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INGERSOLL-RAND
MATERIAL HANDLING



ZIMMERMAN

REGISTRATION FORM

Registration Form For Rail Systems Catalog

Please complete and fax this registration form to **(248) 398-1374 Attention: Marketing Services** so that future revisions or additions can be sent to your attention.

Please record my address for update Service for Rail Systems and Trolleys.

Name: _____	Title: _____	
Company: _____		
Address: _____ _____		
City: _____	State: _____	Zip _____
Phone: _____	Ext: _____	
Fax: _____		

INGERSOLL-RAND
MATERIAL HANDLING

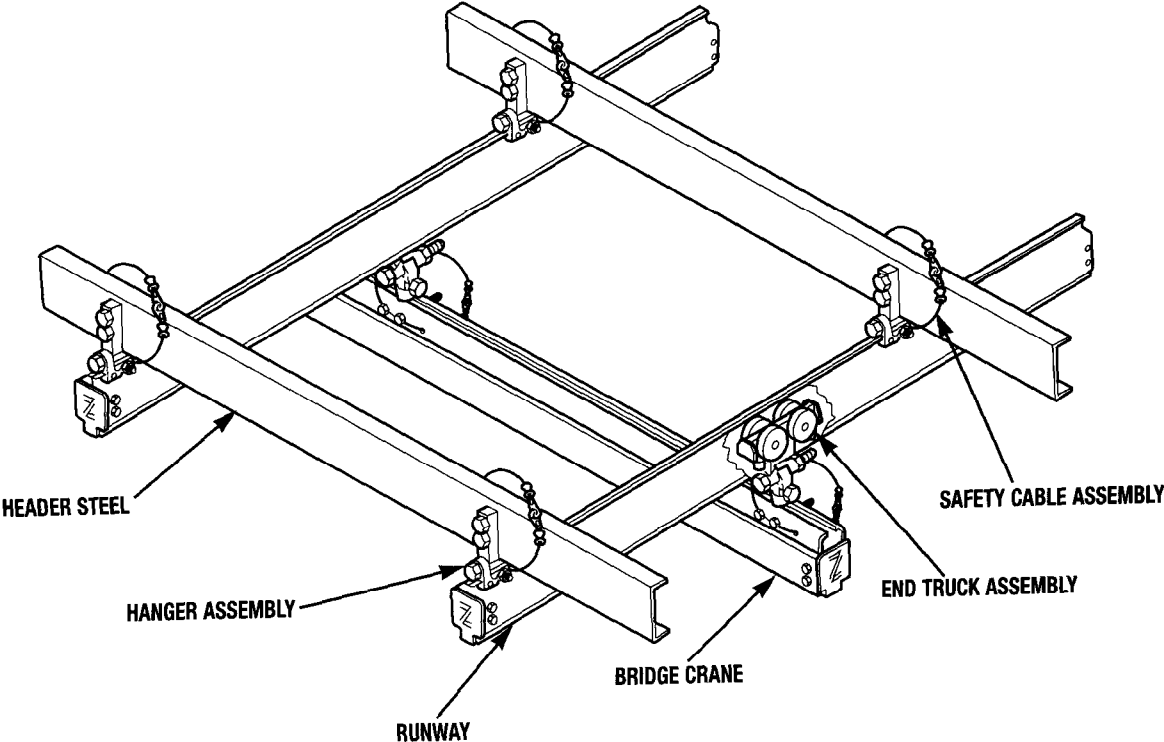
INTRODUCTION TO ZIMMERMAN

Zimmerman Handling Systems has been the leader in Ergonomic Lift-Assist products and systems since 1959. Our commitment to customer satisfaction through ongoing product improvement, new product development and unparalleled versatility in custom design and fabrication has created a company that specializes in ergonomic solutions. Out of this commitment to our customers, our new generation of light duty, ergonomic enclosed track has evolved. Manufactured in our dedicated rail systems facility in LaVergne, TN., we are proud to introduce the most complete and intrinsically safe rail systems in the world. Offered in several cross sections in powder coated carbon steel, clear anodized aluminum or polished stainless steel, you will find a high quality solution ideally suited to your application.

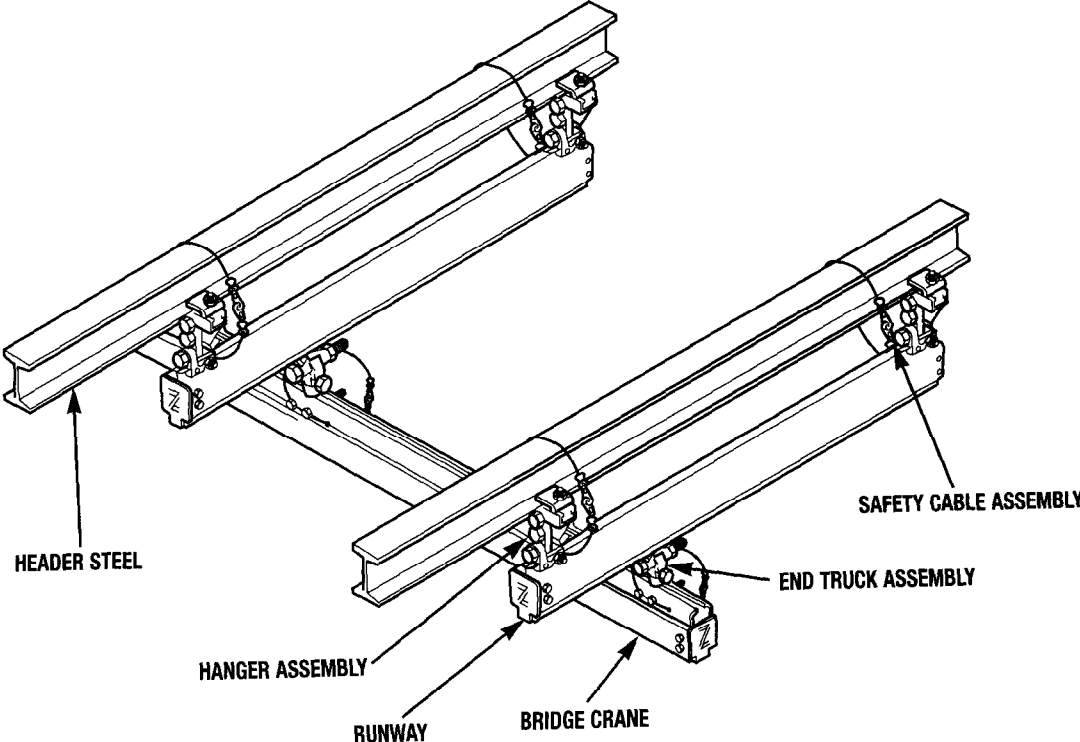
We invite you to explore our sales literature, technical manuals, installation, operation and maintenance instructions in detail. Or, if you prefer, contact our highly trained distributor and regional sales manager in your area for application and pricing assistance. Our doors are always open in our manufacturing facilities or our regional offices to get a “hands-on” opportunity to try the look and feel of Zimmerman quality.

Your satisfaction is our goal. Let us use our experience and your input to help address the productivity, quality, safety and ergonomics issues that are the primary challenge in industry today.

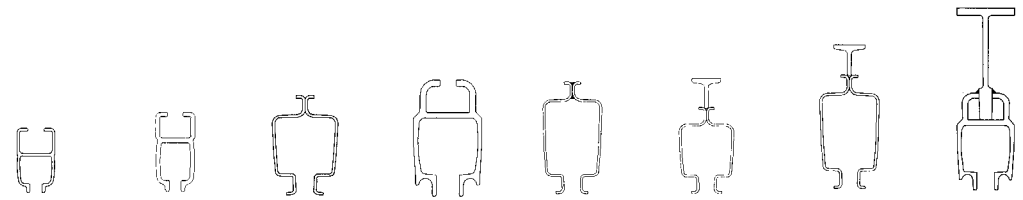
TYPICAL SYSTEM ILLUSTRATION PERPENDICULAR TO HEADER STEEL



TYPICAL SYSTEM ILLUSTRATION PARALLEL TO HEADER STEEL



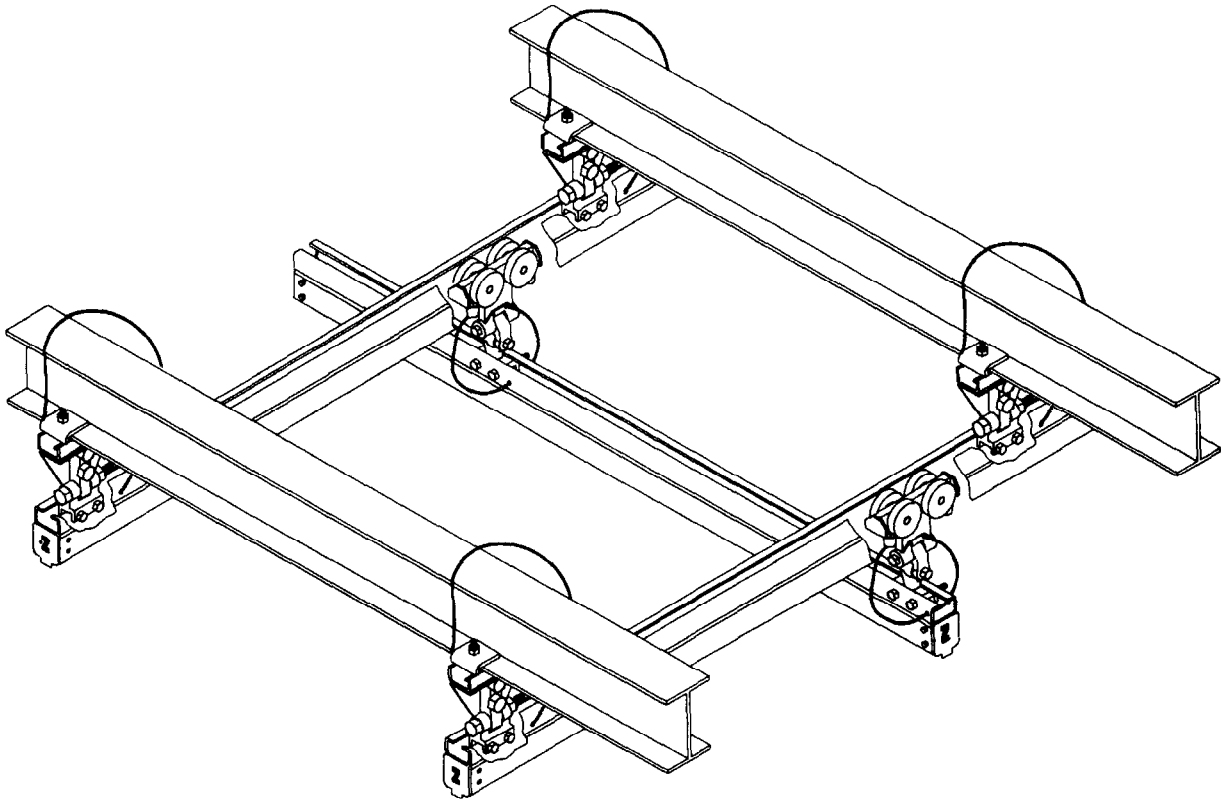
ZIMMERMAN QUICK REFERENCE ENCLOSED TRACK LOAD COMPARISON CHART



SPAN FT.	ZRAT	ZRA1	ZRS2	ZRA2	ZRS3	ZRS2T	ZRS3T	ZRA2T
5	655	2018	2600	2900	2600	2600	2600	2900
6	455	1401	2600	2900	2600	2600	2600	2900
7	334	1029	2600	2900	2600	2600	2600	2900
8	256	788	2600	2900	2600	2600	2600	2900
9	202	623	2235	2566	2600	2600	2600	2900
10	164	504	1810	2079	2600	2600	2600	2900
11	135	417	1496	1718	2581	2600	2600	2900
12	114	350	1257	1443	2169	2600	2600	2900
13	97	298	1071	1230	1848	2600	2600	2900
14	84	257	923	1060	1593	2332	2600	2900
15	73	224	804	924	1388	2050	2600	2900
16	64	197	707	812	1220	1816	2540	2900
17	57	175	626	719	1080	1585	2215	2900
18	51	156	558	642	964	1424	1990	2900
19	45	140	501	576	865	1286	1799	2606
20	41	126	452	520	780	1146	1603	2352
21	-	114	410	471	708	1046	1463	2133
22	-	104	374	422	645	958	1340	1956
23	-	95	342	393	590	867	1213	1778
24	-	88	-	361	-	-	-	1633
25	-	81	-	333	-	-	-	1505
26	-	75	-	307	-	-	-	1392
27	-	69	-	285	-	-	-	1290
28	-	64	-	265	-	-	-	1199

NOTE: ABOVE FIGURES ARE IN LBS. AND AT L/450 DEFLECTION.

ZRAT ALUMINUM RAIL AND COMPONENTS



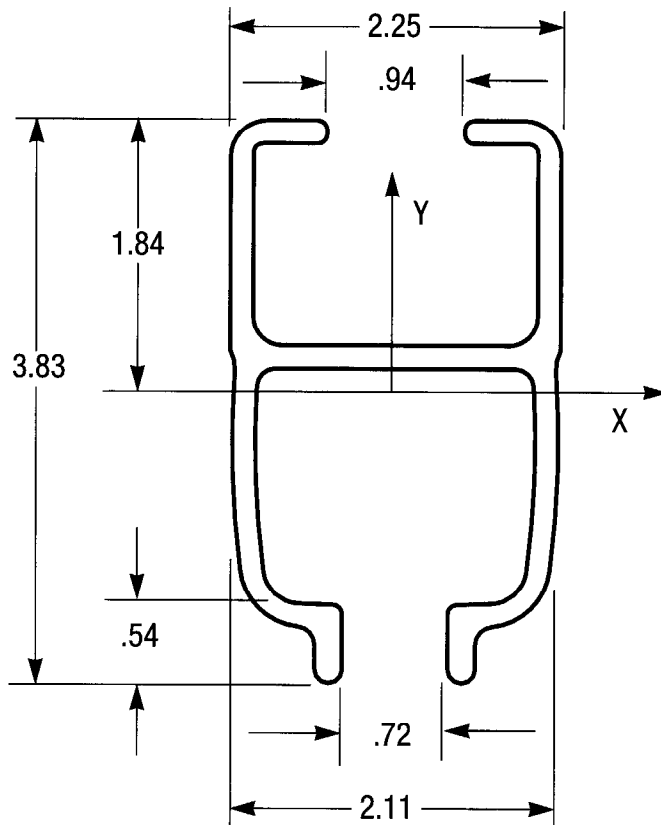
ENGINEERING DATA FOR ZRAT ALUMINUM RAIL

1. All rail and hangers must be installed in accordance with Zimmerman Handling Systems' (Z.H.S.) instructions.
2. Rail provided is ZRAT aluminum alloy.
3. The rail or bridge beam provided is modular design, weld free application, and self aligning with complete bolt-together capability at all splice joints and hangers.
4. All rail sections provided are saw cut square to required length by Z.H.S. All rail joints should be flush when installation is completed.
5. The capacity of the rail, monorail or bridge crane will be determined so that deflection under rated load shall not exceed 1/450 of the span. Lateral deflection will not be accepted.
6. The allowable stresses applied must not exceed 20% of the **minimum yield strength** of the materials used.
7. The maximum capacity for all rail provided by the contractor including hoist, product, process equipment, and all attachments, etc., must not exceed the capacity specified below: ZRAT Aluminum Rail - acceptable for maximum capacities up to and including 500 lbs.
8. For bridge crane or hoist application(s), the maximum overhang of the bridge girder to the center of a runway rail must not exceed 12.00". (For larger overhangs consult the factory.)
9. All bridge cranes, runway, and monorail, must be installed straight, parallel, level and at the same elevation. Installation tolerance cannot exceed the values specified below:
 - a. **Longitudinal leveling.** Multiple runways and single rail systems .250" in overall length, with a maximum rate of change of no more than .125" on twenty-foot centers.
 - b. **Elevation runway to runway** .250" in span, maximum rate of change .125" on twenty-foot centers.
 - c. **Centering runway-to-runway** .250" in overall length, maximum rate of change .125" on twenty-foot centers.
 - d. **Centering for single rail** to a parallel conveyor of workstation will be $\pm .500$ " in overall length of the system, maximum rate of change .125" on twenty-foot centers.
10. Sway bracing should be used when the hanger meets or exceeds 24.00" in length. (See system installation manual.)
11. One month after system buy off, the enclosed rail system should be inspected and re-leveled by the installation contractor. All bolts at the splice joints, hangers and support structure should be re-checked for proper torque. Abnormalities noted by the inspector must be reported to Z.H.S. immediately.
12. All splice connections shall not exceed 12" from hanger points.
13. All trolley running surfaces must be aligned flush in accordance with this specification and present no shock loading at splice connections. Transverse tilt will not be accepted.
14. Tension tubes at all splice connections will be aligned and welded by Z.H.S.
15. Joint modification or holes required in track section(s) will be by drilling or saw cutting only. Flame cutting of holes or splice joints is not permitted.
16. Where hanger rods are used, the allowable stress will be 20% of the minimum yield strength of the material provided.
17. All hangers must be installed true and vertical. All suspension fittings should bear the load equally.
18. All bolts, nuts, fasteners, attachments, etc., required for enclosed rail systems will be provided by Z.H.S.
19. All double girder bridge cranes provided will incorporate diagonal bracing for parallel stabilization.

TROLLEYS

1. All trolleys are manufactured by Zimmerman Handling Systems.
2. All aluminum trolleys consist of high-tensile aluminum-magnesium alloy body.
3. All steel trolleys consist of a welded, stamped steel body.
4. All trolley wheels provided for hoists, bridge cranes, and related equipment must conform to Z.H.S.'s standards.
5. Trolley wheels are delrin, machined symmetrically true with the axis. All trolley wheels are retainer type, designed for a single row of high quality, precision-ground ball bearings. All trolley wheels have a stud that is press-fitted into the trolley body.
6. Trolley side guide rollers are delrin machined symmetrically true with the axis.
7. All trolleys are equipped with safety lugs so in the event of a wheel failure the trolley cannot come out of the rail.
8. All bearings are protected by grease and dust seals.

CROSS SECTION • ZRAT/PART NO. 31000



MOMENT OF INERTIA: $I_{xx} = 2.206 \text{ IN}^4 [9.182\text{E}5 \text{ mm}^4]$

$I_{yy} = 1.348 \text{ IN}^4 [5.611\text{E}5 \text{ mm}^4]$

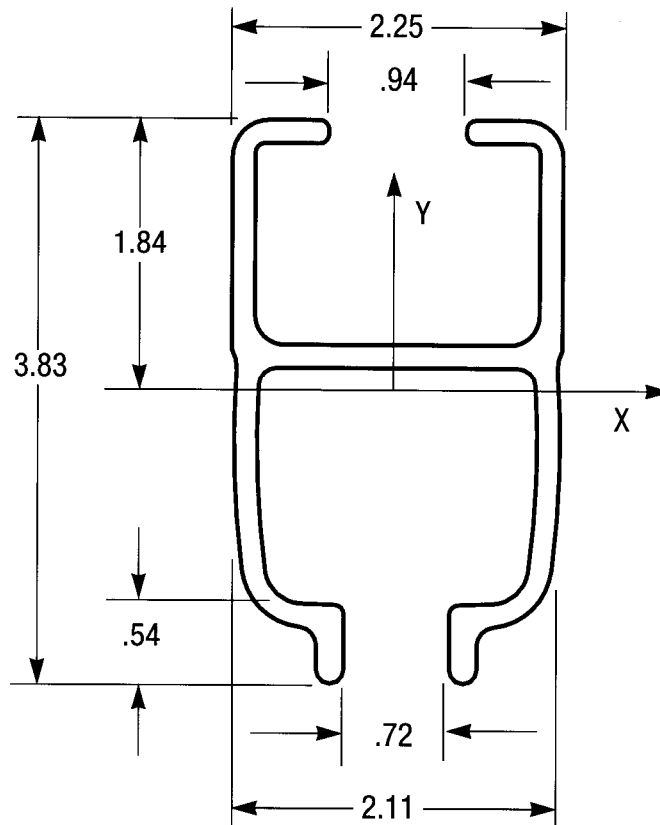
STANDARD LENGTHS:

WEIGHT: 2.146 LB./FT. [3.194 Kg/M]

LIVE LOAD DEFLECTIONS • ZRAT/PART NO. 31000

RAIL/BRIDGE SPAN				DEFLECTION LIMITS				POINT LOAD			
FT.	IN.	m	mm	1/450 IN.	1/450 mm	1/550 IN.	1/550 mm	1/450 lbs.	1/450 kg.	1/550 lbs.	1/550 kg.
5	60	1.52	1524	.13	3.4	.11	2.8	655	298	536	244
6	72	1.83	1828.8	.16	4.1	.13	3.3	455	207	372	169
7	84	2.13	2133.6	.19	4.7	.15	3.9	334	152	273	124
8	96	2.44	2438.4	.21	5.4	.17	4.4	256	116	209	95
9	108	2.74	2743.2	.24	6.1	.20	5.0	202	92	165	75
10	120	3.05	3048.0	.27	6.8	.22	5.5	164	75	134	61
11	132	3.35	3352.8	.29	7.5	.24	6.1	135	61	111	50
12	144	3.66	3657.6	.32	8.1	.26	6.7	114	52	93	42
13	156	3.96	3962.4	.35	8.8	.28	7.2	97	44	79	36
14	168	4.27	4267.2	.37	9.5	.31	7.8	84	38	68	31
15	180	4.57	4572.0	.40	10.2	.33	8.3	73	33	59	27
16	192	4.88	4876.8	.43	10.8	.35	8.9	64	29	52	24
17	204	5.18	5181.6	.45	11.5	.37	9.4	57	26	46	21
18	216	5.49	5486.4	.48	12.2	.39	10.0	51	23	41	19
19	228	5.79	5791.2	.51	12.9	.41	10.5	45	20	37	17
20	240	6.10	6096.0	.53	13.5	.44	11.1	41	19	33	15

HOW TO ORDER • ZRAT ALUMINUM RUNWAY OR MONORAIL



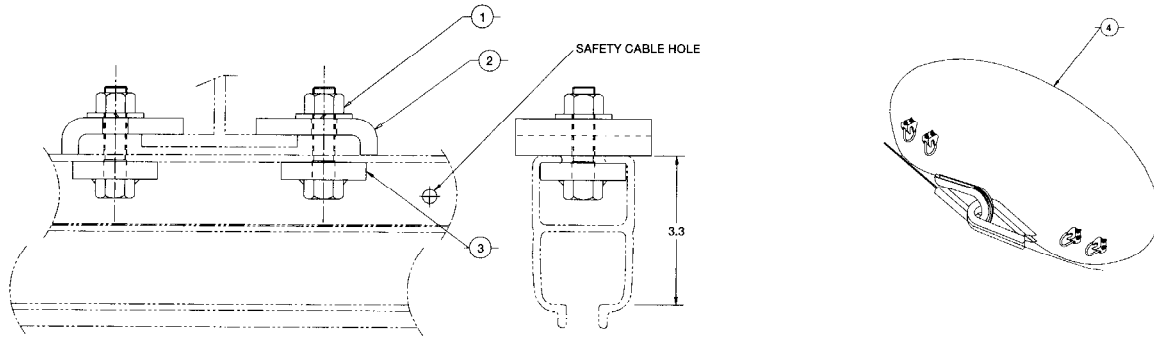
PART NUMBER:

31000-150

INDICATES LENGTH OF RAIL IN FEET (150 = 15 FEET)
INDICATES CROSS SECTION

NOTE: ALL RUNWAY RAIL WILL BE DRILLED FOR BOTH END STOPS AND SPLICE HOLES.

RIGID MOUNT HANGER KIT • ZRAT/PART NO. 30227

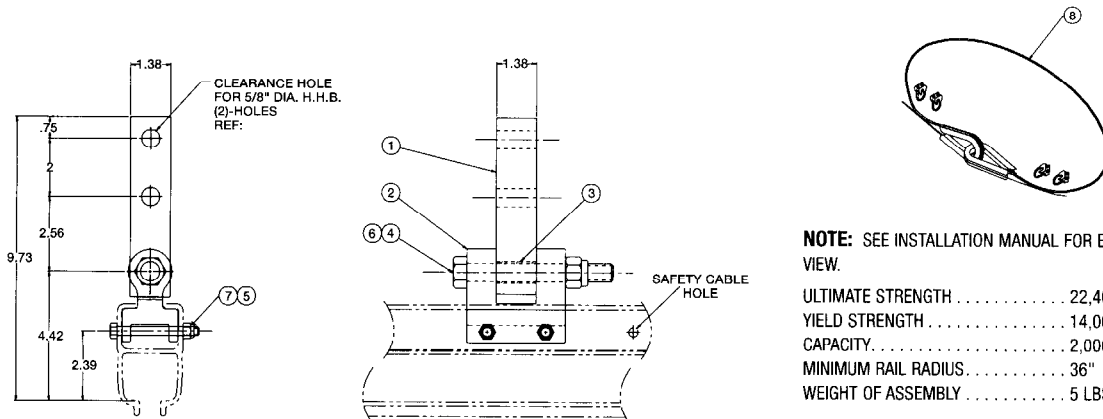


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH 22,400 LBS.
 YIELD STRENGTH 14,000 LBS.
 CAPACITY 2,000 LBS.
 MINIMUM RAIL RADIUS 36"
 WEIGHT OF ASSEMBLY 4 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
75589	-	1	2	1/2-13 FLANGED NUT
-	30160	2	2	TOE CLAMP
-	30218	3	2	SUSPENSION PLATE ASS'Y.
30907-06	-	4	1	SAFETY CABLE ASS'Y.

BLOCK HANGER KIT • ZRAT/PERPENDICULAR/PART NO. 30285

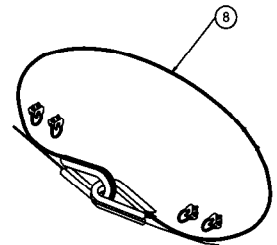
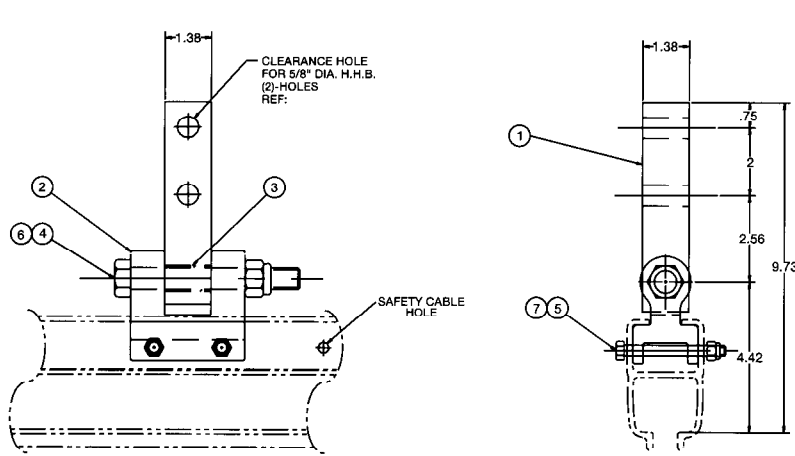


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH 22,400 LBS.
 YIELD STRENGTH 14,000 LBS.
 CAPACITY 2,000 LBS.
 MINIMUM RAIL RADIUS 36"
 WEIGHT OF ASSEMBLY 5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30162	1	1	HANGER
-	30266	2	1	HANGER BRACKET
65075	-	3	1	BRONZE BEARING
72623	-	4	1	5/8-11 x 5.00" LG. H.H.B.
70968	-	5	2	5/16-18 X 3.25" LG. H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
75582	-	7	2	5/16-18 LOCK NUT
30907-06	-	8	1	SAFETY CABLE ASS'Y (CABLE LENGTH 6 FEET)

BLOCK HANGER KIT • ZRAT/PARALLEL/PART NO. 30289

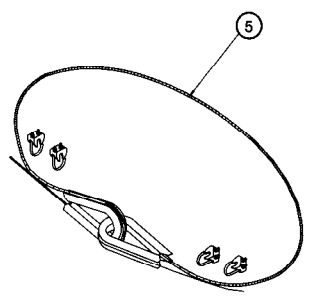
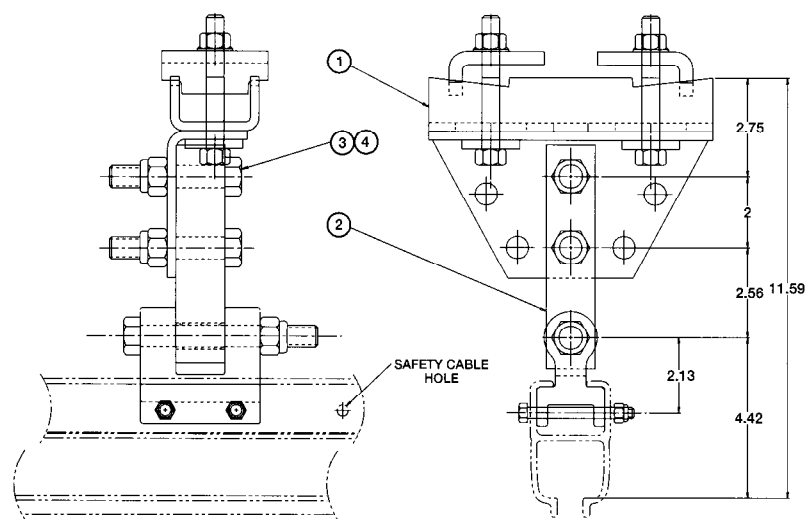


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH 22,400 LBS.
 YIELD STRENGTH 14,000 LBS.
 CAPACITY 2,000 LBS.
 MINIMUM RAIL RADIUS 36"
 WEIGHT OF ASSEMBLY 5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30197	1	1	HANGER
-	30266	2	1	HANGER BRACKET
65075	-	3	1	BRONZE BEARING
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
70968	-	5	2	5/16-18 X 3.25" LG. H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
75582	-	7	2	5/16-18 LOCK NUT
30907-06	-	8	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET.)

BEAM HANGER KIT • ZRAT/PARALLEL/STANDARD FLANGE/ PART NO. 30290



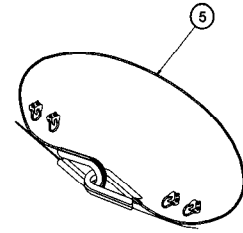
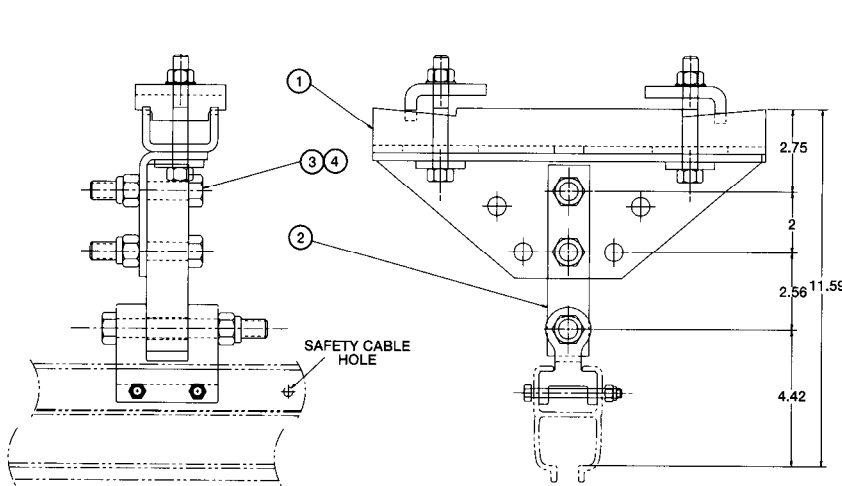
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW

STANDARD FLANGE HANGER KIT WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH 22,400 LBS.
 YIELD STRENGTH 14,000 LBS.
 CAPACITY 2,000 LBS.
 MINIMUM RAIL RADIUS 36"
 WEIGHT OF ASSEMBLY 15 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER KIT-STD FLANGE
-	30285	2	1	HANGER KIT SUB ASS'Y
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET.)

BEAM HANGER KIT • ZRAT/PARALLEL/WIDE FLANGE/PART NO. 30291



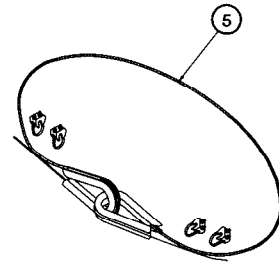
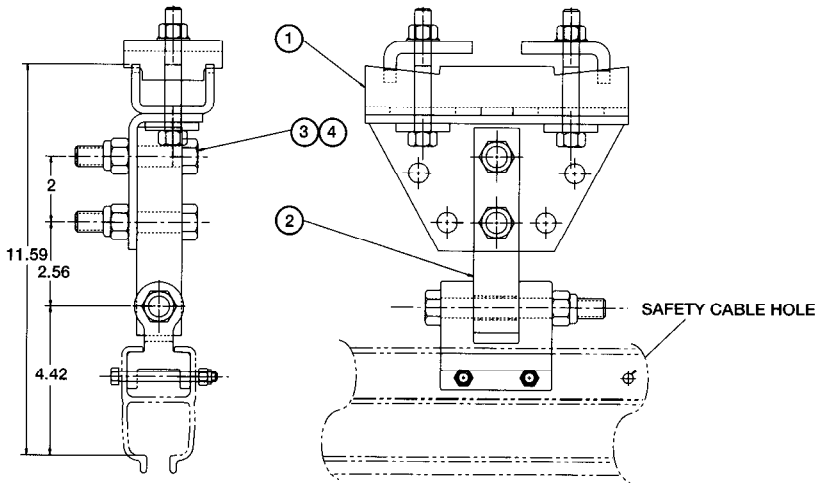
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH.....22,400 LBS.
 YIELD STRENGTH.....14,000 LBS.
 CAPACITY.....2,000 LBS.
 MINIMUM RAIL RADIUS.....36"
 WEIGHT OF ASSEMBLY.....16 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT-STD FLANGE
-	30285	2	1	HANGER KIT SUB ASS'Y
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET.)

BEAM HANGER KIT • ZRAT/PERPENDICULAR/STANDARD FLANGE/PART NO. 30292



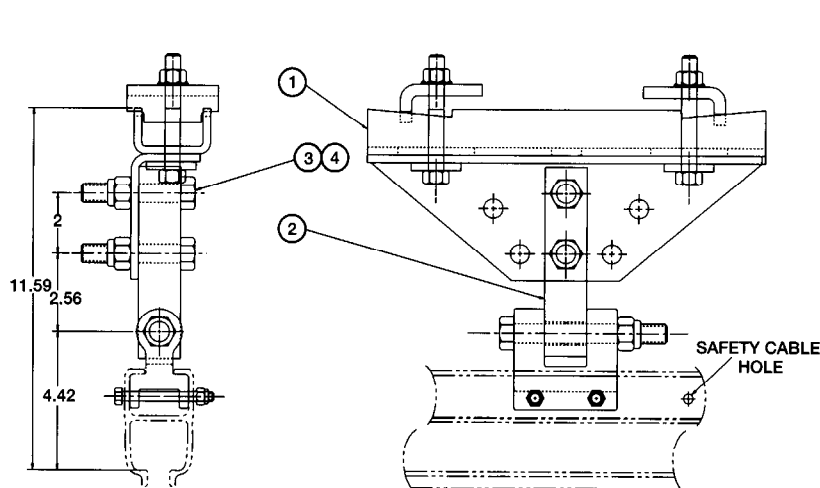
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KIT WILL ACCOMMODATE FROM 2.5: TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH.....22,400 LBS.
 YIELD STRENGTH.....14,000 LBS.
 CAPACITY.....2,000 LBS.
 MINIMUM RAIL RADIUS.....36"
 WEIGHT OF ASSEMBLY.....15 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER KIT-STD FLANGE
-	30289	2	1	HANGER KIT SUB ASS'Y
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET.)

BEAM HANGER KIT • ZRAT/PERPENDICULAR/WIDE FLANGE/ PART NO. 30293



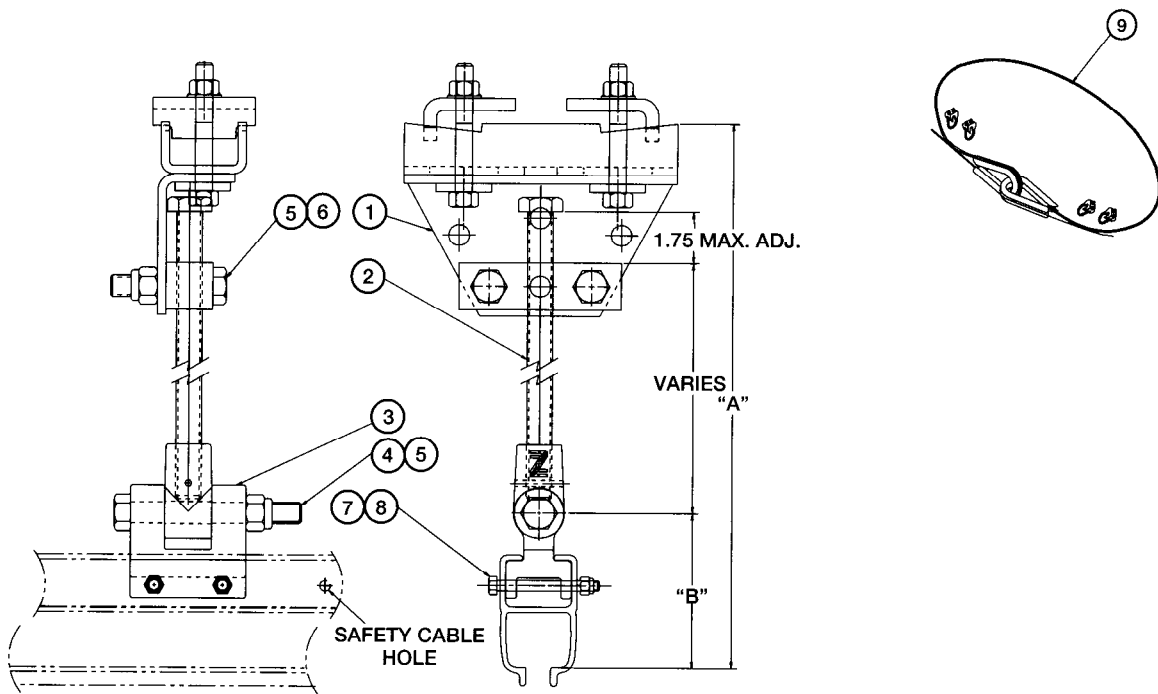
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH.....22,400 LBS.
YIELD STRENGTH.....14,000 LBS.
CAPACITY.....2,000 LBS.
MINIMUM RAIL RADIUS.....36"
WEIGHT OF ASSEMBLY.....16 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT-STD FLANGE
-	30289	2	1	HANGER KIT SUB ASS'Y
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET.)

ADJUSTABLE HANGER KIT • ZRAT/STANDARD FLANGE/PART NO. 30287



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KIT WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH 19,000 LBS.

YIELD STRENGTH 12,000 LBS.

CAPACITY 2,000 LBS.

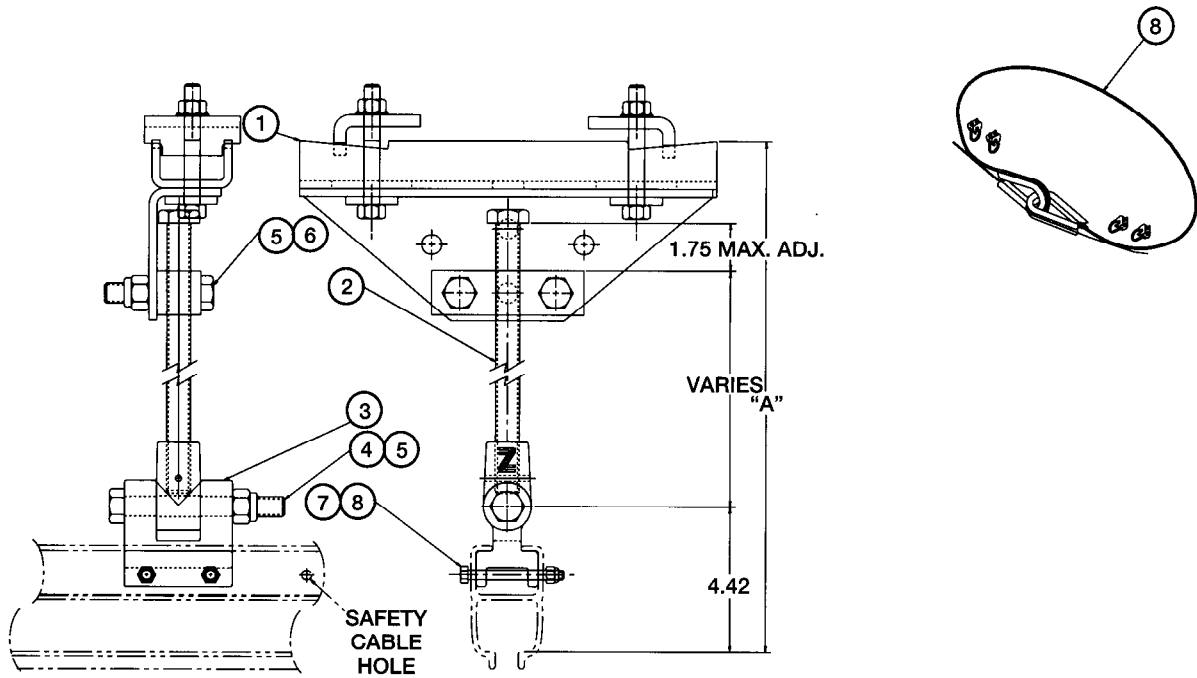
MINIMUM RAIL RADIUS 36"

* ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING. SEE ACCESSORIES SECTION.

MIN. "A" DIM	ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y. NO.	ORDER NUMBER HANGER KIT ASS'Y NO.
14.31	6.00"	30192-006	30907-06	30287-006
20.31	12.00"	30192-012	30907-08	30287-012
26.31	18.00"	30192-018	30907-10	30287-018
32.31	*24.00"	30192-025	30907-10	30287-024
44.31	*36.00"	30192-036	30907-12	30287-036
56.31	*48.00"	30192-048	30907-14	30287-048
68.31	*60.00"	30192-068	30907-16	30287-060
80.31	*72.00"	30192-072	30907-18	30287-072

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30186	1	1	HANGER KIT-STD FLANGE	
-	30190	2	1	HANGER ADJUSTMENT ASS'Y	
-	30266	3	1	HANGER BRACKET	
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72646	-	6	2	5/8-11 X 3.25" H.H.B.	
70968	-	7	2	5/16-18 X 3.25" H.H.B.	
75582	-	8	2	5/16-18 LOCK NUT	
SEE CHART	-	9	1	SAFETY CABLE ASS'Y	

ADJUSTABLE HANGER KIT • ZRAT/WIDE FLANGE/PART NO. 30288



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:19,000 LBS.

YIELD STRENGTH:14,000 LBS.

WEIGHT OF ASSEMBLY:14 LBS.

CAPACITY:2,000 LBS.

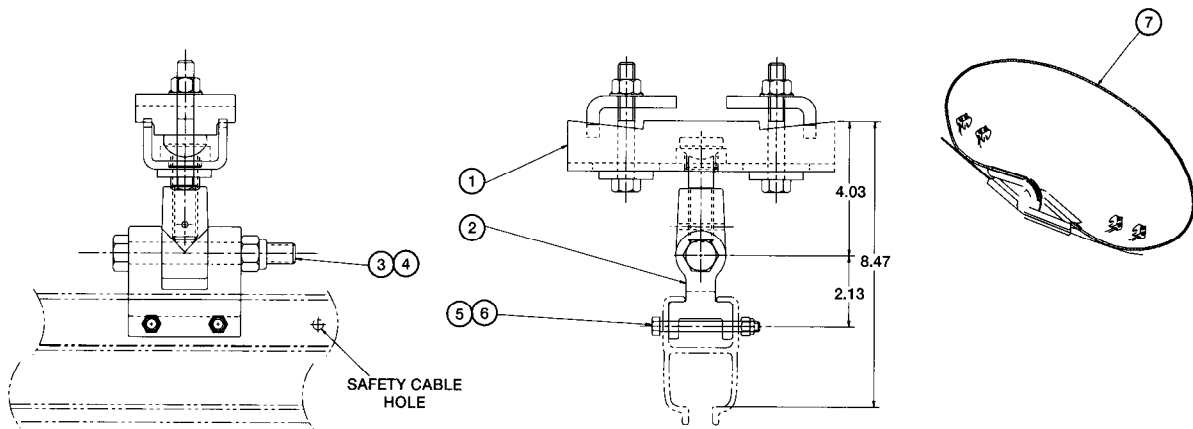
MINIMUM RAIL RADIUS:36"

*ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING.

MIN. "A" DIM	ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y. NO.	ORDER NUMBER HANGER KIT ASS'Y. NO.
14.31	6.00"	30192-006	30907-06	30288-006
20.31	12.00"	30192-012	30907-08	30288-012
26.31	18.00"	3-102-018	30907-10	30288-018
32.31	*24.00"	30192-025	30907-10	30288-024
44.31	*36.00"	30192-036	30907-12	30288-036
56.31	*48.00"	30192-048	30907-14	30288-048
68.31	*60.00"	30192-068	30907-16	30288-060
80.31	*72.00"	30192-072	30907-18	30288-072

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT-STD. FLANGE
-	30190	2	1	HANGER ADJUSTMENT ASS'Y.
-	30266	3	1	HANGER BRACKET
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72646	-	6	2	5/8-11 X 3.25" H.H.B.
70968	-	7	2	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT
SEE CHART	-	9	1	SAFETY CABLE ASS'Y.

CLOSE HANGER KIT • ZRAT/STANDARD FLANGE/PART NO. 30300



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KITS WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH:19,500 LBS.

YIELD STRENGTH:12,000 LBS.

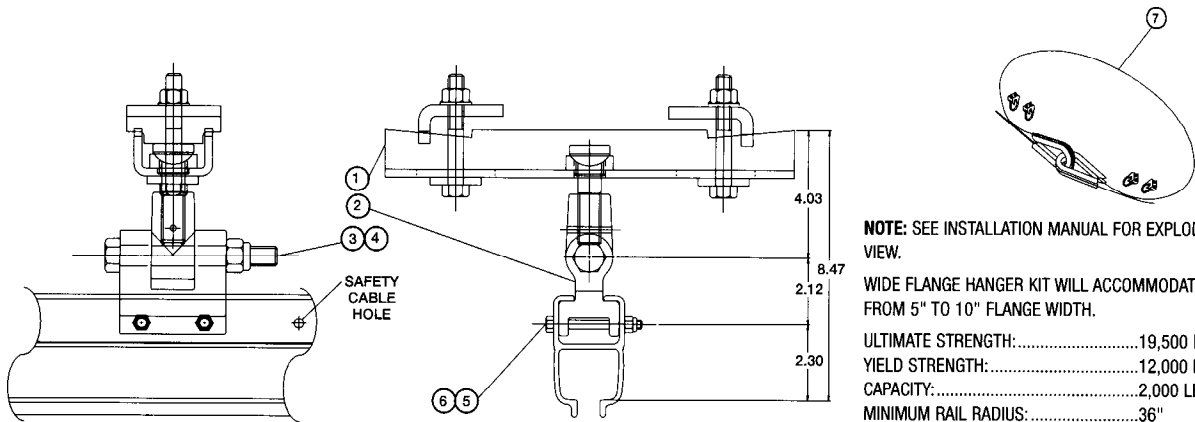
CAPACITY:2,000 LBS.

MINIMUM RAIL RADIUS:36"

WEIGHT OF ASSEMBLY:9 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30919	1	1	HANGER KIT-SUB ASS'Y.
-	30266	2	2	HANGER BRACKET
72623	-	3	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	4	1	5/8-11 LOCK NUT
70968	-	5	2	5/16-18 X 3.25" H.H.B.
75582	-	6	2	5/16-18 LOCK NUT
30907-06	-	7	1	SAFETY CABLE ASS'Y.

CLOSE HANGER KIT • ZRAT/WIDE FLANGE/PART NO. 30301



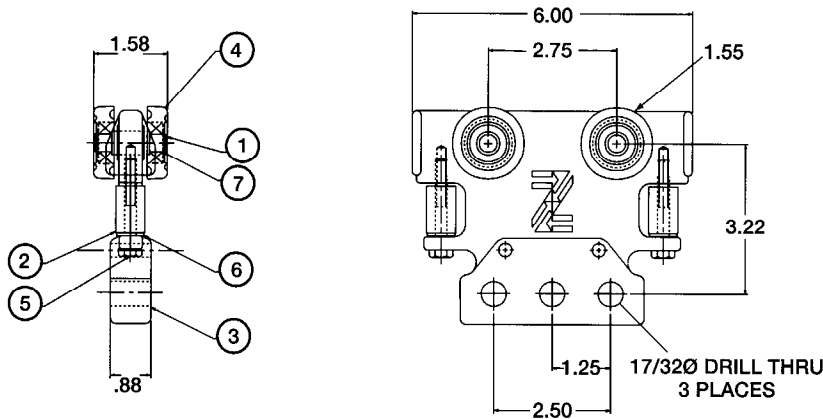
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:.....19,500 LBS.
 YIELD STRENGTH:.....12,000 LBS.
 CAPACITY:.....2,000 LBS.
 MINIMUM RAIL RADIUS:.....36"
 WEIGHT OF ASSEMBLY:.....10 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30920	1	1	HANGER KIT-SUB ASS'Y.
-	30266	2	2	HANGER BRACKET
72623	-	3	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
70968	-	5	2	5/16-18 X 3.25" H.H.B.
75582	-	6	2	5/16-18 LOCK NUT
30907-06	-	7	1	SAFETY CABLE ASS'Y.

ZRAT ALUMINUM TROLLEY • 500 LBS. CAPACITY/PART NO. 31056



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

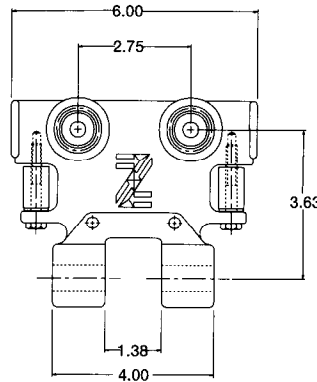
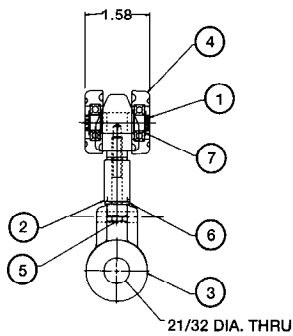
ROLLING FRICTION:.....ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:.....8,575 LBS.
 YIELD STRENGTH:.....7,500 LBS.
 CAPACITY:.....500 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:.....1.55" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELRIN
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF TROLLEY:.....4 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY, YOU MUST ORDER IT SEPARATELY.

REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30203	1	2	AXLE-ZRA1 TROLLEY-CAST BRKT.
-	30223	2	2	GUIDE ROLLER-ZRA1 ALUM. BRKT.
-	30278	3	1	TROLLEY BRACKET-ZRA1 RAIL
-	31007	4	4	TROLLEY WHEEL ASSY-ZRAT RAIL
-	70484	5	2	1/4-20 X 2.00 HCS
-	74504	6	2	WASHER-1/4" FLAT SAE UNPLATED
-	99085	7	4	CLIP-WHEEL MOUNTING-ZRA1/ZRS

ZRAT ALUMINUM TROLLEY • 500 LBS. CAPACITY/PART NO. 31057



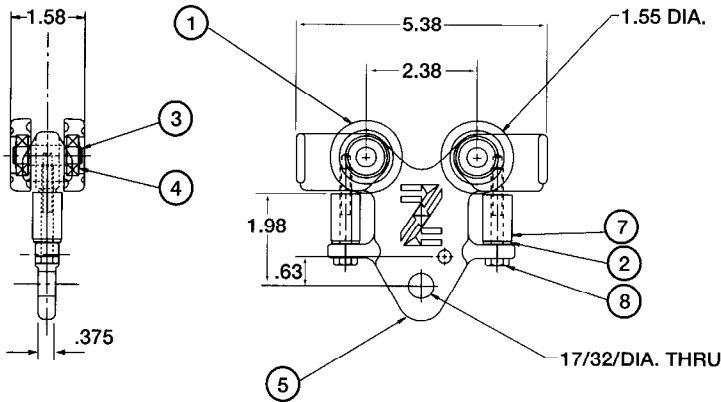
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:2.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELTRIN
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF TROLLEY:3.75 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY. REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31007	1	4	TROLLEY WHEEL
-	-	2	4	BEARING (REF.)
-	30203	3	2	AXLE
99085	-	4	4	CLIP WHEEL MTG.
-	30280	5	1	TROLLEY BODY
-	30223	6	2	GUIDE ROLLER
70484	-	7	2	1/4-20 X 2.00" H.H.C.S.
74504	-	8	2	WASHER 1/4" FLAT

ZRAT UNIVERSAL TROLLEY • 250 LBS. CAPACITY/PART NO. 31005



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

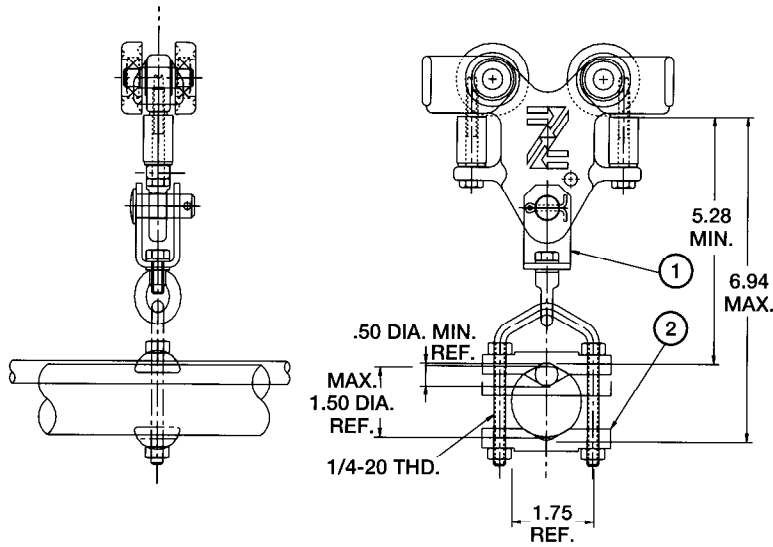
ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:5,000 LBS.
 YIELD STRENGTH:1,250 LBS.
 CAPACITY:250 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:2.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELTRIN
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF TROLLEY:1.0 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY. REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

TROLLEY – 500# CARZRAI

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31007	1	4	TROLLEY WHEEL
74504	-	2	1	WASHER-1/4" FLAT
-	30203	3	2	AXLE
99085	5105-37	4	4	RETAINING RING-WHEEL TO AXLE
-	31006	5	1	TROLLEY BRKT.-UNIVERSAL ZRA1 & ZRAT
-	-	6	-	-
-	30223	7	2	GUIDE ROLLER 9/32 I.D. X 5/8 O.D. X 1 LG.
70484	-	8	2	1/4-20 X 2.00" LG. H.H.C.S.

