Made in USA by Innova
909.971.0000

www.iTroll.us

Advanced servo tuning:

iTroll sends 1000 throttle positions to the servo. If you use the shortest linkage travel possible for your fishing requirements, each one of the 1000 steps will be smaller, thus allowing the most precise throttle control. This will also provide a large spread of throttle positions between your slowest and fastest usable trolling speeds which maximizes the versatility of iTroll's HUNT mode. Note: iTroll has adjustable servo travel - 90 degrees is best for sensitivity as each of the 1000 throttle steps is SMALLER!

The distance the linkage travels sets a limit on the fastest motor speed attainable with iTroll - You will get more throttle with a 3/4 inch throw than with 1/2 inch. **Due to the fact that throttle controllers spend so little time at higher throttle settings, it is preferable to maximize sensitivity at trolling speeds at the expense of maximum attainable speed.**

You can "fine tune" your servo to perfectly match the type of angling that you do. This is done by adjusting the amount of throttle the servo pulls and the rate at which the throttle is opened.

Variables in kicker motors and boats:

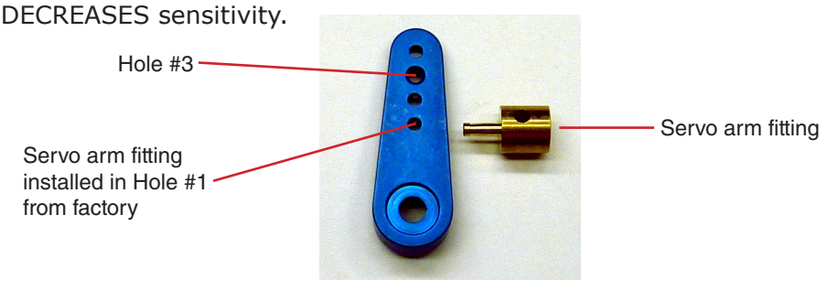
A) A kicker on a small boat, slow bait presentations or finicky fish requires tuning the servo for increased or maximum sensitivity.
B) A kicker on a large boat, fast bait presentations or fast swimming fish may require tuning the servo to provide increased or maximum throttle movement.

There are two variables that this document addresses:

A) The position of the servo arm fitting in the servo arm
B) The initial position of the servo arm at when at idle

Reference 1: Stock servo arm setup

When we ship a servo, the default position of the servo arm fitting is chosen for maximum sensitivity. If you were to move the fitting to a hole further away from the arm's center, it spins around a LARGER circle, INCREASING throttle throw which DECREASES sensitivity.



Reference 2: Servo arm position when iTroll is at idle setting

When iTroll is at idle, the position of the servo arm relative to the cable or rod that is pulling the throttle has a huge impact on the amount of throttle pulled by the servo and the rate at which the throttle is applied. Pay special attention to "Virtual Servo Arm Length" when you observe the following figures:

Note: Photos show servo at IDLE position, with servo rotating clockwise when throttle is increased. Increase Throttle

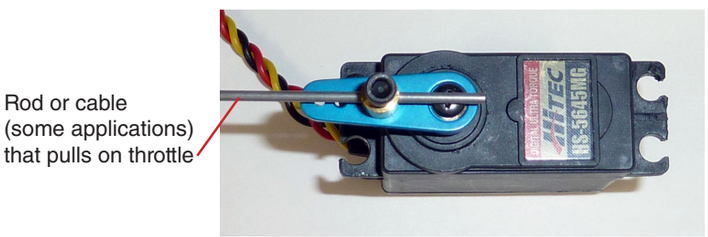


Fig. 1
Virtual servo arm length = ZERO
because there is NO angle between
servo arm and pull rod

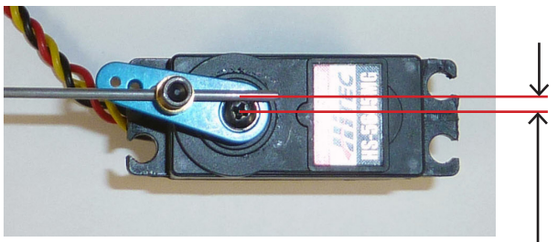


Fig. 2
Servo arm indexed one spline in direction of
servo travel (clockwise in this case).
Virtual servo arm length

