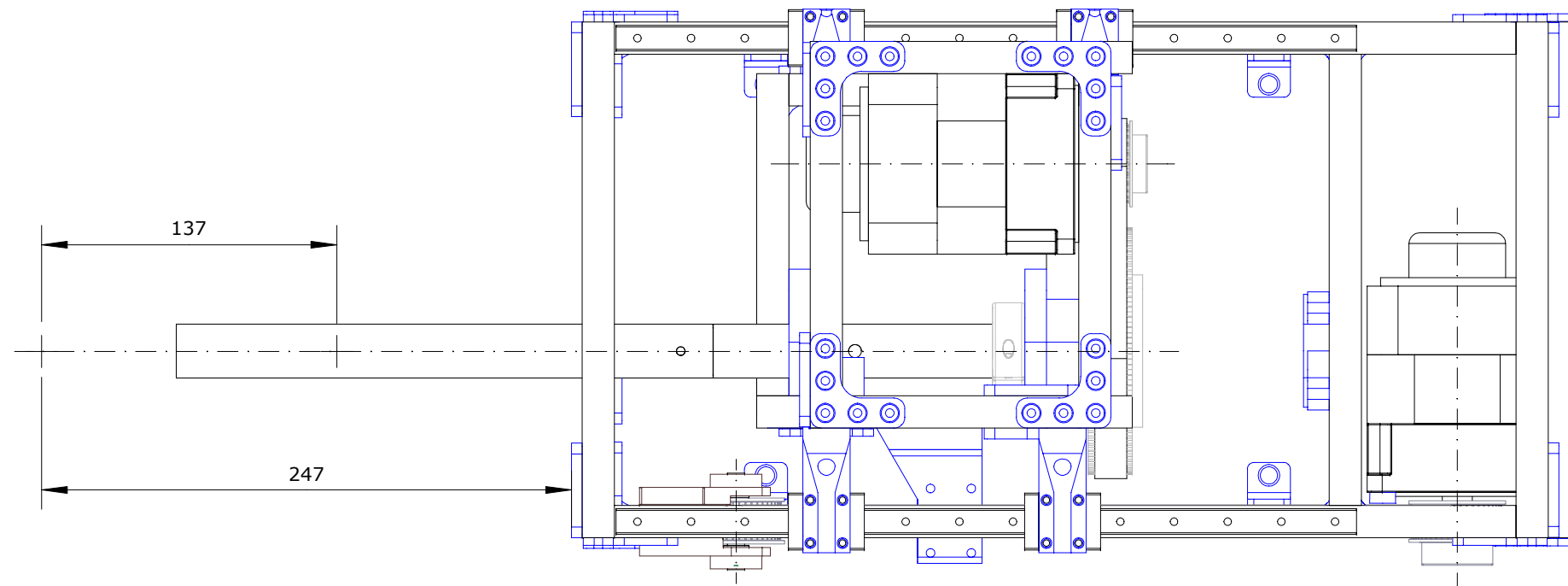
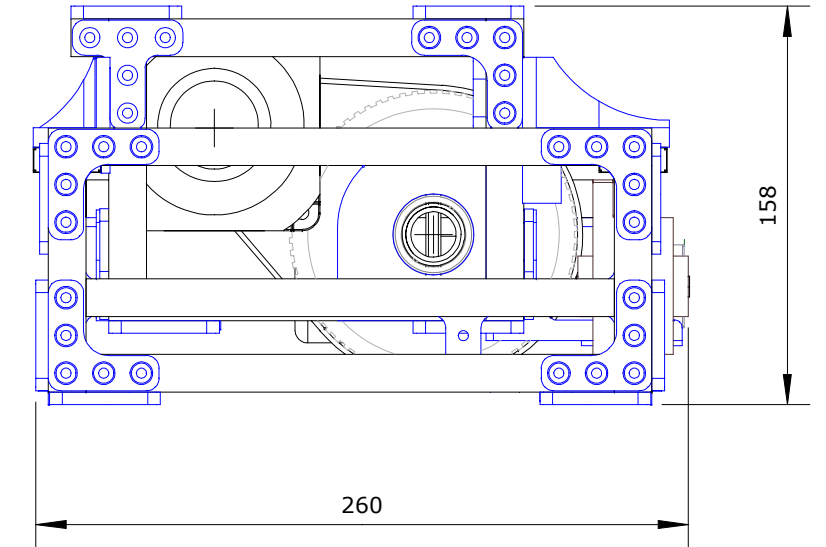
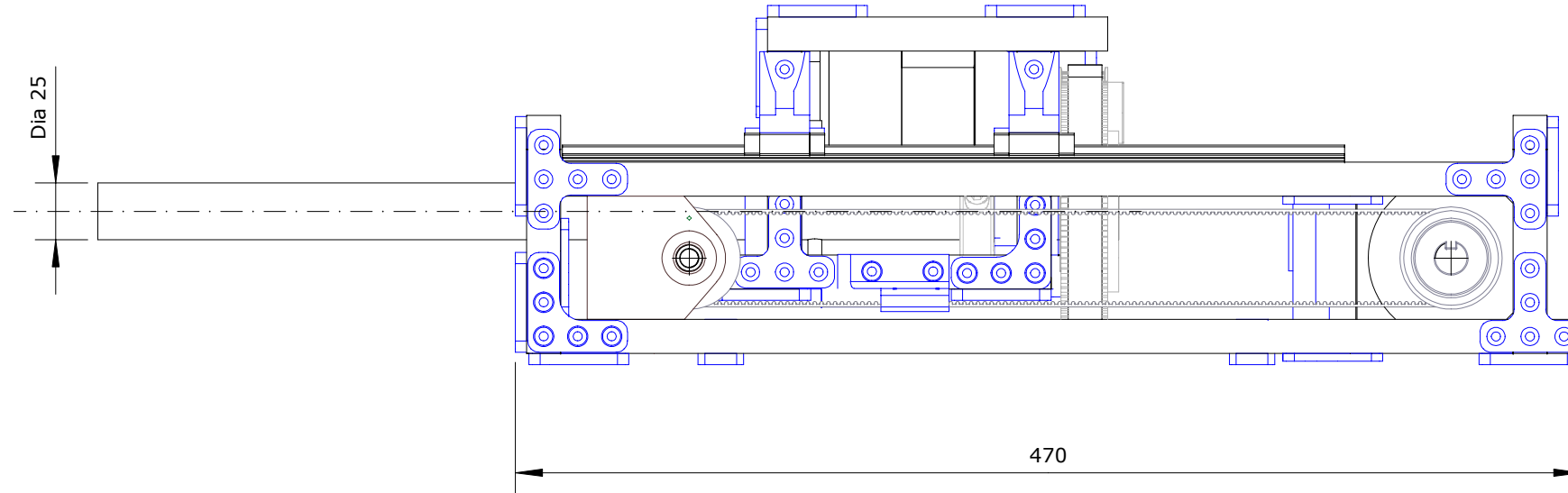


**BFF OPENBEAM FFB FLIGHT YOKE**



**BFF DIY FORCE FEEDBACK OPENBEAM FLIGHT YOKE  
(YOKE CONTROL LOADER)**

**SPECIFICATIONS:**

- 1. AILERON ROTATION: +/- 90 DEG
- 2. ELEVATOR TRAVEL: 137 MM
- 3. AILERON FORCE LEVEL: 4.25 KGF (9 LBF) - SINGLE HANDED AT 135MM WHEEL RADIUS)
- 4. ELEVATOR FORCE LEVEL: 9 KGF (20 LBF)

SEE BFF CL SYSTEM DOCUMENTATION FOR DETAILS OF FORCE FEEDBACK FEATURES.

