

How to Clock a MotoAlliance Viper MX Series Motor

Created By: MotoAlliance



Objective: **Rotate the MX Series motor** to eliminate any interference that the power terminals may be causing. This is otherwise known as "**Clocking the Motor**"



Tools:

- 10mm Wrench
- Phillips Screw Driver
- #5 Allen Wrench or 3/16" Allen Wrench
- Electrical Tape

Figure 1

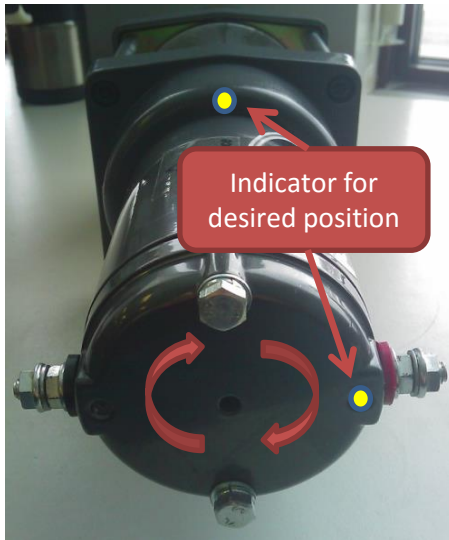


Figure 2



Figure 3

(Figure 2) shows the motor casing, this is the part of the winch that we will be rotating

It may be helpful to place a mark of some kind (pen or tape) on the side of the motor housing and the winch assembly to indicate where you want the motor to end up. This will be helpful later on. Keep in mind that the motor rotates in 90 degree increments. See yellow dots in (Figure 2). When completed, the two (2) dots should line up.

Step 1 - Tape brush housing to motor housing

Using electrical tape, make a cross pattern as shown in (Figure 3) and (Figure 4)

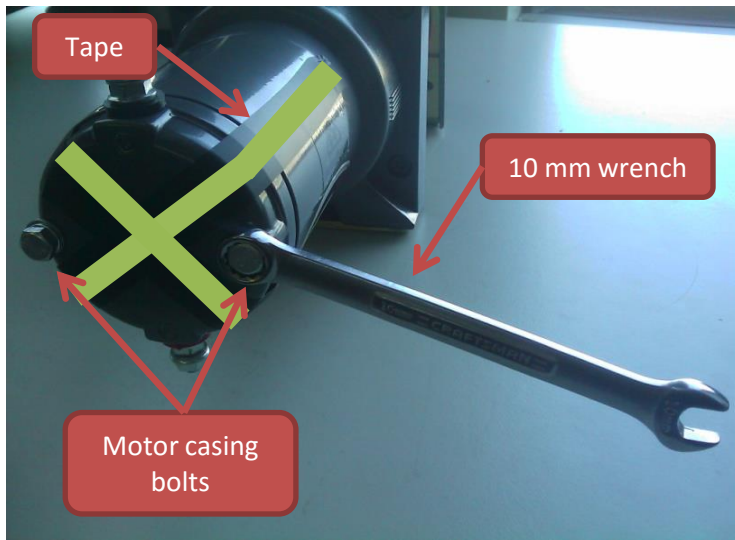


Figure 4

Step 2 - Remove two (2) motor casing bolts using a 10mm wrench as seen in (Figure 4)



Figure 5

Step 2.b) After removing both motor casing bolts, take note of the two black O-rings in front of the lock washers, see that they are not left behind in the motor housing. (See Figure 5)

