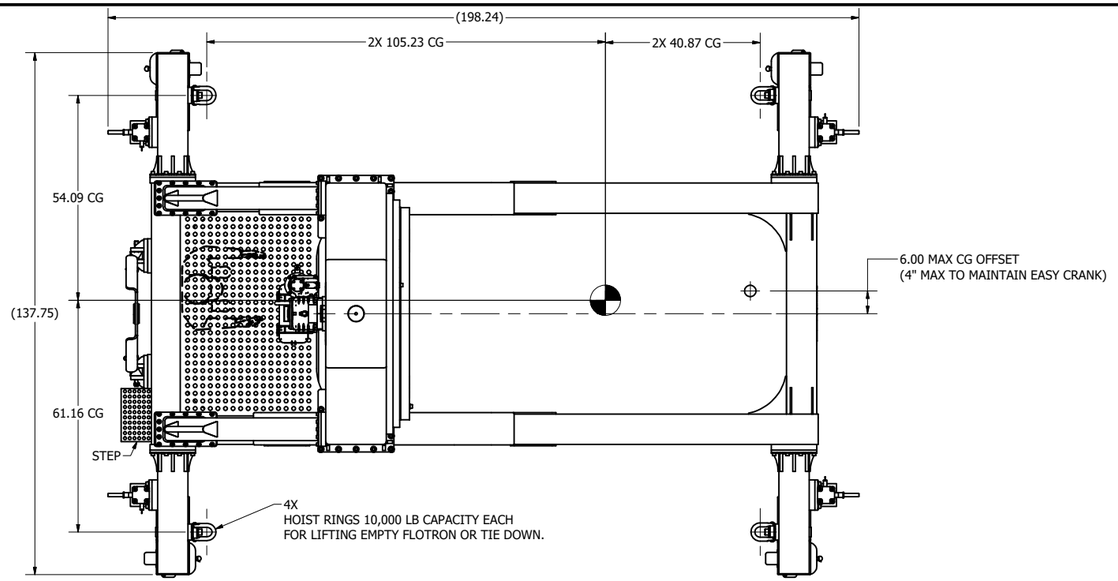
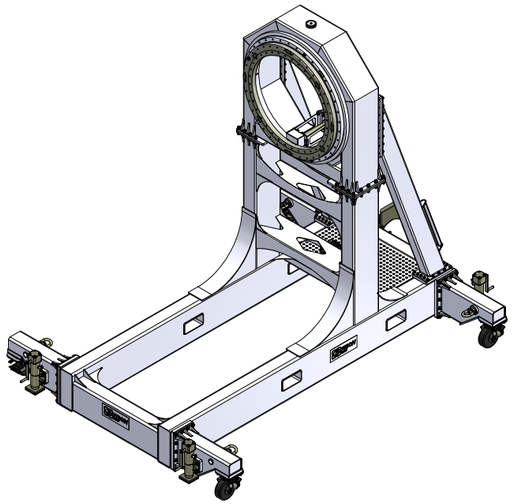
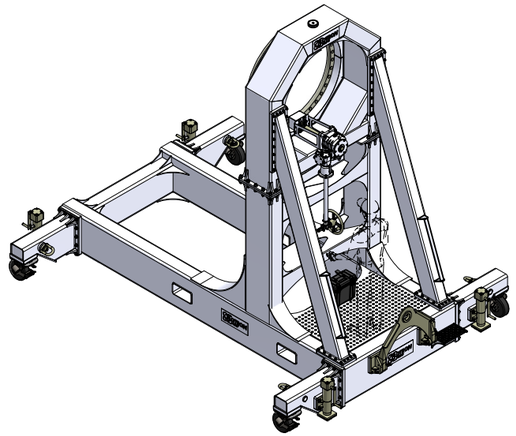
