

LONGITUDINAL STABILITY @ 49" "B" DISTANCE WITH 960 LB PAYLOAD: 23.72 / 39.41 = .60G

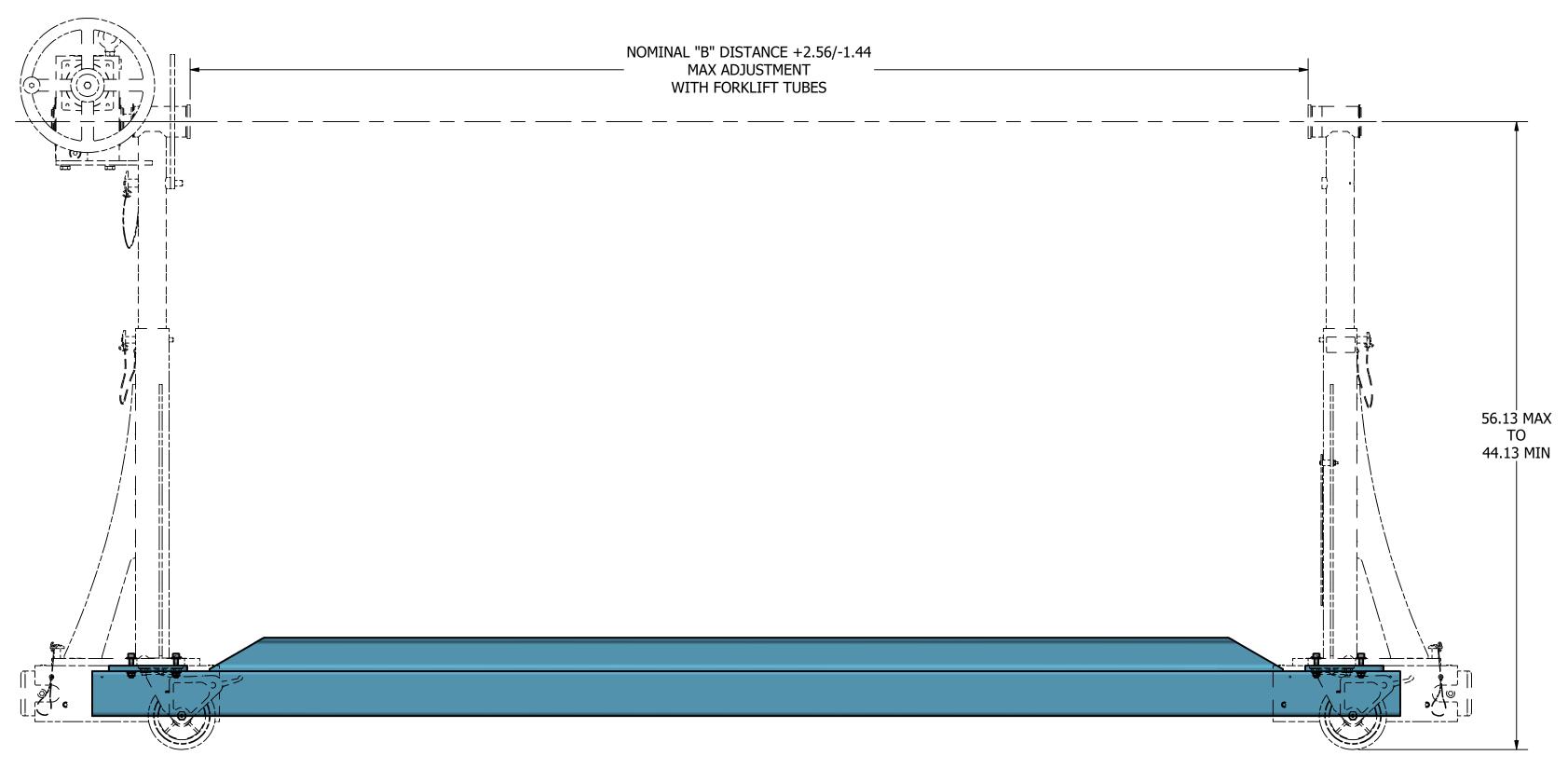
- 5. PROOF LOAD TEST OPTIONAL. SEE SHEET 7 FOR DETAILS.
- 4. CONFIGURATION SHOWN: SFPE-655-P8-IND15-B049-C1
- 3. FINISHES:
- A. "STANDARD" FLOTRON FINISHES (SHOWN) CLASS 10K (ISO 7 CLEANROOM COMPATIBLE FINISHES) FLOTRON BLUE POWDER COATED END FRAMES, GEARBOX PAINTED FLOTRON BLUE, ZINC PLATED STEEL OR BLACK OXIDE FASTENERS, MISC. HARDWARE, AND COMPONENTS. STANDARD LUBRICANTS.
- B. "N" FINISH CLASS 10K (ISO 7 CLEANROOM COMPATIBLE FINISHES) FLOTRON BLUE POWDER COATED END FRAMES, GEARBOX PAINTED FLOTRON BLUE, NICKEL PLATED COMPONENTS (NO ZINC), STAINLESS STEEL, OR BLACK OXIDE FASTENERS AND MISC. HARDWARE. STANDARD LUBRICANTS.
- C. "C" FINISH CLASS 1K (ISO 6 CLEANROOM COMPATIBLE FINISHES) SKY WHITE POWDER COATED END 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 CASTER SWIVEL BEARINGS, TRUNNION SHAFTS, AND JACKS (IF APPLICABLE).
- 2. LOAD RATING: 960 LBS @ 5.62" MAX ECCENTRICITY CONSIDERING A SIMULTANEOUS 1/2G SIDE LOAD (WORST CASE DIRECTION) AND A 1G VERTICAL LOAD. SFy=3 & SFult=5. MAX TORQUE ON GEARBOX 5,400 IN-LBS (2,000 IN-LBS MAX EASY CRANK FOR 60:1 STANDARD GEARBOX AND 5,400 IN-LBS EASY CRANK FOR 250:1 RATIO DR GEARBOX).
- 1. WEIGHT IN TITLE BLOCK INCLUDES PAYLOAD.

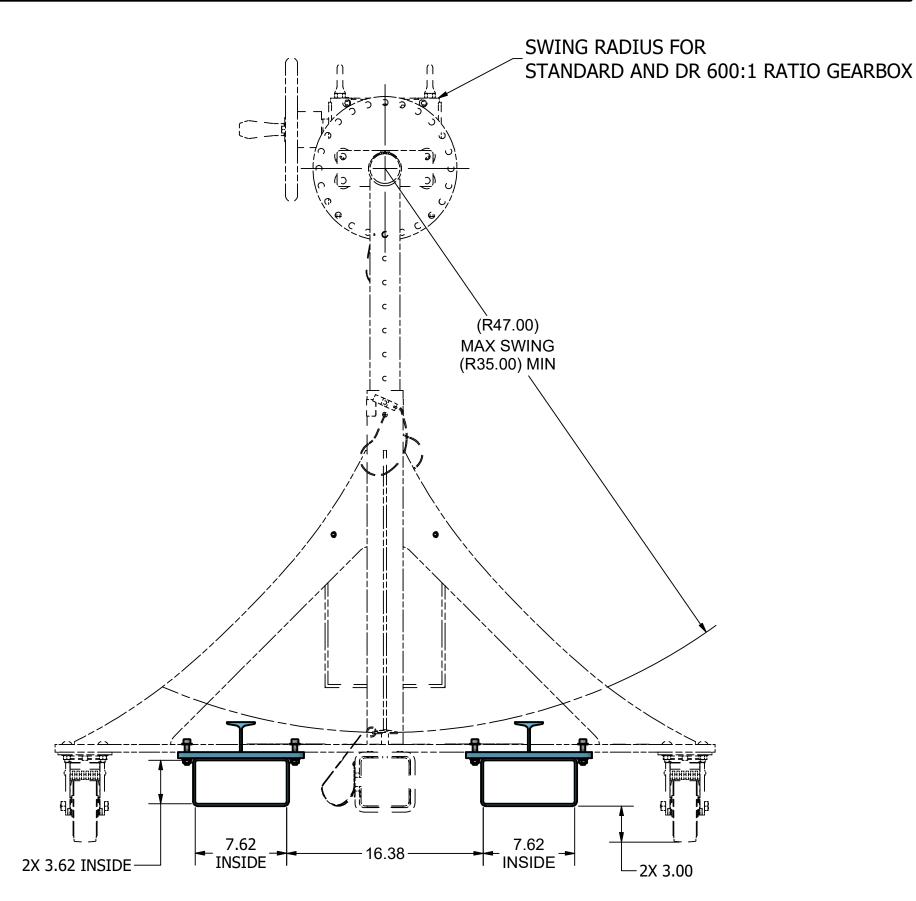
NOTES:

LATERAL STABILITY WITH 960 LB PAYLOAD: 19.77 / 39.41 = .50G

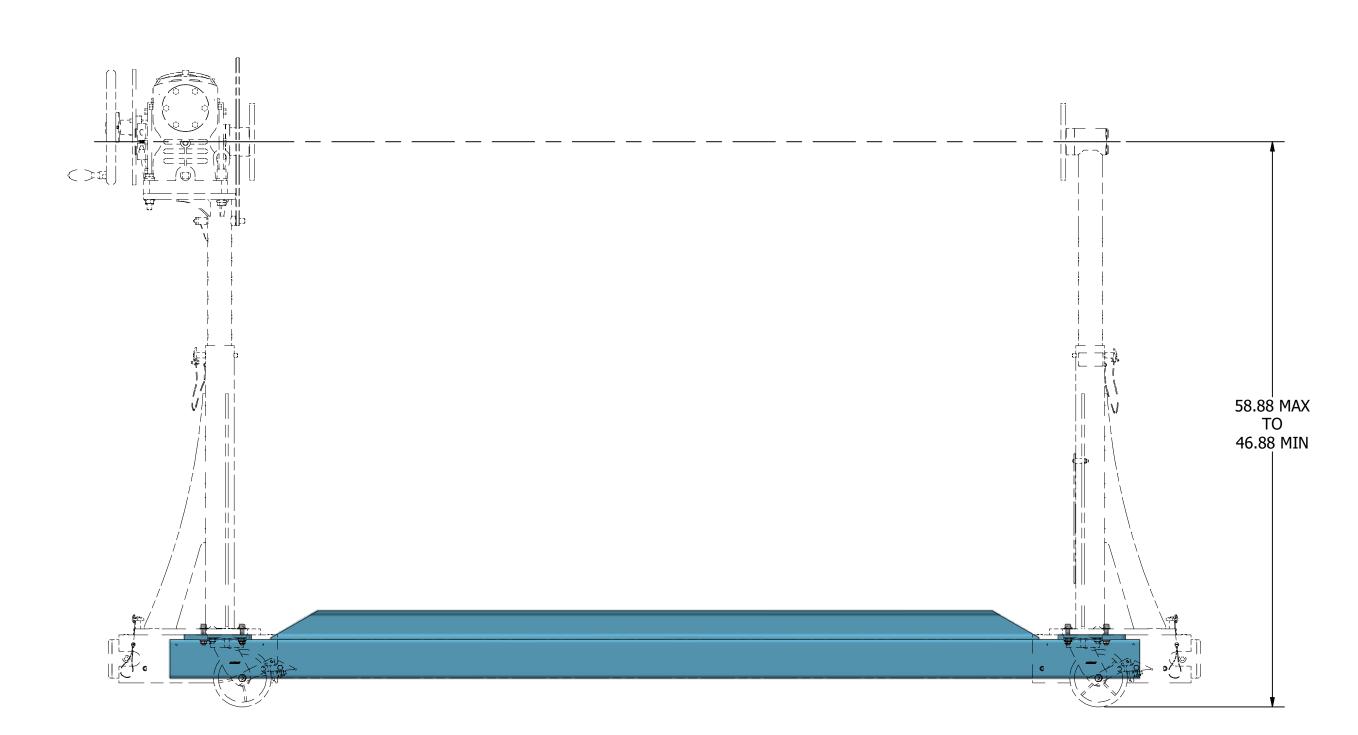
PROPRIETARY This Drawing is the preparty	DIMENSIONS AR			FLOT	'RON®	VISTA, CAL	IFORNIA 92	
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when said purpose has been fulfilled, it should be destroyed			1:10	D	8081-900	•		
or returned to FLOTRON, Inc.			WT: 1523.	3 Ibmass	Cad soft	ware: Inventor	SHEET 1 (OF 9