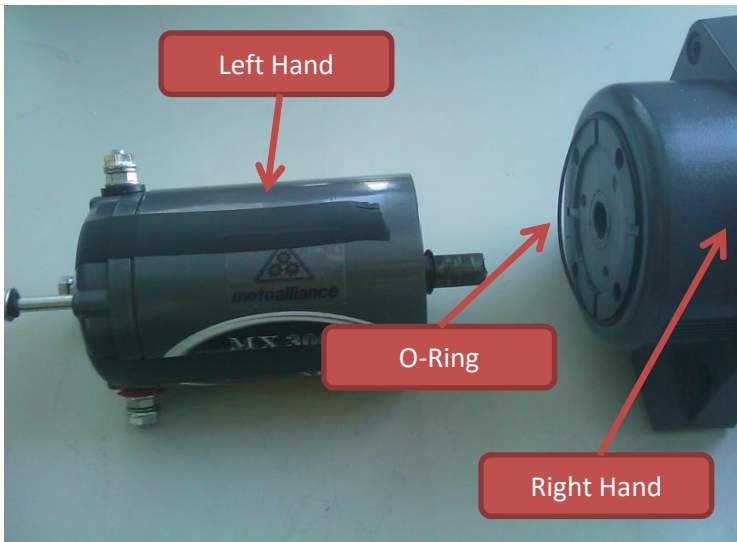


Figure 6

Step 3 - Remove Motor Casing

After the two motor casing bolts are removed, place your left hand firmly on the motor housing and your right hand on the winch housing. Pull the two pieces apart using a rocking motion if necessary.

Take note of the O-ring between the motor casing and the winch casing, see that it is not lost or damaged in the removal process. (See Figure 6)

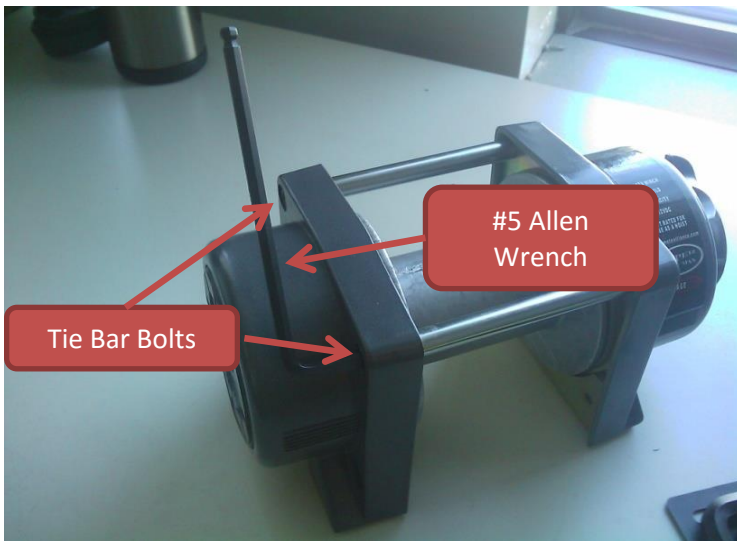


Figure 7

Step 4 - Remove two (2) tie bar bolts

Using a #5 Allen Wrench or 3/16" Allen Wrench, remove the two bolts the hold the tie bars together (see Figure 7)

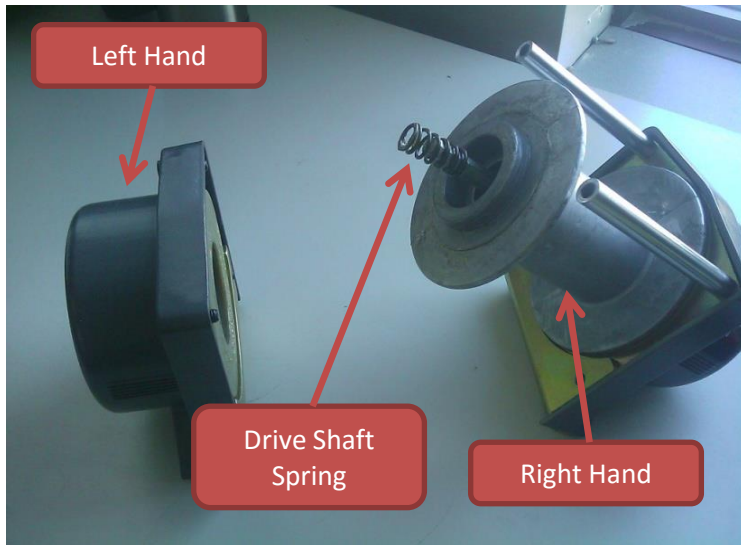


Figure 8

Step 5 - Pull apart cable spool and gear box

Again, placing your left hand on the gear box and right hand on the winch spool, lightly pull the pieces apart using a rocking motion if necessary. Take note of the spring located on the drive shaft. (See Figure 8)

