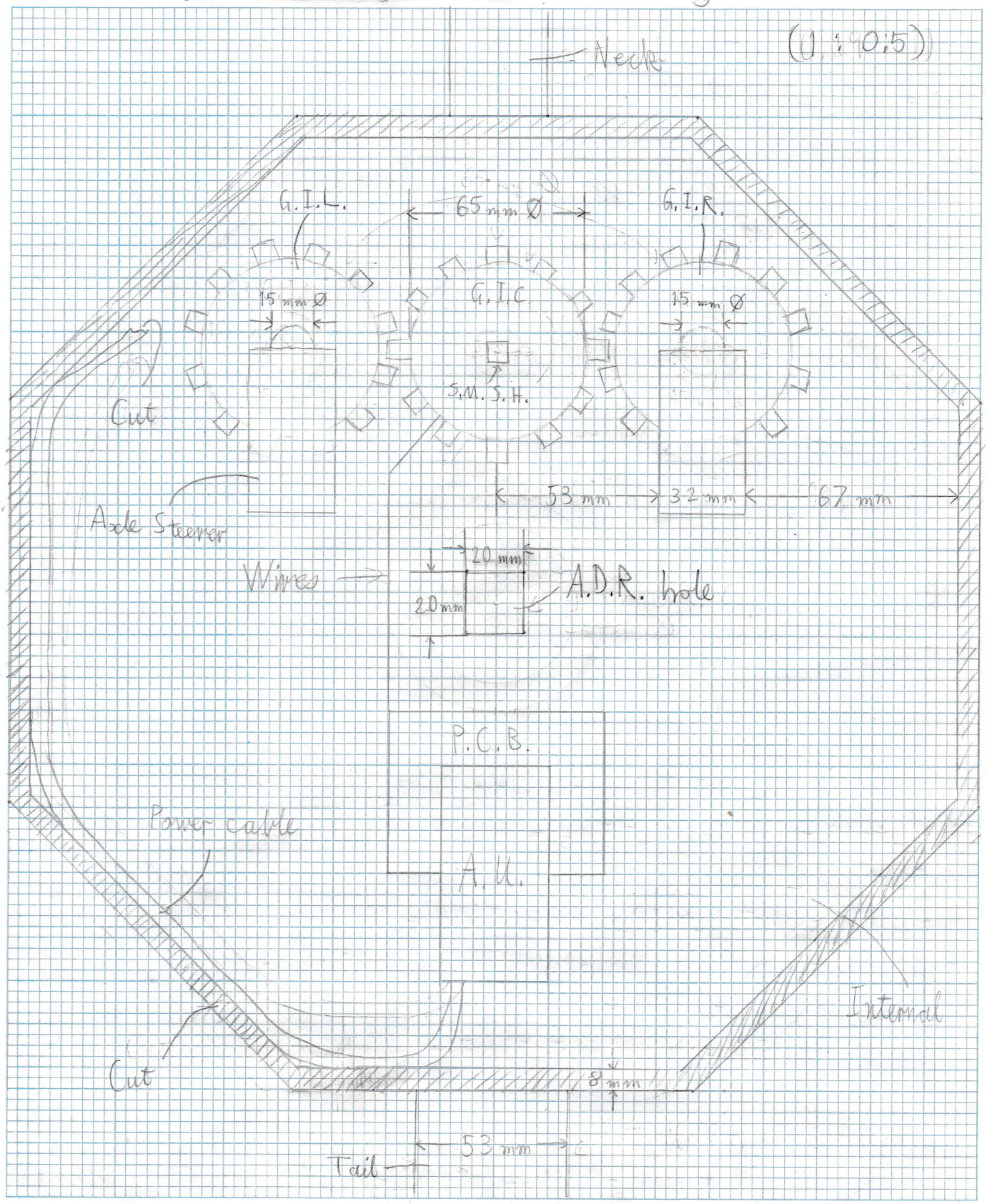
Internal Body Gear System front (Rev. C) Drawing 1 17/06/2019



G.I.C.: Gear Internal Centre. Powered by stepper motor. hidden behind G.I.C.

G.I.R.: Gear Internal Right, G.I.L.: Gear Internal Left. Powered by G.I.C.

Axle steerer holds axle in place (see drawings 2 & 5).

A.U.: Arduino Unit, e.g. Arduino nano or Arduino uno.

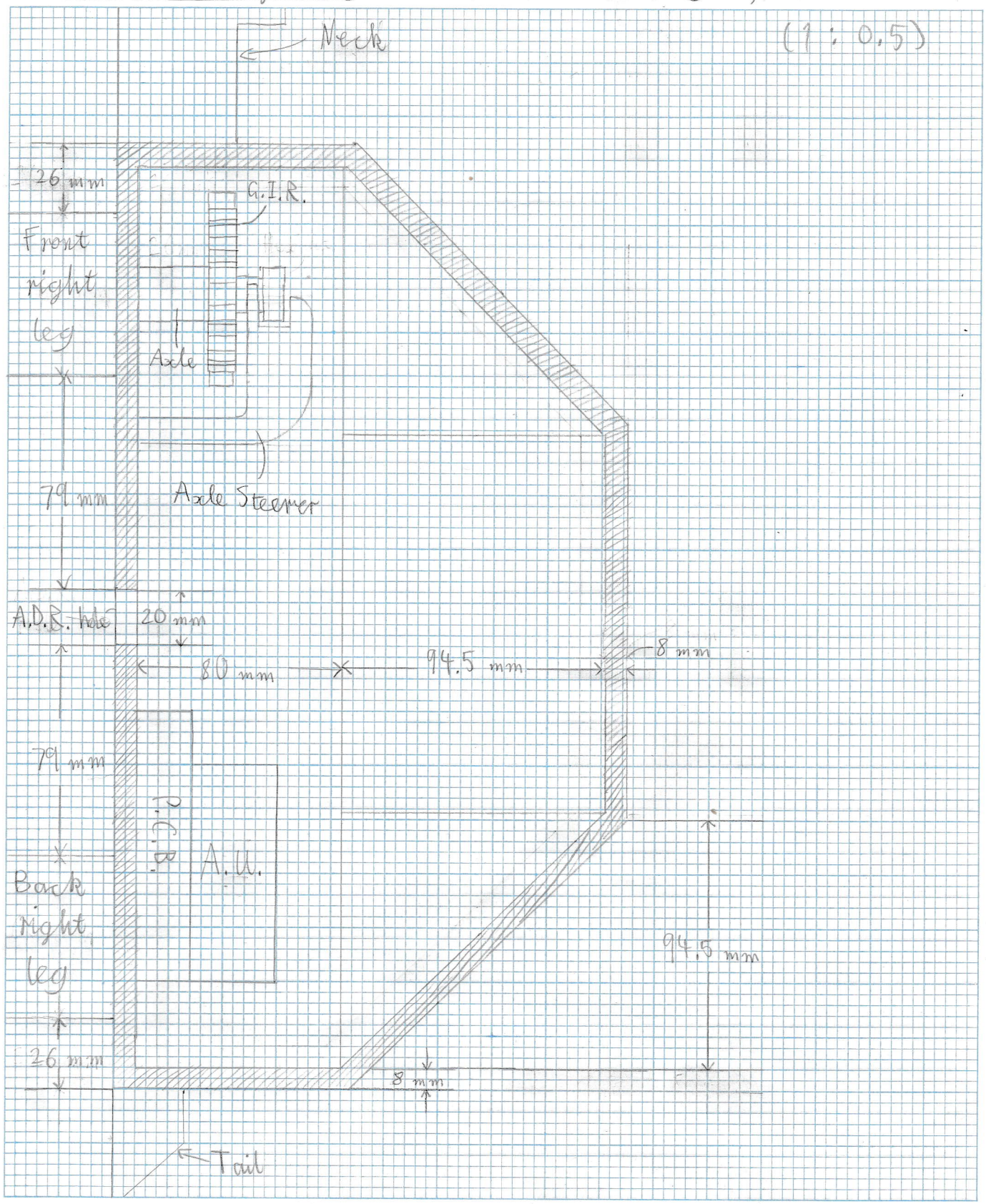
G.I.C., G.I.R., & G.I.L. are identical, with teeth side lengths of 4 mm.

A.D.R.: Anti-Detaching Rod (drawing 11). Secured with A.D.R. cap.

S.M.S.H.: Stepper Motor Shaft Hole.