(F1) FRAME MOUNTED FORKLIFT TUBE KIT INSTALLATION INSTRUCTIONS

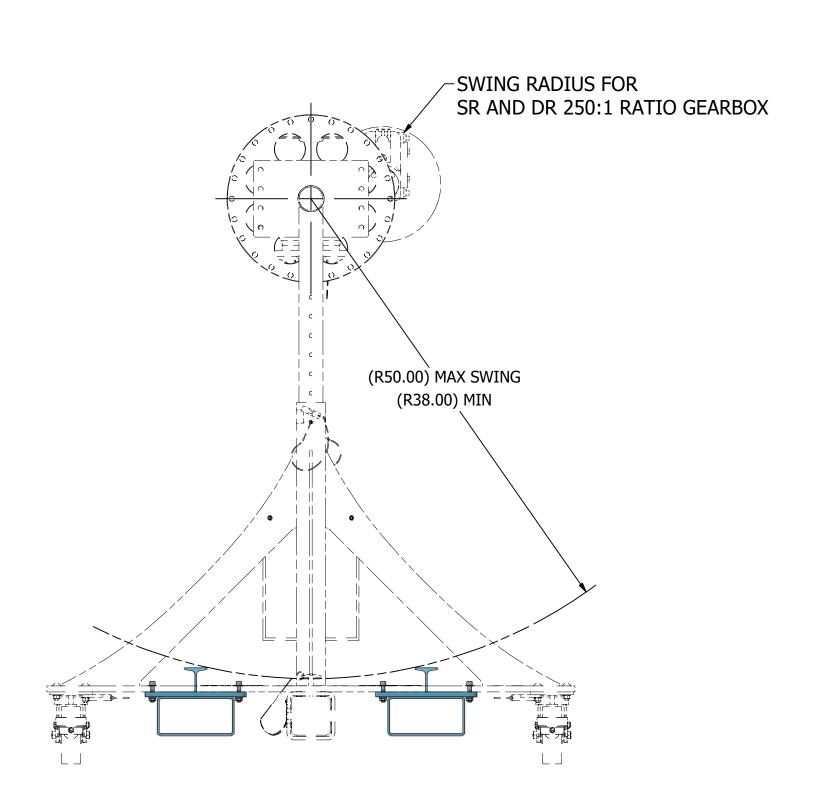




STANDARD & DR (600:1) GEARBOX OPTION



SR & DR (250:1) GEARBOX OPTION



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TRUNNION INTERFACE MOUNT OPTIONS

INTERFACE OPTIONS COMPATIBLE WITH STANDARD GEARBOX ONLY

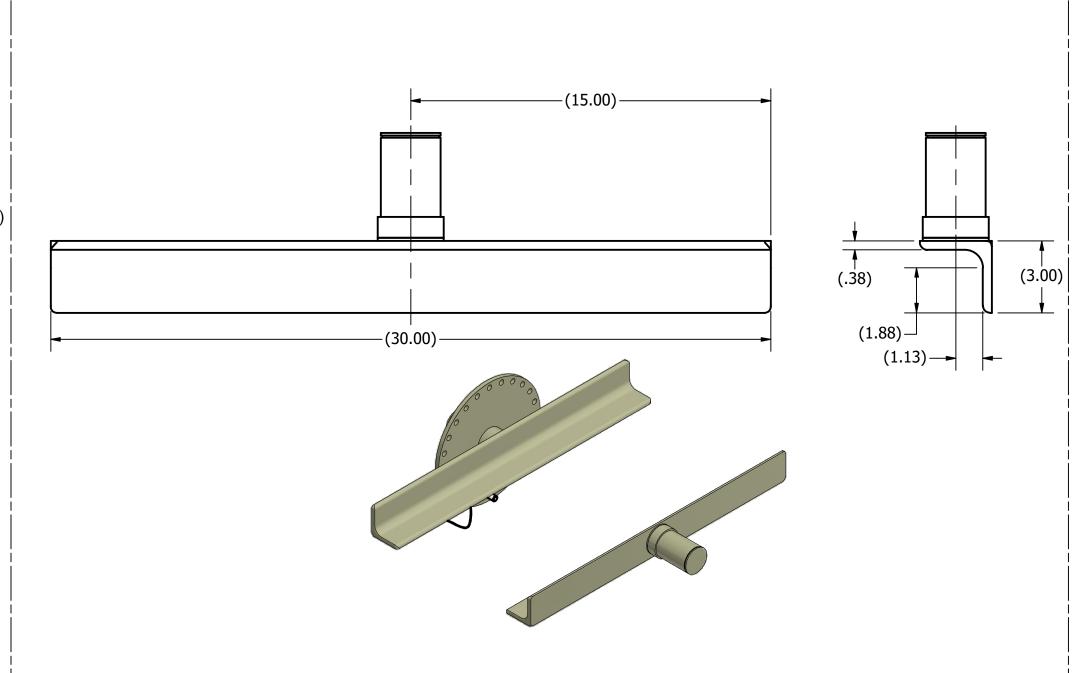
B30 ANGLE PAYLOAD INTERFACE

(WITH STANDARD BOLT PATTERN AND MACHINED MOUNTING SURFACE)

-7X Ø.531 ^{+.008} THRU _4.500_ TYP (1.188) (.313)—► .005

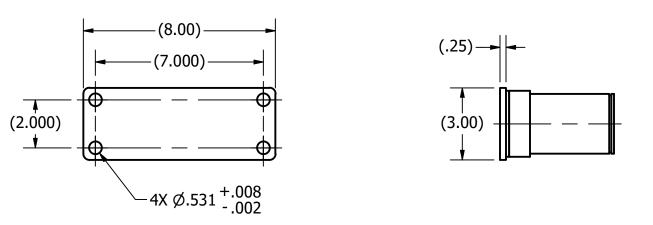
A30 PAYLOAD INTERFACE

(SHOWN WITH OPTIONAL IND15)



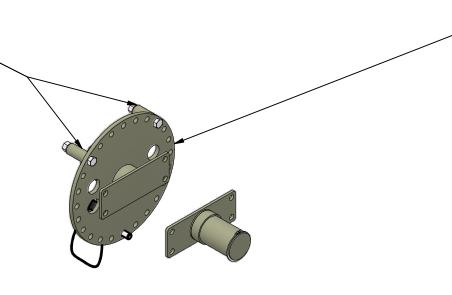
P8 PAYLOAD INTERFACE

(SHOWN WITH OPTIONAL IND15)



OPTIONAL IND15 INDEX PLATE LOCKS ROTATION IN 15° INCREMENTS TO PROVIDE REDUNDANT SAFETY. INDEX LOCKING PIN **MUST** BE REMOVED BEFORE ROTATION. TO ADD STOPS SPECIFY INDS15

INDEX STOPS (S) **CAN PREVENT ROTATION** PAST A DESIRED ANGLE IN EITHER DIRECTION.

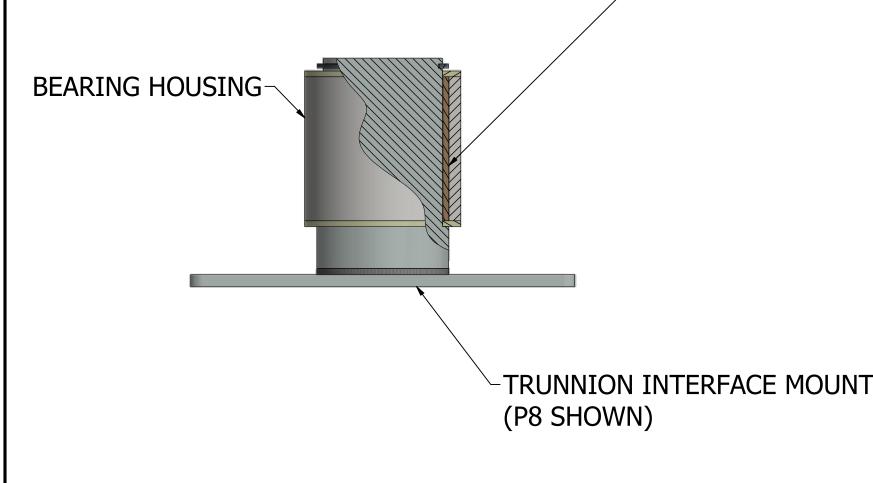


B1 TRUNNION BEARING OPTION

B1 BEARING HOUSING BUSHINGS

AVAILABLE FOR ALL INTERFACE OPTIONS THIS OPTION IS RECOMMENDED FOR LONG OR FLEXIBLE PAYLOADS TO EXTEND BEARING LIFE

PTFE COMPOSITE BUSHING LINER (TYP ON GEARBOX & NON-GEARBOX SIDE)

