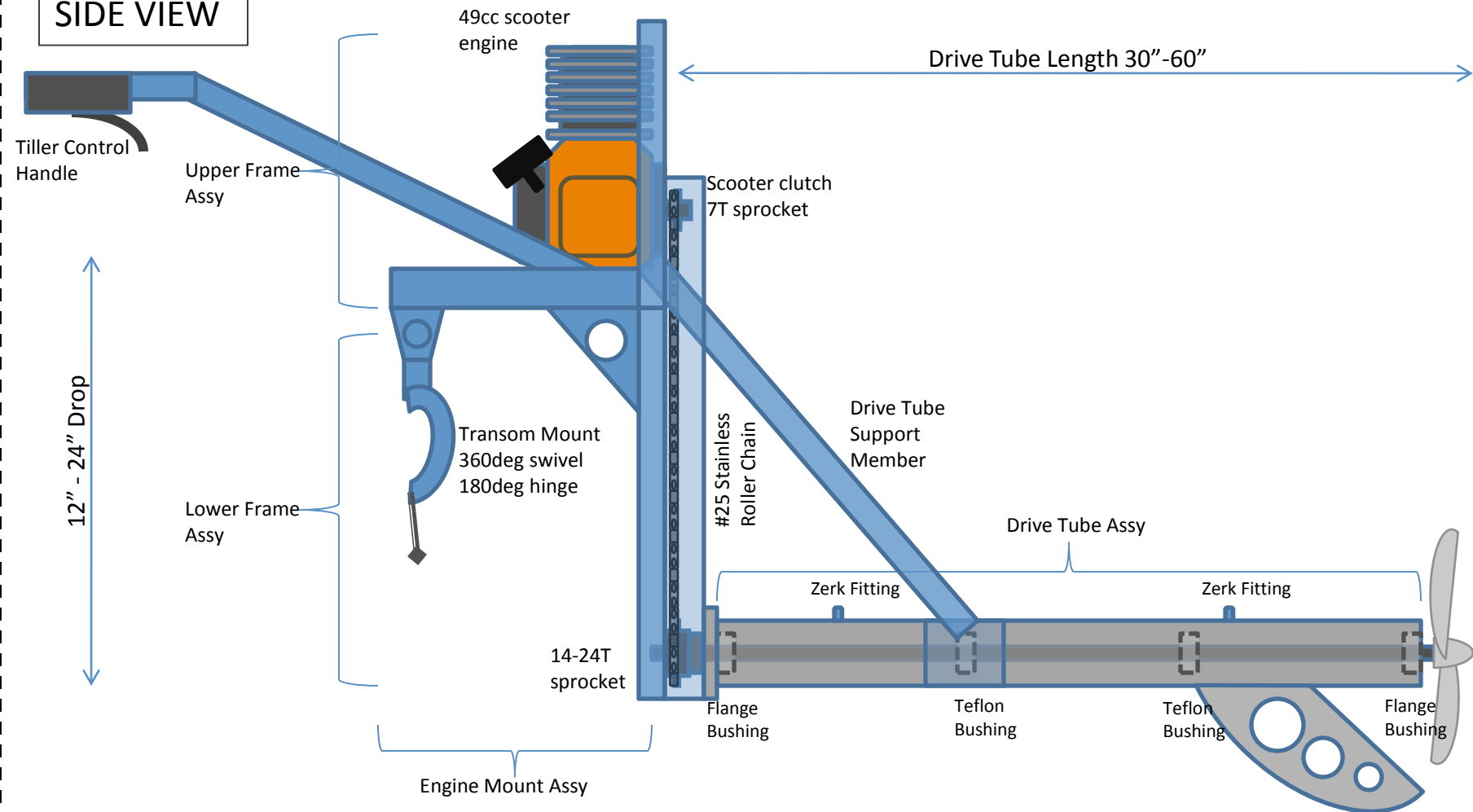


SIDE VIEW

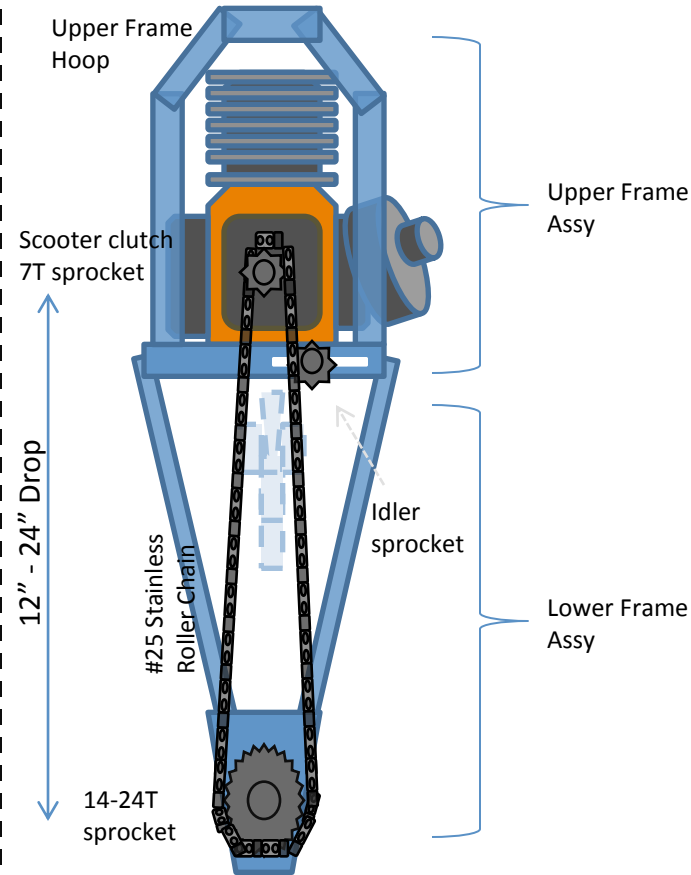


NOTES:

1. Frame constructed of $\frac{3}{4}$ "-1" Aluminum square stock
2. Drive Tube of 1"-1-1/4" DOM or zinc-coated steel conduit
3. Marine grease, with fittings on drive tube for lubrication
4. Drop is easily scaled up/down for transom design
5. Drive tube length scales up/down easily for transom height
6. 49cc-52cc engine from scooter with integral centrifugal clutch and #25 chain sprocket (6-7T is standard)
7. Lower shaft sprocket should be 14-24T to achieve 1:2 - 1:3 drive ratio
8. Propeller is ideally 6.5-7" diameter with 1" pitch
11. Engine mount swivels 180deg on horizontal and 360deg on vertical axis
12. Motor may be easily rotated to face forward or rearward for different propellers
13. Drive shaft ($\frac{3}{8}$ " or $\frac{1}{2}$ " steel rod) is supported by teflon bushings (self-lubricating) and sealed with flange bearing on each end
14. Shaft collar locks driveshaft into tube on engine side only
15. Propeller attached using pin in shaft and nut/lock washer on end of shaft (pin should be point of failure in case of snagged prop to save engine)
16. Design considerations are 1. Performance, 2. Weight, 3. Portability, 4. Cost
17. Chain and sprocket safety cover not depicted for clarity

