

NYRS

Turntable Indexing That Works

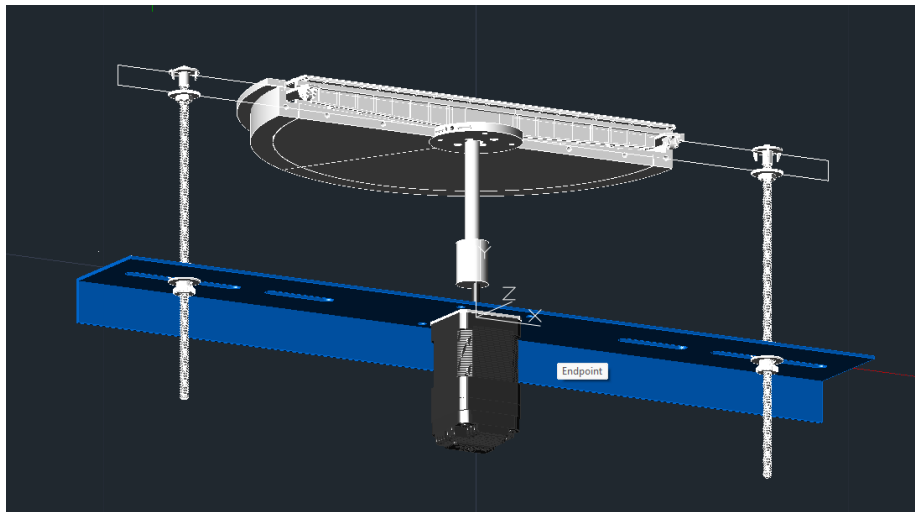
PTC Series

Programmable Turntable Controller

Basic Motor Mount Kit

For PTC Model 4+ and PTC Model 5

P/N 09-820



Installation Instructions

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Quick Start Guide

This checklist summarizes the installation. Read the full instructions before you begin — several steps are important for smooth operation and are easier to get right the first time than to correct later.

1. Survey the site. Check bracket length and clearance, and locate the two mounting stud holes on a line through the center of the pit.
2. Cut the threaded rod to length and, if required, trim the bracket at a web.
3. Install the motor in the bracket, adding spacers as required for shaft alignment.
4. Install the shaft coupler on the turntable shaft.
5. Drill the mounting holes and install the T-nuts and mounting studs.
6. Slide the bracket onto the studs and raise it until the motor shaft engages the coupler.
7. Level the bracket, align the shafts, and tighten all hardware.
8. Verify the bridge rotates freely through a full revolution, then proceed to the PTC4+ or PTC5 manual for programming.

WARNING: If your installation includes the optional electronic brake, do NOT rotate the bridge by hand until the brake has been released by entering Learn Mode (PTC4+) or Program Tracks mode (PTC5).

1. Introduction

The NYRS Basic Motor Mount Kit provides a rigid, adjustable method of coupling the PTC turntable motor to your turntable — without suspending the motor from the turntable shaft or otherwise stressing the model it drives. The kit is used with the PTC Model 4+ and PTC Model 5 controllers and the NYRS closed-loop stepper motors supplied with them.

The bracket is mounted under the benchwork, suspended from the same surface that supports the turntable and pit. The motor is bolted into the bracket, and the motor shaft is joined to the turntable shaft by the supplied coupler. The slotted bracket and threaded mounting studs provide continuous height and position adjustment, which is what makes precise alignment practical.

Please review these instructions thoroughly before you begin. Certain aspects of the installation are important for smooth operation; these are called out in the boxes throughout this manual.

NOTE: Proper alignment is essential. The PTC positions the bridge to a fraction of a degree, so mechanical binding or a misaligned shaft will show up as inconsistent track alignment no matter how carefully the controller is programmed.

2. Kit Contents

The Basic Motor Mount Kit includes the following parts:

- Motor mount bracket, 20 in.
- 2 – 8 in. threaded rods (used to create the bracket mounting studs)
- Motor mount hardware kit, including:
 - 2 T-nuts
 - 6 hex nuts
 - 4 brass knurled (thumb) nuts
 - 6 washers
- These instructions

NOTE: The shaft coupler is supplied with the motor, not with this kit. Couplers are available in several bore sizes to match common turntable shafts.