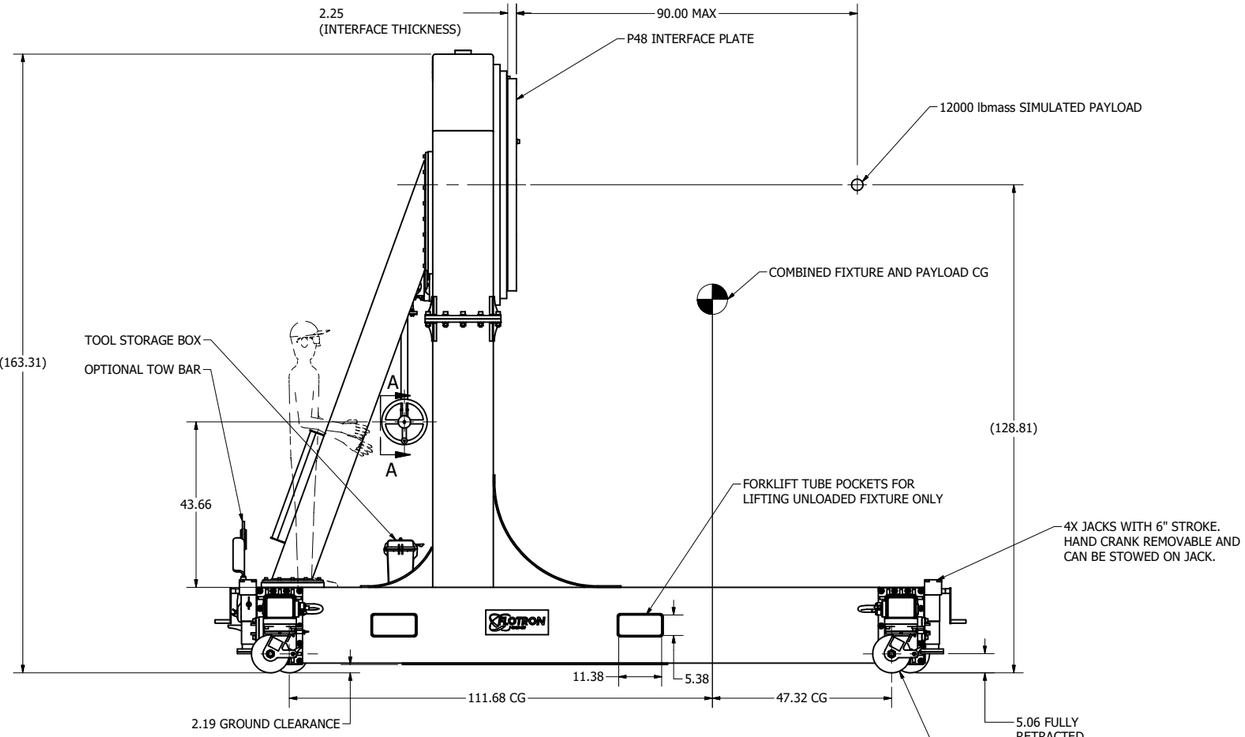
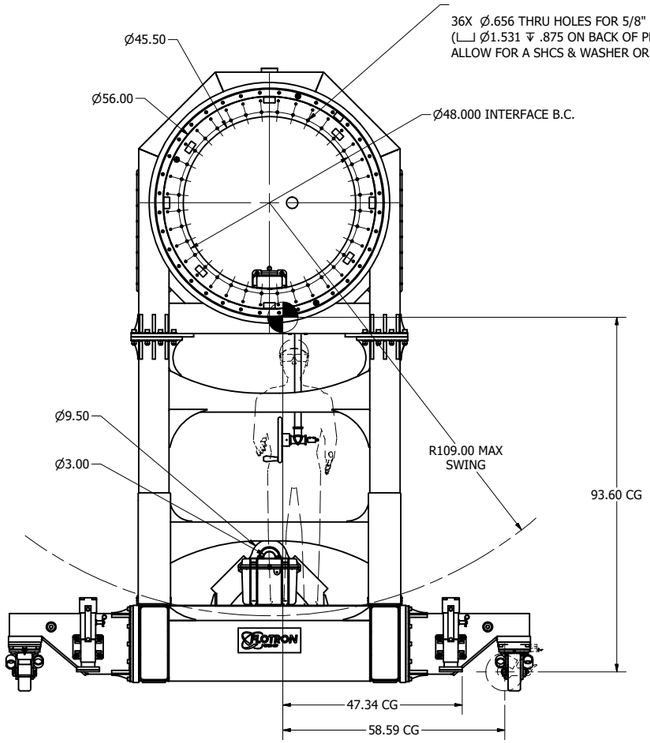