Power cable is secured to body via strong duct tape

Interal Side View of Body, Half (Rev. C) Drawing 2, 17/06/2019



G.I.C. (see drawing 1) was not included so that the gear holder could be seen.

A.U.: Arduino Unit, e.g. Arduino Nano & Uno.

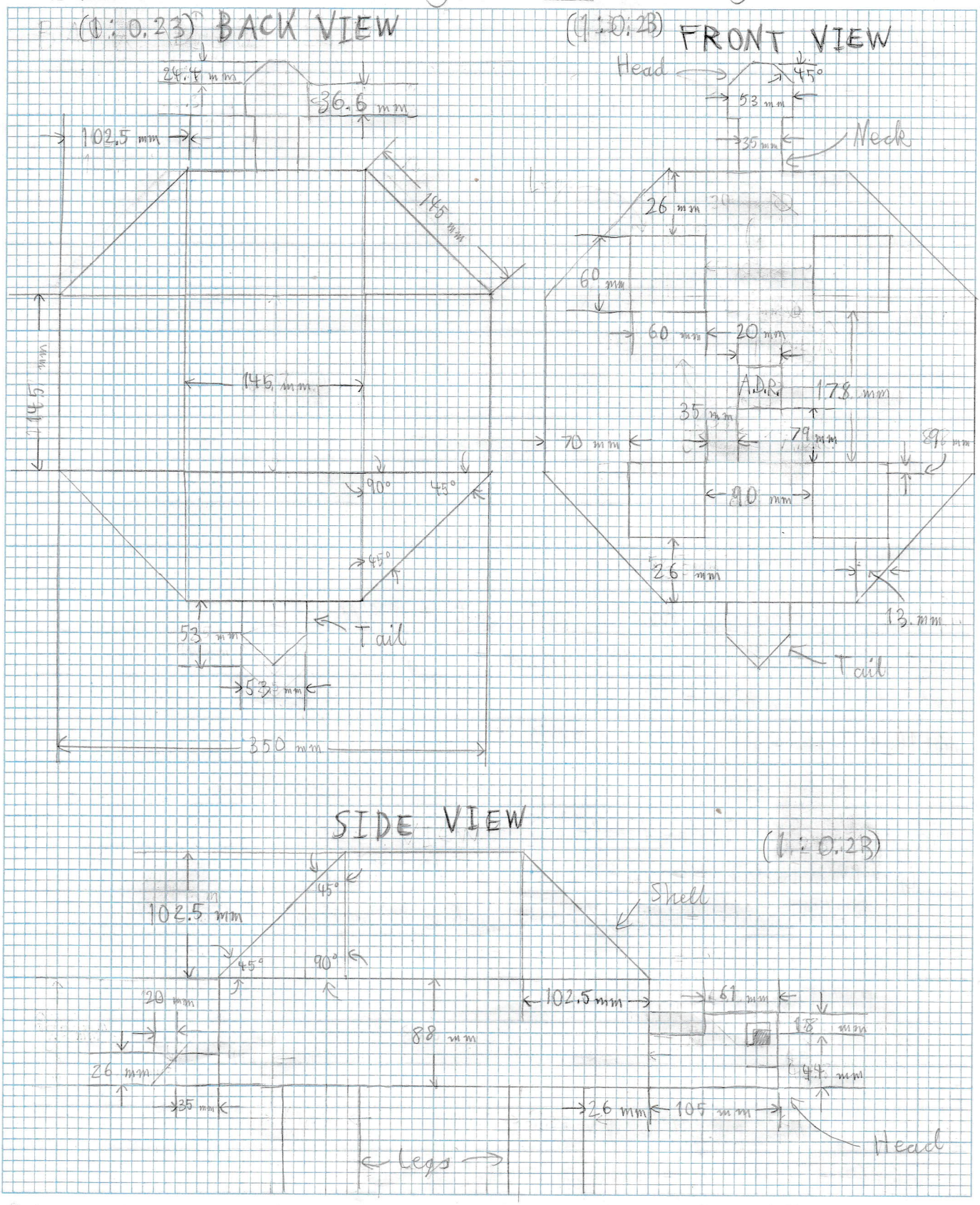
P.C.B. & A.U. dimensions T.B.A.

Axle Steerer is detailed in drawing 5.

G.I.R.: Gear Internal Right (see drawing 15).

See drawing 13 for axle & hex nut detailed drawing.

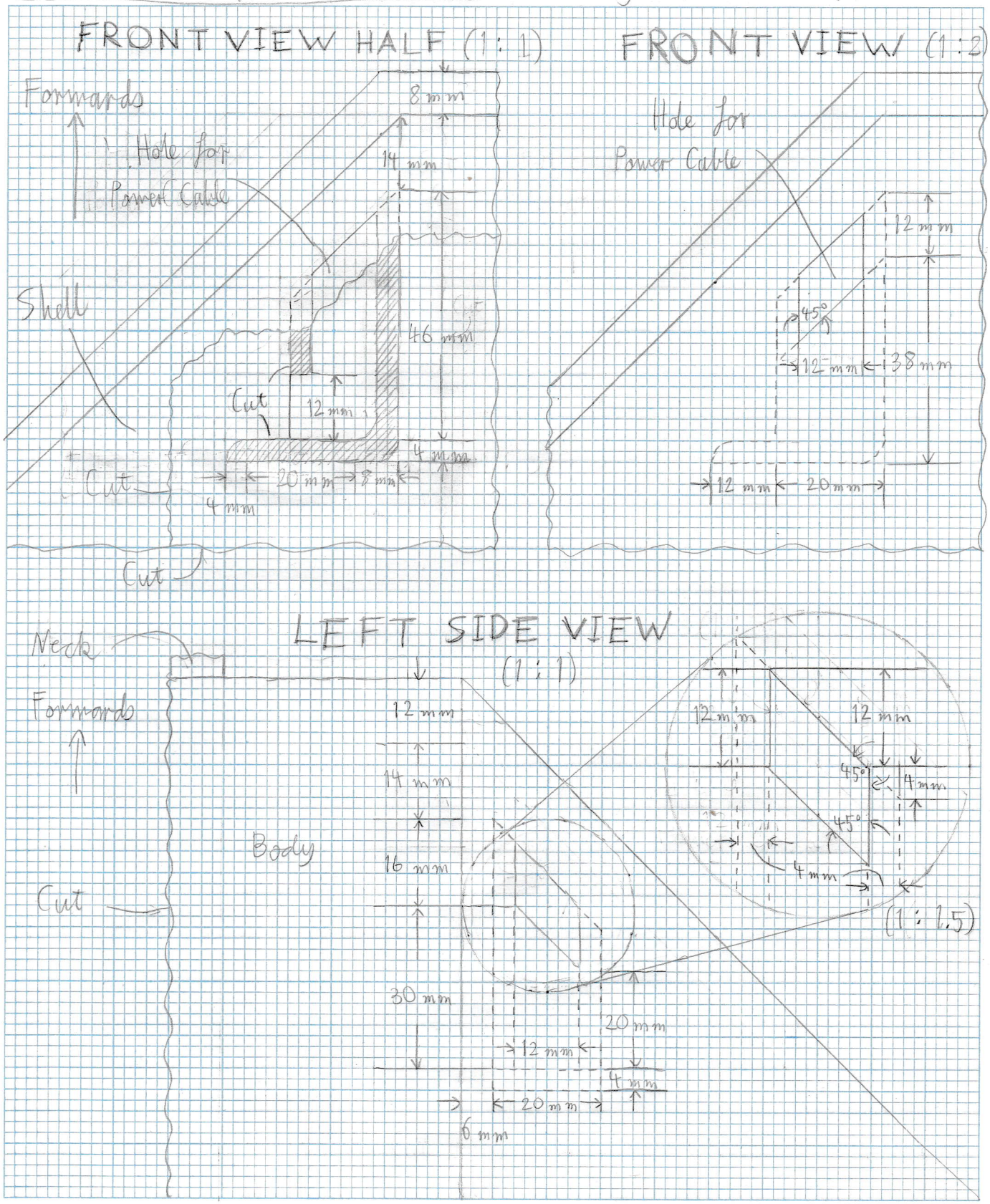
Tortoise Detailed Drawing (Rev. C): Drawing 3 18/06/2019



Only 350 mm dimension is final; all other dimensions are subject to change.