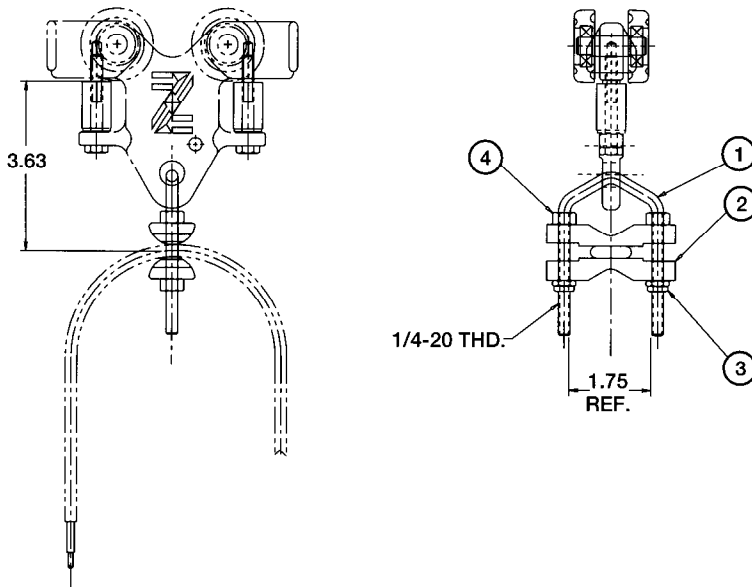
ZRAT SWIVEL ASSEMBLY • HOSE AND CABLE ADAPTER/ PART NO. 31011



NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY. REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	17090	1	1	SWIVEL MOUNTING
-	31012	2	1	HOSE & CABLE ADAPTER ASSEMBLY

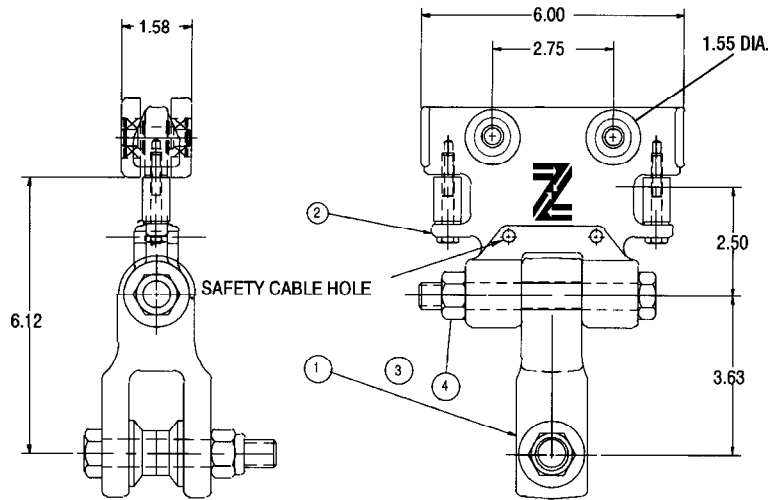
ZRAT HOSE & CABLE ADAPTER ASSEMBLY/PART NO. 31012



NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY. REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31014	1	1	HANGER
-	31015	2	2	CLAMP
75528	-	3	2	1/4-20 HEX. LOCK NUT – ESNA NTE.
75541	-	4	2	1/4-20 HEX. NUT

HOIST TROLLEY-SINGLE • ZRAT/500 LBS. CAPACITY/PART NO. 30313



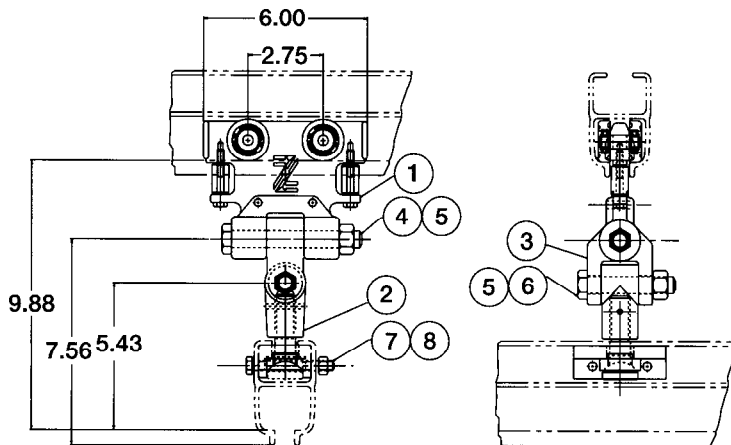
NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS ASSEMBLY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30903	1	1	HOIST HOOK BRACKET
30281	-	2	1	TROLLEY
72623	-	3	1	SCREW 5/8-11 X 5 H.C.S.
75582	-	4	1	NUT 5/8-11

END TRUCK SINGLE • ZRAT TO ZRAT/500 LBS. CAPACITY/PART NO. 31059A

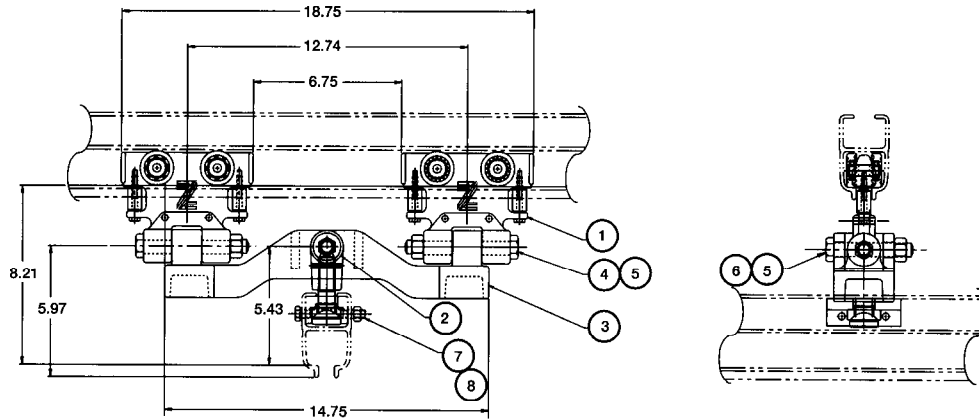


NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 WEIGHT OF TROLLEY:5.75 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31057	1	1	TROLLEY-ZRAT RAIL
-	30282	2	1	BRIDGE SUSPEN. SUB-ASSY-ZRAT
-	30166	3	1	FEMALE CLEVIS-ZRAT/ZRS RAIL
-	72623	4	1	SCREW 5/8-11 X 5.00 HCS
-	75587	5	2	NUT 5/8-11 PT LOCK
-	72544	6	1	SCREW 5/8-11 X 4.00 HCS
-	70968	7	2	SCREW 5/16-18 X 3.25 HCS
-	75582	8	2	NUT 5/16-18 PT LOCK

END TRUCK-DUAL • ZRAT TO ZRAT/1000 LBS. CAPACITY/PART NO. 31060

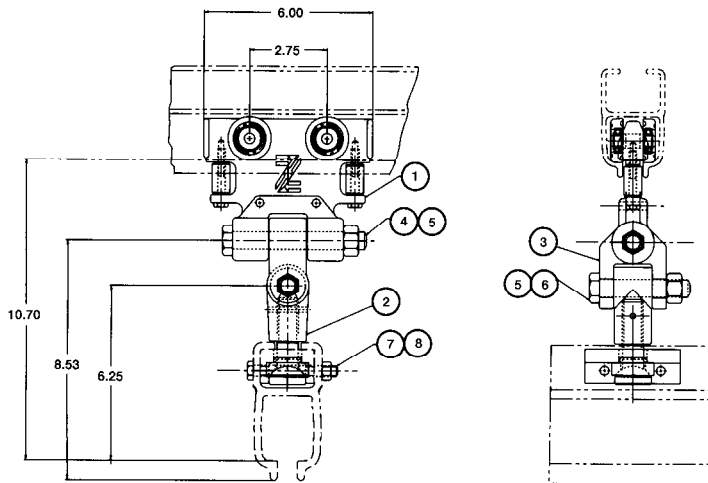


NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF TROLLEY:15.5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31057	1	2	TROLLEY-ZRAT RAIL
-	30282	2	1	BRIDGE SUSPEN. SUB-ASSY-ZRA1
-	30173	3	1	DUAL TROLLEY TIE BAR
-	72623	4	2	SCREW 5/8-11 X 5.00 HCS
-	75587	5	3	NUT 5/8-11 PT LOCK
-	72644	6	1	SCREW 5/8-11 X 4.00 HCS
-	70968	7	2	SCREW 5/16-18 X 3.25 HCS
-	75582	8	2	NUT 5/16-18 PT LOCK

END TRUCK ASSEMBLY • SINGLE/ZRA1 TO ZRAT/500 LBS. CAPACITY/PART NO. 31059

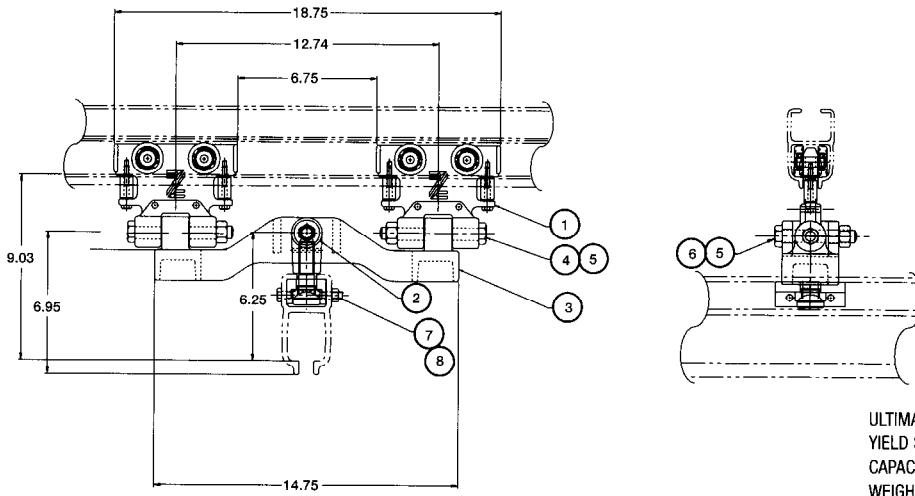


NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 WEIGHT OF TROLLEY:5.75 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31057	1	1	TROLLEY-ZRAT RAIL
-	30282	2	1	BRIDGE SUSPEN. SUB-ASSY-ZRA1
-	30166	3	1	FEMALE CLEVIS-ZRA/ZRS RAIL
-	72623	4	1	SCREW 5/8-11 X 5.00 HCS
-	75587	5	2	NUT 5/8-11 PT LOCK
-	72644	6	1	SCREW 5/8-11 X 4.00 HCS
-	70968	7	2	SCREW 5/16-18 X 3.25 HCS
-	75582	8	2	NUT 5/16-18 PT LOCK

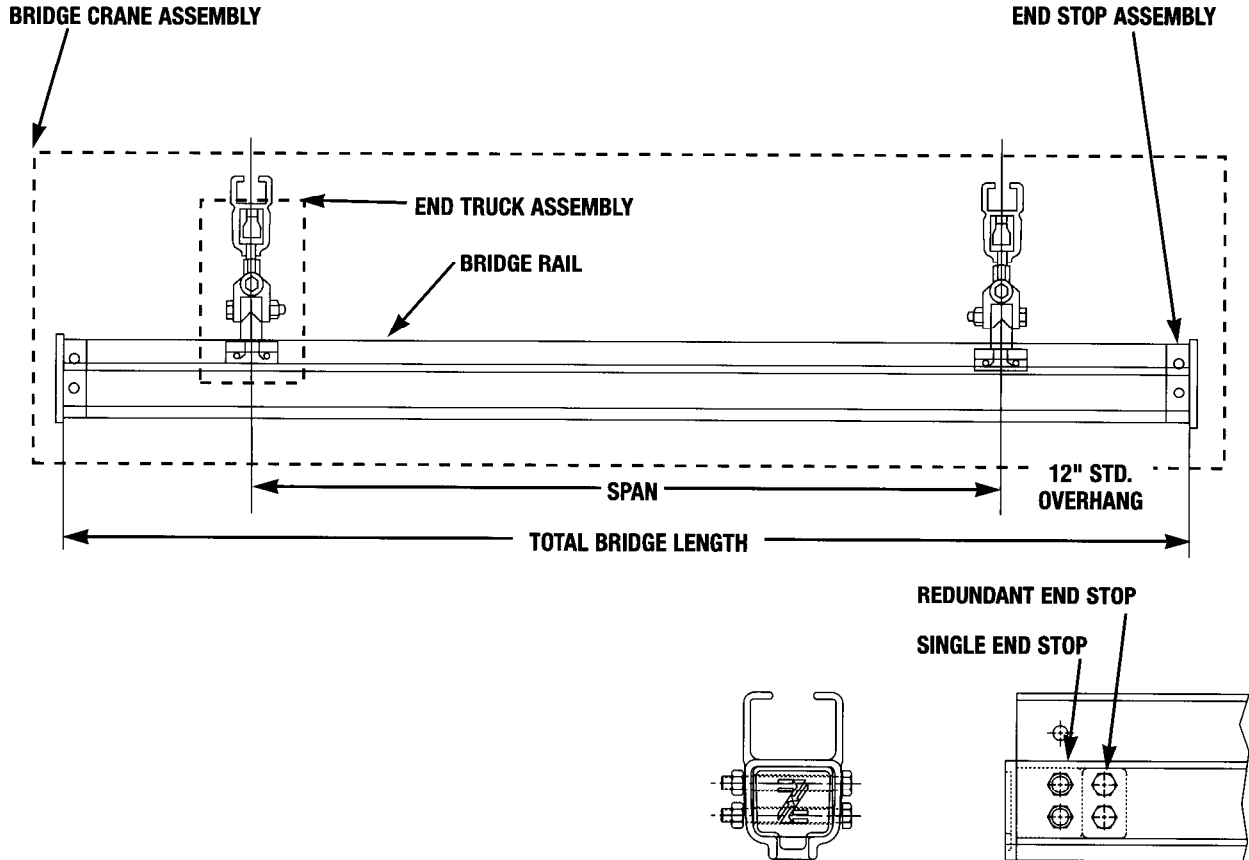
END TRUCK ASSEMBLY • ZRA1 ON ZRAT/1000 LBS. CAPACITY DUAL TROLLEY/PART NO. 31060



ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF TROLLEY:15.5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31057	1	2	TROLLEY-ZRAT RAIL
-	30282	2	1	BRIDGE SUSPEN. SUB-ASSY-ZRA1
-	30173	3	1	DUAL TROLLEY TIE BAR
-	72623	4	2	SCREW 5/8-11 X 5.00 HCS
-	75587	5	3	NUT 5/8-11 PT LOCK
-	72644	6	1	SCREW 5/8-11 X 4.00 HCS
-	70968	7	2	SCREW 5/16-18 X 3.25 HCS
-	75582	8	2	NUT 5/16-18 PT LOCK

BRIDGE CRANE ASSEMBLY • EXAMPLE OF HOW TO ORDER



THE BRIDGE CRANE ASSEMBLY CONSISTS OF:
 ONE BRIDGE BEAM (SECTION OF RAIL)
 TWO END TRUCK ASSEMBLIES (MOUNTED TO THE BRIDGE WITH A TROLLEY TO ROLL INSIDE OF THE RUNWAY, SAFETY CABLES WILL BE PRE-INSTALLED)
 TWO END STOPS (ONE INSTALLED AT EACH END OF THE BRIDGE)
 REDUNDANT END STOPS ARE AVAILABLE (PLEASE SPECIFY)

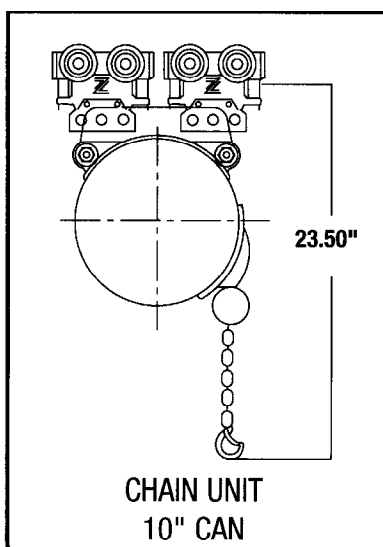
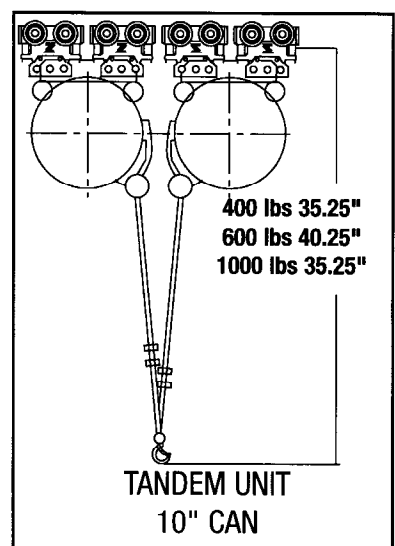
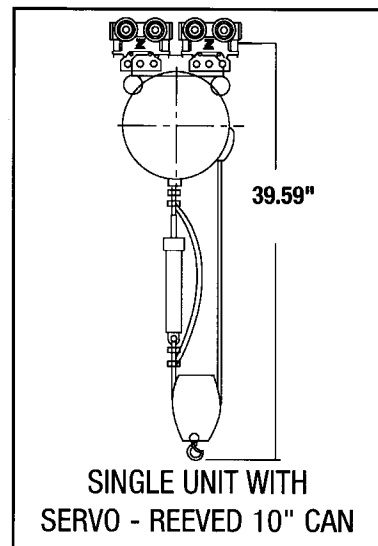
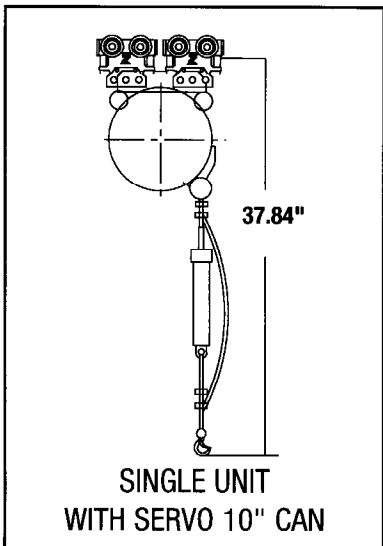
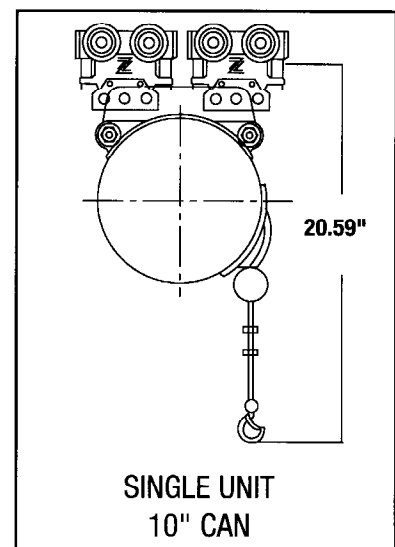
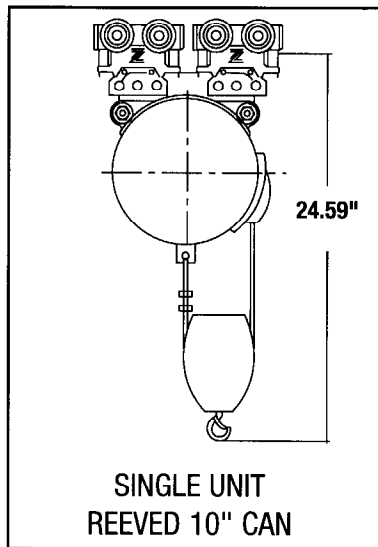
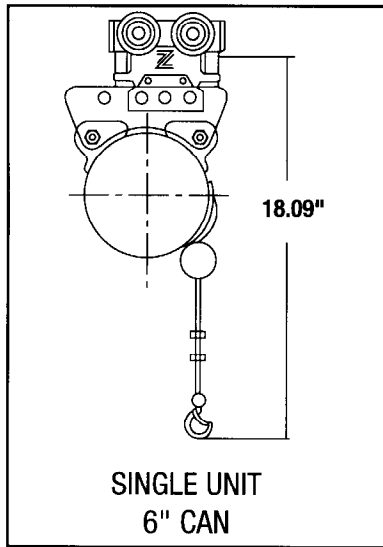
EXAMPLE

ORDER NUMBER:

ZRAT 06 08 31059 R

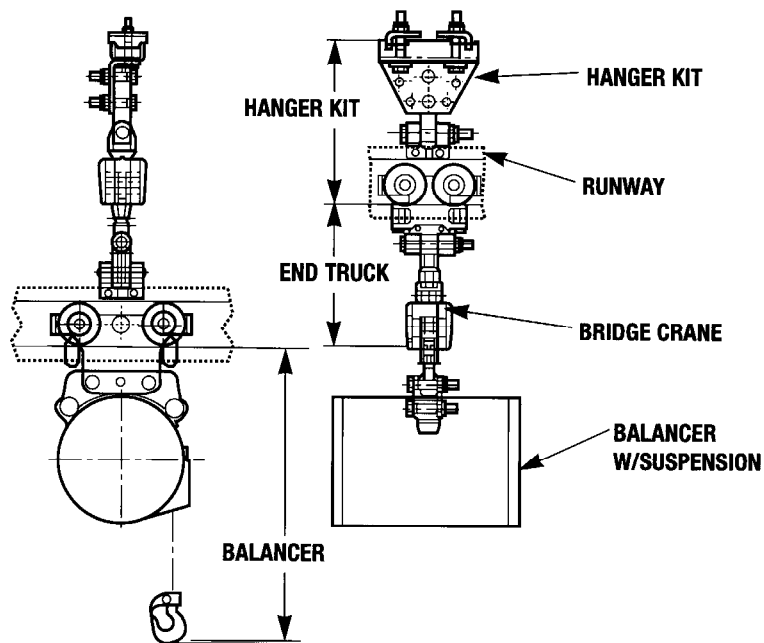
ZRAT: TYPE OF BRIDGE RAIL
 06: SPAN (RUNWAY CENTER-CENTER DIMENSION IN FEET)
 08: TOTAL BRIDGE LENGTH (IN FEET)
 31059: END TRUCK ASSEMBLY
 R: REDUNDANT END STOP (OPTIONAL)

BALANCER STACK-UP DIMENSION • FOR ZRAT ALUMINUM RAIL

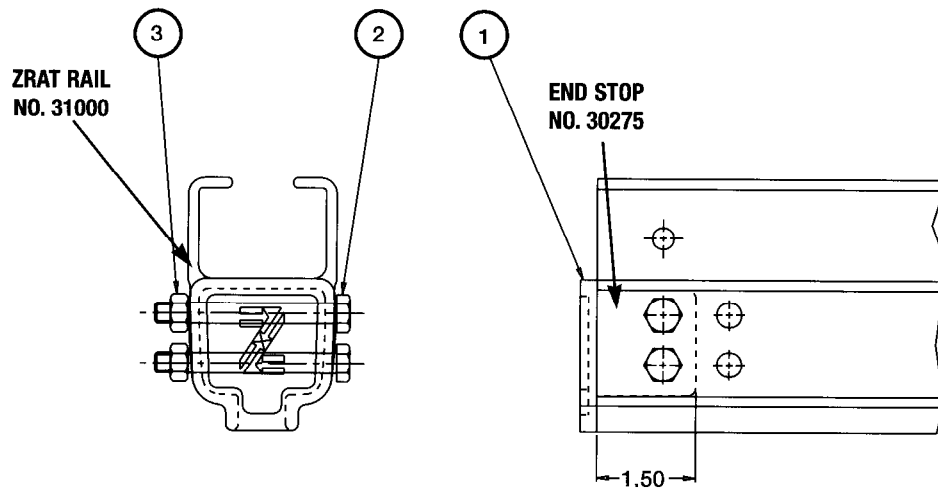


SYSTEM STACK-UP DIMENSION • ZRAT/QUICK REFERENCE

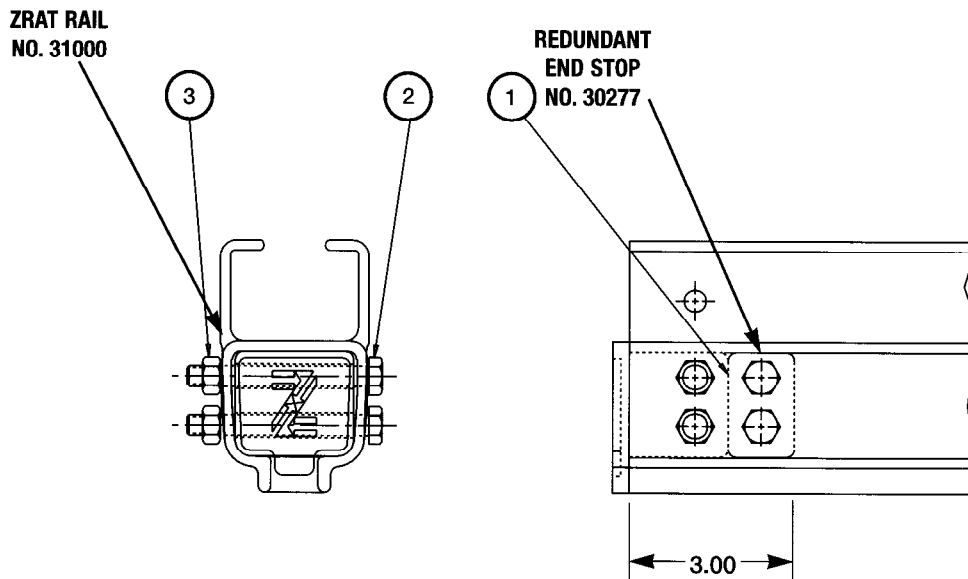
HANGER KITS	END TRUCKS	BALANCERS WITH SUSPENSION
30227 – 3.30"	31059 – 9.88"	SINGLE UNIT 10" – 20.59"
30285 – 6.98"	31060 – 8.21"	SINGLE UNIT REEVED 10" – 24.59"
30289 – 6.98"	31059 – 10.70"	SINGLE UNIT WITH SERVO 10" – 37.84"
30290 – 11.59"	31060 – 9.03"	SINGLE UNIT REEVED WITH SERVO 10" – 39.59"
30291 – 11.59"		SINGLE UNIT 6" – 18.09"
30292 – 11.59"		SINGLE UNIT (CHAIN) 10" – 23.50"
30293 – 11.59"		TANDEM UNIT 10" – 400 LBS. 35.25"
30287 – (ADJUSTABLE)		600 LBS. 40.25"
30288 – (ADJUSTABLE)		1000 LBS. 35.25"
30300 – 8.47"		
30301 – 8.47"		



END STOPS • ZRAT/PART NO. SINGLE-31022/REDUNDANT-31024

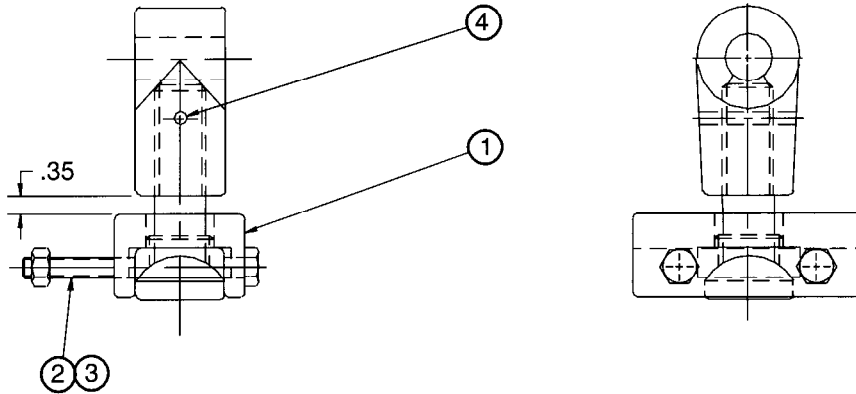


BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31019	1	1	END STOP
70972	-	2	2	5/16-18 X 2.75" LG H.H.B. GRADE 5
75582	-	3	2	5/16-18 LOCK NUT



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	31023	1	1	RED. END STOP
70972	-	2	2	5/16-18 X 2.75" LG H.H.B. GRADE 5
75582	-	3	2	5/16-18 LOCK NUT

ZRAT RAIL • BRIDGE SUSPENSION SUB-ASSEMBLY/PART NO. 30305

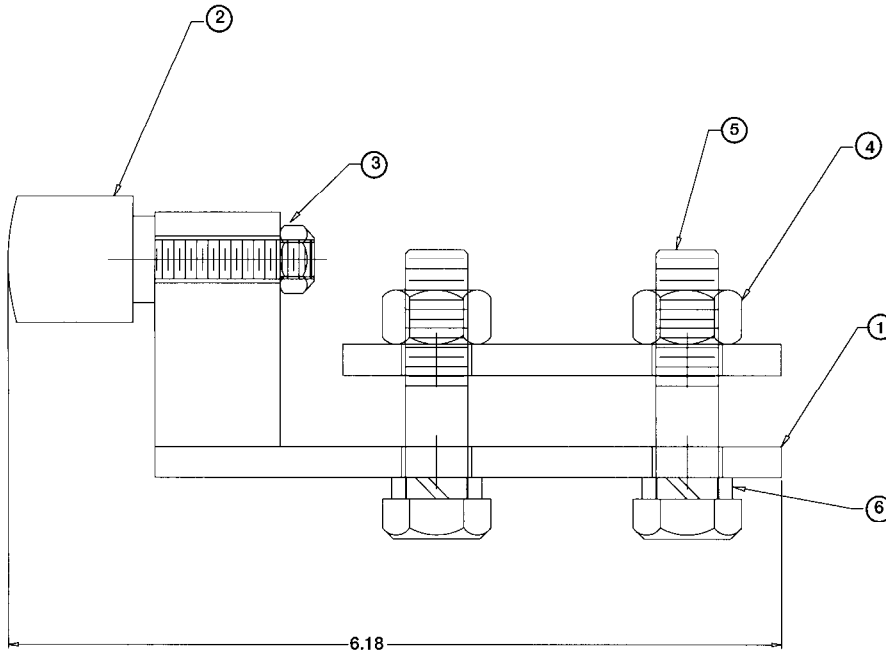


NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

ULTIMATE STRENGTH:.....8,575 LBS.
 YIELD STRENGTH:.....7,500 LBS.
 CAPACITY:.....1,000 LBS.
 WEIGHT OF ASSEMBLY:.....3 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
70968	-	2	2	5/16-18 X 3.25" H.H.B.
75582	-	3	2	5/16-18 LOCK NUT
99118	-	4	1	SCREW & NUT ASSY.
30282	-	1	1	BRIDGE SUSPENSION SUBASSY.

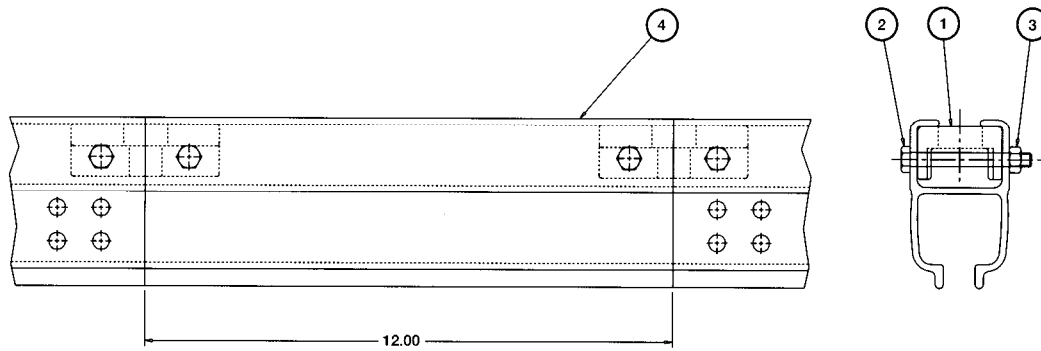
ZRAT RAIL • ADJUSTABLE STOP/PART NO. 30738



NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

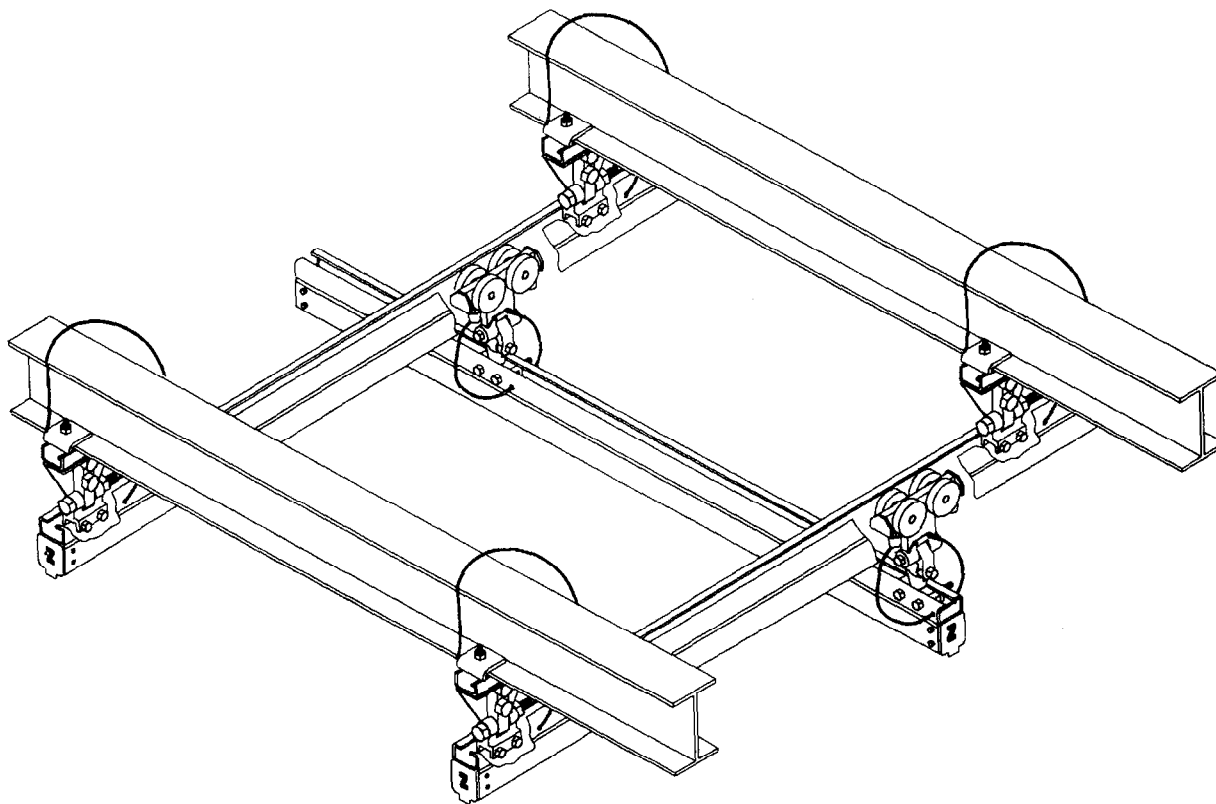
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30734	1	1	BAR WELDMENT
-	30744	2	1	THRD AND HEX SHOULDER
-	75582	3	1	5/16-18 PT LOCKNUT
-	30736	4	1	NUT WELDMENT
-	72002	5	2	1/2-13 X 2.00 HEX HEAD CAPSCREW
-	74513	6	2	1/2 MED. SPRING LOCKWASHER

ZRAT RAIL • INSPECTION GATE/PART NO. 31034



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30267	1	2	BRIDGE SUSPENSION BRKT.-(ZRA1)
70972	-	2	4	5/16-18 X 2.75 LG. H.H.B. GRADE 5
75582	-	3	4	5/16-18 STOVER LOCK NUT
31035	-	4	1	GATE END - ZRAT

ZRA1 ALUMINUM RAIL AND COMPONENTS



ENGINEERING DATA FOR ZRA1 ALUMINUM RAIL

1. All rail and hangers must be installed in accordance with Zimmerman Handling Systems' (Z.H.S.) instructions.
2. Rail provided is ZRA1 aluminum alloy.
3. The rail or bridge beam provided is modular design, weld free application, and self aligning with complete bolt-together capability at all splice joints and hangers.
4. All rail sections provided are saw cut square to required length by Z.H.S. All rail joints should be flush when installation is completed.
5. The capacity of the rail, monorail or bridge crane will be determined so that deflection under rated load shall not exceed 1/450 of the span. Lateral deflection will not be accepted.
6. The allowable stresses applied must not exceed 20% of the **minimum yield strength** of the materials used.
7. The maximum capacity for all rail provided by the contractor including hoist, product, process equipment, and all attachments, etc., must not exceed the capacity specified below: ZRA1 Aluminum Rail - acceptable for maximum capacities up to and including 1000 lbs.
8. For bridge crane or hoist application(s), the maximum overhang of the bridge girder to the center of a runway rail must not exceed 12.00". (For larger overhangs consult the factory.)
9. All bridge cranes, runway, and monorail, must be installed straight, parallel, level and at the same elevation. Installation tolerance cannot exceed the values specified below:
 - a. **Longitudinal leveling.** Multiple runways and single rail systems .250" in overall length, with a maximum rate of change of no more than .125" on twenty-foot centers.
 - b. **Elevation runway to runway** .250" in span, maximum rate of change .125" on twenty-foot centers.
 - c. **Centering runway-to-runway** .250" in overall length, maximum rate of change .125" on twenty-foot centers.
 - d. **Centering for single rail** to a parallel conveyor of workstation will be $\pm .500$ " in overall length of the system, maximum rate of change .125" on twenty-foot centers.
10. Sway bracing should be used when the hanger meets or exceeds 24.00" in length. (See system installation manual.)
11. One month after system buy off, the enclosed rail system should be inspected and re-leveled by the installation contractor. All bolts at the splice joints, hangers and support structure should be re-checked for proper torque. Abnormalities noted by the inspector must be reported to Z.H.S. immediately.
12. All trolley running surfaces must be aligned flush in accordance with this specification and present no shock loading at splice connections. Transverse tilt will not be accepted.
13. Tension tubes at all splice connections will be aligned and welded by Z.H.S.
14. Joint modification or holes required in track section(s) will be by drilling or saw cutting only. Flame cutting of holes or splice joints is not permitted.
15. Where hanger rods are used, the allowable stress will be 20% of the minimum yield strength of the material provided.

16. All hangers must be installed true and vertical. All suspension fittings should bear the load equally.
17. All bolts, nuts, fasteners, attachments, etc., required for enclosed rail systems will be provided by Z.H.S.
18. All double girder bridge cranes provided will incorporate diagonal bracing for parallel stabilization.
19. All splice connections shall not exceed 12" from hanger point.

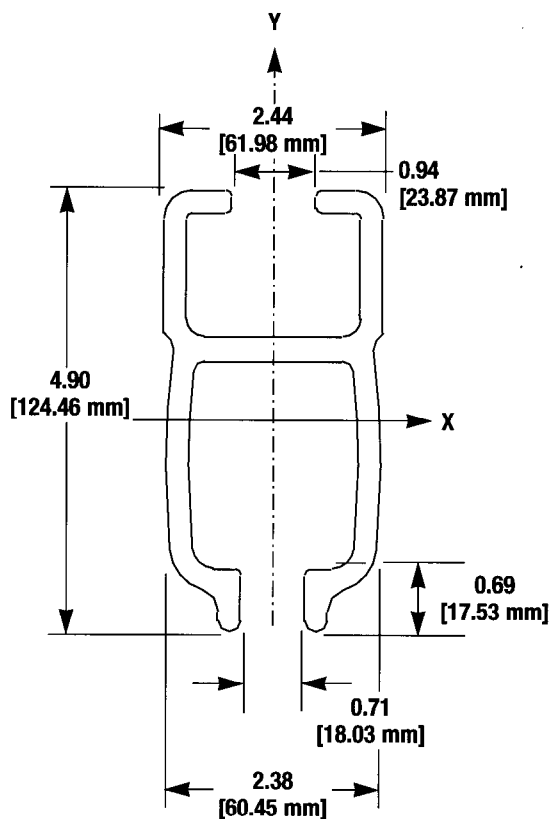
CURVED RAIL

1. Enclosed rail turns will be pre-formed by Z.H.S. All tension tubes will be aligned and installed by Z.H.S.
2. The radius of all enclosed rail turns will be designed to allow the carriers or trolleys to freely negotiate each horizontal turn without binding.
3. The minimum radius for ZRA1 aluminum rail is 36.00".
4. Short radius turns with a radius that is less than the standard specified above must be pre-approved by Z.H.S.
5. The maximum overhang of a straight track to the tangent point of a horizontal turn cannot exceed 12.00".
6. A minimum of two hangers should be used in the radius of each 90-degree turn, the two hangers should be in addition to one hanger at each splice joint. The maximum distance between hanger centers cannot exceed 36.00". If required, additional hangers can be provided in accordance with the design and calculated distance based on the trolley or carrier loading.
7. Special curves will be supported and braced in accordance with Z.H.S.'s requirements. Under no condition will rail hanger center exceed 36.00".
8. Curved rail sections will be installed with uniform bolt tension to insure that the load trolley do not bind at splice joints.
9. A straight section of rail will be provided between each horizontal turn. For single trolley systems the length will be 12.00", for dual trolley systems the length will be 28.00".
10. All hangers provided must be installed true to the vertical plane.

TROLLEYS

1. All trolleys are manufactured by Zimmerman Handling Systems.
2. All aluminum trolleys consist of high-tensile aluminum-magnesium alloy body.
3. All steel trolleys consist of a welded, stamped steel body.
4. All trolley wheels provided for hoists, bridge cranes, and related equipment must conform to Z.H.S.'s standards.
5. Trolley wheels are delrin, machined symmetrically true with the axis. All trolley wheels are retainer type, designed for a single row of high quality, precision-ground ball bearings. All trolley wheels have a stud that is press-fitted into the trolley body.
6. Trolley side guide rollers are delrin machined symmetrically true with the axis.
7. All trolleys are equipped with safety lugs so in the event of a wheel failure the trolley cannot come out of the rail.
8. All bearings are protected by grease and dust seals.

CROSS SECTION • ZRA1/PART NO. 30200



MOMENT OF INERTIA: $I = 2.80 \text{ IN} [1.16\text{E}6 \text{ mm}]$
 Y

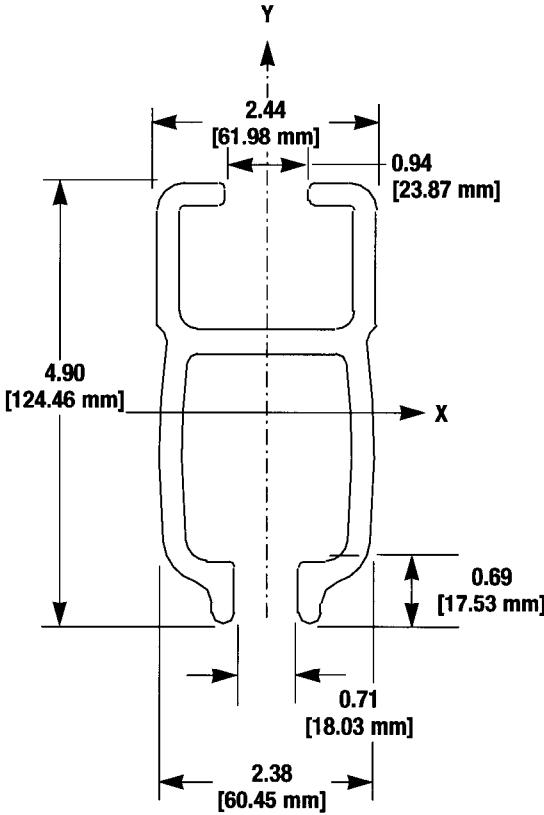
$I = 6.81 \text{ IN} [2.83\text{E}6 \text{ mm}]$
 X

MAX. LENGTH: 30 FT. [9146.34 mm]
 WEIGHT: 3.96 LB./FT. [5.90 Kg/M]

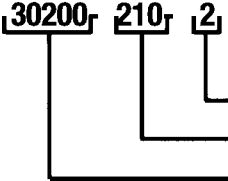
LIVE LOAD DEFLECTIONS • ZRA1/PART NO. 30200

RAIL/BRIDGE SPAN				DEFLECTION LIMITS				POINT LOAD			
FT.	IN.	m	mm	1/450 IN.	1/450 mm	1/550 IN.	1/550 mm	1/450 lbs.	1/450 kg.	1/550 lbs.	1/550 kg.
5	60	1.52	1524	.13	3.3	.11	2.7	2018	917	1651	750
6	72	1.82	1828.8	.16	4.0	.13	3.3	1401	637	1146	521
7	84	2.13	2133.6	.19	4.8	.15	3.8	1029	468	842	383
8	96	2.43	2438.4	.21	5.3	.17	4.3	788	358	645	293
9	108	2.74	2743.2	.24	6.0	.20	5.0	623	283	510	232
10	120	3.04	3048.0	.27	6.8	.22	5.5	504	229	413	188
11	132	3.35	3352.8	.29	7.3	.24	6.0	417	189	341	155
12	144	3.65	3657.6	.32	8.1	.26	6.6	350	159	287	130
13	156	3.96	3962.4	.35	8.8	.28	7.1	298	135	244	111
14	168	4.26	4267.2	.37	9.3	.31	7.8	257	117	211	96
15	180	4.57	4572.0	.40	10.1	.33	8.3	224	102	183	83
16	192	4.87	4876.8	.43	10.9	.35	8.8	197	89	161	73
17	204	5.18	5181.6	.45	11.4	.37	9.3	175	79	143	65
18	216	5.48	5486.4	.48	12.1	.39	9.9	156	71	127	58
19	228	5.79	5791.2	.51	12.9	.41	10.4	140	64	114	52
20	240	6.09	6096.0	.53	13.9	.44	11.1	126	57	103	47
21	252	6.40	6400	.56	14.2	.46	11.6	114	51	94	42
22	264	6.70	6705	.59	14.9	.48	12.1	104	47	85	38
23	276	7.01	7010	.61	15.4	.50	12.7	95	43	78	35
24	288	7.31	7315	.64	16.2	.52	13.2	88	39	72	32
25	300	7.62	7650	.67	17.0	.55	13.9	81	36	66	29
26	312	7.92	7924.8	.69	17.5	.57	14.4	75	34	61	27
27	324	8.25	8255	.72	18.2	.59	14.9	69	31	57	25
28	336	8.53	8534.4	.75	19.0	.61	15.4	64	29	53	24

HOW TO ORDER • ZRA1 ALUMINUM RUNWAY OR MONORAIL



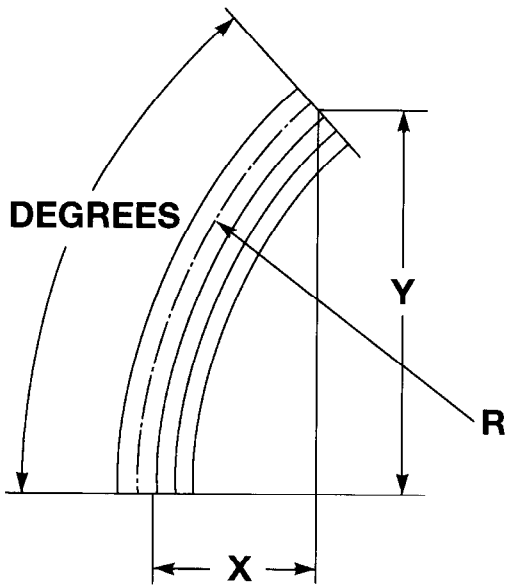
PART NUMBER:



INDICATES SPLICE LUGS WELDED ON
 INDICATES LENGTH OF RAIL IN FEET (210=21 FEET)
 INDICATES CROSS SECTION

NOTE: ALL RUNWAY RAIL WILL BE DRILLED FOR BOTH END STOPS AND WILL HAVE SPLICE LUGS WELDED ON.

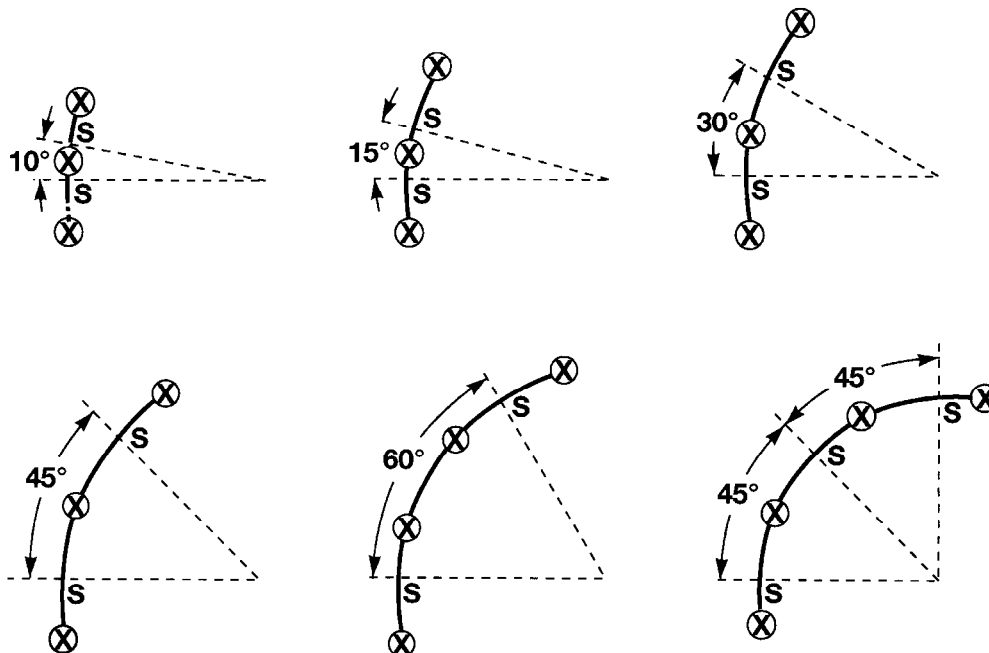
CURVED RAIL DIMENSIONS • ZRA1 ALUMINUM RAIL



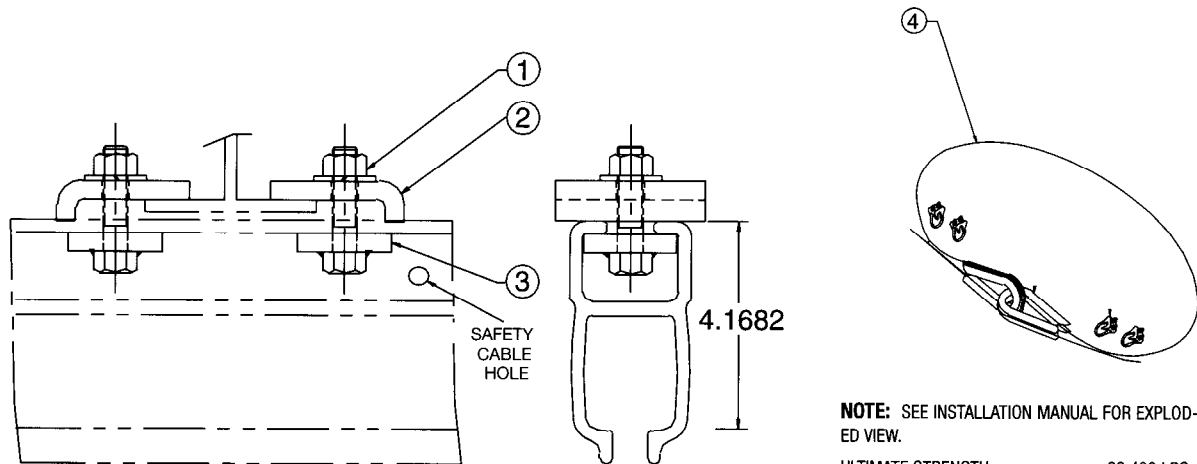
CURVED RAIL DIMENSIONS ZRA1 ALUMINUM RAIL					
	DEGREES	X	Y	APPROX. WEIGHT	PART NUMBER
ZRA1 R=36"	15	1.22	9.32	3.212	30254
	30	4.82	18.00	6.22	30255
	45	10.54	25.56	9.33	30256
	60	18.00	31.18	12.44	30257
	90	36.00	36.00	18.66	30258

RAIL MUST BE SUPPORTED WITH A SUSPENSION HANGER IN THE CENTER AND ONE SUSPENSION HANGER NEAR EACH SPLICE JOINT. FOR MULTIPLE CURVED RAILS BEING SPLICED TOGETHER, SUSPENSION HANGERS WILL BE AS SHOWN BELOW.