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INCLUDE 4 X M3 NUTS ON INNER FACES FOR MOTOR SCREWS  
SEE STEP 5

INCLUDE SUFFICIENT M3 NUTS ON TOP FACE FOR LINEAR GUIDE RAIL  
SEE STEP 5 - MIN 7 X M3 NUTS FOR 320MM RAIL - MORE FOR LONGER RAIL IF USED

2 X 90 MM

USE M3 X 6MM HEX SOCKET BUTTON HEAD SCREWS FOR L AND T BRACKETS

USE M3 X 12MM HEX SOCKET HEAD CAP SCREWS FOR IDLER PULLEY BRKT

OUTBOARD VIEW

2 x 420 MM (CUT TO LENGTH)

3DP - IDLER PULLEY BRKT

LEAVE LOOSE UNTIL FINAL BELT TIGHTENING

SEE STEP 7

M3 X 6MM SCREWS

INBOARD VIEW

3DP FEET x 4

LEAVE FINAL POSITIONING TO END OF ASSEMBLY

USE PULLEY BRKT TO SET BEAM SPACING

SIDE VIEW

54

TOP VIEW

79

ASSEMBLY STEP 1 - BASE FRAME - RIGHT SIDE

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INCLUDE SUFFICIENT M3 NUTS ON  
TOP FACE FOR LINEAR GUIDE RAIL

SEE STEP 5 - MIN 7 X M3 NUTS FOR  
320MM RAIL - MORE FOR LONGER RAIL  
IF USED

ASSEMBLY NOTES AS PER STEP 1

OUTBOARD VIEW

INBOARD VIEW

SIDE VIEW

54

TOP VIEW

STEP 2 - BASE FRAME - LEFT SIDE

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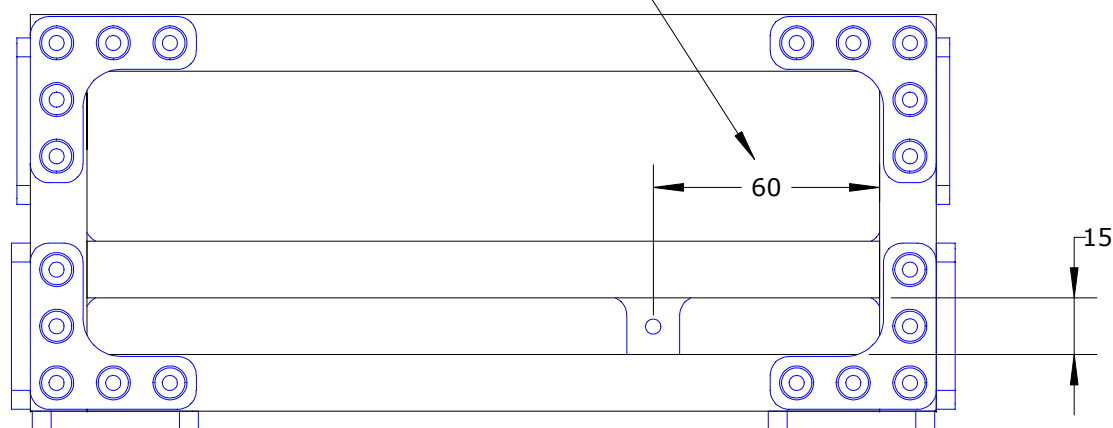
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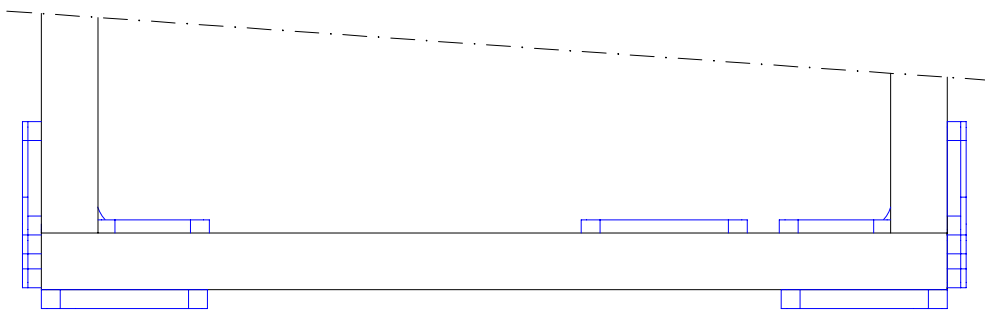
VIEW FROM REAR

T-BRACKET POSITIONED AS SHOWN TO PROVIDE END STOP FOR CARRIAGE

FRONT VIEW



TOP VIEW



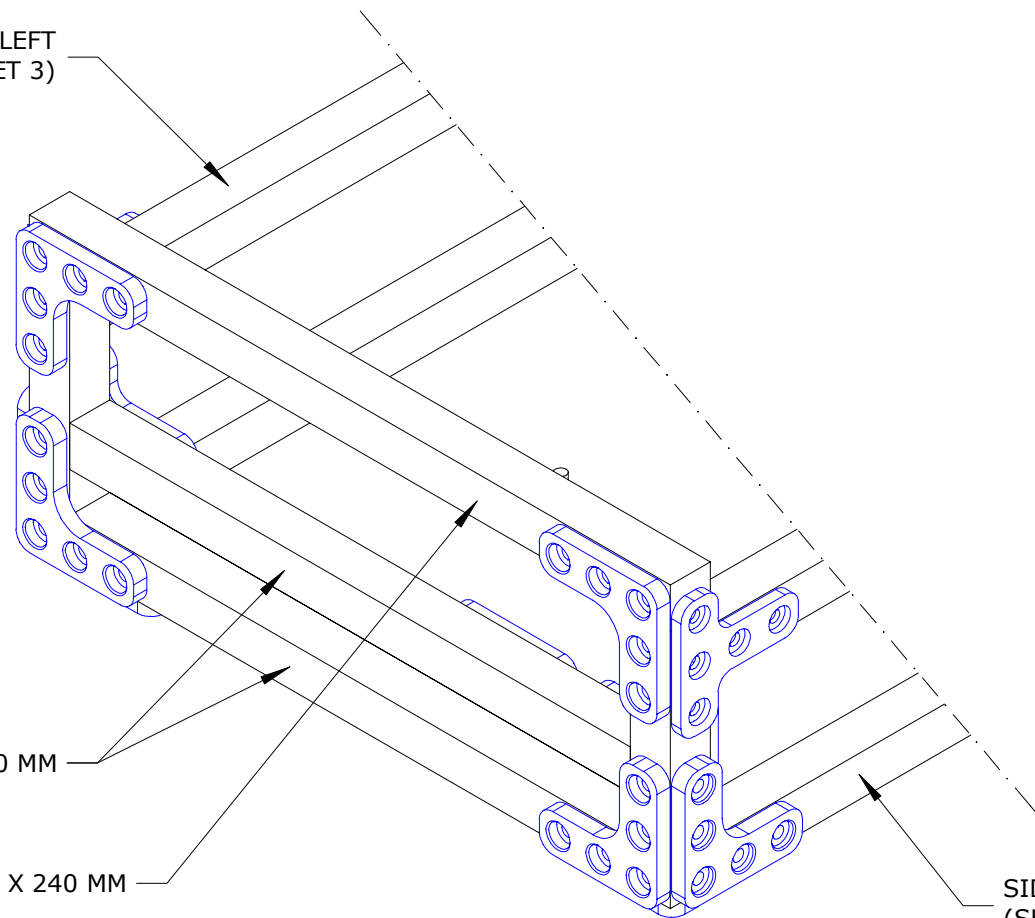
SIDE LEFT (SHEET 3)

2 X 210 MM

1 X 240 MM

SIDE RIGHT (SHEET 2)