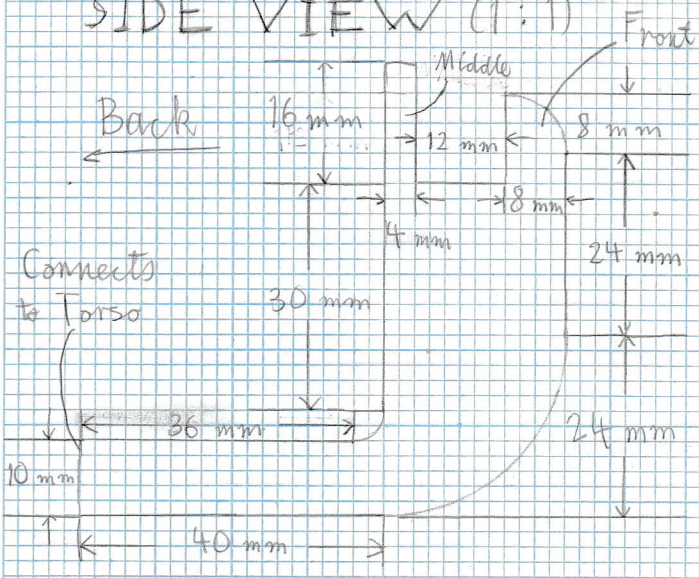
A.D.R.: Anti-Detatching Rod. Used to prevent robot from off. See drawing 11.

Power Cable Holder (Rev. C) Drawing 4, 18/06/2019

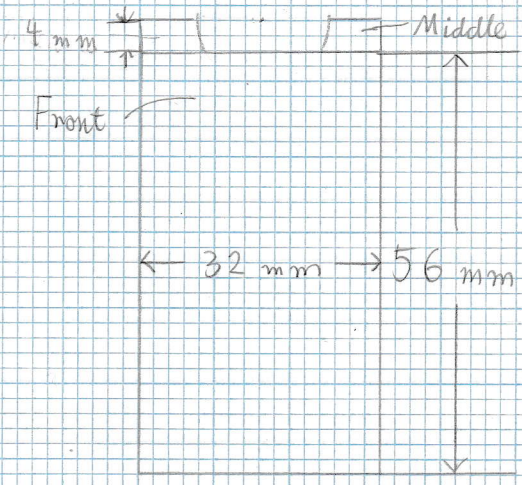


Axle Steerer Detailed Drawing (Rev. C) Drawing 5, 17/06/2019

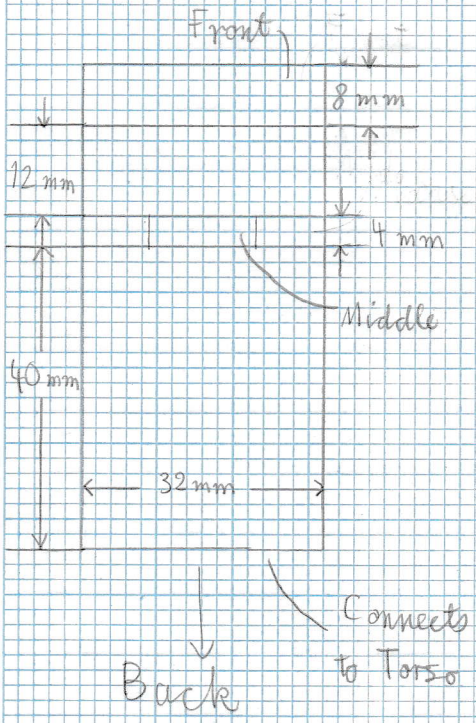
SIDE VIEW (1:1)



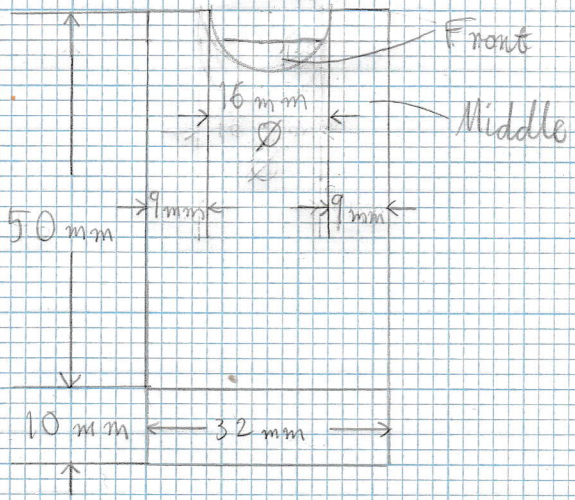
FRONT VIEW (1:1)



TOP VIEW (1:1)



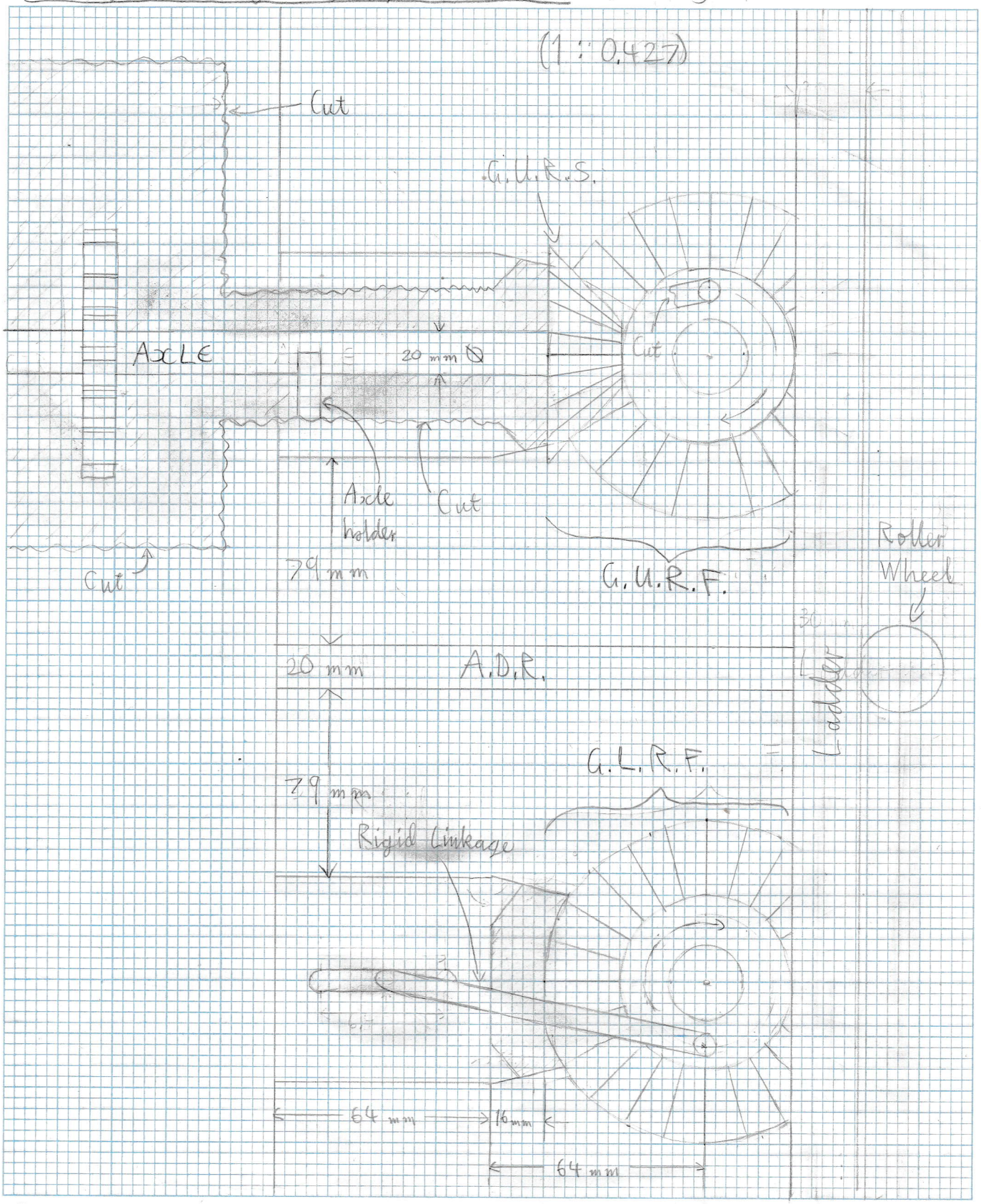
BACK VIEW (1:1)



See drawings 1 & 2 for where axle steerer connects to body.
Nut at end of axle (see drawing 15) rests inbetween middle & front.