CURVED RAIL SUSPENSION POINTS DIAGRAM
 S - DENOTES SPLICE JOINTS
 X - DENOTES SUSPENSION POINTS



RIGID MOUNT HANGER KIT • ZRA1/PART NO. 30227

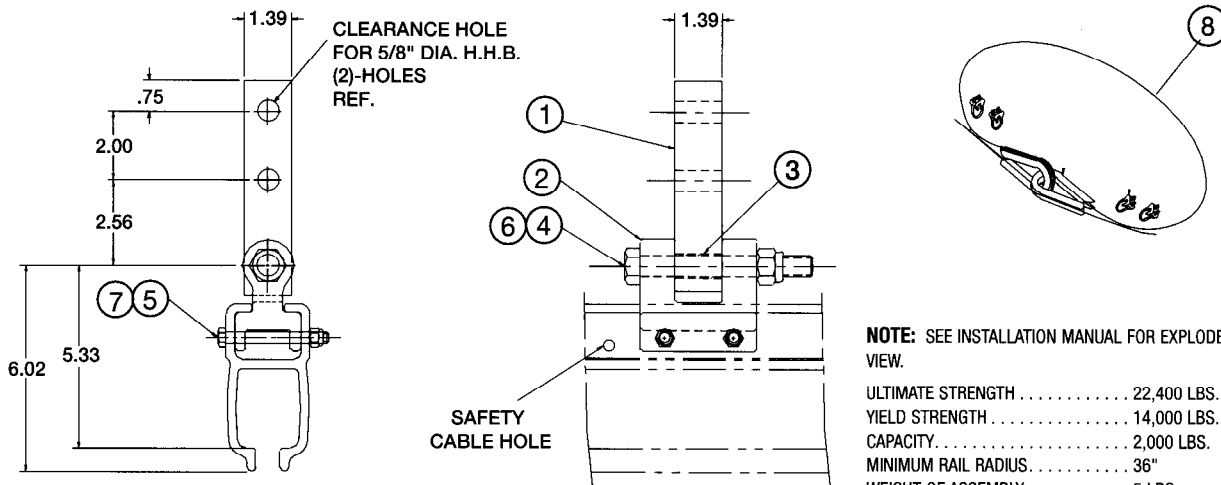


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH 22,400 LBS.
 YIELD STRENGTH 14,000 LBS.
 CAPACITY 2,000 LBS.
 MINIMUM RAIL RADIUS 36"
 WEIGHT OF ASSEMBLY 4 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
75589	-	1	2	1/2-13 FLANGED NUT
-	30160	2	2	TOE CLAMP
-	30218	3	2	SUSPENSION PLATE ASS'Y.
30907-06	-	4	1	SAFETY CABLE ASS'Y.

BLOCK HANGER KIT • ZRA1/PERPENDICULAR/PART NO. 30285

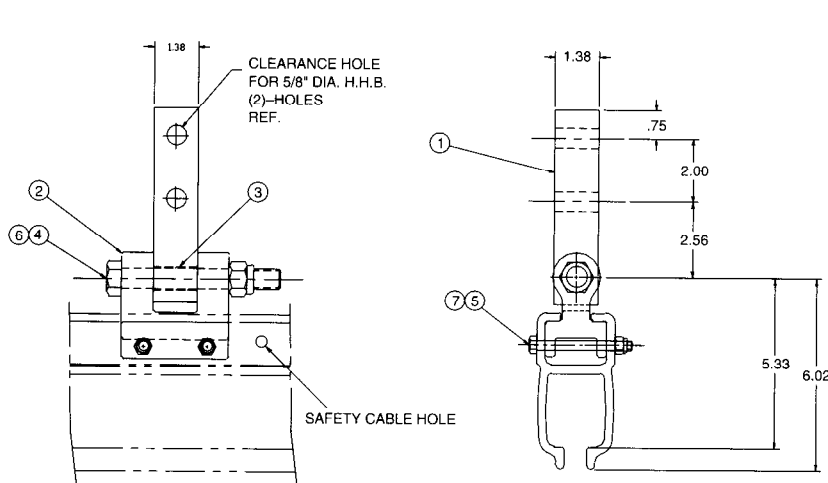


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH 22,400 LBS.
 YIELD STRENGTH 14,000 LBS.
 CAPACITY 2,000 LBS.
 MINIMUM RAIL RADIUS 36"
 WEIGHT OF ASSEMBLY 5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30162	1	1	HANGER
-	30266	2	1	HANGER BRACKET
65075	-	3	1	BRONZE BEARING
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
70968	-	5	2	5/16-18 X 3.25" LG. H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
75582	-	7	2	5/16-18 LOCK NUT
30907-06	-	8	1	SAFETY CABLE ASS'Y (CABLE LENGTH 6 FEET)

BLOCK HANGER KIT • ZRA1/PARALLEL/PART NO. 30289

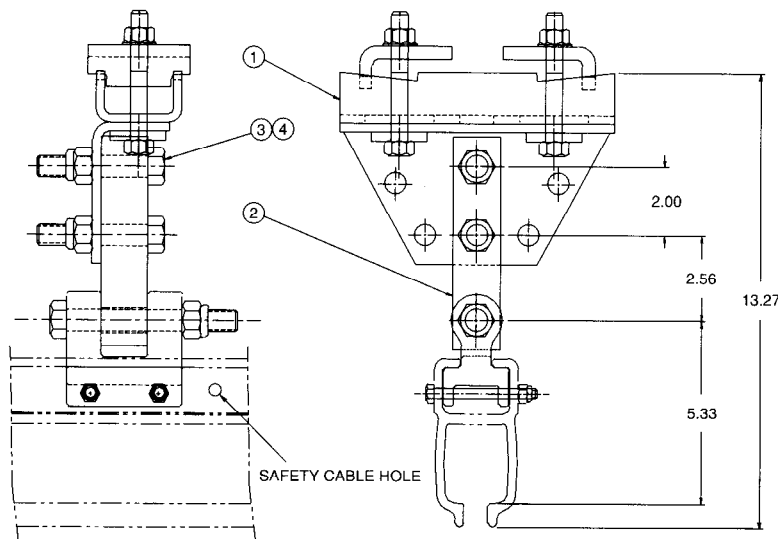


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH 22,400 LBS.
 YIELD STRENGTH 14,000 LBS.
 CAPACITY 2,000 LBS.
 MINIMUM RAIL RADIUS 36"
 WEIGHT OF ASSEMBLY 5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30197	1	1	HANGER
-	30266	2	1	HANGER BRACKET
85075	-	3	1	BRONZE BEARING
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
70968	-	5	2	5/16-18 X 3.25" LG. H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
75582	-	7	2	5/16-18 LOCK NUT
30907-06	-	8	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET.)

BEAM HANGER KIT • ZRA1/PARALLEL/STANDARD FLANGE/ PART NO. 30290



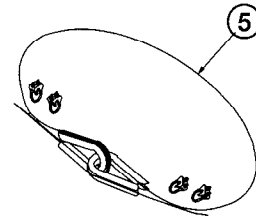
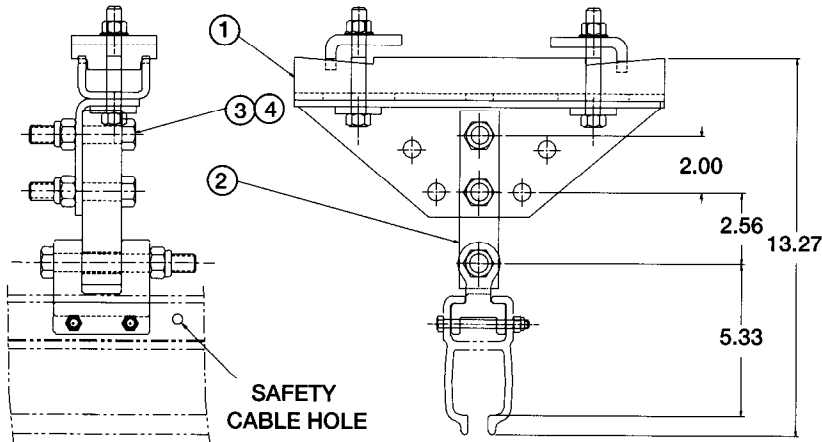
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW

STANDARD FLANGE HANGER KIT WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH 22,400 LBS.
 YIELD STRENGTH 14,000 LBS.
 CAPACITY 2,000 LBS.
 MINIMUM RAIL RADIUS 36"
 WEIGHT OF ASSEMBLY 15 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER KIT-STD FLANGE
-	30285	2	1	HANGER KIT SUB ASS'Y
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y (CABLE LENGTH 6 FEET.)

BEAM HANGER KIT • ZRA1/PARALLEL/WIDE FLANGE/PART NO. 30291



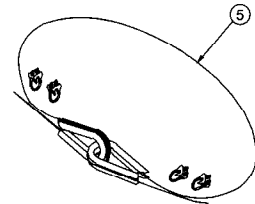
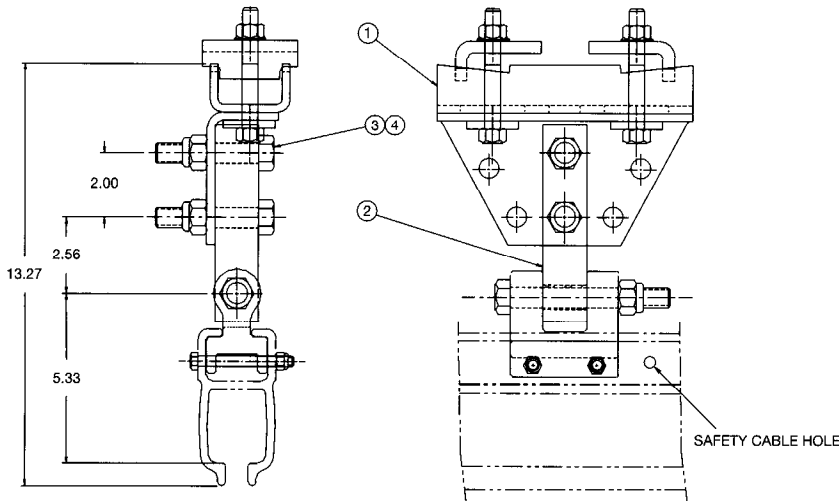
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH.....22,400 LBS.
 YIELD STRENGTH.....14,000 LBS.
 CAPACITY.....2,000 LBS.
 MINIMUM RAIL RADIUS.....36"
 WEIGHT OF ASSEMBLY.....16 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT-STD FLANGE
-	30285	2	1	HANGER KIT SUB ASS'Y
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET.)

BEAM HANGER KIT • ZRA1/PERPENDICULAR/STANDARD FLANGE/PART NO. 30292



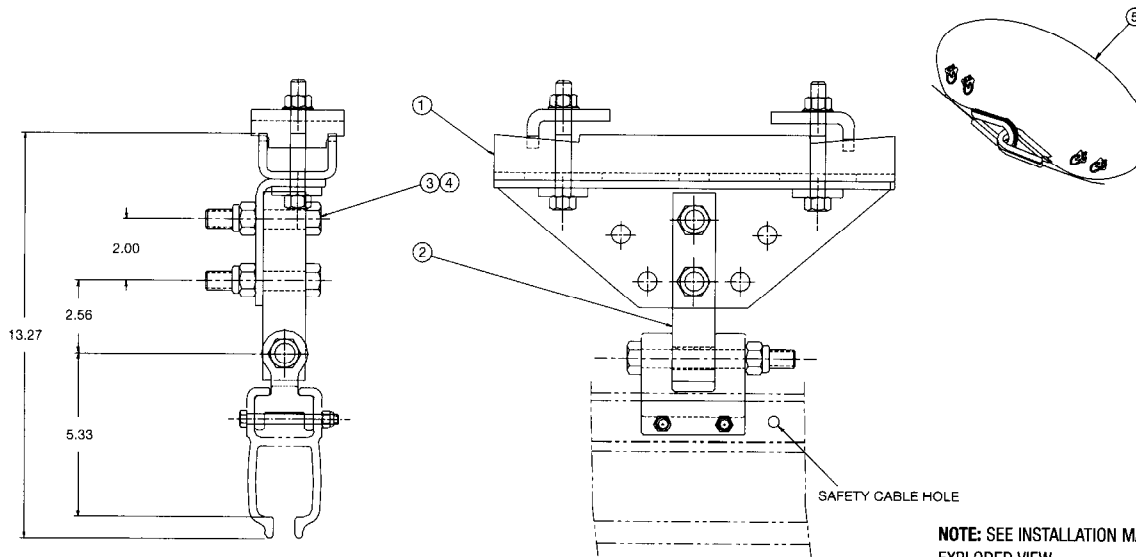
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KIT WILL ACCOMMODATE FROM 2.5: TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH.....22,400 LBS.
 YIELD STRENGTH.....14,000 LBS.
 CAPACITY.....2,000 LBS.
 MINIMUM RAIL RADIUS.....36"
 WEIGHT OF ASSEMBLY.....15 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER KIT-STD FLANGE
-	30289	2	1	HANGER KIT SUB ASS'Y
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET.)

BEAM HANGER KIT • ZRA1/PERPENDICULAR/WIDE FLANGE/ PART NO. 30293



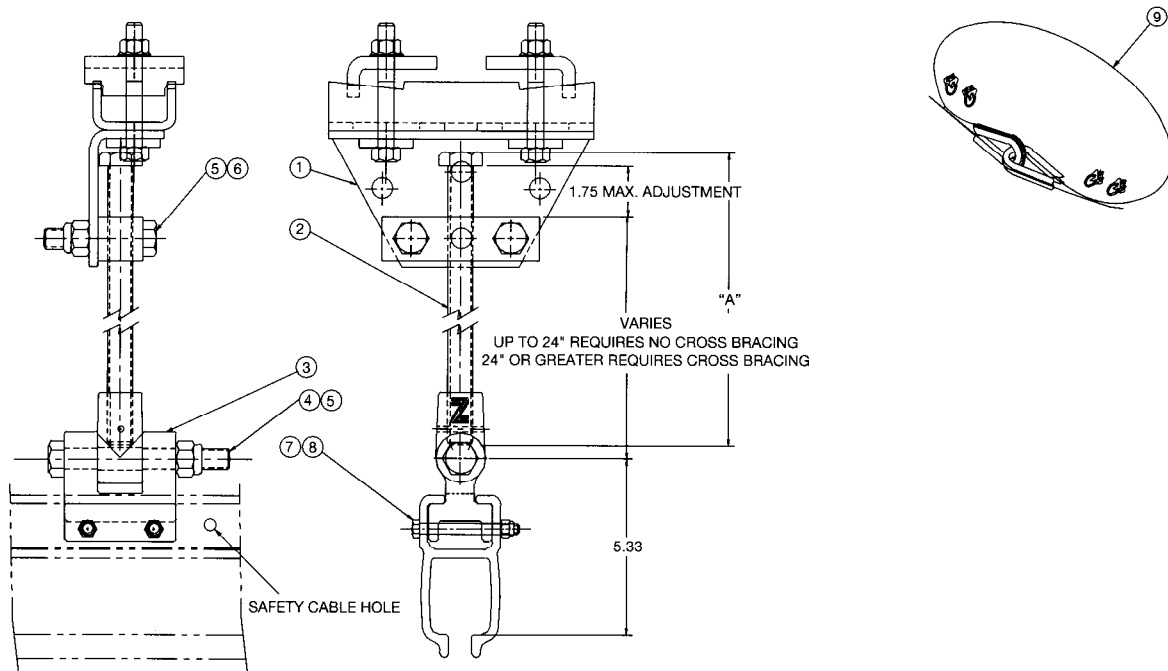
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH22,400 LBS.
 YIELD STRENGTH.....14,000 LBS.
 CAPACITY2,000 LBS.
 MINIMUM RAIL RADIUS.....36"
 WEIGHT OF ASSEMBLY16 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT-STD FLANGE
-	30289	2	1	HANGER KIT SUB ASS'Y
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

ADJUSTABLE HANGER KIT • ZRA1/STANDARD FLANGE/PART NO. 30287



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KIT WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH 19,000 LBS.

YIELD STRENGTH 12,000 LBS.

CAPACITY 2,000 LBS.

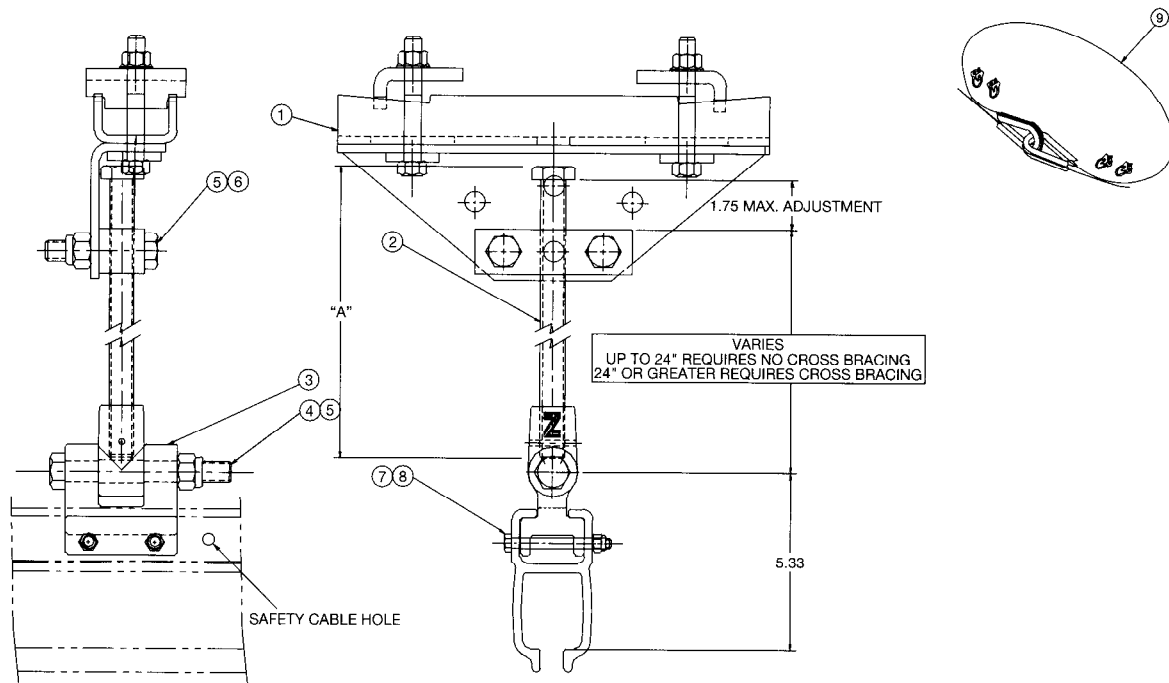
MINIMUM RAIL RADIUS 36"

* ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING. SEE ACCESSORIES SECTION.

MIN. "A" DIM	ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y. NO.	ORDER NUMBER HANGER KIT ASS'Y NO.
14.31	6.00"	30192-006	30907-06	30287-006
20.31	12.00"	30192-012	30907-08	30287-012
26.31	18.00"	30192-018	30907-10	30287-018
32.31	*24.00"	30192-025	30907-10	30287-024
44.31	*36.00"	30192-036	30907-12	30287-036
56.31	*48.00"	30192-048	30907-14	30287-048
68.31	*60.00"	30192-068	30907-16	30287-060
80.31	*72.00"	30192-072	30907-18	30287-072

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30186	1	1	HANGER KIT-STD FLANGE	
-	30190	2	1	HANGER ADJUSTMENT ASS'Y	
-	30266	3	1	HANGER BRACKET	
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72646	-	6	2	5/8-11 X 3.25" H.H.B.	
70968	-	7	2	5/16-18 X 3.25" H.H.B.	
75582	-	8	2	5/16-18 LOCK NUT	
SEE CHART	-	9	1	SAFETY CABLE ASS'Y	

ADJUSTABLE HANGER KIT • ZRA1/WIDE FLANGE/PART NO. 30288



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:19,000 LBS.

YIELD STRENGTH:14,000 LBS.

WEIGHT OF ASSEMBLY:14 LBS.

CAPACITY:2,000 LBS.

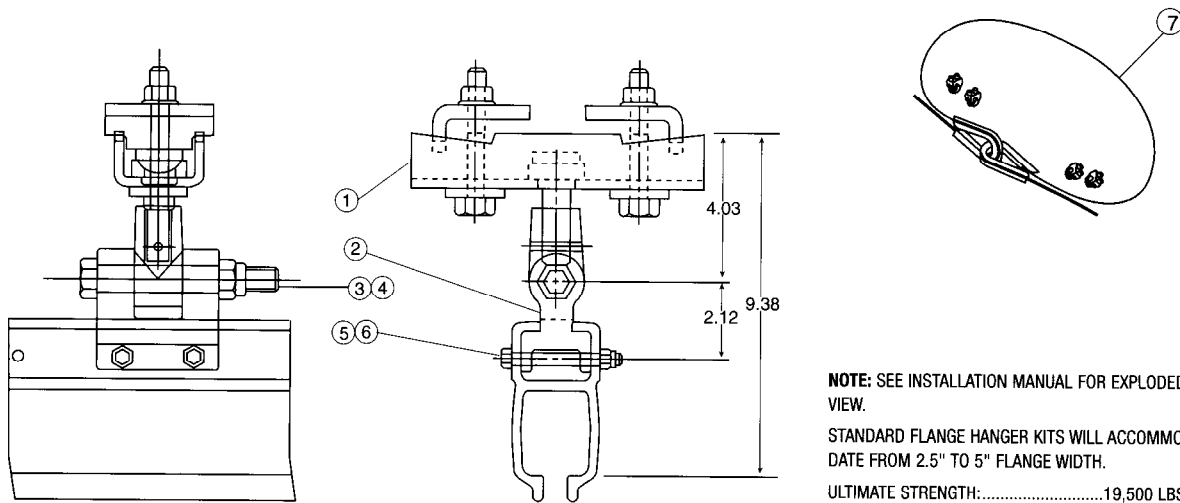
MINIMUM RAIL RADIUS:36"

*ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING.

MIN. "A" DIM	ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y. NO.	ORDER NUMBER HANGER KIT ASS'Y NO.
14.31	6.00"	30192-006	30907-06	30288-006
20.31	12.00"	30192-012	30907-08	30288-012
26.31	18.00"	3-102-018	30907-10	30288-018
32.31	*24.00"	30192-025	30907-10	30288-024
44.31	*36.00"	30192-036	30907-12	30288-036
56.31	*48.00"	30192-048	30907-14	30288-048
68.31	*60.00"	30192-068	30907-16	30288-060
80.31	*72.00"	30192-072	30907-18	30288-072

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT-STD. FLANGE
-	30190	2	1	HANGER ADJUSTMENT ASS'Y.
-	30286	3	1	HANGER BRACKET
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72646	-	6	2	5/8-11 X 3.25" H.H.B.
70968	-	7	2	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT
SEE CHART	-	9	1	SAFETY CABLE ASS'Y.

CLOSE HANGER KIT • ZRA1/STANDARD FLANGE/PART NO. 30300



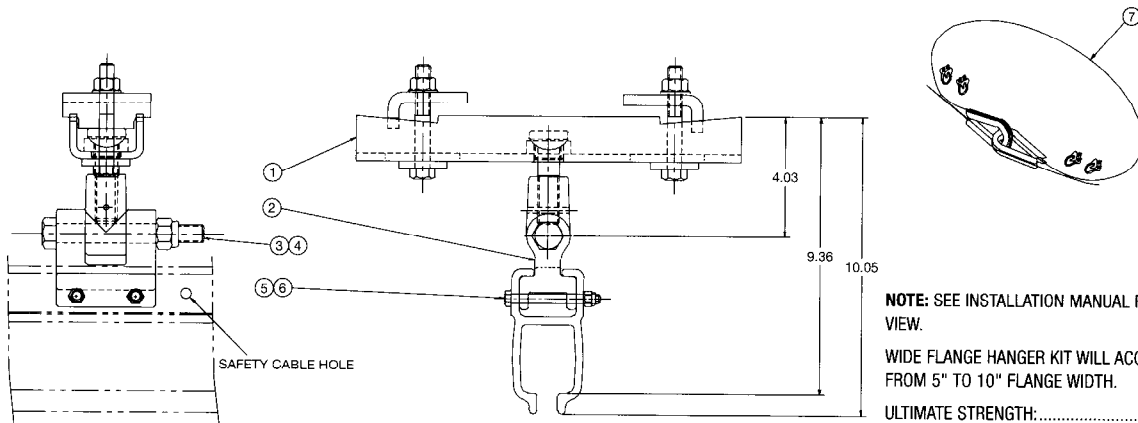
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KITS WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH:.....19,500 LBS.
 YIELD STRENGTH:.....12,000 LBS.
 CAPACITY:.....2,000 LBS.
 MINIMUM RAIL RADIUS:......36"
 WEIGHT OF ASSEMBLY:.....9 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30919	1	1	HANGER KIT-SUB ASS'Y.
-	30266	2	2	HANGER BRACKET
72623	-	3	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	4	1	5/8-11 LOCK NUT
70968	-	5	2	5/16-18 X 3.25" H.H.B.
75582	-	6	2	5/16-18 LOCK NUT
30907-06	-	7	1	SAFETY CABLE ASS'Y.

CLOSE HANGER KIT • ZRA1/WIDE FLANGE/PART NO. 30301



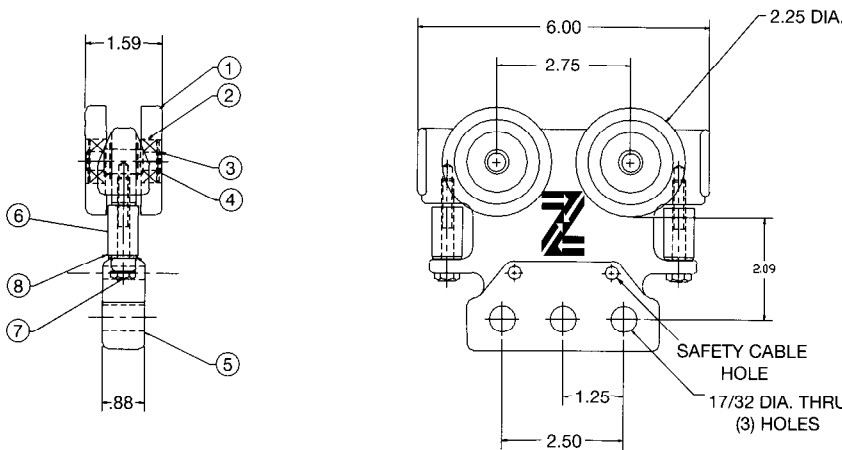
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:.....19,500 LBS.
 YIELD STRENGTH:.....12,000 LBS.
 CAPACITY:.....2,000 LBS.
 MINIMUM RAIL RADIUS:.....36"
 WEIGHT OF ASSEMBLY:.....10 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30920	1	1	HANGER KIT-SUB ASS'Y.
-	30266	2	2	HANGER BRACKET
72623	-	3	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
70968	-	5	2	5/16-18 X 3.25" H.H.B.
75582	-	6	2	5/16-18 LOCK NUT
30907-06	-	7	1	SAFETY CABLE ASS'Y.

ZRA1 ALUMINUM TROLLEY • 500 LBS. CAPACITY/PART NO. 30279



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

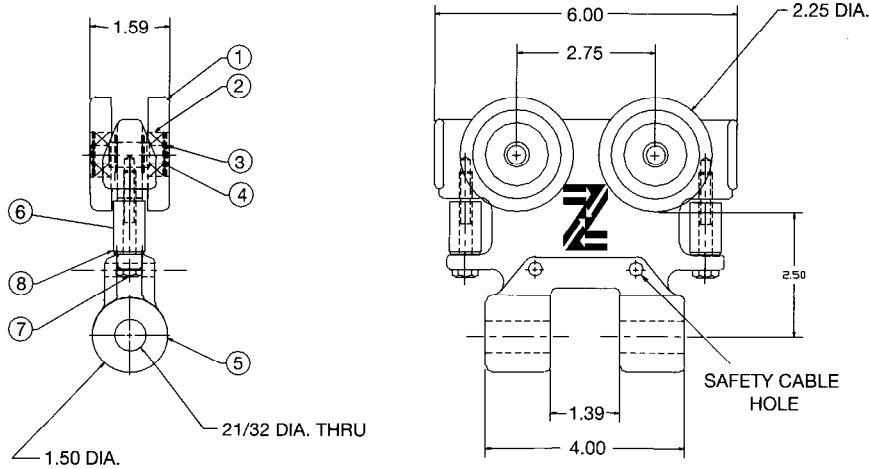
ROLLING FRICTION:.....ONE PERCENT
 MAXIMUM WHEEL LOAD:.....125 LBS.
 ULTIMATE STRENGTH:.....8,575 LBS.
 YIELD STRENGTH:.....7,500 LBS.
 CAPACITY:.....500 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:.....2.25" DIA. DELRIN
 BEARINGS:.....BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELRIN
 MINIMUM RAIL RADIUS:.....36.00"
 WEIGHT OF TROLLEY:.....4 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY, YOU MUST ORDER IT SEPARATELY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30208	1	4	TROLLEY WHEEL
-	-	2	4	BEARING (REF.)
-	30203	3	2	AXLE
99085	-	4	4	CLIP WHEEL MTG.
-	30278	5	1	TROLLEY BODY
-	30223	6	2	GUIDE ROLLER
70484	-	7	2	1/4-20 X 2.00" H.H.C.S.
74504	-	8	2	WASHER 1/4" FLAT

ZRA1 ALUMINUM TROLLEY • 500 LBS. CAPACITY/PART NO. 30281



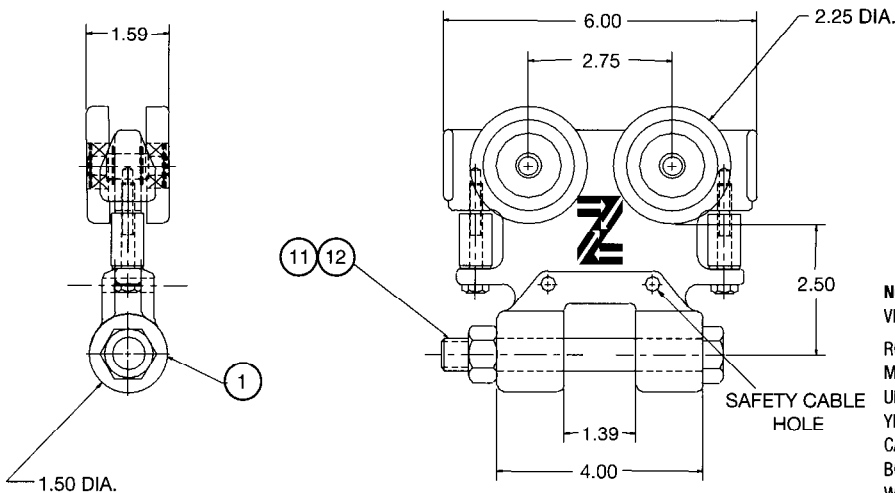
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:2.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF TROLLEY:4 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY. REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30208	1	4	TROLLEY WHEEL
-	-	2	4	BEARING (REF)
-	30203	3	2	AXLE
99085	-	4	4	CLIP WHEEL MTG.
-	30280	5	1	TROLLEY BODY
-	30223	6	2	GUIDE ROLLER
70484	-	7	2	1/4-20 X 2.00" H.H.C.S.
74504	-	8	2	WASHER 1/4" FLAT

ZRA1 ALUMINUM LOAD TROLLEY • 500 LBS. CAPACITY/PART NO. 30304



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

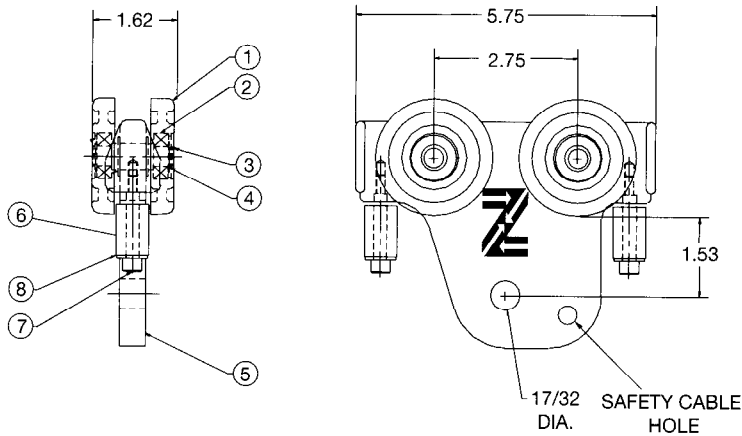
ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:2.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF TROLLEY:4.5 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY. REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE 06 = 6 FEET)

TROLLEY - 500# CARZRAI

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30281	-	1	1	TROLLEY
75587	-	2	1	5/8-11 LOCK NUT
72623	-	3	1	5/8-11 X 5" H.H.B.

ZRA1 UNIVERSAL TROLLEY • ALUMINUM/500 LBS. CAPACITY/ PART NO. 30204



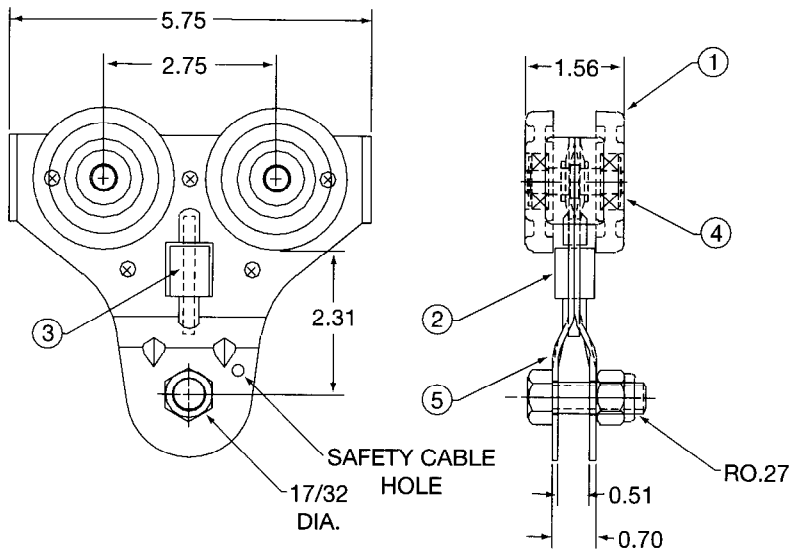
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:2.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF TROLLEY:3.5 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY. REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30208	1	4	TROLLEY WHEEL
-	-	2	4	BEARING (REF.)
99085	30203	3	2	AXLE
-	-	4	4	CLIP - WHEEL MTG.
-	30201	5	1	TROLLEY BRACKET
-	30223	6	2	GUIDE ROLLER
70476	-	7	2	1/4-20 X 1-1/4" S.H.C.S.
74504	-	8	2	WASHER 1/4" FLAT

ZRA1 UNIVERSAL TROLLEY • STEEL/500 LBS. CAPACITY/PART NO. 30259



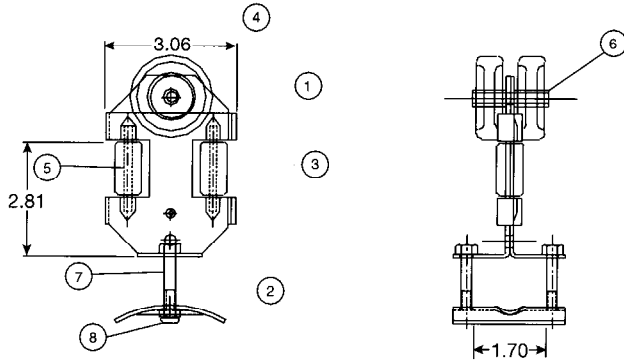
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:2.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF TROLLEY:3.5 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY. REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30208	1	4	TROLLEY WHEEL
-	30262	2	1	1/4 ID X 5/8 OD X 81 DELRIN
77057	-	3	1	3/16 ROLL PIN X 2 LG.
99085	-	4	4	CLIP - WHEEL MTG. / NUT 3/8-16 LOCK
-	30602	5	1	TROLLEY SUB ASS'Y
72035	-	6	1	1/2-13 X 1-1/2 BOLT
75511	-	7	1	1/2-13 LOCK NUT

FESTOON TROLLEY • ZRA1/ALUMINUM RAIL/PART NO. 30579



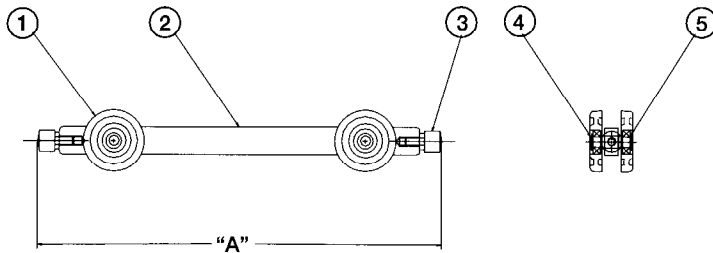
NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)
THIS TROLLEY IS USED FOR FESTOONING FLAT WIRE OR AIR HOSE.

CAPACITY:50 LBS.
WEIGHT OF ASSEMBLY:5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30577	1	2	TROLLEY STAMPING
-	30578	2	1	CLAMP PLATE
-	30582	3	2	GUIDE ROLLER
-	9960T11	4	2	SKATE WHEEL
77057	-	5	2	3/16 DIA. X 2.00" ROLL PIN
77010	-	6	1	1/4 DIA. X 1-3/4" ROLL PIN
70498	-	7	2	1/4-20 X 2.00" H.H.B.
75581	-	8	2	1/4-20 LOCK NUT

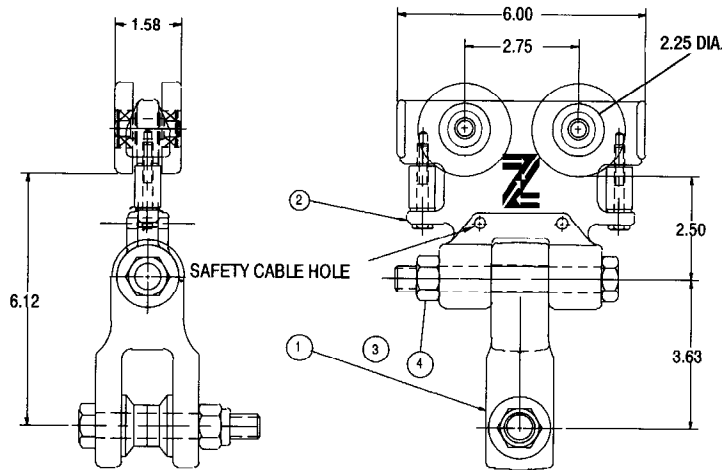
BUMPER TROLLEY • ZRA1 ALUMINUM RAIL/PART NO. 30307



"A" DIMENSION	PART NO.	WEIGHT
12"	30307-1200	3 LBS.
24"	30307-2400	5 LBS.
36"	30307-3600	7 LBS.
48"	30307-4800	9 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30208	1	4	TROLLEY WHEEL ASS'Y.
-	30311	2	1	BUMPER TROLLEY BRACKET
99097	-	3	2	RUBBER BUMPER
-	30203	4	2	AXLE
99085	-	5	4	CLIP – WHEEL MTG.

HOIST TROLLEY-SINGLE • ZRA1/500 LBS. CAPACITY/PART NO. 30313



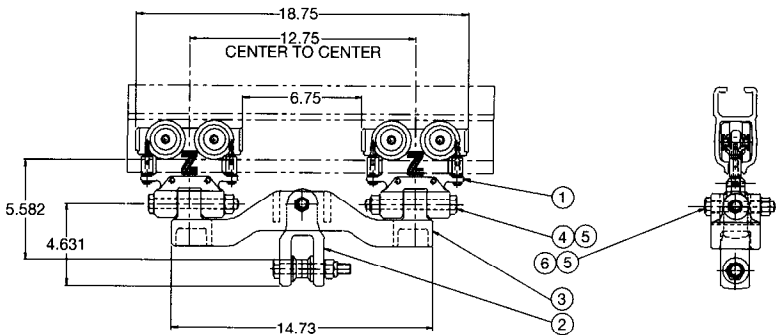
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:125 LBS.
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS ASSEMBLY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30903	1	1	HOIST HOOK BRACKET
30281	-	2	1	TROLLEY
72623	-	3	1	SCREW 5/8-11 X 5 H.C.S.
75582	-	4	1	NUT 5/8-11

HOIST TROLLEY-DUAL • ZRA1/1000 LBS. CAPACITY/PART NO. 30303



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

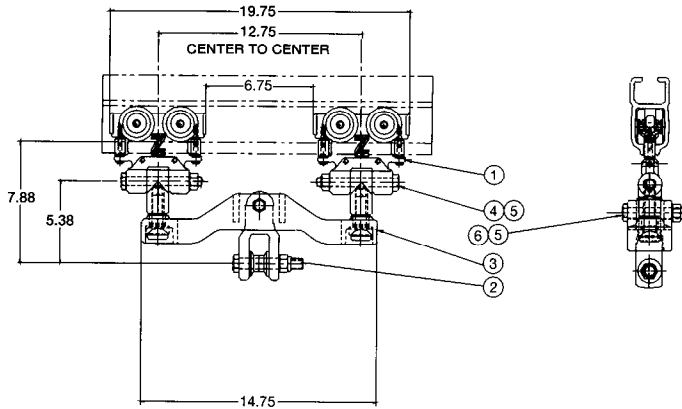
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:18 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30281	1	2	TROLLEY ASS'Y.
-	30903	2	1	AIR HOIST BRACKET ASS'Y.
-	30173	3	1	DUAL TROLLEY TIE BAR
72623	-	4	2	5/8-11 X 5.00" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.

CURVE HOIST TROLLEY-DUAL • 1000 LBS. CAPACITY/PART NO. 30318



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

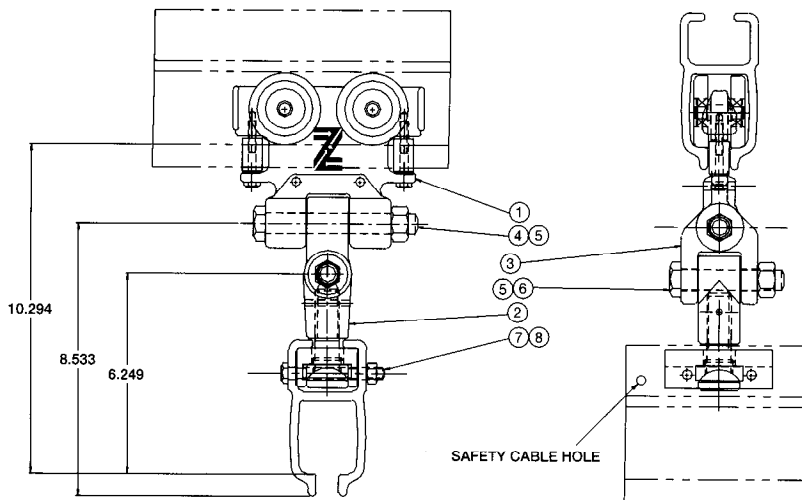
REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:.....13,250 LBS.
 YIELD STRENGTH:.....10,600 LBS.
 CAPACITY:.....1,000 LBS.
 MINIMUM RAIL RADIUS:.....36.00"
 WEIGHT OF ASSEMBLY:.....19 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30304	1	2	ZRA1 TROLLEY ASS'Y.
-	30903	2	1	AIR HOIST BRACKET ASS'Y.
-	30832	3	1	DUAL TROLLEY TIE BAR
72644	-	4	1	5/8-11 X 4.00" H.H.B.
75587	-	5	1	5/8-11 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRA1/500 LBS. CAPACITY SINGLE TROLLEY/PART NO. 30283



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

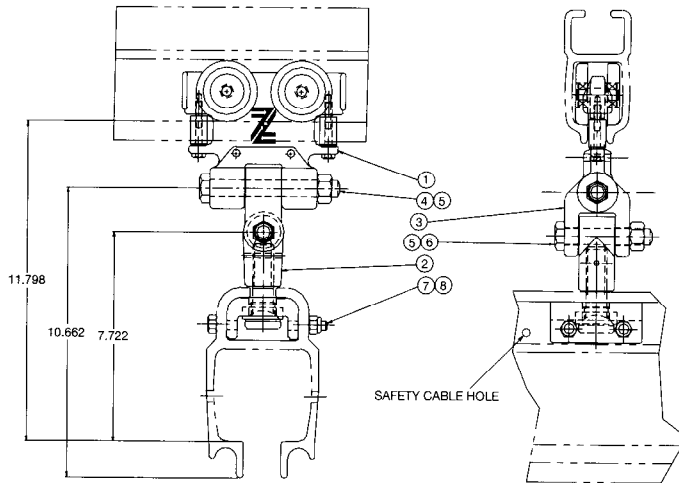
REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 ULTIMATE STRENGTH:.....8,575 LBS.
 YIELD STRENGTH:.....7,500 LBS.
 CAPACITY:.....500 LBS.
 MINIMUM RAIL RADIUS:.....36.00"
 WEIGHT OF ASSEMBLY:.....6 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30281	1	1	ZRA1 TROLLEY
-	30282	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30166	3	1	FEMALE CLEVIS
72623	-	4	1	5/8-11 X 5.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
70968	-	7	2	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT

END TRUCK ASSEMBLY • ZRA2 ON ZRA1/500 LBS. CAPACITY SINGLE TROLLEY/PART NO. 30295



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

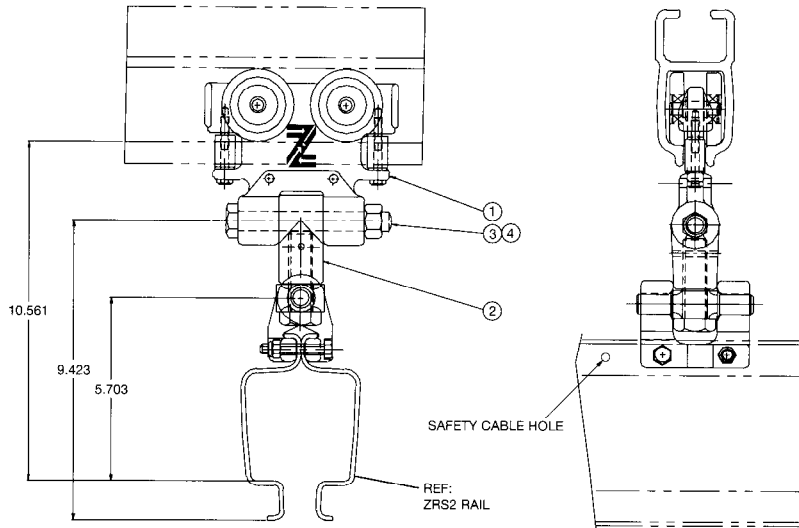
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF ASSEMBLY:6.5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30281	1	1	ZRA1 TROLLEY
-	30175	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30166	3	1	FEMALE CLEVIS
72623	-	4	1	5/8-11 X 5.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
71481	-	7	2	3/8-16 X 4.50" H.H.B.
75583	-	8	2	3/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRS2/3 ON ZRA1/500 LBS. CAPACITY SINGLE TROLLEY/PART NO. 30320



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

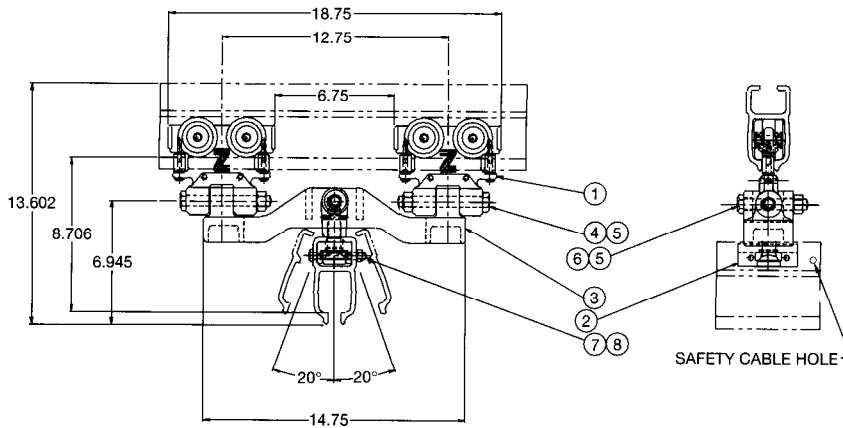
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:500 LBS.
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF ASSEMBLY:6.5 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30281	1	1	ZRA1 TROLLEY
-	30596	2	1	BRIDGE SUSP. SUB-ASS'Y.
72623	-	3	1	5/8-11 X 5.00" H.H.B.
75587	-	4	1	5/8-11 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRA1/1000 LBS. CAPACITY DUAL TROLLEY/PART NO. 30286



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

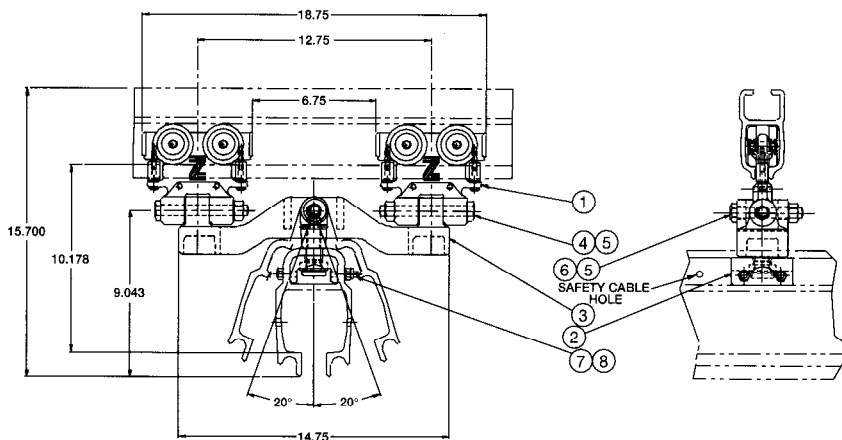
REF: PART NO. 30907 – LENGTH IN FEET
(EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:12 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30281	1	2	ZRA1 TROLLEY	
-	30282	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30173	3	1	DUAL TROLLEY TIE BAR	
72623	-	4	2	5/8-11 X 5.00" H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	
70968	-	7	2	5/16-18 X 3.25" H.H.B.	
75582	-	8	2	5/16-18 LOCK NUT	

END TRUCK ASSEMBLY • ZRA2 ON ZRA1/1000 LBS. CAPACITY DUAL TROLLEY/PART NO. 30272



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

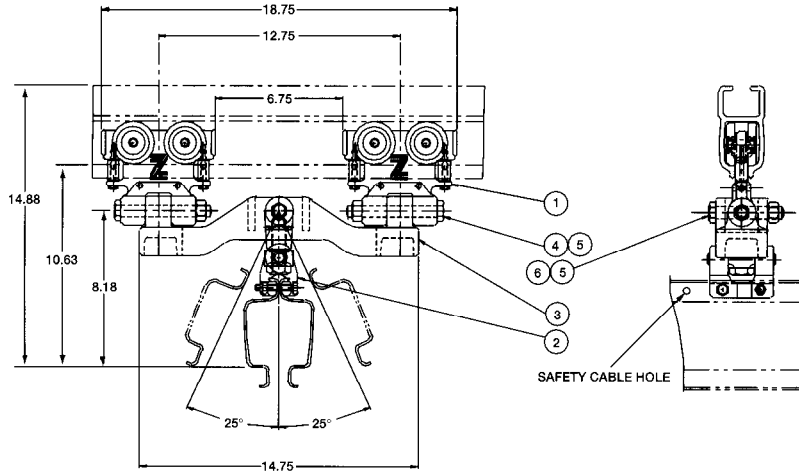
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:12 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30281	1	2	ZRA1 TROLLEY	
-	30175	2	1	BRIDGE CUSPS. SUB-ASS'Y.	
-	30173	3	1	DUAL TROLLEY TIE BAR	
72623	-	4	2	5/8-11 X 5.00" H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	
71481	-	7	2	3/8-16 X 4.50" H.H.B.	
75583	-	8	2	3/8-16 LOCK NUT	

END TRUCK ASSEMBLY • ZRS2 OR 3 ON ZRA1/1000 LBS. CAPACITY DUAL TROLLEY/PART NO. 30298



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

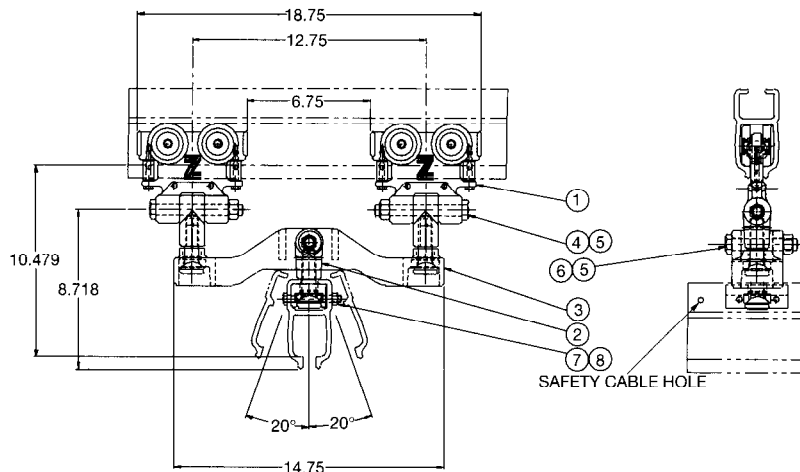
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:13 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30281	1	2	ZRA1 TROLLEY	
-	30596	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30173	3	1	DUAL TROLLEY TIE BAR	
72623	-	4	2	5/8-11 X 5.00" H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	

END TRUCK ASSEMBLY • ZRA1 ON ZRA1 CURVED RAIL/1000 LBS. CAP. DUAL TROLLEY/PART NO. 30296



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

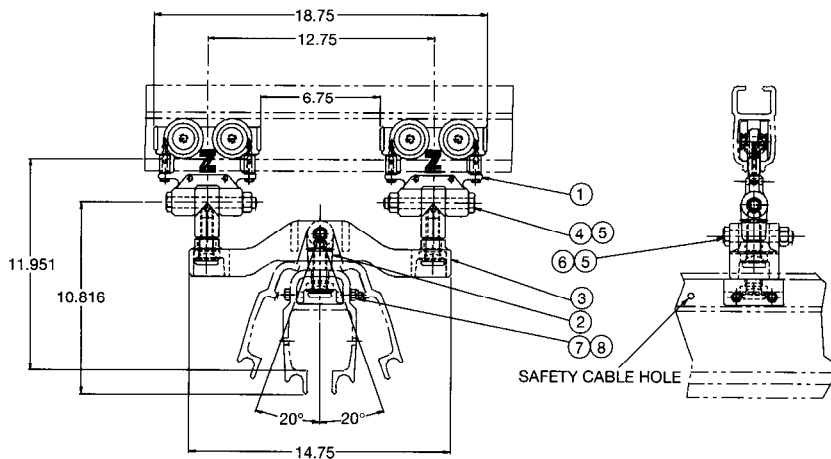
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:
 CAPACITY:
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF ASSEMBLY:16 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30281	1	2	ZRA1 TROLLEY	
-	30282	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30832	3	1	DUAL TROLLEY TIE BAR	
72623	-	4	2	5/8-11 X 5.00" H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	
70968	-	7	2	5/16-18 X 3.25" H.H.B.	
75582	-	8	2	5/16 LOCK NUT	

END TRUCK ASSEMBLY • ZRA2 ON ZRA1 CURVED RAIL/1000 LBS. CAP. DUAL TROLLEY/PART NO. 30297



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

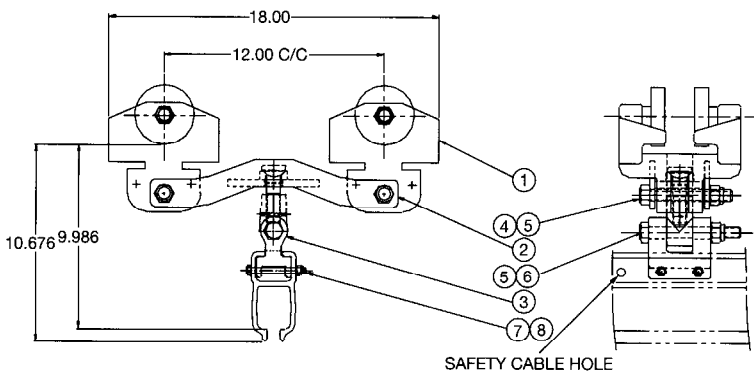
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS:36.00"
 WEIGHT OF ASSEMBLY:16.5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30281	1	2	ZRA1 TROLLEY
-	30175	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30832	3	1	DUAL TROLLEY TIE BAR
72623	-	4	2	5/8-11 X 5.00" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
71481	-	7	2	3/8-16 X 4.50" H.H.B.
75583	-	8	2	3/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON PATENT TRACK/1000 LBS. CAPACITY DUAL TROLLEY/PART NO. 30299



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

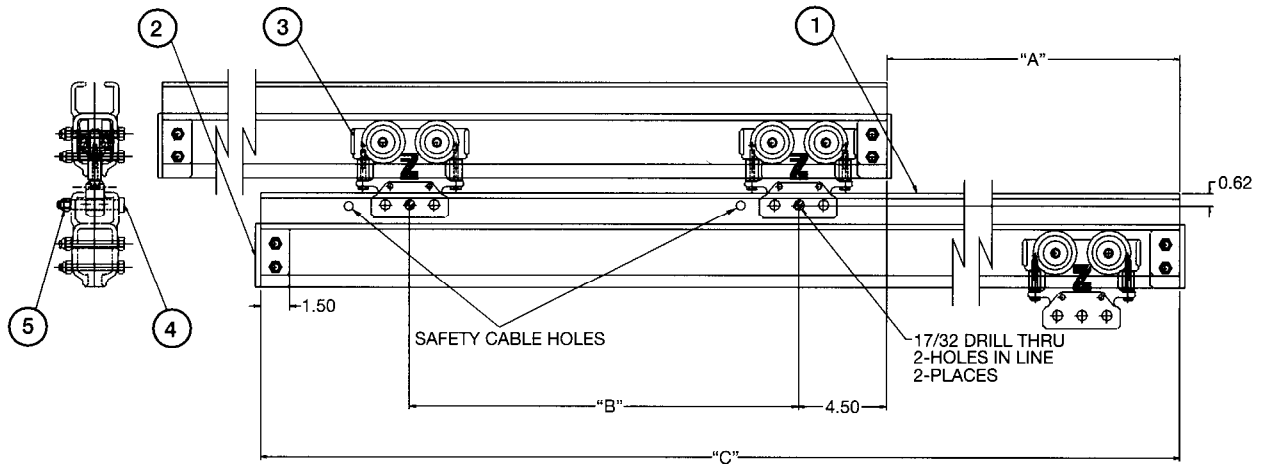
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:
 YIELD STRENGTH:
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:32 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	93813	1	2	TROLLEY ASS'Y.
-	30917	2	1	DUAL END TRUCK-ASS'Y.
-	30266	3	1	HANGER BRACKET
72615	-	4	2	5/8-11 X 4.50" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72623	-	6	1	5/8-11 X 5.00" H.H.B.
70968	-	7	2	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT

BRIDGE EXTENSIONS • ZRA1/SINGLE TROLLEY/PART NO. 30308



"A" DIMENSION FOR 2 FOOT EXTENSION			
PART NO.	"B" DIMENSION	"C" DIMENSION	CAPACITY
30308-22	2'-0"	5'-0"	250 LBS.
30308-23	3'-0"	6'-0"	300 LBS.
30308-24	4'-0"	7'-0"	325 LBS.