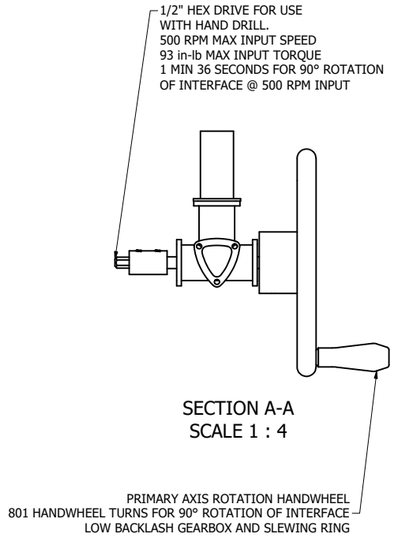




LONGITUDINAL TIPOVER: 47.22 / 93.57 = .50G



LATERAL TIPOVER ON CASTERS: 58.58 / 93.57 = .62G
LATERAL TIPOVER ON JACKS: 47.33 / 93.57 = .51G



4. CONFIGURATION SHOWN ON SHEET 1: CTL-C-129-P48-C10-J1-T1
3. FINISH: CLEAN ROOM COMPATIBLE "C" FINISHES STANDARD - SKY WHITE POWDER COATED FRAMES, GEARBOX PAINTED GLOSS WHITE EPOXY, NICKEL PLATED COMPONENTS (NO ZINC), STAINLESS STEEL FASTENERS AND MISC. HARDWARE. OPEN-ENDED TUBES NICKEL PLATED. KRYTOX GPL 207 LUBRICANT ON CASTERS & JACKS.
2. LOAD RATING: 12,000 LBS @ 6" MAX ECCENTRICITY & 90° FROM INTERFACE CONSIDERING A SIMULTANEOUS 1/2G SIDE LOAD (WORST CASE DIRECTION) AND A 1G VERTICAL LOAD. SFy=3 & SFult=5. MAX TORQUE ON SLEWING RING 72,000 IN-LBS (48,000 IN-LBS MAX EASY CRANK)
1. WEIGHT IN TITLE BLOCK INCLUDES 12,000 LB PAYLOAD.

NOTES:

SINGLE AXIS OF ROTATION CONFIGURATION

PROPRIETARY
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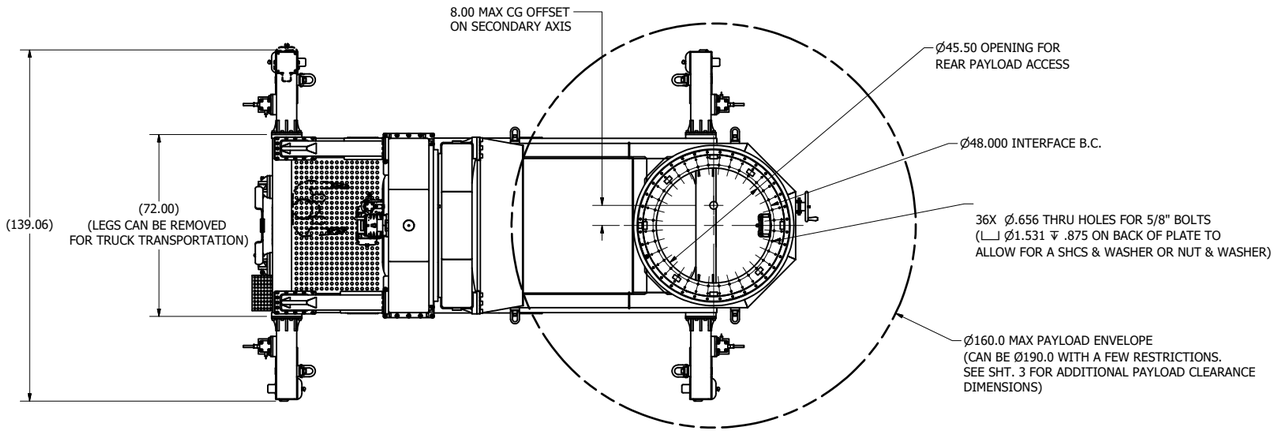
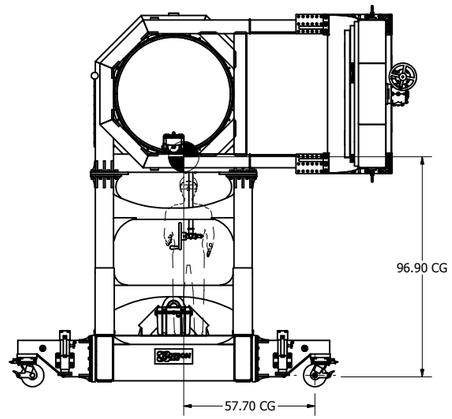
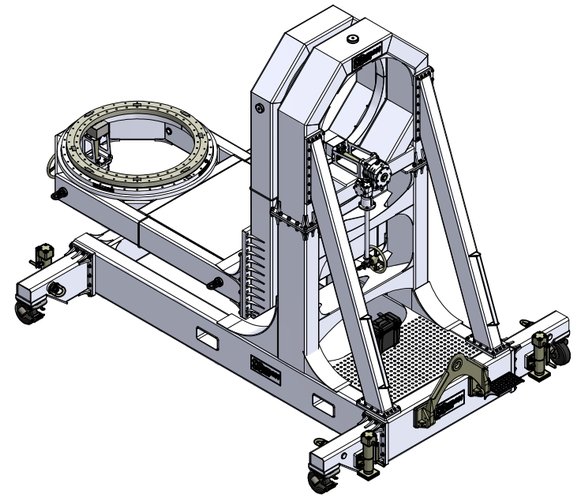
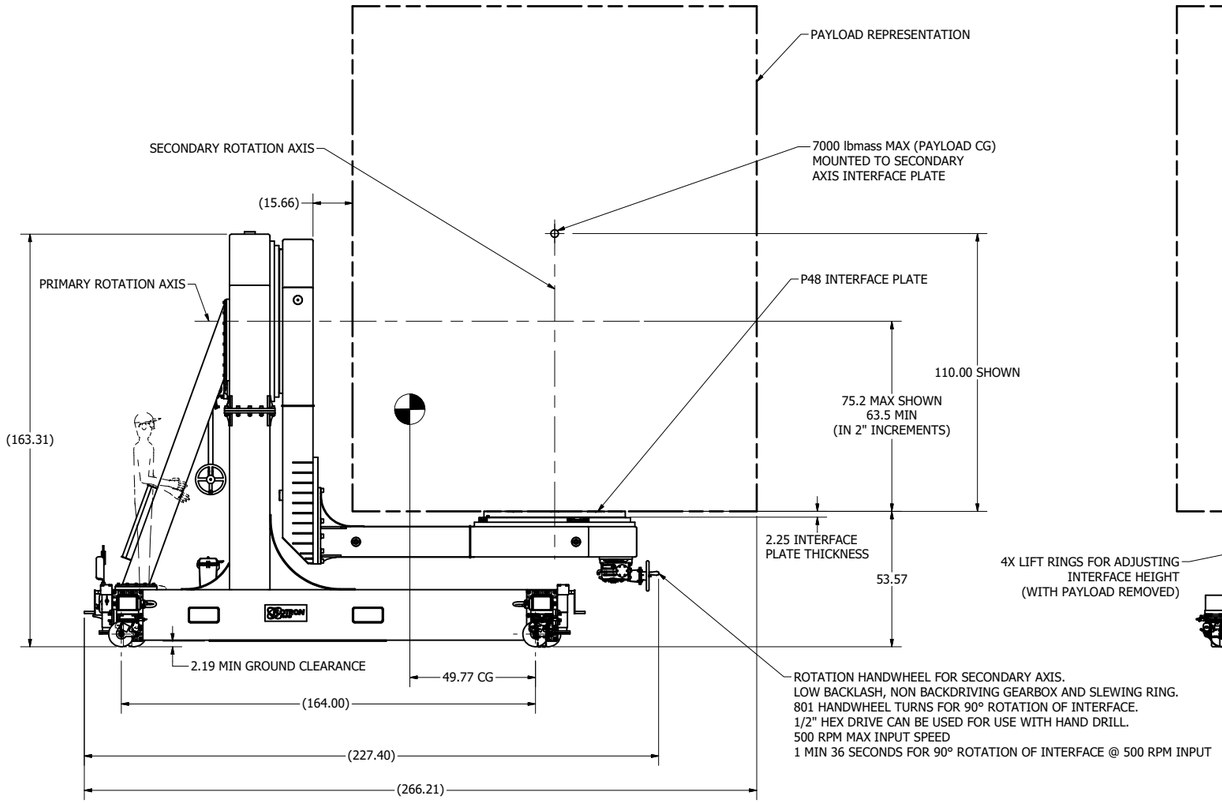
TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTION DEC. ANGLES ±.03 ±.010 ±.5° XX XXX	FLOTRON® 2630 PROGRESS STREET VISTA, CALIFORNIA 92081 http://www.flotron.com
APPROVALS / DATE	SINGLE OR DUAL AXIS CANTILEVERED ROTATION FIXTURE
DRAWN AJZ 2/7/2018	
CHECKED	SCALE 1 : 20 / SIZE D / DRAWING NO. 8055-000 / REV -
MFG	
STATUS Released	WT: 20511.7 lbmass / Cad software: Inventor / SHEET 1 OF 3