Internal Gear System, Legs (Rev. C) Drawing 6

13/06/2019



G.I.R.: Gear Internal Right. Powered by G.I.C. (see drawing 7)

G.U.R.F.: Gear Upper-Right Foot, G.L.R.F.: Gear Lower-Right Foot.

G.U.R.F. & G.L.R.F. are identical bevel gears (see drawing 7)

G.U.R.S.: Gear Upper-Right Support. Bevel gear (see drawing 8)

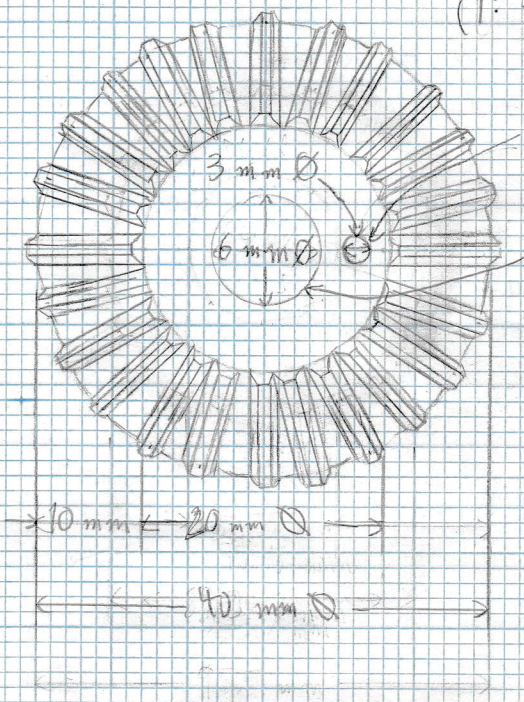
Axle continues off page to the left to connect to shell

A.D.R.: Anti-Detatching Rod. See drawing 11.

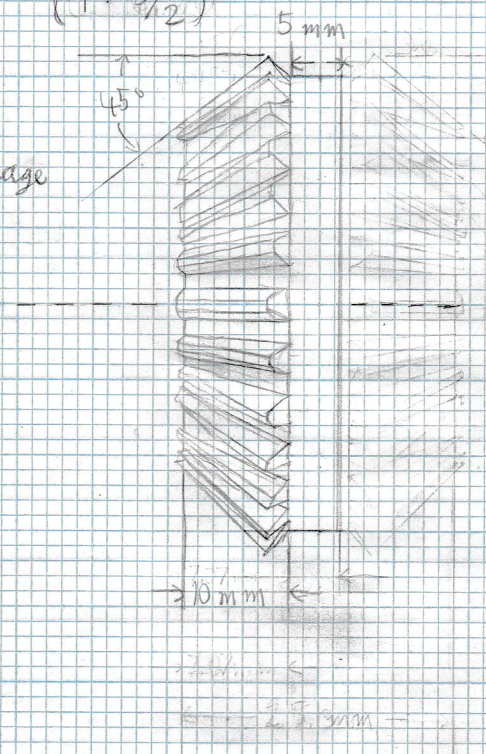
See drawing 13 for ladder detailed drawing.

Feet Gear Detailed Drawing (Rev. C) Drawing 7 18/06/2019

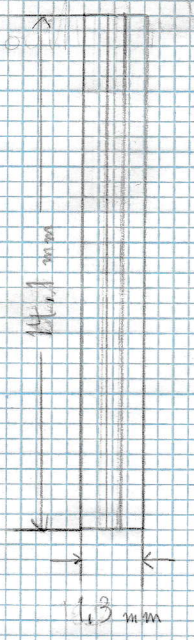
FRONT/BACK VIEW (1 : 3/2)



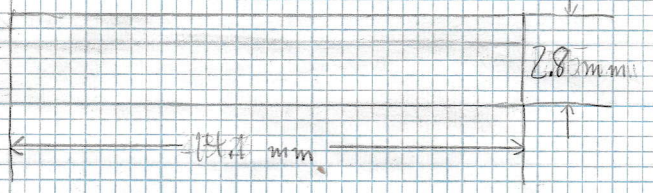
SIDE VIEW (1 : 3/2)



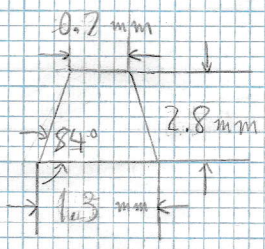
TOOTH TOP VIEW (1 : 4.2)



TOOTH SIDE VIEW (1 : 4.3)



TOOTH FRONT VIEW (1 : 2.46)

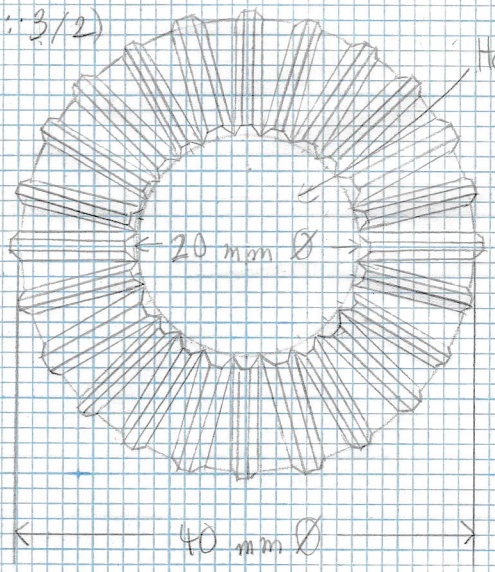


~~Pitch diameter 95.5 mm should remain the same relative rotation gear hour (150 mm/hr * 1/2 rotation/hr → diameter ≈ mm)~~

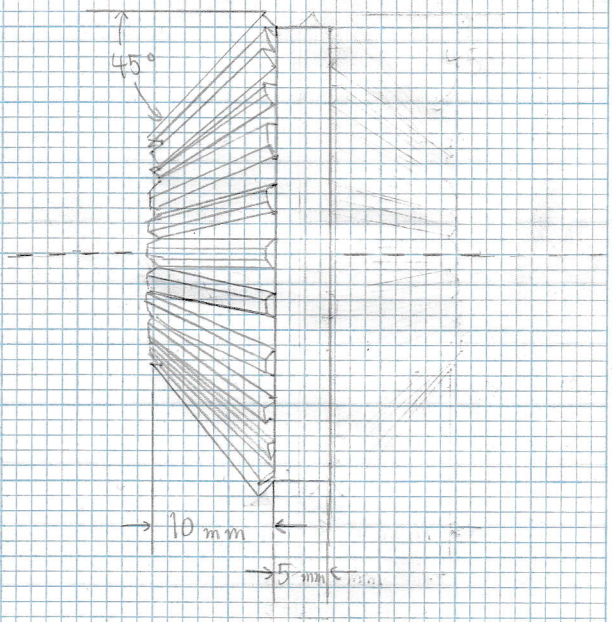
All other dimensions and number of teeth are subject to change.
Small rounding errors are present to minimise number of decimal places.
Teeth across feet gear & support gears (drawing 8) are identical.
See drawing 10 for feet gear shaft
Rigid linkage hole centre is 6.5 mm from foot gear centre.