VIEW FROM FRONT



STEP 3 - BASE FRAME - FRONT

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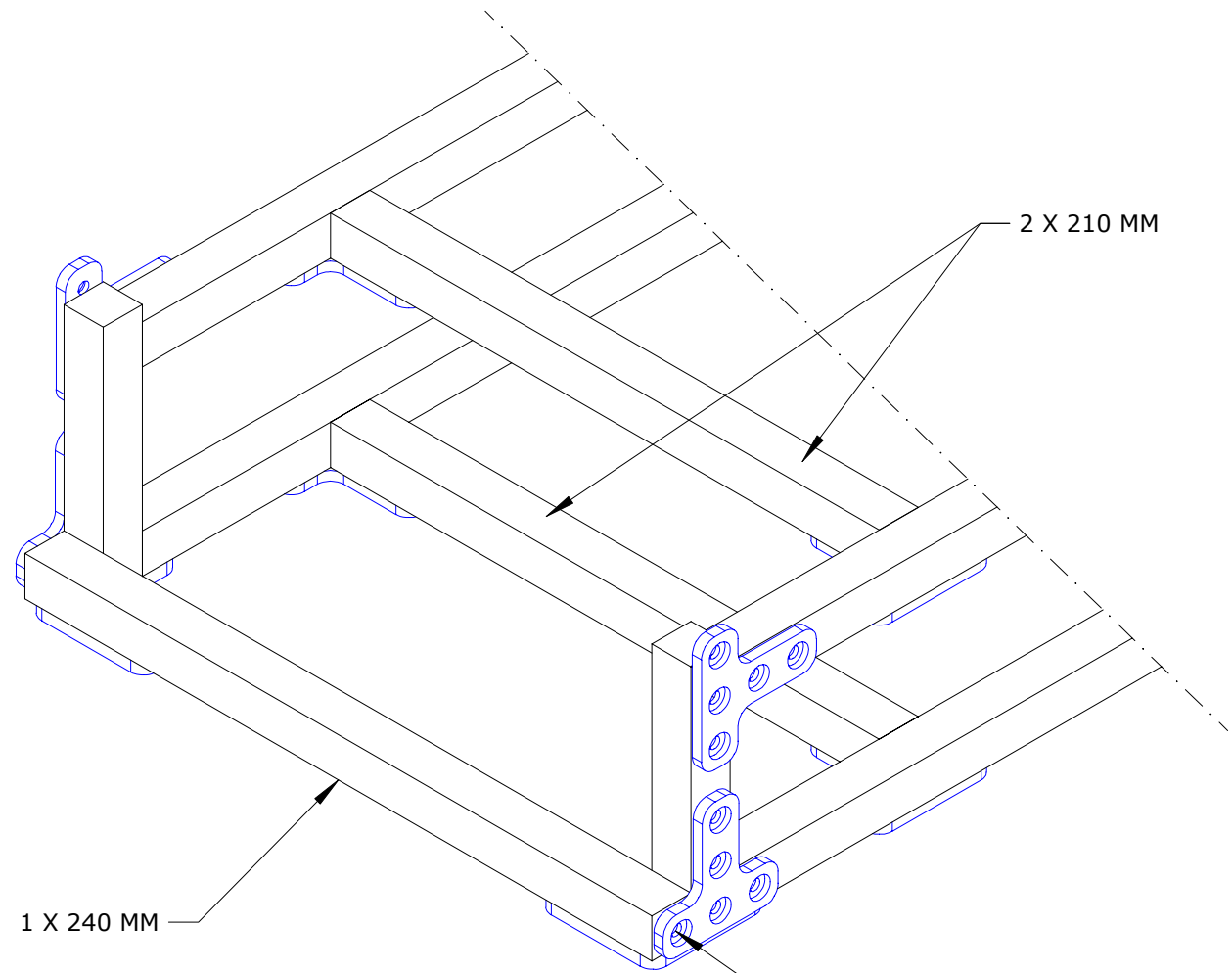
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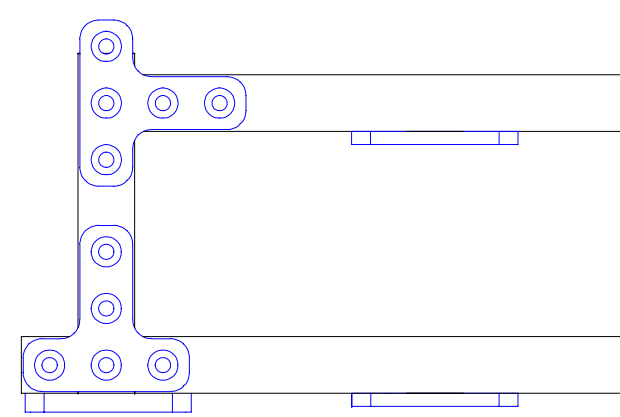


1 X 240 MM

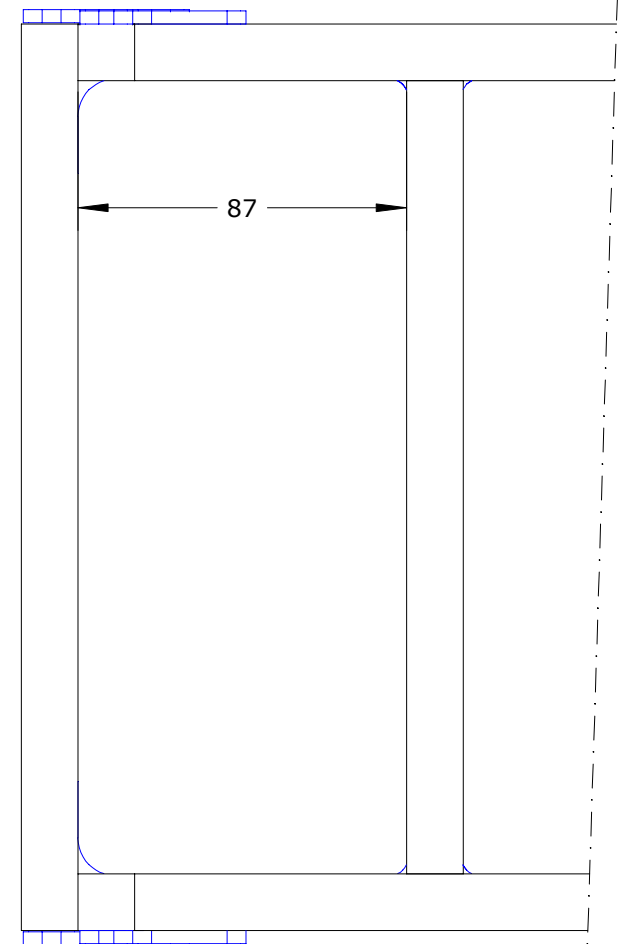
2 X 210 MM

REAR VIEW

TAP END FACES OF BEAM WITH M3 SELF TAPPING SCREW BEFORE FIXING



SIDE VIEW



87

TOP VIEW

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STEP 4 - BASE FRAME - REAR

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TOP VIEW

MBO82GA210 MOTOR WITH ENCODER

3PD - MOTOR SPACER X 4

USE M3 X 20 MM SOCKET HEX HEAD CAP SCREWS WITH M4 & M3 WASHERS TO SECURE MOTOR

PACK WITH ADDITIONAL M3 WASHERS TO REDUCE ENGAGEMENT LENGTH AS REQUIRED

VIEWS FROM REAR

1 X 240 MM  
FIT AFTER INSTALLING MOTOR

STEP 5 - BASE FRAME - ELEVATOR MOTOR

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TOP VIEW

2 X MGN12 12 mm LINEAR GUIDE RAIL (OR EQUIV)  
LENGTH 320 MM MINIMUM  
420 MM MAXIMUM

4 X MGN12C BLOCK  
(OR EQUIV - CHECK SECURING  
HOLE SPACING AGAINST CARRIAGE  
BRACKETS HOLES  
SEE DETAIL IN TOP VIEW)

3DP - END STOP

TEMPORARILY FIT OVERLENGTH SCREWS  
IN END HOLES TO PREVENT BLOCKS FROM  
ACCIDENTALLY SLIDING OFF RAILS DURING  
HANDLING  
CAN BE REMOVED AFTER FINAL ASSY OF  
CARRIAGE

44

20

15

USE M3 X 6 MM SOCKET HEAD CAP  
SCREWS TO SECURE RAILS  
LEAVE LOOSE UNTIL FINAL ASSEMBLY OF  
CARRIAGE ON BASE TO ALLOW PROPER  
RAIL ALIGNMENT TO BE FOUND BEFORE  
FINAL TIGHTENING