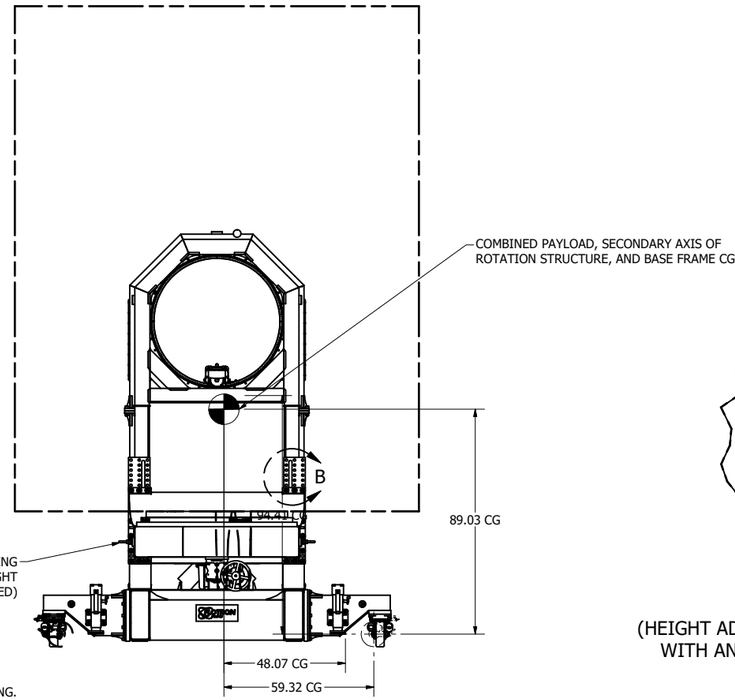


PAYLOAD ROTATED 90°
LATERAL TIPOVER: 58.49 / 96.19 = .60G

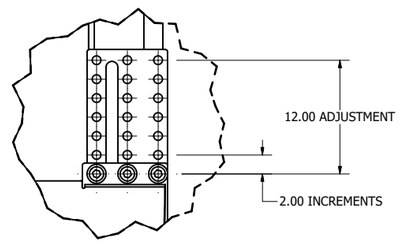




LONGITUDINAL TIPOVER: 49.69 / 89.05 = .56G



LATERAL TIPOVER ON CASTERS: 59.31 / 89.05 = .66G
LATERAL TIPOVER ON JACKS: 48.06 / 89.05 = .54G



DETAIL B
SCALE 1 : 8
(HEIGHT ADJUSTMENT NEEDS TO BE MADE
WITH AN OVERHEAD LIFTING DEVICE)

