shelbyville, Ky
Posts 365
Post Thanks / Like
Likes (Given) 32
Likes (Received) 110

WOW! Awesome write up! I should get you to come out and help me do a good inspection on my CBB someday. I can barely comprehend some of the checks you perform. I just know turn, check diameter, turn some more until it is right. I like to think I have everything set correctly and that everything is working like it should, but sometimes I wonder about the oiling system. I don't have anything to comparre it to so I just assume since it leaves oil on the ways it must be working right. Your write up on the DRO installation a long time ago did inspire and help me to install one on my lathe. It certainly made my life easier. I can trun my camshaft blanks in a 1/10th the time it used to take doing it all manual with calipers and dial indicators and tons of mag bases. Keep up the good work.
Brian

Like this post | Reply | Reply With Quote

12-01-2010, 01:54 AM #207

rimcanyon
Titanium

Join Date Sep 2002
Location Salinas, CA USA
Posts 3,852
Post Thanks / Like
Likes (Given) 183
Likes (Received) 164

Harry, boy do those parts look familiar. You can see the same designer's influence on the 60, round dial 10EE and square dial 10EE, all for similar tasks. The worm is like the one used for round dial ELSR, the partial sector gear is like the one on the square dial ELSR.

-Dave

Like this post | Reply | Reply With Quote

beckley23
Titanium

Join Date Feb 2003
Location Louisville, KY, USA
Posts 3,247
Post Thanks / Like
Likes (Given) 5
Likes (Received) 146

The Follow Rest

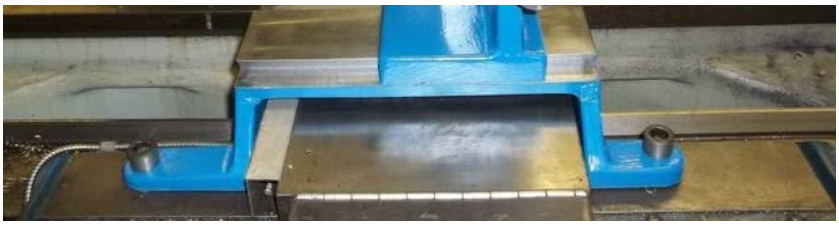
About a week ago I posted a new topic, it's linked here, that I will continue here, where it belongs.
Test Picture-Follow Rest
The FR pictured above and below, with the exception of some fine tuning is complete. There are some design and assembly changes I would make, were I to do this again; I would locate the clamping on the rear of the top slide to make the clamping easier to do, and I would put reference lines on some of the pieces to be welded before welding, to avoid positioning errors. If you look closely, the left side bridge riser is slightly out of place, and the mounting holes are off center. The entire FR is made from hot and cold rolled steel. I included slots and reference edges on the critical pieces to help insure alignments. In an effort to minimize weld distortion, I used 5 clamps to locate the top 4 pieces in position prior to welding. There is a picture with the clamp bars in place, in a re-creation attempt. This came out, surprisingly, relatively flat. All butt joints were champfered for welding, and ground afterwards, hence Russ's "chrome".
The jaws are 100* apart, starting at 5* under horizontal, the capacity is approx 1/2" to 4-3/4", although I don't think I'll ever get past 3"'s.
Those are the highlights, time for pictures.

Checking for squareness of the weldment. Of course I would think of this after priming. It's hard to see, but there is a .012" feeler gauge between the square and the top.

Set-up on the horizontal for milling the bottom square. I also had to do the dovetail section.

This is the partial re-creation of the weld clamping. The welder did long tacks on each side before the clamps were removed, and the welds completed.

The next 5 pictures, for show and tell only, are on the lathe. The lathe is set up for a job. The pictures are pretty much self explanantory.



I made up 3 sets of jaws, bronze tipped, roller bearing, and what supposed to be carbide tipped. I haven't located the 1/2" D X 1" long carbide yet, so I'll use dowel pins instead. The pins in place are for show, and will be replaced with the proper length dowels, or carbide, whichever comes first. The roller bearing jaws have .1 MM shims on each side of the 5200 sealed double row bearings, as spacers.

Harry

Like this post | Reply | Reply With Quote

12-19-2011, 12:11 PM #209

latzanimal
Aluminum

Join Date	Nov 2011
Location	IL, USA
Posts	50
Post Thanks / Like	
Likes (Given)	4
Likes (Received)	10

Wow...just wow....

Like this post | Reply | Reply With Quote

05-28-2012, 09:48 AM #210

Panza
Hot Rolled

Join Date	Oct 2005
Country	NORWAY
Posts	789
Post Thanks / Like	
Likes (Given)	266
Likes (Received)	154

I really appreciate the time you have taken to post all of this info. It will be useful to a lot of us.

Reply **Reply With Quote**

07-06-2013, 08:50 AM #211

kawboy
Banned

Join Date	Jun 2013
Location	Oregon
Posts	20
Post Thanks / Like	
Likes (Given)	2
Likes (Received)	10

Just bought an old Monarch series 60 (13 x 30)...good price, pretty rough shape.
This thread will be my guide. Thank you SO much!

Like this post **Reply** **Reply With Quote**

07-21-2013, 09:57 PM #212

jrm68fj40
Aluminum

Join Date	Feb 2012
Location	Cherry Valley Ca
Posts	91
Post Thanks / Like	
Likes (Given)	3
Likes (Received)	5

Thank You, Thank You. i just read though your post and really appreciate your time spent post pics and writing out the details for us.