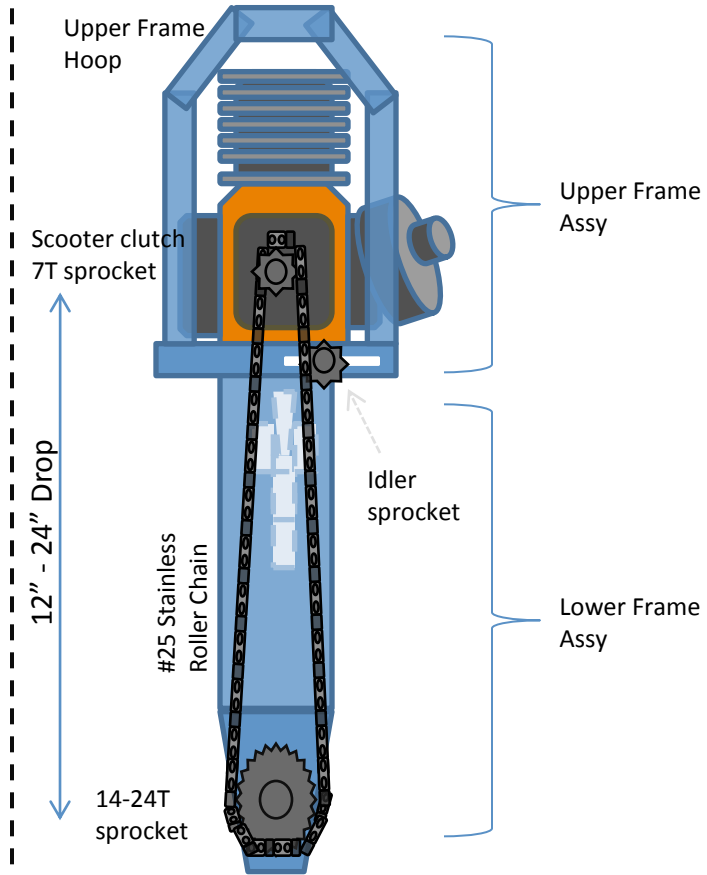
REAR VIEW (FRAME) v1

Open Lower Frame Assembly



REAR VIEW (FRAME) v2

Sealed Lower Frame Assembly



NOTES: Open Lower Frame

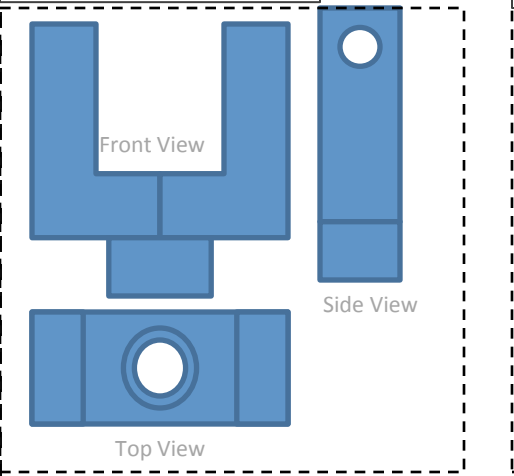
1. Idler pulley maintains chain tension, mounted to slot in upper frame
2. Tension adjusted via bolt/nut running through slot in frame, idler pulley freewheels on bolt shaft, nut locks the pulley bolt onto the slot when in position
3. Upper frame hoop acts as mount and carrying handle
4. Drive Tube diagonal support member runs from upper frame to drive tube center and also serves as carrying handle
5. Lower sprocket mounts to drive shaft using allen key and slot
6. Drive tube also braced to lower frame member via brackets (aluminum angle)

NOTES: Closed Lower Frame

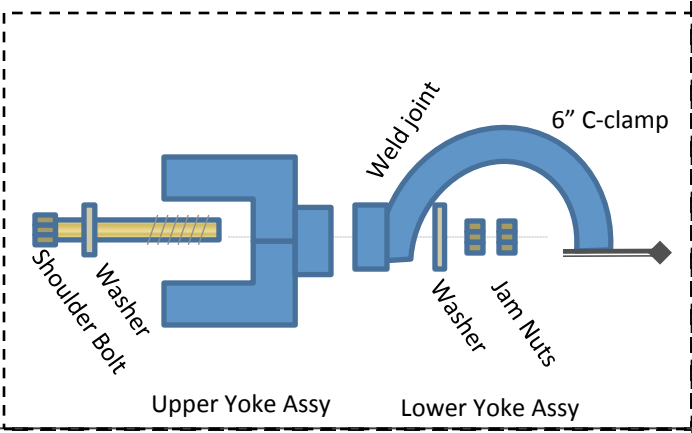
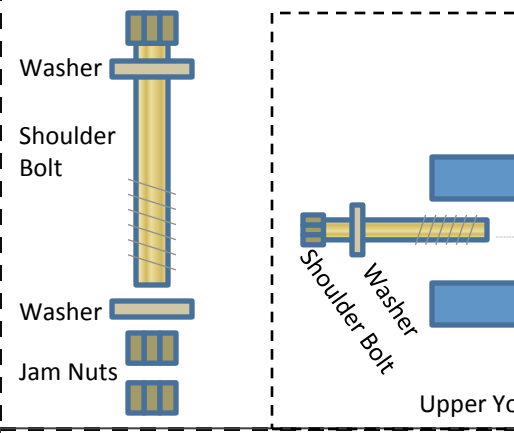
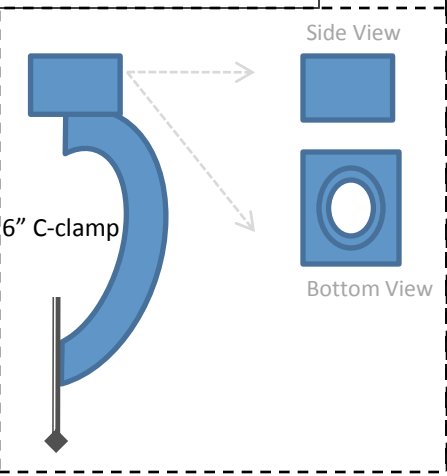
1. Idler pulley maintains chain tension, mounted to slot in upper frame
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3. Upper frame hoop acts as mount and carrying handle
4. Drive Tube diagonal support member runs from upper frame to drive tube center and also serves as carrying handle
5. Lower sprocket mounts to drive shaft using allen key and slot
6. Drive tube also braced to lower frame member via brackets (aluminum angle)
7. Lower support frame is a aluminum sheet skinned aluminum angle frame to seal chain from water/debris

