SHERLINE PRODUCTS
INCORPORATED 1974

CNC Rotary Table Maintenance

General Maintenance Instructions for the CNC Rotary Table

These instruction are for those that may need to perform some general maintenance on their rotary table. You should only attempt this if you are confident in your mechanical skills and your ability to follow instructions. If you are unsure whether you should proceed, it is advisable you first contact Sherline Products and inquire about returning your rotary table for factory maintenance (a fee will apply).

NOTE: If your rotary table does not turn while turning the stepper motor, or handwheel, the screw (P/N 37200) that holds the coupling adapter (P/N 37124) onto the end of the worm shaft has probably come loose. Use the instructions for Troubleshooting CNC Rotary Table Problems (https://www.sherline.com/wp-content/uploads/2021/02/cnc_rt_troubleshoot_inst.pdf) to regaining the connection between the stepper motor and the worm shaft.

Disassembly Instructions for the Rotary Table

1. The following screws all have removable "Loctite" on their threads. We use Loctite #242 thread locker. [(2) P/N 37200 10-32 button head screws, and P/N 37160 preload nut].

2. Use a 1" socket (possibly a 26mm socket) and loosen the preload nut (P/N 37160) at the base of the table.

3. Remove the (2) 10-32 screws (P/N 40510) that hold the worm housing (P/N 37121) to the rotary table base (P/N 37100).

4. Wiggle the worm housing back and forth to break the silicone seal. Then remove the entire worm housing assembly.

5. Use the handwheel (P/N 40050) to turn the stepper motor (P/N 67130). Look through the access hole in the stepper motor mount and turn the handwheel until the set screw (P/N 40520) lines up with the access hole (see Figure 1).

The set screw can be seen through the stepper motor mount access hole.

FIGURE 1— The set screw is aligned with the access hole.

6. Use a 3/32" Allen wrench to loosen the set screw (P/N 40520) a couple turns (see Figure 2).

7. Remove the (4) 8-32 screws (P/N 67100) that hold the stepper motor onto the stepper motor mount (see the Exploded View on page 4).

8. Remove the stepper motor. If it is hard to remove, loosen the set screw (P/N 40520) a bit more.
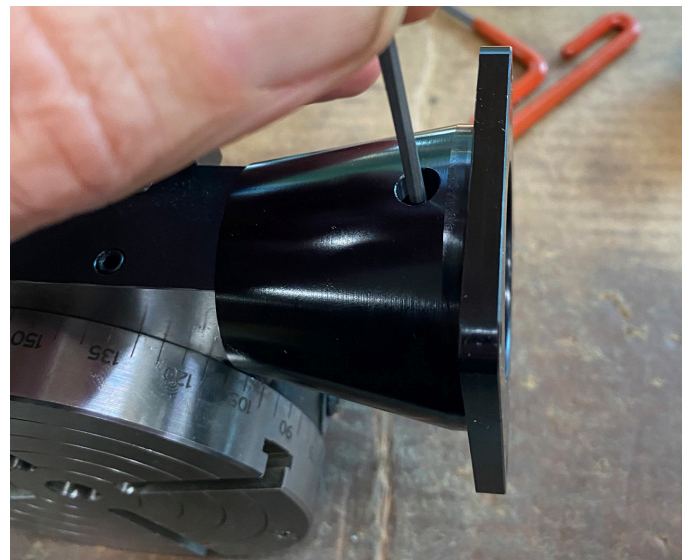

FIGURE 2—Shows the 3/32" Allen wrench inserted through the motor mount access hole.

NOTE: Please refer to the exploded view on page 3 of these instructions for all P/N references.

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9. Screw in the set screw (P/N 40520) until it is flush with the outside of the CNC rotary table coupling (P/N 37123). Insert the Allen wrench through the access hole and into the set screw. You will be using the Allen wrench to keep the worm (P/N 37131) from turning, so you can loosen the (2) 10-32 button head screws (P/N 37200). Break the two screws loose.

NOTE, If you want to add Loctite to the threads of screw 37200, you will need to follow instructions 10, 11, & 12. Apply Loctite to the threads. Hold the coupling adapter securely, and tighten 37200 again.