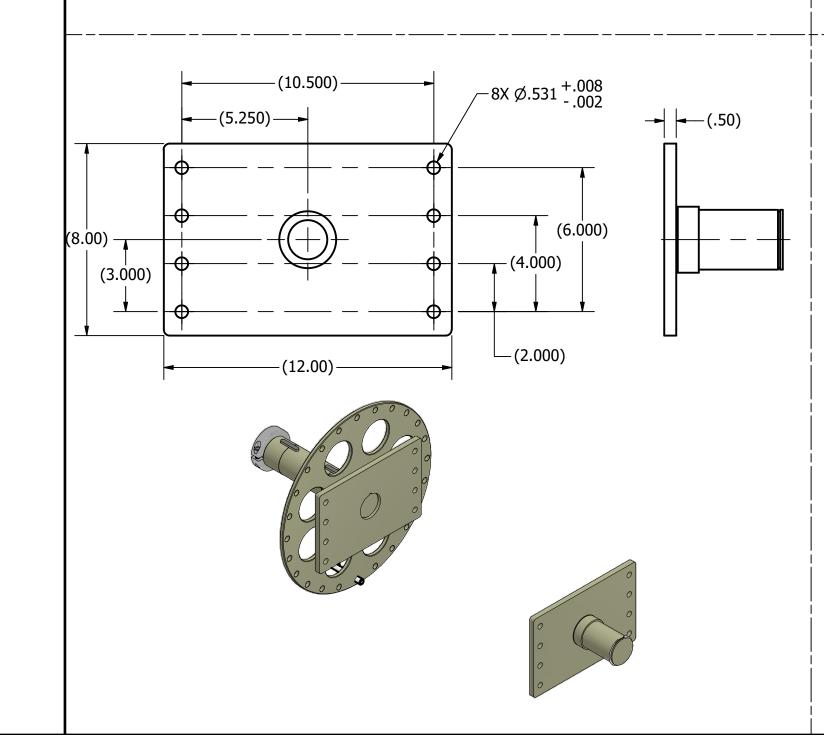


INTERFACE OPTIONS COMPATIBLE WITH SR AND DR GEARBOX ONLY

("SR" GEARBOX IS A SINGLE REDUCTION 60:1 LOW BACKLASH, NON-BACKDRIVING GEARBOX) ("DR" GEARBOX IS A DOUBLE REDUCTION 250:1 RATIO LOW BACKLASH, NON-BACKDRIVING GEARBOX)

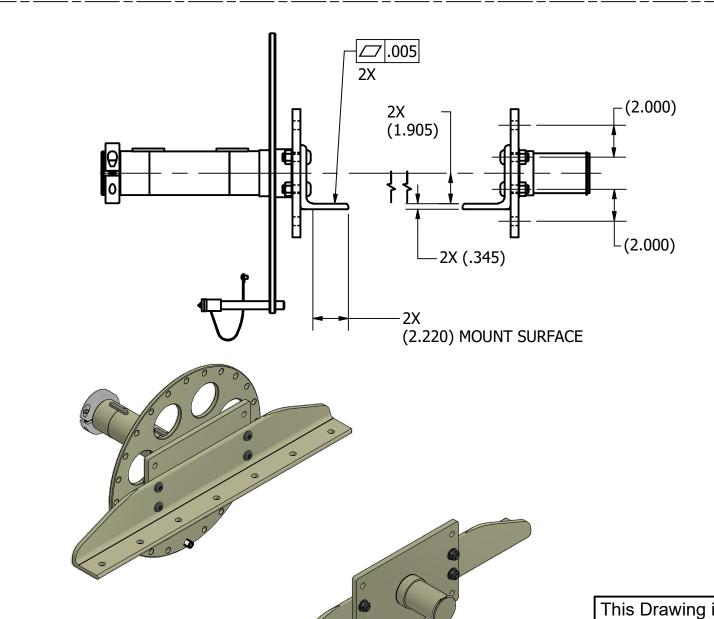
P12 PAYLOAD INTERFACE

(SHOWN WITH OPTIONAL IND15)



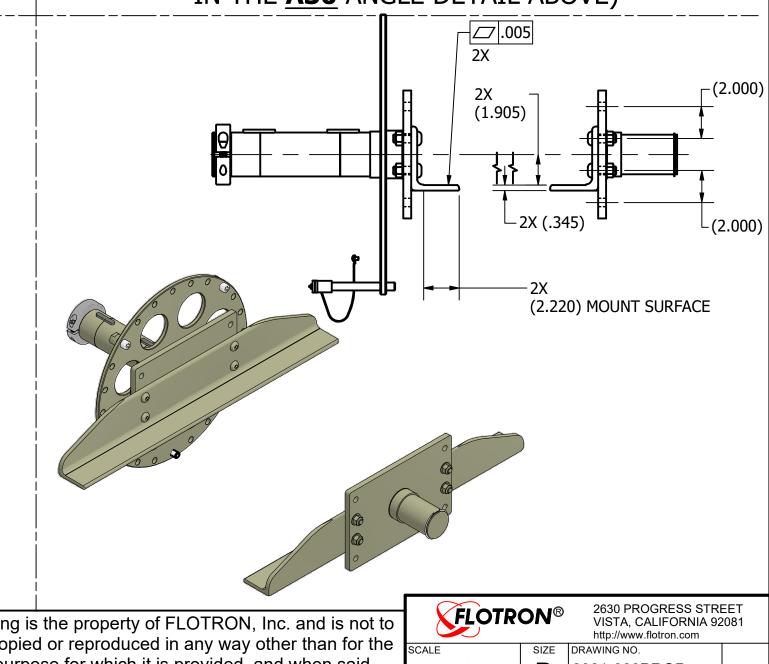
P12/B30 PAYLOAD INTERFACE

(SHOWN WITH OPTIONAL IND15) (SEE HOLE LOCATIONS AS DETAILED IN THE **B30** ANGLE DETAIL ABOVE)



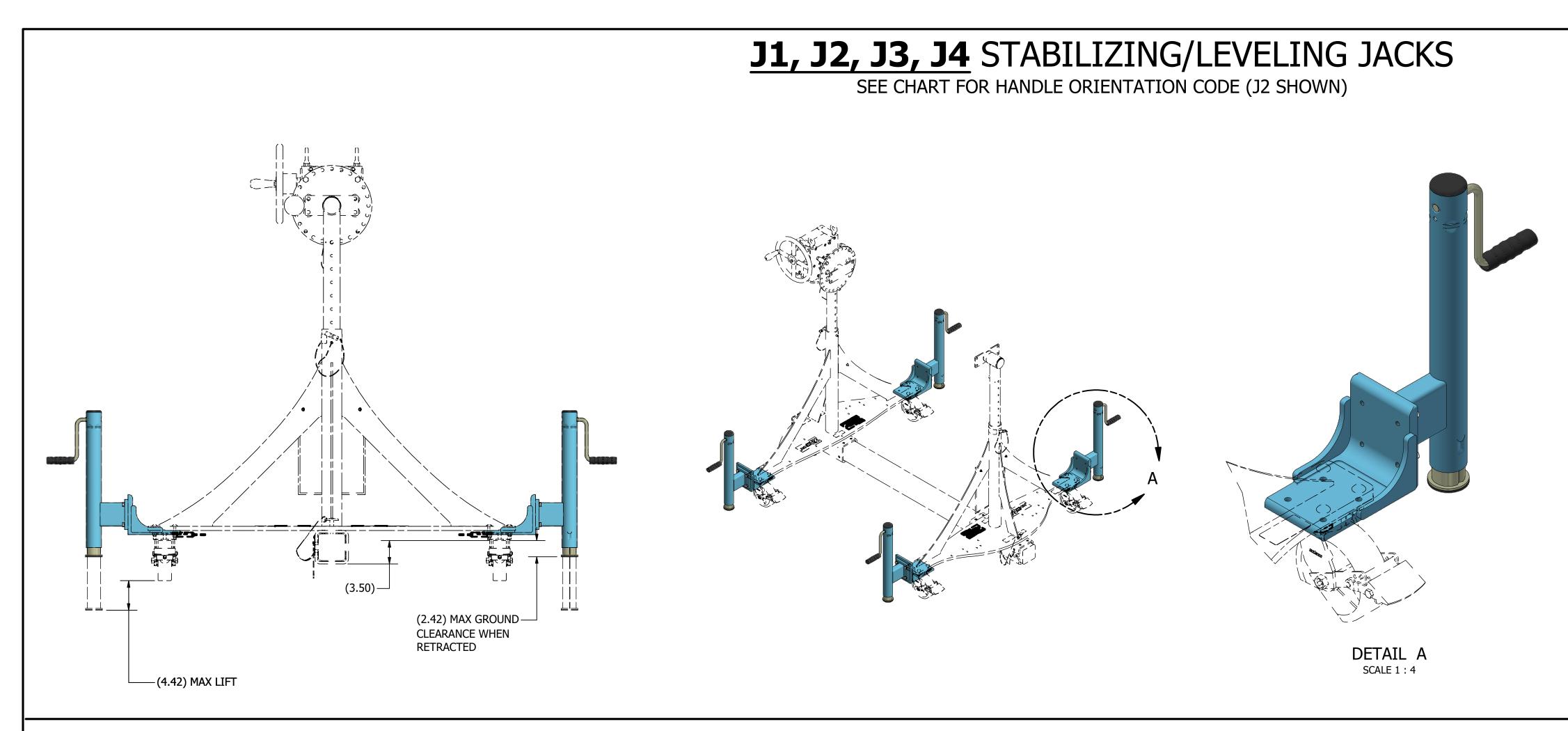
P12/A30 PAYLOAD INTERFACE

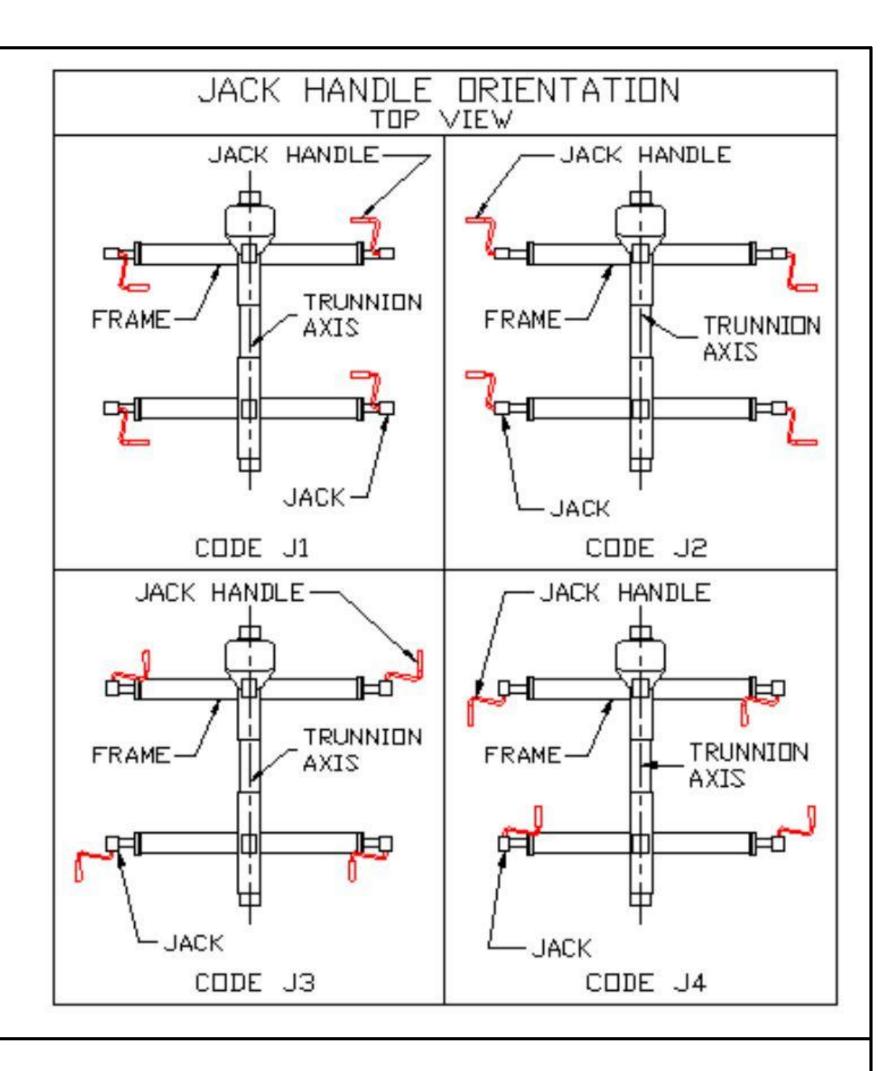
(SHOWN WITH OPTIONAL IND15) (SEE ANGLE SIZE AND POSITION AS DETAILED IN THE **A30** ANGLE DETAIL ABOVE)