STEP 6 - BASE FRAME - GUIDE RAILS

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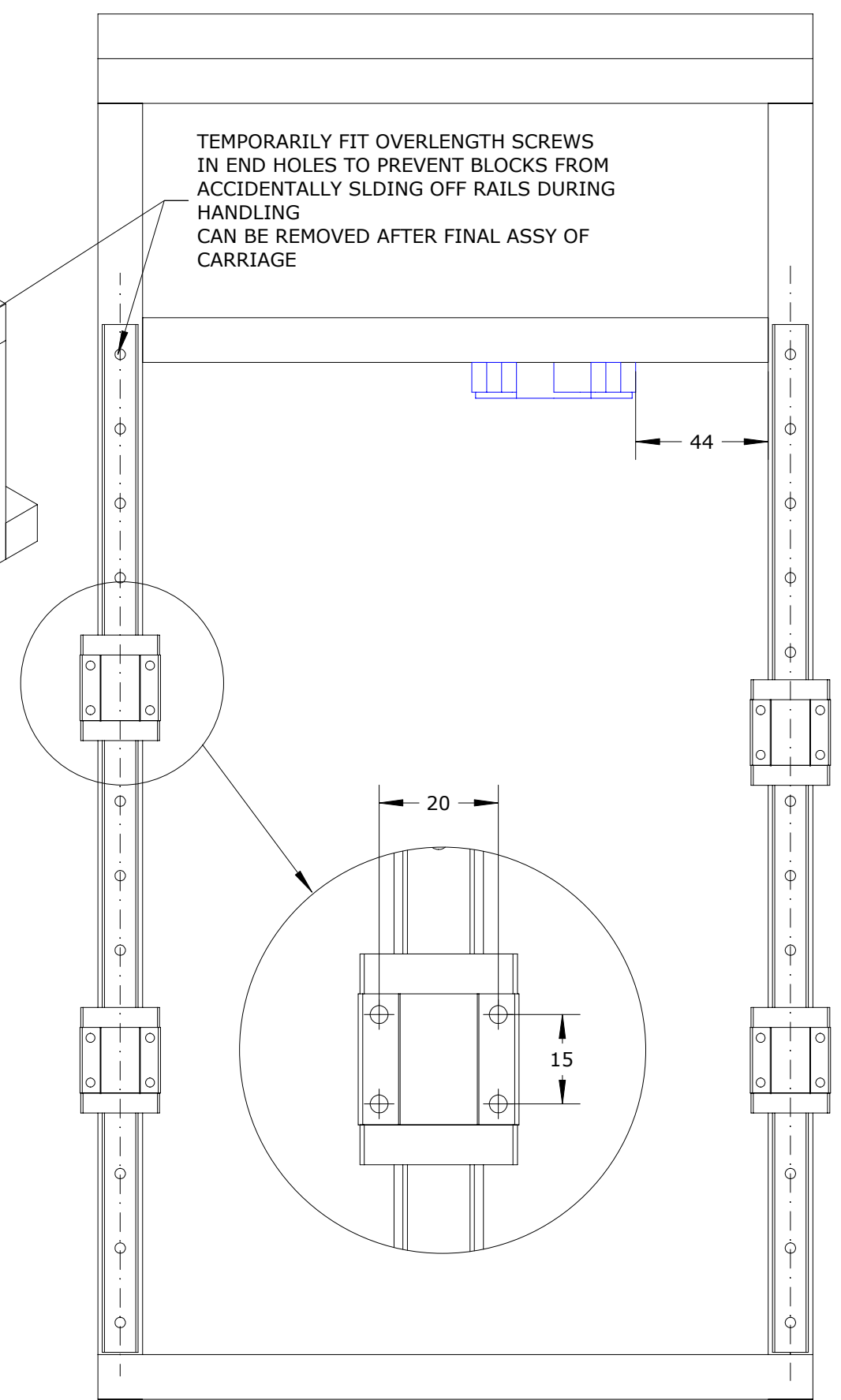
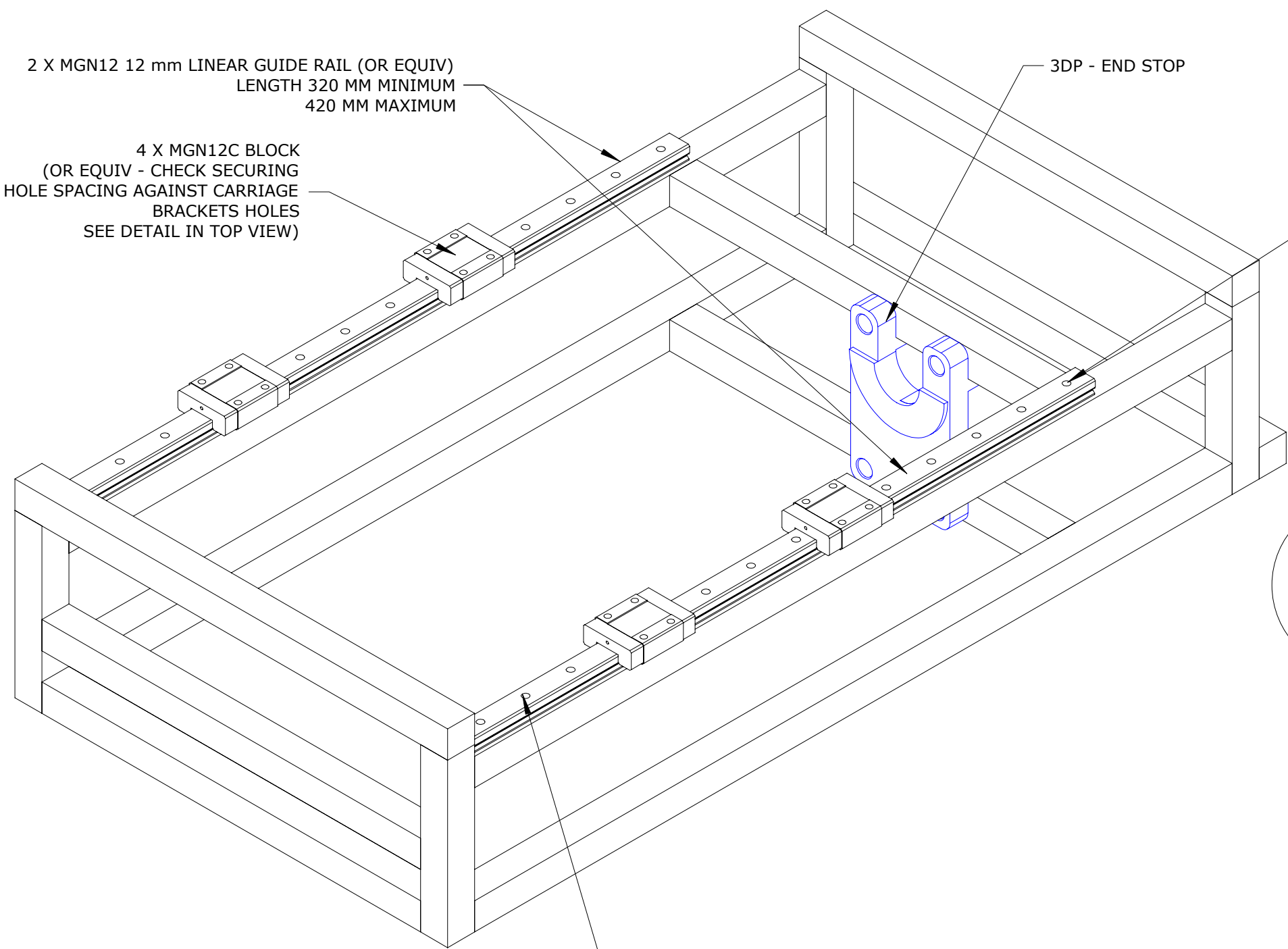
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PULL FORWARD TO TIGHTEN BELT  
THEN TIGHTEN SCREWS TO FIX IN  
POSITION