NOTE: BRIDGE EXTENSION ADDS 5.67" TO STACK-UP DIMENSION – FOR LONGER EXTENSIONS CONSULT THE FACTORY.

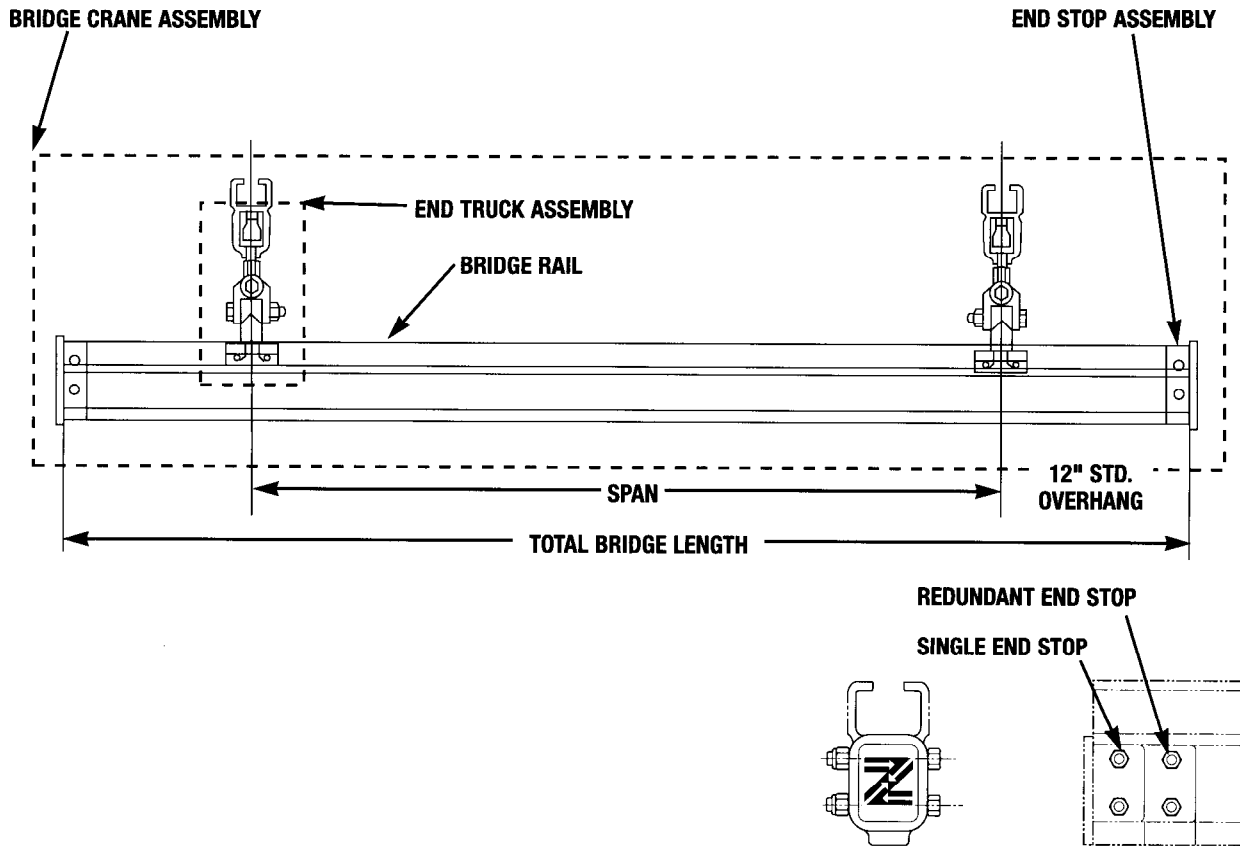
"A" DIMENSION FOR 3 FOOT EXTENSION			
PART NO.	"B" DIMENSION	"C" DIMENSION	CAPACITY
30308-32	2'-0"	6'-0"	200 LBS.
30308-33	3'-0"	7'-0"	250 LBS.
30308-34	4'-0"	8'-0"	275 LBS.

"A" DIMENSION FOR 4 FOOT EXTENSION			
PART NO.	"B" DIMENSION	"C" DIMENSION	CAPACITY
30308-42	2'-0"	7'-0"	150 LBS.
30308-43	3'-0"	8'-0"	200 LBS.
30308-44	4'-0"	9'-0"	250 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
30200	—	1	1	ZRA1 RAIL X "C" LG.	
30275	—	2	2	END STOP ASS'Y.	
30279	—	3	2	TROLLEY ASS'Y.	
72050	—	4	2	1/2 X 2-1/2 S.H.S.S.	
75583	—	5	2	3/8-16 LOCK NUT	

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY.

BRIDGE CRANE ASSEMBLY • EXAMPLE OF HOW TO ORDER



THE BRIDGE CRANE ASSEMBLY CONSISTS OF:
 ONE BRIDGE BEAM (SECTION OF RAIL)
 TWO END TRUCK ASSEMBLIES (MOUNTED TO THE BRIDGE WITH A TROLLEY TO ROLL INSIDE OF THE RUNWAY, SAFETY CABLES WILL BE PRE-INSTALLED)
 TWO END STOPS (ONE INSTALLED AT EACH END OF THE BRIDGE)
 REDUNDANT END STOPS ARE AVAILABLE (PLEASE SPECIFY)

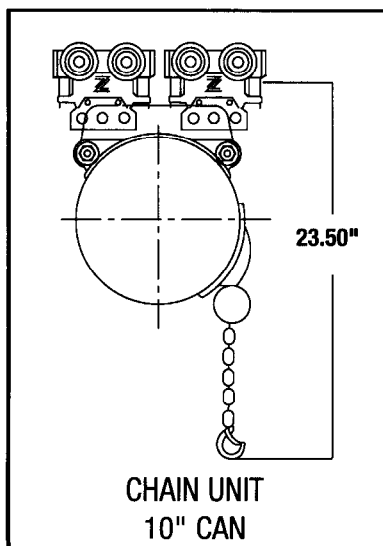
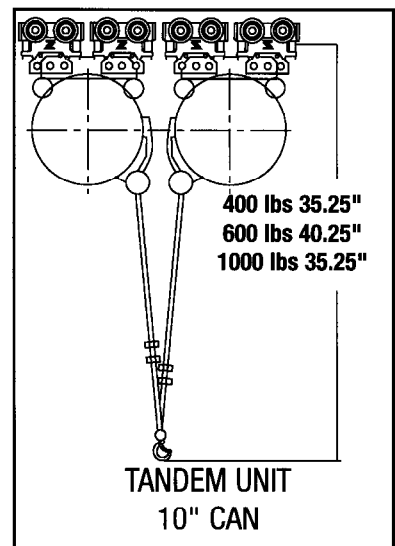
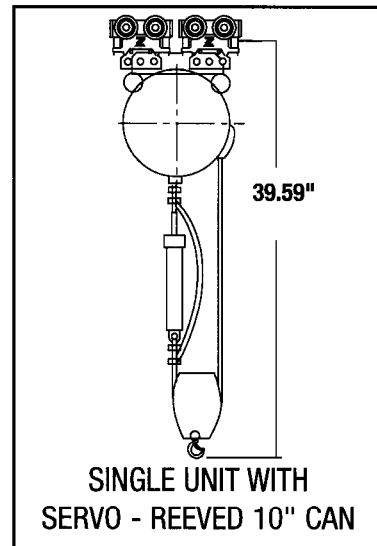
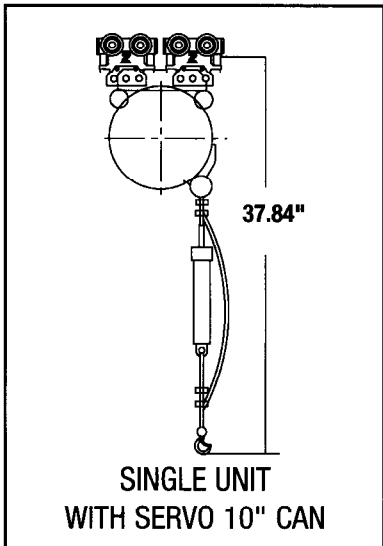
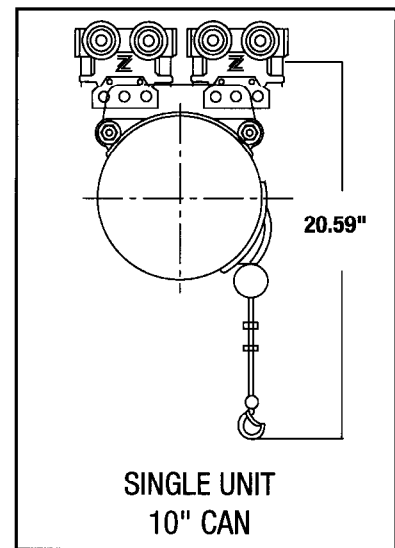
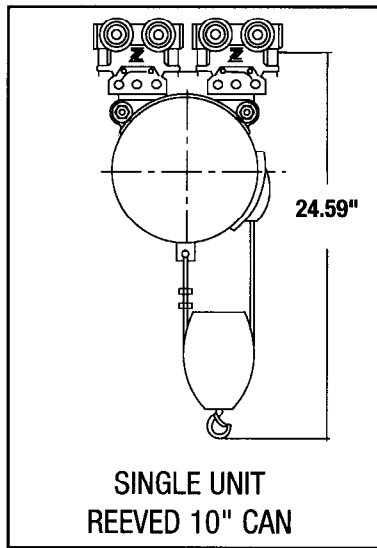
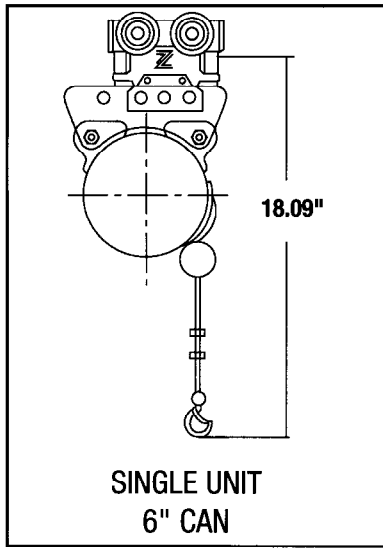
EXAMPLE

ORDER NUMBER:

ZRA1 06 08 30283 R

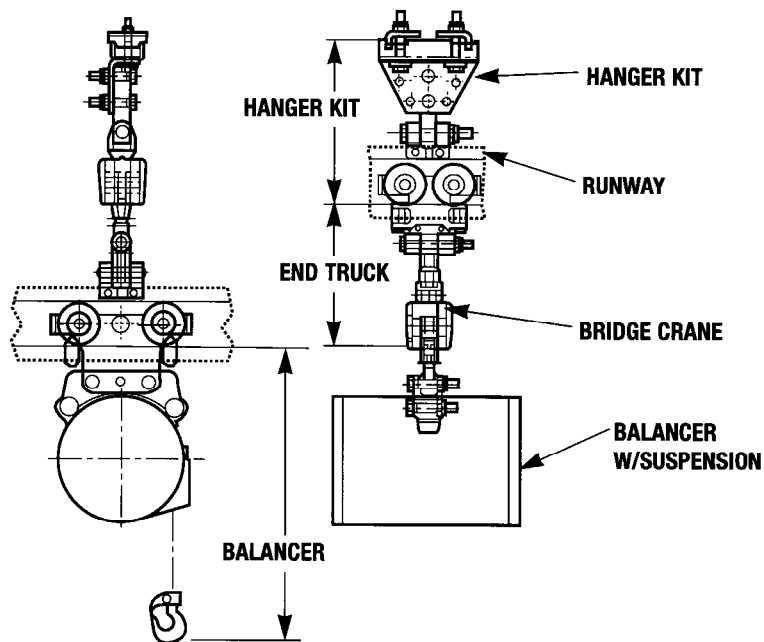
ZRA1 — TYPE OF BRIDGE RAIL
 06 — SPAN (RUNWAY CENTER-CENTER DIMENSION IN FEET)
 08 — TOTAL BRIDGE LENGTH (IN FEET)
 30283 — END TRUCK ASSEMBLY
 R — REDUNDANT END STOP (OPTIONAL)

BALANCER STACK-UP DIMENSION • FOR ZRA1 ALUMINUM RAIL

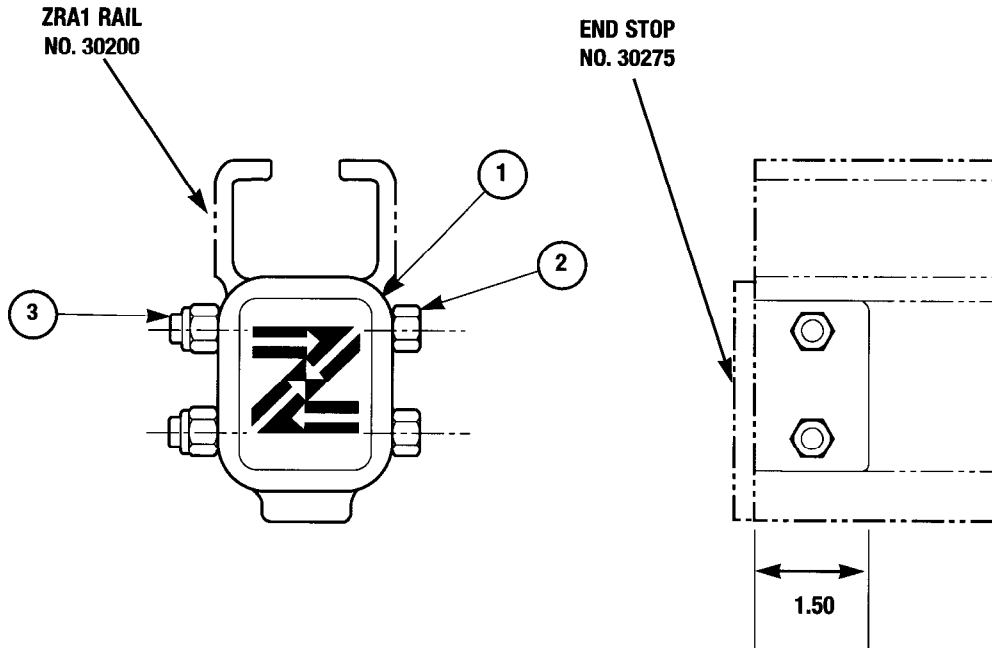


SYSTEM STACK-UP DIMENSION • ZRA1/QUICK REFERENCE

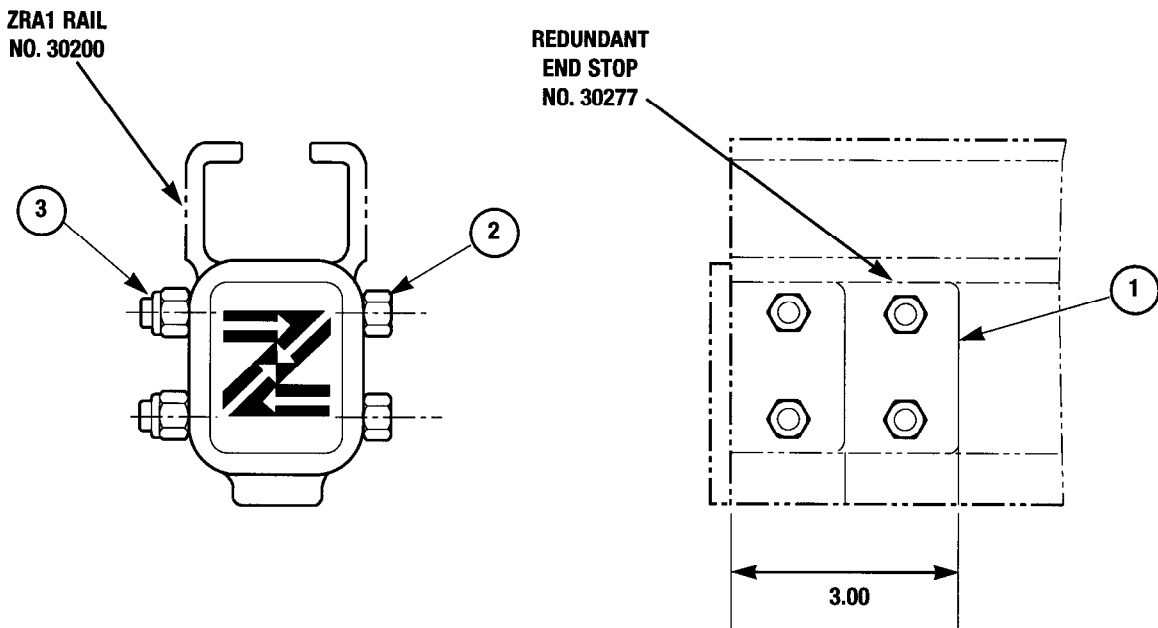
HANGER KITS	END TRUCKS	BALANCERS WITH SUSPENSION
30227 – 4.21"	30283 – 10.25"	SINGLE UNIT 10" – 20.59"
30285 – 7.38"	30295 – 11.75"	SINGLE UNIT REEVED 10" – 24.59"
30289 – 7.38"	30286 – 8.75"	SINGLE UNIT WITH SERVO 10" – 37.84"
30290 – 12.50"	30272 – 10.13"	SINGLE UNIT REEVED WITH SERVO 10" – 39.59"
30291 – 12.50"	30289 – 10.63"	SINGLE UNIT 6" – 18.09"
30292 – 12.50"	30296 – 10.50"	SINGLE UNIT (CHAIN) 10" – 23.50"
30293 – 12.50"	30297 – 12.00"	TANDEM UNIT 10" – 400 LBS. 35.25"
30287 – (ADJUSTABLE)	30299 – 10.00"	600 LBS. 40.25"
30288 – (ADJUSTABLE)	30320 – 10.56"	1000 LBS. 35.25"
30300 – 9.38"		
30301 – 9.38"		



END STOPS • ZRA1/PART NO. SINGLE-30275/REDUNDANT-30277

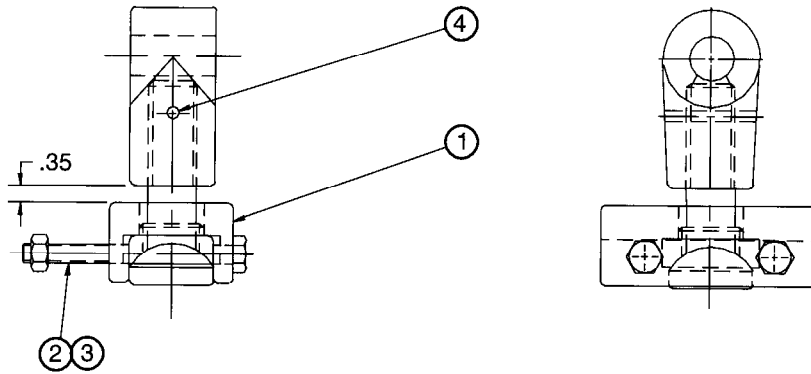


BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30274	1	1	END STOP
71479	-	2	2	3/8-16 X 3.00" LG H.C.S.
75583	-	3	2	3/8-16 LOCK NUT



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30276	1	1	REDUNDANT END STOP
71479	-	2	2	3/8-16 X 3.00" LG H.C.S.
75583	-	3	2	3/8-16 LOCK NUT

ZRA1 RAIL • BRIDGE SUSPENSION SUB-ASSEMBLY/PART NO. 30305

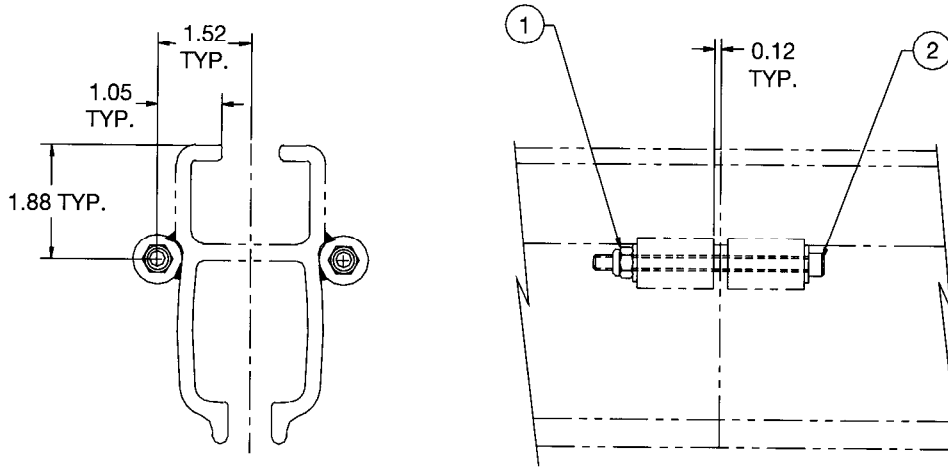


NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

ULTIMATE STRENGTH:.....8,575 LBS.
 YIELD STRENGTH:7,500 LBS.
 CAPACITY:.....1,000 LBS.
 WEIGHT OF ASSEMBLY:.....3 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
70968	-	2	1	5/16-18 X 3.25" H.H.B.
75582	-	3	1	5/16-18 LOCK NUT
99118	-	4	1	SCREW & NUT ASSY.
30282	-	1	1	BRIDGE SUSPENSION SUBASSY.

SPLICE BOLT KIT • ZRA1/PART NO. 30231

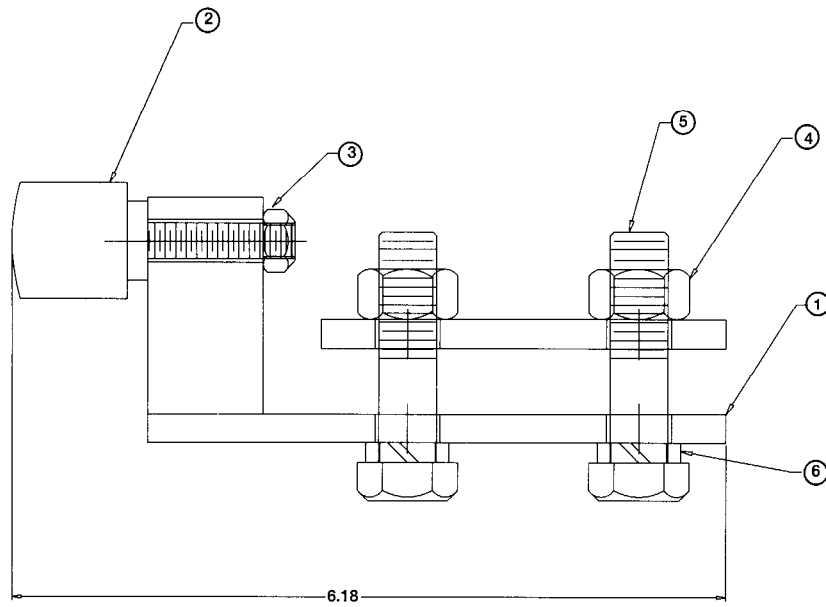


NOTE: THERE MUST BE A HANGER KIT WITHIN 12 IN. (305 MM) OF THE SPLICE JOINT ON THE RUNWAY.

CONSULT THE FACTORY IF MODIFICATIONS NEED TO BE MADE TO SPLICE JOINTS THAT REQUIRE WELDING OF SPLICE LUGS.

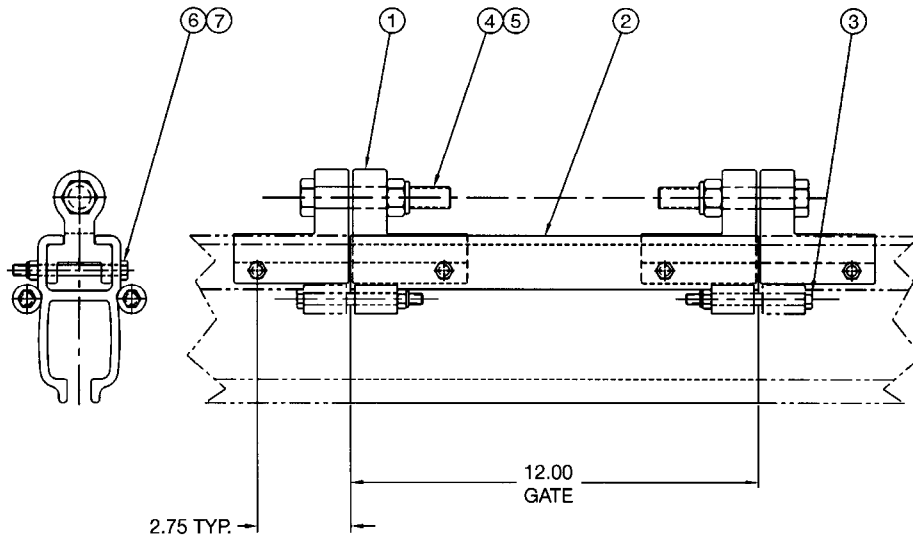
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
70926	-	2	2	5/16-18 X 3-1/2 S.H.C.S.
75582	-	1	2	NUT 5/16-18

ZRA1 RAIL • ADJUSTABLE STOP/PART NO. 30738



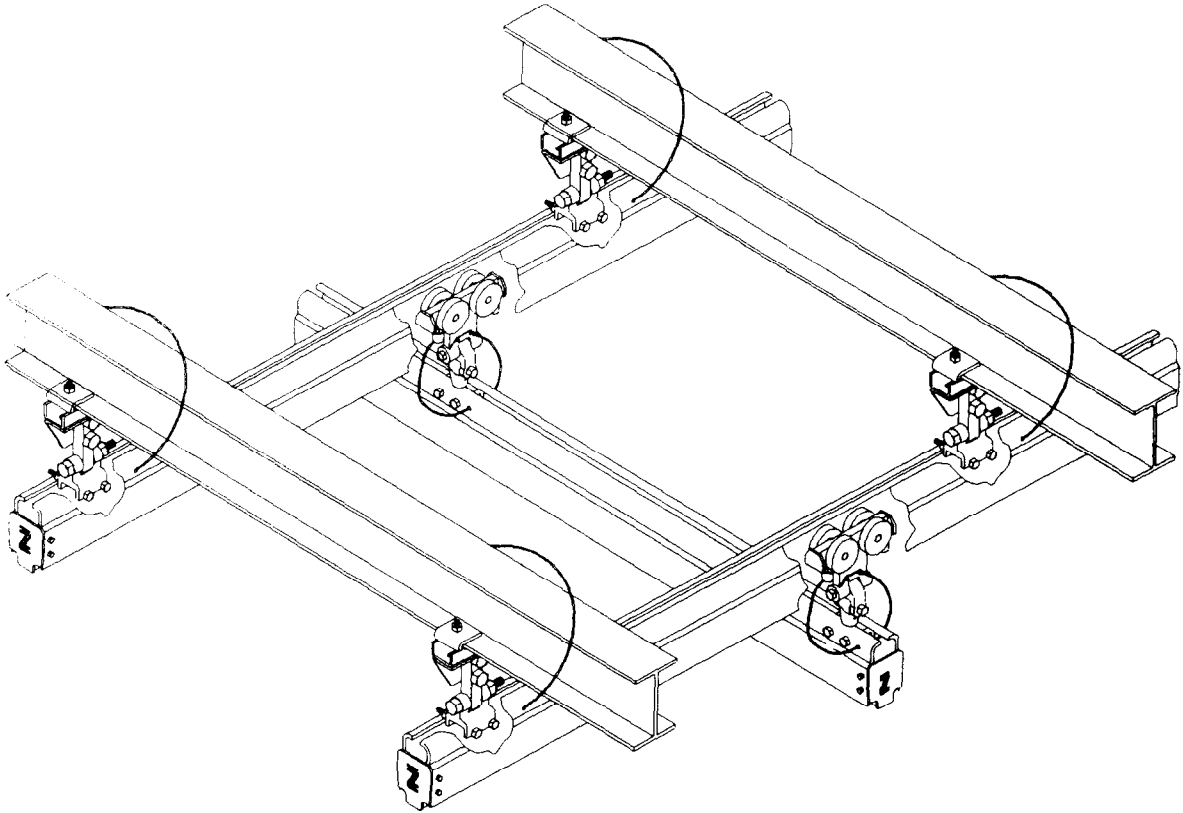
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30734	1	1	BAR WELDMENT
-	30744	2	1	THRD AND HEX SHOULDER
-	75582	3	1	5/16-18 PT LOCKNUT
-	30736	4	1	NUT WELDMENT
-	72002	5	2	1/2-13 X 2.00 HEX HEAD CAPSCREW
-	74513	6	2	1/2 MED. SPRING LOCKWASHER

ZRA1 RAIL • INSPECTION GATE/PART NO. 30998



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30996	1	4	HANGER BRACKET
-	30997	2	1	GATE - ZRA1
-	30231	3	2	SPLICE BOLT KIT - ZRA1
72644	-	4	2	5/8-11 X 4.00" LG. H.H.B. GRADE 5
75587	-	5	2	5/8-11 STOVER LOCK NUT
70968	-	6	4	5/16-18 X 3.25" LG. H.H.B. GRADE 5
75582	-	7	4	5/16-18 STOVER LOCK NUT

ZRA2 ALUMINUM RAIL AND COMPONENTS



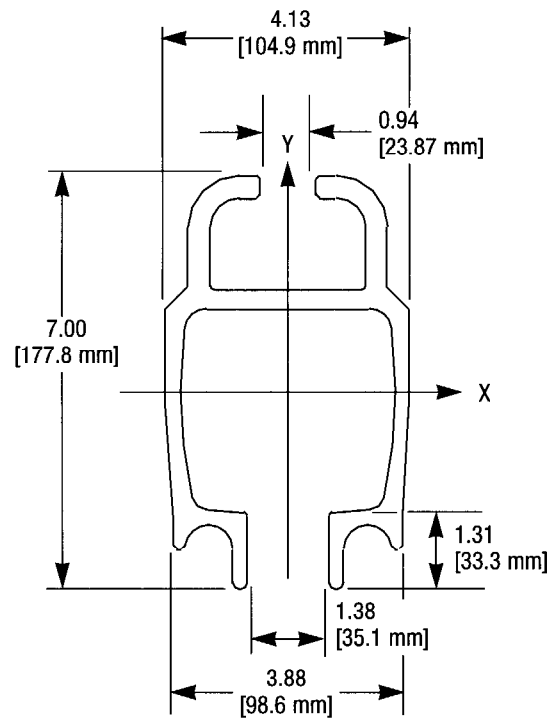
ENGINEERING DATA FOR ZRA2 ALUMINUM RAIL

1. All rail and hangers must be installed in accordance with Zimmerman Handling Systems' (Z.H.S.) instructions.
2. Rail provided is ZRA2 aluminum alloy.
3. The rail or bridge beam provided is modular design, weld free application, and self aligning with complete bolt-together capability at all splice joints and hangers.
4. All rail sections provided are saw cut square to required length by Z.H.S. All rail joints should be flush when installation is completed.
5. The capacity of the rail, monorail or bridge crane will be determined so that deflection under rated load shall not exceed 1/450 of the span. Lateral deflection will not be accepted.
6. The allowable stresses applied must not exceed 20% of the **minimum yield strength** of the materials used.
7. The maximum capacity for all rail provided by the contractor including hoist, product, process equipment, and all attachments, etc., must not exceed the capacity specified below: ZRA2 Aluminum Rail - acceptable for maximum capacities up to and including 2000 lbs.
8. For bridge crane or hoist application(s), the maximum overhang of the bridge girder to the center of a runway rail must not exceed 12.00". (For larger overhangs consult the factory.)
9. All bridge cranes, runway, and monorail, must be installed straight, parallel, level and at the same elevation. Installation tolerance cannot exceed the values specified below:
 - a. **Longitudinal leveling.** Multiple runways and single rail systems .250" in overall length, with a maximum rate of change of no more than .125" on twenty-foot centers.
 - b. **Elevation runway to runway** .250" in span, maximum rate of change .125" on twenty-foot centers.
 - c. **Centering runway-to-runway** .500" in overall length, maximum rate of change .125" on twenty-foot centers.
 - d. **Centering for single rail** to a parallel conveyor of workstation will be $\pm .500$ " in overall length of the system, maximum rate of change .125" on twenty-foot centers.
10. Sway bracing should be used when the hanger meets or exceeds 24.00" in length. (See system installation manual.)
11. One month after system buy off, the enclosed rail system should be inspected and re-leveled by the installation contractor. All bolts at the splice joints, hangers and support structure should be re-checked for proper torque. Abnormalities noted by the inspector must be reported to Z.H.S. immediately.
12. All trolley running surfaces must be aligned flush in accordance with this specification and present no shock loading at splice connections. Transverse tilt will not be accepted.
13. Tension tubes at all splice connections will be aligned and welded by Z.H.S.
14. Joint modification or holes required in track section(s) will be by drilling or saw cutting only. Flame cutting of holes or splice joints is not permitted.
15. Where hanger rods are used, the allowable stress will be 20% of the minimum yield strength of the material provided.
16. All hangers must be installed true and vertical. All suspension fittings should bear the load equally.
17. All bolts, nuts, fasteners, attachments, etc., required for enclosed rail systems will be provided by Z.H.S.
18. All double girder bridge cranes provided will incorporate diagonal bracing for parallel stabilization.
19. All splice connections shall not exceed 12" from hanger point.

TROLLEYS

1. All trolleys are manufactured by Zimmerman Handling Systems.
2. All aluminum trolleys consist of high-tensile aluminum-magnesium alloy body.
3. All steel trolleys consist of a welded, stamped steel body.
4. All trolley wheels provided for hoists, bridge cranes, and related equipment must conform to Z.H.S.'s standards.
5. Trolley wheels are delrin, machined symmetrically true with the axis. All trolley wheels are retainer type, designed for a single row of high quality, precision-ground ball bearings. All trolley wheels have a stud that is press-fitted into the trolley body.
6. Trolley side guide rollers are delrin machined symmetrically true with the axis. All trolley side guide rollers are designed for single row ball bearings.
7. All trolleys are equipped with safety lugs so in the event of a wheel failure the trolley cannot come out of the rail.
8. All bearings are protected by grease and dust seals.

CROSS SECTION • ZRA2/PART NO. 30000



MOMENT OF INERTIA: $I = 14.05 \text{ IN}^4 [5.84\text{E}6 \text{ mm}^4]$
Y

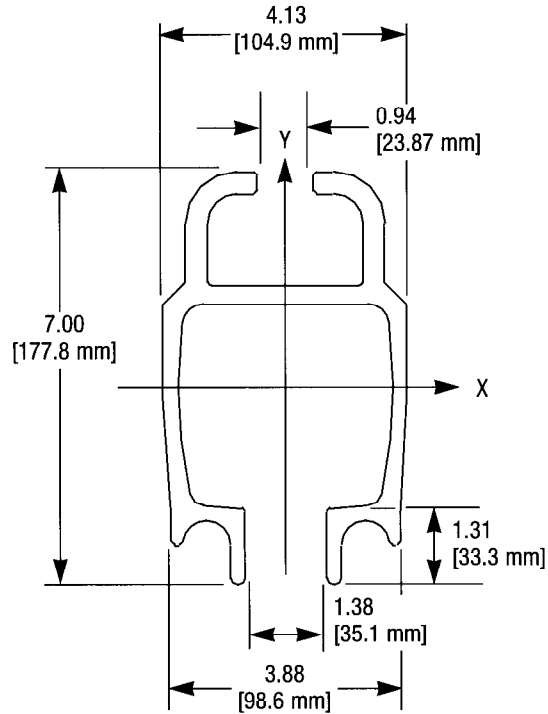
$I = 28.06 \text{ IN}^4 [11.6\text{E}6 \text{ mm}^4]$
X

LENGTH: 30 FT. [9144 mm]
WEIGHT: 7.50 LB./FT. [11.16 Kg/M]

LIVE LOAD DEFLECTIONS • ZRA2/PART NO. 30000

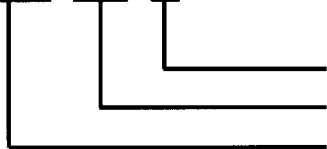
RAIL/BRIDGE SPAN				DEFLECTION LIMITS				POINT LOAD			
FT.	IN.	m	mm	1/450 IN.	1/450 mm	1/550 IN.	1/550 mm	1/450 lbs.	1/450 kg.	1/550 lbs.	1/550 kg.
5	60	1.52	1524	.13	3.3	.11	2.7	2900	1316	2900	1316
6	72	1.82	1828.8	.16	4.0	.13	3.3	2900	1316	2900	1316
7	84	2.13	2133.6	.19	4.8	.15	3.8	2900	1316	2900	1316
8	96	2.43	2438.4	.21	5.3	.17	4.3	2900	1316	2657	1208
9	108	2.74	2743.2	.24	6.0	.20	5.0	2566	1166	2100	954
10	120	3.04	3048.0	.27	6.8	.22	5.5	2079	945	1701	773
11	132	3.35	3352.8	.29	7.3	.24	6.0	1718	781	1405	639
12	144	3.65	3657.6	.32	8.1	.26	6.6	1443	656	1181	537
13	156	3.96	3962.4	.35	8.8	.28	7.1	1230	559	1006	457
14	168	4.26	4267.2	.37	9.3	.31	7.8	1060	482	868	394
15	180	4.57	4572.0	.40	10.1	.33	8.3	924	420	756	344
16	192	4.87	4876.8	.43	10.9	.35	8.8	812	369	664	302
17	204	5.18	5181.6	.45	11.4	.37	9.3	719	327	588	267
18	216	5.48	5486.4	.48	12.1	.39	9.9	642	292	525	239
19	228	5.79	5791.2	.51	12.9	.41	10.4	576	262	471	214
20	240	6.09	6096.0	.53	13.4	.44	11.1	520	236	425	193
21	252	6.40	6400	.56	14.2	.46	11.6	471	214	386	175
22	264	6.70	6705	.58	14.7	.48	12.1	422	192	366	166
23	276	7.01	7010	.61	15.4	.50	12.7	393	179	321	146
24	288	7.31	7315	.64	16.2	.52	13.2	361	164	295	134
25	313	7.95	7950	.67	17.0	.55	13.9	333	151	272	124
26	325	8.25	8255	.69	17.5	.57	14.4	307	139	252	114
27	337	8.55	8559	.72	18.2	.59	14.9	285	129	233	106
28	349	8.86	8864	.75	19.0	.61	15.4	265	120	217	99

HOW TO ORDER • ZRA2 ALUMINUM RUNWAY OR MONORAIL



PART NUMBER:

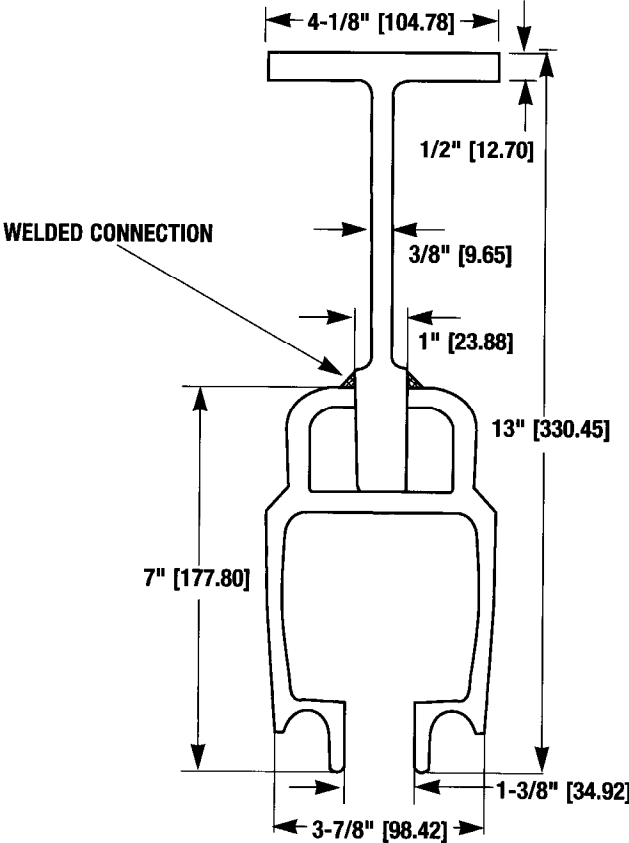
30000-210-2



INDICATES SPLICE LUGS WELDED ON
INDICATES LENGTH OF RAIL IN FEET (210=21 FEET)
INDICATES CROSS SECTION

NOTE: ALL RUNWAY RAIL WILL BE DRILLED FOR BOTH END STOPS AND WILL HAVE SPLICE LUGS WELDED ON.

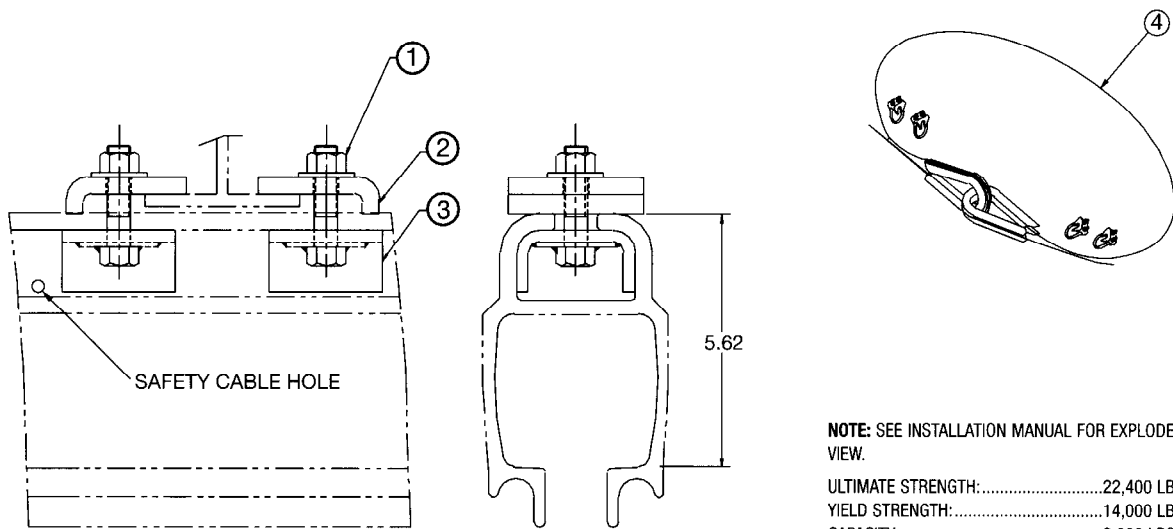
CROSS SECTION • ZRA2 STRONG BACK RAIL/PART NO. 30000T



CONSULT FACTORY FOR APPLICATIONS

LENGTH: 30 FT. [6400.8 mm]
WEIGHT: 14.96 LB./FT. [11.90 Kg/M]

RIGID MOUNT HANGER KIT • ZRA2/PART NO. 30052

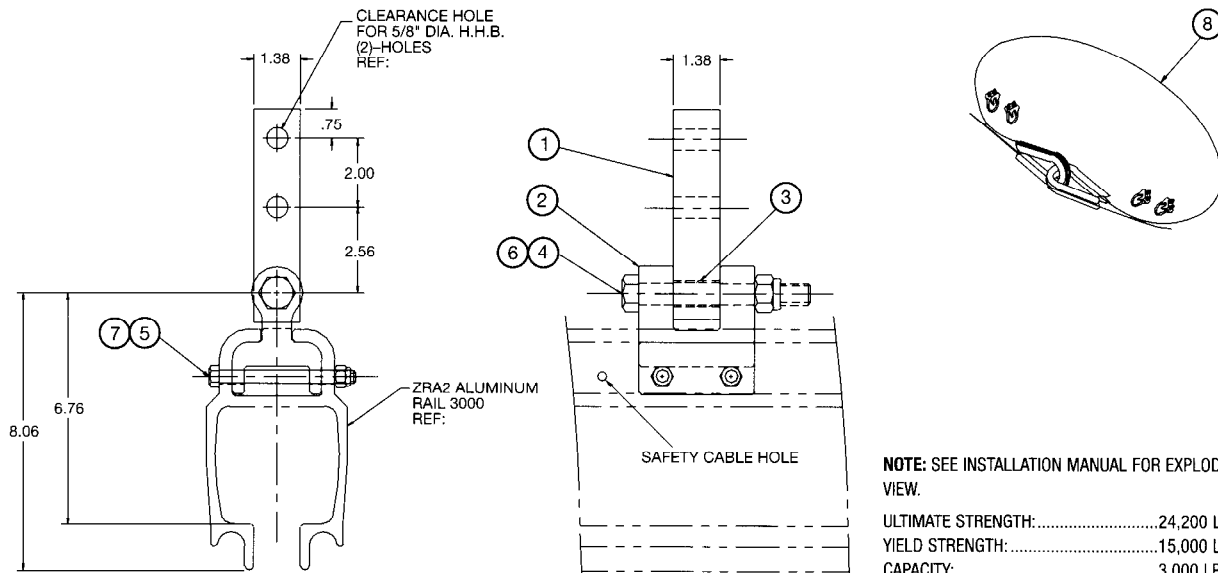


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH:.....22,400 LBS.
 YIELD STRENGTH:.....14,000 LBS.
 CAPACITY:.....2,000 LBS.
 WEIGHT OF ASSEMBLY:.....4 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
75589	-	1	2	1/2-13 FLANGED NUT
-	30160	2	1	TOE CLAMP
-	30109	3	2	SUSPENSION PLATE ASS'Y.
30907-06	-	4	1	SAFETY CABLE ASS'Y.