Like this post **Reply** **Reply With Quote**

01-03-2014, 04:40 PM #213

Alain
Aluminum

Join Date	Mar 2005
Location	New Brunswick, Canada
Posts	204
Post Thanks / Like	
Likes (Given)	7
Likes (Received)	12

Harry
Here is a 4" x 1/2"D carbide round stock that would work

Garr Polished 4" Long 500" Dia Solid Carbide Precision Round Blank | eBay

Like this post **Reply** **Reply With Quote**

08-13-2014, 05:58 PM #214

dian
Stainless

Join Date	Feb 2010
Location	ch
Posts	1,837
Post Thanks / Like	
Likes (Given)	170
Likes (Received)	231

whats the idea with the carbide tips and how did you drill the hole in the carriage? is it blind? as its made out of steel, does the fr ring?

Like this post **Reply** **Reply With Quote**

08-15-2014, 08:50 PM #215

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The carbide tips are for wear resistance. The holes in the saddle were drilled with a electric hand drill, and they are blind. The FR does not ring, in my experience, but then again I hardly ever use it. I can count on both hands how many times in the past 30 years that I've used a follow rest, but when you need there simply isn't any other choice.
BTW, the last time I saw this lathe was 11-18-11, it was sold at auction.
Harry

Like this post | Reply | Reply With Quote

12-28-2014, 08:20 AM #216

TheOldCar
Hot Rolled

Join Date	Jul 2011
Country	UNITED STATES
State/Province	Utah
Posts	611
Post Thanks / Like	
Likes (Given)	1033
Likes (Received)	199

I'm getting LOTS of help from this thread as I work on my series 60 13". Thanks for the photos and walk-throughs!

Like this post | Reply | Reply With Quote

12-28-2014, 06:09 PM #217

TheOldCar
Hot Rolled

Join Date	Jul 2011
Country	UNITED STATES
State/Province	Utah
Posts	611
Post Thanks / Like	
Likes (Given)	1033
Likes (Received)	199

> Originally Posted by **beckley23**
>
> The meter units may be leaking at the manifold, but it's pretty hard to tell. They are passing oil at a respectable rate, at least the ones I could see. I did have to change one from a 00 to a 0, today, on the gearbox system. There are 2 lines that go into the "bowl", one oils a bearing and the other is for the gears. I could see some tell tale traces from the bearing, but wasn't getting anything out of the gear tube. That unit got changed, and things are better. I was able to get the suction end of the pump covered without totally filling the gearbox.
> The Bijur meter unit has a radiused end on the inout, that I think acts as the compression seal, the "Trico's" don't and I think that may be the cause of the leakage problem. I think an easier solution to that leakage problem would be to put some pipe dope on the threads.
> I think I've got seal a problem on the pump on top of the piston. IIRC, there is a very small O ring in there. I may investigate later.
> Harry

Did you find out if the meters have an O-ring? I'm nervous I may be melting (or swelling) any rubber in mine since I have my headstock pump disassembled and soaking in lacquer thinner.

The gearbox pump is done, and flushing out the gearbox took 12 fills and drains before crud stopped flowing out. I used diesel fuel and kerosene. I thought I was done at around 5 flushes, and began to pour ISO 68 into the gearbox. Then a new section of crap broke free somewhere inside and the constant flow of floaties (or sinkies) started coming.

Like this post | Reply | Reply With Quote

12-28-2014, 06:53 PM #218

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

No "O" rings.
Harry

Like this post | Reply | Reply With Quote

12-28-2014, 07:45 PM #219

TheOldCar
Hot Rolled

Join Date	Jul 2011
Country	UNITED STATES
State/Province	Utah
Posts	611
Post Thanks / Like	
Likes (Given)	1033
Likes (Received)	199

Thanks!

How noticeable should flow be on the sight glass that shows pump is working? I removed and cleaned all of the sight glasses...some were covered in paint! After flushing the headstock and refilling, I ran the lathe and the pump slowly flowed, filling the sight glass up to almost half. But after one week, it is starting to flow almost nothing (which is why I'm cleaning the pumps and lines). Is it supposed to be a slow sort of runny drip when working right?

Like this post | Reply | Reply With Quote

12-28-2014, 09:49 PM #220

beckley23
Titanium

Join Date	Feb 2003
Location	Louisville, KY, USA
Posts	3,247
Post Thanks / Like	
Likes (Given)	5
Likes (Received)	146

The pumping action is cam operated off the bull gear. A lot is going to depend on the size of meter unit supplying the sight glass.
This may help clarify;
12"CK Headstock Gearing & Oil Pump
Harry

Like this post | Reply | Reply With Quote

02-16-2015, 08:39 AM #221

GMTG
Plastic

Join Date	Oct 2009
Location	NE OH
Posts	17
Post Thanks / Like	
Likes (Given)	0
Likes (Received)	1

Mr beckley23 --- i was trying to message you
but it says your inbox is full

Like this post | Reply | Reply With Quote

12-19-2016, 09:35 PM #222

rke[pler
Diamond

Join Date	Feb 2002
Location	Peralta, NM USA
Posts	5,286
Post Thanks / Like	
Likes (Given)	35
Likes (Received)	271

> Originally Posted by **onecut**
> You should take an apprentice on and pass your great knowledge on to some lucky youngster

Unfortunately Harry passed away a little more than a year ago. If you read his postings here you'll have served some sort of apprenticeship, I think.