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1:10 | **D** | 8081-900PROP SHEET 3 OF 9

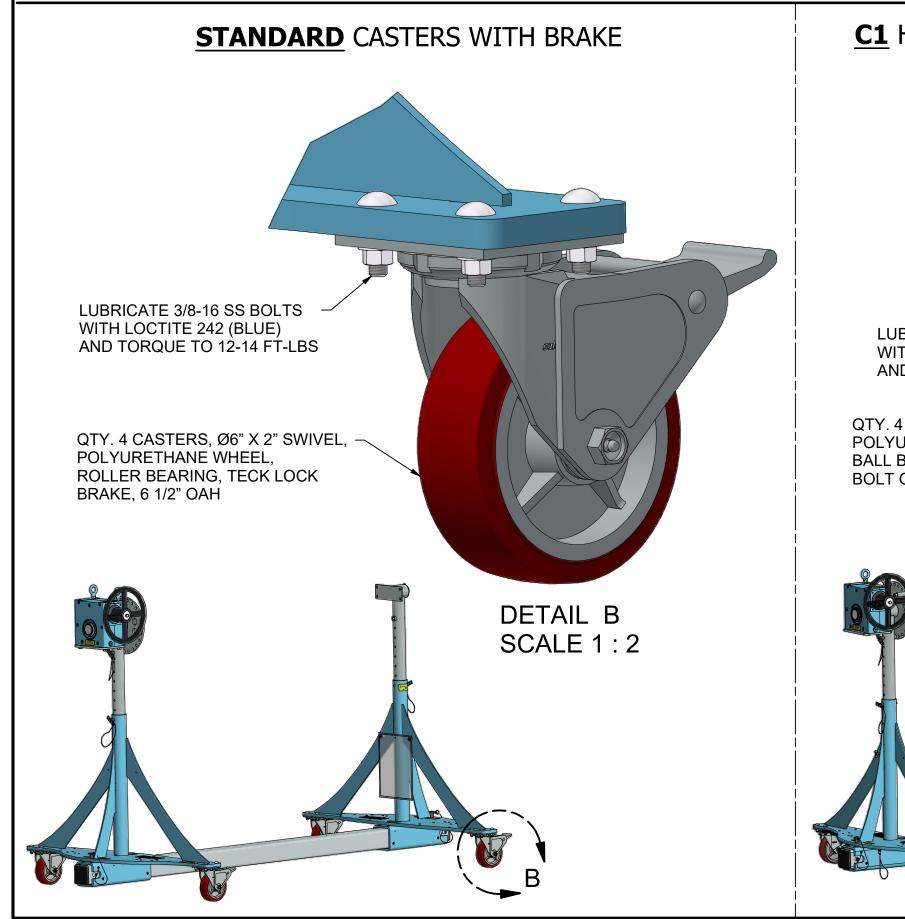


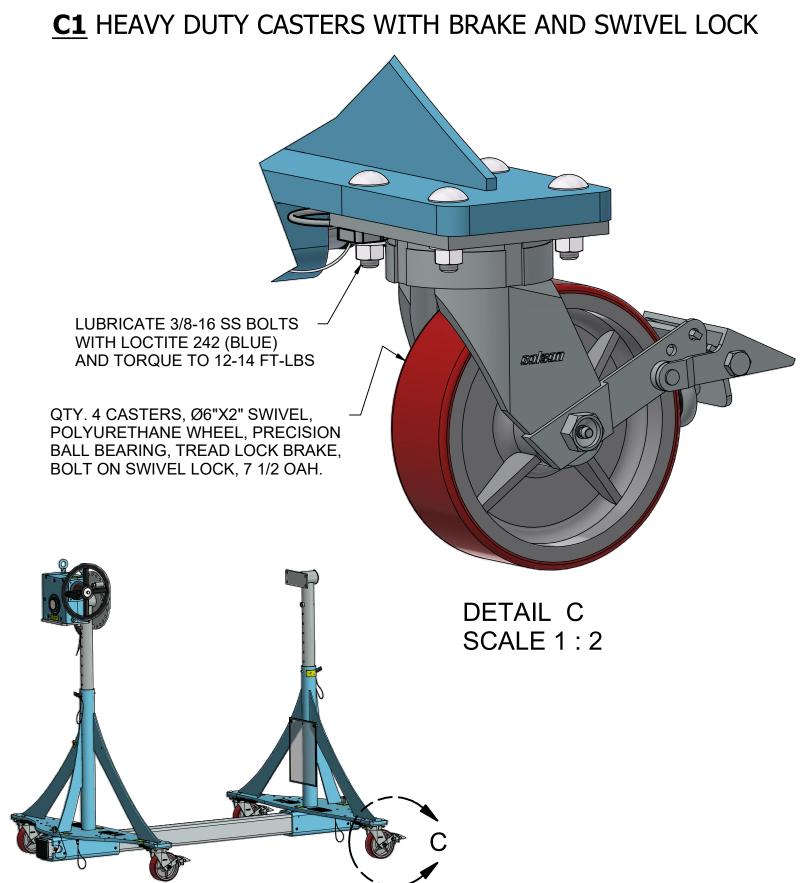


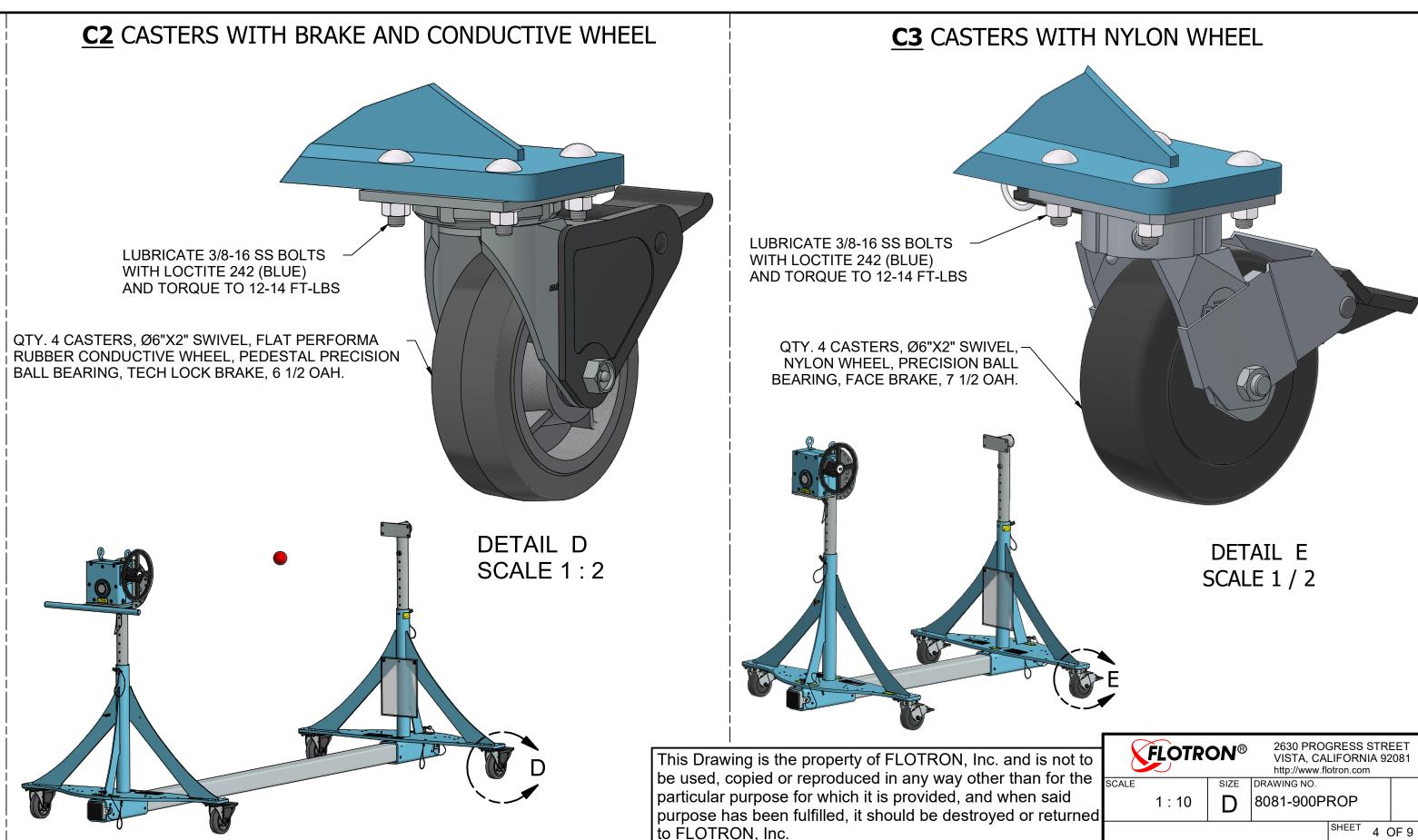
DETAIL E

SCALE 1 / 2

CASTER OPTIONS







D CORDLESS HAND DRILL INPUT

AVAILABLE WITH **DR** OPTION ONLY.

WHEN <u>D</u> OPTION IS CHOSEN, <u>DR</u> GEARBOX WILL HAVE A 600:1 RATIO.

DRILL MAX RPM IS 300 RESULTING IN A MAX OUTPUT PAYLOAD ROTATION OF .5 RPM.