3. Tools You Will Need

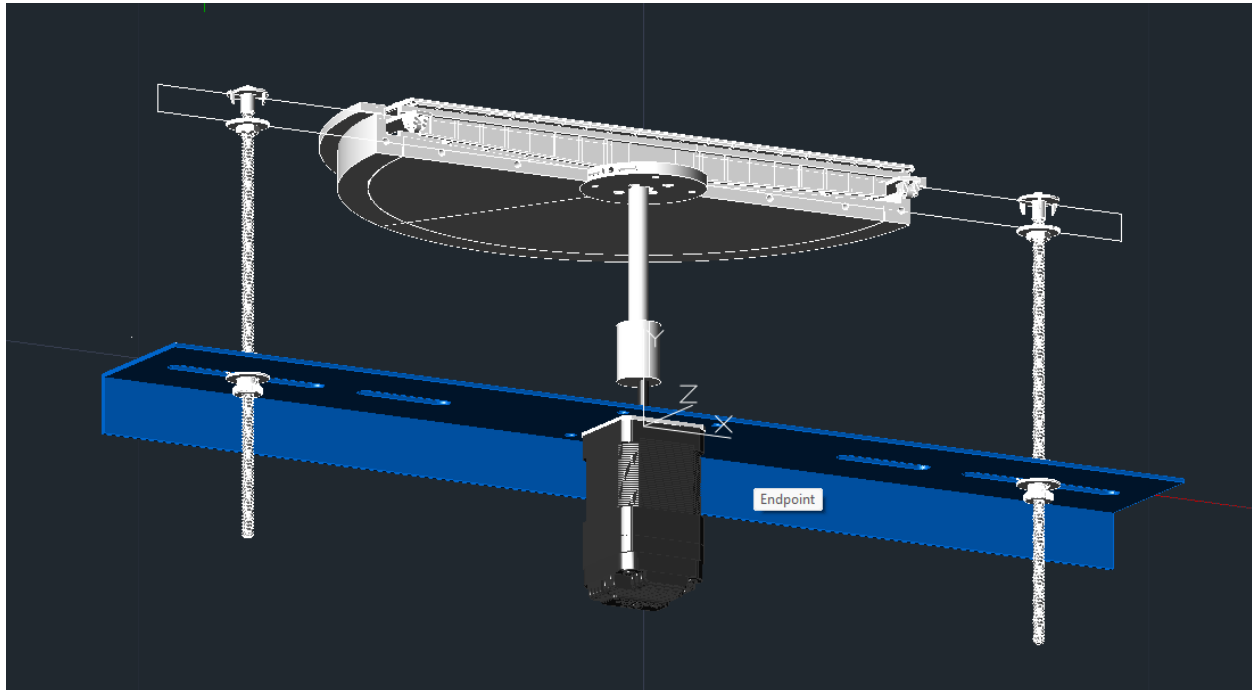
To complete the installation, have the following on hand:

- Straight edge
- Power drill with 1/4 in. drill bit (7/32 in. if your layout surface is Homasote)
- Allen wrench, 3/32 in. (for the motor coupler)
- Razor saw, cut-off tool, or jeweler's saw (to cut the threaded rod)
- Small crescent wrench or 3/8 in. open-end wrench

- Center punch
- Lock-Tite™, Thread-Lok™, or cyanoacrylate (CA) gel

4. Planning the Installation

The motor must be supported by the mounting bracket, never by the turntable shaft. Before drilling anything, survey the area under the turntable and confirm that the bracket will fit and that you have two usable locations for the mounting studs.



Typical motor mount installation (see Figure 1 in Appendix A for a dimensioned cross section).

WARNING: Do not support the motor from the turntable shaft. The shaft coupler is intended to transmit torque only.

4.1 Check Bracket Length

The bracket in your kit is 20 in. long, which is suitable for most installations. In some cases (certain bookshelf or corner layouts, for example) the full-length bracket will not fit. Examine the area under the turntable to determine whether one or both ends must be shortened.

