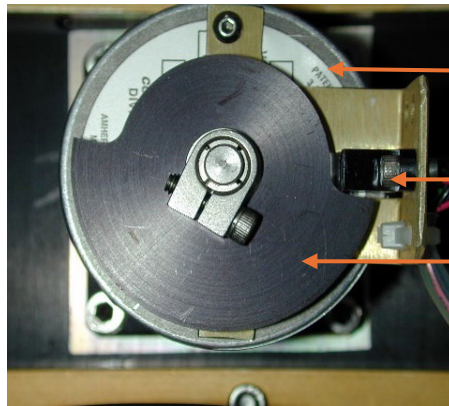


How to Home Stepper Motors



Need help? If you have questions, problems, or comments about this note, call us at +1 (360) 764-8850 or email office@nmt.us.

A home sensor is attached to each stepper motor and works with the home sensor flag to determine motor positions. The flags attach directly to the motor shafts with a split hub clamp. The home sensor is connected directly to the line controller PCB. The home position is the location of the motor when the flat edge of the flag reaches the sensor. The software bases all motor movements from this home position.



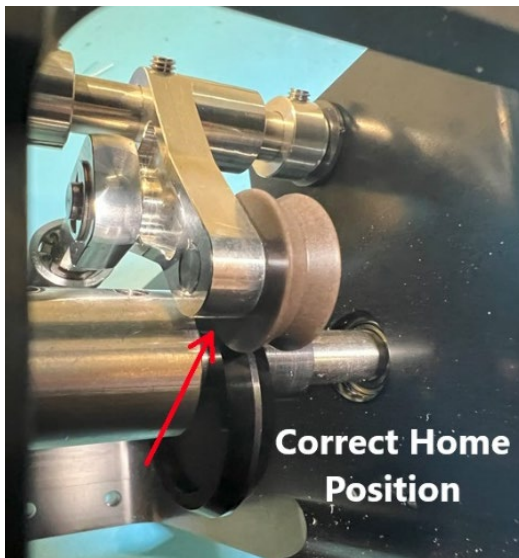
Stepper Motor

Home Sensor

Home Sensor Flag

Each of the nine stepper motors has a unique home position. The motor function on the tablet is used to check the home positions. Use the tablet to 'Home' the desired motor and compare the position of the mechanism to the home positions as described below.

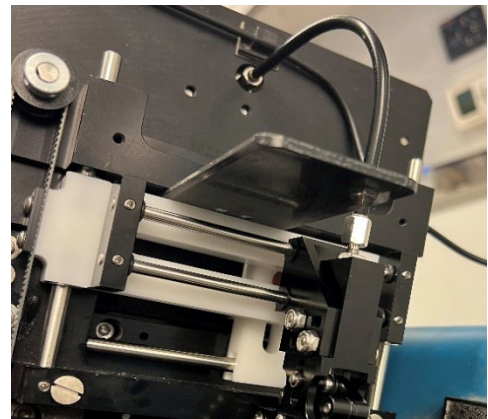
1. The **clipper** home position is the same as the fully open position with the gap between the blade and anvil at its largest. When fully open, the smallest portion of the lobed black cam should be in contact with the brown pulley.



- The home position for the **marker X** motor centers the clipper carrier on the horizontal shafts. The measured distance on either side of the clipper carrier should be equal.



- The **marker Y** home position should place the carrier 3mm from the top of the travel range. The line stop gate can be used as a shim, between the white y-position carrier and the black position block, to check or set the home position.



- The **front and rear clamp** home position is set by NMT at the shop with specialized equipment to required specifications. The home position of these two motors should not need to be adjusted. If front or rear clamps are suspected to have come out of home position, please contact NMT for assistance.

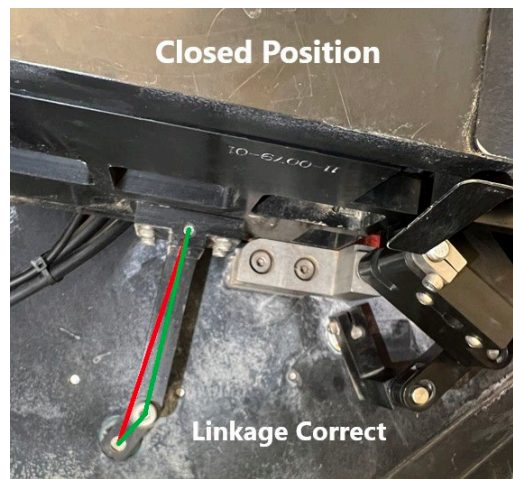
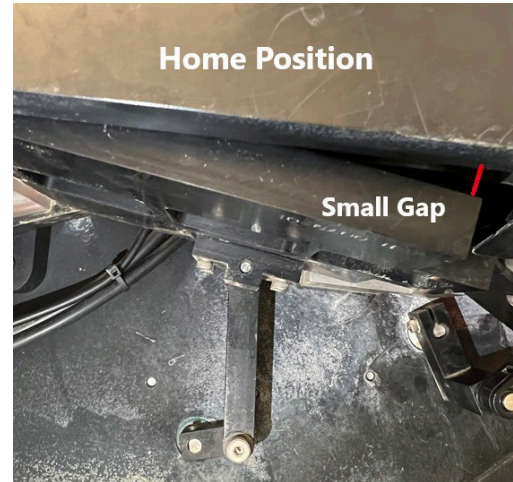
- The **trapdoor** home position is the location in which the trapdoor is completely closed. Proper positioning is best measured using the shaft in the spring linkage of the trap door. This shaft should be centered in the oval opening of the spring linkage when in the home and/or closed position.