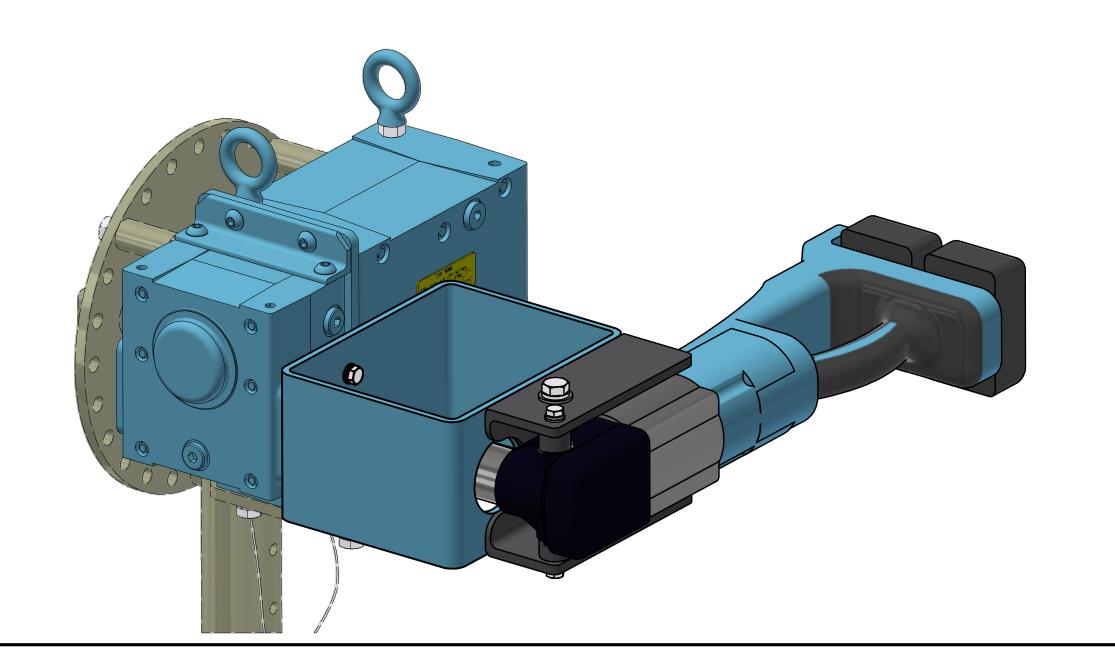
WITH <u>D</u> OPTION, FULL GEARBOX TORQUE CAPACITY CAN BE USED.

COMES STANDARD WITH CLUTCH BETWEEN THE GEARBOX AND HAND CRANK

TO PREVENT OVER-TORQUE OF GEARBOX IN CASE INDEX PIN WAS

NOT REMOVED BEFORE ROTATION OR PAYLOAD ECCENTRICITY IS TOO HIGH.

(SHOWN ABOVE WITH THE IND(S)15 INDEX PLATE AND P8 TRUNNION INTERFACE MOUNT OPTIONS)



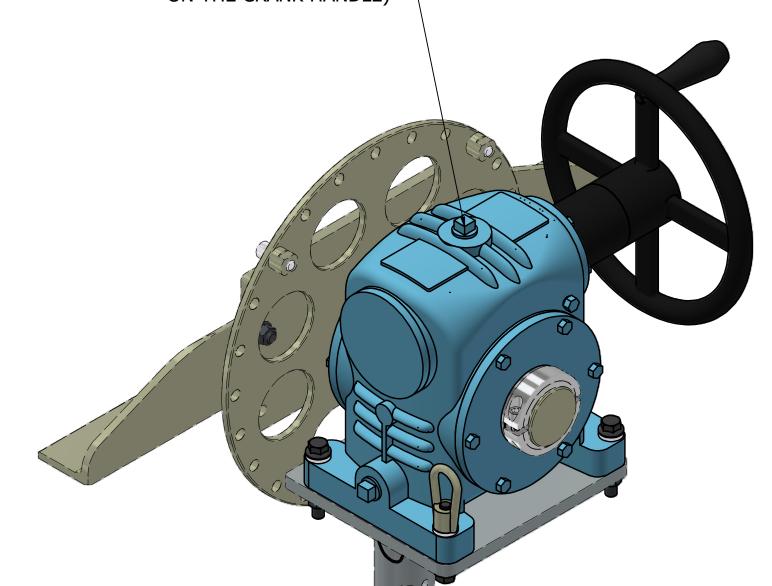
NON-STANDARD HAND CRANK GEARBOX OPTIONS

SR GEARBOX OPTION (60:1)

LOW BACKLASH, NON-BACKDRIVING GEARBOX WITH DOUBLE ENVELOPING WORM GEAR DRIVE.

(SHOWN ABOVE WITH THE IND(S)15 INDEX PLATE AND P12/A30 TRUNNION INTERFACE MOUNT OPTIONS)

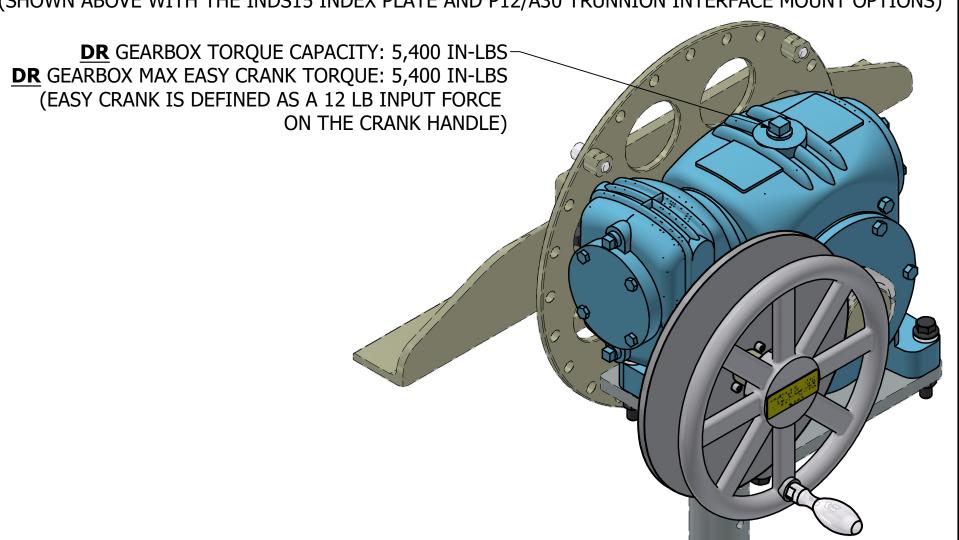
SR GEARBOX TORQUE CAPACITY: 5,400 IN-LBS-SR GEARBOX MAX EASY CRANK TORQUE: 2,000 IN-LBS (EASY CRANK IS DEFINED AS A 12 LB INPUT FORCE ON THE CRANK HANDLE)



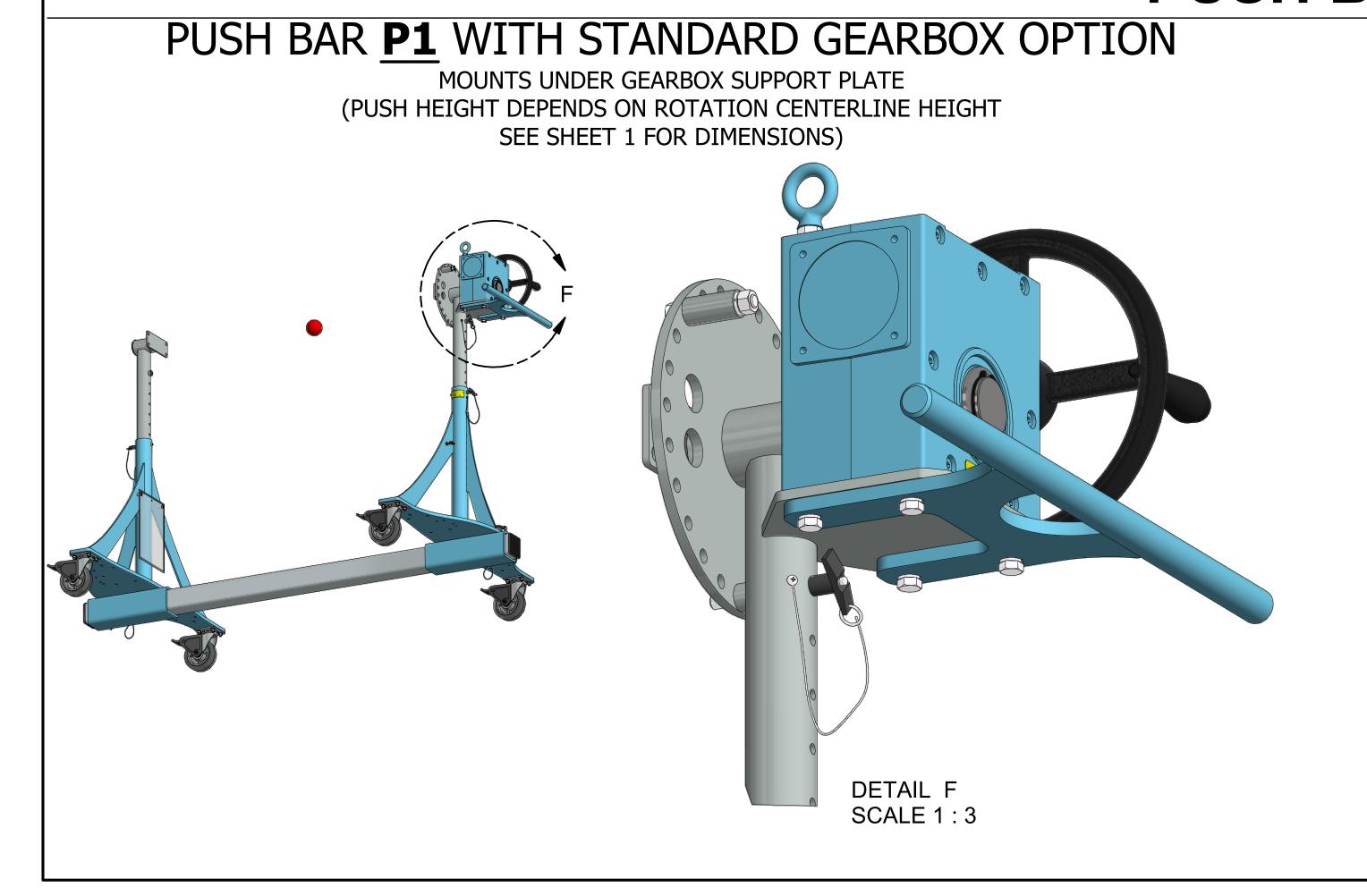
DR GEARBOX OPTION (250:1)

LOW BACKLASH, NON-BACKDRIVING GEARBOX
WITH DOUBLE ENVELOPING WORM GEAR DRIVE.
COMES STANDARD WITH CLUTCH BETWEEN THE GEARBOX AND HAND CRANK
TO PREVENT OVER-TORQUE OF GEARBOX IN CASE INDEX PIN IS
NOT REMOVED BEFORE ROTATION OR PAYLOAD ECCENTRICITY IS TOO HIGH
HANDWHEEL CAN BE REMOVED TO REVEAL A 3/8" SQUARE
MALE INPUT FOR USE WITH A HAND DRILL (NOT PROVIDED).