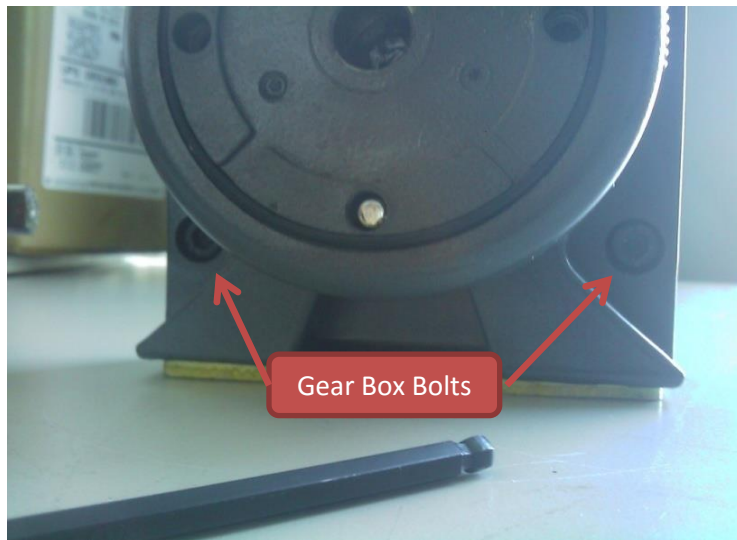


Figure 9

Step 6 - Remove remaining two (2) gear box bolts to expose the gear box

Using your #5 Allen Wrench of 3/16" Allen Wrench, remove the bolts. (See Figure 9)

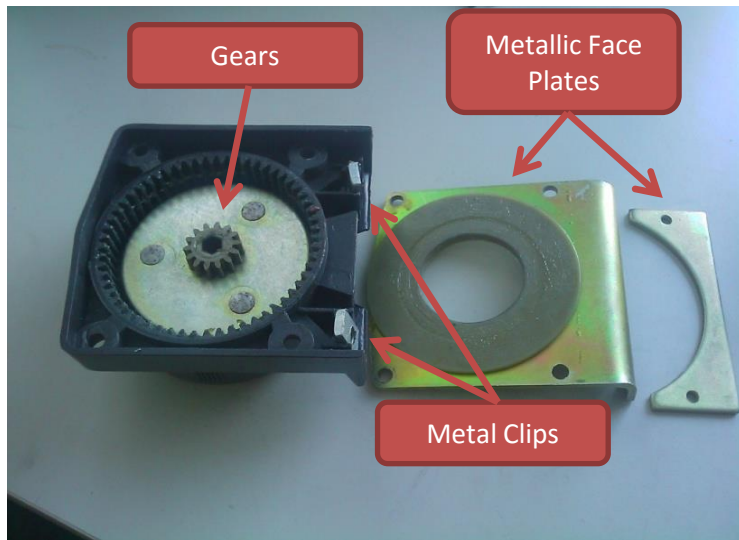


Figure 10

Step 7 - Remove the face plate of the gear box

Once the two gear box bolts are removed, the two metallic face plate parts should pull off easily, exposing the gear box. (See Figure 10)

Note the two (2) metal clips that rest inside the plastic housing, they can be removed and set aside for later installation. (See Figure 10)