5. CONFIGURATION SHOWN ON SHEET 2: CTL-C-129-P48-C10-J1-T1-SA
4. WHEN SECONDARY AXIS OF ROTATION FRAME IS EMPTY, IT MUST BE IN THE PAYLOAD VERTICAL ORIENTATION AS SHOWN ON THIS SHEET.
3. SEE SHEET 3 FOR SETTING SECONDARY AXIS INTERFACE HEIGHT POSITION BASED ON PAYLOAD WEIGHT AND CG LOCATION.
2. LOAD RATING WHEN USING SECONDARY AXIS OF ROTATION: 7,000 LBS @ 8.0" MAX ECCENTRICITY (SECONDARY AXIS) & 110" FROM INTERFACE
CONSIDERING A SIMULTANEOUS 1/2G SIDE LOAD (WORST CASE DIRECTION) AND A 1G VERTICAL LOAD. SFy=3 & SFult=5.
MAX TORQUE ON GEARBOX 56,000 IN-LBS (48,000 IN-LBS MAX EASY CRANK)
1. SHEET 2 CONFIGURATION HAD A UNIT WEIGHT OF 20,329 LBS WHICH INCLUDES BASE, 4,834 LB SECONDARY AXIS, AND 7,000 LB PAYLOAD
NOTES:

DUAL AXIS OF ROTATION CONFIGURATION

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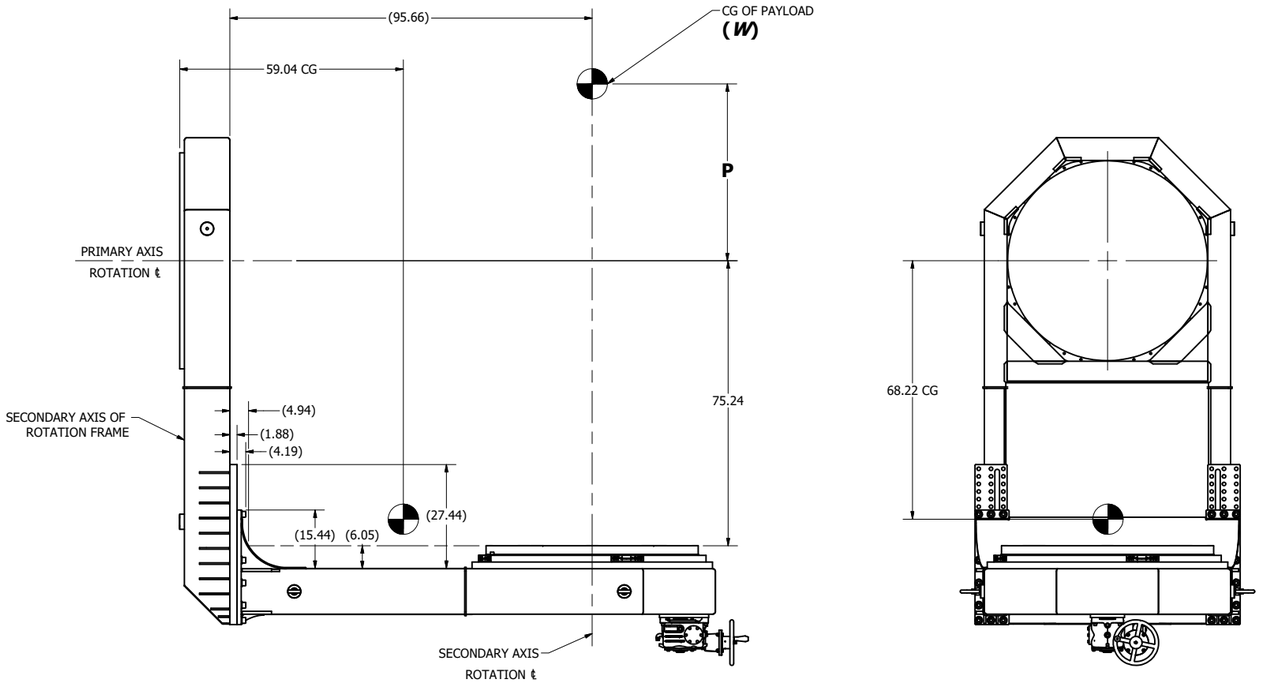
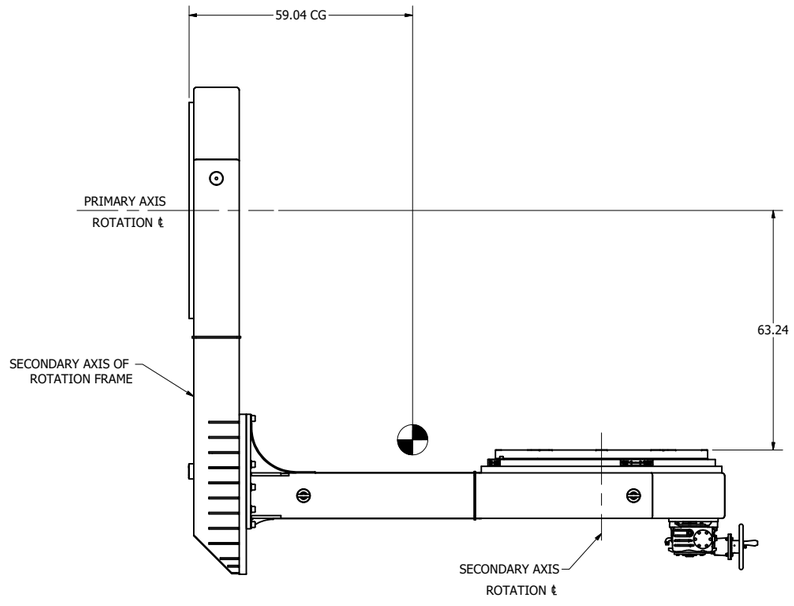
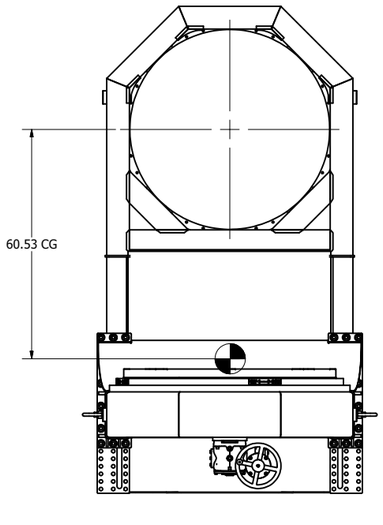
SCALE	SIZE	DRAWING NO.	REV
1 : 20	D	8055-000	-



	Secondary Axis of Rotation Frame CG (No Payload) to Primary Axis of Rotation Centerline	Payload interface to Primary Axis of Rotation Centerline	Torque on Primary Axis From L Frame (No Payload) (T_{frame})	Max Allowed Torque on Primary Axis (in-lbs)	Max Torque on Primary Axis To Maintain Easy Crank (in-lbs)
Bolt Position 1 (Payload Interface Plate in Lowest Position)	68.30"	75.24"	330,162 in-lb	72,000	48,000
Bolt Position 2 (Raised by 2")	67.02	73.24	323,975 in-lb	72,000	48,000
Bolt Position 3 (Raised by 4")	65.74	71.24	317,787 in-lb	72,000	48,000
Bolt Position 4 (Raised by 6")	64.45	69.24	311,551 in-lb	72,000	48,000
Bolt Position 5 (Raised by 8")	63.17	67.24	305,364 in-lb	72,000	48,000
Bolt Position 6 (Raised by 10")	61.89	65.24	299,176 in-lb	72,000	48,000
Bolt Position 7 (Raised by 12") (Payload Interface Plate in Highest Position)	60.61"	63.24"	292,989 in-lb	72,000	48,000