Support Gear Detailed Drawing (Rev. C) Drawing 8, 17/06/2019

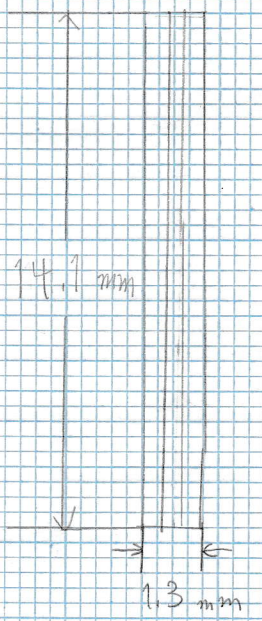
FRONT/BACK VIEW
(1 : 3/2)



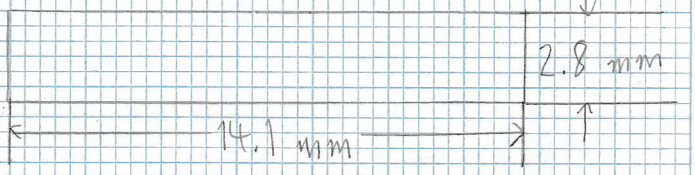
SIDE VIEW (1 : 3/2)



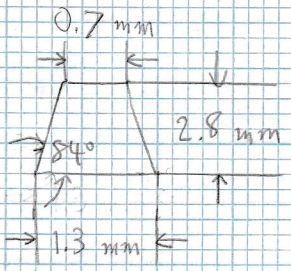
TOOTH TOP VIEW
(1 : 4.8)



TOOTH SIDE VIEW
(1 : 4.3)

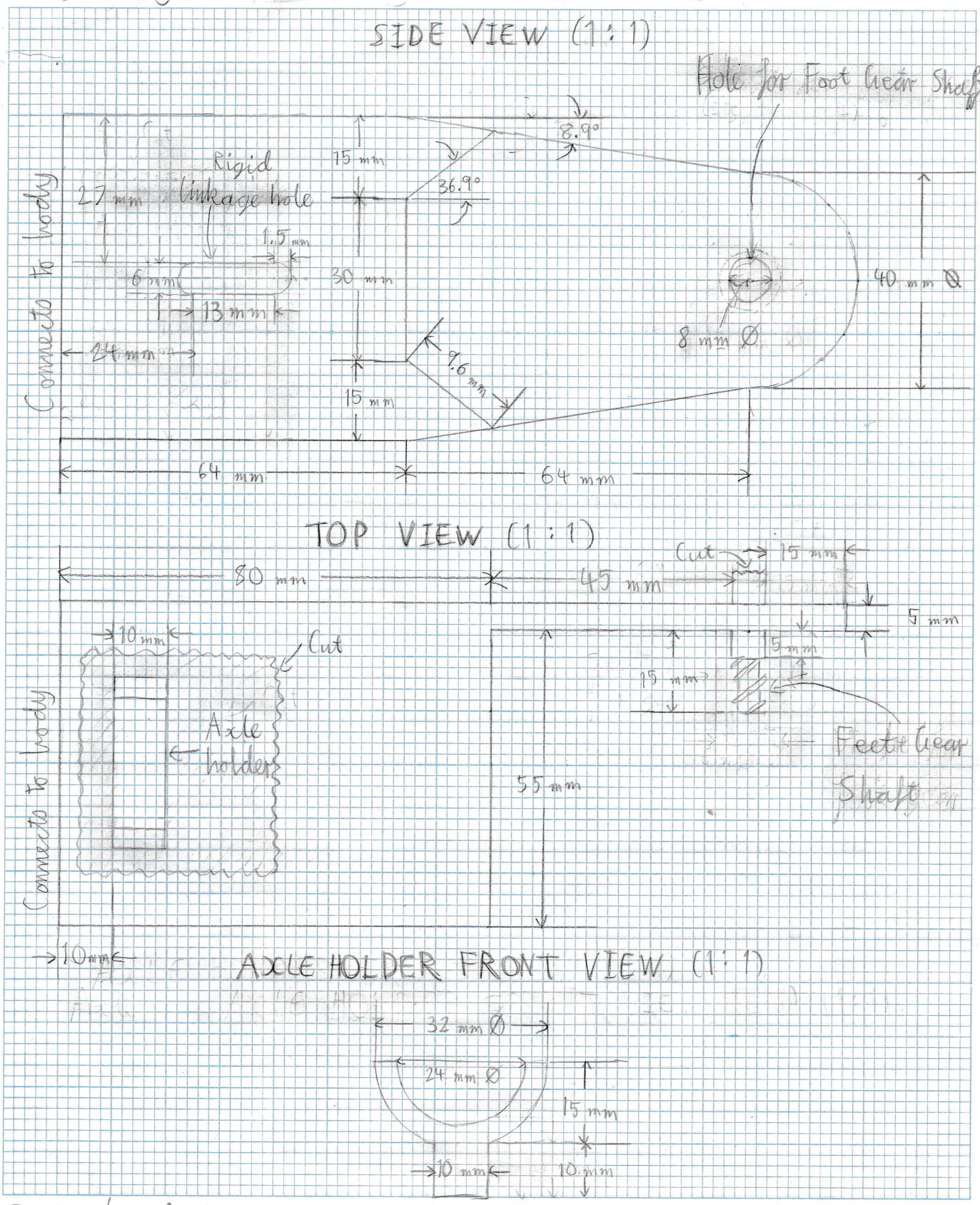


TOOTH FRONT VIEW
(1 : 2.46)



See drawing 6 & 10 for where the support gears are placed

Right Leg Detailed Drawing (Rev. C) Drawing 9 17/06/2019



Right front & back legs are identical. Left legs are vertically symmetrically to right legs about axle going through legs (see drawing 3).

See drawing 7 for feet gear detailed drawing.

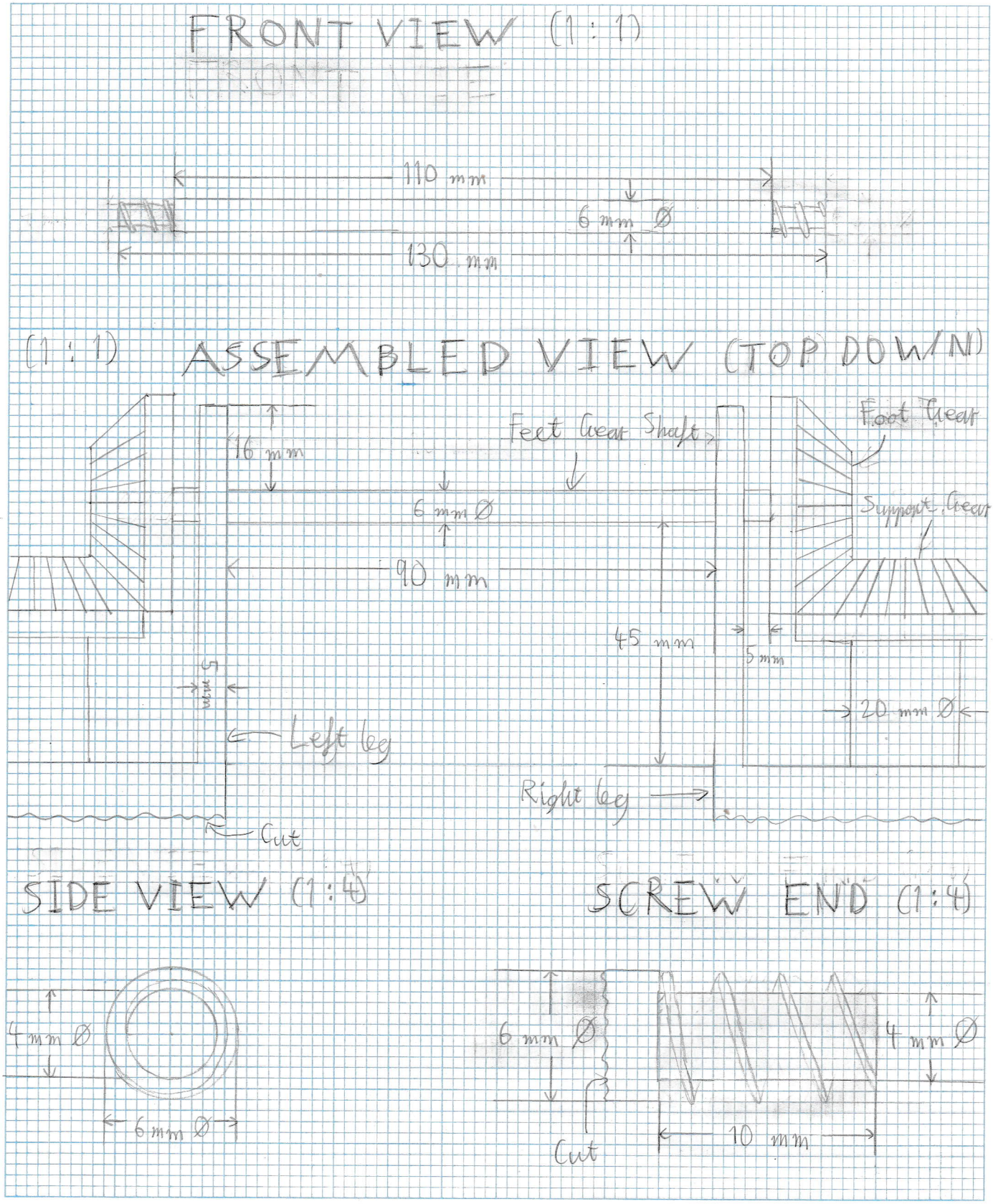
Thickness of leg walls is universally 5 mm.