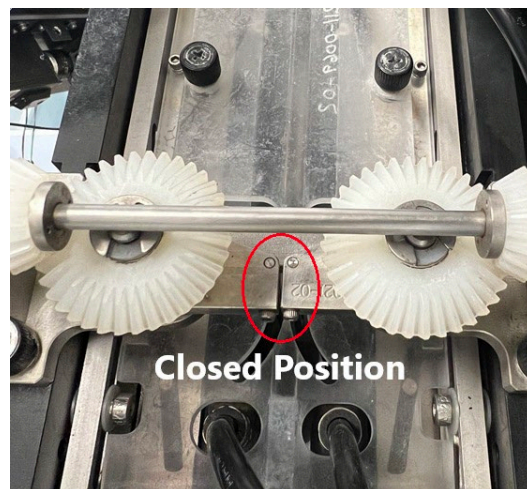
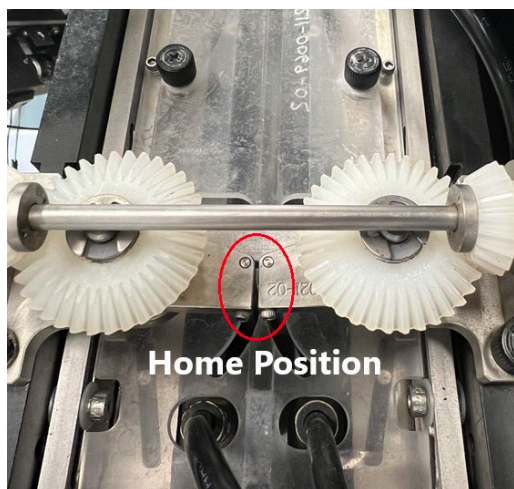
6. The **water diverter** has no measurable home position. Instead, the closed position is critical for this mechanism. When the diverter is closed, it should be flush with the bottom of the channel. If it does not close completely, the home position will have to be adjusted.

To check it, put the motor in the closed position and tap up on the bottom of the water diverter. If it is loose and/or moving, then step the motor closed until it makes solid contact with the channel. Note how many steps the diverter was moved in the closed position. Put the motor in the home position and move the same number of steps in the same direction. This will be the new home position, which will translate to the proper closed position.

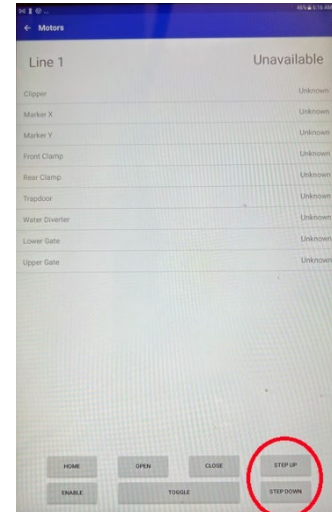
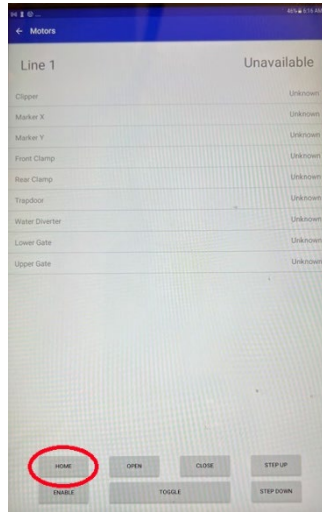
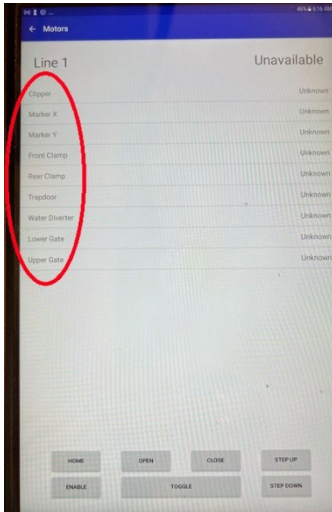
It is important when in the closed position, the linkage that connects the motor shaft to the water diverter does not rotate too far. If the center pin in the linkage rotates too far towards being in line, displayed here by the red line, then the mechanism may over-rotate, and the center pin will end up on the left side of the center line. The mechanism will not function in this state. When in the home position, there will be a small gap between the bottom of the channel and the top of the water diverter.



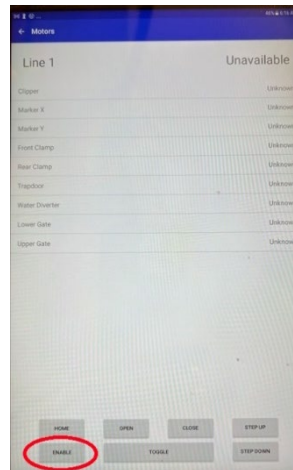
7. The **upper and lower gates** have the same home position. Both bars of the gates should just begin to open in unison when in the home position.



Setting the Home Position



1. Using the motor option on the tablet, select the desired motor.
2. Place the motor in the current home position.
3. Using the step up and step down buttons, step the mechanism into the desired home position as described above.



4. Loosen the hub clamp on the desired home sensor flag.
5. Place the homing tool over the edge of the home sensor flag and move the flag into the home sensor.
6. Hold the home sensor flag in position and tighten the hub clamp on the motor shaft.
7. Press the enable button to disable the motor and rotate the home sensor flag to remove the homing tool.
8. Re-enable the motor with the tablet and check the new home position.