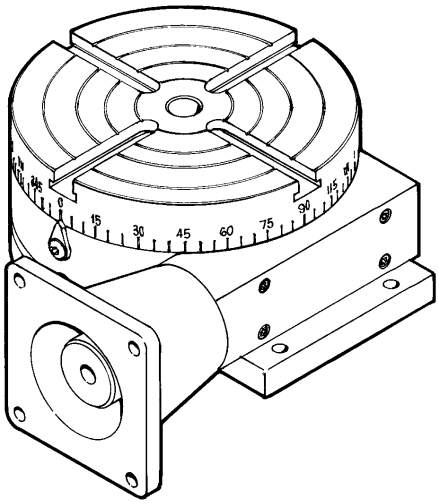


SHERLINE PRODUCTS
INCORPORATED 1974

CNC-Ready Rotary Table

P/N 3700-CNC

The Sherline 4" rotary table has been adapted for CNC use with the application of a stepper motor mount in place of the standard manual handwheel. The mount accepts a #23 frame size stepper motor. Screws are provided for attachment of the motor. Also included is a handwheel that can be used on the rear shaft of a dual-shaft stepper motor if manual control is desired for simple operations.

We have included a copy of the regular P/N 3700 rotary table instructions. These will give you a good introduction to using a rotary table.

Rotary Table Specifications

Backlash — ± 0.1°
Repeatability — ± 0.1°
Positioning accuracy — ± 0.1°
Horizontal orientation weight limit — 50 lbs.
Vertical orientation weight limit — 30 lbs.
Vertical rotational torque — 6 foot/lbs. (meaning it can lift a 6 lb. weight when suspended 12" away from the center of the rotary table)

NOTE: We have stated the weight limits for our rotary tables when under continual use. The rotary tables can hold more weight when they are not under a continuous load.

Flats on the Motor Shafts

It is necessary to provide a flat on the shaft of the stepper motor in the proper location so that the coupler set screw tightens on the flat. If this is not done, the set screw can distort the surface of the shaft, making it impossible to remove from the coupler. The drawing below shows the proper location for the flat. (Note: Stepper motors purchased from Sherline for use on Sherline CNC applications have the flats already milled in place. Ask for P/N 67130.)