If the bracket must be cut down, mount it in a padded vise and cut on the endmost side of the bracket webs, which are provided for this purpose. The preferred cut points are shown in Figure 2. Determine and double-check your mounting hole locations before cutting.

4.2 Determine Mounting Hole Locations

Using your straight edge, sight a line that passes through the center of the turntable pit (between the tracks) and out to clear area beyond the pit. You are looking for two points you can drill through to install the bracket mounting studs — locations that are easily accessible, easy to re-scenic later, and have about 3/4 in. of diameter clearance around them for the head of the T-nut.

The slots in the bracket define the usable radius range for each hole:

- Short slot: 4 in. to 5-1/2 in. from the turntable center.

- Long slot: 6-1/2 in. to 9-1/4 in. from the turntable center.

Place the holes as far apart as practical — it makes adjusting the bracket much easier later on.

TIP: If your pit is too large (greater than 18 in.) for the bracket to be mounted as described, mount the bracket to the underside of the pit itself. Cut two blocks of 3/4 in. plywood about 3 in. square, install the studs through the blocks (cut to length first), then affix the blocks and studs to the bottom of the pit with hot-melt glue or quick-set epoxy. Set the blocks as far apart as possible and be sure the pit bottom is free of dust for maximum adhesion.

4.3 Determine Length of the Mounting Studs

With the hole locations and bracket position established, determine the length of the mounting studs. The stud length L is:

$$L = T + S + 2.5 \text{ in.}$$

where T is the thickness of the layout surface and S is the distance from the tip of the turntable shaft to the underside of the layout (both dimensioned in Figure 1). These measurements are not critical — just be sure the stud is long enough.

Example: if the layout surface is 1/2 in. thick and the shaft tip is about 3-1/2 in. below the underside of the layout, the stud will be roughly 1/2 in. + 3-1/2 in. + 2-1/2 in. = 6 in. If the extra length is not in the way, you may simply use the full 8 in. studs. Do not use studs longer than supplied; long studs can flex and cause alignment problems.

CHECK: The layout surface must be at least 1/2 in. thick — the minimum needed for the T-nut to hold. If it is thinner, glue scrap material (plywood, Homasote, etc.) under the surface to build it up.

TIP: Tempting as it is to simply cut the 8 in. rod in two, keep the studs as short as practical if you work under the layout often. A low-hanging threaded rod is easy to walk into — and knocking one out of alignment means realigning the bracket.

5. Preparing the Bracket, Rods, and Motor

5.1 Adjust Bracket Length

After the mounting hole locations are confirmed, cut the bracket if necessary. Be careful not to twist or bend the bracket while cutting.

CHECK: Cut so that the bracket web remains after the cut. See Figure 2 for the recommended cut locations.

5.2 Cut the Threaded Rod to Length

Cut the two threaded rods to the length determined in Section 4.3.

TIP: Thread one of the knurled nuts onto the rod before cutting. Unscrewing the nut afterward will deburr the cut end.

5.3 Install the Motor in the Bracket

Install the motor into the bracket using the screw kit supplied with the motor — the four 100° countersunk screws. The bracket provides more than one hole pattern; use the pattern that matches your motor frame size.

NOTE: Spacer thickness varies with the installation. Some installations require no spacers, while others require one or more spacers between the motor and the bracket to obtain correct shaft alignment and to clear the boss on the motor face.

6. Installing the Shaft Coupler

Install the coupler on the turntable shaft and tighten securely. The turntable shaft should be inserted about halfway into the length of the coupler.

CHECK: The turntable shaft must have a flat on it to prevent the coupler from rotating on the shaft. Make sure the coupler set screw seats securely on that flat — turn the coupler as you tighten to find the most secure position.

TIP: Couplers vary in length depending on bore size. Measure your coupler and mark half its length on the turntable shaft; this makes it easy to see when the shaft is inserted the correct distance.

7. Installing the Mounting Studs

7.1 Drill the Mounting Holes

Clear away any scenic material around the hole locations. Center-punch each location to keep the bit from creeping, then drill with a 1/4 in. bit. Drill as plumb as possible so the studs hang straight down, and make sure the two holes line up through the center of the turntable as accurately as you can.