DO NOT OVER TENSION THE BELT

DRIVE PULLEY

SECTION B-B

1 X 44T 3 MM PITCH PULLEY  
HTD 44-3M-15

3DP - 44T MOTOR PULLEY

SECTION A-A

IDLER PULLEY

2 X NEEDLE ROLLER BEARINGS  
Ø8 BORE x Ø12 OD x 10 L

1 X PULLEY SHAFT  
STEEL - Ø8.0 DIA X 45 L

1 X 44T 3 MM PITCH PULLEY  
HTD 44-3M-15

3DP - IDLER PULLEY

3MM x 804 mm HTD BELT  
15 MM WIDE  
HTD-804-3M

THE 44T 3D PRINTED PULLEY IS A FIRM  
PRESS FIT ONTO THE MOTOR SHAFT AND  
MAY NEED TO BE TAPPED INTO POSITION  
USING A SOFT MALLET

IT HAS AN INTEGRAL KEY TO SUIT THE  
MOTOR SHAFT KEYWAY

IDE VIEW

STEP 7 - BASE FRAME - DRIVE BELT

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TAP END FACES M3 USING SELF TAPPING SCREW BEFORE FIXING BRACKETS

3 X 150 MM

4 X 150 MM

BOTTOM

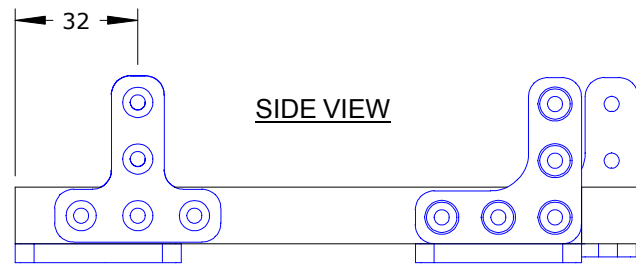
TOP

INCLUDE 2 X M3 NUTS ON INNER FACE FOR FWD BEARING HOUSING

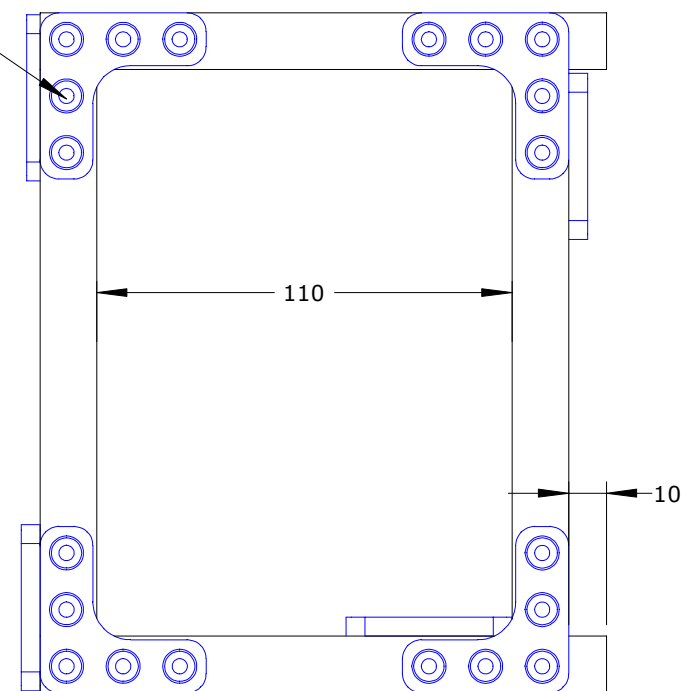
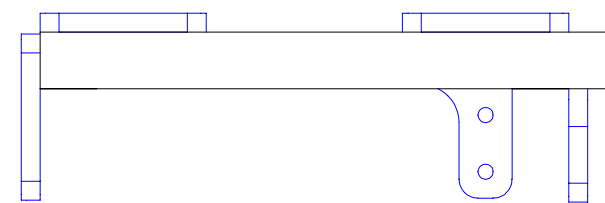
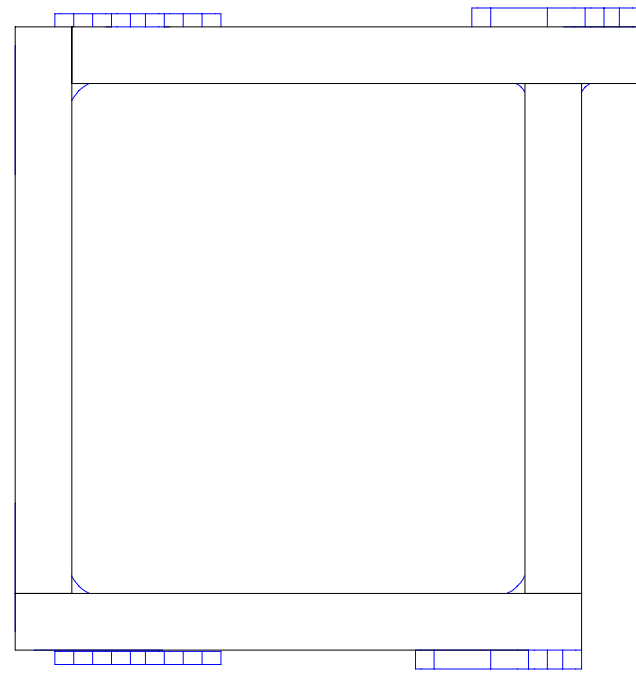
1 X 135 MM (CUT TO LENGTH)

INCLUDE 2 X M3 NUTS ON INNER FACE FOR REAR BEARING HOUSING

INCLUDE 2 X M3 NUTS ON INNER FACE FOR MOTOR



USE M3 C 6 MM HEX SOCKET BUTTON HEAD SCREWS FOR L AND T-BRACKETS



**ASSEMBLY STEP 8 - CARRIAGE - TOP & BOTTOM**

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ADD 90 MM UPRIGHTS

INCLUDE 1 X M3 NUT ON INNER FACE FOR FWD BEARING HOUSING

4 X 90 MM

INCLUDE 1 X M3 NUT ON INNER FACE FOR MOTOR

INCLUDE 2 X M3 NUTS ON OUTBOARD FACE OF EACH UPRIGHT FOR GUIDE RAIL BRACKETS  
8 X NUTS IN TOTAL

BOTTOM FRAME  
SEE STEP 8

TOP FRAME  
SEE STEP 8

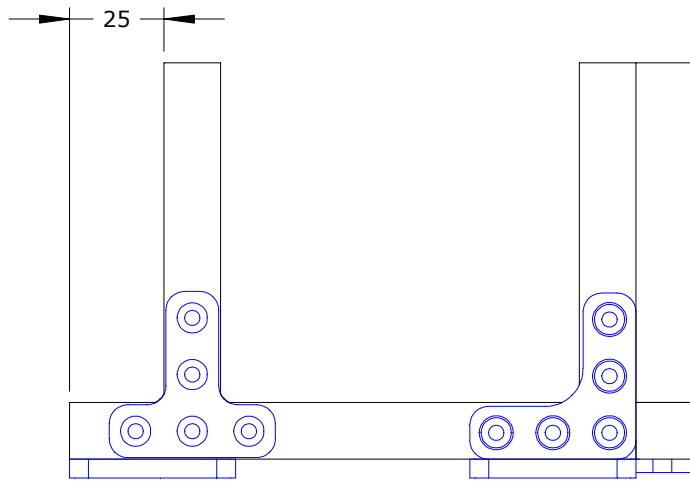
INCLUDE 2 X M3 NUTS ON OUTER FACE FOR BELT BRACKET