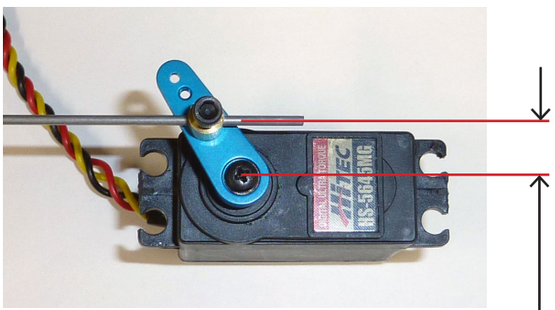


Fig. 3
45 degree angle between servo arm & pull rod
Virtual servo arm length

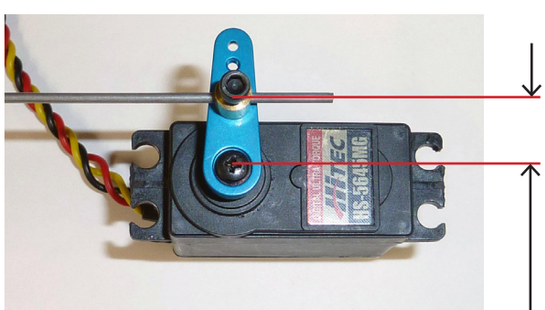


Fig. 4
90 degree angle between servo arm & pull rod
Virtual servo arm length

Reference 3: Rate at which throttle is applied
Note: Most motors have a non - linear rate of throttle application, commonly known as "tip-in". This is to prevent the initial application of throttle from being "jumpy". If you set up your servo to be most sensitive in the motor's "tip-in", you will have the most control over your trolling.

For the most precise control, it is best to set your idle position like Figures 1 or 2 in Reference section 2 (above). The reason for this is that you have little (Fig 2) or NO (Fig 1) servo arm length when the throttle first opens, pulling very little cable or rod with each of iTroll's throttle steps in the tip-in area. As the servo continues to rotate, your virtual servo arm length gradually increases.

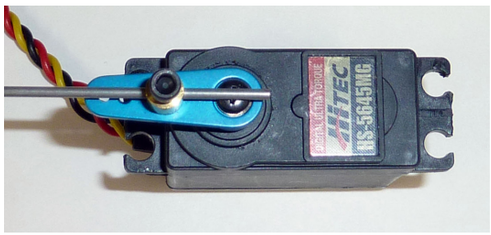
If you were to set your idle position like Figures 3 or 4, you would get a lot of throttle pull per iTroll step in the tip-in, with possible poor throttle control and limited HUNT mode versatility if you were trolling at slow speeds.

Reference 4: Servo Travel Data / All Measurements rounded for simplicity
Servo Travel set to 90 degrees in clockwise direction as throttle increases.
Your actual linkage travel may differ from test data due to slack in cable or rod.

Servo Rotation
Increase Throttle

Rod / Arm Alignment at IDLE

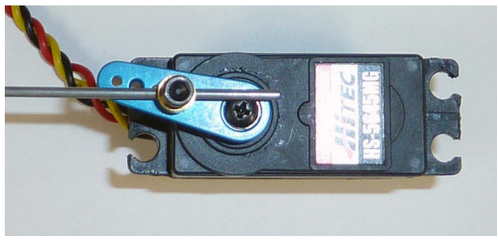
Most Sensitivity (Less Travel)



Example 1:
BEST Sensitivity / LEAST Throttle Pull
Slowest initial response, faster when advanced

Linkage Travel from Idle to 100%:
Hole #1 - 5/16 Inch
Hole #2 - 7/16 Inch
Hole #3 - 5/8 Inch