TRANSOM MOUNT v1

Upper Yoke Assembly



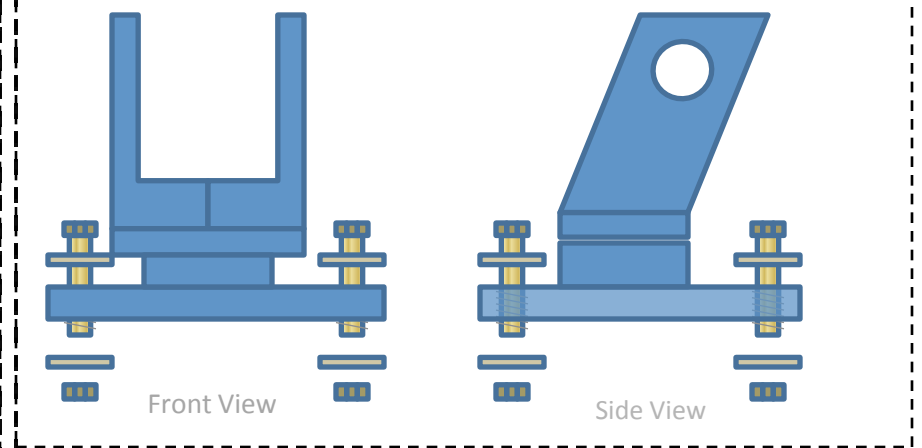
Lower Yoke Assembly



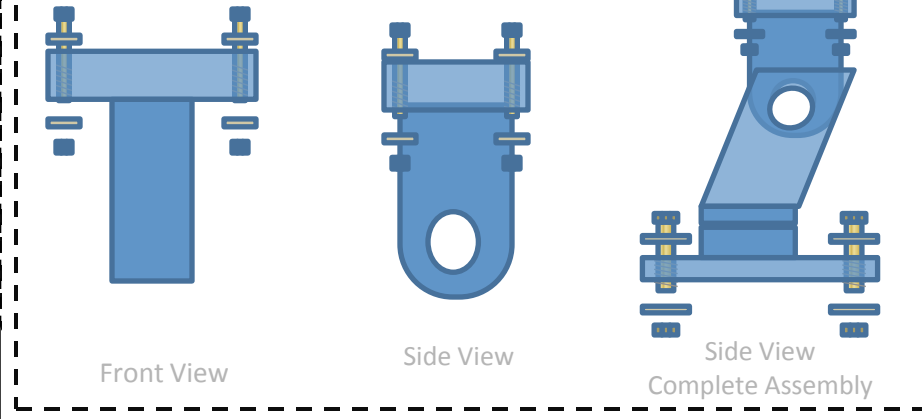
- NOTES:**
1. 6" C-clamp mounts to transom. Welded to machined lower yoke mount to allow for 360" rotation about vertical axis.
 2. Shoulder bolt head and washer sit in recessed hole of yoke. Jam nuts ensure assembly remains tight, but has sufficient tolerance to rotate.
 3. Yoke is 1/4 or 3/8" mild steel to allow easy welding and machining.

TRANSOM MOUNT v1 *Adapted Wheel Caster Mount*

Caster Lower Yoke Assembly

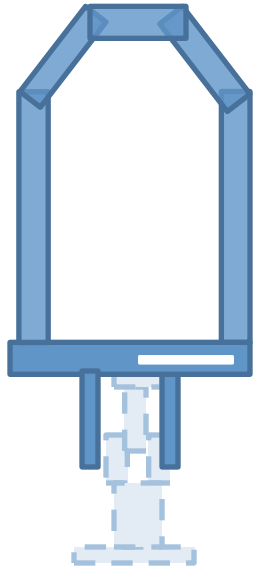


Upper Transom Mount Assembly

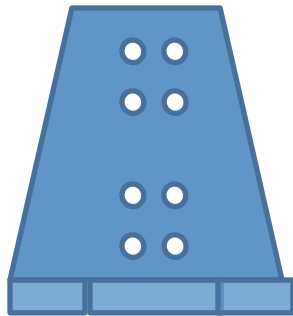


- NOTES:**
1. Use a large rotating wheel caster assembly, preferable with a wheel brake. Remove the caster wheel, and fabricate a mount the same width as the wheel to attach to the engine mount upper frame assembly.
 2. Utilize bolts to secure the wheel caster base plate to the transom.
 3. Fabricate upper transom mount using 3/8" -1/2" mild steel. Weld together. Attach to engine mount upper frame assembly with four bolts and lock washers