BLOCK HANGER KIT • ZRA2/PERPENDICULAR/PART NO. 30193

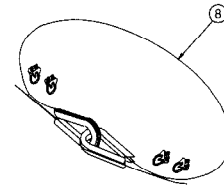
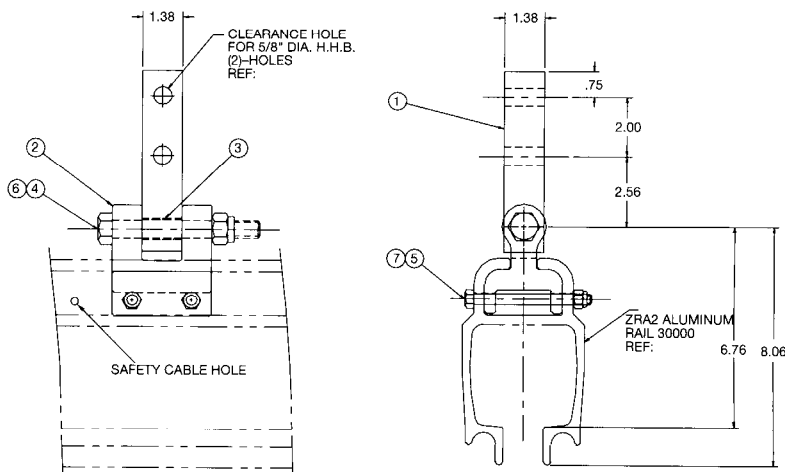


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH:.....24,200 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30162	1	1	HANGER
-	30165	2	1	HANGER BRACKET
65075	-	3	1	BRONZE BEARING
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
71481	-	5	2	3/8-16 X 4.50" LG. H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
75583	-	7	2	3/8-16 LOCK NUT
30907-06	-	8	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

BLOCK HANGER KIT • ZRA2/PARALLEL/PART NO. 30198

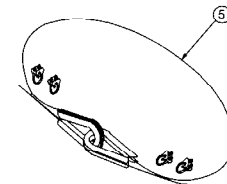
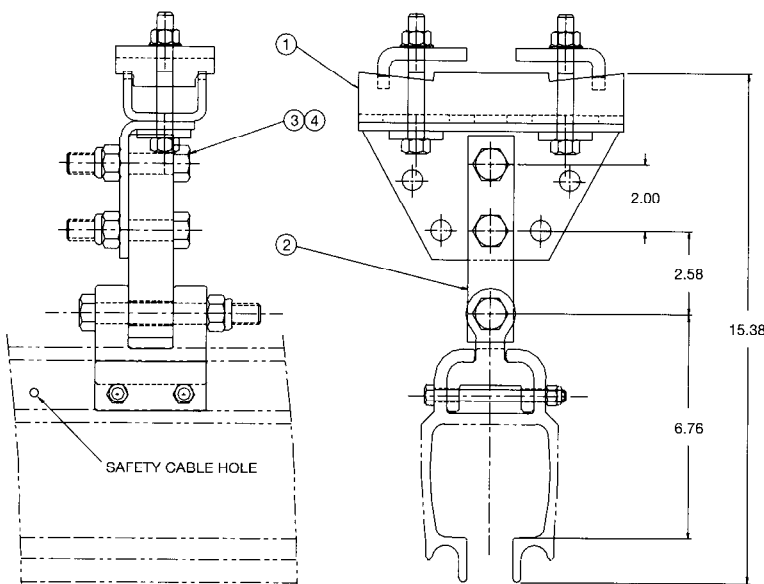


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH:.....24,200 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30197	1	1	HANGER
-	30165	2	1	HANGER BRACKET
65075	-	3	1	BRONZE BEARING
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
71481	-	5	2	3/8-16 X 4.50" LG. H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
75583	-	7	2	3/8-16 LOCK NUT
30907-06	-	8	1	SAFETY CABLE ASS'Y. (CABLE LENGTH = 6 FEET)

BEAM HANGER KIT • ZRA2/PARALLEL/STANDARD FLANGE/PART NO. 30199



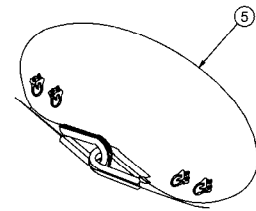
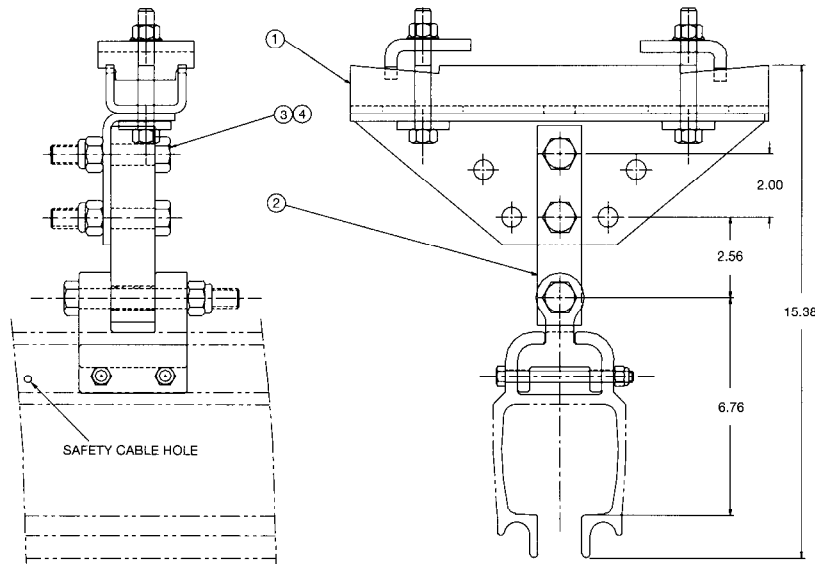
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KITS WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH:.....24,200 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....15 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER KIT
-	30193	2	1	RUNWAY HANGER KIT
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH = 6 FEET)

BEAM HANGER KIT • ZRA2/PARALLEL/WIDE FLANGE/PART NO. 30900



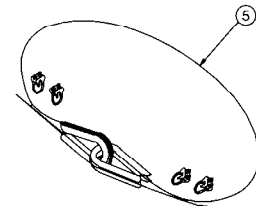
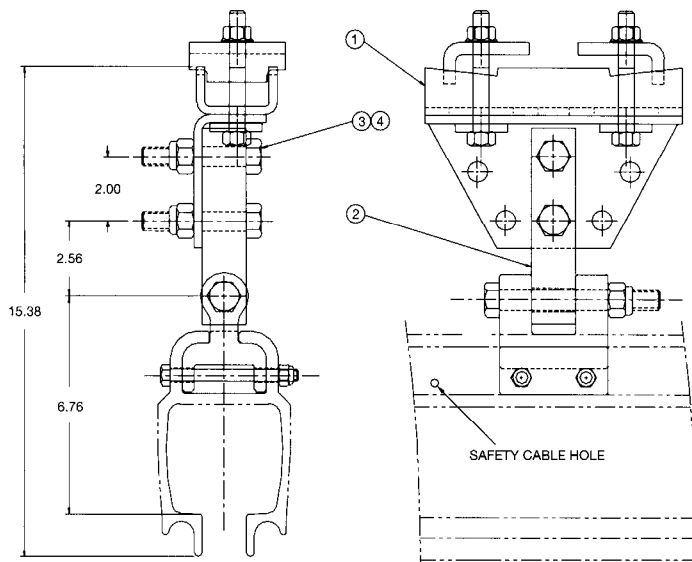
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KITS WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:.....24,200 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....16 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT
-	30193	2	1	RUNWAY HANGER KIT
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH = 6 FEET)

BEAM HANGER KIT • ZRA2/PERPENDICULAR/STANDARD FLANGE/ PART NO. 30901



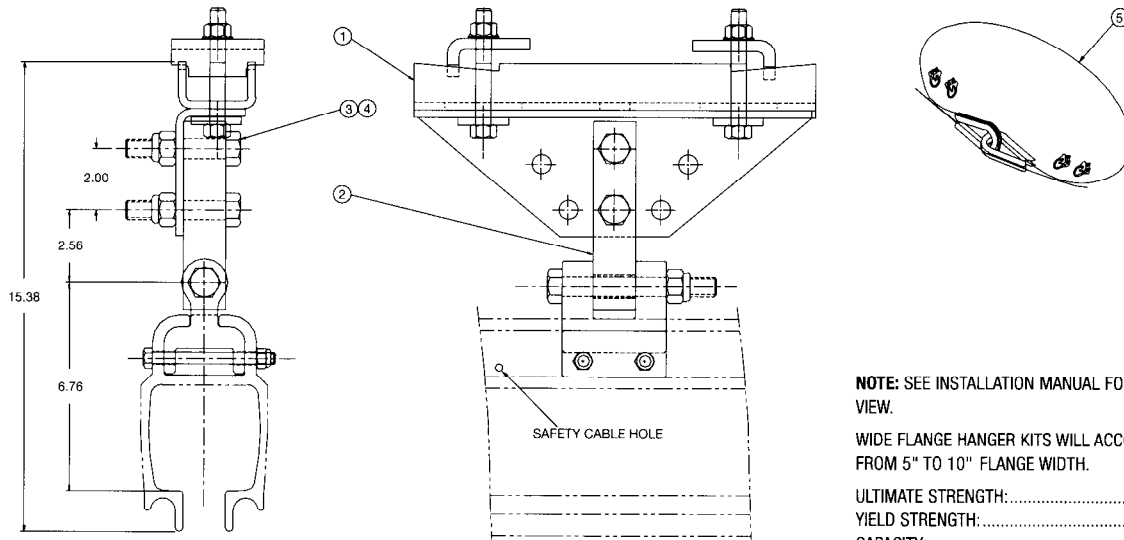
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KITS WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH:.....24,200 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....15 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER KIT
-	30198	2	1	RUNWAY HANGER KIT
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH = 6 FEET)

BEAM HANGER KIT • ZRA2/PERPENDICULAR/WIDE FLANGE/ PART NO. 30902



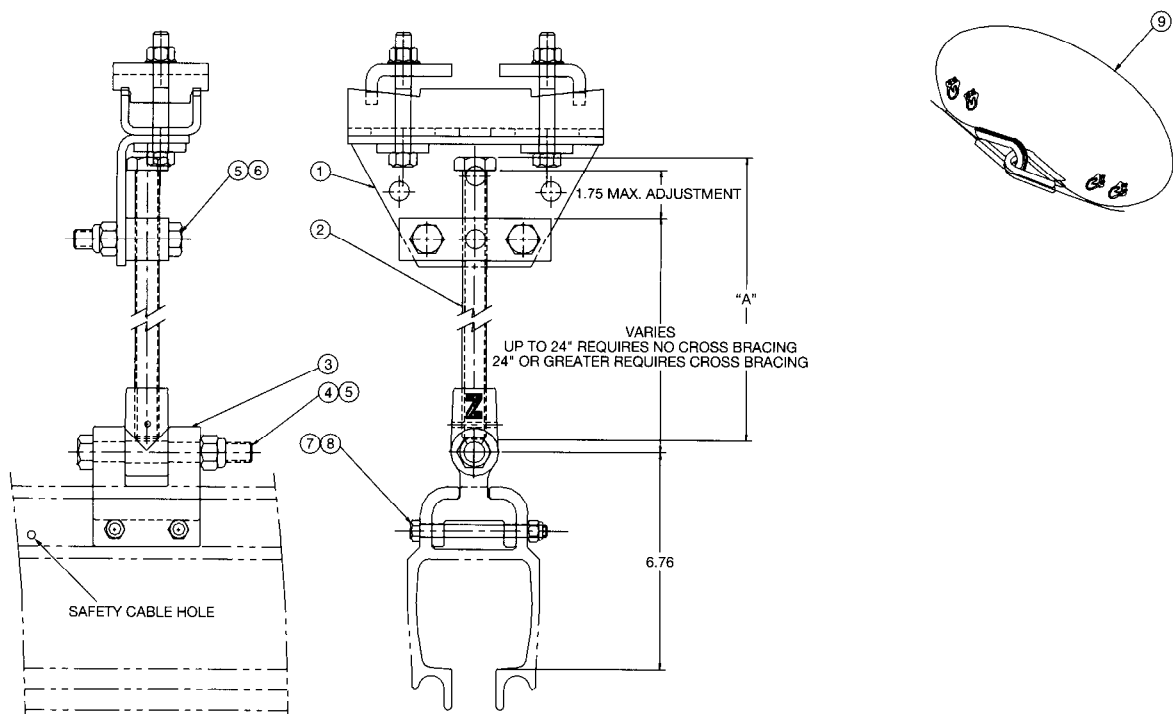
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KITS WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:.....24,200 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....16 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT
-	30198	2	1	RUNWAY HANGER KIT
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH = 6 FEET)

ADJUSTABLE HANGER KIT • ZRA2/STANDARD FLANGE/PART NO. 30195



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KIT WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH:.....19,500 LBS.

YIELD STRENGTH:.....15,600 LBS.

WEIGHT OF ASSEMBLY:.....14 LBS.

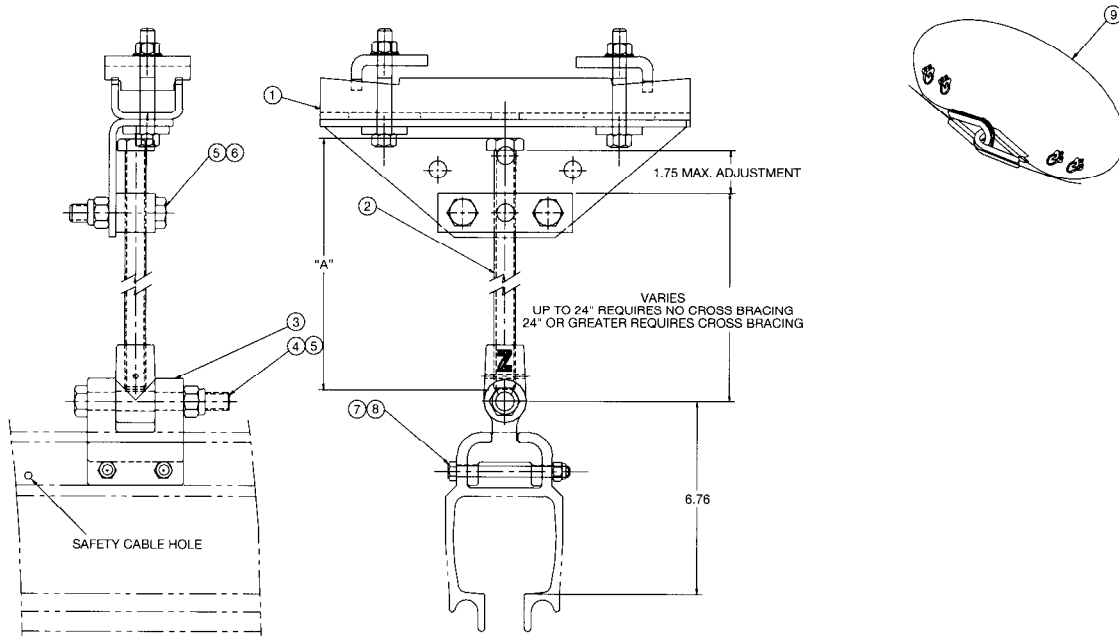
CAPACITY:.....3,000 LBS.

*ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING. SEE ACCESSORIES SECTION.

MIN. "A" DIM	ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y. NO.	ORDER NUMBER HANGER KIT ASS'Y NO.
15.75	6.00"	30192-006	30907-06	30195-006
21.75	12.00"	30192-012	30907-08	30195-012
27.75	18.00"	30192-018	30907-10	30195-018
33.75	*24.00"	30192-025	30907-10	30195-024
45.75	*36.00"	30192-036	30907-12	30195-036
57.75	*48.00"	30192-048	30907-14	30195-048
69.75	*60.00"	30192-068	30907-16	30195-060
81.75	*72.00"	30192-072	30907-18	30195-072

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER KIT - STD. FLANGE
-	30190-0	2	1	HANGER ADJUSTMENT ASS'Y.
-	30165	3	1	HANGER BRACKET
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72646	-	6	2	5/8-11 X 3.25" H.H.B.
71481	-	7	2	3/8-16 X 4.50" H.H.B.
75583	-	8	2	3/8-16 LOCK NUT
SEE CHART	-	9	1	SAFETY CABLE ASS'Y.

ADJUSTABLE HANGER KIT • ZRA2/WIDE FLANGE/PART NO. 30196



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:.....19,500 LBS.

YIELD STRENGTH:.....15,600 LBS.

WEIGHT OF ASSEMBLY:.....15 LBS.

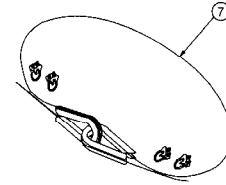
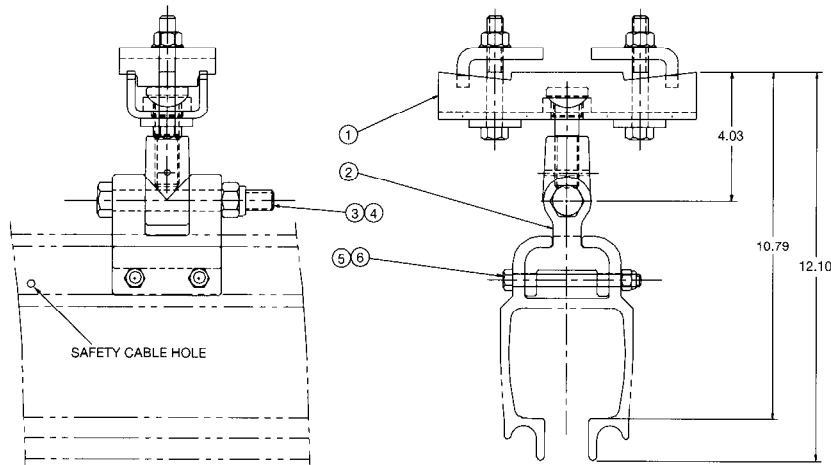
CAPACITY:.....3,000 LBS.

*ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING.

MIN. "A" DIM	ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y. NO.	ORDER NUMBER HANGER KIT ASS'Y NO.
15.75	6.00"	30192-006	30907-06	30196-006
21.75	12.00"	30192-012	30907-08	30196-012
27.75	18.00"	30192-018	30907-10	30196-018
33.75	*24.00"	30192-025	30907-10	30196-024
45.75	*36.00"	30192-036	30907-12	30196-036
57.75	*48.00"	30192-048	30907-14	30196-048
69.75	*60.00"	30192-068	30907-16	30196-060
81.75	*72.00"	30192-072	30907-18	30196-072

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER KIT - STD. FLANGE
-	30190	2	1	HANGER ADJUSTMENT ASS'Y.
-	30165	3	1	HANGER BRACKET
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72646	-	6	2	5/8-11 X 3.25" H.H.B.
71481	-	7	2	3/8-16 X 4.50" H.H.B.
75583	-	8	2	3/8-16 LOCK NUT
SEE CHART	-	9	1	SAFETY CABLE ASS'Y.

CLOSE HANGER KIT • ZRA2/STANDARD FLANGE/PART NO. 30921



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KITS WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH:.....19,500 LBS.

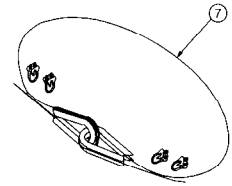
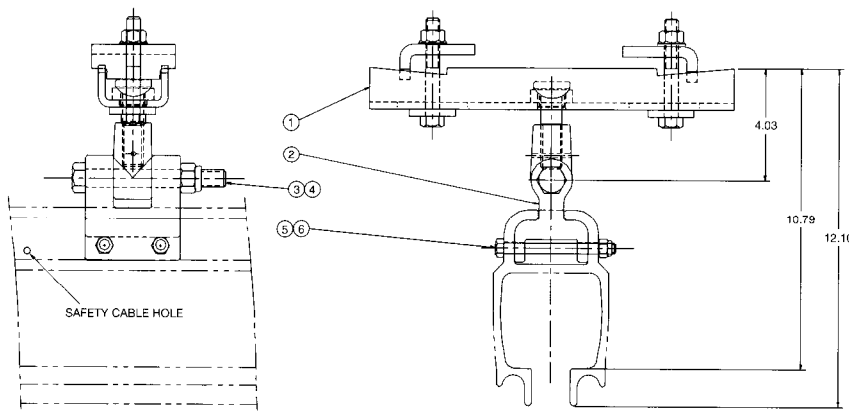
YIELD STRENGTH:.....15,600 LBS.

CAPACITY:.....3,000 LBS.

WEIGHT OF ASSEMBLY:.....10 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30919	1	1	HANGER KIT - SUB ASS'Y.
-	30165	2	2	HANGER BRACKET
72623	-	3	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	4	1	5/8-11 LOCK NUT
71481	-	5	2	3/8-16 X 4.50" H.H.B.
75583	-	6	2	3/8-16 LOCK NUT
30907-06	-	7	1	SAFETY CABLE ASS'Y.

CLOSE HANGER KIT • ZRA2/WIDE FLANGE/PART NO. 30922



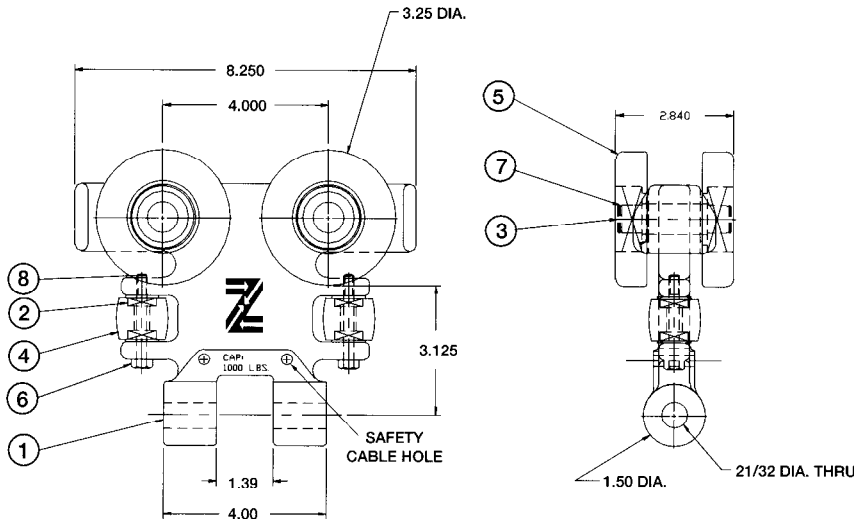
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KITS WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:.....19,500 LBS.
 YIELD STRENGTH:.....15,600 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....11 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30920	1	1	HANGER KIT - SUB ASS'Y.	
-	30165	2	2	HANGER BRACKET	
72623	-	3	1	5/8-11 X 5.00" LG. H.H.B.	
75587	-	4	1	5/8-11 LOCK NUT	
71481	-	5	2	3/8-16 X 4.50" H.H.B.	
75583	-	6	2	3/8-16 LOCK NUT	
30907-06	-	7	1	SAFETY CABLE ASS'Y.	

ZRA2 ALUMINUM TROLLEY • 1000 LBS. CAPACITY/PART NO. 30172



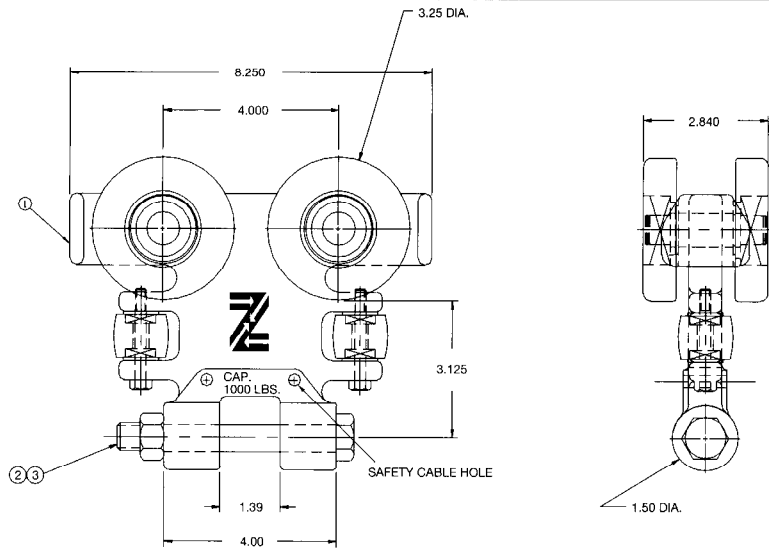
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:.....17,575 LBS.
 YIELD STRENGTH:.....15,500 LBS.
 CAPACITY:.....1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:.....3.25" DIA. DELRIN
 BEARINGS:.....BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELRIN
 WEIGHT OF TROLLEY:.....5 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30171	1	1	TROLLEY	
65038	-	2	4	BEARING	
-	93934	3	2	AXLE	
-	93935	4	2	GUIDE WHEEL	
-	30056	5	4	TROLLEY WHEEL ASM.	
70416	-	6	2	1/4-20 X 2.25" H.H.C.S.	
93939	-	7	4	RETAINING RING	
75581	-	8	2	NUT 1/4-20 LOCK	

ZRA2 ALUMINUM LOAD TROLLEY • 1000 LBS. CAPACITY/PART NO. 30923



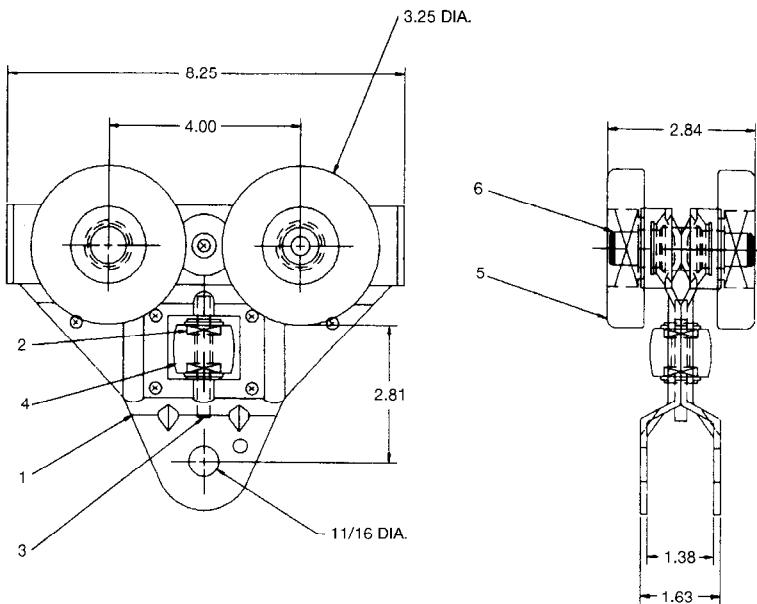
NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:.....17,575 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:.....3.25" DIA. DELRIN
 BEARINGS:.....BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELTRIN
 WEIGHT OF TROLLEY:.....5.5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30172	1	1	TROLLEY ASSY.
75587	-	2	1	5/8-11 LOCK NUT
72623	-	3	1	5/8-11 X 5" H.H.B.

ZRA2 STEEL TROLLEY • 1000 LBS. CAPACITY/PART NO. 30126



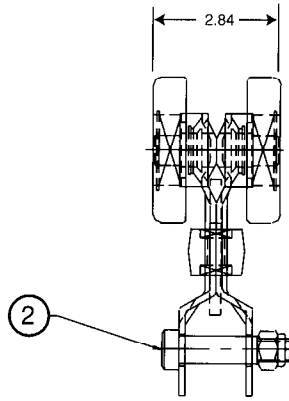
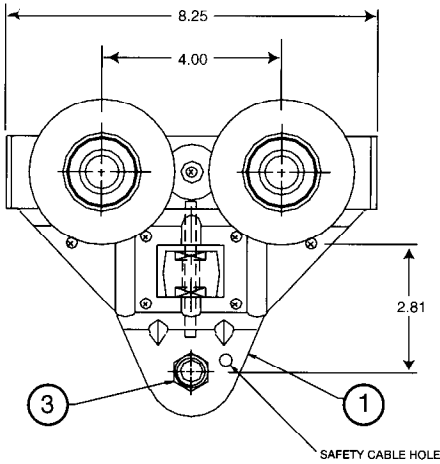
NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:.....8,925 LBS.
 YIELD STRENGTH:.....7,140 LBS.
 CAPACITY:.....1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:.....3.25" DIA. DELRIN
 BEARINGS:.....BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELTRIN
 WEIGHT OF TROLLEY:.....4 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30125	1	1	TROLLEY
65038	-	2	2	BEARING
77062	-	3	2	PIN SPRING
-	93935	4	1	GUIDE WHEEL
-	30056	5	4	TROLLEY WHEEL ASM.
93939	-	6	4	RETAINING RING

ZRA2 STEEL LOAD TROLLEY • 1000 LBS. CAPACITY/PART NO. 30131



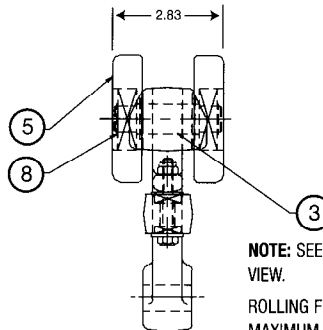
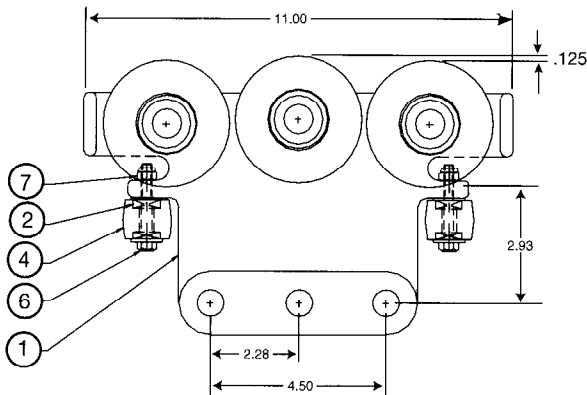
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:8,925 LBS.
 YIELD STRENGTH:7,140 LBS.
 CAPACITY:1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 WEIGHT OF TROLLEY:4.5 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30126	1	1	TROLLEY ASSY.
72608	-	2	1	SCREW 5/8 X 1.75
75585	-	3	1	NUT 1/2-13 LOCK

ZRA2 REACTION TROLLEY • 1000 LBS. CAPACITY/PART NO. 30016



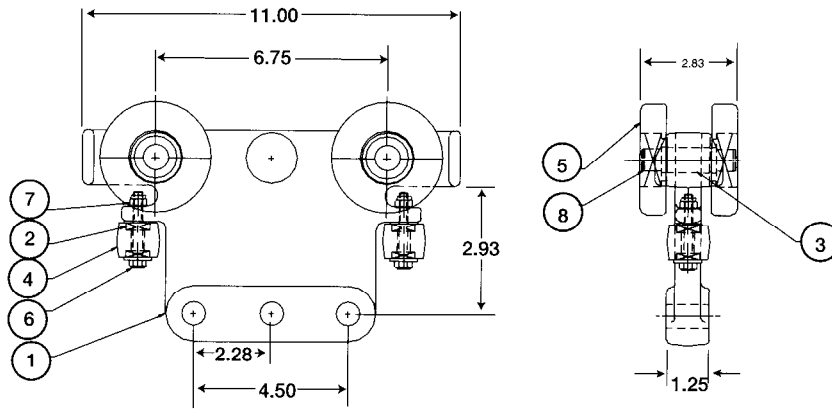
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:17,250 LBS.
 YIELD STRENGTH:14,575 LBS.
 CAPACITY:1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 WEIGHT OF TROLLEY:6 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30014	1	1	TROLLEY
65038	-	2	4	BEARING
-	93934	3	3	AXLE
-	93935	4	2	GUIDE WHEEL
-	30056	5	6	TROLLEY WHEEL ASM.
70484	-	6	2	1/4-20 X 2" H.H.B.
75581	-	7	2	1/4-20 NUT
93939	-	8	6	RETAINING RING

ZRA2 LOAD TROLLEY • 1000 LBS. CAPACITY/PART NO. 30015



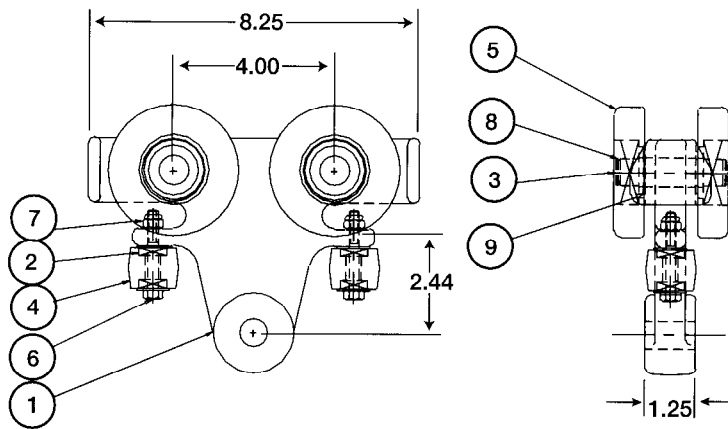
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:.....17,250 LBS.
 YIELD STRENGTH:.....14,575 LBS.
 CAPACITY:.....1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:.....3.25" DIA. DELRIN
 BEARINGS:.....BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELRIN
 WEIGHT OF TROLLEY:.....5.5 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30014	1	1	TROLLEY	
65038	-	2	4	BEARING	
-	93934	3	2	AXLE	
-	93935	4	2	GUIDE WHEEL	
-	30056	5	4	TROLLEY WHEEL ASM.	
70484	-	6	2	1/4-20 X 2" H.H.B.	
75581	-	7	2	1/4-20 NUT	
93939	-	8	4	RETAINING RING	

ZRA2 UNIVERSAL TROLLEY • 1000 LBS. CAPACITY/PART NO. 30011



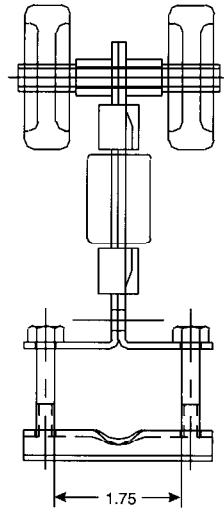
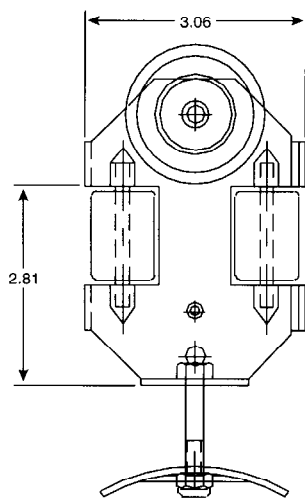
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:.....18,000 LBS.
 YIELD STRENGTH:.....14,950 LBS.
 CAPACITY:.....1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:.....3.25" DIA. DELRIN
 BEARINGS:.....BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELRIN
 WEIGHT OF TROLLEY:.....4 LBS.

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30010	1	1	TROLLEY	
65038	-	2	4	BEARING	
-	93934	3	2	AXLE	
-	93935	4	2	GUIDE WHEEL	
-	30056	5	4	TROLLEY WHEEL ASM.	
70484	-	6	2	1/4-20 X 2" H.H.B.	
75581	-	7	2	1/4-20 NUT	
93939	-	8	4	RETAINING RING	
-	93938	9	4	SIDE GUIDE ROLLER	
99125	-	-	-	WHEEL	

FESTOON TROLLEY • ZRA2 ALUMINUM RAIL/PART NO. 30581



NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.

REF: PART NO. 30907 – LENGTH IN FEET
(EXAMPLE: 06 = 6 FEET)

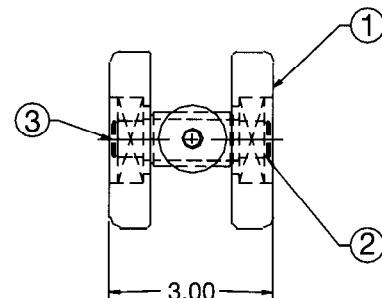
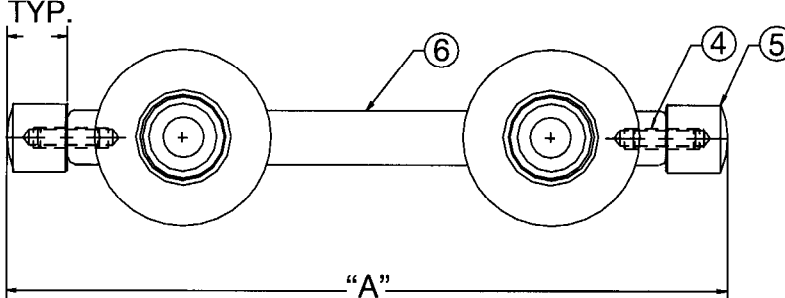
THIS TROLLEY IS USED FOR FESTOONING FLAT WIRE OR AIR HOSE.

CAPACITY:.....50 LBS.
WEIGHT OF ASSEMBLY:.....6 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30577	1	2	TROLLEY STAMPING
-	30578	2	1	CLAMP PLATE
-	30584	3	2	GUIDE ROLLER
-	99069	4	2	SKATE WHEEL
77057	-	5	2	3/16 DIA. X 2.00" ROLL PIN
77011	-	6	1	1/4 DIA. X 1-3/4" ROLL PIN
70498	-	7	2	1/4-20 X 2.00" H.H.B.
75581	-	8	2	1/4-20 LOCK NUT
-	30585	9	2	SPACER

BUMPER TROLLEY • ZRA2 ALUMINUM/PART NO. 30148

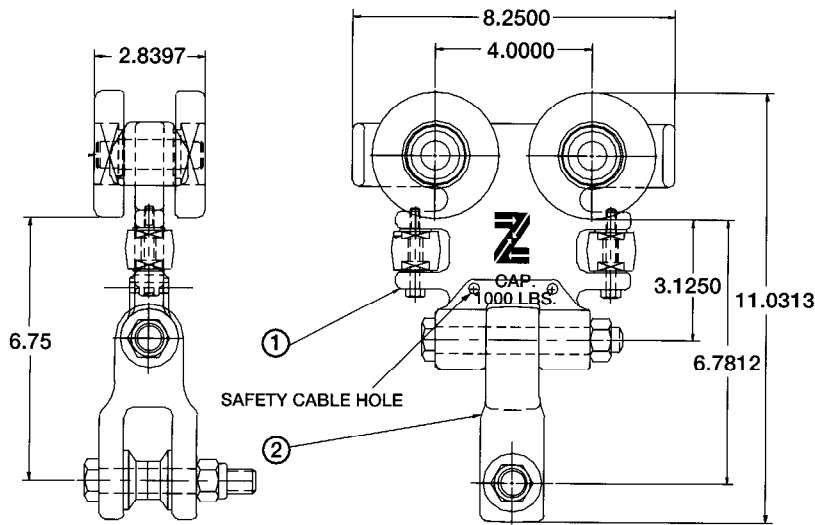
113
TYP.



"A" DIMENSION	PART NO.	WEIGHT
12"	30148-1200	3 LBS.
24"	30148-2400	5 LBS.
36"	30148-3600	7 LBS.
48"	30148-4800	9 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30056	1	4	TROLLEY WHEEL
-	93939	2	4	RETAINING RING
-	93934	3	2	AXLE
71492	-	4	2	3/8-16 X 1-1/4 SET SCR.
93809	-	5	2	RUBBER BUMPER
-	30149	6	1	BUMPER TROLLEY BRACKET

HOIST TROLLEY-SINGLE • ZRA2/1000 CAPACITY/PART NO. 30314



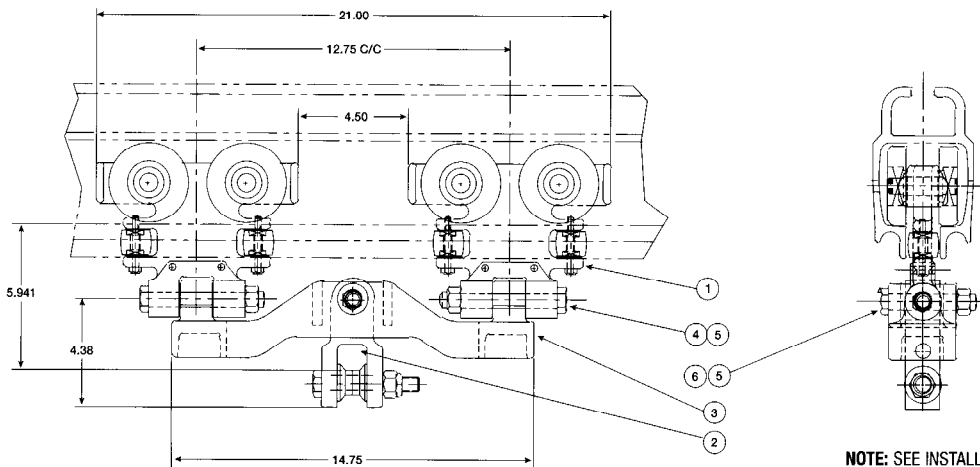
NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 MAXIMUM WHEEL LOAD:250 LBS.
 ULTIMATE STRENGTH:13,750 LBS.
 YIELD STRENGTH:11,000 LBS.
 CAPACITY:1,000 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30903	1	1	HOIST HOOK BRACKET
-	30923	2	1	TROLLEY

HOIST TROLLEY-DUAL • 2000 LBS. CAPACITY/PART NO. 30906



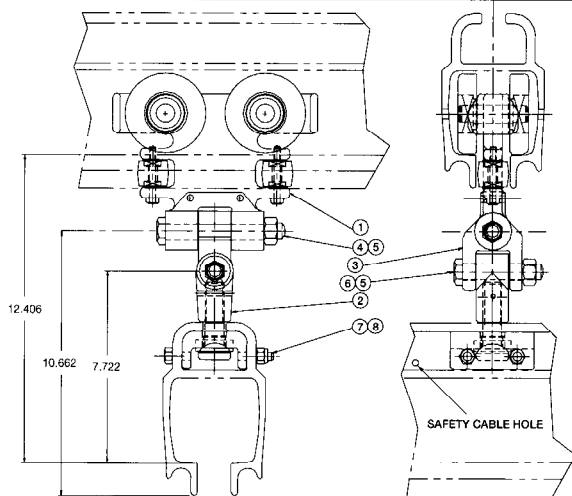
NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 WEIGHT OF ASSEMBLY:19 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30172	1	2	TROLLEY ASS'Y.
-	30903	2	1	AIR HOIST BRACKET ASS'Y.
-	30173	3	1	DUAL TROLLEY TIE BAR
72623	-	4	2	5/8-11 X 5.00" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.

END TRUCK ASSEMBLY • ZRA2 ON ZRA2/1000 LBS. CAPACITY/SINGLE ALUM. TROLLEY/PART NO. 30176



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

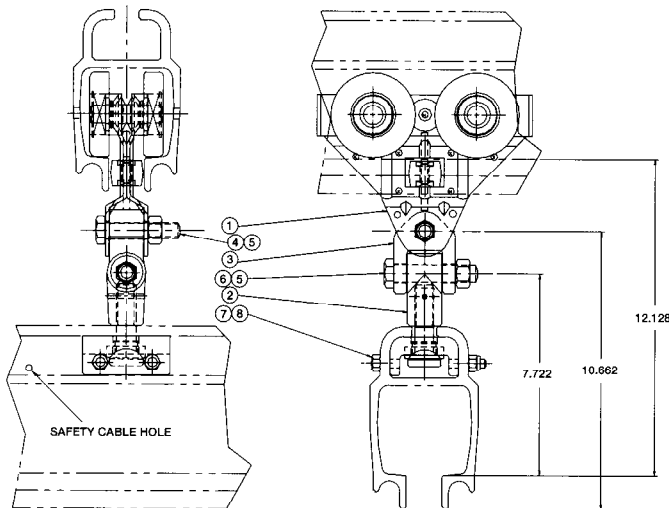
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:17,575 LBS.
 YIELD STRENGTH:15,000 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:10 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30172	1	1	ZRA2 TROLLEY	
-	30175	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30166	3	1	FEMALE CLEVIS	
72623	-	4	1	5/8-11 X 5.00" H.H.B.	
75587	-	5	2	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	
71481	-	7	2	3/8-16 X 4.50" H.H.B.	
75583	-	8	2	3/8-16 LOCK NUT	

END TRUCK ASSEMBLY • ZRA2 ON ZRA2/1000 LBS. CAPACITY/SINGLE STEEL TROLLEY/PART NO. 30167



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

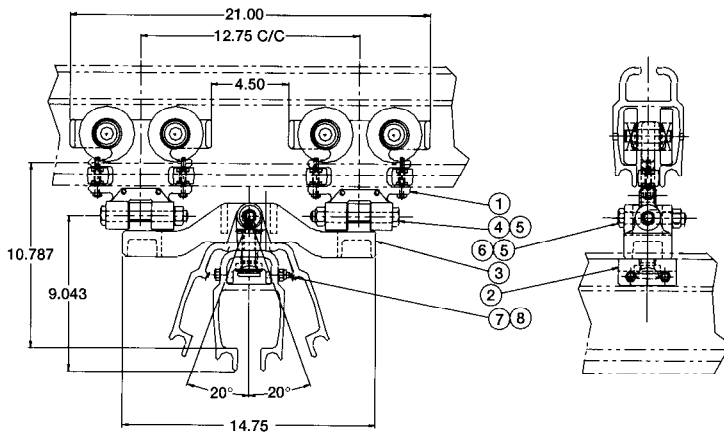
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:8,925 LBS.
 YIELD STRENGTH:7,140 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:8 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30126	1	1	ZRA2 STEEL TROLLEY	
-	30175	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30166	3	1	FEMALE CLEVIS	
72646	-	4	1	5/8-11 X 3.25" H.H.B.	
75587	-	5	2	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	
71481	-	7	2	3/8-16 X 4.50" H.H.B.	
75583	-	8	2	3/8-16 LOCK NUT	

END TRUCK ASSEMBLY • ZRA2 ON ZRA2/2000 LBS. CAPACITY/DUAL ALUM. TROLLEY/PART NO. 30177



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

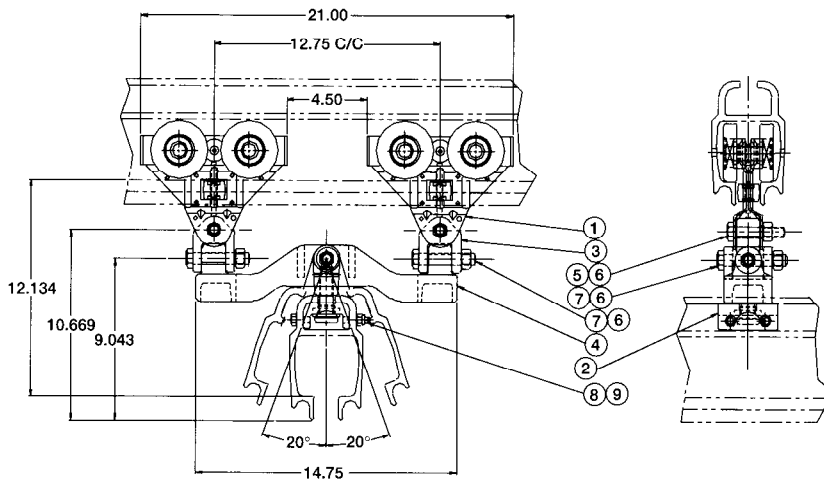
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 WEIGHT OF ASSEMBLY:16 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30172	1	1	ZRA2 TROLLEY
-	30175	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30173	3	1	DUAL TROLLEY TIE BAR
72623	-	4	1	5/8-11 X 5.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
71481	-	7	2	3/8-16 X 4.50" H.H.B.
75583	-	8	2	3/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRA2 ON ZRA2/2000 LBS. CAPACITY/DUAL STEEL TROLLEY/PART NO. 30178

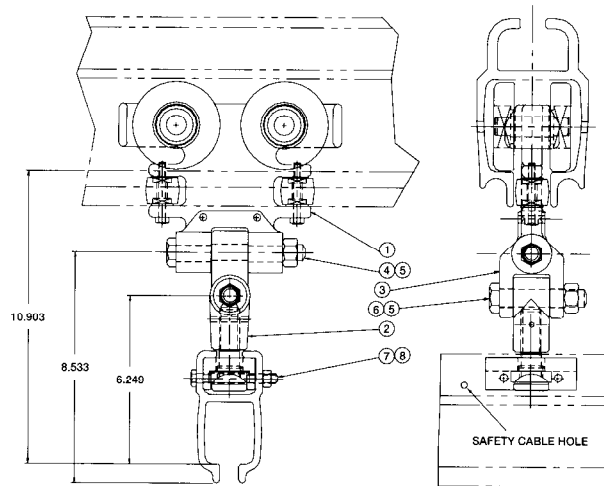


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 WEIGHT OF ASSEMBLY:18 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30126	1	1	ZRA2 TROLLEY
-	30175	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30166	3	1	FEMALE CLEVIS
-	30173	4	1	DUAL TROLLEY TIE BAR
72646	-	5	2	5/8-11 X 3.25" H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
72644	-	7	2	5/8-11 X 4.00" H.H.B.
71481	-	8	2	3/8-16 X 4.50" H.H.B.
75583	-			3/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRA2/1000 LBS. CAPACITY/SINGLE ALUM. TROLLEY/PART NO. 30909



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

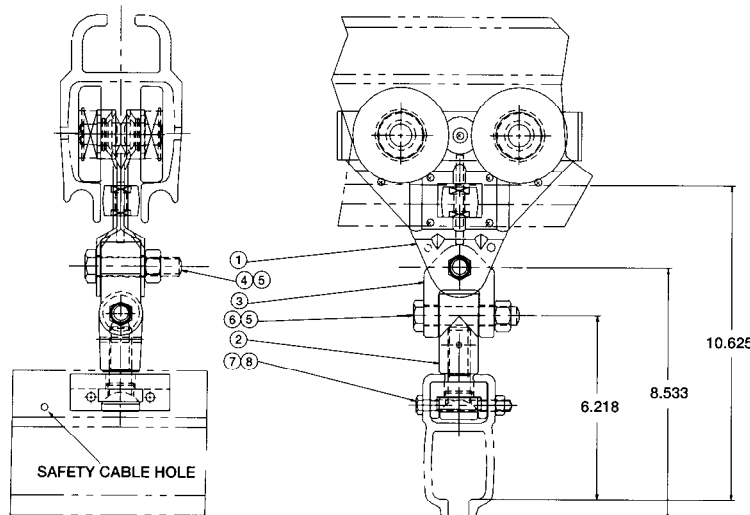
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:17,575 LBS.
 YIELD STRENGTH:15,000 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:8 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30172	1	1	ZRA2 TROLLEY
-	30282	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30166	3	1	FEMALE CLEVIS
72623	-	4	1	5/8-11 X 5.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
70968	-	7	2	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRA2/1000 LBS. CAPACITY/SINGLE STEEL TROLLEY/PART NO. 30910



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

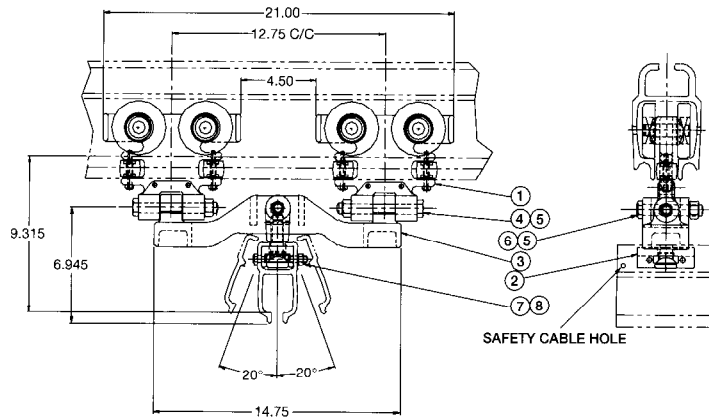
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:8,925 LBS.
 YIELD STRENGTH:7,140 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:9 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30126	1	1	ZRA2 TROLLEY
-	30282	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30166	3	1	FEMALE CLEVIS
72646	-	4	1	5/8-11 X 3.25" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
70968	-	7	2	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRA2/1000 LBS. CAPACITY/DUAL ALUM. TROLLEY/PART NO. 30911



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

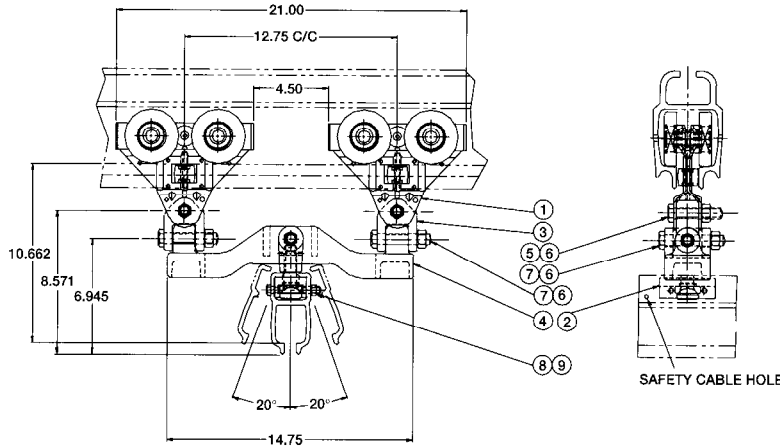
REF. PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:.....13,250 LBS.
 YIELD STRENGTH:.....10,600 LBS.
 CAPACITY:.....1,000 LBS.
 WEIGHT OF ASSEMBLY:.....15 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30172	1	2	ZRA2 TROLLEY	
-	30282	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30173	3	1	DUAL TROLLEY TIE BAR	
72623	-	4	1	5/8-11 X 5.00" H.H.B.	
75587	-	5	2	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	
70968	-	7	2	5/16-18 X 3.25" H.H.B.	
75582	-	8	2	5/16-18 LOCK NUT	

END TRUCK ASSEMBLY • ZRA1 ON ZRA2/1000 LBS. CAPACITY/DUAL STEEL TROLLEY/PART NO. 30912



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

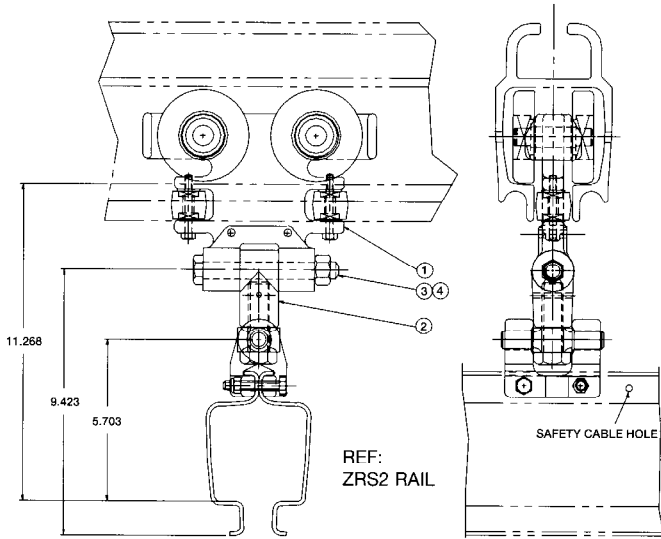
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:18 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF. PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30126	1	2	ZRA2 TROLLEY	
-	30282	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30166	3	1	FEMALE CLEVIS	
-	30173	4	1	DUAL TROLLEY TIE BAR	
72646	-	5	1	5/8-11 X 3.25" H.H.B.	
75587	-	6	2	5/8-11 LOCK NUT	
72644	-	7	1	5/8-11 X 4.00" H.H.B.	
70968	-	8	2	5/16-18 X 3.25" H.H.B.	
75582	-	9	2	5/16-18 LOCK NUT	

END TRUCK ASSEMBLY • ZRS2/3 ON ZRA2/1000 LBS. CAPACITY/SINGLE ALUM. TROLLEY/PART NO. 30913

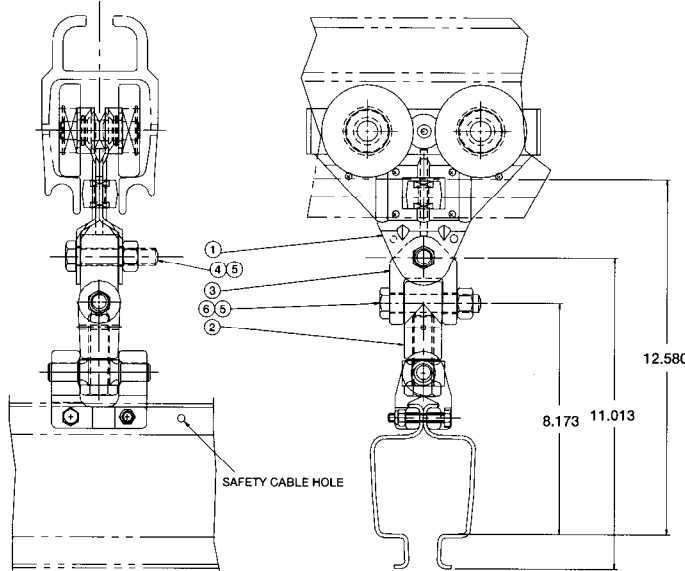


NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.
 ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:17,250 LBS.
 YIELD STRENGTH:14,250 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:10 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30172	1	1	ZRA2 TROLLEY
-	30596	2	1	BRIDGE SUSP. SUB-ASS'Y.
72623	-	3	1	5/8-11 X 5.00" H.H.B.
75587	-	4	1	5/8-11 LOCK NUT

END TRUCK ASSEMBLY • ZRS2/3 ON ZRA2/1000 LBS. CAPACITY/SINGLE STEEL TROLLEY/PART NO. 30914



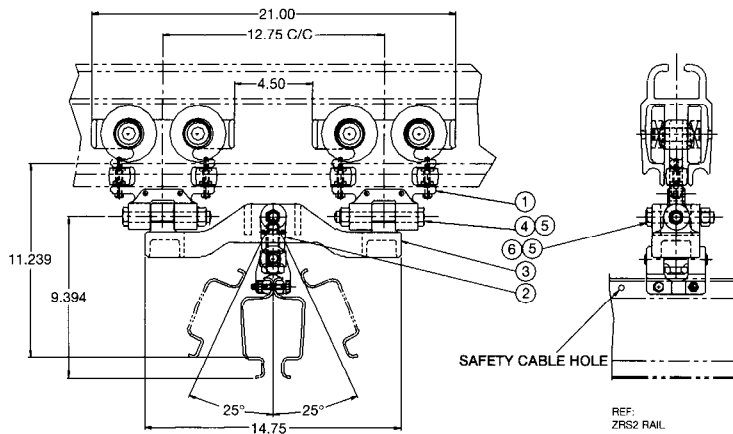
REF:
ZRS2 RAIL

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.
 ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:8,925 LBS.
 YIELD STRENGTH:7,140 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:10 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30126	1	1	ZRA2 TROLLEY
-	30596	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30166	3	1	FEMALE CLEVIS
72646	-	4	1	5/8-11 X 3.25" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.

