

(Shown without motor and speed control)

SHERLINE PRODUCTS

INCORPORATED 1974

The Lever Collet Closer is designed to accept Sherline WW collets. Up to 3/16" diameter material can be passed through the collet. Collets go from .3mm or 1/64" to 8.0mm or 5/16". Pot Chucks are available for larger parts.

Lever Collet Closer

P/N 1150

Introduction

When we decided to make a lever collet closer for the Sherline lathe, we wanted to design another quality Sherline accessory that would increase the capability of our machine and enhance its performance. We wanted a design that would be streamlined, compact, balanced, durable and easy to install. We chose a design that incorporated an internal locking and tensioning mechanism. We chose this design over the standard external "cam to rocker arm" design for a couple reasons. First of all, we didn't want any additional external parts that could cause an unbalanced or dangerous situation. Secondly, we wanted our collet closer to be easy to use with the fewest possible moving parts.

The Sherline collet closer's locking mechanism is inside the cam and is actuated by pushing the handle towards the rear of the headstock. To unlock you pull the lever forward. The tension mechanism is a ball detent that rides on a knurled wheel. As you turn the drawbar knob to tighten the collet, the ball moves to the next knurled tooth, giving a positive feel and holding it in place.

In order to make our collet closer durable, we made all of the wear parts out of hardened A2 tool steel and 1144 Stress-proof steel along with hardened dowel pins in the pivot joints.

Last of all, we wanted our collet closer to be easy to mount to any Sherline lathe. This collet closer base is easily mounted to the end of the existing leadscrew support below the rear of the headstock with two 10-32 socket head cap screws. The spindle mounting sleeve is attached to the rear of the spindle shaft with a single 4-40 socket head cap screw.

The lever operated collet closer makes production work and collet work easier and faster. You can run stock that is 3/16" (4.76mm) diameter and smaller through the headstock. You can hold larger parts (without through feeding) in one of our larger WW Collets, or in one of our WW Collet Pot Chucks (P/N's 2100-2105).

We believe that you will find this collet closer to be a nice addition to your Sherline lathe. We have been using it on the Sherline CNC Lathe in our shop to machine second

operations on several of the parts that we use in this collet closer and have been very pleased with its performance.

Installation

Tapping the spindle shaft hole—There is a small hole in the rear portion of the spindle shaft that extends past the 2-position pulley to the operator's left on the lathe. If you have installed a P/N 3100 threading attachment on your lathe in the past, that hole is already tapped 4-40, and you will need to remove the small screw that is in the hole. If the hole is not yet threaded, we have included a small 4-40 self-tapping screw. Thread this screw into the hole with a screwdriver and it will cut 4-40 threads about 80% deep for you. When done, remove the screw and thread the 4-40 socket head cap screw (SHCS) included with the kit into this hole to do the final cutting of the thread, then remove it for installation of the collet closer. (You can also use a 4-40 tap if you have one, but using the self-tapping screw will probably give a tighter fit that assures the SHCS will not come loose.)

Installing the Collet Closer Base—Loosen the two 10-32 screws in the collet closer base. (See Figure 2 on next page for location.) After inserting the collet drawbar tube (P/N 11510) into the rear of the headstock spindle shaft, slide the collet closer base onto the rear of the leadscrew support that extends from the lower left end of the lathe base. Push the base of the collet closer up tight against the lathe base. Tighten the two 10-32 screws using the 5/32" hex key provided with your collet closer to secure it to the collar.

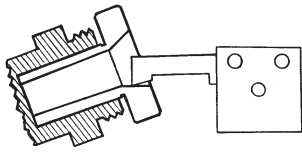
Attaching the collet closer body—The spindle mount sleeve (P/N 11512) has a hole that will align with the 4-40 tapped hole in the spindle shaft. Install the 4-40 SHCS included with your kit to secure this sleeve in place. A small 5/32" hex key is provided to fit this screw. **NOTE: Do not overtighten this screw or you will strip out the threads in the spindle.**

(See Figure 2 on next page for location.)