Axle holder is screwed in to the bottom of the leg.

Inner axle holder diameter is 4 mm greater than axle diameter to min. friction.

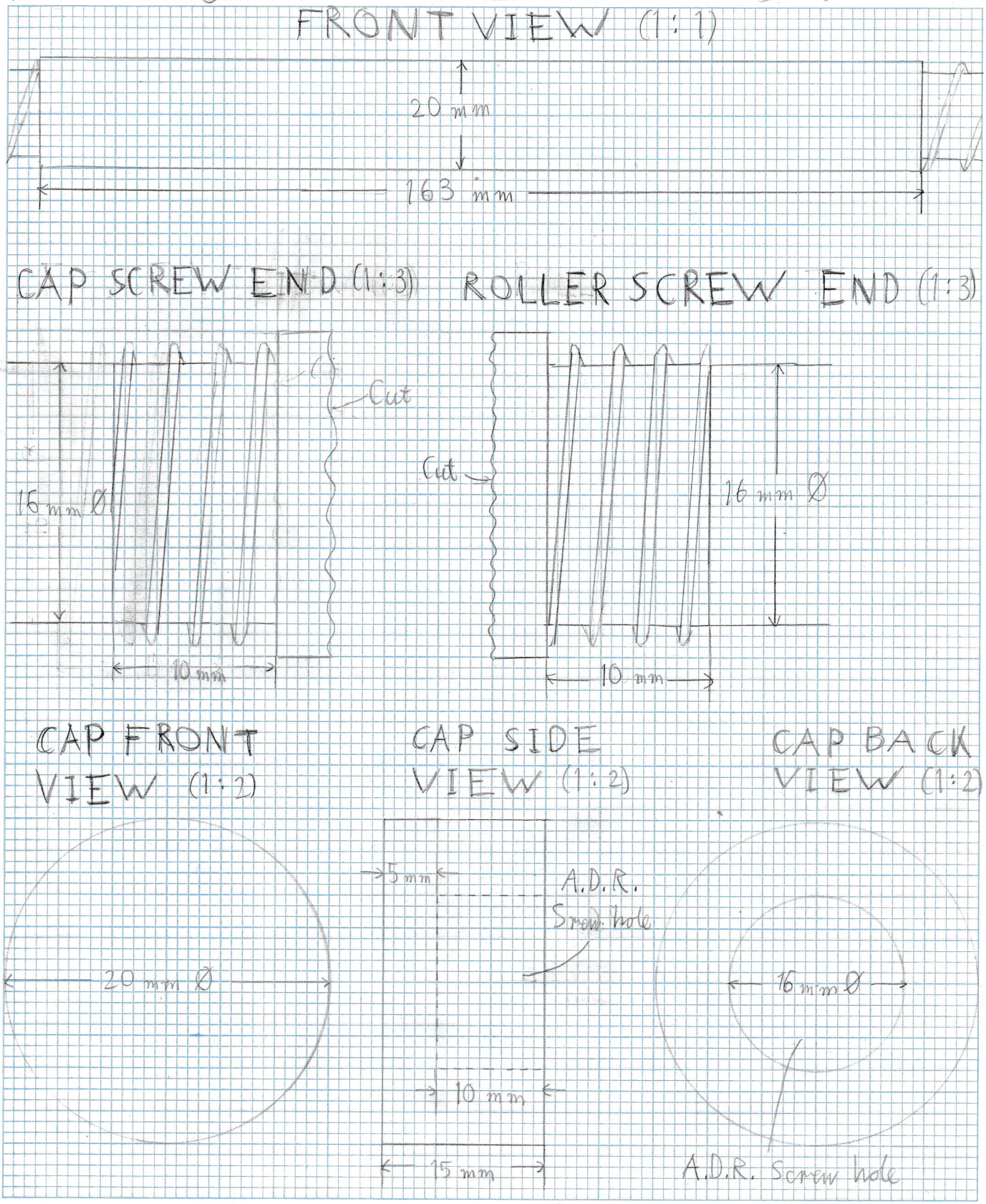
See drawing 10 for feet gear shaft.

Feet Gear Shaft Detailed Drawing (Rev. C) Drawing 10, 13/06/2019



See drawings 7 & 8 for the gear drawings.
See drawing 9 for leg detailed drawing.

Anti-Detaching Roel Detailed Drawing (Rev. C) Drawing 1/, 16/06/2019



Roller screw end goes into roller's screw hole (see drawing 12).

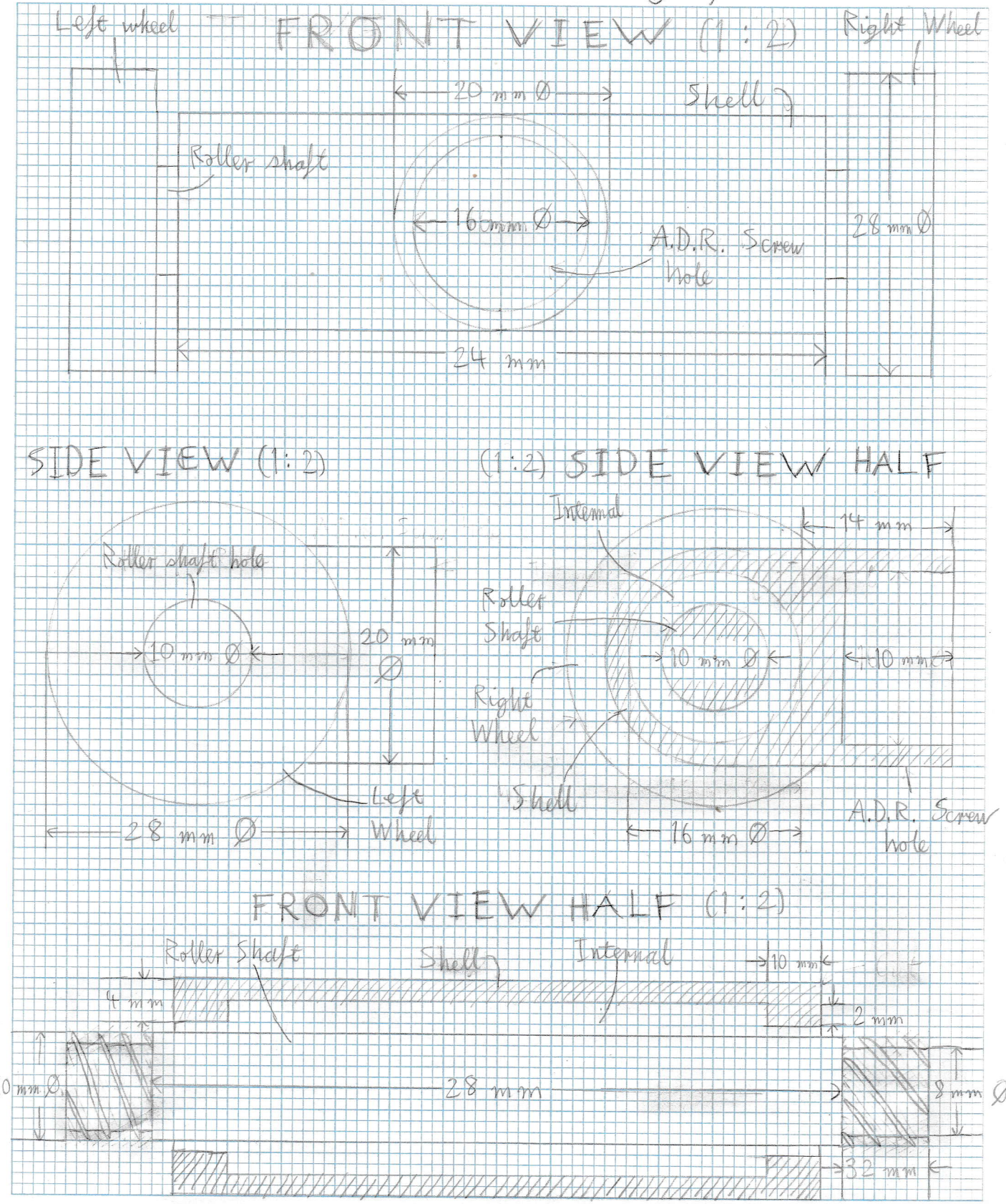
Cap screw end is screwed to cap from within torso (see drawings 1 & 3)

A.D.R. is a square rod, not a circle rod!