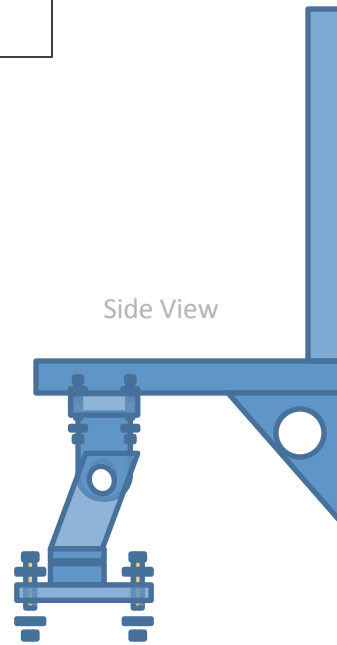
ENGINE MOUNT ASSEMBLY



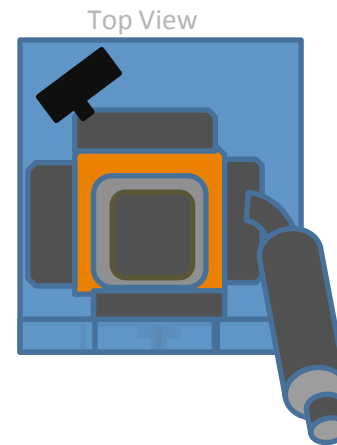
Rear View



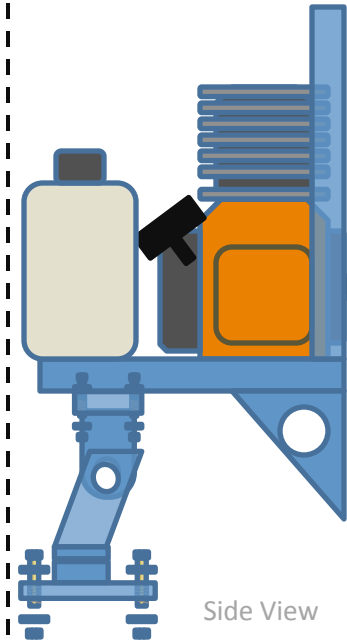
Top View



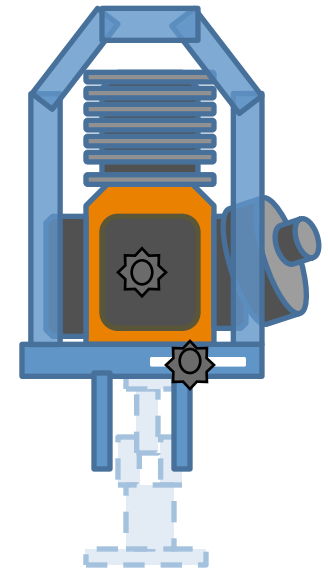
Side View



Top View



Side View



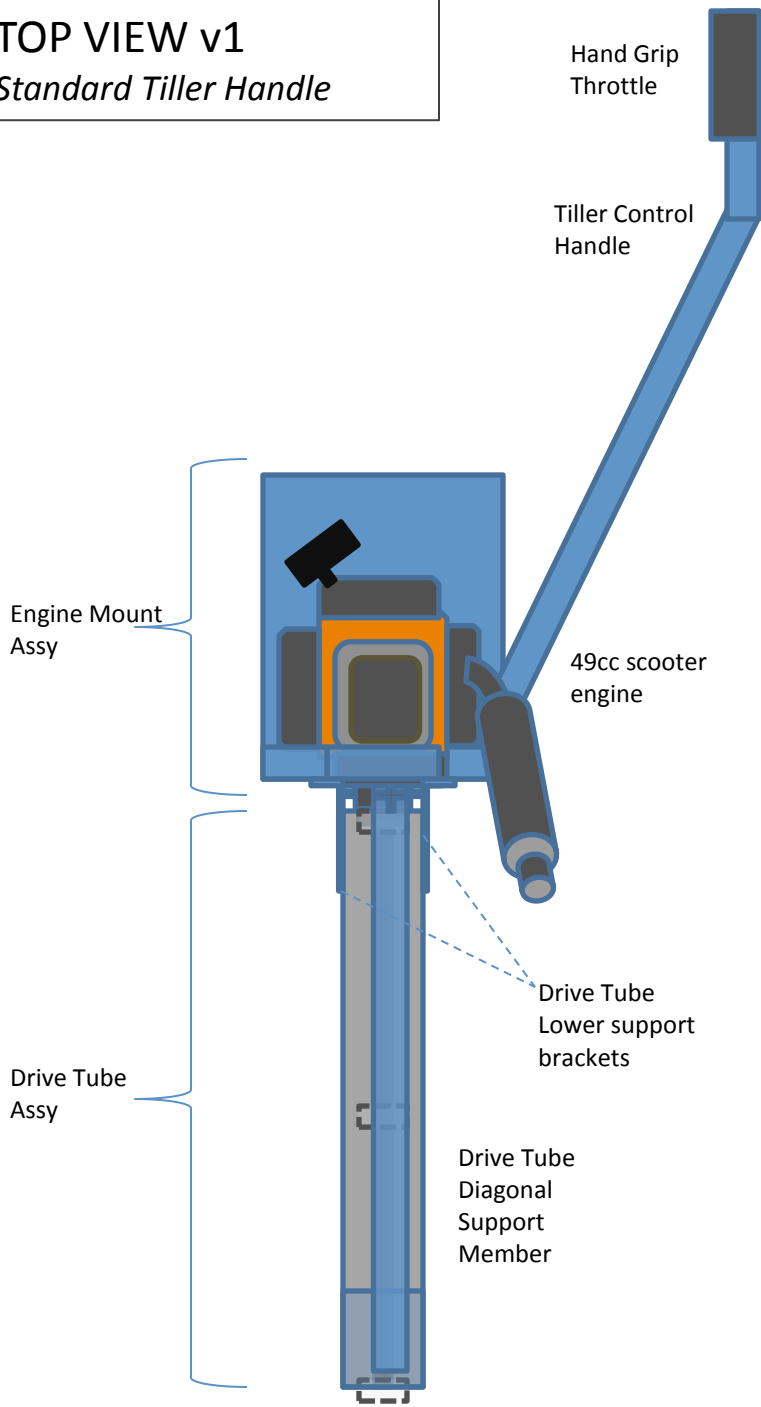
Rear View

NOTES:

1. Idler pulley slot in lower frame cross member.
2. Upper frame hoop acts as mount and carrying handle, made from ½" conduit
3. Lower frame bolts holes drilled for engine mount bolt pattern.
4. Lower frame bolt holes drilled for transom mount upper bracket.
5. Fuel tank mounted above transom mount on lower frame.