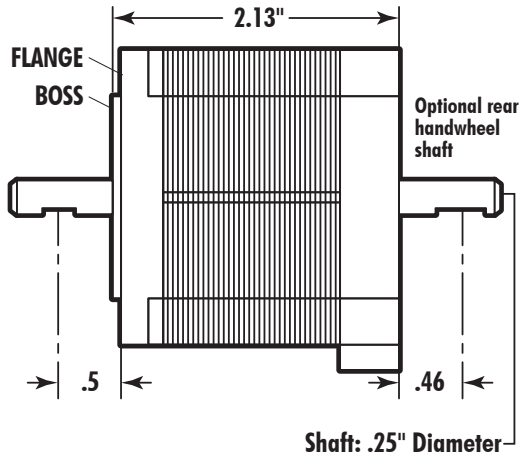


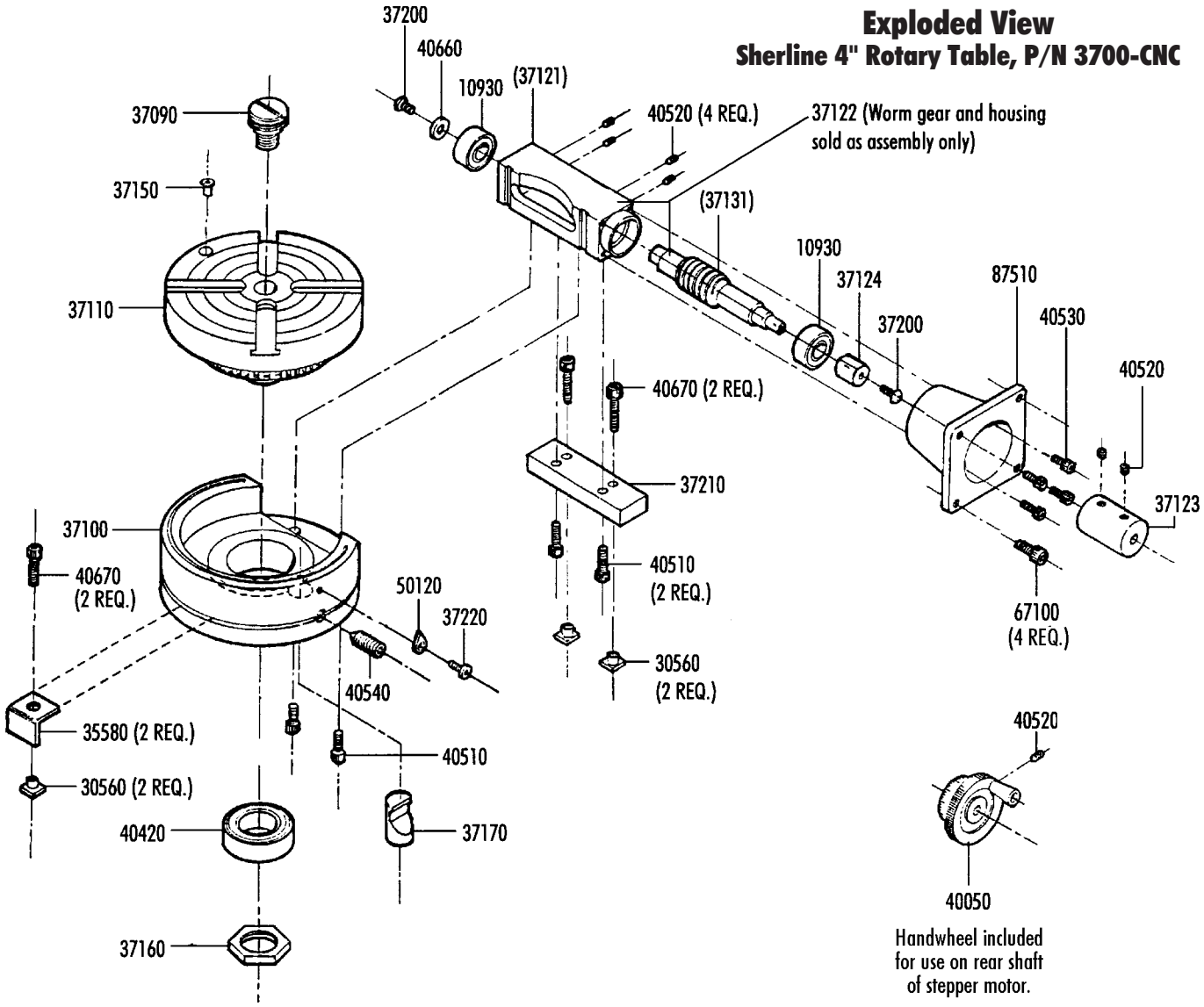
FIGURE 1—Locations for the flats on stepper motor shaft.

Using a Riser Plate on Sherline Mills

On page 3 we provide a drawing of a riser plate that will lift the rotary table enough to clear the mill handwheel on Sherline mills. Four mounting holes marked "A" are used to mount it to the mill table T-slots. If used on a non-Sherline machine, you may eliminate these holes. You may make the plate yourself from the drawing. Sherline offers the plate as an accessory should you wish to order one ready-made. The finished block can be purchased from Sherline as P/N 37511.

Thank you,
Sherline Products Inc.

