

## Tilt-Trim Tech Help

Today's tilt-trim motors use both a wire wound, or permanent magnet, field. To accurately test these tilt-trim motors, one must know which type of field is present. Wire wound field motors will normally use three wires. Permanent magnet field motors use 2 wires. However, on some older Mercury Marine models, the wire wound field motor only had two wires, and also used an external ground wire that is attached to the motor housing. Permanent magnet field motors draw much less current, and miniature relays are used to relay the battery current.

REMEMBER –

BLUE SKY (UP) WIRE TO POSITIVE MAKES THE MOTOR RUN IN THE UP DIRECTION

GREEN GRASS (DOWN) WIRE TO POSITIVE MAKES THE MOTOR RUN IN THE DOWN DIRECTION

### Wire Wound Field Motor

Connecting the blue lead to battery positive and the black lead to battery negative will make the motor run in the up direction, or will raise the outdrive or outboard motor.

Connecting the green lead to battery positive and the black lead to battery negative will make the motor run in the down direction, or will lower the outdrive or outboard motor.

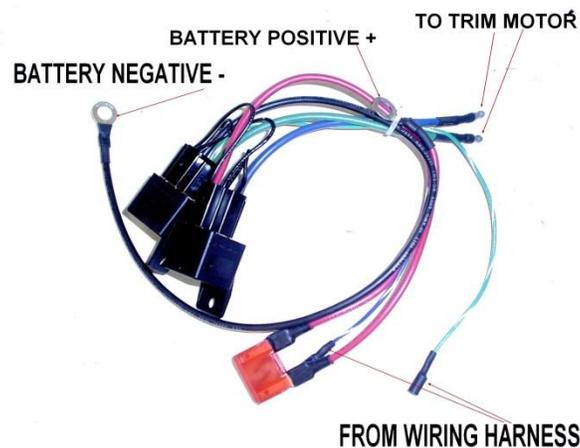
### Permanent Magnet Field Motors

#### Motor Running in the Up Direction

When the tilt-trim switch is moved to the up position, relay #2 activates, supplying positive voltage to the blue wire by connecting terminal #87 to terminal #30. Relay #1 remains in the off position. Terminal #87A and #30 are connected when the relay is in the off position. This allows the green wire to be connected to battery negative.

#### Motor Running in the Down Direction

When the tilt-trim switch is moved to the down position, relay #1 activates, supplying positive voltage to the green wire by connecting terminal #87 to terminal #30. Relay #2 remains in the off position. This allows the blue wire to be connected to battery negative.



## Tilt-Trim Tech Help

# TILT / TRIM Filling and Bleeding

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**Filling:** To properly check the fill, the trim/tilt rams must be extended. Raise OB all the way up (if you can't via the trim motor, then back off the manual release valve and with extra help, tilt/raise the OB all the way up and set it on its mooring/full raise lock, then re-tighten the release valve).

Tilt reservoirs are easier and best to fill IMHO when the boat is on a trailer, as you can lower the tongue all the way to the ground, as you want the tilt/trim reservoir as straight up & down as you can get it. This procedure is also best to have someone assist you, as they will keep their finger on the UP button on the OB cowl, when needed.

Trim the OB all the way up and engage the full-up tilt support (or use a block ... you do NOT want an OB to fall on any body part!). Slowly open the t/t reservoir cap (allowing air to escape) and insert the trim fluid tube/nozzle. I use a small long/slender nozzle on the end of the recommended trim fluid container to help keep it in there.

Now this is where your assistant comes in. Have them press the t/t UP button as you put in ALL the fluid it will take. Keep pressing UP while the OB goes all the way up (off its supports), you will hear the t/t motor hit the bypass valve (the motor sound will change) and until the t/t reservoir won't take any more fluid and it starts to drip/gush out. Mind you, your helper's finger is still ON the UP button ... and while their finger is still pressing the UP button, quickly put the trim reservoir cap back on. All done!

FYI: the concept behind [red]"holding the UP button pressed while filling"[/red] allows the trim motor to suck in all of the fluid it can via the hydraulic system. Doing in this manner, you should not have to top off the reservoir again, hopefully for a long time.

**Bleeding:** late model OB's tilt/trim units are "self-bleeding" and you should always perform these "purge cycles" to follow even if you don't need to add any more fluid. To purge/check, remove the tilt lock (if engaged) and cycle the OB down by "jogging" it down, in 2-3 seconds runs. Then rest the motor a few seconds (just like NOT over cranking a starter motor), then cycle it UP all the way in one long blast. Rest/pause again ... 10 seconds or more ... then repeat the complete cycle a few more times to ensure that it has bled all the air out of the tilt/trim system. When you have bled of all air out, you won't hear bubbling or gurgling as the OB starts its up or down cycle ... you should just hear a smooth start of the rams in motion.