10. Now remove the button head screw (P/N 37200) that is on the "preload bearing" side of the worm housing.

11. Once the (2) button head screws (P/N 37200) are removed, you can remove the (4) screws (P/N 40530) that hold the motor mount (P/N 87510) onto the worm housing (P/N 37121). Then twist and pull the motor mount off.

12. Now remove the other set screw (P/N 40520) that holds the coupling (P/N 37123) onto the coupling adapter (P/N 37124). Then pull the coupling off.

13. Place the long end of a 1/8" Allen wrench into the 10-32 hole at the "preload end" of the worm shaft (P/N 37131). Tap the allen wrench with a hammer. The worm shaft, along with the top bearing (P/N 10930) should all come out of the stepper motor side of the worm housing. All of the bearing fits are very light slip fits. They are not press fits.

14. Now remove the coupling adapter. There may be some Loctite on the adapter, so you may need to use pliers to twist it free. Once the adapter is off you can remove the bearing from the worm shaft.

Reassembly Instructions

1. Place the bearing and adapter onto the worm shaft. Apply a drop of "Loctite #242" to the thread of the 10-32 button head screw (P/N 37200). Screw it in tight.

2. Push the assembled worm shaft into the worm housing (and the bearing at the preload end of the worm housing).

3. Mount the coupling (P/N 37123) onto the adapter. Be sure that the "Flat" on the adapter is aligned with the set screw. Tighten the set screw.

4. Now leave the Allen wrench in the set screw and use it for leverage, so you can tighten the screw (P/N 37200) that holds the adapter onto its final tension. All of the screws on the stepper motor end must be very tight to avoid any extra backlash.

5. Now it is time to tighten the screw (P/N 37200)* at the "preload end" of the worm housing. The purpose of this screw is to take up any slop in the bearing and any backlash in the final worm assembly. If you over tighten this screw, you will damage the bearings.

* **NOTE:** Before you tighten this screw, you need to spin the worm with your fingers. Use the coupling to spin the worm. Notice how freely it spins. There should not be any resistance to the spinning motion.

Now place a drop of Loctite #242 on the threads (not too much or it may get into the bearings). Turn the screw in until the washer makes contact with the inner bearing face. Then just finger tighten a little to take up the bearing play. Now spin the worm again and see how it feels. If there is noticeable resistance to the turning motion, then the screw is too tight. Loosen the screw and tighten it a little. Then give the worm another spin.

6. Before you assemble the worm housing, you will need to look at all of the teeth on the rotary table top (P/N 37110). Look for any steel chips on the gear teeth, or in the grease that is on the gear teeth. It only takes one little chip to lock up the whole table.

7. Apply fresh grease to the gear teeth of the rotary table top (P/N 37110).

8. Now apply fresh grease to the teeth of the worm gear.

9. Put a little line of "Silicone Caulk" on the two 1/8" grooves that are on the worm housing. This is used as a dust seal between the worm housing and the rotary table base.

10. Now set the rotary table on its side, with the worm housing "Step" facing up.

11. Pull the rotary table top away from the base just enough so the worm housing will fit in without getting damaged.

12. Wipe all mating surfaces of the worm housing, base, and table clean.

13. Gently lower the worm housing down into place.

   A. You can turn the coupling to get the worm teeth and the table teeth to line up.

   B. Once the teeth are aligned, turn the worm to move the housing back and forth to line up the (2) 10-32 screw holes for mounting the worm housing to the base.

   C. Insert the (2) 10-32 screws (P/N 40510) and leave them loose.

   D. When the worm housing is assembled, there will be a slight gap between the worm housing and the base. This is so you can adjust for gear wear in the future.

   E. Gently rock the worm housing back and forth until it is square to the base.

   F. Use "Very Light" finger pressure to hold the worm housing in place. Then tighten the (2) 10-32 mounting screws (P/N 40510) to secure the worm housing in place.

   G. Gently tighten the preload nut (P/N 37160) to remove any backlash from the headstock bearing (P/N 40420).

      NOTE: The torque on the preload nut is less than 1 in/lb. When we assemble the table, we just tighten

the preload nut up until it makes contact with the bearing (by hand). If you exceed 1 in/lb., you will lock up the table. The preload nut is there just to keep the bearing in place and the table top held slightly against the base.