Cap has undrawn grooves on side view for added grip.

Roller Detailed Drawing (Rev. C) Drawing 12

18/06/2019

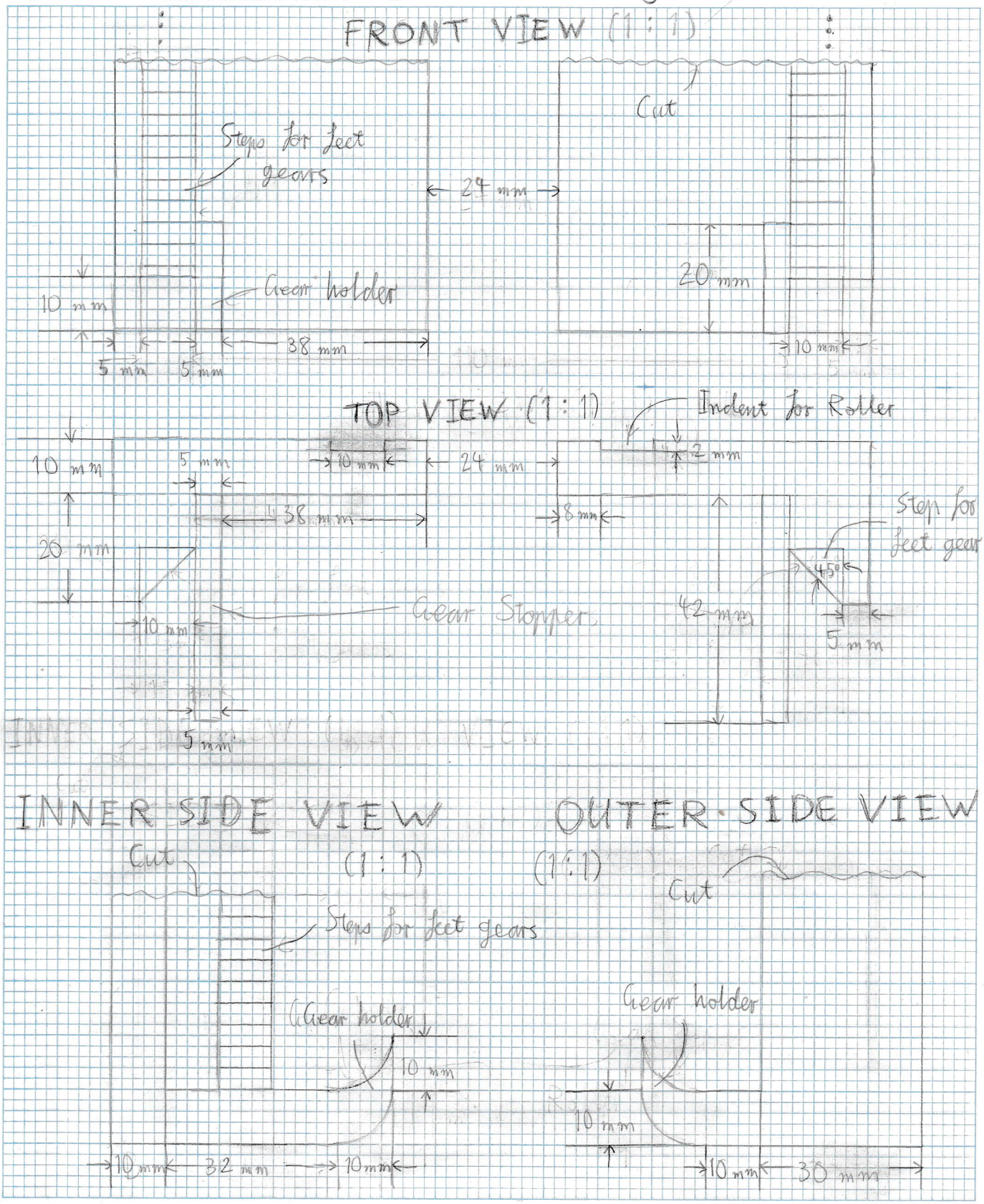


A.D.R.: Anti-Detatching Rod (See drawing 11).

Ends of roller shaft are identical to screw shafts. They screw into the wheels.

Wheels fit into indents of back of ladder (See drawing 13).

Ladder Detailed Drawing (Rev. C) Drawing #3 17/06/2019



24 mm gap is for A.D.R. (see drawings 1, 2, & 3)

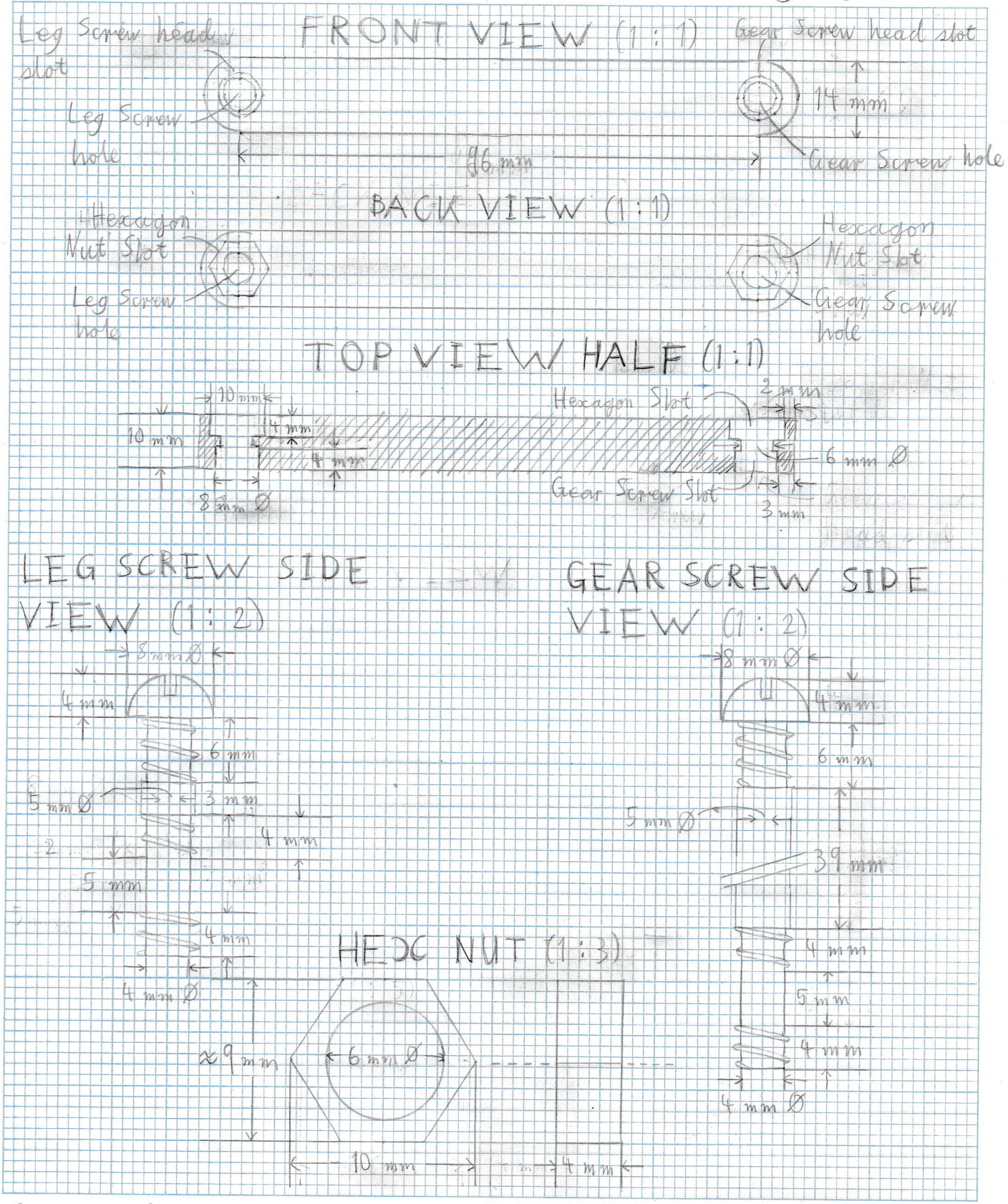
Roller prevents robot from falling off (see drawing 6) & 5)

Height of ladder is 1.8 m + (height of turtoise)

10 mm side lengths of steps must be adjusted to fit feet gear teeth.

