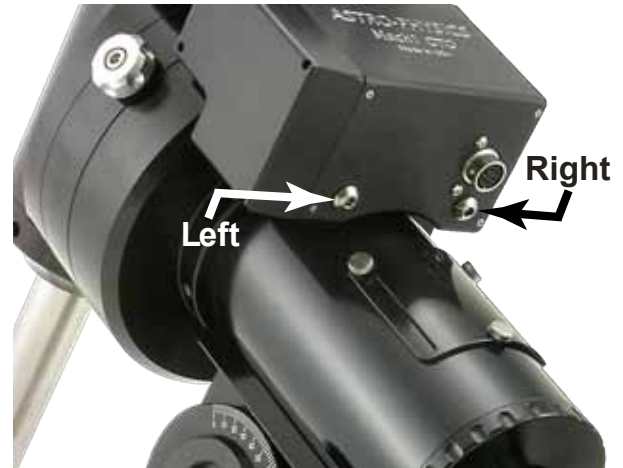


# MACH1GTO - RE-MESHING THE WORM GEAR AND WHEEL

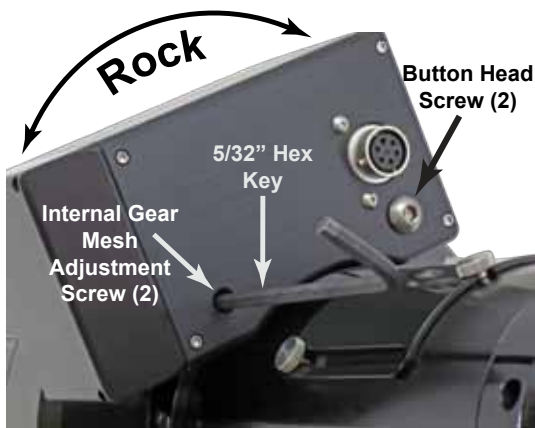
## (Mount Serial # M10669 and earlier)

The revolutionary design of the *Mach1GTO* motor / gearbox makes re-meshing the worm gear into the worm wheel a simple process. The instructions apply equally to either axis.

- 1. Remove the placeholder screws.** On the face of the motor / gearbox that has the cable connection are two 1/4-20x5/16 Button Head Cap Screws. These are by far the two largest screw heads on that surface, and will be located on either side at the bottom of the box. (See the photo at right.) These screws are merely place holders to fill the holes that give access to the mounting bolts underneath. They do not hold anything. Simply remove them using a 5/32" Allen (hex) wrench and set them aside.
- 2. Engage and loosen the internal shoulder bolts.** Insert the long end of the same 5/32" Allen wrench into the left hole and engage the socket of the attachment shoulder bolt that is inside. The bolt and the hole are lined up, so only minimal "fishing around" should be required. Loosen this bolt between 1/4 and 1/2 turn. DO NOT loosen any further or remove the bolt! Repeat with the right hole (always work left to right). As you loosen the second bolt you will feel the motor / gearbox come loose on the axis.



**1/4-20x5/16" Button Head  
Use 5/32" Allen Wrench**



- 3. Rock the gearbox to seat the worm gear.** Gently rock the motor / gearbox from side to side. This ensures that the worm is fully seated in the wheel.

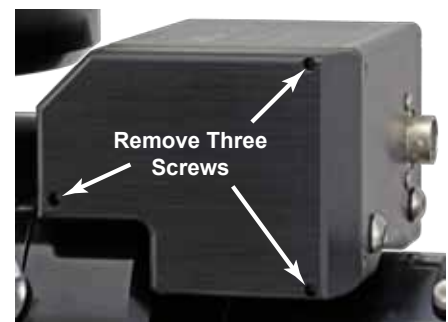
- 4. Snug and tighten the shoulder bolts.** Snug the left shoulder bolt first and then the right bolt. It is critical for proper worm mesh to tighten the left bolt first. As you tighten, wiggle the box slightly so that it finds its center as the bolt is gradually tightened. Once both are snug, return to the left screw and finish tightening, followed by the right screw. Tighten the bolts in small increments. Once the bolts have made full contact, tighten about another 1/8 turn.

- 5. Replace the placeholder screws.** Once the attachment bolts are both tight, replace the two button head screws to close the access holes back up, and the re-meshing is complete.

NOTE: These are not lug nuts that hold the wheel onto your car. If you are unsure how tight to make the attachment bolts, I would suggest that you err on the side of caution and don't risk over tightening. It is easier to do this whole process over making everything a bit tighter the second time around than it is to undue the damage from too heavy a hand on the wrench. We have found that a good practice is to have the long end of the wrench in the hole, so that you only have the short end for leverage. Make it as tight as you can with this short lever, and then reverse the wrench and tweak the tightness by no more than 5-10 additional degrees.