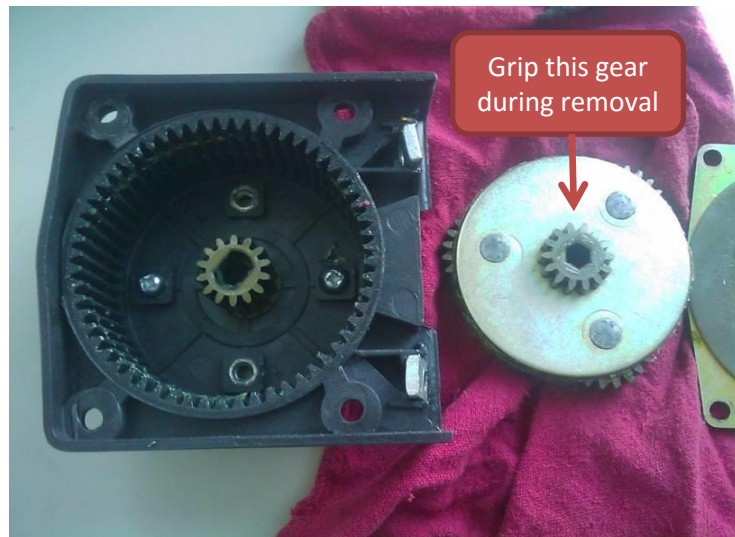


Figure 11

Step 8 - Remove the planetary gears from the gear box

Placing two fingers on the exposed central sprocket pull the gear assembly out of the box, using a rocking motion if necessary (See Figure 11)

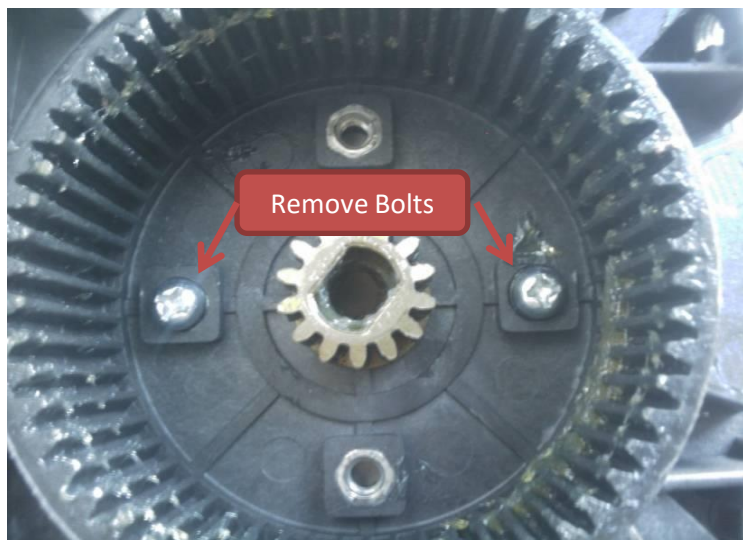


Figure 12

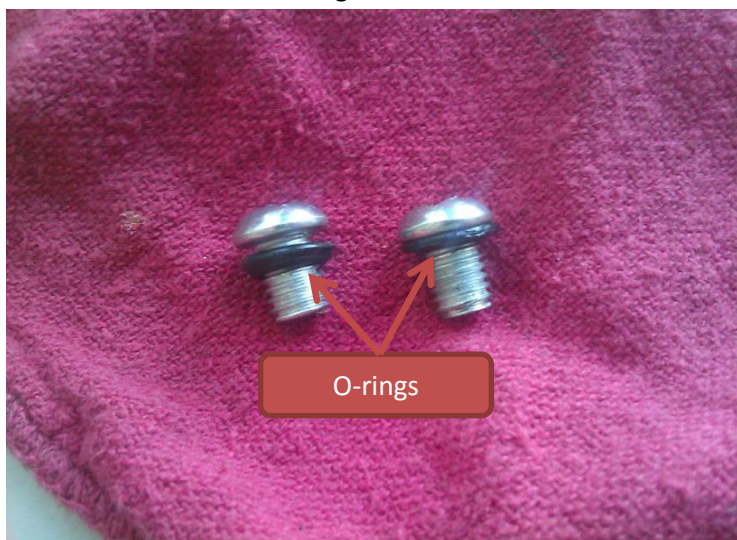


Figure 13

Step 9 - Remove two (2) plug screws

Note the location of the two Phillips head screws (See Figure 12). They must be removed and installed 90 degrees from their original location. Note (Figure 13) prior to removing the screws as it shows two O-rings that must remain present on the screws when they are reinstalled.