(SHOWN ABOVE WITH THE INDS15 INDEX PLATE AND P12/A30 TRUNNION INTERFACE MOUNT OPTIONS)



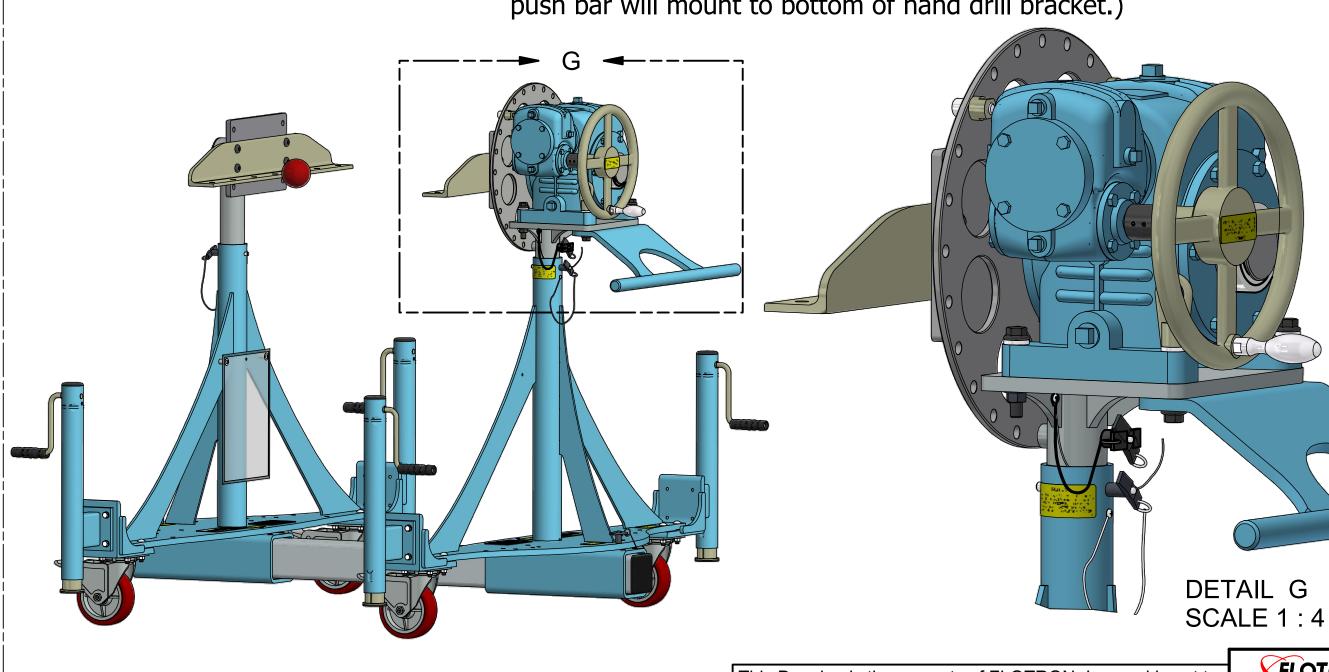
PUSH BAR OPTION





(PUSH HEIGHT DEPENDS ON ROTATION CENTERLINE HEIGHT SEE SHEET 1 FOR DIMENSIONS)

(Note: When cordless hand drill input option (D) is chosen, push bar will mount to bottom of hand drill bracket.)



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TOW HARDWARE OPTIONS

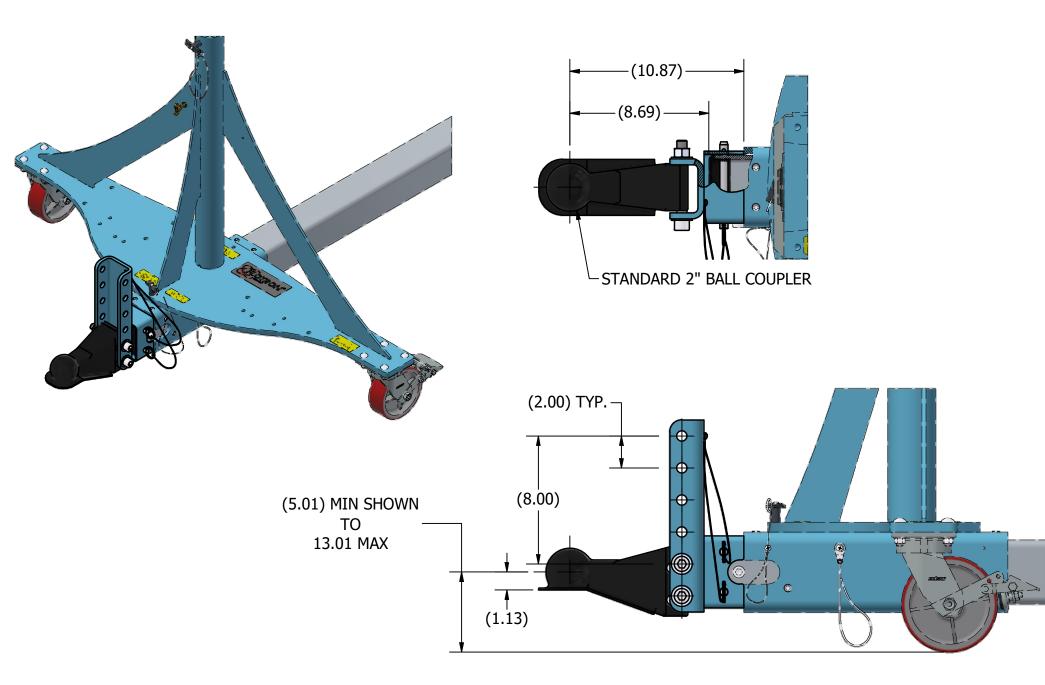
T1 REMOVEABLE TOW RING INSERT (1.00) (4.26) MIN SHOWN TO 12.26 MAX (1.00) (1.00) (1.00) (1.00) (1.00)