After making sure the spindle nose is clean and free from chips, clean and then insert the #1 Morse tapered WW

collet adapter into the spindle nose. Note the position of the pin inside the adapter. This pin registers on the collet's keyway to keep it from rotating in the adapter

Figure 1—Truing up the collet adapter taper



As with any new WW collet adapter, we recommend that before using it, you take a light cut on the 20° internal taper to assure it is perfectly aligned with your particular lathe.

Installation of the WW Collet Adapter

For accuracy, repeatability, and ease of use we recommend that you insert the WW collet adapter into the spindle with the keyway pin aligned with one of the Tommy bar holes in the collar of the spindle. Then mark the tommy bar hole with a scribed line for future identification. This will help you in two ways: 1) It will give you an exterior sight mark so you will know the location of the keyway pin when you insert a WW collet, and 2) Once you have machined the 20 degree angle on the WW collet adapter to increase the accuracy, you will want to reinstall it in the same relationship to the spindle each time you use it. This will insure minimum runout of the WW collet adapter.

Adjustment

With the lever handle (P/N 1501) pushed to your right toward the spindle and a collet installed in the adapter, slip a piece of appropriately sized raw stock into the collet. Rotate the knurled drawbar knob (P/N 11506) clockwise until the collet closes onto the part and it can't be moved by hand. Back off (counter-clockwise) a little on the handwheel until the part can just be slid in and out of the collet.

Move the lever handle to your left, locking the part in place. Check to see that the part is held securely. You may need to make some fine adjustments of the drawbar knob to find a position that allows a part to be easily installed in the collet while still being held securely when the arm is actuated.

Lubrication

The primary wear parts of the collet closer are the shoes (P/N 11518). We recommend that you place a few drops of light weight oil (such as 3-in-1 oil) into the oiler hole on the top front side of the Yoke (P/N 11522) prior to each use or hourly if used constantly. (See Figure 2.)

The other wear parts are the steel balls (P/N 11507), the thrust washers (P/N 11509) and the cam (P/N 11509). All of these parts are hardened steel. They are assembled at the factory using Super-Lube PTFE (Teflon-based) grease available from Sherline as P/N 7550. If you use your collet closer frequently, we suggest that you disassemble the cam periodically and add fresh grease to the balls and inner face of the thrust washers.

Thank you,
Sherline Products Inc.

CAUTION!

- 1. Do not over-tighten the collet before engaging the cam lever**—Because of the cam lever action of this collet closer, you can exert a very high closing force on the collet if it is over-tightened prior to final closing with the lever handle. Do not pre-tighten the collet on the part to a point where the collet is in the full clamp position prior to clamping with the lever. This will put excessive force on the collet threads and result in premature wear and failure of your collets and your collet closer.
- 2. Do not allow long stock to protrude too far from the left end of the spindle**—An inherent danger when running long stock through the spindle on all lathes is the possibility of an excessive whipping action. Just as there is a rule of thumb for how far unsupported stock should be sticking out of a collet when machining (1.5 times the diameter of the stock), a similar rule also applies to how far your stock should be sticking out of the rear end of the spindle without support. Since 3/16" is the largest diameter of stock that can feed through the spindle, we recommend that your stock does not protrude more than 1.5" past the end of the spindle. This distance could be increased if the spindle speed is reduced or decreased if the spindle speed is increased.

The inherent danger caused by the whipping action is this: As your stock begins to whip, the centrifugal force on the end of the stock increases. If the forces on the end of the stock exceed the stress level of the material, which can happen very quickly, your stock will bend at a 90 degree angle to the spindle and become the equivalent of an airplane propeller, damaging everything it hits while rotating. Excess stock longer than noted above must be supported.