Gear holders prevents robot from falling off ladder when reseting.

Rigid Linkage Detailed Drawing (Rev. C) Drawing 14, 18/06/2019



Screw head type & length are arbitrary; however, the 8 mm Ø diameter is not.

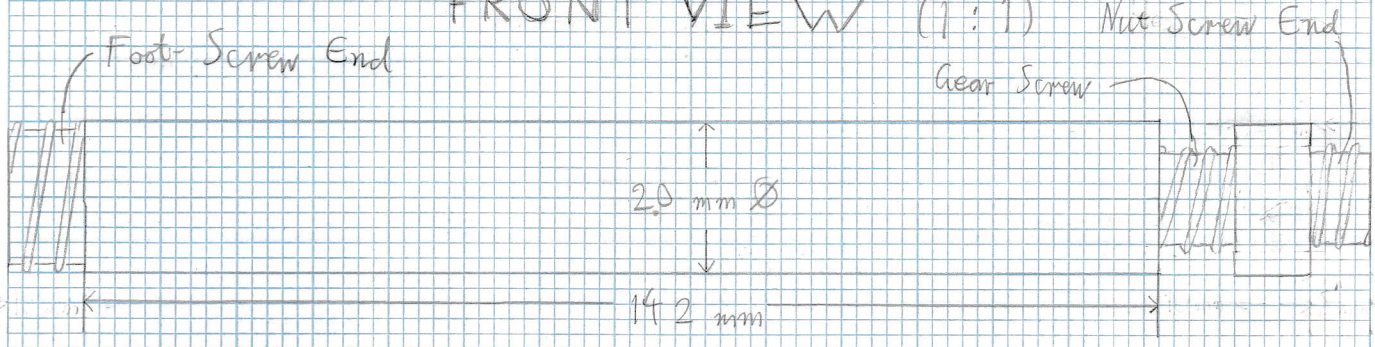
Ratio of hex nut width is (width across corners)/(width across flats) ≈ 1.106.

Leg screws is secured into legs via 2 hex nuts (see drawing 6).

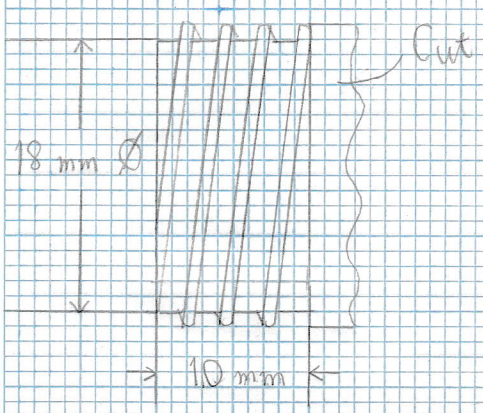
Gear screws are secured into gear feet gears via 2 hex nuts (see drawing 7).

Axle Detailed Drawing (Rev. C) Drawing 15, 17/06/2019

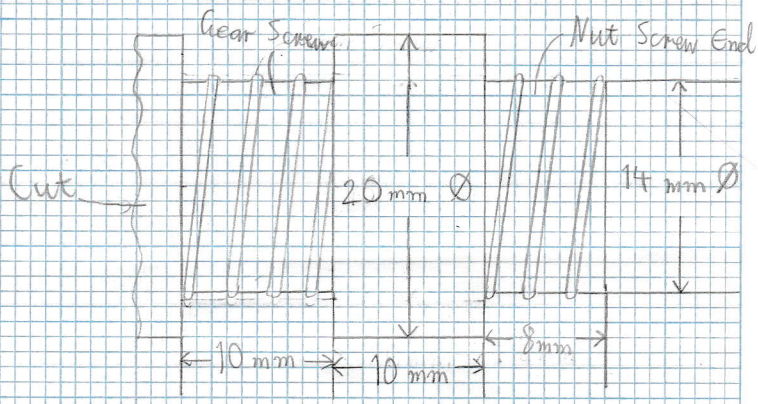
FRONT VIEW (1 : 1)



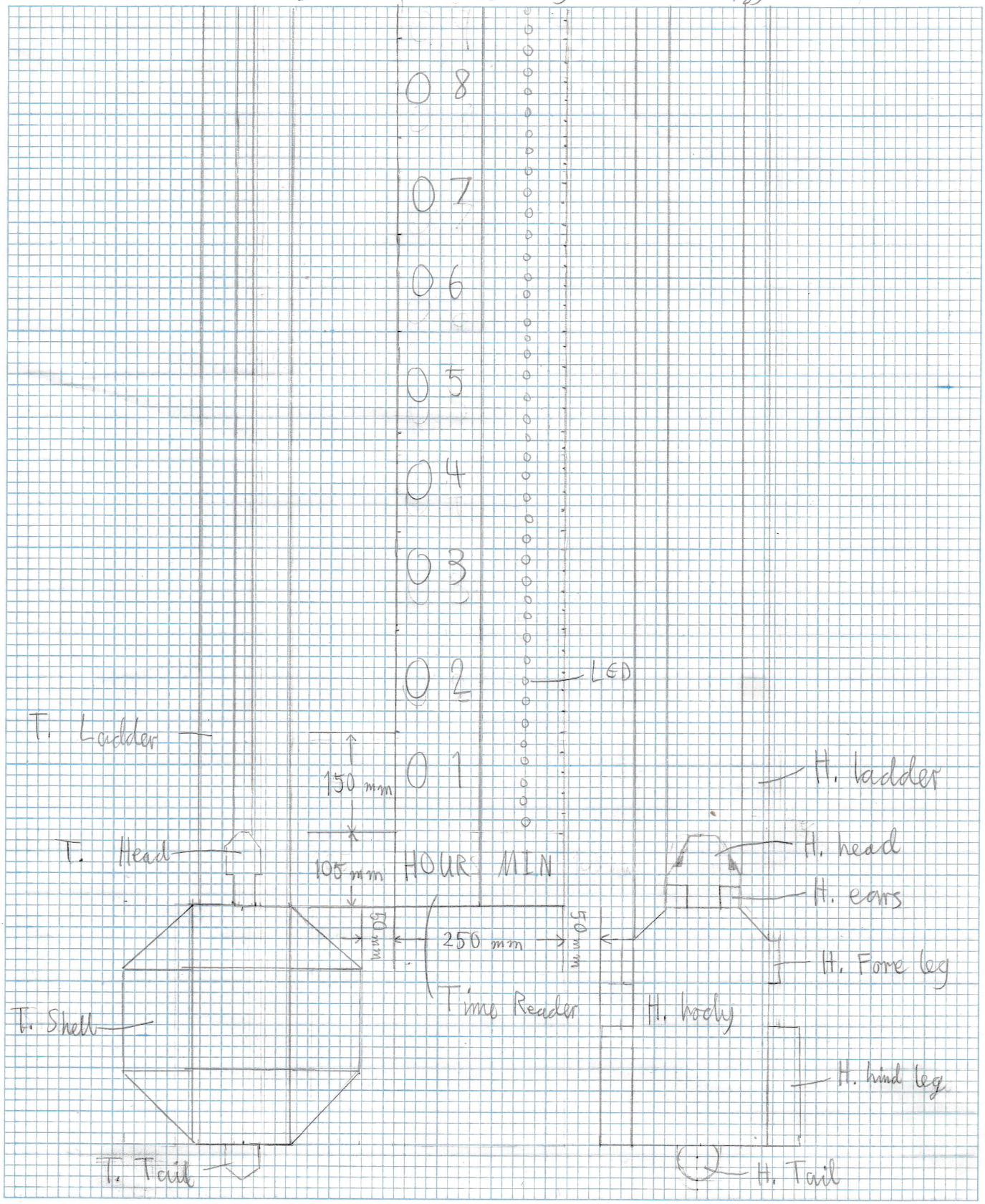
FOOT SCREW END (1:2)



(1:2) NUT SCREW END



Entire System Drawing (Rev. C) Drawing 15, (1 : 1/8) 18/06/2019



The T. & H. are short for Tortoise & Hare respectively.
Hare dimensions T.B.A.
Time Reader dimensions & materials are subject to change.
- Suggestion: use LED lights controlled by Arduino to display time