Warning: Let Clark Kent be Superman when it comes to these screws, the O-Rings will tear if you flex your might during reinstallation. Tighten them snugly against the gear box.

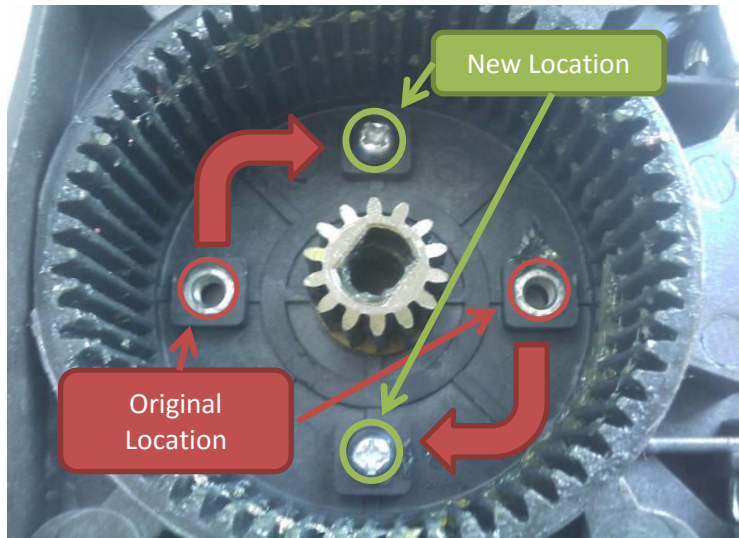


Figure 14

Step 10 - Rotate the location of the screws

Replace the two screws 90 degrees from their original location (See Figure 14)

Second Warning: Let Clark Kent be Superman when it comes to these screws, the O-Rings will tear if you flex your might during reinstallation. Tighten them snugly against the gear box.

Congratulations!!! This is as deep as we need to go, time to put everything back together. Consider yourself an honorary winch specialist.

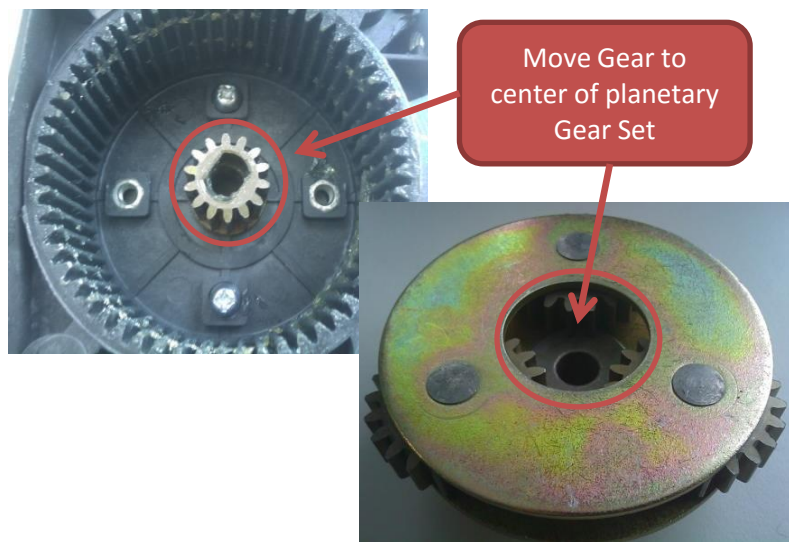


Figure 15

Step 11 - Move central gear to planetary gear

Place the central planetary gear inside the gear set that was removed earlier. This will require some convincing, if frustration grasps you don't throw the gears, try holding the gear assembly in your right hand and with your left hand move one of the gears in the assembly at a time to align them. (See Figure 15).