PAYLOAD INTERFACE PLATE IN LOWEST POSTION (BOLT POSITION 1)
SECONDARY AXIS FRAME AND P38 INTERFACE WEIGHT (NO PAYLOAD): 4,834 LBS
TORQUE ON PRIMARY AXIS = 4,834 LBS X 68.30" = 330,162 IN-LBS





PAYLOAD INTERFACE PLATE IN HIGHEST POSTION (BOLT POSITION 7)
SECONDARY AXIS FRAME AND P38 INTERFACE WEIGHT (NO PAYLOAD): 4,834 LBS
TORQUE ON PRIMARY AXIS = 4,834 LBS X 60.61" = 292,989 IN-LBS

TO DETERMINE CORRECT STARTING INTERFACE HEIGHT (L-FRAME BOLT POSITION), MULTIPLY INITAL PAYLOAD WEIGHT (***Wi***) BY DISTANCE FROM INITIAL PAYLOAD CG TO PRIMARY AXIS ROTATION CENTERLINE (***Pi***) TO DETERMINE INITIAL PAYLOAD TORQUE ***(Wi X Pi)***. DO THE SAME THING FOR THE FINAL PAYLOAD WEIGHT AND CG LOCATION ***(Wf X Pf)***. THE L FRAME TORQUE (T_{frame}) THAT IS HALFWAY BETWEEN THE INITIAL AND FINAL PAYLOAD TORQUES IS THE BOLT POSITION THAT SHOULD BE USED. CHECK THE PRIMARY AXIS RESULTANT TORQUE FOR BOTH THE INITIAL AND FINAL BOLT POSITIONS TO MAKE SURE THAT THE VAUES ARE NOT ABOVE THE EASY CRANK OF THE PRIMARY AXIS GEARBOX. THE PRIMARY AXIS RESULTANT TORQUE IS THE DIFFERENCE BETWEEN THE FRAME TORQUE AND THE PAYLOAD TORQUE

Resultant Torque = T_{frame} - (W X P)

IF THE NET TORQUE EXCEEDS EASY CRANK DURING ANY PART OF THE BUILD, THE FRAME WILL HAVE TO BE ADJUSTED TO ANOTHER BOLT POSITION IN THE MIDDLE OF THE ASSEMBLY PROCESS. THIS WILL REQUIRE THE PAYLOAD TO BE REMOVED FROM THE FIXTURE.

NOTE: THE PAYLOAD CG MUST BE ABOVE PRIMARY AXIS ROTATION CENTERLINE FOR THIS FORMULA TO BE VALID. IF THE COMBINED PAYLOAD AND SECONDARY AXIS OF ROTATION FRAME TORQUE IS OUTSIDE THE 48,000 IN-LB MAX PRIMARY AXIS EASY CRANK TORQUE, A PAYLOAD ADAPTER STANDOFF MAY NEED TO BE USED OR A MODIFIED SECONDARY AXIS OF ROTATION FRAME MAY NEED TO BE BUILT.

Example: Payload Initial Weight ***(Wi)*** = 6,000 lbs
Initial Payload CG distance to Primary axis of rotation ***(Pi)*** = 45"
Initial Payload Torque = 6,000 lbs X 45" = 270,000 in-lbs

Payload Final Weight ***(Wf)*** = 7,000 lbs
Final Payload CG distance to Primary axis of rotation ***(Pf)*** = 48"
Final Payload Torque = 7,000 lbs X 45" = 336,000 in-lbs

Midpoint between inital and final payload torques = (270,000 in-lbs + 336,000 in-lbs) / 2 = 303,000 in-lb
Closest T_{frame} value in chart = 305,364 in-lb (Bolt position 5)

Resultant Initial Torque on Primary axis = |305,364 in-lb - 270,000 in-lb| = 35,364 in-lb < 48,000 in-lb OK
Resultant Final Torque on Primary axis = |305,364 in-lb - 336,000 in-lb| = 30,636 in-lb < 48,000 in-lb OK

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SCALE	SIZE	DRAWING NO.	REV
1 : 20	D	8055-000	-