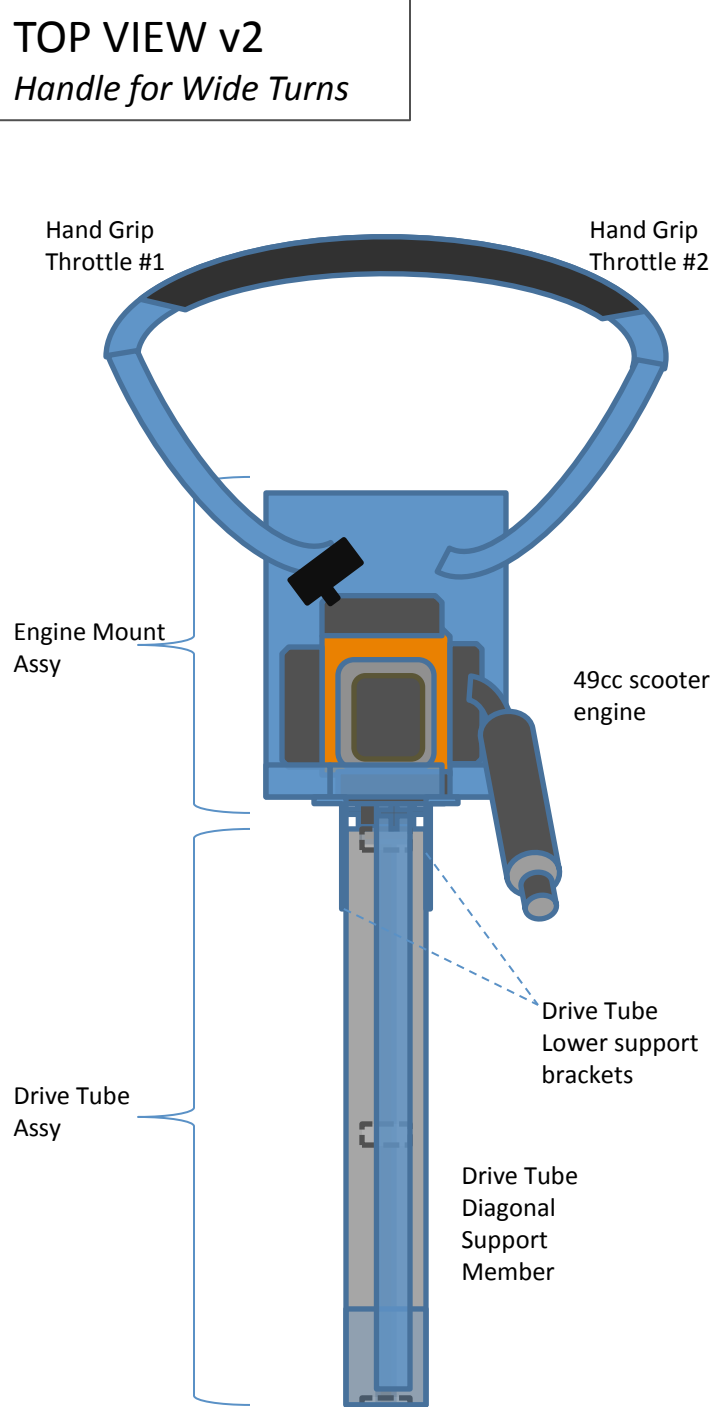
TOP VIEW v1

Standard Tiller Handle



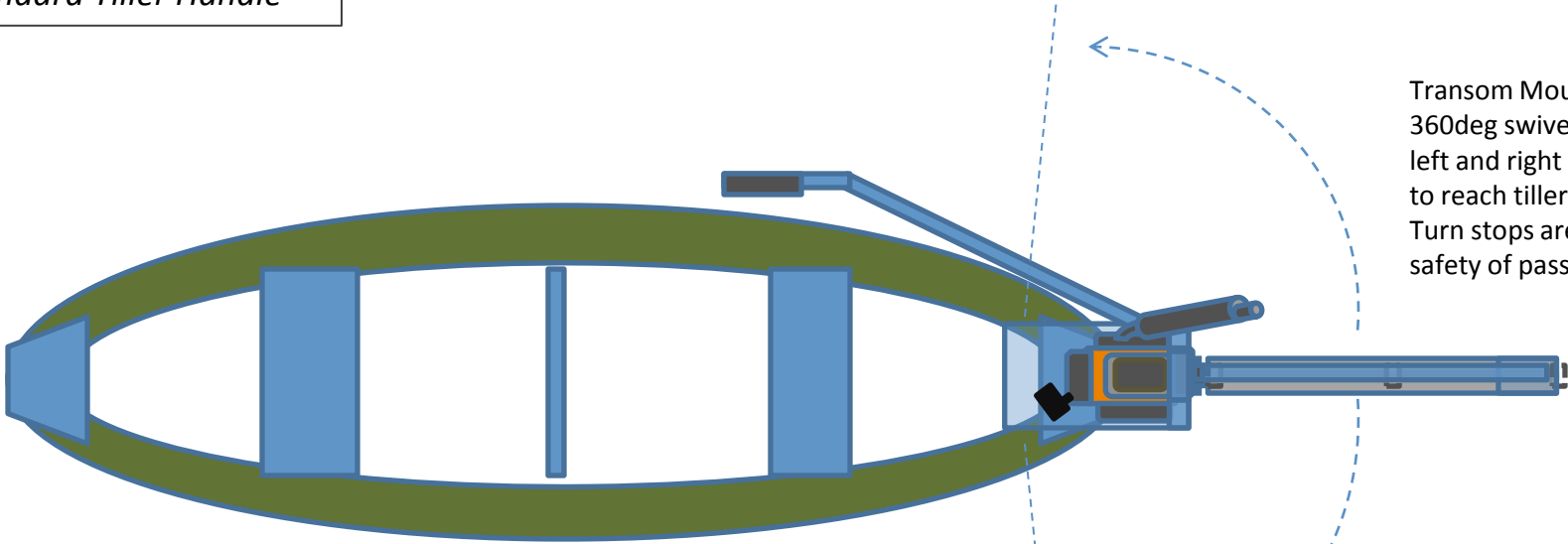
TOP VIEW v2

Handle for Wide Turns

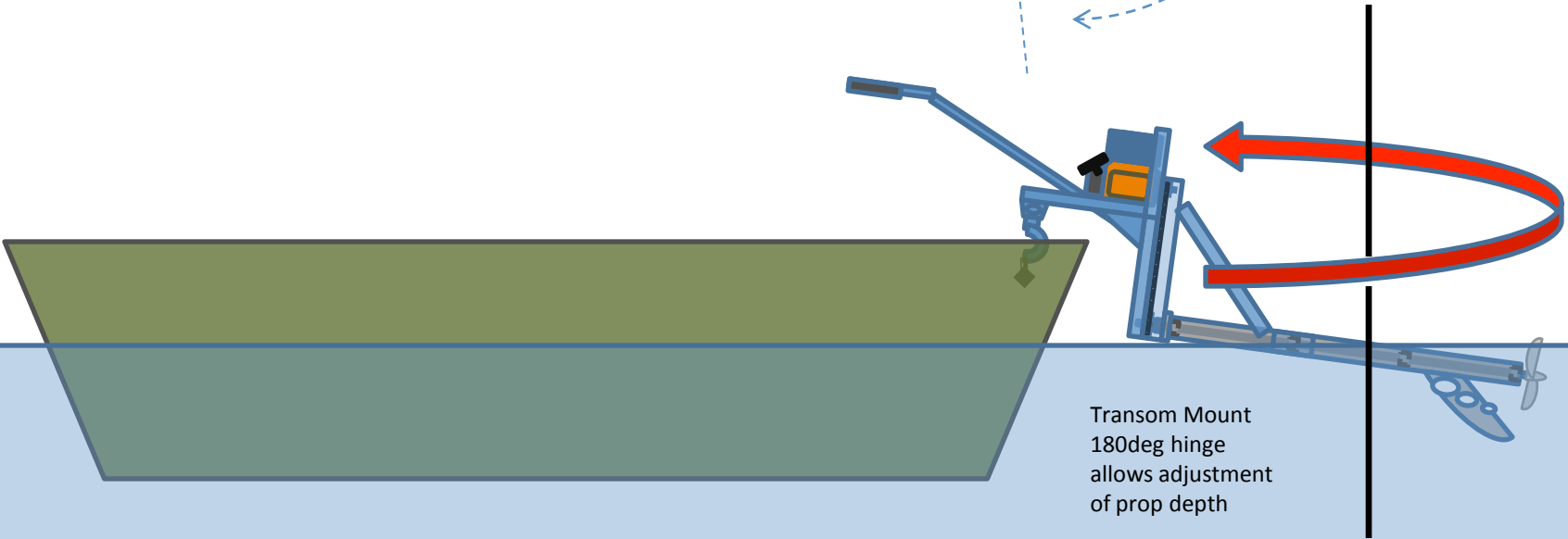


Tiller Handle v1

Standard Tiller Handle



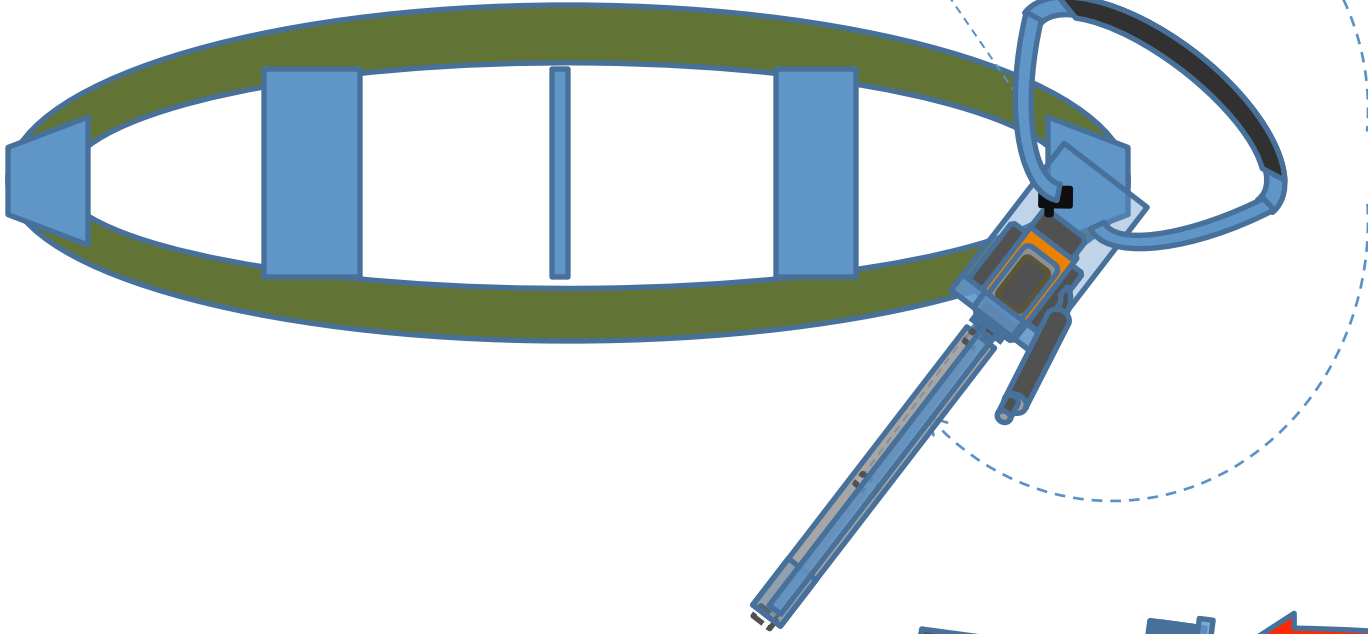