INCLUDE 3 X M3 NUTS ON BOTTOM FACE FOR BELT BRACKET

INCLUDE 2 X M3 NUTS ON INNER FACE FOR REAR BEARING HOUSING

NOTE L-BRACKET ON INSIDE

ADD TOP FRAME



SIDE VIEW

STEP 9 - CARRIAGE - UPRIGHTS AND TOP

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FIT MOTOR

USE M3 X 16 MM HEX SOCKET HEAD CAP SCREWS WITH M4 & M3 WASHERS

FIT BEARING HOUSINGS

MB082GA210 AILERON DRIVE MOTOR

3DP - FORWARD BEARING HOUSING

LEAVE SCREWS LOOSE ON REAR HOUSING UNTIL BELT FITTING AND TIGHTENING

3DP - REAR BEARING HOUSING

2 X NEEDLE ROLLER BEARING  
Ø25 BORE X Ø32 OD X 20 LONG

USE M3 X 12 MM HEX SOCKET HEAD CAP SCREWS WITH M3 WASHERS FOR BEARING HOUSINGS

FIT ROLLER BEARINGS IN HOUSINGS BEFORE FITTING HOUSINGS TO FRAME

THEY WILL BE A FIRM PRESS FIT AND MAY NEED TO BE TAPPED HOME WITH A SOFT MALLET

REAR VIEW

THIS CORNER UNCONNECTED

STEP 10 - CARRIAGE - MOTOR & BEARING HOUSINGS

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REAR VIEW

SIDE VIEW

2 X 3DP - LONG RAIL BRACKET

2 X 3DP - SHORT RAIL BRACKET

3DP - BELT BRACKET

LEAVE RAIL BRACKET SCREWS UNTIGHTENED UNTIL FINAL ASSEMBLY OF CARRIAGE ON RAILS TO ENSURE PROPER ALIGNMENT AND RUNNING OF GUIDES

USE M3 X 12 MM HEX SOCKET HEAD CAP CSREWS & M3 WASHER FOR BRACKETS

TOP VIEW

STEP 11 - CARRIAGE - GUIDE AND BELT BRACKETS

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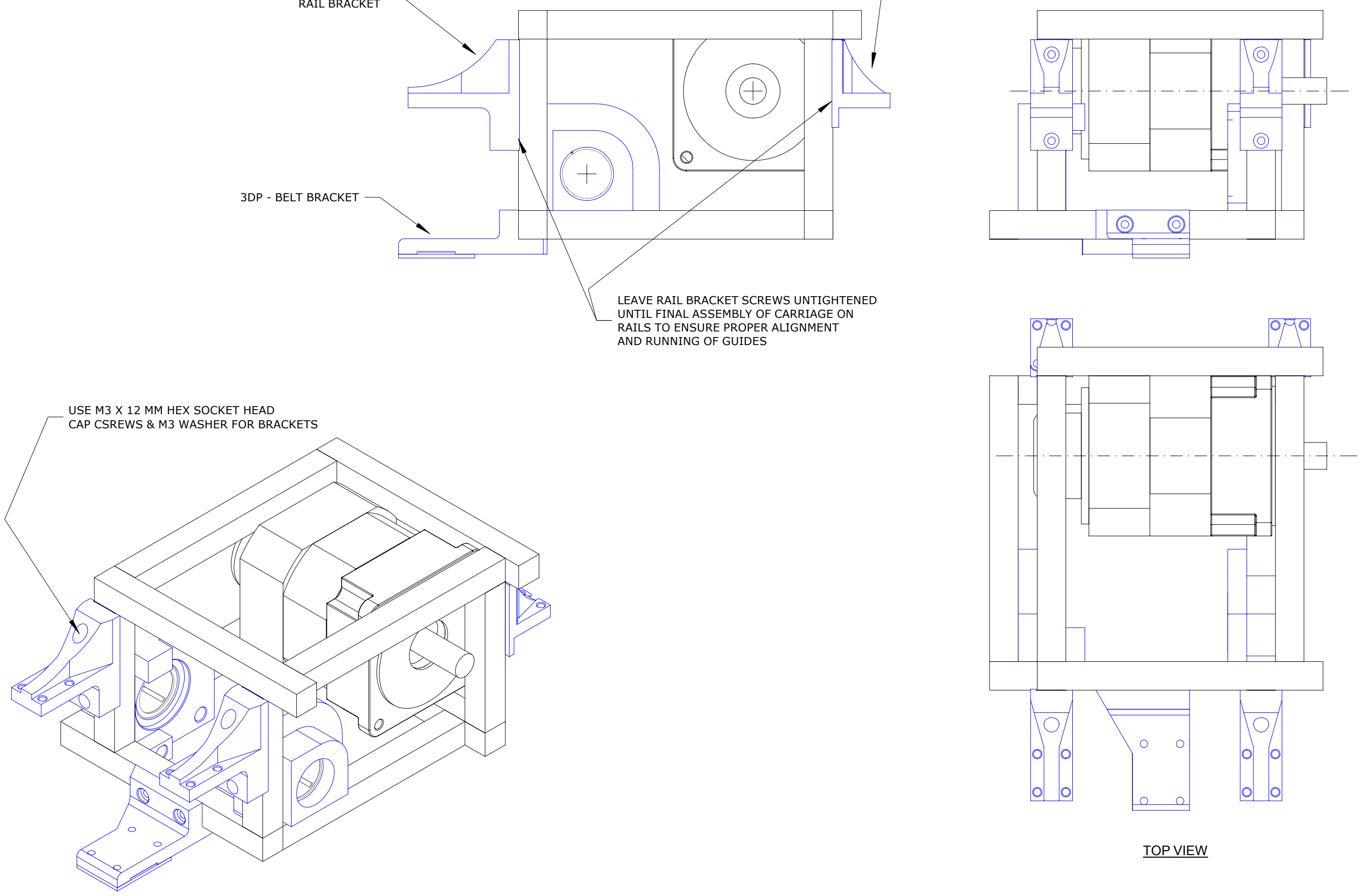
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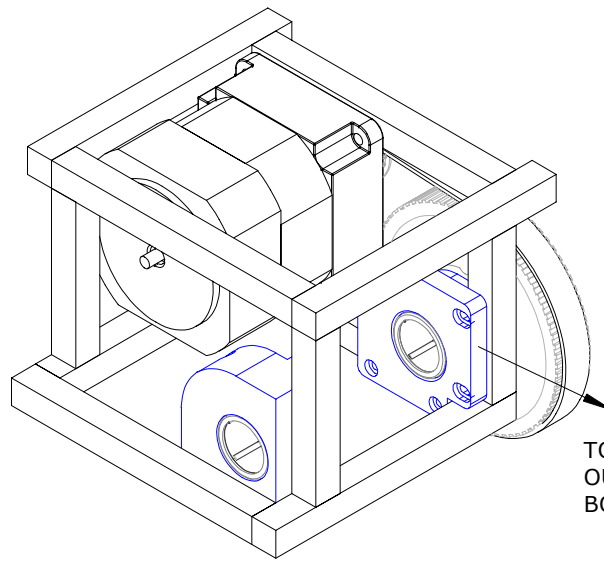
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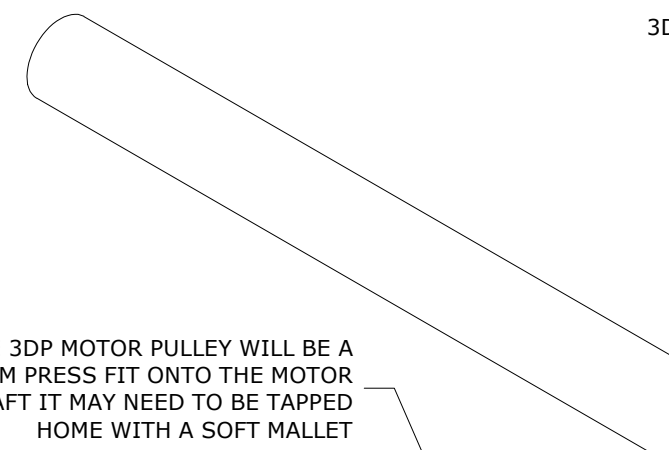
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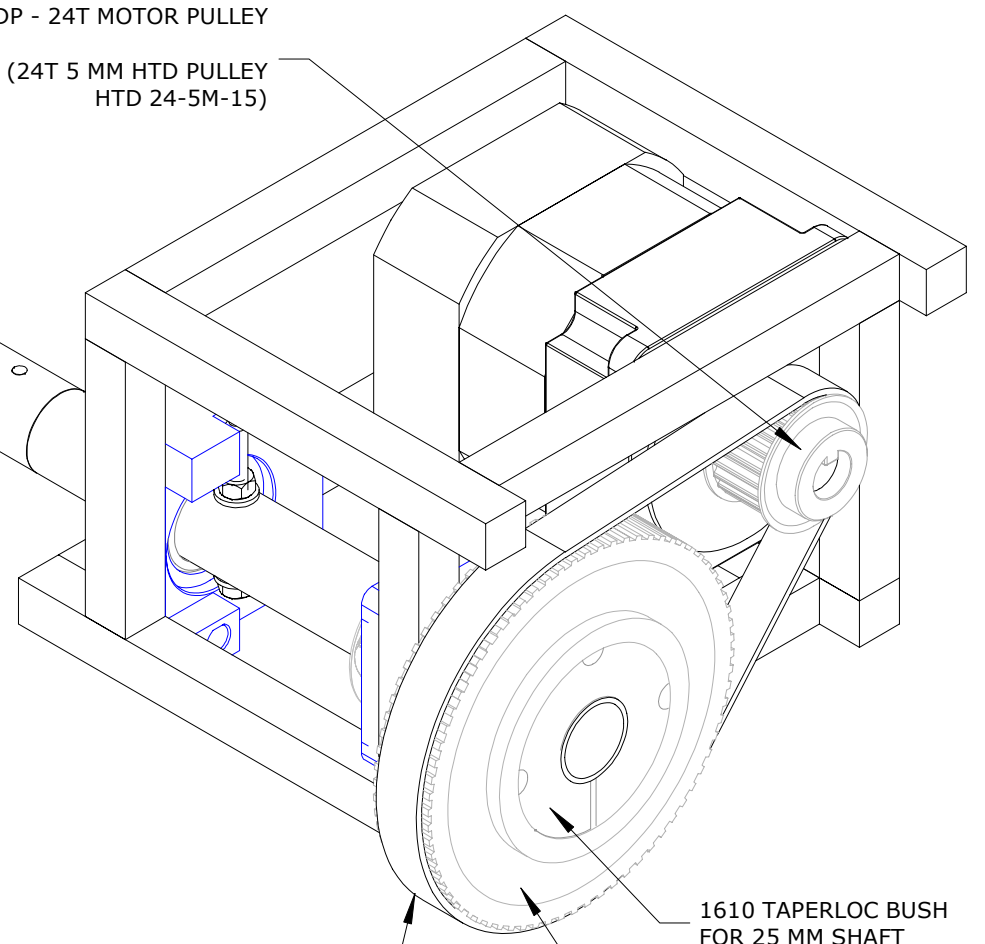