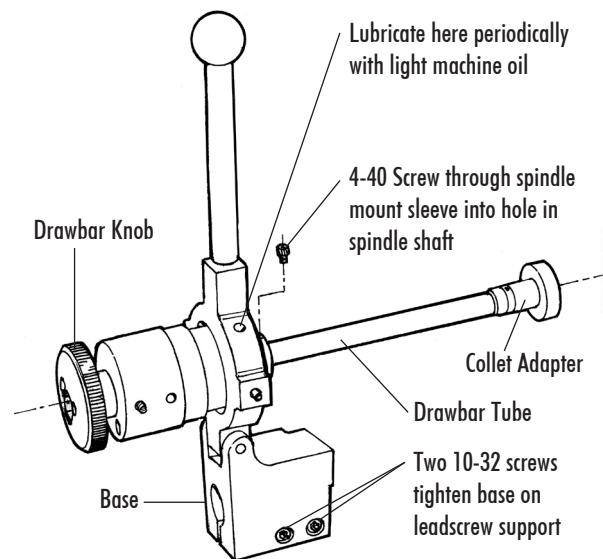


Figure 2—Lubrication and attachment points.

Troubleshooting the Lever Collet Closer (LCC)

There are a limited number of things that can go wrong with our collet closer. If yours is not functioning correctly, here are a couple items to check.

First, the easy things:

1. Is the #11512 Spindle Mount Sleeve attached securely to the Headstock Spindle with the #11538 4-40 x 3/16" SHCS?
2. Is the #11520 LCC Base pressed all the way up to the end of the lathe bed? There will be a space between the Base and the casting, but there shouldn't be any space between the Base and the lathe Bed. Are the clamping screws #40690 tightened securely so the base cannot move?

Now the more serious topics: Collet clamping and unclamping problems.

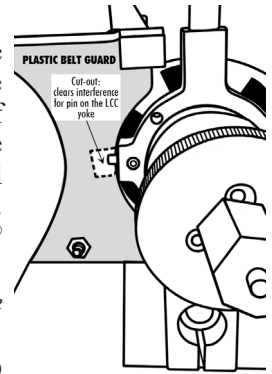
3. Does the spindle turn freely inside the yoke with the collet unclamped? If not, there is a problem with the Shoes #11518 binding in the groove in the Cam #11514. See fix below in instruction 4 a-c below.
4. Does the spindle turn freely inside the Yoke with the collet clamped? If not, there is a problem with the Shoes #11518 binding in the groove in the Cam #11514. See fix below in sections a-c.
 - a. If the spindle turns freely when the collet is open and locks up when you close the lever, there is either something wrong with the Shoes or the 1/8" pins #11526 are rubbing on the Cam groove.
 - b. First loosen the two set screws #11528 that hold the 1/8" pins in place. Then pull the 1/8" pins out a little. Clamp the collet and see if the spindle turns freely. If it frees up, the problem was the 1/8" pins were in too far, and they were rubbing on the Cam. Retighten the two set screws and try again.
 - c. If the spindle is still binding you may need to flip the Shoes 180 degrees in the Yoke, or replace them. Flip one Shoe at a time first to see if that frees up the spindle.
5. Does your collet lever move forward to the open position when you are running the spindle? This can be caused by a couple things.

- a. The first time you use the Lever to close the collet (after your initial installation of the WW Collet Adapter #11585), the adapter will move farther into the spindle nose until it is fully seated. This will cause the collet to come loose. We recommend that you "clamp, unclamp, retighten and clamp" the collet at least three times to seat the adapter correctly.
 - b. One of the Thrust Washers #11509 was assembled incorrectly. The thrust washers are flat on one side and have a taper cut on the other side. When assembled correctly the taper side of both washers should be facing the Ball Carrier #11507 (See Figure 3). If the Thrust Washers are not assembled correctly, the lever will close the collet, but it will slowly work its way back open during use.
 - c. To fix this you will need to partially disassemble the collet closer. You will need a 1/16" Allen Wrench and a small slotted screw driver.
6. If you happen to strip out the threads of the spindle mount sleeve you can purchase P/N 12710 5-40 x 3/16" SHCS. Retrap the spindle hole with a 5-40 tap. The OD of a 5-40 tap is .125. The hole in the sleeve is .120. Use the spindle mount sleeve as a tap guide and tap through the sleeve and into the spindle hole. Remove the tap, and thread in the

5-40 SHCS.