TIP: If your layout surface is Homasote, use a slightly smaller drill (7/32 in.).

7.2 Install the T-Nuts and Mounting Studs

1. Thread a T-nut onto each rod until the rod is almost flush with the top of the T-nut.
2. Drop each T-nut and stud assembly into a mounting hole from above.
3. From the underside, install a washer and a steel hex nut on each stud and tighten securely.

CHECK: The rods must hang straight down. If necessary, CAREFULLY bend a rod into vertical alignment.

TIP: Before final tightening, apply a drop of Lock-Tite™, Thread-Lok™, or CA gel to the threads to keep the T-nut and hex nut from working loose.

8. Installing the Bracket and Motor Assembly

Refer to Figure 1 as you work through this section.

1. Install a hex nut and a knurled nut on each stud, with the flared flat of the knurled nut facing **down**. Run them well up the stud, out of the way for now.
2. Install a washer on each stud, then slide the bracket (with motor) onto the studs.
3. Install another washer, a knurled nut (flared flat facing **up**), and a hex nut on each stud.
4. Carefully screw the lower knurled nuts up the studs until the motor shaft and the turntable shaft coupler are nearly engaged.
5. Rotate the bridge so the coupler set screw aligns with the flat on the motor shaft, then continue raising the lower knurled nuts until the motor shaft is fully seated in the coupler.

CHECK: Although high-quality deburred washers are supplied, inspect them anyway. A burred washer will make the bracket bind during height adjustment.

9. Shaft Alignment and Final Adjustment

At this point the motor is only loosely supported by the bracket. Screw the upper knurled nuts down to the bracket and snug them lightly. Then check the bracket carefully from the side and along its length:

- The bracket is level lengthwise relative to the layout surface — measure from each end of the bracket to the underside of the layout.
- The bracket (and therefore the motor) is level edge-to-edge relative to the turntable bottom — measure from each edge of the bracket to the underside of the turntable or layout.
- The motor shaft and turntable shaft are concentric and parallel, with a small clearance between the shaft ends inside the coupler.

9.1 Lock In the Adjustments

Once alignment is correct and testing (Section 10) is complete, run the upper and lower hex nuts against the knurled nuts and tighten securely — but do not overtighten. The hex nuts act as lock nuts and keep the knurled nuts from drifting out of adjustment.

NOTE: Do not use CA gel or thread-locking compound on the knurled nuts. If the bracket is ever bumped during layout maintenance, you will want to be able to loosen and realign it easily.

10. Testing

Before locking everything down, test the installation for smoothness. Connect the PTC controller to the motor and rotate the bridge under power — use Index Mode on the PTC4+, or the equivalent bridge-movement mode on the PTC5 (refer to the controller manual). The motor will drive the bridge continuously; watch the full revolution for any sign of binding, stiff spots, stuttering, or unusual noise.

If the bridge rotated smoothly by hand before the motor was installed, binding is almost always the result of misalignment between the motor and turntable shafts. Loosen the knurled nuts, re-adjust the bracket, and test again.

WARNING: If your installation includes the optional electronic brake, do NOT rotate the bridge by hand until the brake has been released by entering Learn Mode (PTC4+) or Program Tracks mode (PTC5).

11. Troubleshooting

Symptom	Possible Cause	Action
Bridge binds or rotates unevenly	Motor and turntable shafts misaligned	Loosen the knurled nuts, re-level the bracket, and re-check shaft alignment (Section 9).
Coupler slips on the shaft	Set screw not seated on the shaft flat, or loose	Confirm the shaft has a flat; reposition and retighten the set screw.
Motor hangs on the turntable shaft	Bracket not supporting the motor	Raise the lower knurled nuts until the bracket carries the motor's weight.
Bridge hard to rotate by hand	Electronic brake engaged	Release the brake by entering Learn Mode (PTC4+) or Program Tracks mode (PTC5).
Bracket moves out of adjustment	Hex lock nuts not tightened against the knurled nuts	Tighten the upper and lower hex nuts against the knurled nuts (Section 9.1).
Low hum during operation	Stepper motor vibration transmitted to the layout surface	Apply Dum-Dum® or high-density foam to the bracket.
Alignment drifts over time	Studs too long and flexing	Shorten the studs; do not exceed the supplied 8 in. length.