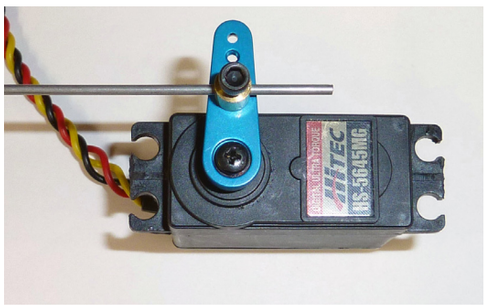
Note: Hole #1 closest to servo shaft



Example 2:
Probably the Best All Around Setting
Slow initial response, faster when advanced

Linkage Travel from Idle to 100%:
Hole #1 - 1/2 Inch
Hole #2 - 5/8 Inch
Hole #3 - 3/4 Inch

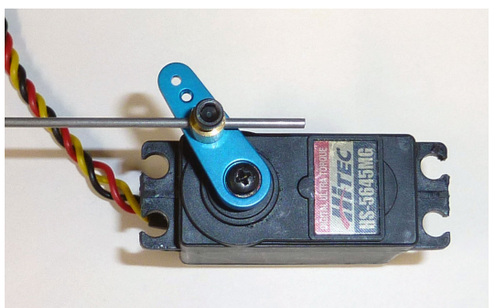
Note: Hole #1 closest to servo shaft



Example 3:
High Speed Trolling with Best Sensitivity at Higher Throttle Settings
Fast initial response, slows with advancement

Linkage Travel from Idle to 100%:
Hole #1 - 3/8 Inch
Hole #2 - 1/2 Inch
Hole #3 - 5/8 Inch

Note: Hole #1 closest to servo shaft



Example 4:
High Speed Trolling
Maximum Throttle Pull

Linkage Travel from Idle to 100%:
Hole #1 - 5/8 Inch
Hole #2 - 3/4 Inch
Hole #3 - 7/8 Inch

Note: Hole #1 closest to servo shaft

Most Travel (Less Sensitivity)

Innova Design & Dist. Inc. 441 W Allen Ave #102 San Dimas, CA 91773 909.971.0000 Fax: 909.971.9333

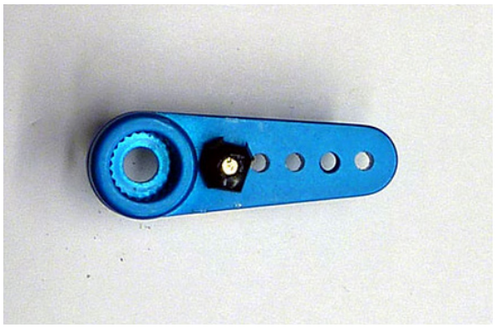
Reference 5: Modification for ULTRA Sensitivity

This is a modification that Joel (iTroll's designer) evaluated when developing the unit. It involves modifying the servo arm to pull the least throttle possible.

For his type of fishing, he found this modification had no advantages over the configurations in Reference 4. However, should you find that you need more sensitivity for your types of angling, here is the modification and servo travel data.

Step 1: Modify Servo Arm

Drill a new 1/16 inch hole below Hole #1 in servo arm as shown. Centers of new hole and Hole #1 are 1/8 inch apart. We will now call the new hole, "Hole #0".



Trim plastic retainer of servo arm fitting to clear lip of splined shaft area and reinstall brass servo arm fitting. Make sure you remove enough material from plastic retainer to allow servo fitting to spin freely!

Reference 6: Linkage travel with servo fitting in Hole #0

Example 1, Ref 4 = 1/4 Inch

Example 2, Ref 4 = 5/16 Inch

Example 3, Ref 4 = 5/16 Inch

Example 4, Ref 4 = 3/8 Inch

If you would like to experiment, the middle setttings above pull the approximately the same amount of throttle, but pull at opposite rates:

Example 2 is very gradual at low speeds and then gets more aggressive as you advance the throttle.
Example 3 is very aggressive at low speeds and then gets less aggessive as you advance the throttle.