END TRUCK ASSEMBLY • ZRS2/3 ON ZRS2/2000 LBS. CAPACITY/DUAL ALUM. TROLLEY/PART NO. 30915



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

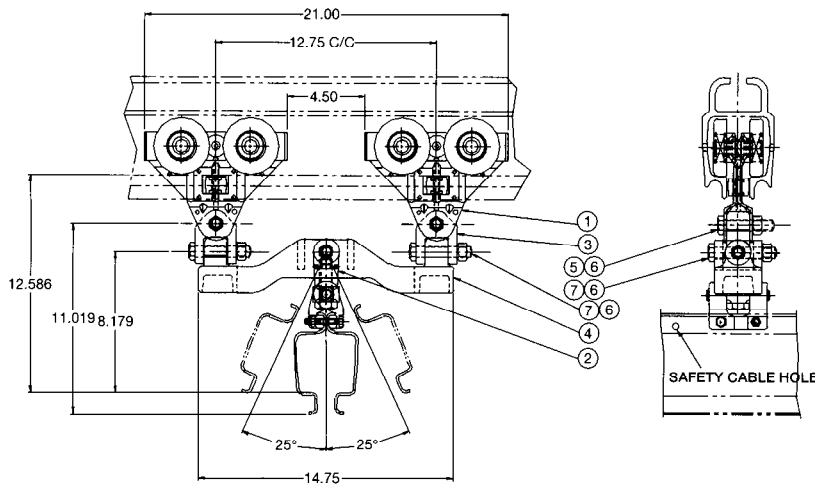
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 ULTIMATE STRENGTH:.....13,250 LBS.
 YIELD STRENGTH:.....10,600 LBS.
 CAPACITY:.....2,000 LBS.
 WEIGHT OF ASSEMBLY:.....19 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30172	1	2	ZRA2 TROLLEY
-	30596	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30173	3	1	DUAL TROLLEY TIE BAR
72623	-	4	1	5/8-11 X 5.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.

END TRUCK ASSEMBLY • ZRS2/3 ON ZRS2/2000 LBS. CAPACITY/DUAL STEEL TROLLEY/PART NO. 30916



REF: ZRS2 RAIL

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

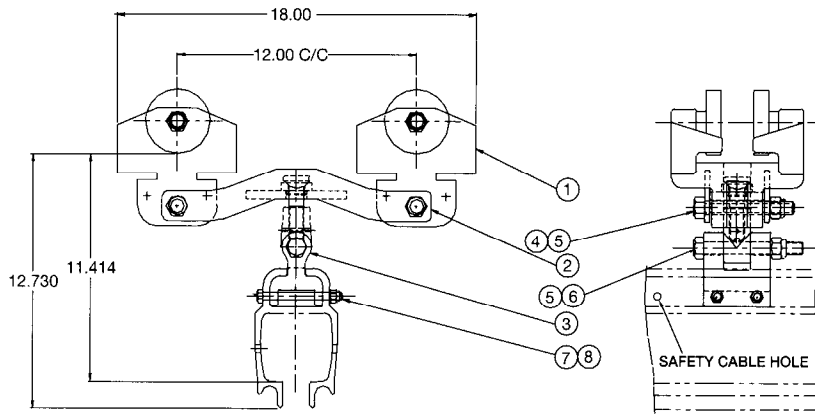
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:.....ONE PERCENT
 ULTIMATE STRENGTH:.....13,250 LBS.
 YIELD STRENGTH:.....10,600 LBS.
 CAPACITY:.....2,000 LBS.
 WEIGHT OF ASSEMBLY:.....20 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30126	1	2	ZRA2 TROLLEY
-	30596	2	1	BRIDGE SUSP. SUB-ASS'Y.
-	30166	3	1	FEMALE CLEVIS
-	30173	4	1	DUAL TROLLEY TIE BAR
72646	-	5	1	5/8-11 X 5.00" H.H.B.
75587	-	6	2	5/8-11 LOCK NUT
72644	-	7	1	5/8-11 X 4.00" H.H.B.

END TRUCK ASSEMBLY • ZRA2 ON PATENT TRACK/1000 LBS. CAPACITY DUAL TROLLEY/PART NO. 30918



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

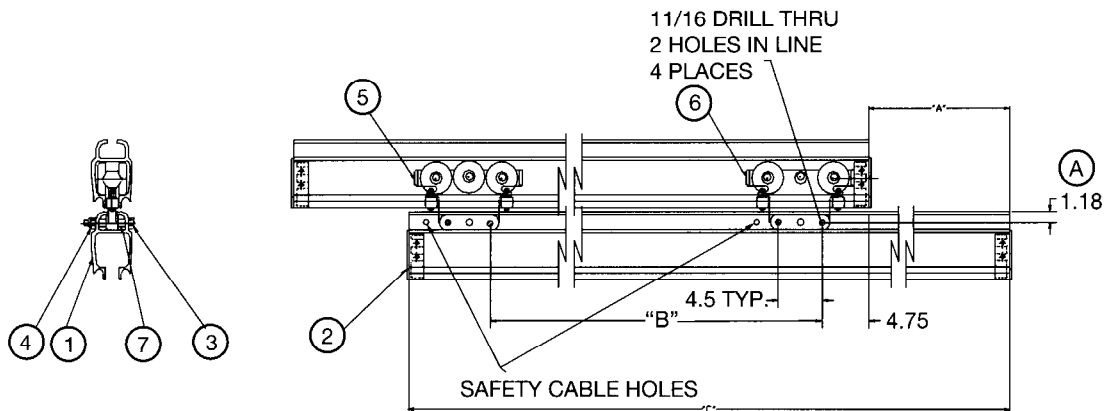
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:
 YIELD STRENGTH:
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	93814	1	2	TROLLEY ASS'Y.
-	30917	2	1	DUAL END TRUCK ASS'Y.
-	30165	3	2	HANGER BRACKET
72615	-	4	2	5/8-11 X 4.50" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72623	-	6	1	5/8-11 X 5.00" H.H.B.
71481	-	7	2	3/8-16 X 4.50" H.H.B.
75583	-	8	2	3/8-16 LOCK NUT

BRIDGE EXTENSIONS • ZRA2 ALUMINUM RAIL/SINGLE TROLLEY/ PART NO. 30309



"A" DIMENSION FOR 2 FOOT EXTENSION			
PART NO.	"B" DIMENSION	"C" DIMENSION	CAPACITY
30309-22	2'-0"	5'-6"	500 LBS.
30309-23	3'-0"	6'-6"	600 LBS.
30309-24	4'-0"	7'-6"	650 LBS.
30309-25	5'-0"	8'-6"	700 LBS.

NOTE: BRIDGE EXTENSION ADDS 5.67" TO STACK-UP DIMENSION – FOR LONGER EXTENSIONS CONSULT THE FACTORY.

NOTE: SAFETY CABLES ARE SWAGGED IN PLACE.

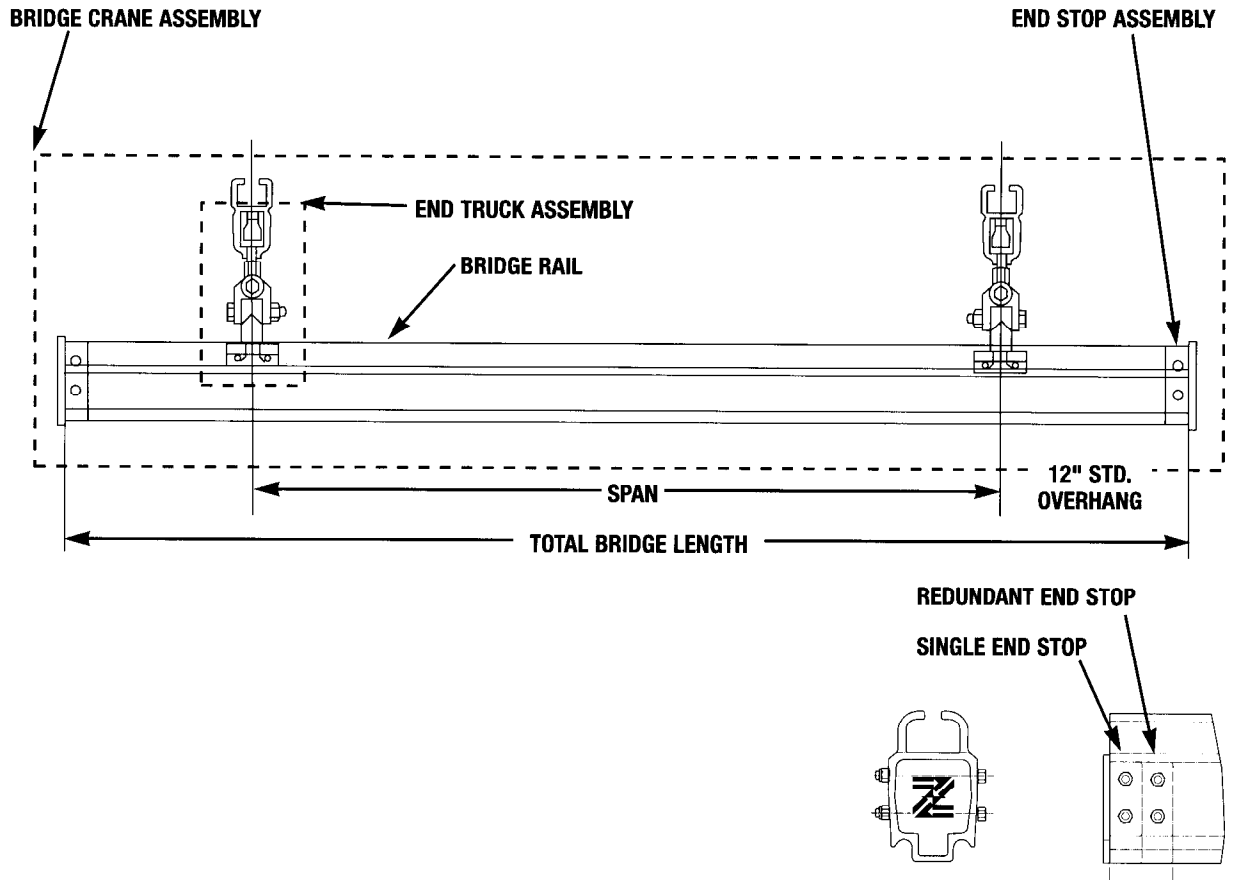
"A" DIMENSION FOR 3 FOOT EXTENSION			
PART NO.	"B" DIMENSION	"C" DIMENSION	CAPACITY
30309-32	2'-0"	6'-6"	400 LBS.
30309-33	3'-0"	7'-6"	500 LBS.
30309-34	4'-0"	8'-6"	575 LBS.
30309-35	5'-0"	9'-6"	625 LBS.

"A" DIMENSION FOR 4 FOOT EXTENSION			
PART NO.	"B" DIMENSION	"C" DIMENSION	CAPACITY
30309-42	2'-0"	7'-6"	325 LBS.
30309-43	3'-0"	8'-6"	425 LBS.
30309-44	4'-0"	9'-6"	500 LBS.
30309-45	5'-0"	10'-6"	550 LBS.

"A" DIMENSION FOR 5 FOOT EXTENSION			
PART NO.	"B" DIMENSION	"C" DIMENSION	CAPACITY
30309-52	2'-0"	8'-6"	275 LBS.
30309-53	3'-0"	9'-6"	375 LBS.
30309-54	4'-0"	10'-6"	450 LBS.
30309-55	5'-0"	11'-6"	500 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30000	-	1	1	ZRA2 RAIL X "C" LG.
-	30183	2	2	END STOP ASS'Y.
72615	-	3	4	5/8-11 X 4-1/2 H.H.B.
75587	-	4	4	5/8-11 LOCK NUT
-	30016A	5	1	TROLLEY ASS'Y.
-	30015A	6	1	TROLLEY ASS'Y.
-	30079	7	8	SPACER

BRIDGE CRANE ASSEMBLY • EXAMPLE OF HOW TO ORDER



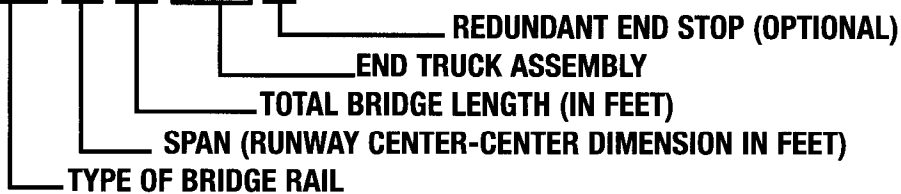
THE BRIDGE CRANE ASSEMBLY CONSISTS OF:

- ONE BRIDGE BEAM (SECTION OF RAIL)
- TWO END TRUCK ASSEMBLIES (MOUNTED TO THE BRIDGE WITH A TROLLEY TO ROLL INSIDE OF THE RUNWAY, SAFETY CABLES WILL BE PRE-INSTALLED)
- TWO END STOPS (ONE INSTALLED AT EACH END OF THE BRIDGE)
- REDUNDANT END STOPS ARE AVAILABLE (PLEASE SPECIFY)

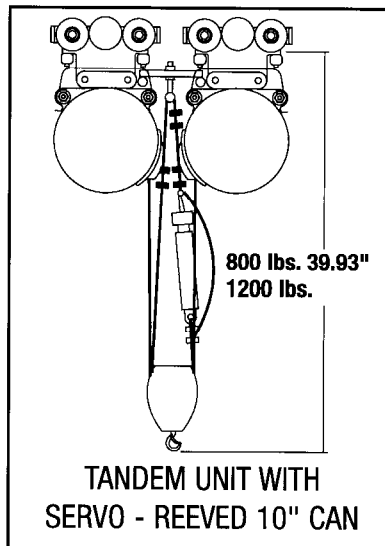
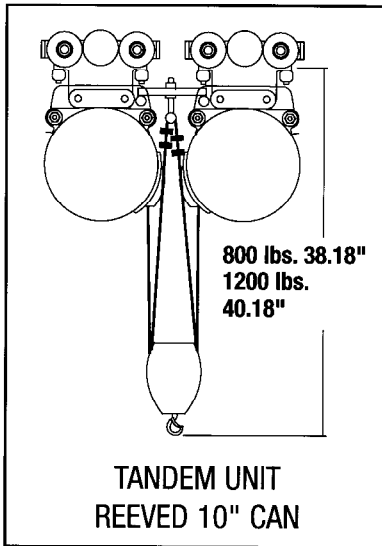
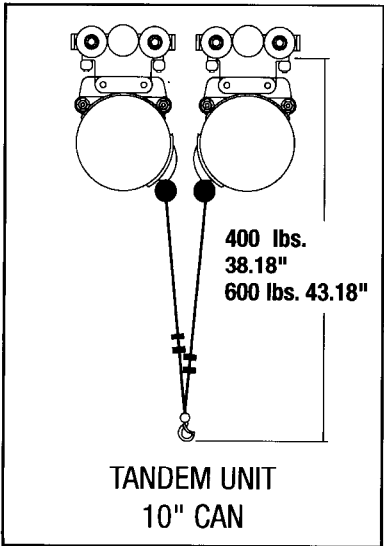
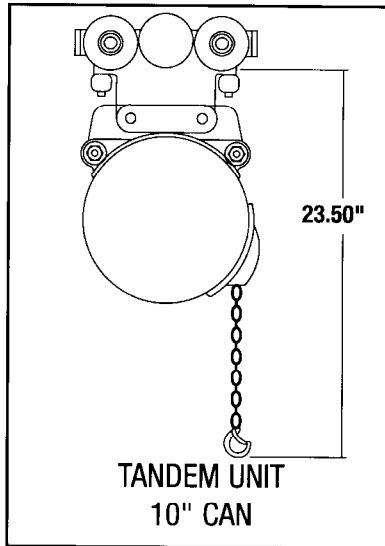
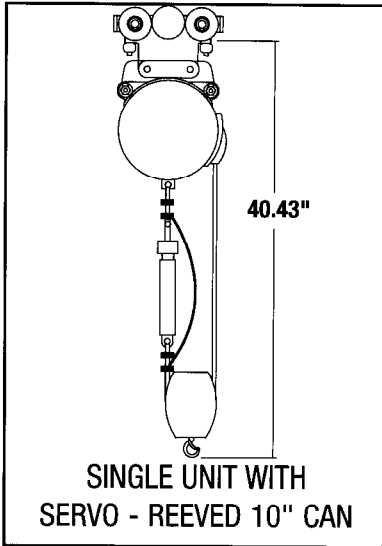
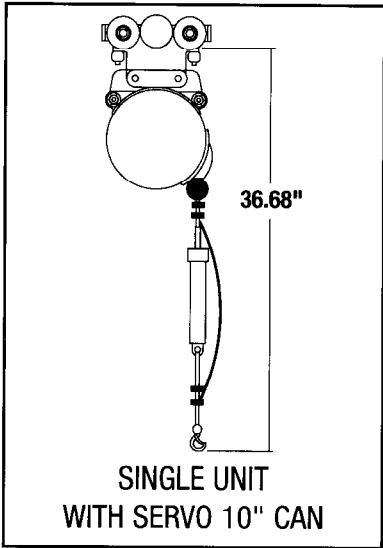
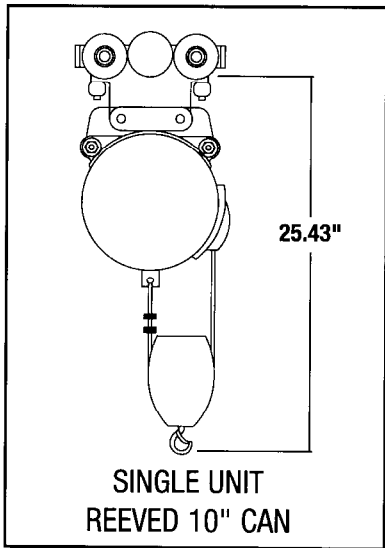
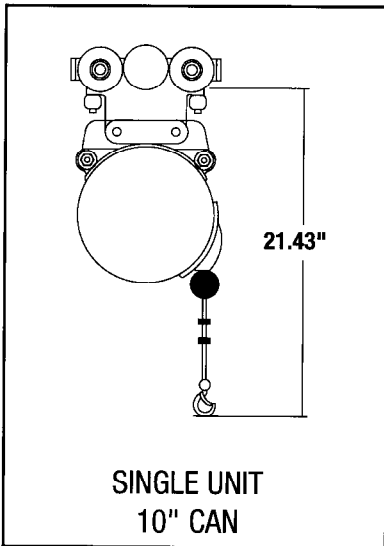
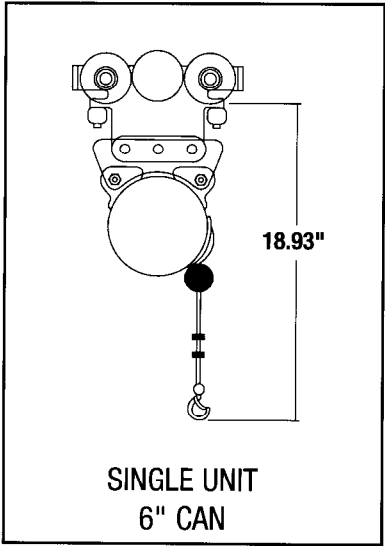
EXAMPLE

ORDER NUMBER:

ZRA2 06 08 30283 R

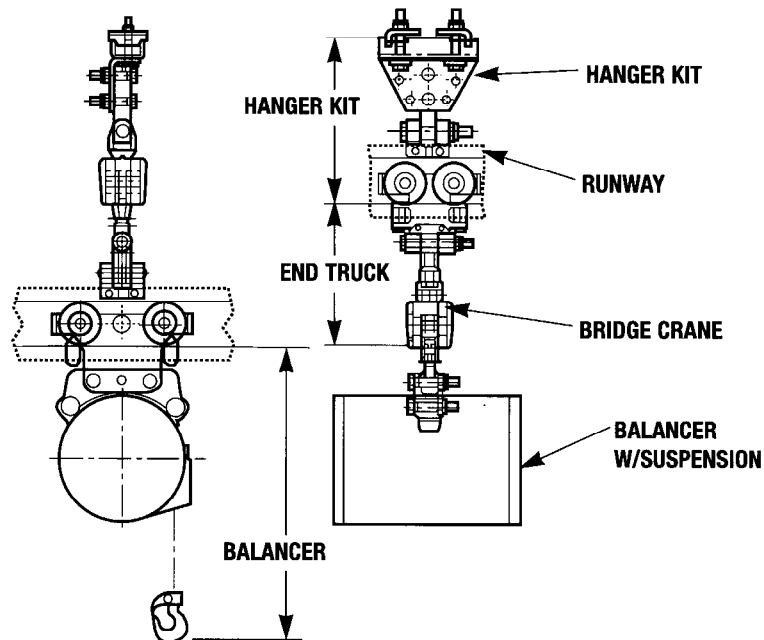


BALANCER STACK-UP DIMENSION • FOR ZRA2 ALUMINUM RAIL



SYSTEM STACK-UP DIMENSION • ZRA2-QUICK REFERENCE

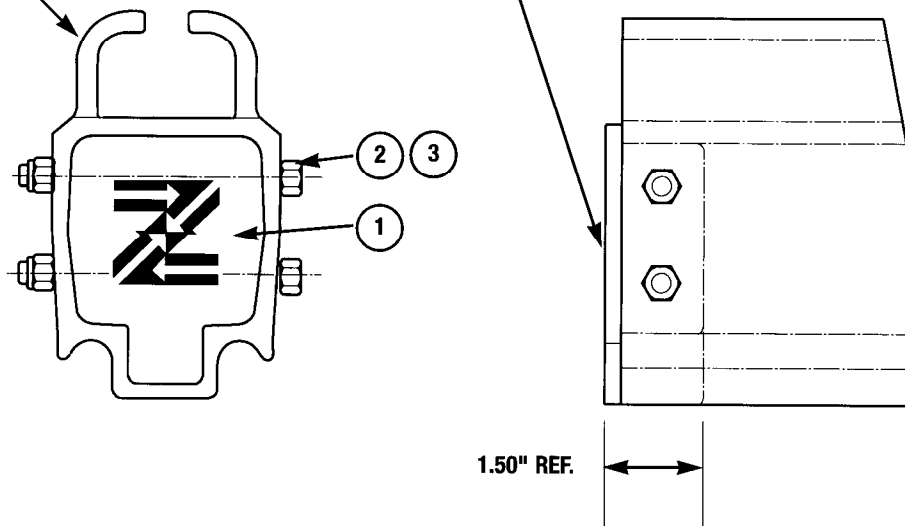
HANGER KITS	END TRUCKS	BALANCERS WITH SUSPENSION
30052 – 5.69"	30167 – 12.13"	SINGLE UNIT 6" – 20.88"
30193 – 12.06"	30176 – 12.38"	SINGLE CHAIN UNIT 10" – 23.50"
30198 – 12.06"	30177 – 10.88"	SINGLE UNIT 10" – 21.43"
30199 – 14.00"	30178 – 12.13"	SINGLE UNIT REEVED 10" – 25.43"
30900 – 14.00"	30909 – 11.00"	SINGLE UNIT WITH SERVO 10" – 36.68"
30901 – 14.00"	30910 – 10.63"	SINGLE UNIT REEVED WITH SERVO 10" – 40.43"
30902 – 14.00"	30911 – 9.38"	TANDEM UNIT 10" – 400 LBS. 38.18"
30195 – (ADJUSTABLE)	30912 – 10.63"	600 LBS. 43.18"
30196 – (ADJUSTABLE)	30913 – 11.25"	1000 LBS. 38.18"
30921 – 10.75"	30914 – 12.50"	TANDEM UNIT REEVED 10" – 800 LBS. 30.18"
30922 – 10.75"	30915 – 11.25"	1200 LBS. 40.18"
	30916 – 12.50"	2000 LBS. 30.18"
	30918 – 12.75"	TANDEM UNIT REEVED WITH SERVO 10" –
		800 LBS. 39.93"
		1200 LBS. 39.93"



END STOPS • ZRA2 ALUMINUM RAIL/PART NO. (SINGLE-30183) (REDUNDANT-30185)

ZRA2 RAIL NO. 30000

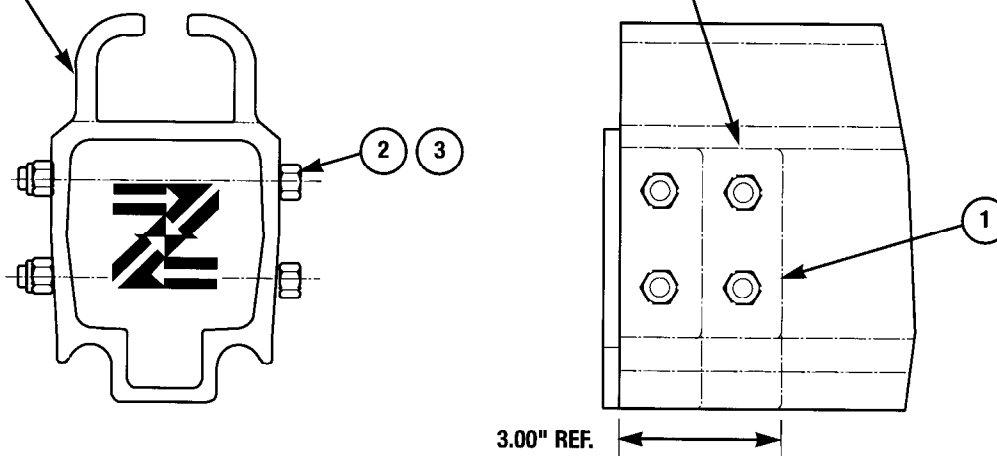
END STOP NO. 30183



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30182	-	1	1	END STOP
71472	-	2	2	3/8-16 X 5.00
75583	-	3	2	3/8-16 LOCK NUT

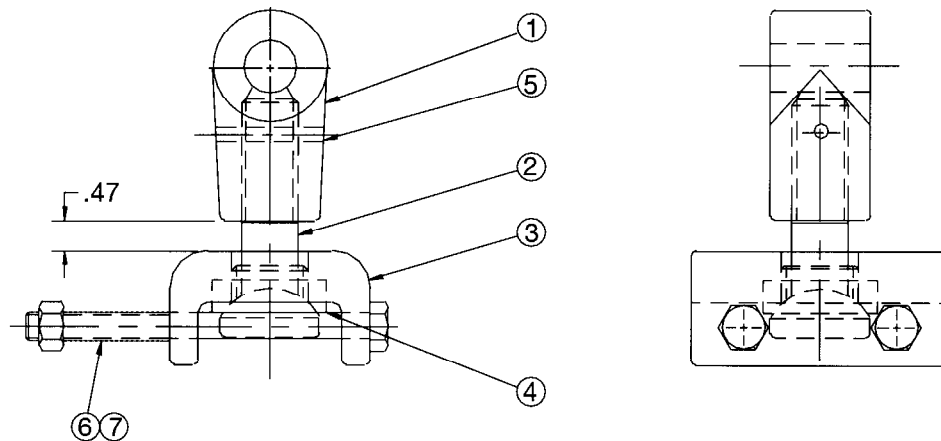
ZRA2 RAIL NO. 30000

REDUNDANT END STOP NO. 30185



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30184	-	1	1	RED END STOP
71472	-	2	2	3/8-16 X 5.00 H.C.S.
75583	-	3	2	3/8-16 LOCK NUT

ZRA2 RAIL/BRIDGE SUSPENSION SUB-ASSEMBLY/PART NO. 30924

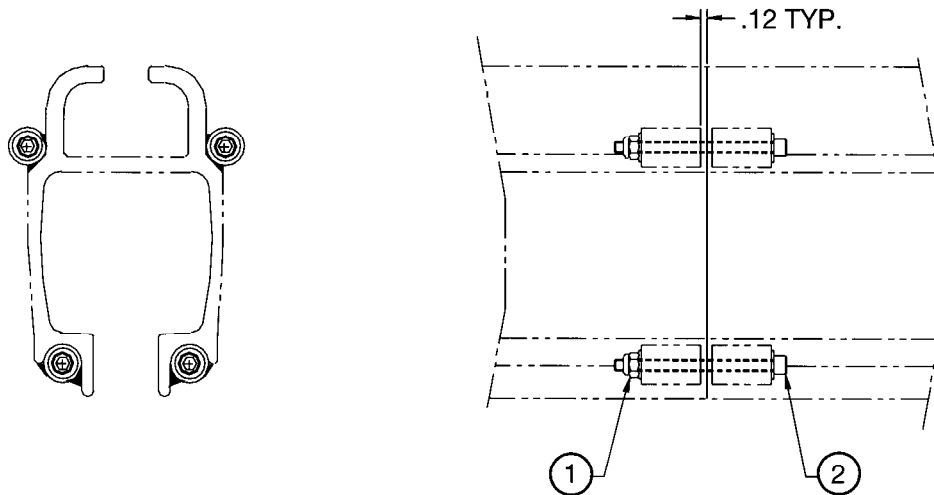


NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 - LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

ULTIMATE STRENGTH:17,575 LBS.
 YIELD STRENGTH:15,000 LBS.
 CAPACITY:2,000 LBS.
 WEIGHT OF ASSEMBLY:3 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30163	1	1	MALE CLEVIS
-	30174	2	1	CHAIR WASHER SCREW
-	30164	3	1	BRIDGE SUSPENSION BRACKET
-	91105	4	1	CHAIR WASHER
71481	-	6	2	3/8-16 X 4.50" H.H.B.
75583	-	7	2	3/8-16 LOCK NUT
99118	-	5	1	SCREW & NUT ASS'Y.

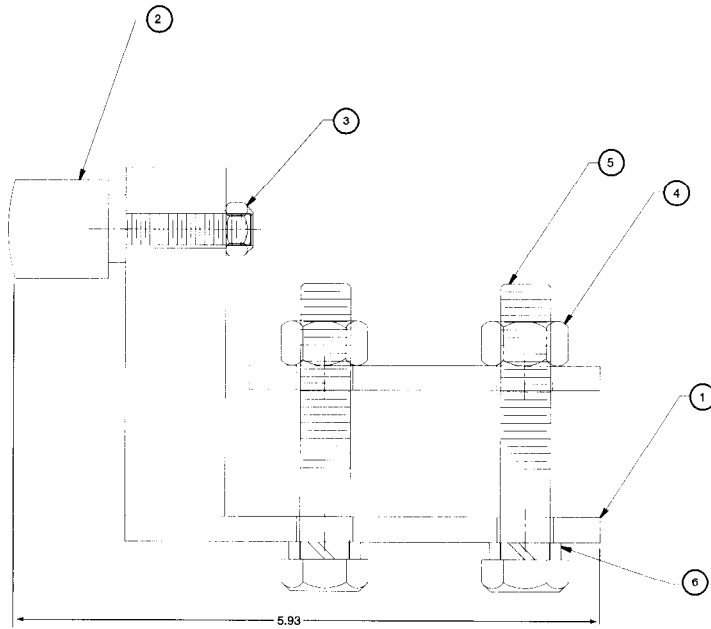
SPLICE BOLT KIT • ZRA2/PART NO. 30057



NOTE: THERE MUST BE A HANGER KIT WITHIN 12 IN. (305 MM) OF THE SPLICE JOINT ON THE RUNWAY.
 CONSULT THE FACTORY IF MODIFICATIONS NEED TO BE MADE TO SPLICE JOINTS THAT REQUIRE WELDING OF SPLICE LUGS.

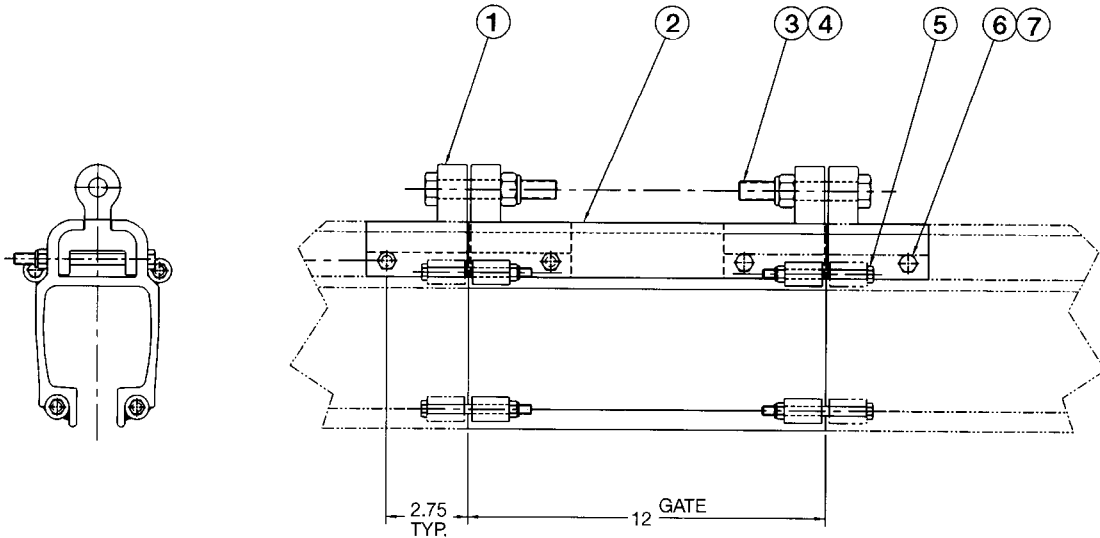
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
75582	-	1	4	5/16-18 LOCK NUT
70926	-	2	4	5/16-18 x 3-1/2 S.H.C.S.

ZRA2 RAIL • ADJUSTABLE STOP/PART NO. 30733



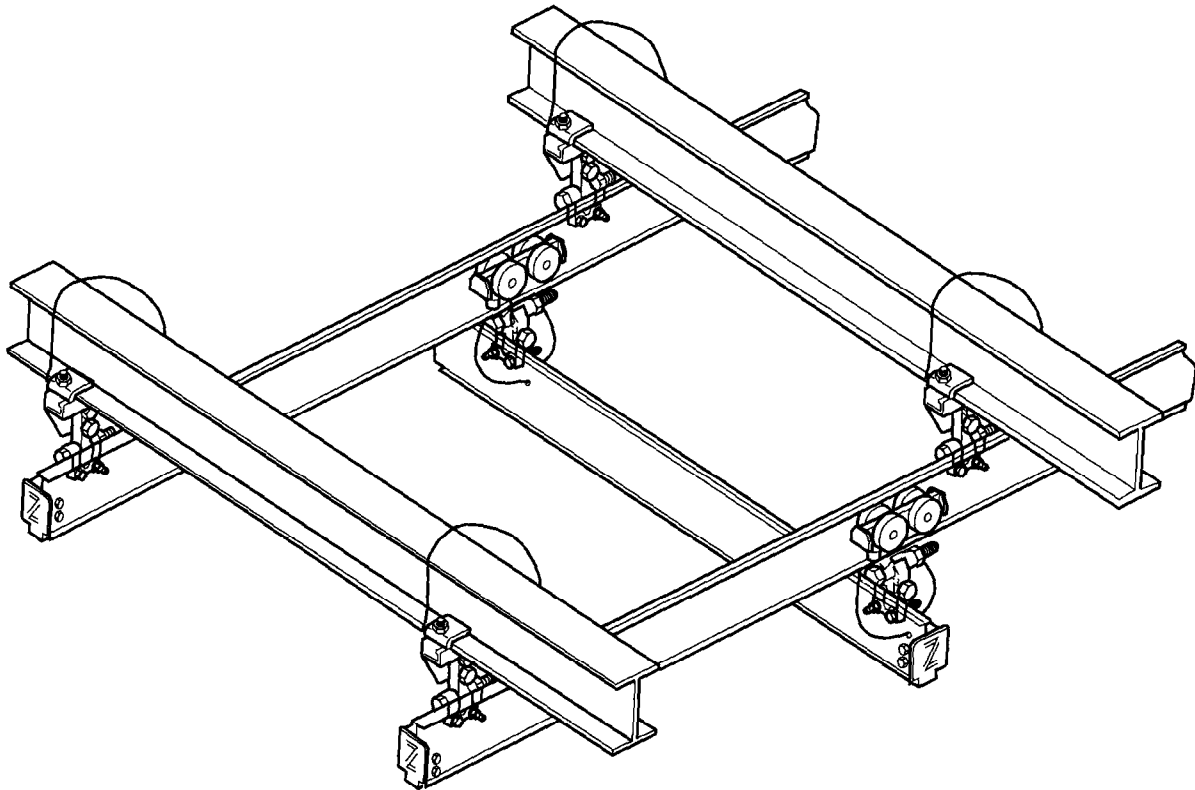
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30735	1	1	BAR WELDMENT
-	30744	2	1	THRD AND HEX SHOULDER
-	75582	3	1	5/16-18 PT LOCKNUT
-	30737	4	1	NUT WELDMENT
-	72002	5	2	1/2-13 X 2-3/4 HEX HEAD CAPSCREW
-	74513	6	2	1/2" MED SPRING LOCKWASHER

ZRA2 RAIL • INSPECTION GATE/PART NO. 30995



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30994	1	4	HANGER BRACKET
-	30993	2	1	GATE - ZRA2
72644	-	3	2	5/8-11 X 4" LG. H.H.C.S.
75587	-	4	2	5/8-11 LOCK NUT
-	30057	5	2	SPLICE BOLT KIT - ZRA2
71481	-	6	4	3/8-16 X 4 1/2 LG. H.H.C.S.
75583	-	7	4	3/8-16 LOCK NUT

ZRS2/3 STEEL RAIL AND COMPONENTS



ENGINEERING DATA FOR ZRS2/3 STEEL RAIL

1. All rail and hangers must be installed in accordance with Zimmerman Handling Systems' (Z.H.S.) instructions.
2. Rail provided is ZRS2/3 steel.
3. The rail or bridge beam provided is modular design, weld free application, and self aligning with complete bolt-together capability at all splice joints and hangers.
4. All rail sections provided are saw cut square to required length by Z.H.S. All rail joints should be flush when installation is completed.
5. The capacity of the rail, monorail or bridge crane will be determined so that deflection under rated load shall not exceed 1/450 of the span. Lateral deflection will not be accepted.
6. The allowable stresses applied must not exceed 20% of the **minimum yield strength** of the materials used.
7. The maximum capacity for all rail provided by the contractor including hoist, product, process equipment, and all attachments, etc., must not exceed the capacity specified below:
ZRS2 Steel Rail - acceptable for maximum capacities up to and including 2000 lbs.
ZRS3 Steel Rail - acceptable for maximum rated load up to and including 3000 lbs.
8. For bridge crane or hoist application(s), the maximum overhang of the bridge girder to the center of a runway rail must not exceed 12.00". (For larger overhangs consult the factory.)
9. All bridge cranes, runway, and monorail, must be installed straight, parallel, level and at the same elevation. Installation tolerance cannot exceed the values specified below:
 - a. **Longitudinal leveling.** Multiple runways and single rail systems .250" in overall length, with a maximum rate of change of no more than .125" on twenty-foot centers.
 - b. **Elevation runway to runway.** .250" in span, maximum rate of change .125" on twenty-foot centers.
 - c. **Centering runway-to-runway.** .500" in overall length, maximum rate of change .125" on twenty-foot centers.
 - d. **Centering for single rail** to a parallel conveyor of workstation will be $\pm .500$ " in overall length of the system, maximum rate of change .125" on twenty-foot centers.
10. Sway bracing should be used when the hanger meets or exceeds 24.00" in length. (See system installation manual.)
11. One month after system buy off, the enclosed rail system should be inspected and re-leveled by the installation contractor. All bolts at the splice joints, hangers and support structure should be re-checked for proper torque. Abnormalities noted by the inspector must be reported to Z.H.S. immediately.
12. All trolley running surfaces must be aligned flush in accordance with this specification and present no shock loading at splice connections. Transverse tilt will not be accepted.
13. Tension tubes at all splice connections will be aligned and welded by Z.H.S.
14. Joint modification or holes required in track section(s) will be by drilling or saw cutting only. Flame cutting of holes or splice joints is not permitted.
15. Where hanger rods are used, the allowable stress will be 20% of the minimum yield strength of the material provided.

16. All hangers must be installed true and vertical. All suspension fittings should bear the load equally.
17. All bolts, nuts, fasteners, attachments, etc., required for enclosed rail systems will be provided by Z.H.S.
18. All double girder bridge cranes provided will incorporate diagonal bracing for parallel stabilization.
19. All splice connections shall not exceed 12" from hanger point.

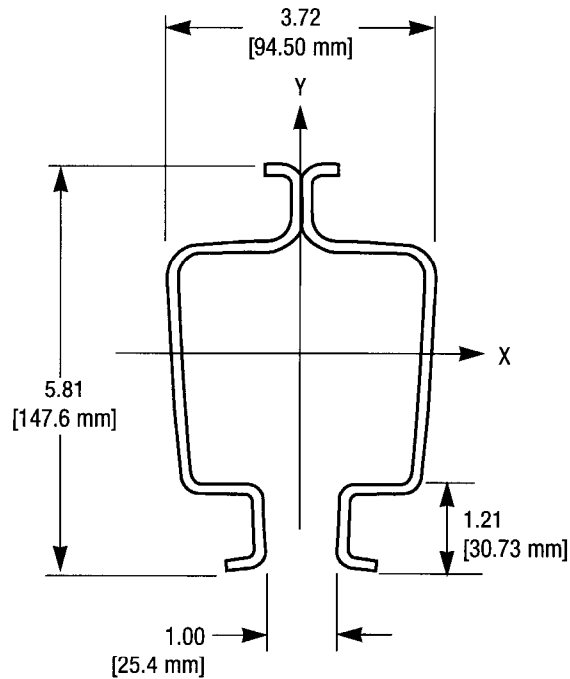
ZRS2 CURVED RAIL

1. Enclosed rail turns will be pre-formed by Z.H.S. All tension tubes will be aligned and installed by Z.H.S.
2. The radius of all enclosed rail turns will be designed to allow the carriers or trolleys to freely negotiate each horizontal turn without binding.
3. The minimum radius for ZRA2 steel rail is 60.00".
4. Short radius turns with a radius that is less than the standard specified above must be pre-approved by Z.H.S.
5. The maximum overhang of a straight track to the tangent point of a horizontal turn cannot exceed 12.00".
6. A minimum of two hangers should be used in the radius of each 90-degree turn, the two hangers should be in addition to one hanger at each splice joint. The maximum distance between hanger centers cannot exceed 36.00". If required, additional hangers can be provided in accordance with the design and calculated distance based on the trolley or carrier loading.
7. Special curves will be supported and braced in accordance with Z.H.S.'s requirements. Under no condition will rail hanger center exceed 36.00".
8. Curved rail sections will be installed with uniform bolt tension to insure that the load trolley do not bind at splice joints.
9. A straight section of rail will be provided between each horizontal turn. For single trolley systems the length will be 12.00", for dual trolley systems the length will be 28.00".
10. All hangers provided must be installed true to the vertical plane.

TROLLEYS

1. All trolleys are manufactured by Zimmerman Handling Systems.
2. All aluminum trolleys consist of high-tensile aluminum-magnesium alloy body.
3. All steel trolleys consist of a welded, stamped steel body.
4. All trolley wheels provided for hoists, bridge cranes, and related equipment must conform to Z.H.S.'s standards.
5. Trolley wheels are delrin, machined symmetrically true with the axis. All trolley wheels are retainer type, designed for a single row of high quality, precision-ground ball bearings. All trolley wheels have a stud that is press-fitted into the trolley body.
6. Trolley side guide rollers are delrin machined symmetrically true with the axis. All trolley side guide rollers are designed for single row, ball bearings.
7. All trolleys are equipped with safety lugs so in the event of a wheel failure the trolley cannot come out of the rail.
8. All bearings are protected by grease and dust seals.

CROSS SECTION • ZRS2 STEEL RAIL/PART NO. 30500



MOMENT OF INERTIA: $I = 7.32 \text{ IN} [3.04\text{E}6 \text{ mm}]$
 X

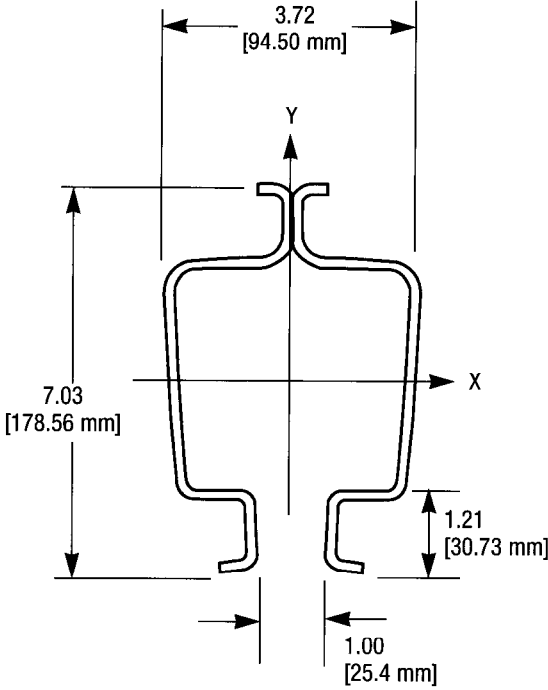
$I = 3.58 \text{ IN} [1.49\text{E}6 \text{ mm}]$
 Y

MAX. LENGTH: 24 FT. [6400.8 mm]
 WEIGHT: 8.0 LB./FT. [11.90 Kg/M]

LIVE LOAD DEFLECTIONS • ZRS2/PART NO. 30500

RAIL/BRIDGE SPAN				DEFLECTION LIMITS				POINT LOAD			
FT.	IN.	m	mm	1/450 IN.	1/450 mm	1/550 IN.	1/550 mm	1/450 lbs.	1/450 kg.	1/550 lbs.	1/550 kg.
5	60	1.52	1524.0	.13	3.3	.11	2.7	2600	1180	2600	1180
6	72	1.82	1828.8	.16	4.0	.13	3.3	2600	1180	2600	1180
7	84	2.13	2133.6	.19	4.8	.15	3.8	2600	1180	2600	1180
8	96	2.43	2438.4	.21	5.3	.17	4.3	2600	1180	2315	1051
9	108	2.74	2743.2	.24	6.0	.20	5.0	2235	1014	1829	830
10	120	3.04	3048.0	.27	6.8	.22	5.5	1810	821	1481	672
11	132	3.35	3352.8	.29	7.3	.24	6.0	1496	679	1224	555
12	144	3.65	3657.6	.32	8.1	.26	6.6	1257	570	1028	466
13	156	3.96	3962.4	.35	8.8	.28	7.1	1071	486	876	398
14	168	4.26	4267.2	.37	9.3	.31	7.8	923	419	755	342
15	180	4.57	4572.0	.40	10.1	.33	8.3	804	365	658	298
16	192	4.87	4876.8	.43	10.9	.35	8.8	707	321	578	262
17	204	5.18	5181.6	.45	11.4	.37	9.3	626	284	512	232
18	216	5.48	5486.4	.48	12.1	.39	9.9	558	253	457	207
19	228	5.79	5791.2	.51	12.9	.41	10.4	501	227	410	186
20	240	6.09	6096.0	.53	13.4	.44	11.1	452	205	370	168
21	252	6.40	6400.8	.56	14.2	.46	11.6	410	186	336	152
22	264	6.70	6705.6	.58	14.9	.48	12.2	374	170	306	139
23	276	7.01	7010.4	.61	15.5	.50	12.7	342	155	280	127

CROSS SECTION • ZRS3 STEEL RAIL/PART NO. 30550



MOMENT OF INERTIA: $I = 12.54 \text{ IN}^4 [5.21\text{E}6 \text{ mm}^4]$
 X

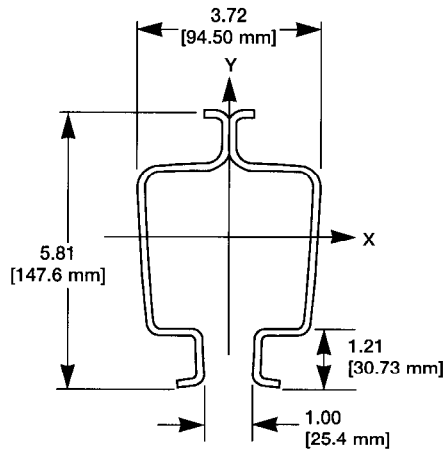
$I = 5.14 \text{ IN}^4 [2.13\text{E}6 \text{ mm}^4]$
 Y

MAX. LENGTH: 24 FT. [6400.8 mm]
 WEIGHT: 8.9 LB./FT. [13.24 Kg/M]

LIVE LOAD DEFLECTIONS • ZRS3 STEEL RAIL/PART NO. 30550

RAIL/BRIDGE SPAN				DEFLECTION LIMITS				POINT LOAD			
FT.	IN.	m	mm	1/450 IN.	1/450 mm	1/550 IN.	1/550 mm	1/450 lbs.	1/450 kg.	1/550 lbs.	1/550 kg.
5	60	1.52	1524	.13	3.3	.11	2.7	2600	1180	2600	1180
6	72	1.82	1828.8	.16	4.0	.13	3.3	2600	1180	2600	1180
7	84	2.13	2133.6	.19	4.8	.15	3.8	2600	1180	2600	1180
8	96	2.43	2438.4	.21	5.3	.17	4.3	2600	1180	2600	1180
9	108	2.74	2743.2	.24	6.0	.20	5.0	2600	1180	2600	1180
10	120	3.04	3048.0	.27	6.8	.22	5.5	2600	1180	2204	1002
11	132	3.35	3352.8	.29	7.3	.24	6.0	2581	1171	2112	958
12	144	3.65	3657.6	.32	8.1	.26	6.6	2169	984	1774	805
13	156	3.96	3962.4	.35	8.8	.28	7.1	1848	838	1512	686
14	168	4.26	4267.2	.37	9.3	.31	7.8	1593	723	1303	591
15	180	4.57	4572.0	.40	10.1	.33	8.3	1388	630	1135	515
16	192	4.87	4876.8	.43	10.9	.35	8.8	1220	553	998	453
17	204	5.18	5181.6	.45	11.4	.37	9.3	1080	490	884	401
18	216	5.48	5486.4	.48	12.1	.39	9.9	964	437	788	357
19	228	5.79	5791.2	.51	12.9	.41	10.4	865	392	707	320
20	240	6.09	6096.0	.53	13.4	.44	11.1	780	354	638	289
21	252	6.30	6400.8	.56	14.2	.46	11.6	708	321	579	262
22	264	6.70	6705.6	.58	14.9	.48	12.1	645	292	528	239
23	276	7.01	7010.4	.61	15.5	.50	12.7	590	267	483	219

HOW TO ORDER • ZRS2 STEEL RUNWAY OR MONORAIL



PART NUMBER:

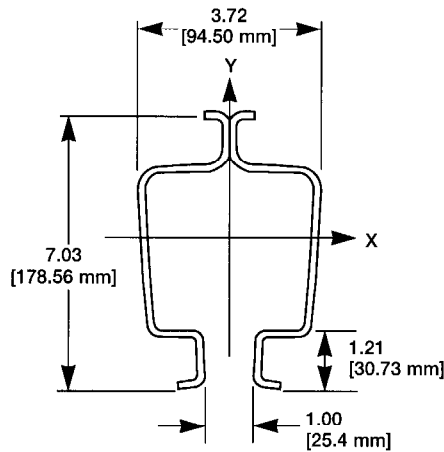
30500 - 210 - 2



INDICATES SPLICE LUGS WELDED ON
INDICATES LENGTH OF RAIL IN FEET (210=21 FEET)
INDICATES CROSS SECTION

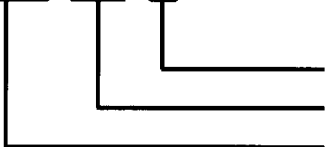
NOTE: ALL RUNWAY RAIL WILL BE DRILLED FOR END STOPS AND WILL HAVE SPLICE LUGS WELDED ON.