H. Now turn the coupling back and forth to see how tight the worm is.

I. If it is hard to turn, you were probably exerting too much pressure on the worm housing when you tightened the worm housing screws. Loosen the (2) screws, and then retighten them without pressing down on the worm housing. Then turn the coupling again.

J. If the worm turns smooth and easy, then you will need to make the table go through one full revolution. As you are turning the coupling, feel for tight spots. Anytime you feel a tight spot, change the direction and go back and forth over that area a couple times (this tightness can be caused by too much grease on the teeth). Once you have squeezed it out by turning the worm through that area a couple times, the rotation should smooth out.

    a. If it gets smoother, then continue turning through the first rotation.

    b. If it gets harder to turn (or if it binds) then you will need to mark the table top to show the part of the table that was engaged with the worm gear. Then remove the worm housing and look for anything that could be causing the worm to jam.

NOTE: If you experience a few areas that are slightly tighter than the rest of the table, loosen the (2) screws (P/N 40510) and lightly tap the worm housing away from the rotary table. Then tighten the screws and turn through another full revolution. The maximum amount of play that is allowable is 2/10 of a degree. This is (2) lines on the handwheel.

K. Once the worm backlash is set, remove the headstock bearing preload nut (P/N 37160). Apply a small drop of Loctite #242 thread locker to the threads. Retighten the preload nut.

NOTE: The torque on this preload nut is the same as the torque on the (P/N 37200) screw on the worm shaft. All you are doing is taking up the backlash in the bearing. This nut should be just finger tight.

L. Turn the worm shaft and see if it still moves as freely as it did before you tightened the preload nut.

14. Use the (4) 8-32 screws (P/N 40530) and remount the motor mount (P/N 87510) to the worm housing (P/N 37121).

15. Turn the coupling until the set screw lines up with the access hole in the motor mount.

16. Put the Allen wrench through the access hole and into the set screw (P/N 40520).

17. Now insert the stepper motor shaft into the coupling (with the flat on the shaft facing the set screw in the coupling).

18. Push the stepper motor into position. Tighten the set screw just finger tight. Now insert the (4) 8-32 screws to mount the stepper motor to the motor mount. Tighten them firmly. Now loosen the set screw in the coupling to relieve any end force that may have been exerted on the coupling. Then retighten the set screw.

19. Tighten the locking screw (P/N 40540) so the table can't move. Now use the handwheel to check the amount of backlash (2/10 of a degree=2 lines). If the backlash is 2/10 or less, unlock the table, and turn the table through a full revolution.