Exploded View
Sherline 4" Rotary Table, P/N 3700-CNC



NO. REQ.	PART NO.	DESCRIPTION
2	10930	3/8" Bearing
4	30561	10-32 T-nut
2	35580	Hold-down clamp
1	37090	Chuck adapter
1	37100	Rotary table base
1	37110	Rotary table top
1	37121	CNC rotary table worm housing (Not sold sep.)
1	37131	CNC rotary table worm shaft (Not sold sep.)
1	37122	CNC rotary table worm housing assembly
1	37123	CNC rotary table coupling
1	37124	CNC rotary table coupling adapter
1	37150	Oiler
1	37160	Preload nut
1	37170	Lock pin

NO. REQ.	PART NO.	DESCRIPTION
2	37200	10-32 x 3/8" button head screw
1	37210	Hold-down tab
1	37220	6-32 x 1/4" button head screw
1	40050	1-5/8" handwheel assembly
2	40330	10-32 x 5/8" SHCS (socket head cap screw)
2	40420	Headstock bearing
4	40510	10-32 x 3/8" SHCS
7	40520	10-32 x 3/16" cup point set screw
4	40530	5-40 x 3/8" SHCS
1	40540	5/16-18 x 3/4" cone point set screw
1	40660	3/16" I.D. washer
2	40670	10-32 x 1/2" SHCS
1	50120	Pointer
4	67100	8-32 x 3/8" SHCS
1	87510	CNC rotary table stepper motor mount

PRECAUTIONS

- Poor connections can cause arcing, which can burn out motors or control chips. Always make sure plugs and connections are fully engaged and making good contact before powering up.
- Do not pull on wires to disconnect motor. Always grasp the plastic connector or the plug itself.
- In manual mode, crank handwheel no faster than 1 rev/second to avoid back-current.

SHERLINE PRODUCTS
INCORPORATED 1974

Installing Stepper Motors

Stepper Motor Installation Instructions

In order to prevent damage during shipment, some of the stepper motors have not been pre-installed. Install them using the following procedure:

1. If not already installed, carefully plug the white cable connector into the slot in the motor. Orient the motor so the plug is either on the right side or on the bottom to keep chips and coolant from causing a possible electrical short at the connection. If you wish, a small amount of silicon sealant or hot melt glue can be used to secure the white plug to the motor and seal the joint.
2. Note the location of the flats on the stepper motor shaft. Always assure that the coupling and handwheel set screws are tightened against the flat on the shaft. Tightening the set screw against the round part of the shaft can gall the shaft and make it impossible to remove from the coupling later.
3. Align the coupler set screw with the access hole in the side of the stepper motor mount and assure that the set screw is sufficiently released so that the motor shaft can be inserted.
4. Insert the motor shaft into the coupling, making sure the set screw is aligned with the flat. Keep the motor square to the mount so as not to flex the coupling during insertion. Loosely tighten the set screw.
5. Install three 8-32 x 3/8" socket head cap screws (SHCS) through the holes in the motor flange and into the stepper motor mount holes. Instead of a 4th screw in the four o'clock position use a tie wrap through that hole to secure the wire bundle from the motor. This will help relieve strain on the motor plug connection.
6. Assure that the flat on the motor shaft is still aligned with the coupling set screw (observe the position of the rear flat or handwheel set screw—the two flats are parallel) and tighten the coupling set screw. Install and turn the handwheel and observe the movement of the leadscrew to make sure everything is turning smoothly.

Using handwheels on the Stepper Motors

When turning an unpowered stepper motor by hand, you may notice a slightly "notchy" feel because of the permanent magnets in the motor; this is normal. When the motors are powered up they lock in position, and it will be very difficult to move them with the handwheels. Therefore, if you wish to use manual mode, you should first turn off the power to the motors using the ON/OFF switch on the external driver box or on the side of the computer if the driver box is built in. Turning a DC motor by hand causes it to act as a generator, sending current backward through the circuit. However, low amounts of current will not damage the board, so avoid cranking faster than about 1 rev/sec to be safe. For longer travels, use LinuxCNC's (formerly EMC) jog mode for approximate positioning, then turn off driver box power and use the handwheel for fine tuning.