TO TENSION BELT PULL REAR HOUSING  
OUTWARD THEN TIGHTEN HOUSING  
BOLTS



THE 3DP MOTOR PULLEY WILL BE A  
FIRM PRESS FIT ONTO THE MOTOR  
SHAFT IT MAY NEED TO BE TAPPED  
HOME WITH A SOFT MALLET

3DP - 24T MOTOR PULLEY  
(24T 5 MM HTD PULLEY  
HTD 24-5M-15)



5 MM HTD BELT  
HTD 450 5M - 15 MM WIDE

1610 TAPERLOC BUSH  
FOR 25 MM SHAFT

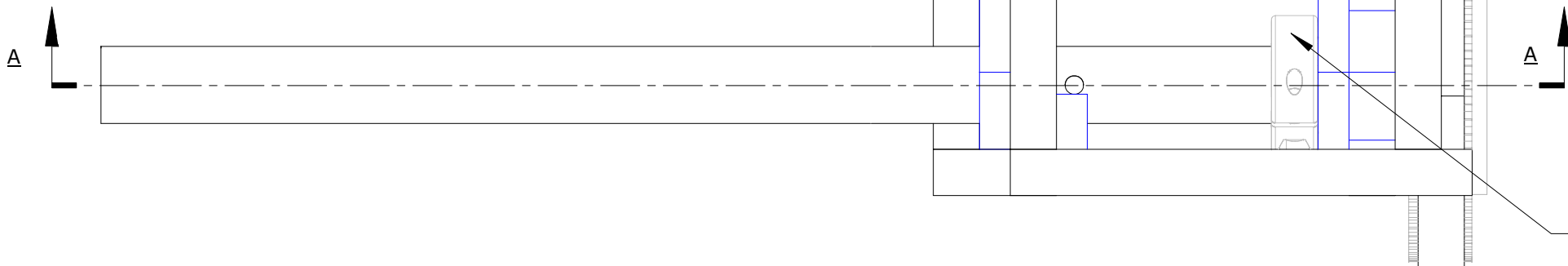
72T HTD PULLEY  
72-5M-15 FOR 1610 TAPERLOC

25 MM CLAMP SHAFT COLLAR  
RULAND MCL-25-F  
OR EQUIVALENT

STEPS:

1. FIT MOTOR PULLEY
2. PREPARE YOKE TUBE (CUT TO LENGTH & DRILL Ø6 FOR M6 BOLT)
3. PASS TUBE THROUGH FWD BEARING HOUSING
4. FIT SHAFT CLAMP AND 1ST NYLON WASHER
5. PASS TUBE THROUGH REAR HOUSING
6. FIT 2ND NYLON WASHER
7. FIT 72T PULLEY WITH 1610 TAPERLOC BUSH
8. FIT BELT
9. TENSION BELT (SEE ABOVE) AND FIX REAR BEARING HOUSING POSITION
10. FIT M6 BOLT AS TRAVEL STOP

NOTE THE M6 BOLT ORIENTATION MUST BE ALIGNED WITH THE YOKE ORIENTATION



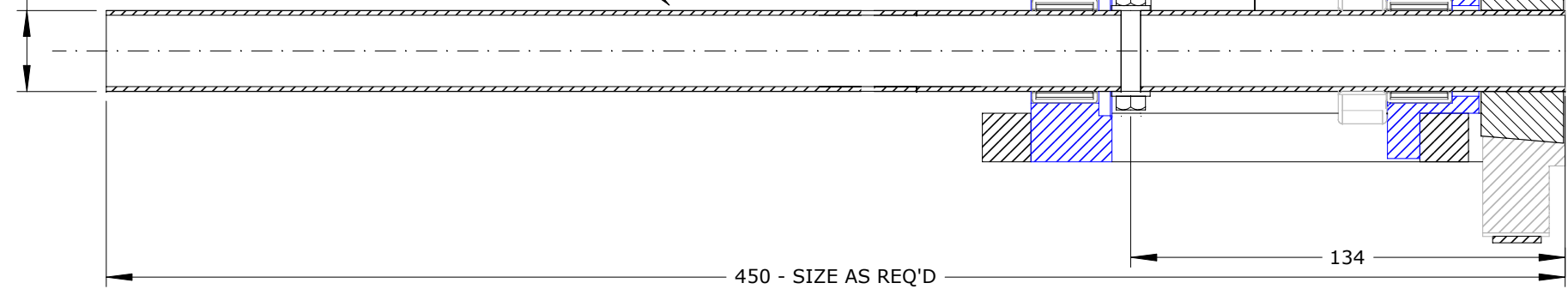
USE M6 x 50L HEX  
SCREW WITH PLAIN  
WASHERS & LOCKNUT  
FOR AILERON AXIS  
END STOP