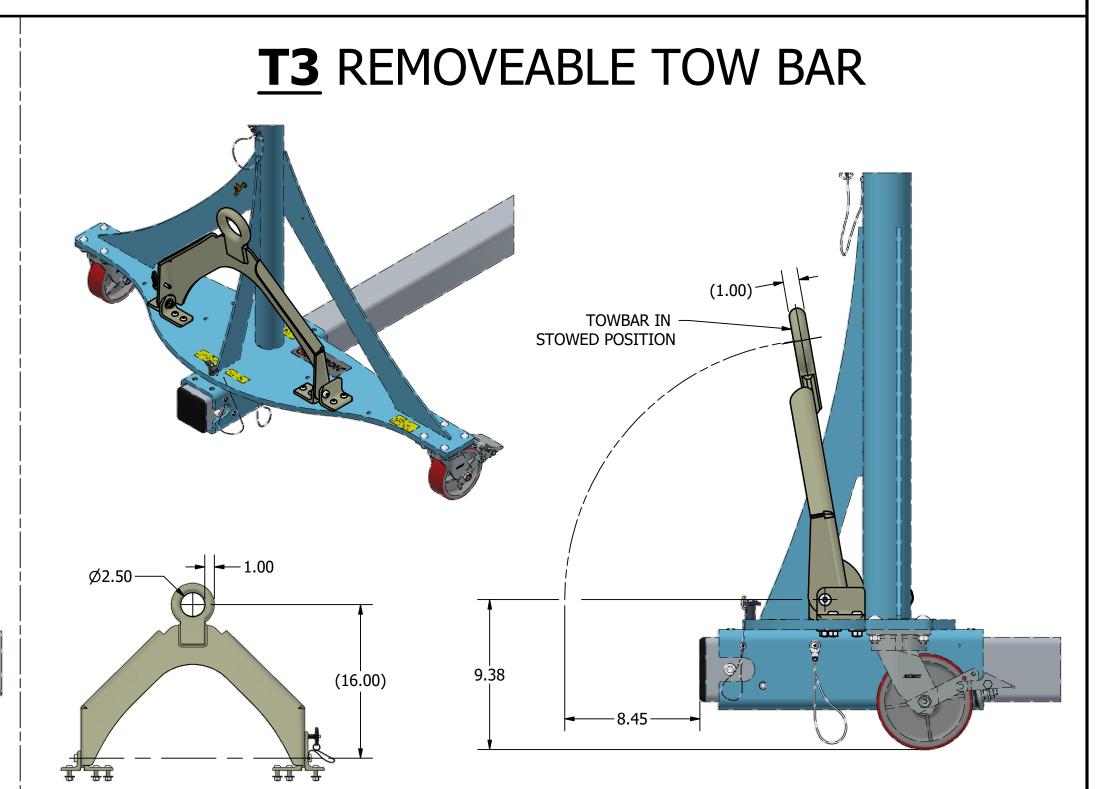
-(6) SET SCREWS PER END FRAME USED

TO SECURE THE MAIN BEAM POSITION

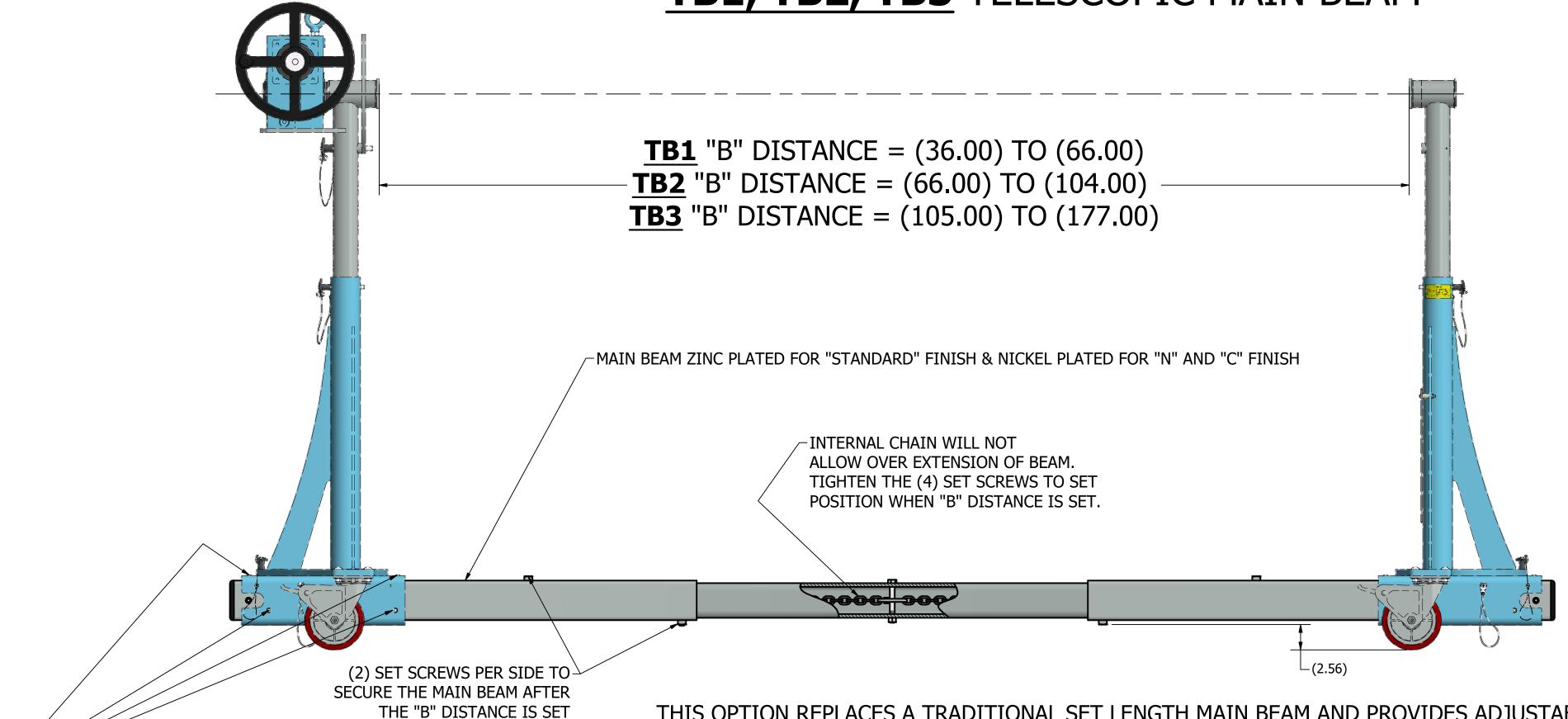
(4) ON THE TOP FACE AND (2) ON ONE SIDE

T2 REMOVEABLE TOW BALL INSERT





TB1, TB2, TB3 TELESCOPIC MAIN BEAM



THIS OPTION REPLACES A TRADITIONAL SET LENGTH MAIN BEAM AND PROVIDES ADJUSTABILITY OF BEAM LENGTH.

TB1 - ALLOWS ADJUSTMENT OF THE "B" DISTANCE FROM 36"-66" WITH THE BEAM MINIMALLY EXTENDING PAST THE END FAME.

TB2 - ALLOWS ADJUSTMENT OF THE "B" DISTANCE FROM 66"-104" WITH THE BEAM MINIMALLY EXTENDING PAST THE END FAME.

TB3 - ALLOWS ADJUSTMENT OF THE "B" DISTANCE FROM 105"-177" WITH THE BEAM MINIMALLY EXTENDING PAST THE END FAME.

END FRAMES CAN ALSO BE ADJUSTED DOWN TO A "B" DISTANCE OF 49" WITH THE BEAM EXTENDING BEYOND THE END FRAME. NOTE: IF THE "B" DISTANCE IS ADJUSTED TO LESS THAN 49", THE LONGITUDINAL STABILITY WILL DROP BELOW .60G.

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PROOF LOAD TEST (PLT) PROCEDURE

STATIC PROOF LOAD REQUIREMENTS:

PROOF LOAD WEIGHT = 2 X 960 LBS = **1,920 LBS (MIN)** 100% RATED TORQUE = **5,400 IN-LBS (MIN)**

STATIC PROOF LOAD TEST PROCEDURE (DO **NOT** ROTATE LOAD):

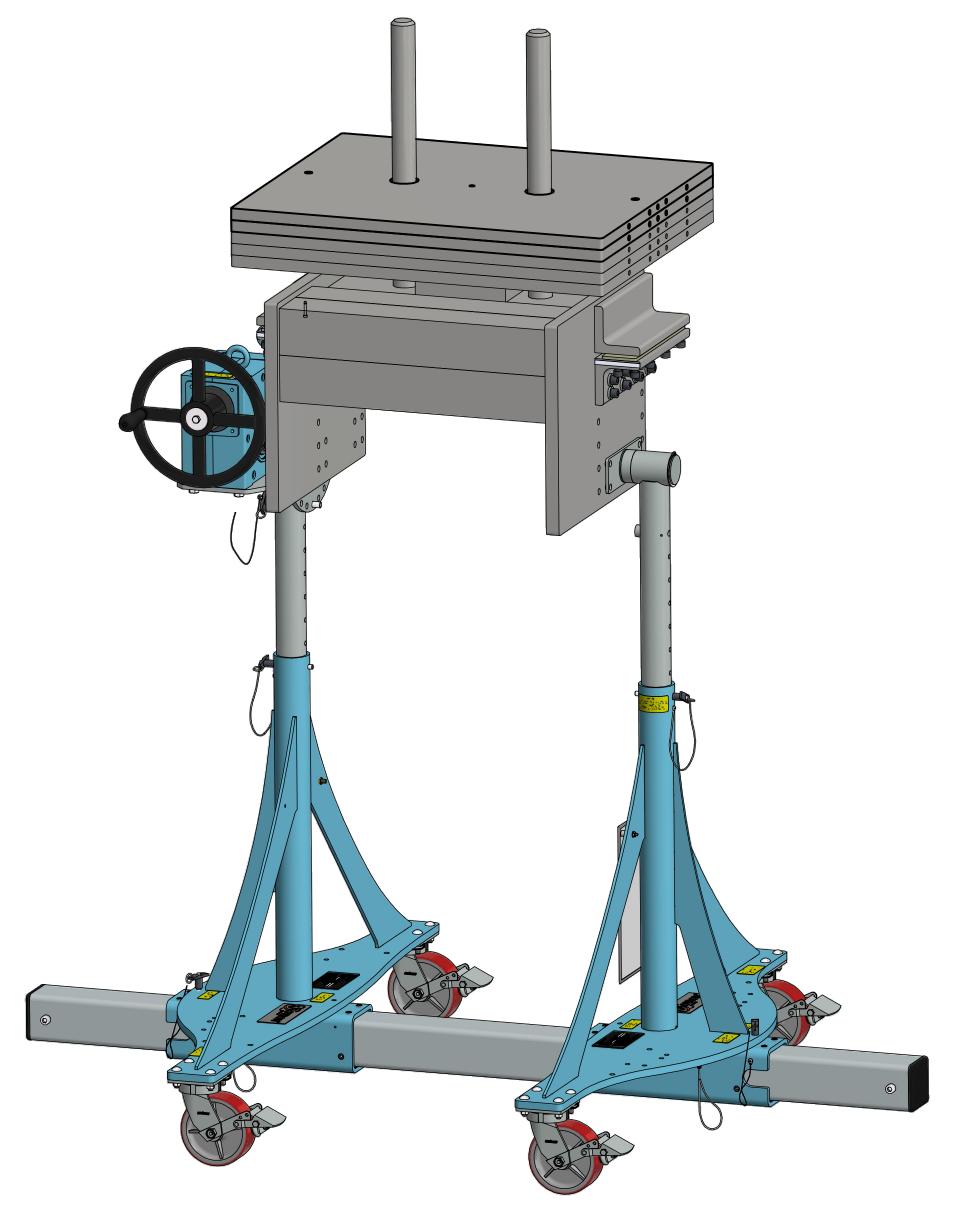
- I. LOAD APPROPRIATE NUMBER OF WEIGHTS WITH CRANE OR FORKLIFT TO MEET PROOF LOAD WEIGHT AND TORQUE REQUIREMENTS LISTED ABOVE.
- II. WEIGH PROOF LOAD TO MAKE SURE IT MEETS REQUIREMENT AND TAKE A PICTURE OF PROOF LOAD ON SCALE WITH LOAD VALUE ON SCALE VISIBLE FOR PROOF LOAD REPORT.
- III. INSTALL PROOF LOAD ONTO FIXTURE.
- IV. STOP AS REQUIRED TO REVIEW AND INSPECT ANY UNEXPECTED NOISES OR MOVEMENTS.
- V. START TIMER, TAKE A PICTURE OF CLOCK ON FIXTURE, AND HOLD FOR (5) FIVE MINUTES. AFTER 5 MINUTES, TAKE A SECOND PICTURE OF CLOCK ON FIXTURE AND VISUALLY INSPECT FOR CRACKS, DEFORMATION, ETC.

IF JACK (J1-J4) OPTION IS CHOSEN:

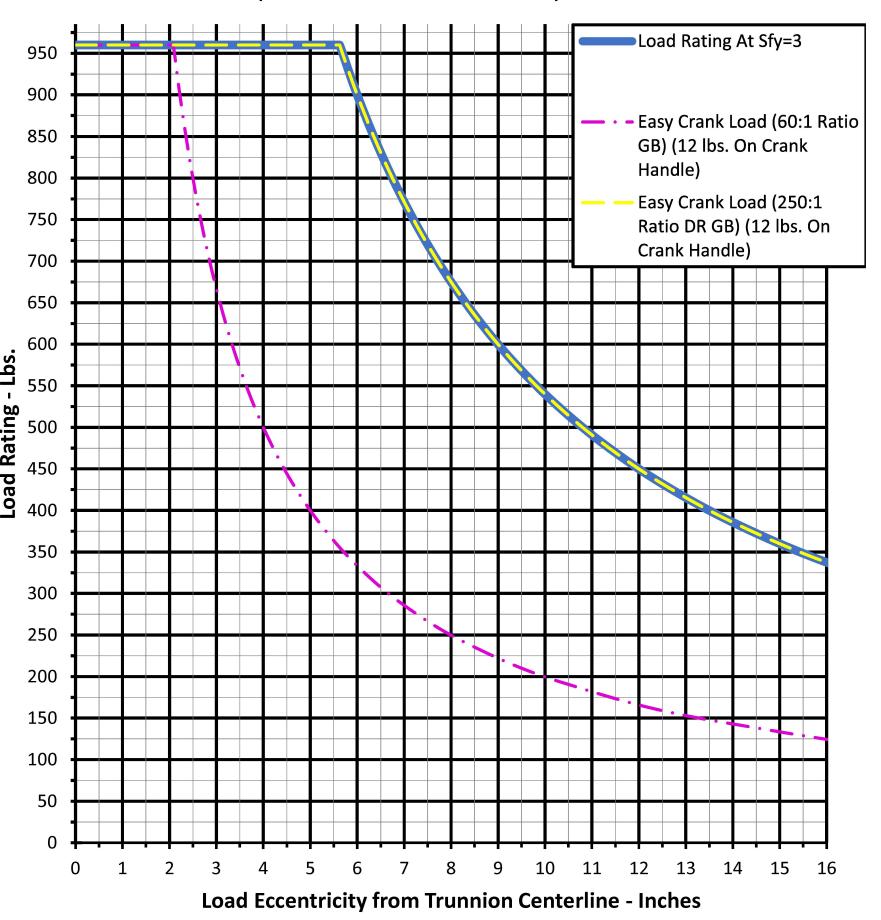
- 1. LOWER ALL JACKS TO CONTACT THE FLOOR WITHOUT COMPLETELY OFFLOADING WEIGHT FROM CASTERS.
- 2. AT ONE JACK LOCATION, EXTEND JACK TO RAISE CASTER 1/2" FROM FLOOR.
- 3. REVIEW THE REMAINING JACK POSITIONS AND DOCUMENT CLEARANCE TO FLOOR IF ANY.
- 4. EXTEND THE PARTNER JACK MOUNTED ON THE SAME END FRAME TO RAISE THE CASTER 1/2" FROM FLOOR LEVEL.
- 5. FOLLOW THE PROCEDURE ON THE OPPOSITE END FRAME.
- 6. START TIMER, TAKE A PICTURE OF CLOCK ON FIXTURE, AND HOLD FOR (5) FIVE MINUTES. AFTER 5 MINUTES, TAKE A SECOND PICTURE OF CLOCK ON FIXTURE AND VISUALLY INSPECT FOR CRACKS, DEFORMATION, ETC.