### Check for Excess Tightness in the Dec. Gearbox:

- 1. Put the mount into a Park 3 position.** This is very important to ensure that there is not uneven pressure on the gears due to an out of balance load when gear meshing. Be sure that the mount is powered off.
- 2. Remove the Gearbox Cover.** See the photo at right to locate the screws to be removed. Use a 5/64" hex key.
- 3. Rotate the Foremost Spur Gear.** The gear should turn freely with your fingers a full turn in both directions. If not, proceed to Steps 4 and 5.

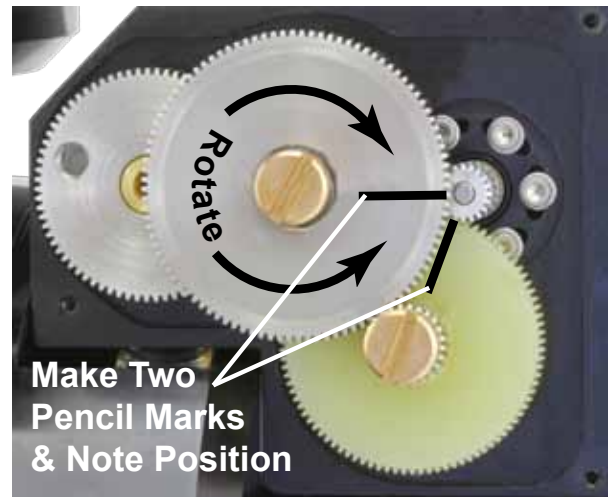


4. **If tight, loosen the gearbox lock-down screws.** Referring to the photos above. If the worm gear is too tight, and it is difficult to rotate the foremost spur gear, try the following solution. Holding the Gearbox in place with finger pressure only, slightly loosen the lock-down screws again. With no hand pressure applied to the housing, attempt to rotate the aluminum spur gear again. The rotation of the spur gear should release the excess pressure between the worm and worm wheel. If it does, re-tighten the screws and check for backlash play. If the aluminum spur gear cannot be rotated with this action, remesh the gears as described previously. Repeat until correct mesh is achieved.
5. **Re-tighten the shoulder bolts.** Snug the bolts from left to right. Once all are snug, return to the left bolt and finish tightening. Again rotate the spur gear in both directions to ensure that the spur gears still turn freely.
6. **Replace the Gearbox Cover.** Using the 5/64" hex key, replace the three gearbox cover screws and you are finished.

## Check for Excess Tightness in the R.A. Gearbox:

**Important:** *The instructions to check for excessive tightness in the R.A. axis are similar to those for the Dec. axis with one very important exception. The spur gears need to return to the original gear angle following rotation so that the stored PE Curve is not lost. It will be necessary to mark both gears shown since the lower gear turns more rapidly and will make several complete turns while rotating the top gear a full turn in each direction. Use a pencil so that the marks can be removed for a future mesh check. If you are a visual observer or an imager who does not use the PE correction, then the PE Curve is not important and you can check both gearboxes identically without concern for gear angle. However, if the R.A. gear angle is changed, it will be necessary to turn off PE correction or, alternatively, install a new PE Curve using PEMPro™.*

1. **Put the mount into a Park 3 position.** This is very important to ensure that there is not uneven pressure on the gears due to an out of balance load when gear meshing. Be sure that the mount is powered off.
2. **Remove the Gearbox Cover.** Remove the three gearbox screws as shown on previous page. Use a 5/64" hex key.
3. **Make pencil marks on the spur gears.** Place marks on both spur gears so that they can be returned to the same gear angle following the test. *See photo below right*
4. **Rotate the Foremost Spur Gear.** The gear should turn freely with your fingers a full turn in both directions. If not, proceed to numbers 5 and 6 in these instructions. If the gear turns freely, re-establish the gear angle via the pencil marks and then you are finished.



5. **If tight, loosen the gearbox lock-down screws.** Refer to the photos on the previous page. If the worm gear is too tight, and it is difficult to rotate the foremost spur gear, try the following solution. Holding the Gearbox in place with finger pressure only, slightly loosen the screws again. With no hand pressure applied to the housing, attempt to rotate the aluminum spur gear again. The rotation of the spur gear should release the excess pressure between the worm and worm wheel. If it does, re-tighten the screws and check for backlash play. If the aluminum spur gear cannot be rotated with this action, remesh the gears as described previously. Repeat until correct mesh is achieved. Re-establish the gear angle so that the stored PE curve is not lost.
6. **Re-tighten the shoulder bolts.** Snug the bolts from left to right. Once all are snug, return to the left bolt and finish tightening, followed by the right bolt. Again rotate the spur gear in both directions to ensure that the spur gears still turn freely. Re-establish the gear angle via the pencil marks. Make a quick check for gear mesh looseness, as described on the previous page, and you are done.
7. **Replace the Gearbox Cover.** Using the 5/64" hex key, replace the three gearbox cover screws and you are finished.

**Remember:** If the R.A. gear angle is changed, it will be necessary to turn off PE correction or, alternatively, install a new PE Curve using PEMPro™.