Appendix A – Reference Drawings

Figure 1 shows the assembled bracket in position under the turntable, including the dimensions T and S used to calculate stud length in Section 4.3. Figure 2 shows the bracket webs and the recommended cut locations if the bracket must be shortened.

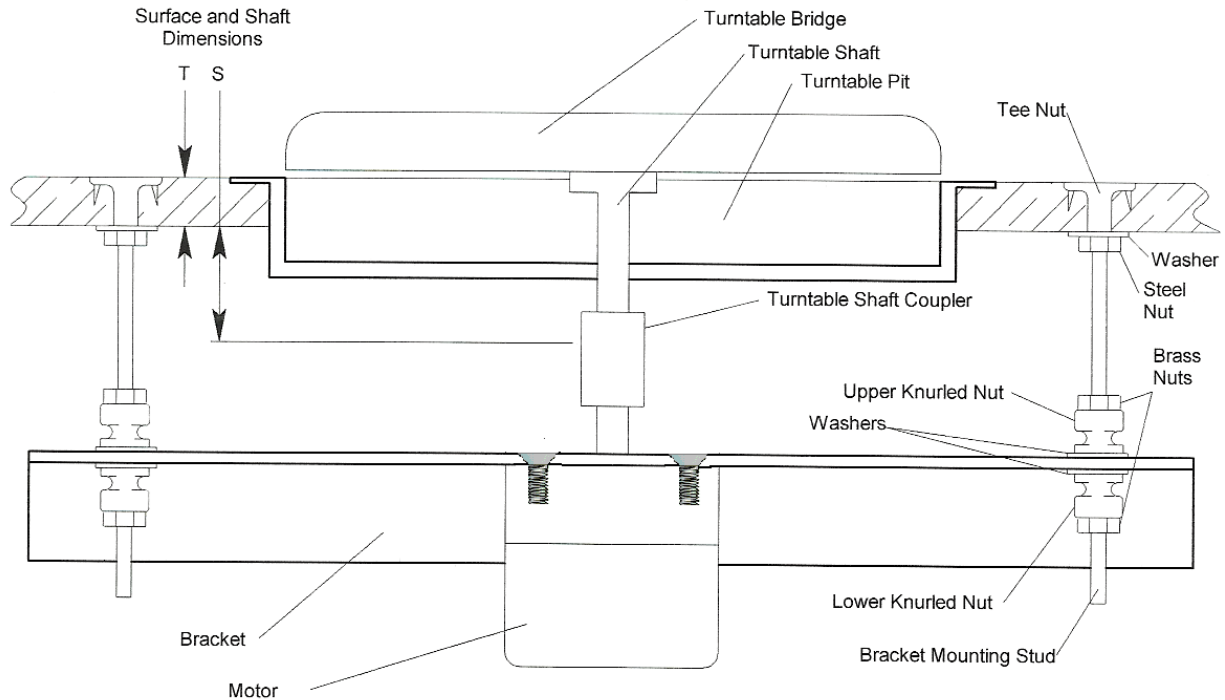


Figure 1: Motor Mount Cross Section
(Not to Scale)

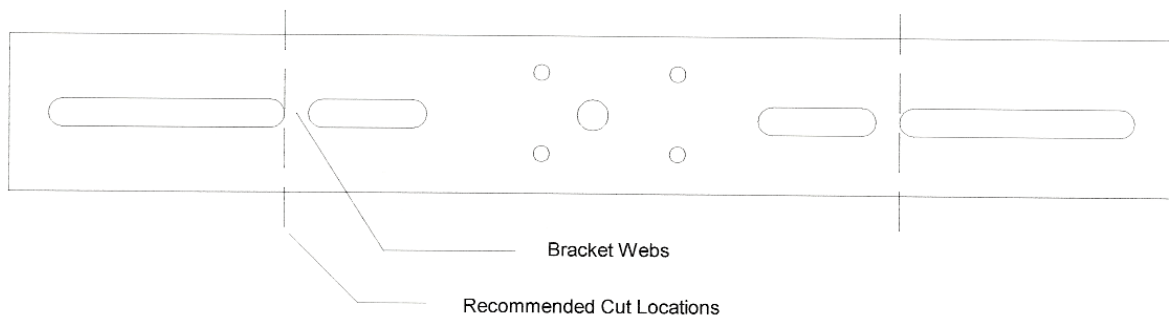


Figure 2: Mounting Bracket Top View
(Not to Scale)