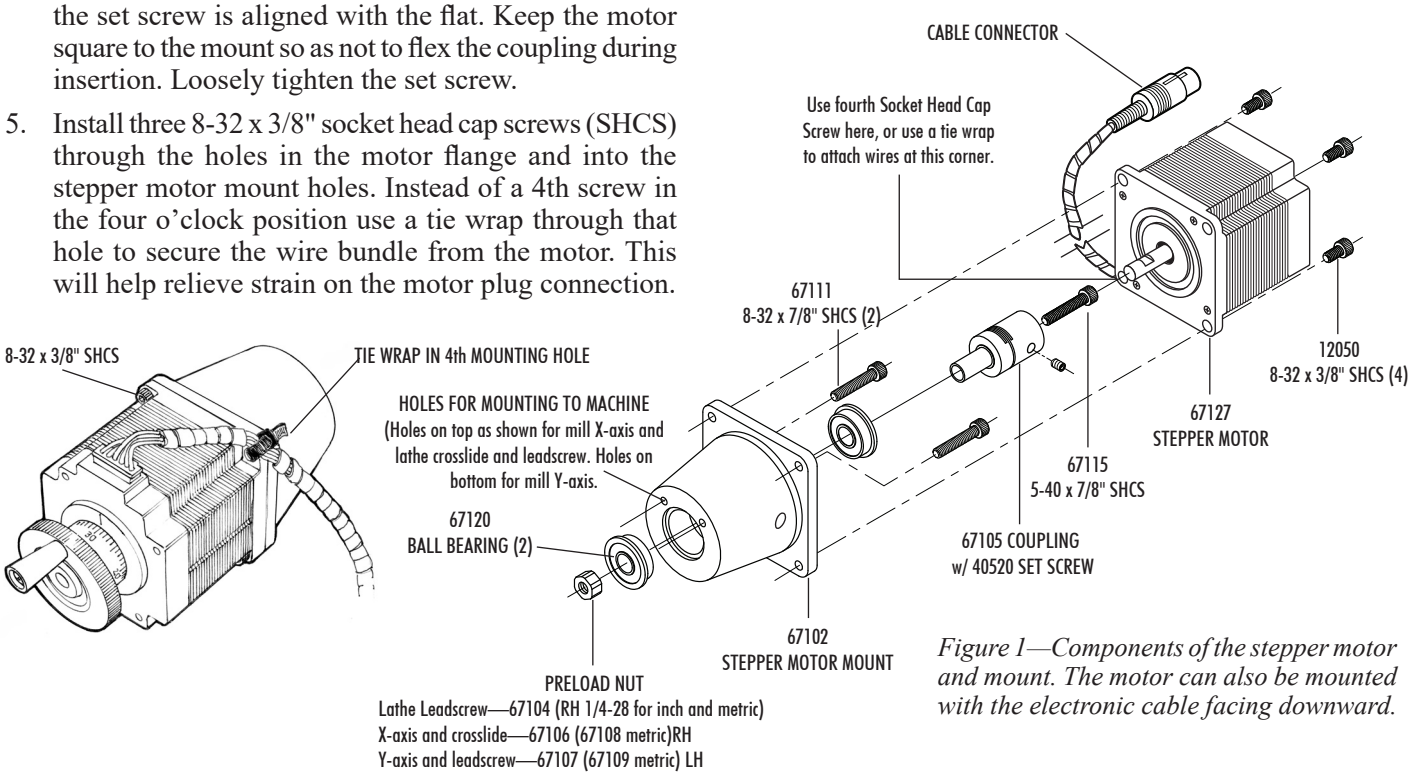
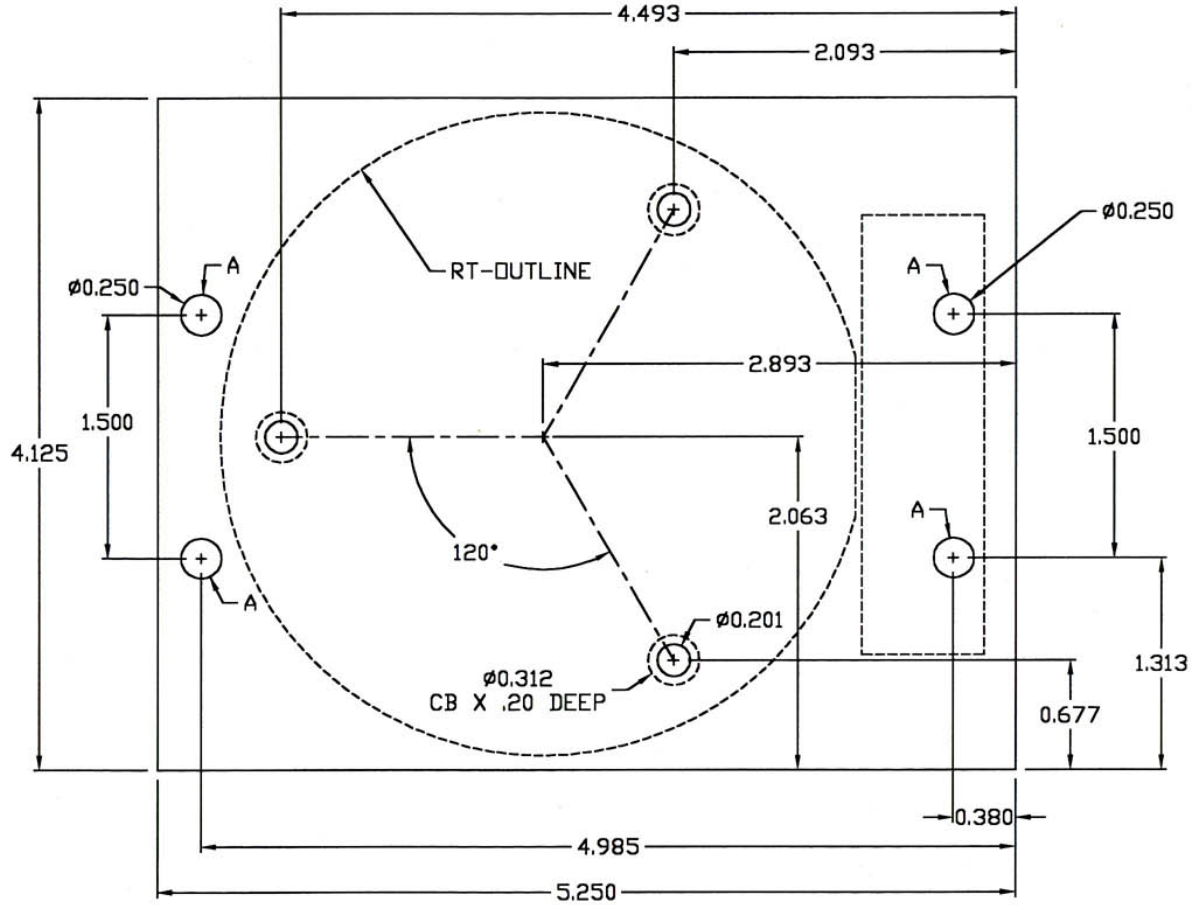


Figure 1—Components of the stepper motor and mount. The motor can also be mounted with the electronic cable facing downward.



TOP VIEW

NOTES:

1. MATERIAL - 4.75 x 5.325 x 1/2" CAST ALUMINUM TOOLING PLATE
2. CHAMFER ALL HOLES 0.010x45°
3. ELIMINATE "A" HOLES IF NOT USED WITH SHERLINE MILL

   LOCATE HOLES AND SIZE PLATE

   FOR YOUR PARTICULAR APPLICATION

DO NOT SCALE DRAWING !!!
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES ARE:
DECIMALS .00 . . . . . ±0.006
DECIMALS .000 . . . . ±0.003
ANGLES . . . . . 1°
DEBURR . . . . . HAND
HEAT TREAT . . . . . NONE
FINISH SANDED

DRAWN	JOE MARTIN	
CHECKED	JOE MARTIN	
DESIGNER	JOE MARTIN	

SHERLINE PRODUCTS, INC.

TITLE: RT RISER PLATE

SCALE	SIZE	PART NUMBER	REV.
	A	8710	2000-01

MATERIAL: SEE DRAWING

SHEET 1 of 1

DRAWING NOT TO SCALE