The end result should appear like (Figure 16)



Figure 16



Figure 17

Step 12 - Install gear assembly into gear housing

Stand the gear housing on end. (See Figure 17)



Figure 18

Step 12.b) - Install gear assembly into gear housing

With the gear housing on end and gear assembly held by the FIXED central gear, place the assembly back into the housing. This may require some rocking back and forth. (See Figure 18)

The gear assembly is inserted sideways to avoid the NON-FIXED central gear from falling out of the three (3) planetary gears during install.

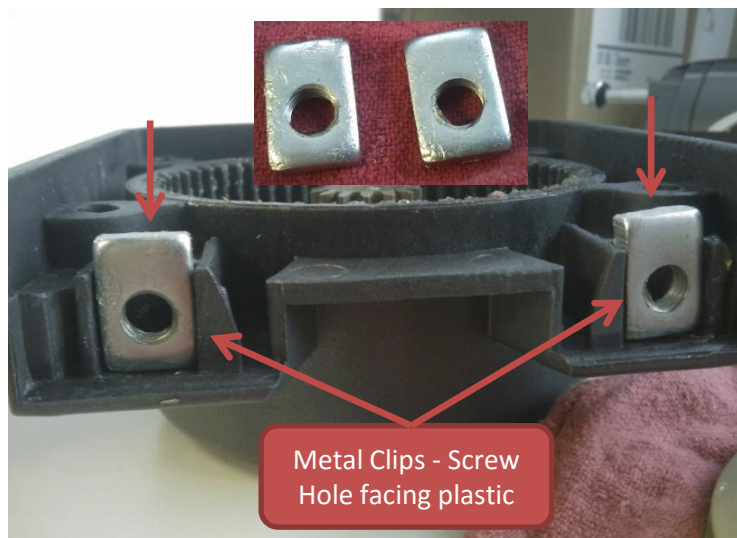


Figure 19

Step 13 - Install Metal face plates

Locate the two (2) metal clips and insert them into the base of the plastic housing with the side of the clip that is closest to the screw hole set nearest to the plastic housing (See Figure 19)

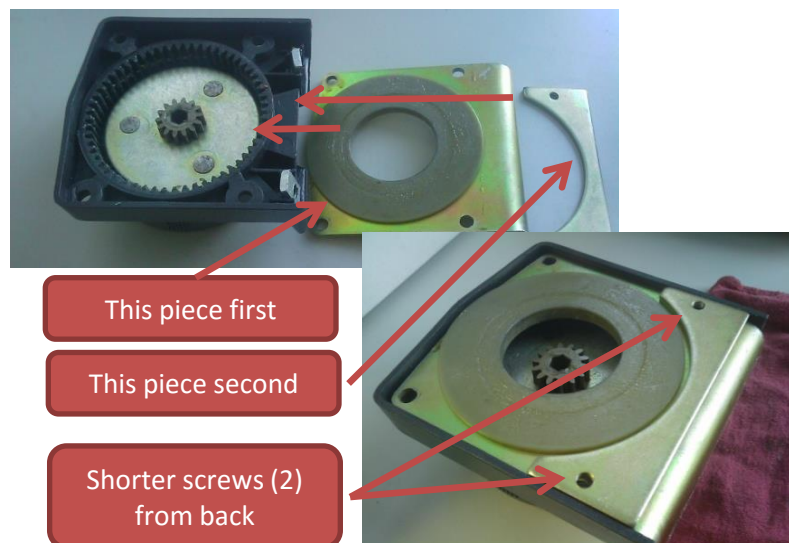


Figure 20

Step 13.b) - Install Metal face plates

With metal clips in place, set the large metal face plate on the gear box with the screw holes aligned. Place the second, smaller, plate on top of the first. (See Figure 20)

Insert the two (2) screws taken out earlier through the back of the plastic housing.