Appendix B – Modification of an Existing Motor Mount for NEMA Motors

Motor mount brackets supplied with earlier PTC systems were drilled for the older NYRS motor and do not include the mounting hole pattern used by the NEMA frame motors supplied with the PTC Model 4+ and PTC Model 5. An existing bracket can be reused by drilling the correct NEMA pattern using the drilling template supplied by NYRS.

Drill only the pattern that matches your motor:

- NEMA 17 — HO and N scale motors. Clearance holes for M3 screws: 3.4 mm (9/64 in.).
- NEMA 23 — O scale motors. Clearance holes for M5 screws: 5.5 mm (7/32 in.).

NOTE: The template carries both hole patterns. The bracket shown in Figure B-5 was drilled for both patterns for illustration only — you only need to drill the pattern for your motor.

B.1 Procedure

1. Locate the existing mounting holes in the bracket (Figure B-1).

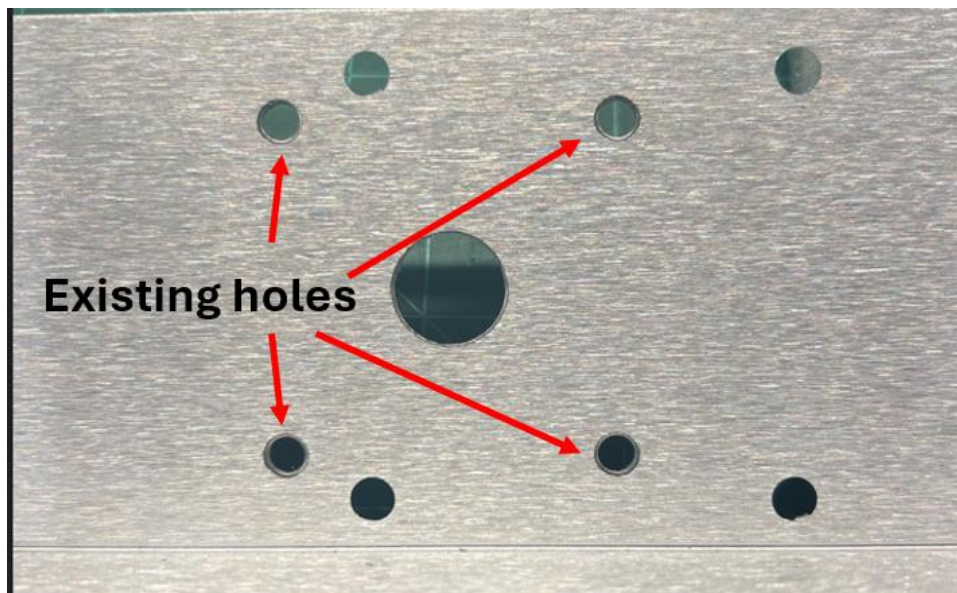


Figure B-1 — Existing mounting holes in the bracket.

2. Attach the NYRS-supplied template to the bracket as shown in Figure B-2, using hardware from the old motor or any other convenient fastener that holds the template firmly in place. Two diagonal holes are enough.