20. If all is good, hook up the stepper motor and put the table through some test moves.

Exploded View
Sherline CNC Rotary Table, P/N 8730
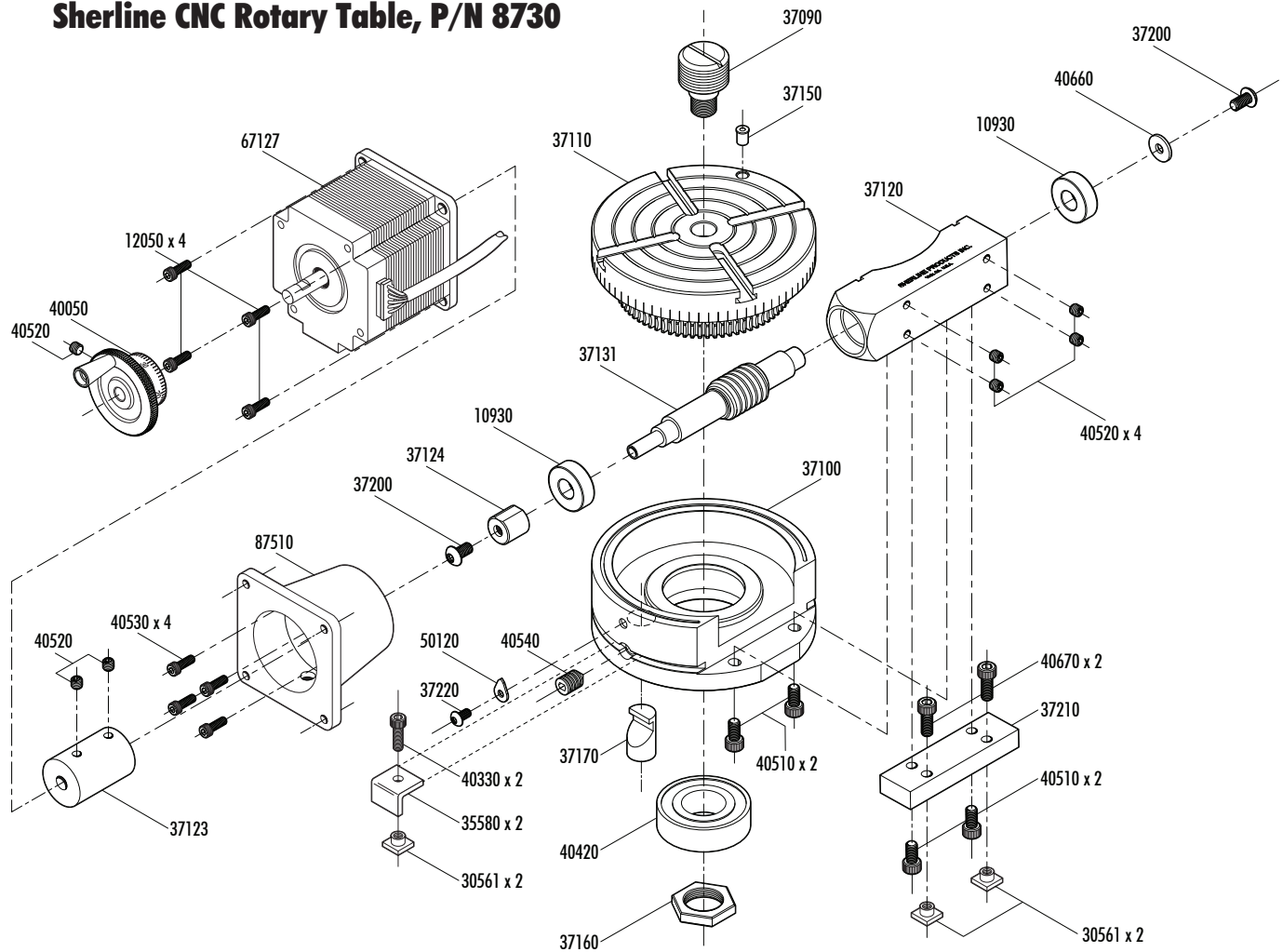
NO. REQ.	PART NO.	DESCRIPTION	NO. REQ.	PART NO.	DESCRIPTION
2	10930	3/8" Bearing	1	40050	1-5/8" handwheel assembly
4	30560	10-32 T-nut	2	40330	10-32 x 5/8" SHCS
2	35580	Hold-down clamp	1	40420	Headstock bearing
1	37090	Chuck adapter	4	40510	10-32 x 3/8" Socket head cap screw (SHCS)
1	37100	Rotary table base	7	40520	10-32 x 3/16" cup point set screw
1	37110	Rotary table top	4	40530	5-40 x 3/8" SHCS
(1)	37121	CNC rotary table worm housing (Not sold sep.)	1	40540	5/16-18 x 3/4" cone point set screw
(1)	37131	CNC rotary table worm shaft (Not sold sep.)	1	40660	3/16" I.D. washer
1	37122	CNC rotary table worm housing assembly	2	40670	10-32 x 1/2" SHCS
1	37123	CNC rotary table coupling	1	50120	Pointer
1	37124	CNC rotary table coupling adapter	4	67100	8-32 x 3/8" SHCS
1	37150	Oiler	1	67127	2 Amp, 100-oz., 23 frame size stepper motor
1	37160	Preload nut	1	87041	120 VAC power supply (24 VDC, 1 amp output)
1	37170	Lock pin	1	87100	Control unit with keypad/electronics (not shown)
2	37200	10-32 x 3/8" button head socket hd. screw	1	87250	Motor-to-keypad 6' extension cable (not shown)
1	37210	Hold-down tab	1	87350	Remote (limit) switch/daisy-chain 1/2 cable (not shown)
1	37220	6-32 x 1/4" button head socket hd. Screw	1	87510	CNC rotary table stepper motor mount