Transom Mount
360deg swivel allows for sharp left and right turns—limit is ability to reach tiller handle from seat. Turn stops are likely required for safety of passengers/operator



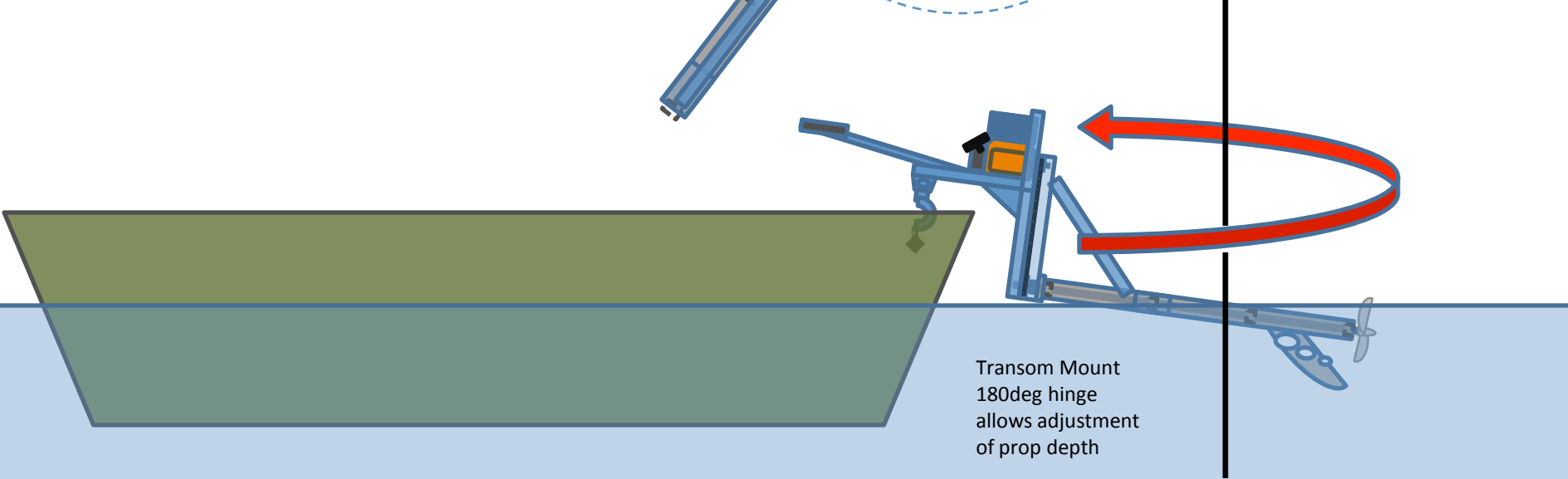
Transom Mount
180deg hinge allows adjustment of prop depth

Tiller Handle v2

Handle for Wide Turns



Transom Mount
360deg swivel allows for sharp left and right turns—limit is ability to reach tiller handle from seat. Turn stops are likely required for safety of passengers/operator



Transom Mount
180deg hinge allows adjustment of prop depth