HOW TO ORDER • ZRS3 STEEL RUNWAY OR MONORAIL



PART NUMBER:

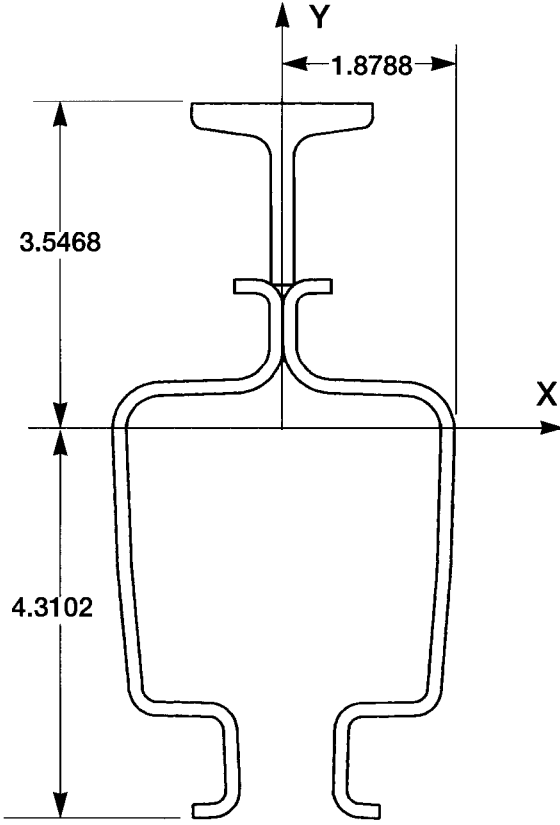
30500 - 210 - 2



INDICATES SPLICE LUGS WELDED ON
INDICATES LENGTH OF RAIL IN FEET (210=21 FEET)
INDICATES CROSS SECTION

NOTE: ALL RUNWAY RAIL WILL BE DRILLED FOR END STOPS AND WILL HAVE SPLICE LUGS WELDED ON.

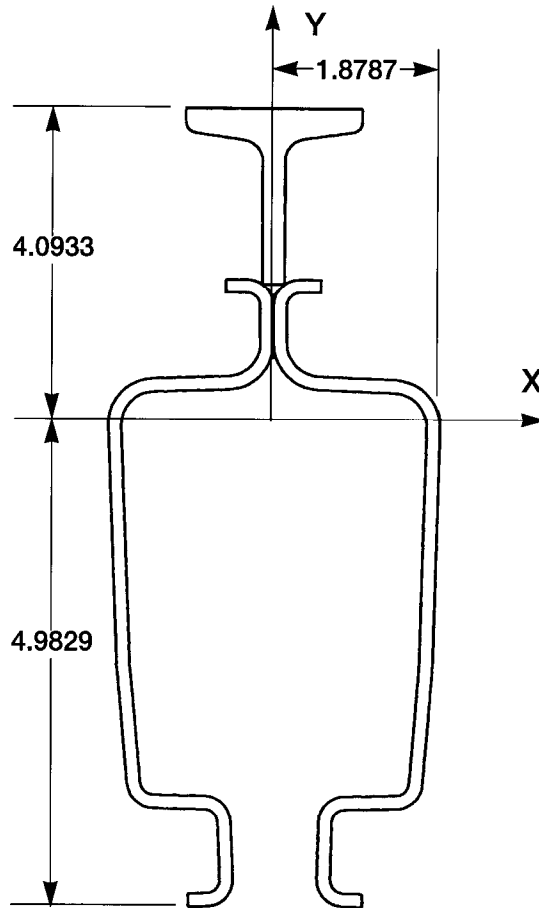
CROSS SECTION • ZRS2 STRONG BACK RAIL/PART NO. 30500T



CONSULT FACTORY FOR APPLICATIONS

LENGTH: 24 FT. [6400.8 mm]
WEIGHT: 11.62 LB/FT. [17.19 kg/m]

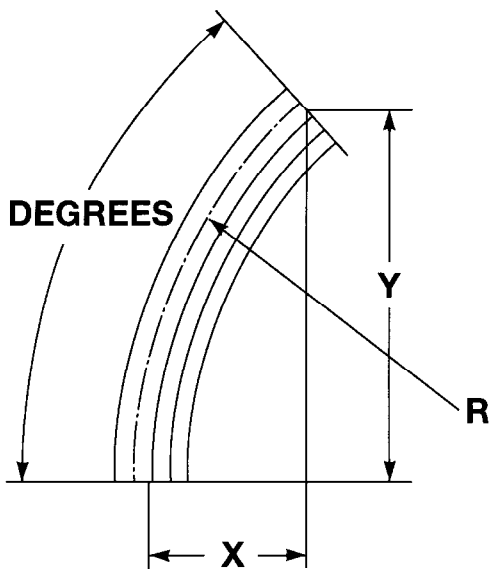
CROSS SECTION • ZRS3 STRONG BACK RAIL/PART NO. 30550T



CONSULT FACTORY FOR APPLICATIONS

LENGTH: 24 FT. [6400.8 mm]
WEIGHT: 12.52 LB/FT. [18.52 kg/m]

CURVED RAIL DIMENSIONS • ZRS2 STEEL RAIL



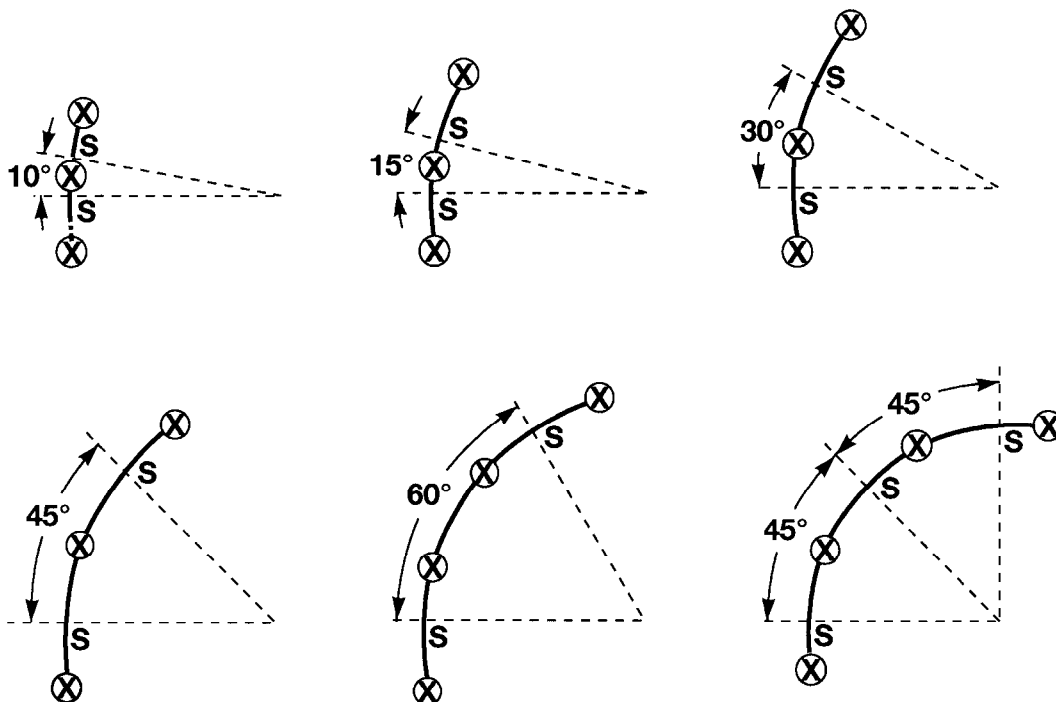
CURVED RAIL DIMENSIONS ZRA1 ALUMINUM RAIL					
	DEGREES	X	Y	APPROX. WEIGHT	PART NUMBER
ZRS2	10	.91	10.42	6.98	30567
R = 60"	15	2.04	15.53	10.47	30569
	30	8.04	30.00	20.94	30571
	45	17.57	42.43	31.44	30573

RAIL MUST BE SUPPORTED WITH A SUSPENSION HANGER IN THE CENTER AND ONE SUSPENSION HANGER NEAR EACH SPLICE JOINT. FOR MULTIPLE CURVED RAILS BEING SPLICED TOGETHER, SUSPENSION HANGERS WILL BE AS SHOWN BELOW.

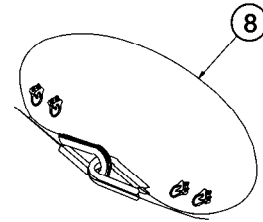
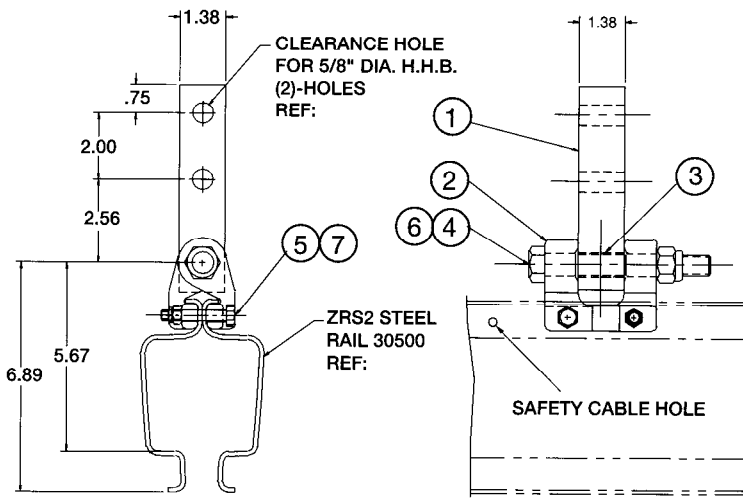
CURVED RAIL SUSPENSION POINTS DIAGRAM

S – DENOTES SPLICE JOINTS

X – DENOTES SUSPENSION POINTS



BLOCK HANGER KIT • ZRS2/3 STEEL RAIL/PERPENDICULAR/ PART NO. 30813

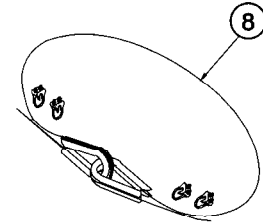
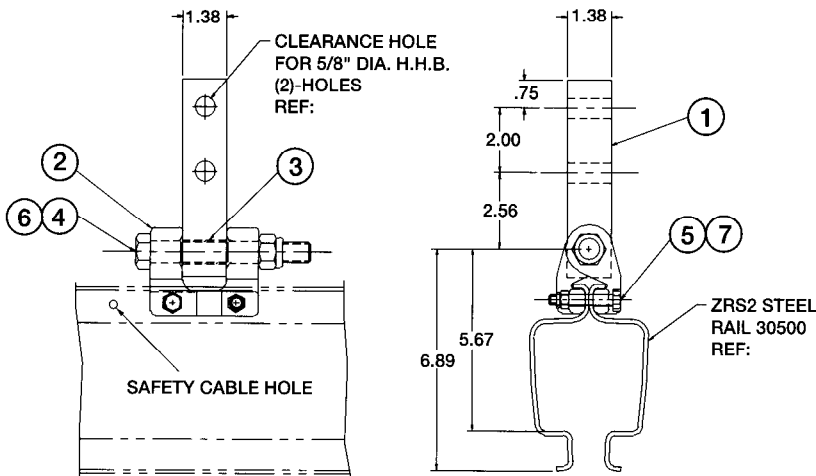


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH:.....17,250 LBS.
YIELD STRENGTH:.....14,250 LBS.
CAPACITY:.....2,850 LBS.
MINIMUM RAIL RADIUS (ZRS2).....60"
WEIGHT OF ASSEMBLY:.....6 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30162	1	1	HANGER
-	30801	2	1	HANGER BRACKET
65075	-	3	1	BRONZE BEARING
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
70967	-	5	2	5/16-18 X 2.25" LG. H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
75582	-	7	2	5/16-18 LOCK NUT
30907-06	-	8	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

BLOCK HANGER KIT • ZRS2/3 STEEL RAIL/PARALLEL/ PART NO. 30816

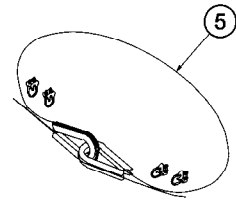
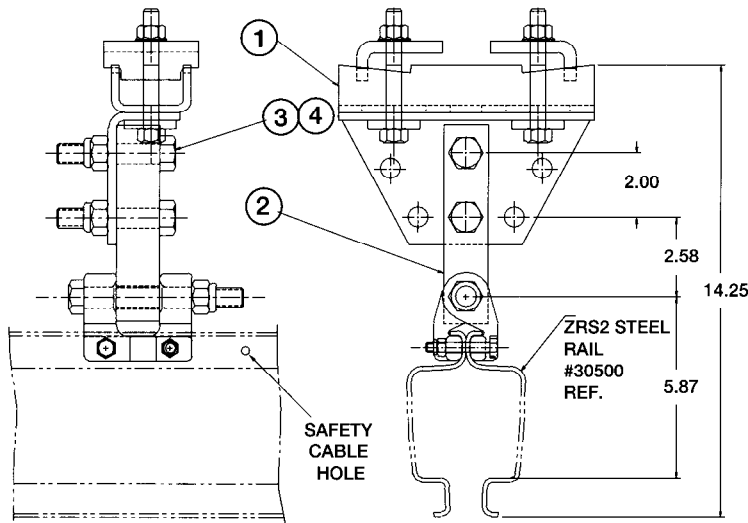


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH:.....17,250 LBS.
YIELD STRENGTH:.....14,250 LBS.
CAPACITY:.....2,850 LBS.
MINIMUM RAIL RADIUS (ZRS2).....60"
WEIGHT OF ASSEMBLY:.....6 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30197	1	1	HANGER
-	30801	2	1	HANGER BRACKET
65075	-	3	1	BRONZE BEARING
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
70967	-	5	2	5/16-18 X 2.25" LG. H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
75582	-	7	2	5/16-18 LOCK NUT
30907-06	-	8	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

BEAM HANGER KIT • ZRS2/3 STEEL RAIL/PARALLEL/STANDARD FLANGE/ PART NO. 30817

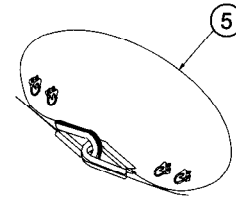
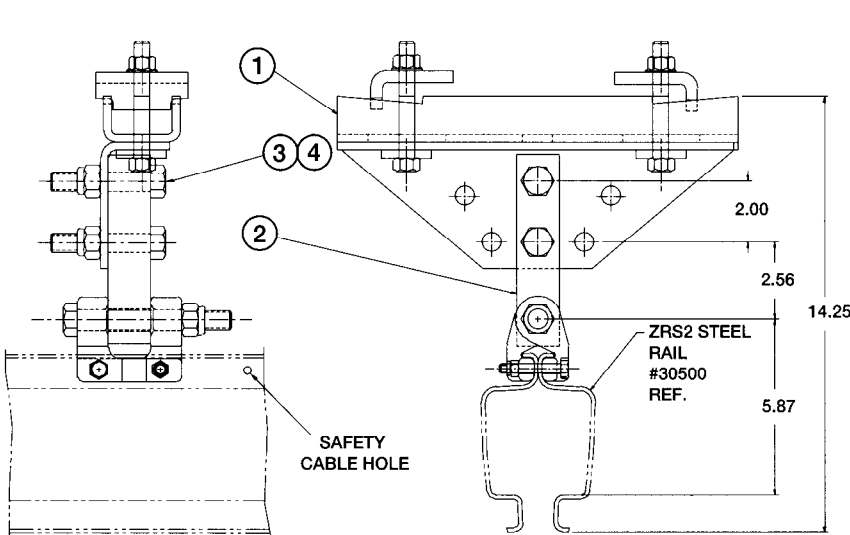


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KITS WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.
 ULTIMATE STRENGTH:.....17,250 LBS.
 YIELD STRENGTH:.....14,250 LBS.
 CAPACITY:.....2,850 LBS.
 MINIMUM RAIL RADIUS (ZRS2).....60"
 WEIGHT OF ASSEMBLY:.....15 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER
-	30813	2	1	HANGER BRACKET
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

BEAM HANGER KIT • ZRS2/3 STEEL RAIL/PARALLEL/WIDE FLANGE/ PART NO. 30818

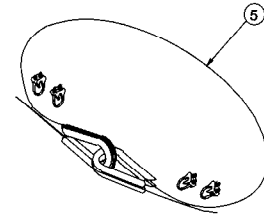
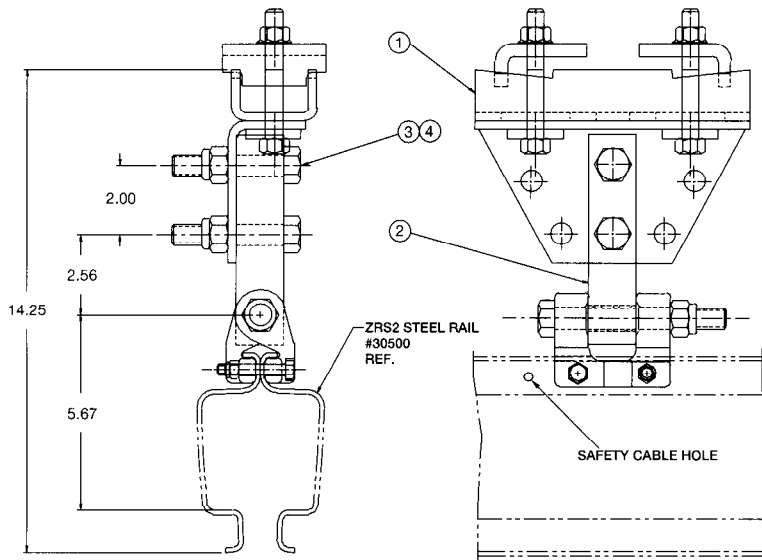


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KITS WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.
 ULTIMATE STRENGTH:.....17,250 LBS.
 YIELD STRENGTH:.....14,250 LBS.
 CAPACITY:.....2,850 LBS.
 MINIMUM RAIL RADIUS (ZRS2).....60"
 WEIGHT OF ASSEMBLY:.....16 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER
-	30813	2	1	HANGER BRACKET
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

BEAM HANGER KIT • ZRS2/3 STEEL RAIL/PERPENDICULAR/STANDARD FLANGE/PART NO. 30819

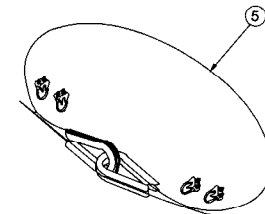
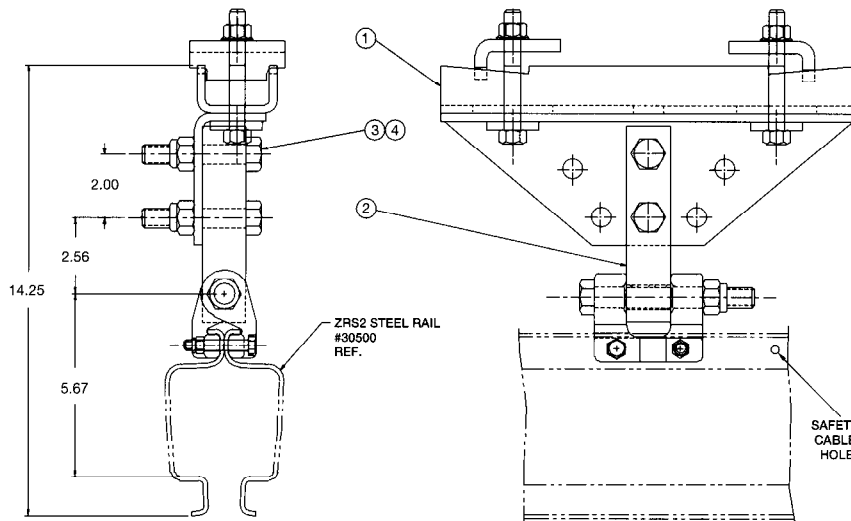


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KITS WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.
 ULTIMATE STRENGTH:.....17,250 LBS.
 YIELD STRENGTH:.....14,250 LBS.
 CAPACITY:.....2,850 LBS.
 MINIMUM RAIL RADIUS (ZRS2).....60"
 WEIGHT OF ASSEMBLY:.....15 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER
-	30816	2	1	HANGER BRACKET
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

BEAM HANGER KIT • ZRS2/3 STEEL RAIL/PERPENDICULAR/WIDE FLANGE/PART NO. 30820

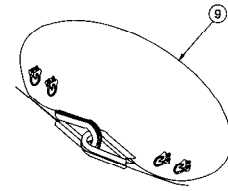
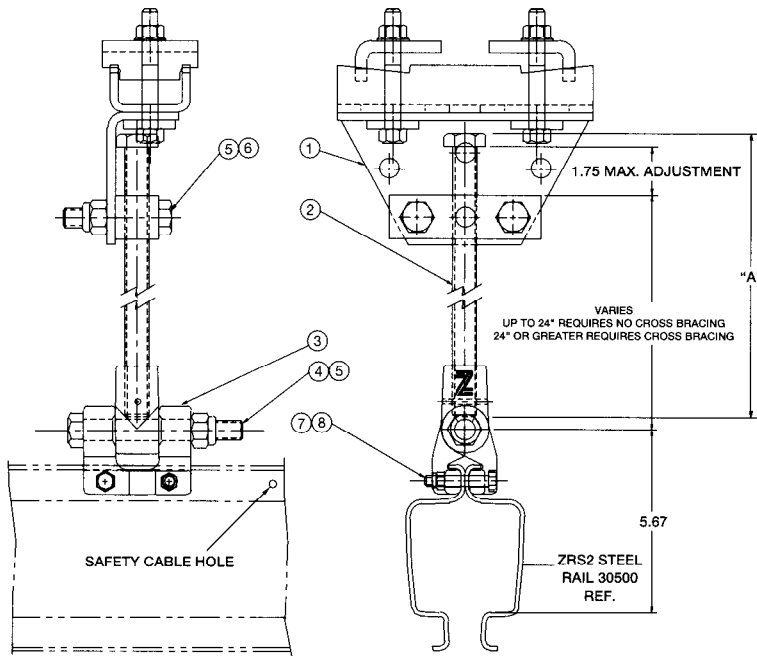


NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KITS WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.
 ULTIMATE STRENGTH:.....17,250 LBS.
 YIELD STRENGTH:.....14,250 LBS.
 CAPACITY:.....2,850 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30187	1	1	HANGER
-	30816	2	1	HANGER BRACKET
72646	-	3	2	5/8-11 X 3.25" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
30907-06	-	5	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

ADJUSTABLE HANGER KIT • ZRS2/3 STEEL RAIL/STANDARD FLANGE/ PART NO. 30814



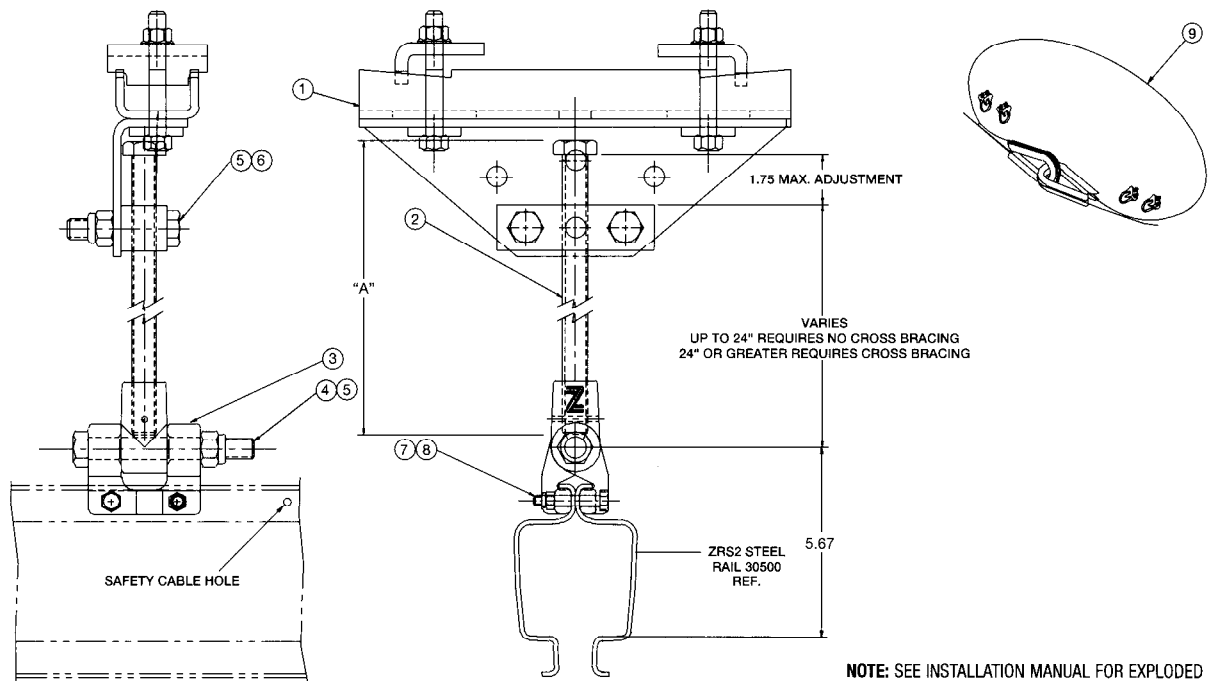
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KIT WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.
 ULTIMATE STRENGTH:.....17,250 LBS.
 YIELD STRENGTH:.....14,250 LBS.
 CAPACITY:.....2,850 LBS.
 MINIMUM RAIL RADIUS (ZRS2).....60"
 *ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING. SEE ACCESSORIES SECTION.

MIN. "A" DIM	ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y. NO.	ORDER NUMBER HANGER KIT ASS'Y. NO.
14.63	6.00"	30192-006	30907-06	30814-006
20.63	12.00"	30192-012	30907-08	30814-012
26.63	18.00"	30192-018	30907-10	30814-018
32.63	*24.00"	30192-025	30907-10	30814-024
44.63	*36.00"	30192-036	30907-12	30814-036
56.63	*48.00"	30192-048	30907-14	30814-048
68.63	*60.00"	30192-068	30907-16	30814-060
80.63	*72.00"	30192-072	30907-18	30814-072

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30186	1	1	HANGER KIT - STD. FLANGE
-	30190	2	1	HANGER ADJUSTMENT ASS'Y.
-	30801	3	1	HANGER BRACKET
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72646	-	6	2	5/8-11 X 3.25" H.H.B.
70967	-	7	2	5/16-18 X 2.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT
SEE CHART	-	9	1	SAFETY CABLE ASS'Y.

ADJUSTABLE HANGER KIT • ZRS2/3 STEEL RAIL/WIDE FLANGE/ PART NO. 30815



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

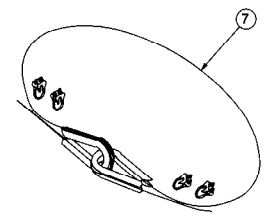
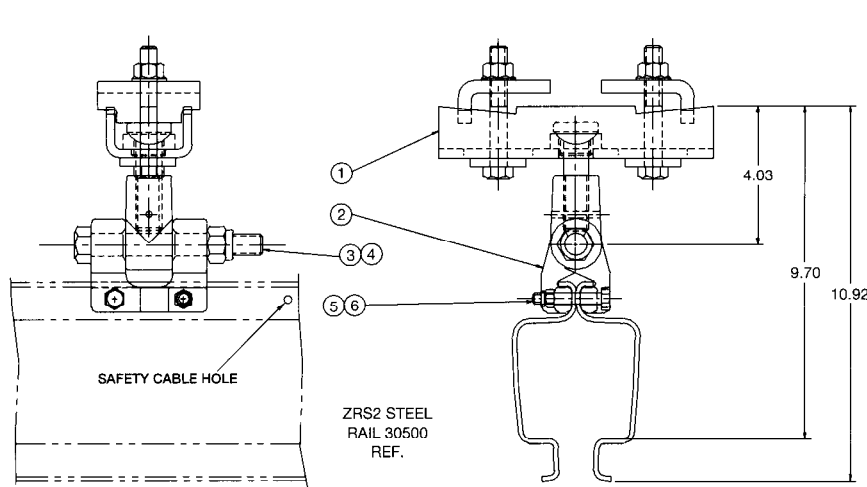
WIDE FLANGE HANGER KIT WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:.....17,250 LBS.
 YIELD STRENGTH:.....14,250 LBS.
 WEIGHT OF ASSEMBLY:.....17 LBS.
 CAPACITY:.....2,850 LBS.
 MINIMUM RAIL RADIUS (ZRS2),.....60"
 *ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING. SEE ACCESSORIES SECTION.

MIN. "A" DIM	ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y. NO.	ORDER NUMBER HANGER KIT ASS'Y NO.
14.63	6.00"	30192-006	30907-06	30815-006
20.63	12.00"	30192-012	30907-08	30815-012
26.63	18.00"	30192-018	30907-10	30815-018
32.63	*24.00"	30192-025	30907-10	30815-024
44.63	*36.00"	30192-036	30907-12	30815-036
56.63	*48.00"	30192-048	30907-14	30815-048
66.63	*60.00"	30192-066	30907-16	30815-060
80.63	*72.00"	30192-072	30907-18	30815-072

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30187	1	1	HANGER KIT - STD. FLANGE	
-	30190	2	1	HANGER ADJUSTMENT ASS'Y.	
-	30801	3	1	HANGER BRACKET	
72623	-	4	1	5/8-11 X 5.00" LG. H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72646	-	6	2	5/8-11 X 3.25" H.H.B.	
70967	-	7	2	5/16-18 X 2.25" H.H.B.	
75582	-	8	2	5/16-18 LOCK NUT	
SEE CHART	-	9	1	SAFETY CABLE ASS'Y.	

CLOSE HANGER KIT • ZRS2/3 STEEL RAIL/STANDARD FLANGE/ PART NO. 30840



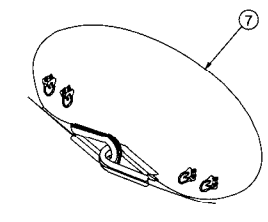
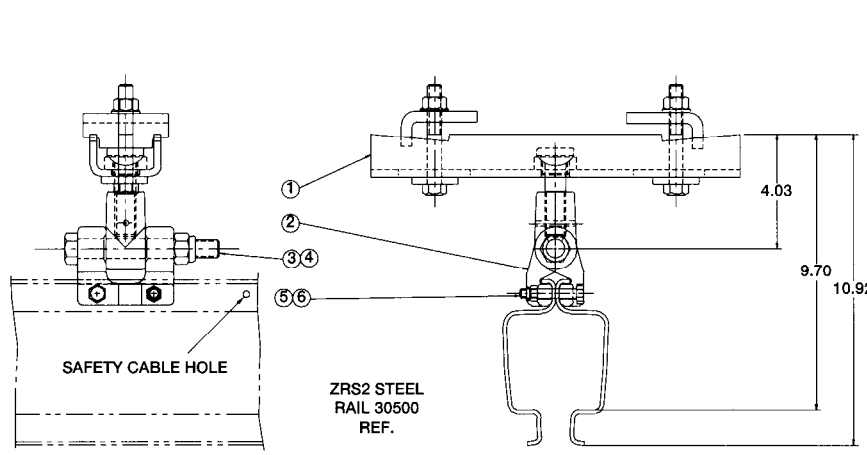
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

STANDARD FLANGE HANGER KITS WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.

ULTIMATE STRENGTH:.....17,250 LBS.
YIELD STRENGTH:.....14,250 LBS.
CAPACITY:.....2,850 LBS.
MINIMUM RAIL RADIUS (ZRS2).....60"
WEIGHT OF ASSEMBLY:.....8 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30919	1	1	CLOSE HANGER KIT
-	30801	2	1	HANGER BRACKET
72623	-	3	2	5/8-11 X 5.00" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
70967	-	5	2	5/16-18 X 2.25" H.H.B.
75582	-	6	2	5/16-18 LOCK NUT
30907-06	-	7	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

CLOSE HANGER KIT • ZRS2/3 STEEL RAIL/WIDE FLANGE/ PART NO. 30841



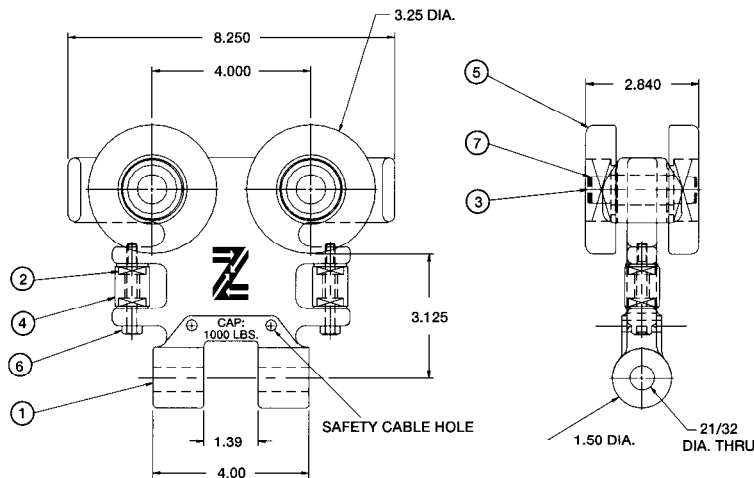
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

WIDE FLANGE HANGER KITS WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTH.

ULTIMATE STRENGTH:.....17,250 LBS.
YIELD STRENGTH:.....14,250 LBS.
CAPACITY:.....2,850 LBS.
MINIMUM RAIL RADIUS (ZRS2).....60"
WEIGHT OF ASSEMBLY:.....9 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30920	1	1	CLOSE HANGER KIT
-	30801	2	1	HANGER BRACKET
72623	-	3	2	5/8-11 X 5.00" LG. H.H.B.
75587	-	4	2	5/8-11 LOCK NUT
70967	-	5	2	5/16-18 X 2.25" H.H.B.
75582	-	6	2	5/16-18 LOCK NUT
30907-06	-	7	1	SAFETY CABLE ASS'Y. (CABLE LENGTH 6 FEET)

ZRS2/3 ALUMINUM TROLLEY • 1000 LBS. CAPACITY/PART NO. 30821



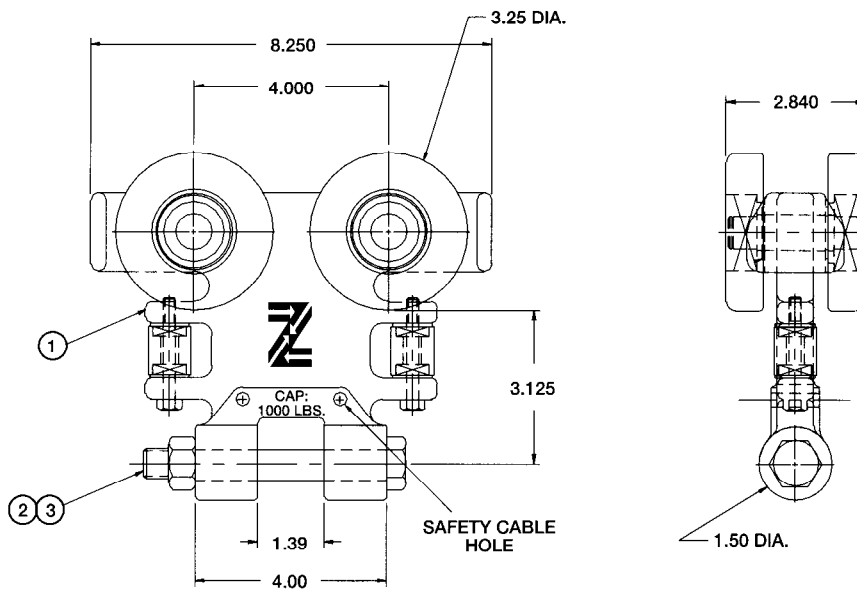
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:250 LBS.
 ULTIMATE STRENGTH:17,575 LBS.
 YIELD STRENGTH:15,000 LBS.
 CAPACITY:1,000 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 WEIGHT OF TROLLEY:5 LBS.
 MINIMUM RAIL RADIUS:60"

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30171	1	1	TROLLEY
65038	-	2	4	BEARING
-	93934	3	2	AXLE
-	93936	4	2	GUIDE WHEEL
-	30056	5	4	TROLLEY WHEEL ASM.
70416	-	6	2	1/4-20 X 2.25" H.H.C.S.
93939	-	7	4	RETAINING RING

ZRS2/3 ALUMINUM LOAD TROLLEY • 1000 LBS. CAPACITY/PART NO. 30842



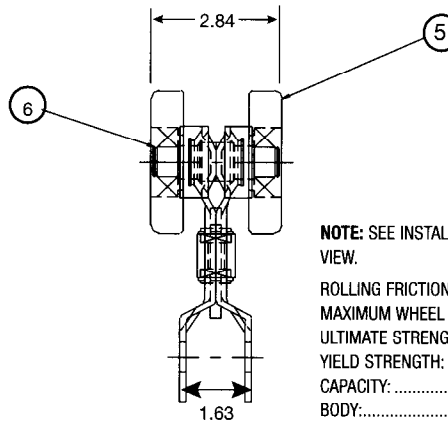
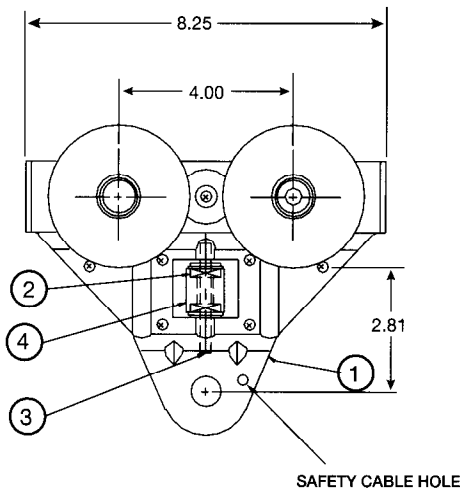
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:250 LBS.
 ULTIMATE STRENGTH:17,575 LBS.
 YIELD STRENGTH:15,000 LBS.
 CAPACITY:1000 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 WEIGHT OF TROLLEY:5.5 LBS.
 MINIMUM RAIL RADIUS:60"

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
72623	-	2	1	5/8-11 X 5" H.H.B.
75587	-	3	1	5/8-11 LOCK NUT
30821	-	1	1	TROLLEY

ZRS2/3 STEEL TROLLEY • 1000 LBS. CAPACITY/PART NO.30561



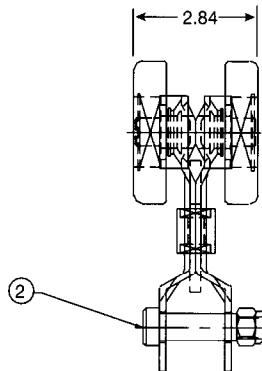
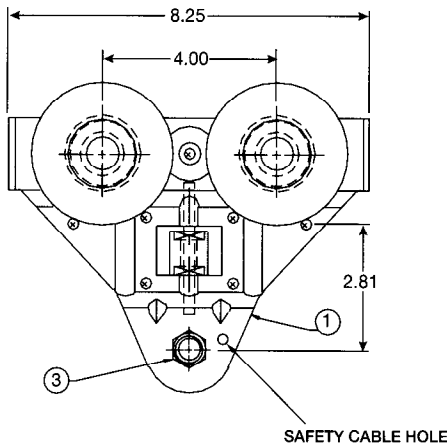
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:250 LBS.
 ULTIMATE STRENGTH:8,925 LBS.
 YIELD STRENGTH:7,140 LBS.
 CAPACITY:1,000 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 WEIGHT OF TROLLEY:4 LBS.
 MINIMUM RAIL RADIUS:60"

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30125	1	1	TROLLEY
65038	-	2	2	BEARING
77062	-	3	1	PIN SPRING
-	93936	4	1	GUIDE WHEEL
-	30056	5	4	TROLLEY WHEEL ASM.
93939	-	6	4	RETAINING RING

ZRS2/3 STEEL LOAD TROLLEY • 1000 LBS. CAPACITY/PART NO. 30565



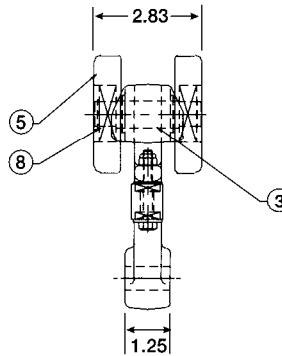
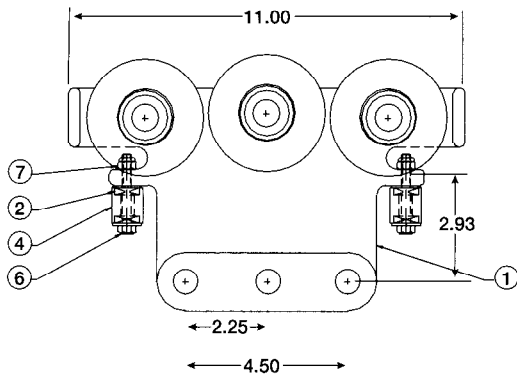
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:250 LBS.
 ULTIMATE STRENGTH:8,925 LBS.
 YIELD STRENGTH:7,140 LBS.
 CAPACITY:1,000 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 WEIGHT OF TROLLEY:4.5 LBS.
 MINIMUM RAIL RADIUS:60"

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30561	-	1	1	TROLLEY
72608	-	2	1	SCREW 5/8 X 1.75
75585	-	3	1	NUT 1/2-13

ZRS2/3 REACTION TROLLEY • 1000 LBS. CAPACITY/PART NO. 30511



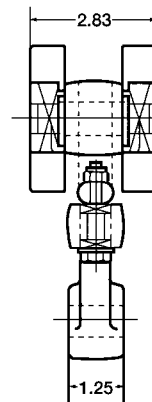
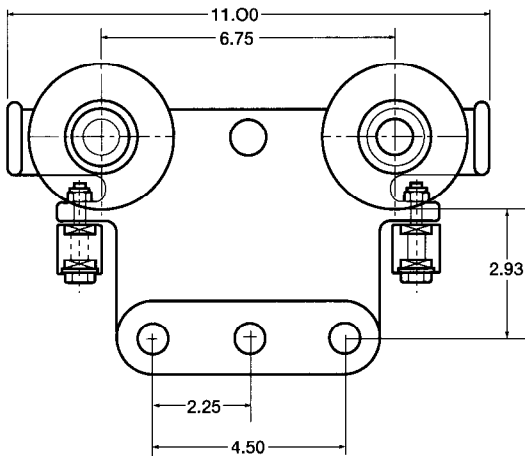
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:17,250 LBS.
 YIELD STRENGTH:14,575 LBS.
 CAPACITY:1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELRIN
 WEIGHT OF TROLLEY:.....5-1/2 LBS.
 MINIMUM RAIL RADIUS
 (ZRS2).....60"

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30014	1	1	TROLLEY
65038	-	2	4	BEARING
-	93934	3	3	AXLE
-	93936	4	2	GUIDE WHEEL
-	30056	5	6	TROLLEY WHEEL ASM.
70484	-	6	2	1/4-20 X 2" H.H.B.
75581	-	7	2	1/4-20 NUT
93939	-	8	6	RETAINING RING

ZRS2/3 LOAD TROLLEY • 1000 LBS. CAPACITY/PART NO. 30510



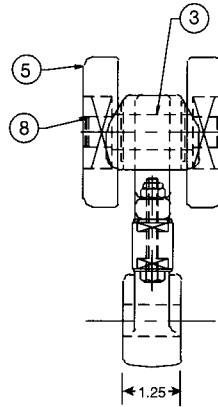
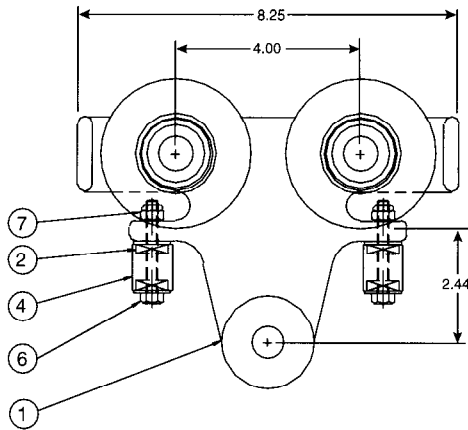
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:.....250 LBS.
 ULTIMATE STRENGTH:17,250 LBS.
 YIELD STRENGTH:14,575 LBS.
 CAPACITY:1,000 LBS.
 BODY:.....HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:.....DELRIN
 WEIGHT OF TROLLEY:.....6 LBS.
 MINIMUM RAIL RADIUS:60"

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30014	1	1	TROLLEY
65038	-	2	4	BEARING
-	93934	3	3	AXLE
-	93936	4	2	GUIDE WHEEL
-	30056	5	4	TROLLEY WHEEL ASM.
70484	-	6	2	1/4-20 X 2" H.H.B.
75581	-	7	2	1/4-20 NUT
93939	-	8	4	RETAINING RING

ZRS2/3 UNIVERSAL TROLLEY • 1000 LBS. CAPACITY/PART NO. 30512



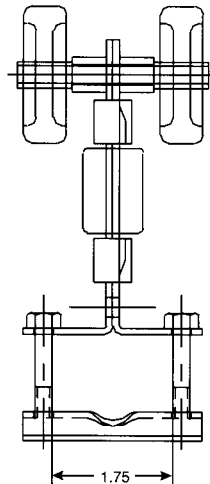
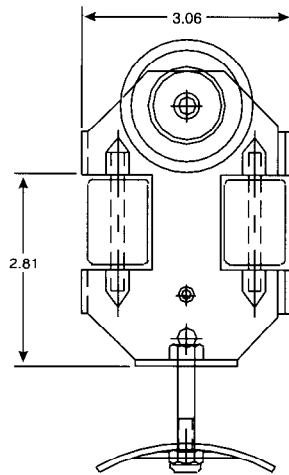
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:250 LBS.
 ULTIMATE STRENGTH:18,000 LBS.
 YIELD STRENGTH:14,950 LBS.
 CAPACITY:1,000 LBS.
 BODY:HIGH TENSILE ALMAG
 WHEELS:3.25" DIA. DELRIN
 BEARINGS:BALL, LUBRICATED
 SIDE GUIDE ROLLERS:DELRIN
 WEIGHT OF TROLLEY:4.5 LBS.
 MINIMUM RAIL RADIUS:60"

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30010	1	1	TROLLEY BRACKET
65038	-	2	4	BEARING
-	93934	3	2	AXLE
-	93836	4	2	GUIDE WHEEL
-	30056	5	4	TROLLEY WHEEL ASM.
70484	-	6	2	1/4-20 X 2" H.H.B.
75581	-	7	2	1/4-20 NUT
93939	-	8	4	RETAINING RING

FESTOON TROLLEY • ZRS2/3 STEEL RAIL/PART NO. 30581



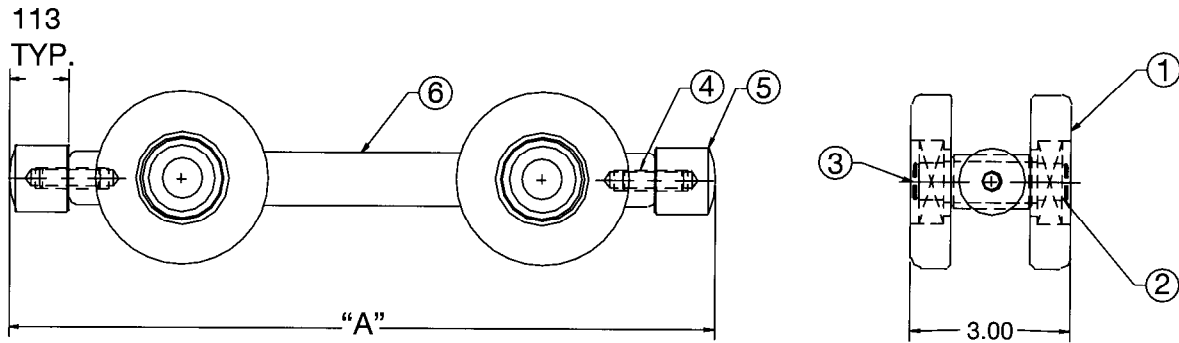
NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS TROLLEY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

THIS TROLLEY IS USED FOR FESTOONING FLAT WIRE OR AIR HOSE.

CAPACITY:50 LBS.
 WEIGHT OF ASSEMBLY:6 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30577	1	2	TROLLEY STAMPING
-	30578	2	1	CLAMP PLATE
-	30584	3	2	GUIDE ROLLER
-	99069	4	2	SKATE WHEEL
77057	-	5	2	3/16 DIA. X 2.00" ROLL PIN
77011	-	6	1	1/4 DIA. X 1-3/4" ROLL PIN
70498	-	7	2	1/4-20 X 2.00" TAP BOLT
75581	-	8	2	1/4-20 LOCK NUT
-	30585	9	2	SPACER

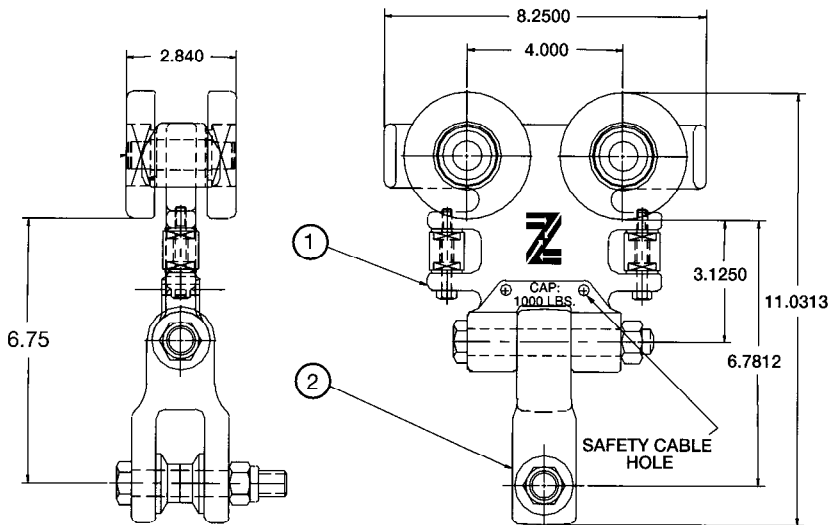
BUMPER TROLLEY • ZRS2/3 STEEL RAIL/PART NO. 30148



"A" DIMENSION	PART NO.	WEIGHT
12"	30148-1200	3 LBS.
24"	30148-2400	5 LBS.
36"	30148-3600	7 LBS.
48"	30148-4800	9 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30056	1	4	TROLLEY WHEEL
-	93939	2	4	RETAINING RING
-	93934	3	2	AXLE
71492	-	4	2	3/8-16 X 1-1/4 SET SCR.
93809	-	5	2	RUBBER BUMPER
-	30149	6	1	BUMPER TROLLEY BRACKET

HOIST TROLLEY-SINGLE • ZRS2/3 1000 LBS. CAPACITY/PART NO. 30315



NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS ASSEMBLY. YOU MUST ORDER IT SEPARATELY.