DELIVERABLE REPORT REQUIRED. IT MUST INCLUDE:

- A) A SUMMARY OF THE TEST PROCEDURE
- B) A PICTURE OF THE ACTUAL MEASURED WEIGHT OF PROOF LOAD ON SCALE. WEIGHT MUST BE EQUAL TO OR HIGHER THAN REQUIRED WEIGHT.
- C) PICTURE OF TIMER WITH PROOF LOAD THAT SHOWS 5 MINUTES OR LONGER FOR EACH TEST.
- D) VISUAL INSPECTION RESULTS

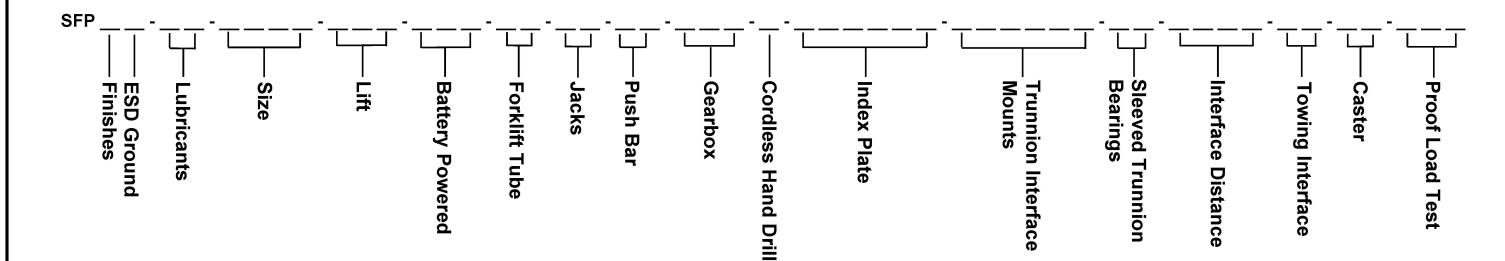


SFP-655 Dynamic Loading (1.0 G Vertical & 0.5 G Horizontal)



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Finishes

(blank) - Standard finishes

C - - - - Clean room finishes (except hydraulic)

N - - - - Electroless nickel plate (No Zinc)

ESD Ground

(blank) - No ESD ground

E - - - - Ground lug and drag chain for use in EPA's

Lubricants

(blank) - Standard lubricants

L1 - - - - Trunnions, caster swivel bearings, and jacks (if

applicable) lubricated with Krytox GPL 207 L2 - - - Trunnions, caster swivel bearings, and jacks (if applicable) lubricated with Braycote 601EF

NOTE: "C" finish includes L1 lubricants

635 - - - 35" wide frame; 31"-39" payload swing radius; 335 lb. capacity

645 - - - 45" wide frame; 25.8"-33.8" payload swing radius; 1300 lb. capacity

655 - - - 55" wide frame; 35.5"-47.5" payload swing radius; 960 lb. capacity

(blank) - Adjustable risers

EML - - - Electromechanical lift

Battery Powered

(blank) - No battery

BAT - - - Battery powered lift for EML option

Forklift Tubes

(blank) - No forklift tubes

F1 - - - - Frame mounted forklift tubes (Available for 645 & 655 sizes only)

Jacks

(blank) - No jacks provided

J1 - - - - Jacks (see orientation dwg)

J4 - - - Jacks (see orientation dwg)

J2 - - - - Jacks (see orientation dwg)

J3 - - - - Jacks (see orientation dwg)

Push Bar

(blank) - No push bar

P1 - - - - Gearbox mounted push bar

(Not required for EML option – comes integrated)

Gearbox

(blank) - 60:1 standard gearbox

SR - - - - 60:1 low backlash gearbox (available for 645 & 655 sizes only)

DR - - - 250:1 low backlash, stairstep resistant gearbox with clutch on input shaft to prevent over torque. (Available for 645 & 655 sizes only) (Ratio will be 600:1 when "D" option is selected)

Cordless Hand Drill Input

(blank) – No hand drill

D - - - - Battery powered hand drill mounted to gearbox input shaft (Must select DR gearbox option) (Available for 645 & 655 sizes only)

Proof Load Test

(blank) - - No proof load test

PLT - - - - Standard proof load Test (includes deliverable report)

Caster

(blank) - - Standard caster with brake

C1 - - - - Heavy duty caster with brake and swivel lock

C3 - - - - Caster with Nylon wheel to improve rollability

C2 - - - - Standard caster with brake and conductive wheel

Towing Interface

(blank) - - No towing interface

T1 - - - - Removable lunette ring towing interface – Available for 645 & 655

sizes only. (attaches to main beam)

T2 - - - - Removable ball coupler towing interface— Available for 645 & 655 sizes only. (attaches to main beam)

T3 - - - - Removable tow bar – Available for 645 & 655 sizes only. (attaches to end frames)

Interface Distance

B"XXX"- - Interface distance where "XXX" = length in inches between trunnion interface mounts. (1" increments within the following range)

> MAX 141" 30" 37" 141" SFP-645 SFP-655 49" 141"

TB1 - - - - Telescopic main beam allows for interface distance range of approx. 36"-66" with main beam minimally sticking out past end frames. Exact interface distance range varies depending on size and configuration options. See sales for more information.

TB2 - - - - Same setup as TB1 option with a range of 66"-104"

TB3 - - - - Same setup as TB1 option with a range of 105"-177"

TB1 & TB2 & TB3 options are not compatible with EML, T1, and T2 options. If TB1 option is used with 655 size, longitudinal stability may be less than 1/2G.

Sleeved Trunnion Bearings

(blank) - - - Standard trunnion bearings

B1 - - - - - PTFE sleeved bushings in bearing housings (Recommended for long or flexible payloads)

Trunnion Interface Mounts

P8 - - - - - Four bolt 3" x 8" mounting plate

(not available with SR or DR options)

SA10 - - - - 10" long angle mount (635 size only)

SB10 - - - - 10" long angle mount with standard hole pattern.

(635 size only)

1018 - - - - 2" x 12.5" mounting plate (635 size only)

A30 - - - - 30" long angle mount (645 & 655 sizes only with standard gearbox)

B30 - - - - 30" long angle mount with standard hole pattern.

(645 & 655 sizes only with standard gearbox)

P12 - - - - 8" x 12" mounting plate (this is available only with SR or DR option).

P12/A30 - - P12 (8" x 12") mounting plate with A30 angle bolted to P12.

(this is available only with 645 & 655 sizes with SR or DR option)

P12/B30 - - P12 (8" x 12") mounting plate with B30 angle bolted to P12. (this is available only with 645 & 655 sizes with SR or DR option)

Special angle interface lengths available upon request. NOTE:

Index Plate

(blank) - - - No index plate

IND15 - - - - 15° index plate

INDS15- - - 15° index plate with index stops

Special index plate hole spacing available upon request. NOTE:

Example: SFP <u>C</u> - <u>655</u> <u>A30</u> **B** 120 Inside Length Angle Interface between Trunnion frame width Clean room finishes interfaces = 120"

SFP-600 SERIES CREATING A MODEL NUMBER

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OPTION MATRIX COMPATIBILITY

													SF	P 64	5 & 6	555 S	ERIE	S															
		LI	FT	BAT POW	TERY 'ERED	FORKLIFT TUBES PUSH BAR			H BAR	GEARBOX			CORDLESS HAND DRILL		INDEX PLATE		TRUNNION INTERFACE INTERFACE DISTANCE TOWING INTERFA										NTERFAC						
		BLANK	EML	BLANK	BAT	BLANK	F1	BLANK	P1	BLANK	SR	DR	BLANK	D	BLANK	IND15	INDS15	P8	SA10	SB10	1018	A30	B30	P12	P12/A30	P12/B30	TB1	TB2	TB3	BLANK	T1	T2	T3
LIFT	BLANK - STANDARD EML				Х				Х										N/A N/A	N/A N/A	N/A N/A						Х	Х	Х				
BATTERY POWERED	BLANK - NO BATTERY	V																	N/A	N/A N/A	N/A N/A												
FORKLIFT TUBES	BAT BLANK - NO TUBES	۸																	N/A N/A	N/A	N/A												
	F1 BLANK - NO PUSH BAR																		N/A N/A	N/A N/A	N/A N/A						X	X	Х				Х
PUSH BAR	P1		Χ											V					N/A	N/A	N/A			N/	V	V							
GEARBOX	BLANK - STANDARD SR													- X				Х	N/A N/A	N/A N/A	N/A N/A	Х	X	X	X	X							
	DR BLANK - NO DRILL																	Χ	N/A N/A	N/A N/A	N/A N/A	Χ	X										
CORDLESS HAND DRILL	D									Χ	-					-	-	Χ	N/A	N/A	N/A	Χ	X										
INDEX PLATE	BLANK - NO INDEX IND15													-					N/A N/A	N/A N/A	N/A N/A												
	INDS15 P8										X	X		-					N/A N/A	N/A N/A	N/A N/A												
TRUNNION INTERFACE	SA10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SB10 1018	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
	A30 B30										X	X		X					N/A N/A	N/A N/A	N/A N/A												
	P12									Х									N/A	N/A	N/A												
	P12/A30 P12/B30									X									N/A N/A	N/A N/A	N/A N/A												
INTERFACE DISTANCE	TB1 TB2		X				X												N/A N/A	N/A N/A	N/A N/A												
	TB3		X				X												N/A	N/A	N/A												
TOWNED INTEREST	BLANK - NO TOW T1																		N/A N/A	N/A N/A	N/A N/A												
TOWING INTERFACE	T2 T3						V												N/A N/A	N/A N/A	N/A N/A												
NOTE:	1. OPTIONS SHOWN AS	X	ARE NO	T COMPAT	I IBLE WIT	H OTHER (OPTIONS		I	ı	I	1	1	I	1				14/74	14/74	19/74		I	1	ı	<u> </u>	ı	l	l	ı			
IVOIL.	2. OPTIONS SHOWN AS	N/A	ARE NO	T AVAILAB	LE FOR SF	P-645 & S	SFP-655	IOT DECO		D																							
	 OPTIONS SHOWN AS OPTIONS NOT SHOWI 	-		MPATIBLE			NIO ROT I	NOT KECOI	IVIIVIENDE	ט																							