You should have a total of four black screws, two of which are shorter. Use the shorter screws for this step.



Figure 21

Step 14 - Attach gear box and winch assembly

At this point, the gear box should be reassembled and the winch assembly should be intact with the drive shaft spring still sitting on the drive shaft. (See Figure 21)



Figure 22

Step 14.b) - Attach gear box and winch assembly

Note that the single gear located in the gear housing and the drive shaft have mating features. (See Figure 22)

See next step for simplest way to reassemble drive shaft and gear box



Stand winch
assembly on end

Figure 23

Step 14.c) - Attach gear box and winch assembly

Stand the winch assembly on end and place the gear assembly onto the drive shaft, this will require twisting the gear assembly back and forth to align the drive shaft features with the gear. (See Figure 23)



Spring force keeps
a gap here

Figure 24

Step 14.c) - Attach gear box and winch assembly

When the gear assembly and winch assembly are connected, the force of the spring on the drive shaft will keep the gear assembly from sitting flush against the spool. (See Figure 24).

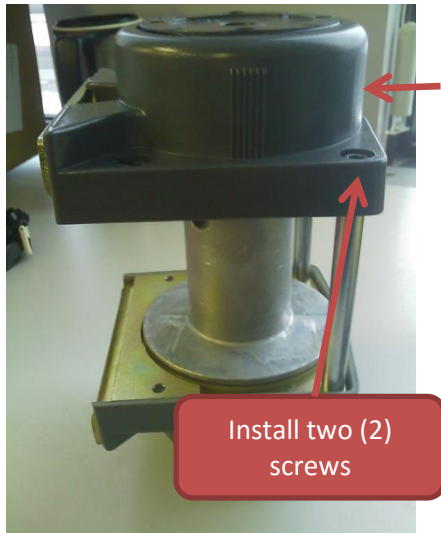


Figure 25



Figure 26

Step 15 - Install tie bar screws

Apply downward force on the gear assembly to overcome the spring force mentioned in step 14.c. If excessive force is needed, check to see that the tie bars aren't stuck on plastic housing. With the screw holes aligned, install the remaining two (2) black screws to secure the tie bars to the gear assembly. (See Figure 25)

Step 16 - Install the motor drive shaft

With the winch and gear assembly still standing upright, align the slotted face of the motor drive shaft with the slotted face of the gear assembly. Fit the two together. This may require some rocking back and forth. (See Figure 26)

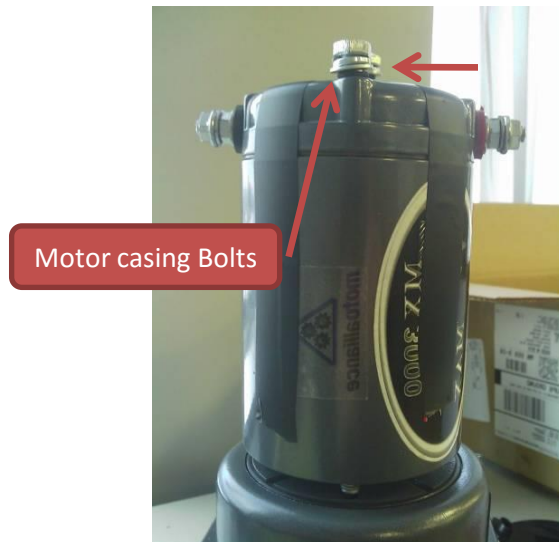


Figure 27

Step 17 - Install motor casing bolts

With the motor drive shaft and gear box aligned, rotate the motor to the desired position. If you created alignment markings as described at the beginning of this document, align those now.

Insert the two motor casing bolts. While pressing downward on the motor casing attach the bolts to the gear assembly. (See Figure 27)

Use your 10mm wrench to tighten the motor casing bolts. Again, resist the urge to demonstrate your Hulk-like strength while tightening the bolts. They should be snug.

Congratulations!!! Merely remove the tape from the motor housing and you have successfully clocked your motor!