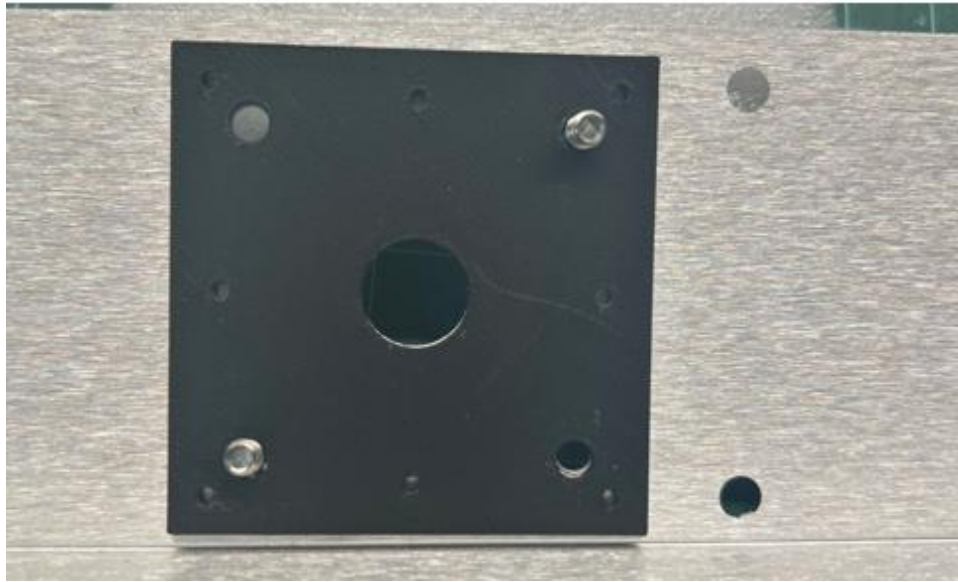


Figure B-2 — Template fastened to the bracket using two diagonal existing holes.

3. With the template held in place, mark the new hole locations through the template using a center punch or a small drill. Mark only the pattern for your motor — NEMA 17 (Figure B-3) or NEMA 23 (Figure B-4).

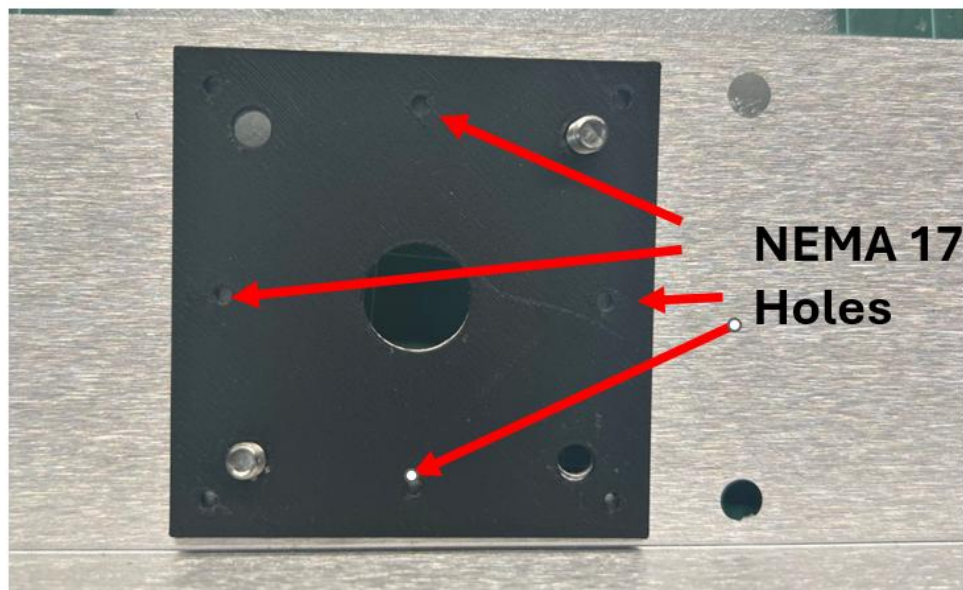


Figure B-3 — NEMA 17 hole locations (HO and N scale motors).