7. You might find possible interference issues between the LCC and the plastic belt guard. If the belt guard interferes with the pin on the LCC yoke make a small cut-out in the guard (see Figure 4). This can be done with an X-acto® knife or Dremel® Tool.

Figure 4—Dashed lines indicate plastic belt guard cut-out.



8. Please note that if you have a DRO Tac Sensor it will not work with the LCC.

Disassembly

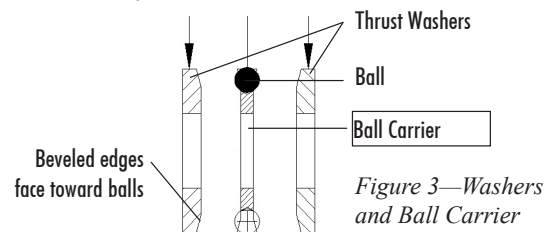
IMPORTANT NOTE: We use blue removable Loctite® on the screws that you will need to loosen to do this partial disassembly.

1. Loosen the two #11532 Dog Point Set Screws about three turns.
2. Loosen the #11535 set screw with ball detent three turns.
3. Remove the collet if necessary.
4. Now you should be able to pull the entire drawbar assembly out from the back side.

Note: Place a rag or towel under the back side of the collet closer. There are eight 1/8" steel balls in the carrier that are only held into the carrier with grease. If they fall out, they will be hard to find.

5. Once the drawbar assembly has been removed, push the two Thrust Washers away from the Ball Carrier #11507 and see if the side with the taper is facing the ball carrier on both of them. If not, pull them off, turn them around, and reassemble them.

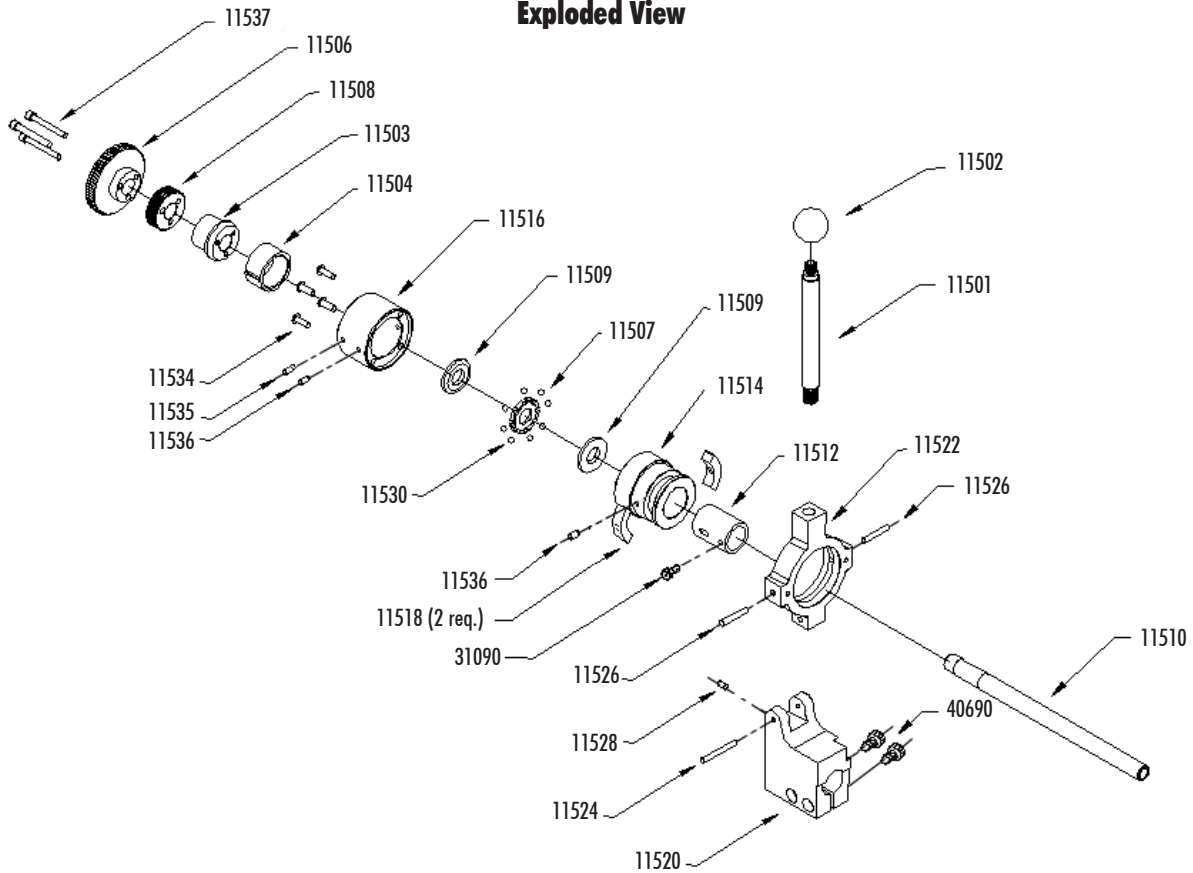
This is how they should be assembled:



6. To reassemble, carefully insert the drawbar shaft assembly back into the Cam body (taking care not to lose any balls).
7. Align the slots in #11504 Guide Ring with the Dog Point Set Screws #11532. Turn one set screw in at a time until it bottoms out in the groove. Then back it out 1/2 turn. There must be clearance between the set screw and the groove so the parts can move back and fourth.
8. Turn the ball detent set screw in until it bottoms out on the #11508 Knob Adapter Plate. Then back it out 1/2 turn. If the screw is adjusted correctly, you should be able to turn the drawbar assembly with ease and feel the Ball click into each knurled groove on the Adapter Plate.

Special Note: This is the same procedure that we use to check the Balls and Thrust Washers for wear. We also use this procedure to apply grease to the Balls and the Ball Carrier during general maintenance.

Exploded View

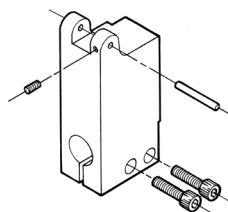


Parts List

NO. REQ.	PART NO.	DESCRIPTION	NO. REQ.	PART NO.	DESCRIPTION
1	11501	LCC Handle Shaft	3	11528	5-40 x 3/16" Cone Point Set Screw
1	11502	LCC Handle Knob	8	11530	1/8" Steel Bearing Balls
1	11503	LCC Hub	1	11532	5-40 x 1/4" Dog Point Set Screw
1	11504	LCC Guide Ring	4	11534	5-40 x 3/4" SHC Screw
1	11506	LCC Drawbar Knob	1	11535	8-32 Set Screw w/ Spring Loaded Ball
1	11507	LCC Ball Carrier	1	11536	4-40 x 1/8" Dog Point Set Screw
1	11508	LCC Knob Adapter Plate	3	11537	5-40 x 1" SHC Screw
2	11509	LCC Thrust Collar	1	11538	4-40 x 3/16" SHC Screw
1	11510	LCC Drawbar Tube	1	11565	WW Collet Adapter w/ 8mm Keyway SS
1	11512	LCC Spindle Mount sleeve	1	11570	WW Collet Knockout Bar (not shown)
2	11514	LCC Cap	1	11585	WW Collet Adapter w/ Keyway Pin
1	11516	LCC Cam Cap	*	(11565)	8mm Collet Adapter w/ Pin (Not Included)
2	11518	LCC Cam Shoe	1	31090	4-40 self-tapping pan head screw
1	11520	LCC Base	1	40560	5/32" hex key (not shown)
1	11522	LCC Yoke	1	40570	3/32" hex key (not shown)
1	11524	1/8" x 1" Steel Dowel Pin	2	40690	10-32 x 3/4" SHC Screw
2	11526	1/8" x 3/4" Hardened Steel Dowel Pin	*		Purchase optional 8mm adapter if using 8mm collets

Accessories for the Lever Collet Closer

- LCC Riser Block P/N 1152
- Adjustable Collet Stop P/N 1153



LEFT: Optional collet closer riser block P/N 1152

RIGHT: Optional adjustable collet closer work stop kit P/N 1153