DRILL TUBE Ø6 THRU AT  
134 MM POSITION SHOWN

STEEL YOKE TUBE -  
PRECISION DIAMETER  
APPROX 1MM WALL THICKNESS

FIT 25 MM NYLON WASHERS  
TO ACT AS THRUST BEARINGS

Ø25.00  
.00  
-.05



VIEW ON A-A

450 - SIZE AS REQ'D

134

**STEP 12 - CARRIAGE - DRIVE AND YOKE TUBE**

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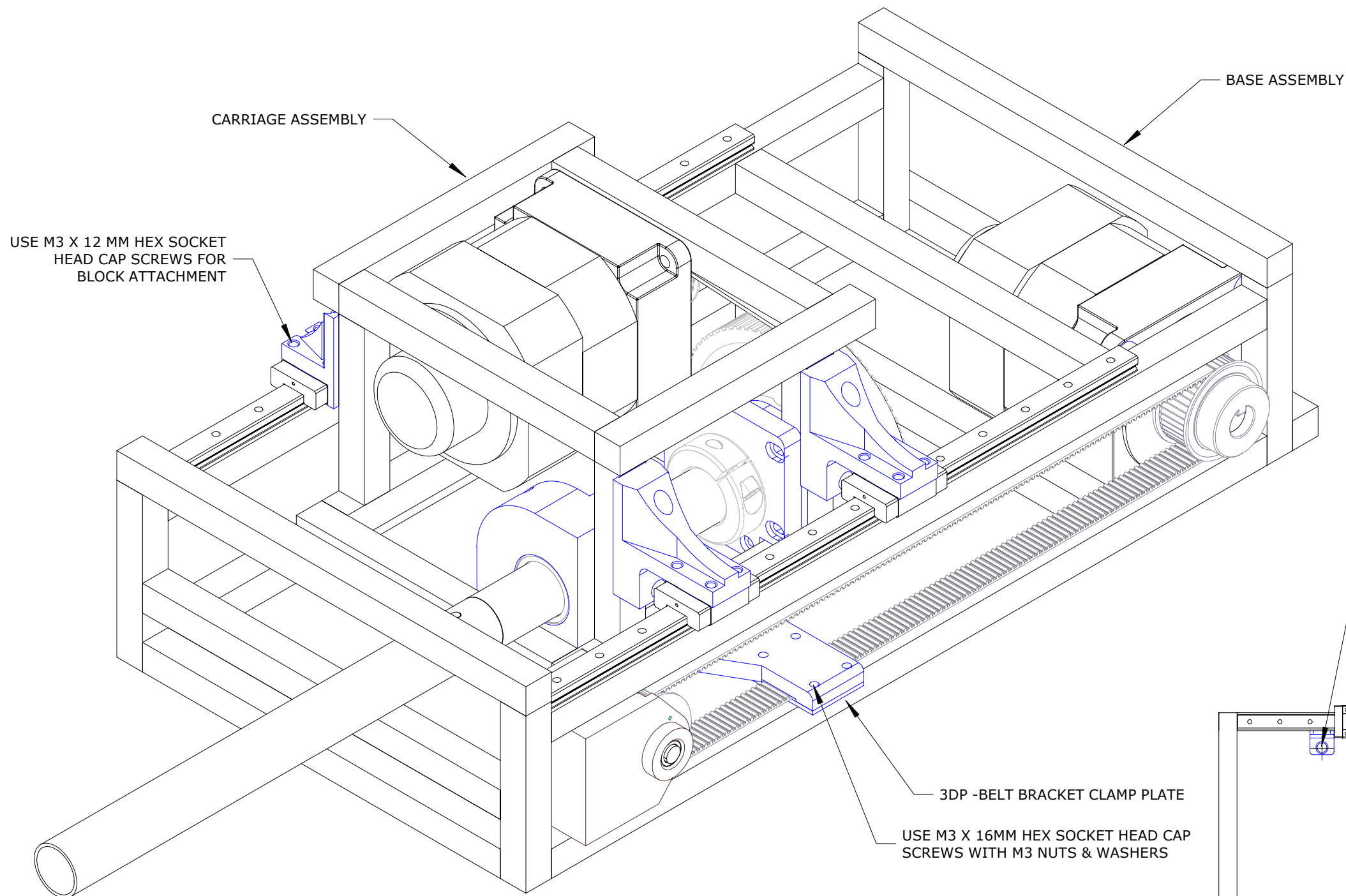
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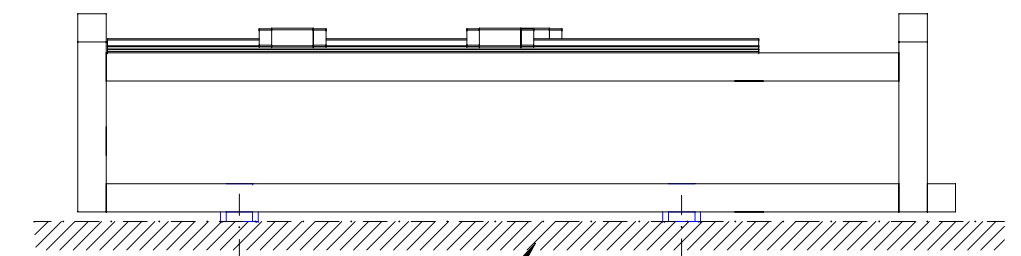
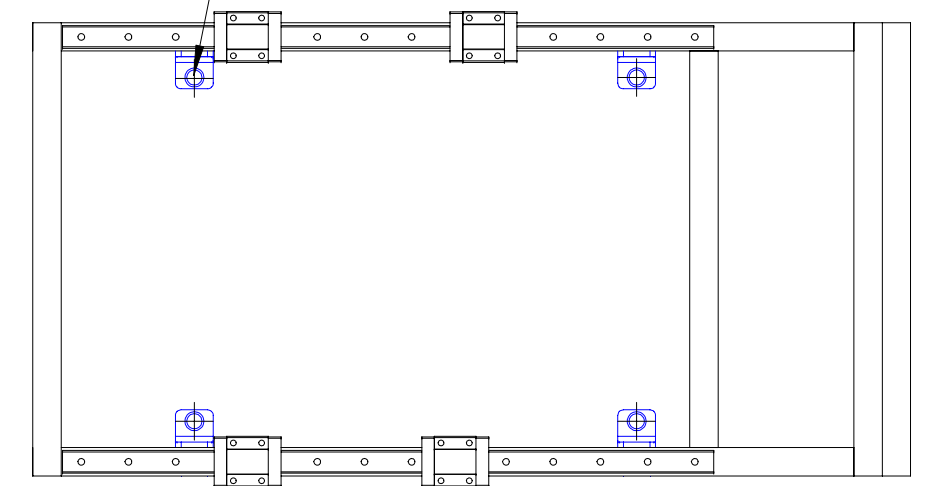
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IMPORTANT - SECURE YOKE TO RIGID BASE TO COMPLETE INSTALLATION THE RIGID BASE WILL LEND STIFFNESS TO THE ASSEMBLY AND PREVENT MOVEMENT WHILST UNDER LOAD.

DO NOT ATTEMPT TO USE THE YOKE WITHOUT FIRST FIXING IT TO BASE STRUCTURE



#### STEPS -

1. ENSURE GUIDE RAIL AND RAIL FIXING BRACKET SCREWS ARE LOOSE
2. SIT CARRIAGE ON BASE AND POSITION GUIDE RAIL BLOCKS TO MATCH RAIL FIXING BRACKETS
3. SECURE FIXING BRACKETS TO RAIL BLOCKS - FINGER TIGHTEN SCREWS ONLY - DO NOT TIGHTEN FULLY
4. CHECK FREE MOTION OF CARRIAGE ON RAILS, THEN FINGER TIGHTEN UPPER SCREWS ON RAIL FIXING BRACKETS
5. RE-CHECK FREE MOVEMENT OF CARRIAGE
6. SLIDE CARRIAGE TO FRONT - TIGHTEN SINGLE SCREW AT FRONT END OF RAIL TO LOCATE RAIL FRONT END
7. SLIDE CARRIAGE TO REAR - TIGHTEN SINGLE SCREW AT REAR OF RAIL TO LOCATE RAIL REAR
8. CONFIRM FREE MOVEMENT OF CARRIAGE. THEN PROGRESSIVELY TIGHTEN REMAINING RAIL SCREWS.
9. TIGHTEN REMAINING RAIL BRACKET AND BLOCK SCREWS - ALL THE TIME CHECKING CONTINUED FREE SLIDING OF CARRIAGE.

### STEP 13 - YOKE - FINAL ASSEMBLY

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