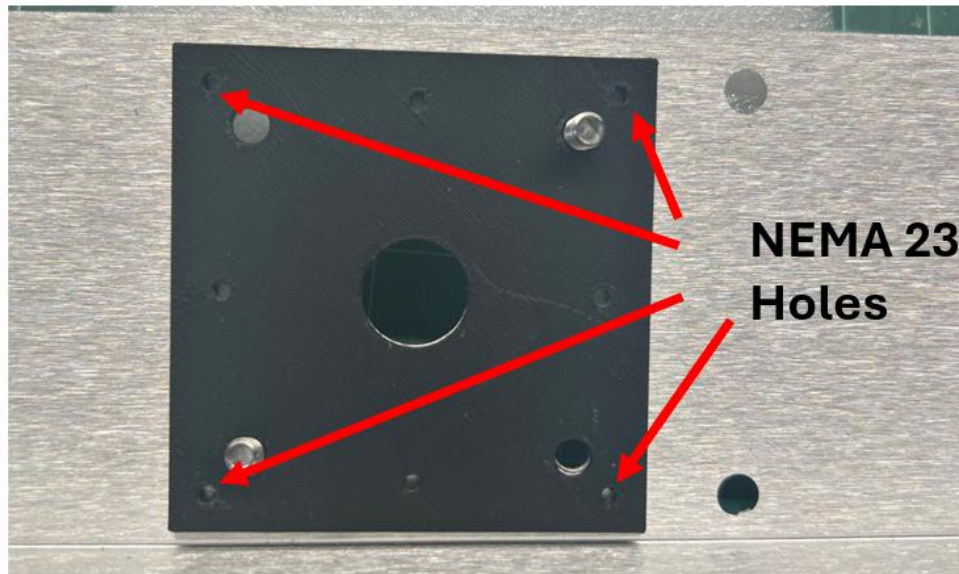


Figure B-4 — NEMA 23 hole locations (O scale motors).

4. Remove the template and drill the marked holes, using the correct drill size for clearance holes: 3.4 mm (9/64 in.) for M3 / NEMA 17, or 5.5 mm (7/32 in.) for M5 / NEMA 23.
5. Deburr the holes and leave no sharp edges (Figure B-5).

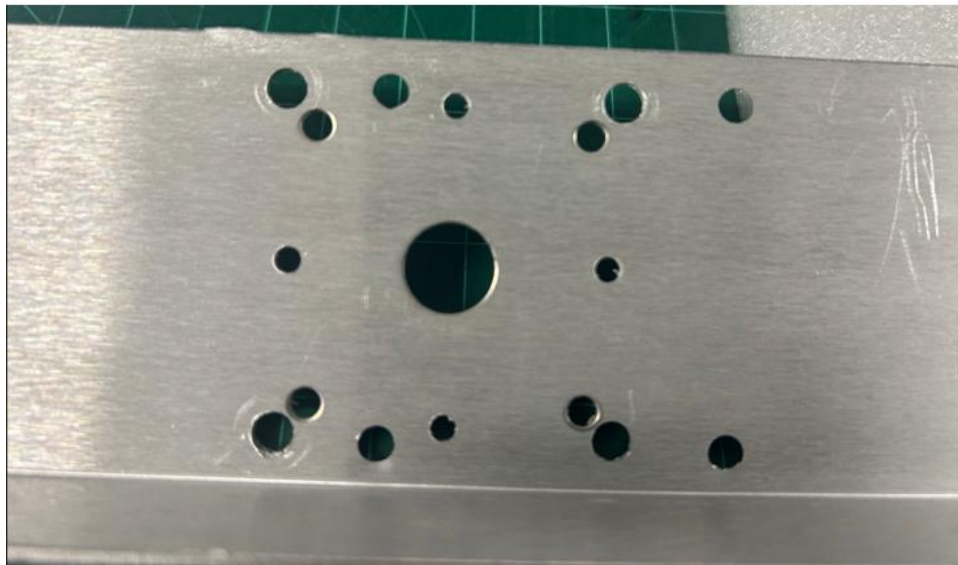


Figure B-5 — Bracket after drilling. Both patterns are shown here for illustration; drill only the pattern for your motor.

6. Install the motor using the supplied motor spacer between the motor boss and the bracket. See Section 5.3 for spacer guidance.

CHECK: Support the bracket squarely while drilling and keep the bit perpendicular to the bracket face. A hole drilled at an angle will pull the motor out of alignment when the screws are tightened.

Once the motor is mounted, continue with the installation as described in Section 6 and following.

Contact and Support

This document and others are available for download at our web site. You are welcome to call or write:

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