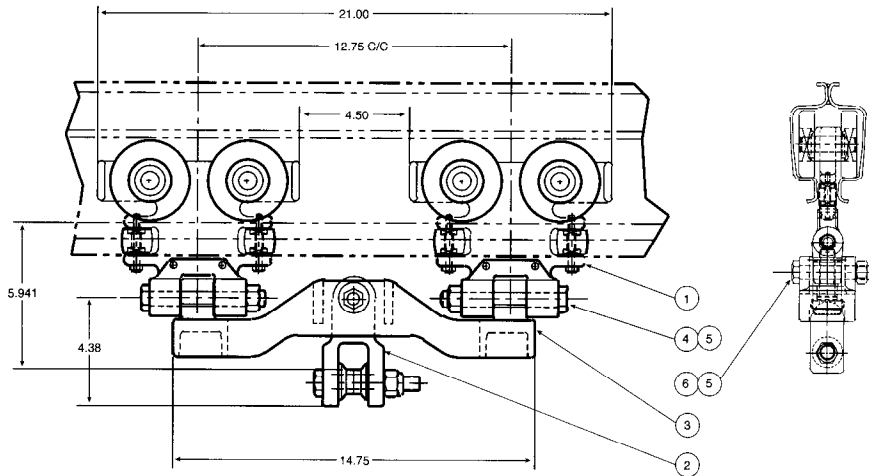
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 MAXIMUM WHEEL LOAD:250 LBS.
 ULTIMATE STRENGTH:13,750 LBS.
 YIELD STRENGTH:11,000 LBS.
 CAPACITY:1,000 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30903	1	1	HOIST HOOK BRACKET
-	30842	2	1	TROLLEY

HOIST TROLLEY-DUAL • 2000 LBS. CAPACITY/PART NO. 30830



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

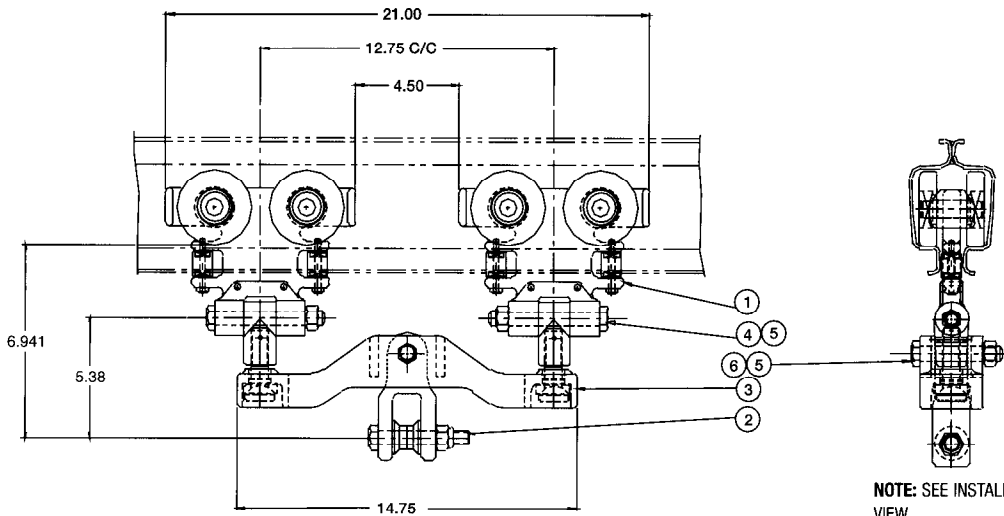
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 WEIGHT OF ASSEMBLY:19 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30821	1	2	ZRS2 TROLLEY ASS'Y.	
-	30903	2	1	AIR HOIST BRACKET ASS'Y.	
-	30173	3	1	DUAL TROLLEY TIE BAR	
72623	-	4	2	5/8-11 X 5.00" H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	

HOIST TROLLEY-DUAL • 2000 LBS. CAPACITY/CURVED RUNWAY/ PART NO. 30319



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

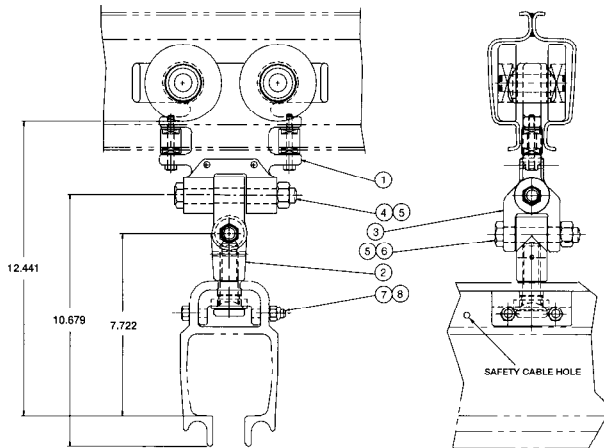
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 MINIMUM RAIL RADIUS:60.00"
 WEIGHT OF ASSEMBLY:19 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30842	1	2	ZRS2 TROLLEY ASS'Y.	
-	30903	2	1	AIR HOIST BRACKET ASS'Y.	
-	30832	3	1	DUAL TROLLEY TIE BAR	
72644	-	4	1	5/8-11 X 4.00" H.H.B.	
75587	-	5	1	5/8-11 LOCK NUT	

END TRUCK ASSEMBLY • ZRA2 ON ZRS2/3/1000 LBS. CAPACITY/SINGLE ALUM. TROLLEY/PART NO. 30824



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

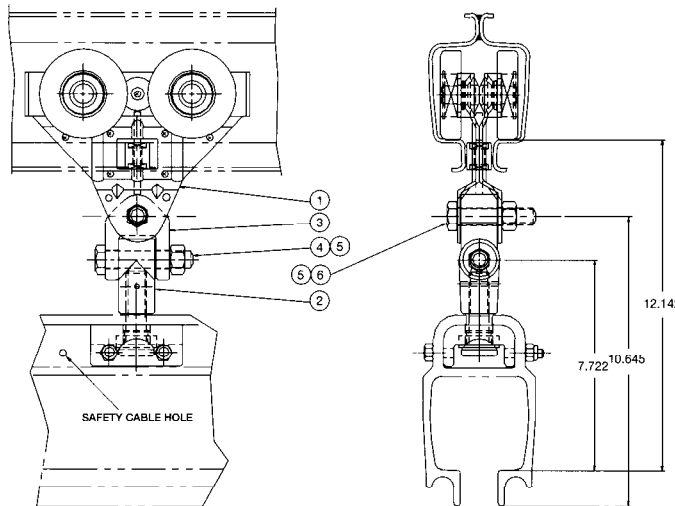
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:17,575 LBS.
 YIELD STRENGTH:15,000 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS
 (ZRS2):60"
 WEIGHT OF ASSEMBLY:10 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30821	1	1	ZRS2 TROLLEY	
-	30175	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30166	3	1	FEMALE CLEVIS	
72623	-	4	1	5/8-11 X 5.00" H.H.B.	
75587	-	5	2	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	
71481	-	7	2	3/8-16 X 4.50" H.H.B.	
75583	-	8	2	3/8-16 LOCK NUT	

END TRUCK ASSEMBLY • ZRA2 ON ZRS2/3/1000 LBS. CAPACITY/SINGLE STEEL TROLLEY/PART NO. 30825



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

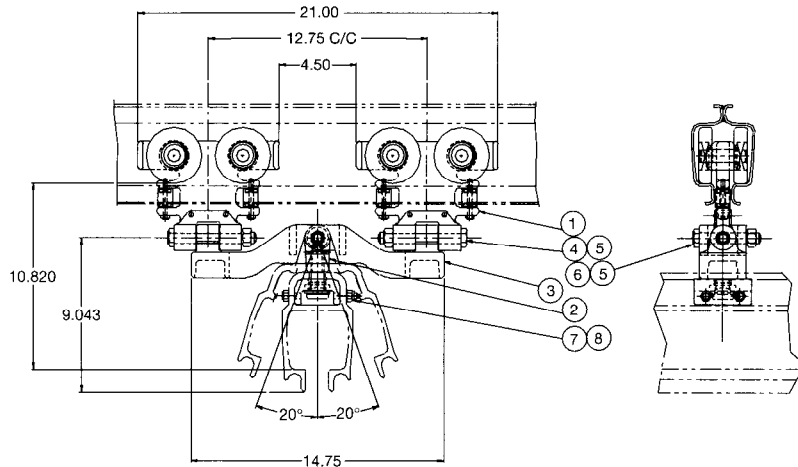
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:8,925 LBS.
 YIELD STRENGTH:7,140 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS
 (ZRS2):60"
 WEIGHT OF ASSEMBLY:11 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30561	1	1	ZRS2 TROLLEY	
-	30175	2	1	BRIDGE SUSP. SUB-ASS'Y.	
-	30166	3	1	FEMALE CLEVIS	
72646	-	4	1	5/8-11 X 3.25" H.H.B.	
75587	-	5	2	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	

END TRUCK ASSEMBLY • ZRA2 ON ZRS2/3/2000 LBS. CAPACITY/DUAL ALUM. TROLLEY/PART NO. 30828



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

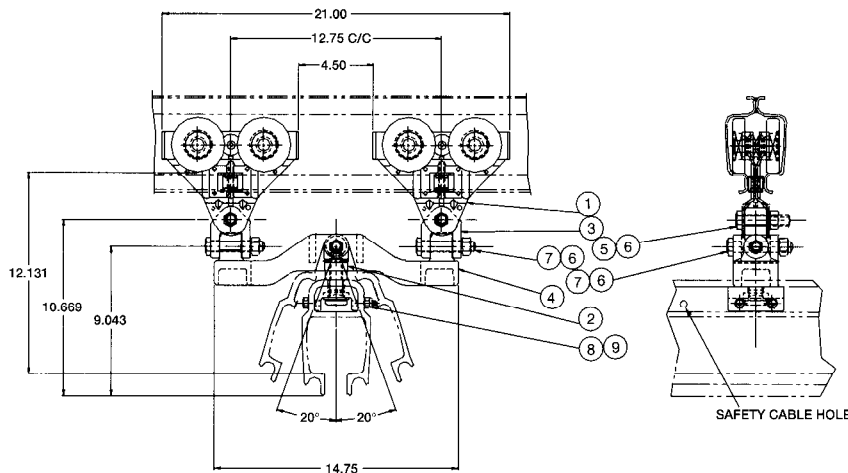
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 WEIGHT OF ASSEMBLY:18 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30821	1	2	ZRS2 TROLLEY ASS'Y.
-	30175	2	1	BRIDGE SUSPENSION ASS'Y.
-	30173	3	1	DUAL TROLLEY TIE BAR
72623	-	4	2	5/8-11 X 5.00" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
71481	-	7	2	3/8-16 X 4.50" H.H.B.
75583	-	8	2	3/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRA2 ON ZRS2/3/2000 LBS. CAPACITY/DUAL ALUM. TROLLEY/PART NO. 30829



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

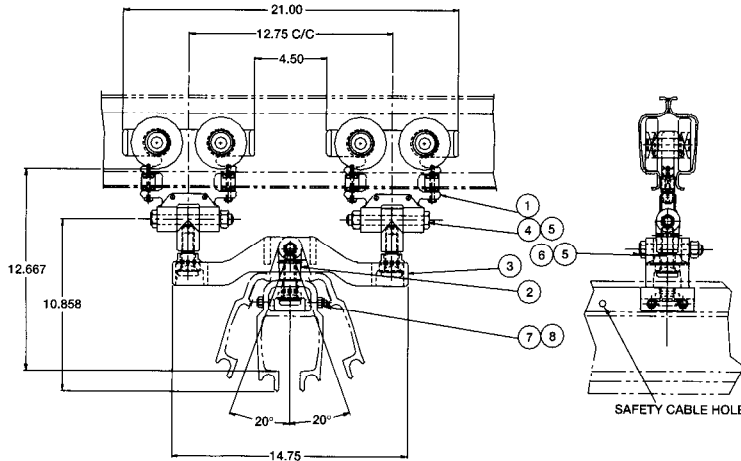
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 WEIGHT OF ASSEMBLY:20 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30561	1	2	ZRS2 TROLLEY ASS'Y.
-	30175	2	1	BRIDGE SUSPENSION ASS'Y.
-	30166	3	1	FEMALE CLEVIS
-	30173	4	2	DUAL TROLLEY TIE BAR
72646	-	5	3	5/8-11 X 3.25" H.H.B.
75587	-	6	1	5/8-11 LOCK NUT
72644	-	7	2	5/8-11 X 4.00" H.H.B.
71481	-	8	2	3/8-16 X 4.50" H.H.B.
75583	-	9	2	3/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRA2 ON ZRS2 CURVED RAIL/2000 LBS. CAP./DUAL ALUM. TROLLEY/PART NO. 30835



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

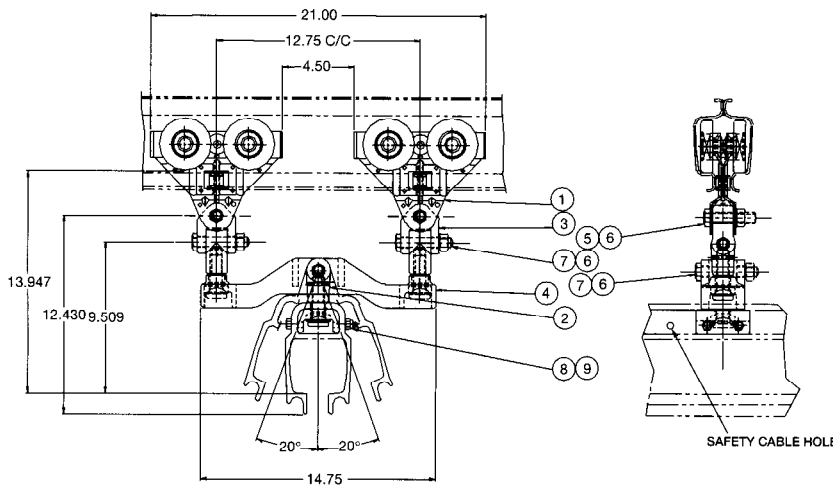
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:
 YIELD STRENGTH:
 CAPACITY:2,000 LBS.
 MINIMUM RAIL RADIUS
 (ZRS2):60"
 WEIGHT OF ASSEMBLY:20 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30821	1	2	ZRS2 TROLLEY ASS'Y.
-	30175	2	1	BRIDGE SUSPENSION ASS'Y.
-	30832	3	1	DUAL TROLLEY TIE BAR
72623	-	4	2	5/8-11 X 5.00" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72620	-	6	1	5/8-11 X 3.50" H.H.B.
71481	-	7	2	3/8-16 X 4.50" H.H.B.
75583	-	8	2	3/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRA2 ON ZRS2 CURVED RAIL/2000 LBS. CAP./DUAL STEEL TROLLEY/PART NO. 30836



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

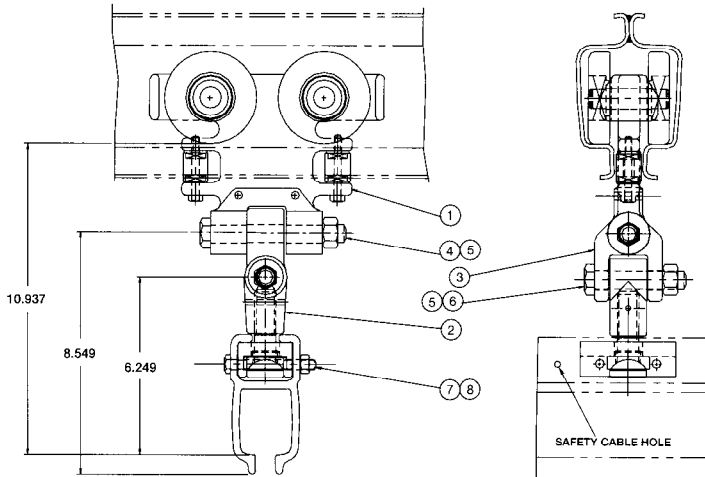
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:
 YIELD STRENGTH:
 CAPACITY:2,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:22 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30561	1	2	ZRS2 TROLLEY ASS'Y.
-	30175	2	1	BRIDGE SUSPENSION ASS'Y.
-	30166	3	2	FEMALE CLEVIS
-	30832	4	1	DUAL TROLLEY TIE BAR
72646	-	5	2	5/8-11 X 3.25" H.H.B.
75587	-	6	5	5/8-11 LOCK NUT
72620	-	7	3	5/8-11 X 3.50" H.H.B.
71481	-	8	2	3/8-16 X 4.50" H.H.B.
75583	-	9	2	3/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRS2/3/1000 LBS. CAPACITY/SINGLE ALUM. TROLLEY/PART NO. 30822



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

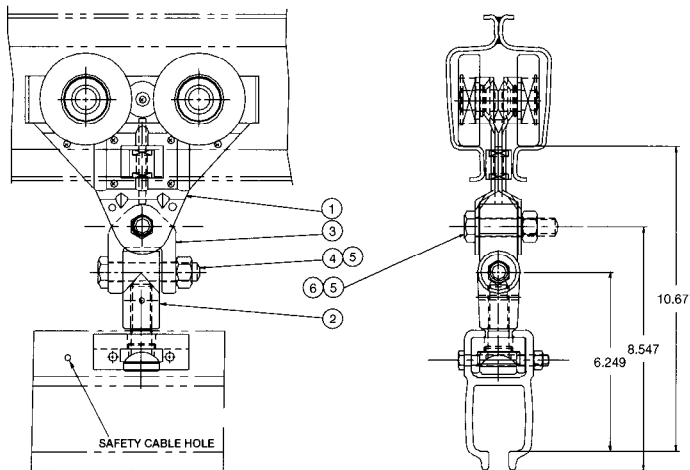
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:17,575 LBS.
 YIELD STRENGTH:15,000 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:10 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30821	1	1	ZRS2 TROLLEY ASS'Y.
-	30282	2	1	BRIDGE SUSPENSION ASS'Y.
-	30166	3	1	FEMALE CLEVIS
72623	-	4	1	5/8-11 X 5.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
70968	-	7	3	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRS2/3/1000 LBS. CAPACITY/SINGLE STEEL TROLLEY/PART NO. 30823



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

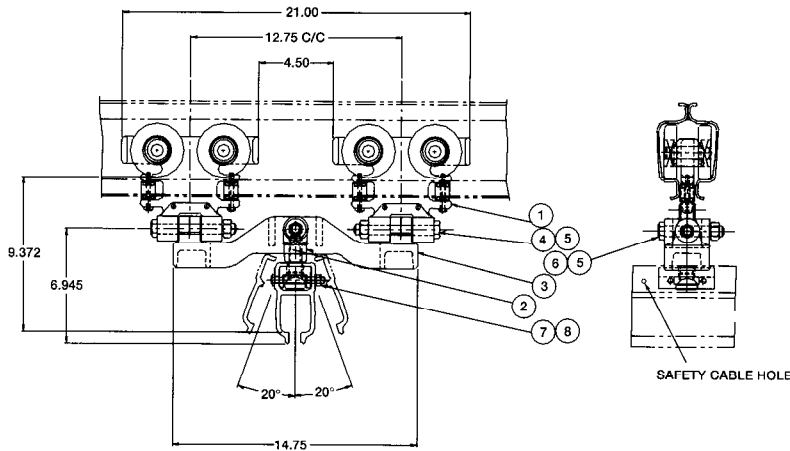
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:8,925 LBS.
 YIELD STRENGTH:7,140 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:10.5 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30561	1	1	ZRS2 TROLLEY ASS'Y.
-	30282	2	1	BRIDGE SUSPENSION ASS'Y.
-	30166	3	1	FEMALE CLEVIS
72644	-	4	1	5/8-11 X 4.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72646	-	6	1	5/8-11 X 3.25" H.H.B.

END TRUCK ASSEMBLY • ZRA1 ON ZRS2/3/1000 LBS. CAPACITY/DUAL ALUM. TROLLEY/PART NO. 30826



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

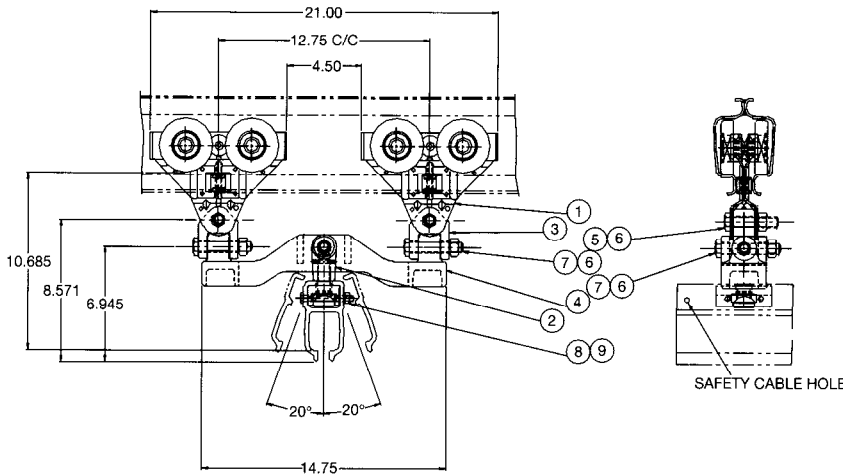
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:14,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:17 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30821	1	2	ZRS2 TROLLEY ASS'Y.
-	30282	2	1	BRIDGE SUSPENSION ASS'Y.
-	30173	3	1	DUAL TROLLEY TIE BAR
72623	-	4	2	5/8-11 X 5.00" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72644	-	6	1	5/8-11 X 4.00" H.H.B.
70968	-	7	2	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRS2/3/1000 LBS. CAPACITY/DUAL STEEL TROLLEY/PART NO. 30827



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

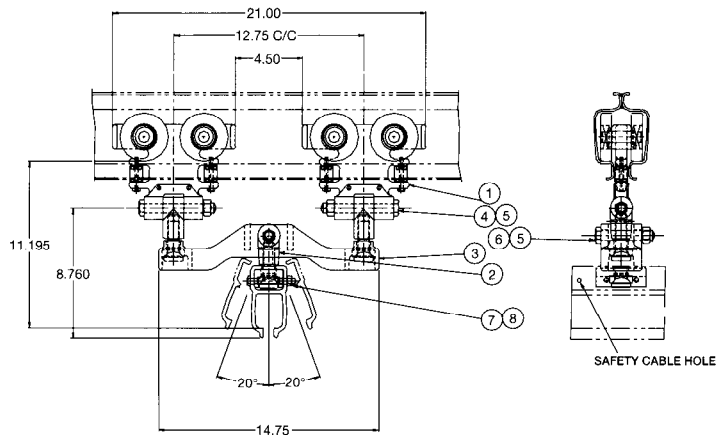
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 WEIGHT OF ASSEMBLY:18 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30561	1	2	ZRS2 TROLLEY ASS'Y.
-	30282	2	1	BRIDGE SUSPENSION ASS'Y.
-	30166	3	1	FEMALE CLEVIS
-	30173	4	2	DUAL TROLLEY TIE BAR
72646	-	5	2	5/8-11 X 5.00" H.H.B.
75587	-	6	5	5/8-11 LOCK NUT
72644	-	7	3	5/8-11 X 4.00" H.H.B.
70968	-	8	2	5/16-18 X 3.25" H.H.B.
75582	-	9	2	5/16-18 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRS2 CURVED RAIL/1000 LBS. CAP./DUAL ALUM.TROLLEY/PART NO. 30833



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

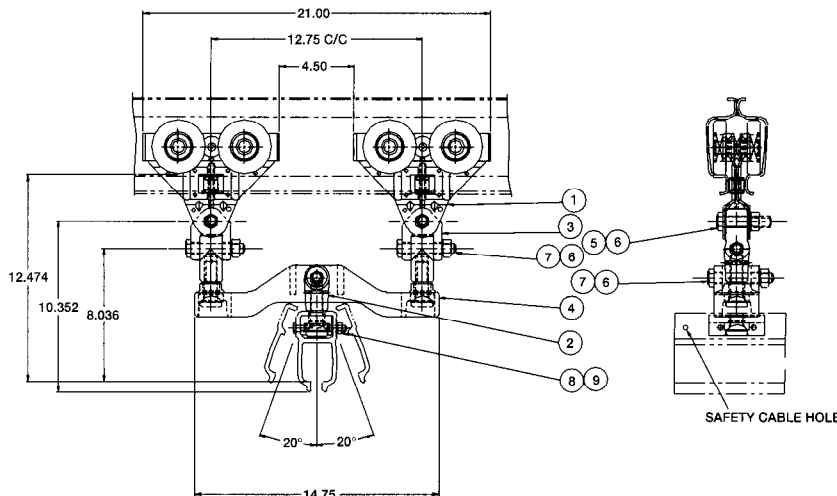
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:19 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30821	1	2	ZRS2 TROLLEY ASS'Y.
-	30282	2	1	BRIDGE SUSPENSION ASS'Y.
-	30832	3	1	DUAL TROLLEY TIE BAR
72623	-	4	2	5/8-11 X 5.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72620	-	6	5	5/8-11 X 3.50" H.H.B.
70968	-	7	3	5/16-18 X 3.25" H.H.B.
75582	-	8	2	5/8-16 LOCK NUT

END TRUCK ASSEMBLY • ZRA1 ON ZRS2 CURVED RAIL/1000 LBS. CAP./DUAL STEEL TROLLEY/PART NO. 30834



NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

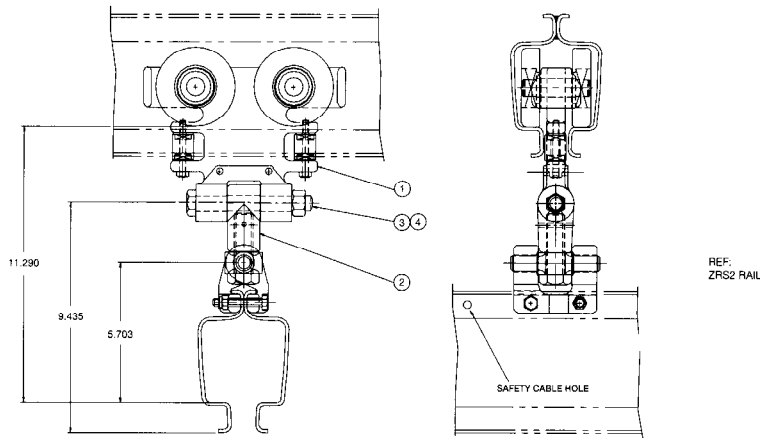
ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:21 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30561	1	2	ZRS2 TROLLEY ASS'Y.
-	30282	2	1	BRIDGE SUSPENSION ASS'Y.
-	30166	3	1	FEMALE CLEVIS
-	30832	4	2	DUAL TROLLEY TIE BAR
72646	-	5	2	5/8-11 X 5.00" H.H.B.
75587	-	6	5	5/8-11 LOCK NUT
72620	-	7	3	5/8-11 X 3.50" H.H.B.
70968	-	8	2	5/16-18 X 3.25" H.H.B.
75582	-	9	2	5/16-18 LOCK NUT

END TRUCK ASSEMBLY • ZRS2/3 ON ZRS2/3/1000 LBS. CAPACITY/SINGLE ALUM. TROLLEY/PART NO. 30597



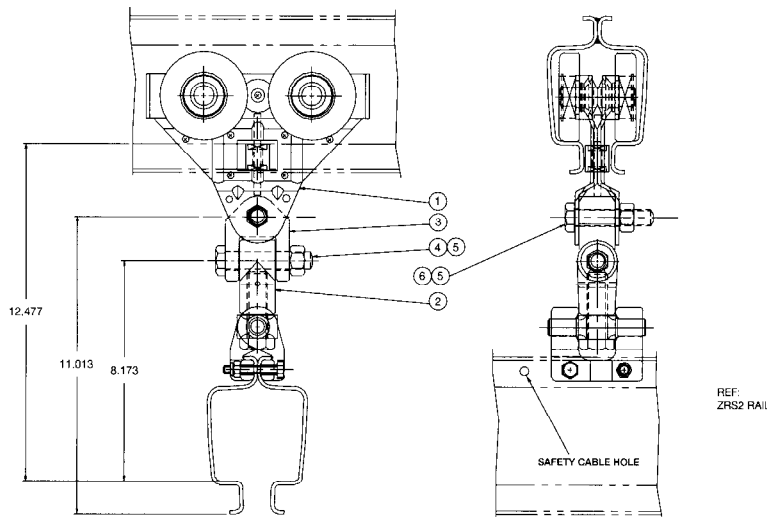
NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY. DIMENSIONS REFLECT ZRS2 RAIL.
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:17,250 LBS.
 YIELD STRENGTH:14,250 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:10 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30821	1	1	ZRS2 TROLLEY ASS'Y.
-	30596	2	1	BRIDGE SUSPENSION ASS'Y.
72623	-	3	1	5/8-11 X 5.00" H.H.B.
75587	-	4	1	5/8-11 LOCK NUT

END TRUCK ASSEMBLY • ZRS2/3 ON ZRS2/3/1000 LBS. CAPACITY/SINGLE STEEL TROLLEY/PART NO. 30598



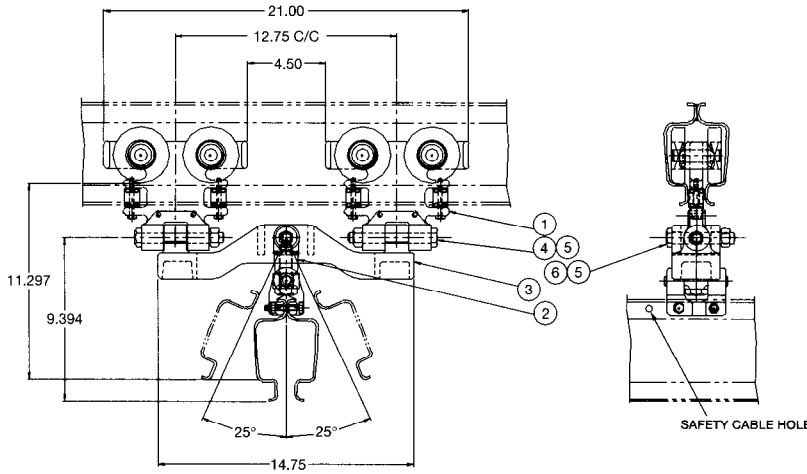
NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY. DIMENSIONS REFLECT ZRS2 RAIL.
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:17,250 LBS.
 YIELD STRENGTH:14,250 LBS.
 CAPACITY:1,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:11 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30561	1	1	ZRS2 TROLLEY ASS'Y.
-	30596	2	1	BRIDGE SUSPENSION ASS'Y.
-	30166	3	1	FEMALE CLEVIS
72644	-	4	1	5/8-11 X 4.00" H.H.B.
75587	-	5	2	5/8-11 LOCK NUT
72646	-	6	1	5/8-11 X 3.25" H.H.B.

END TRUCK ASSEMBLY • ZRS2/3 ON ZRS2/3/2000 LBS. CAPACITY/DUAL ALUM. TROLLEY/PART NO. 30599



NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY. DIMENSIONS REFLECT ZRS2 RAIL.
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

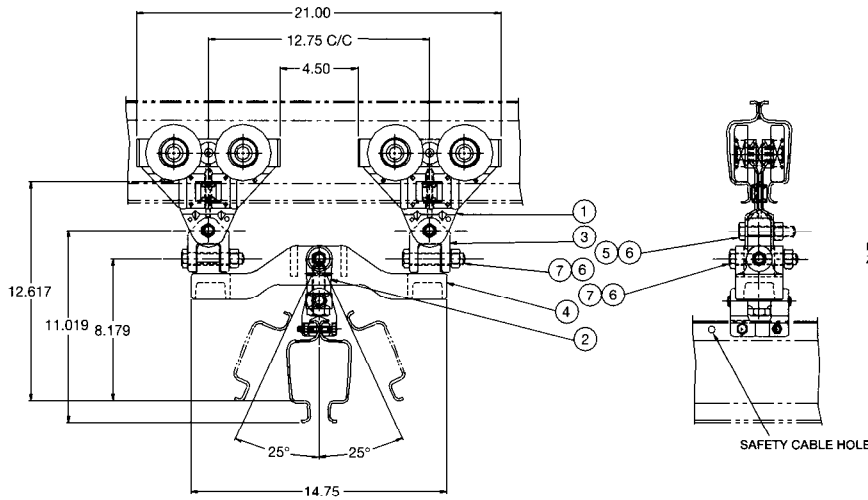
REF:
ZRS2 RAIL

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
ULTIMATE STRENGTH:13,250 LBS.
YIELD STRENGTH:10,600 LBS.
CAPACITY:2,000 LBS.
WEIGHT OF ASSEMBLY:19 LBS.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30821	1	2	ZRS2 TROLLEY ASS'Y.	
-	30596	2	1	BRIDGE SUSPENSION ASS'Y.	
-	30173	3	1	DUAL TROLLEY TIE BAR	
72623	-	4	2	5/8-11 X 5.00" H.H.B.	
75587	-	5	3	5/8-11 LOCK NUT	
72644	-	6	1	5/8-11 X 4.00" H.H.B.	

END TRUCK ASSEMBLY • ZRS2/3 ON ZRS2/3/2000 LBS. CAPACITY/DUAL STEEL TROLLEY/PART NO. 30800



REF:
ZRS2 RAIL

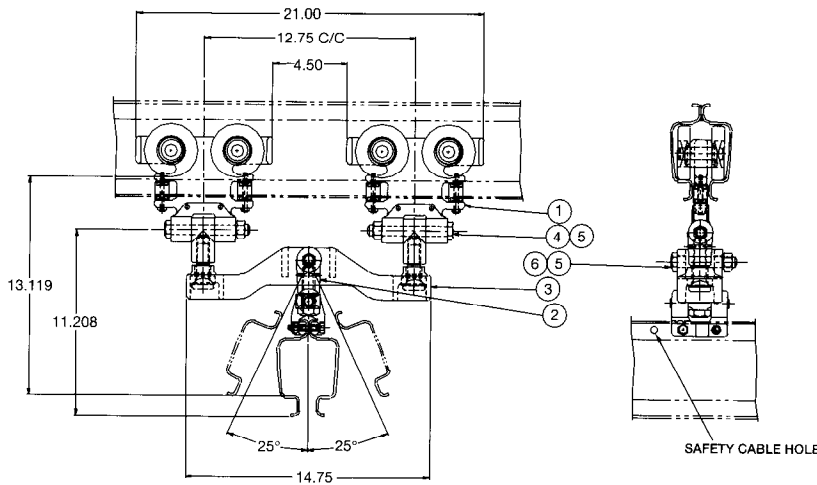
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
ULTIMATE STRENGTH:13,250 LBS.
YIELD STRENGTH:10,600 LBS.
CAPACITY:2,000 LBS.
WEIGHT OF ASSEMBLY:22 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY. DIMENSIONS REFLECT ZRS2 RAIL.
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30565	1	2	ZRS2 TROLLEY ASS'Y.	
-	30596	2	1	BRIDGE SUSPENSION ASS'Y.	
-	30166	3	2	FEMALE CLEVIS	
-	30173	4	1	DUAL TROLLEY TIE BAR	
72646	-	5	2	5/8-11 X 3.25" H.H.B.	
75587	-	6	5	5/8-11 LOCK NUT	
72644	-	7	3	5/8-11 X 4.00" H.H.B.	

END TRUCK ASSEMBLY • ZRS2/3 ON ZRS2/3/2000 LBS. CAPACITY/DUAL ALUM. TROLLEY/PART NO. 30837



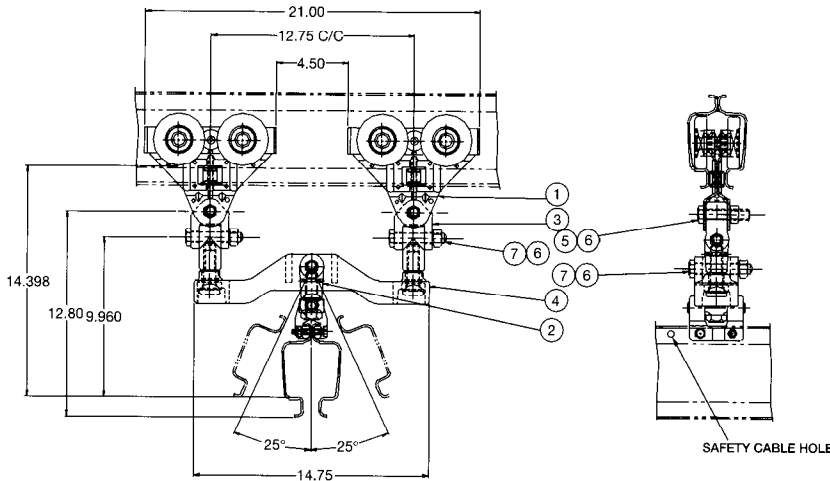
NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY. DIMENSIONS REFLECT ZRS2 RAIL.
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:21 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30821	1	2	ZRS2 TROLLEY ASS'Y.
-	30596	2	1	BRIDGE SUSPENSION ASS'Y.
-	30832	3	1	DUAL TROLLEY TIE BAR
72623	-	4	2	5/8-11 X 5.00" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72620	-	6	1	5/8-11 X 3.50" H.H.B.

END TRUCK ASSEMBLY • ZRS2/3 ON ZRS2/2000 LBS. CAPACITY/DUAL STEEL TROLLEY/PART NO. 30838



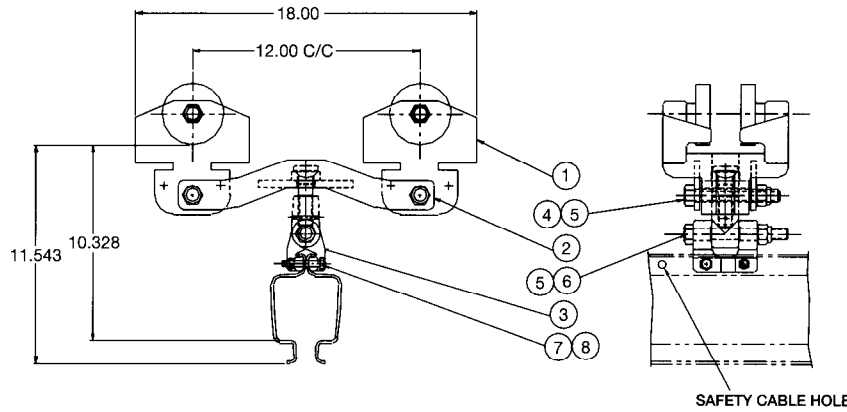
NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 MINIMUM RAIL RADIUS (ZRS2):60"
 WEIGHT OF ASSEMBLY:23 LBS.

NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY. DIMENSIONS REFLECT ZRS2 RAIL.
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30561	1	2	ZRS2 TROLLEY ASS'Y.
-	30596	2	1	BRIDGE SUSPENSION ASS'Y.
-	30166	3	1	FEMALE CLEVIS
-	30832	4	2	DUAL TROLLEY TIE BAR
72646	-	5	2	5/8-11 X 5.00" H.H.B.
75587	-	6	5	5/8-11 LOCK NUT
72620	-	7	3	5/8-11 X 3.50" H.H.B.

END TRUCK ASSEMBLY • ZRS2/3 ON PATENT TRACK/1000 LBS. CAPACITY/ DUAL TROLLEY/PART NO. 30839



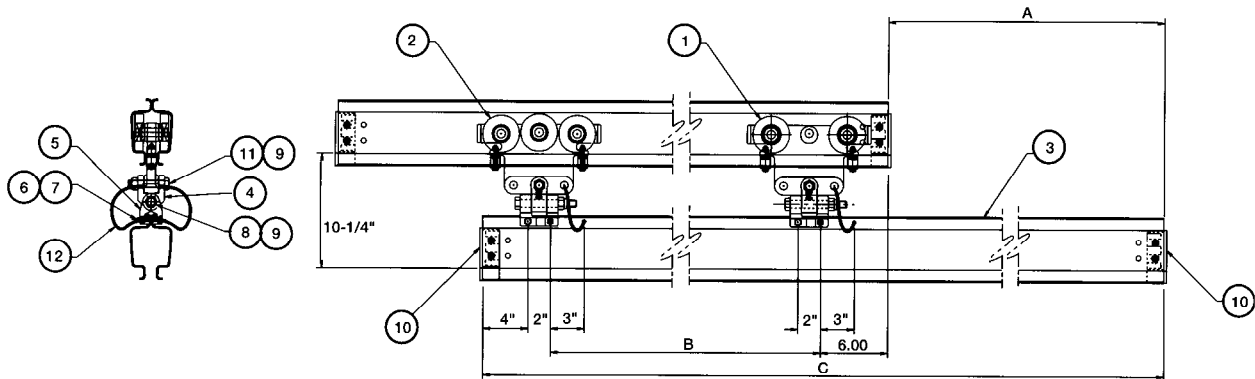
NOTE: SAFETY CABLE ASSEMBLIES ARE INCLUDED IN BRIDGE CRANE ASSEMBLY. IF YOU NEED TO ORDER AN END TRUCK ASSEMBLY SEPARATELY, YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY. DIMENSIONS REFLECT ZRS2 RAIL. REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ROLLING FRICTION:ONE PERCENT
 ULTIMATE STRENGTH:
 YIELD STRENGTH:
 CAPACITY:.....1,000 LBS.
 WEIGHT OF ASSEMBLY:.....

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	93813	1	2	TROLLEY ASS'Y.
-	30917	2	1	DUAL END TRUCK ASS'Y.
-	30801	3	2	HANGER BRACKET
72615	-	4	2	5/8-11 X 4.50" H.H.B.
75587	-	5	3	5/8-11 LOCK NUT
72623	-	6	1	5/8-11 X 5.00" H.H.B.
70967	-	7	2	5/16-18 X 2.25" H.H.B.
75582	-	8	2	5/16-18 LOCK NUT

BRIDGE EXTENSIONS • ZRS2/SINGLE TROLLEY/PART NO. 30721



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30510	1	1	ZRS2 LOAD TROLLEY (1000 LB. CAP.)
-	30511	2	1	ZRS2 REACTION TROLLEY (1000 LB. CAP.)
-	30500	3	1	ZRS2 RAIL X "C" LONG
-	30166	4	2	FEMALE CLEVIS
-	30801	5	4	HANGER BRACKER - ZRS RAIL
-	70967	6	4	5/16-18 X 2.25 HHB
-	75582	7	4	5/16-18 LOCKNUT
-	72623	8	2	5/8-11 X 5.00 HHB
-	75587	9	4	5/8-11 LOCKNUT
-	30804	10	2	ZRS2 END STOP KIT
-	72646	11	2	5/8-11 X 3.25 HHB
-	30907-06	12	2	SAFETY CABLE ASSEMBLY

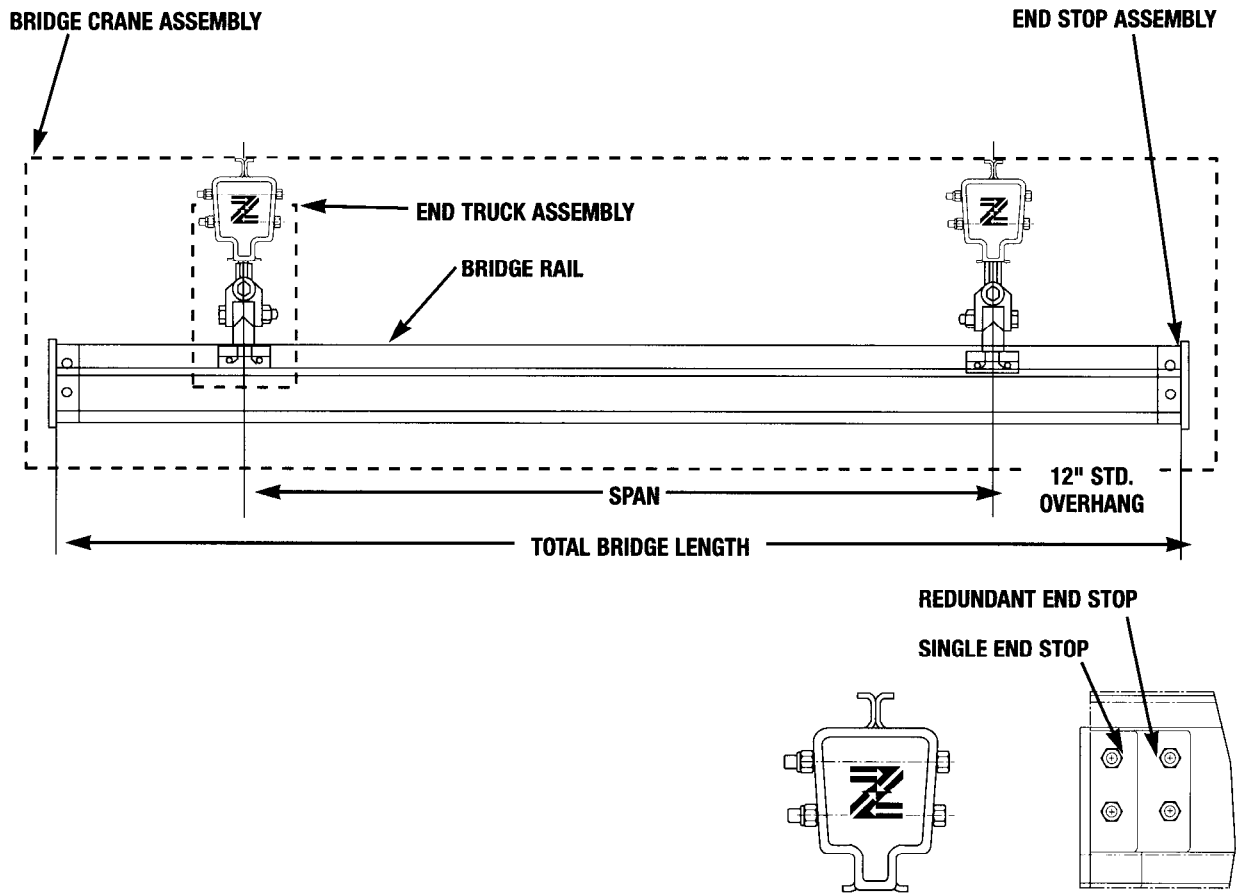
"A" DIM. = 2'-0" FOR 2' EXTENSION			
PART NO.	"B" DIM.	"C" DIM.	RATED CAPACITY
30721-22	2'-0"	5'-0"	425 LBS.
30721-23	3'-0"	6'-0"	525 LBS.
30721-24	4'-0"	7'-0"	600 LBS.
30721-25	5'-0"	8'-0"	650 LBS.

"A" DIM. = 3'-0" FOR 3' EXTENSION			
PART NO.	"B" DIM.	"C" DIM.	RATED CAPACITY
30721-32	2'-0"	6'-0"	350 LBS.
30721-33	3'-0"	7'-0"	450 LBS.
30721-34	4'-0"	8'-0"	525 LBS.
30721-35	5'-0"	9'-0"	575 LBS.

"A" DIM. = 4'-0" FOR 4' EXTENSION			
PART NO.	"B" DIM.	"C" DIM.	RATED CAPACITY
30721-42	2'-0"	7'-0"	325 LBS.
30721-43	3'-0"	8'-0"	400 LBS.
30721-44	4'-0"	9'-0"	450 LBS.
30721-45	5'-0"	10'-0"	525 LBS.

"A" DIM. = 5'-0" FOR 5' EXTENSION			
PART NO.	"B" DIM.	"C" DIM.	RATED CAPACITY
30721-52	2'-0"	8'-0"	250 LBS.
30721-53	3'-0"	9'-0"	350 LBS.
30721-54	4'-0"	10'-0"	400 LBS.

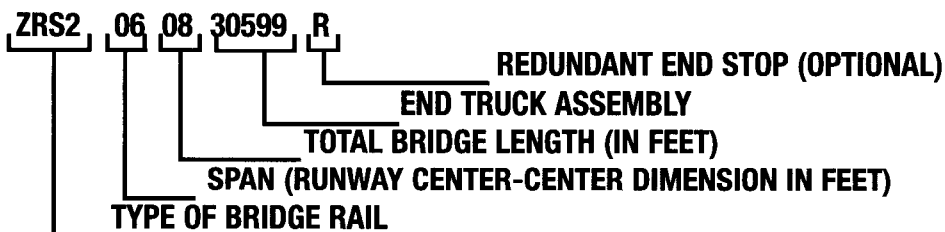
BRIDGE CRANE ASSEMBLY • EXAMPLE OF HOW TO ORDER



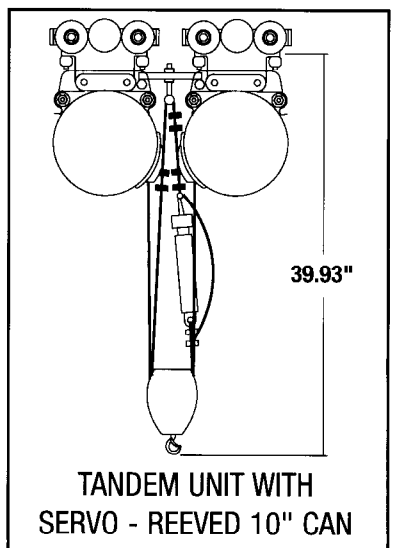
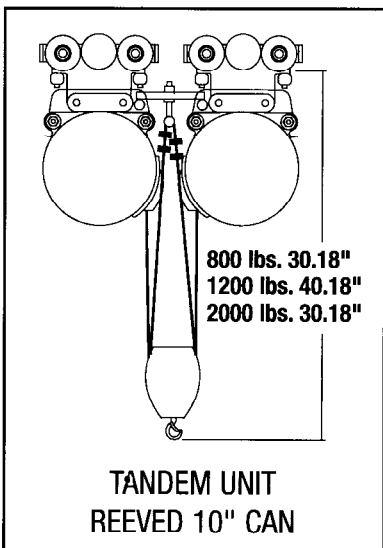
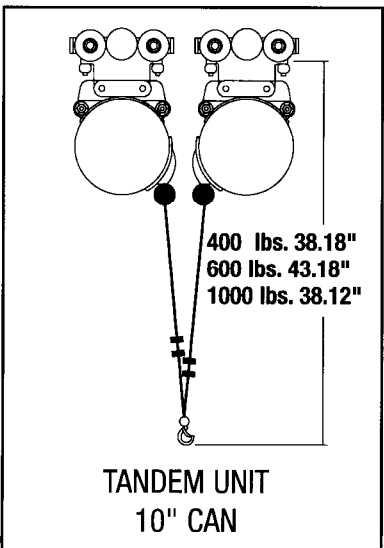
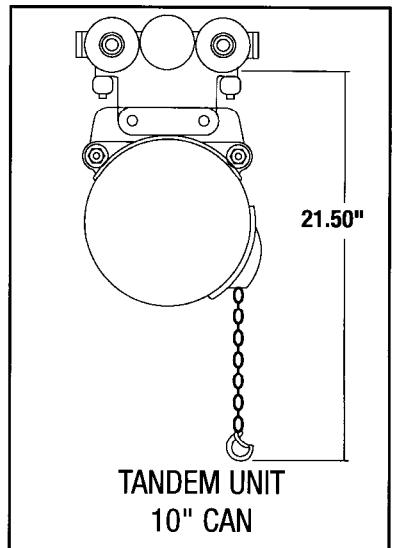
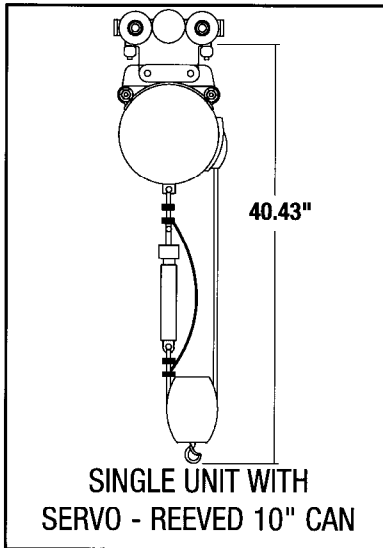
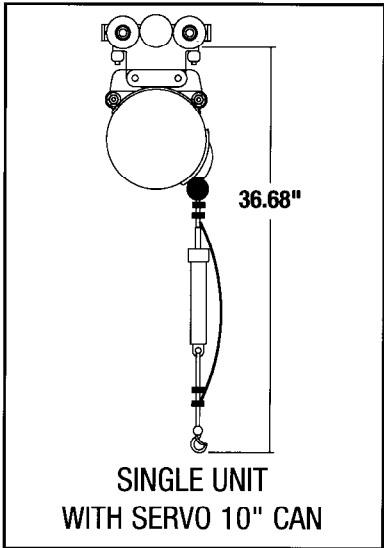
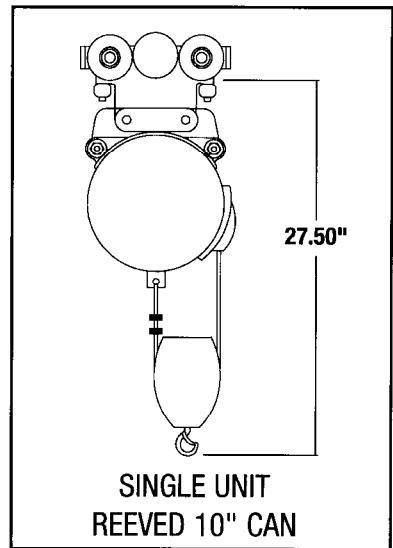
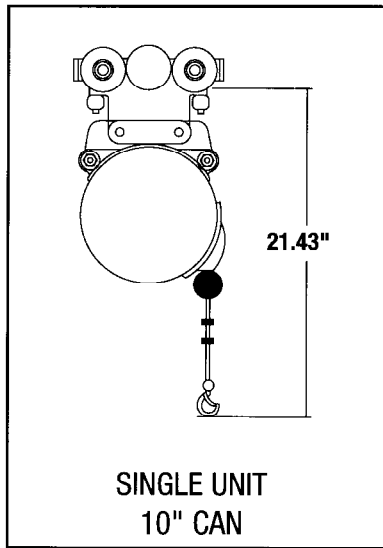
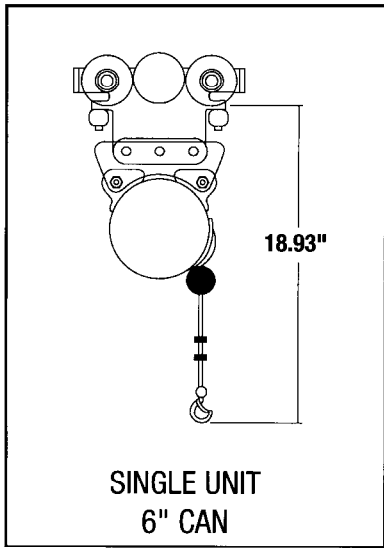
THE BRIDGE CRANE ASSEMBLY CONSISTS OF:
 ONE BRIDGE BEAM (SECTION OF RAIL)
 TWO END TRUCK ASSEMBLIES (MOUNTED TO THE BRIDGE WITH A TROLLEY TO ROLL INSIDE OF THE RUNWAY, SAFETY CABLES WILL BE PRE-INSTALLED)
 TWO END STOPS (ONE INSTALLED AT EACH END OF THE BRIDGE)
 REDUNDANT END STOPS ARE AVAILABLE (PLEASE SPECIFY)

EXAMPLE

ORDER NUMBER:

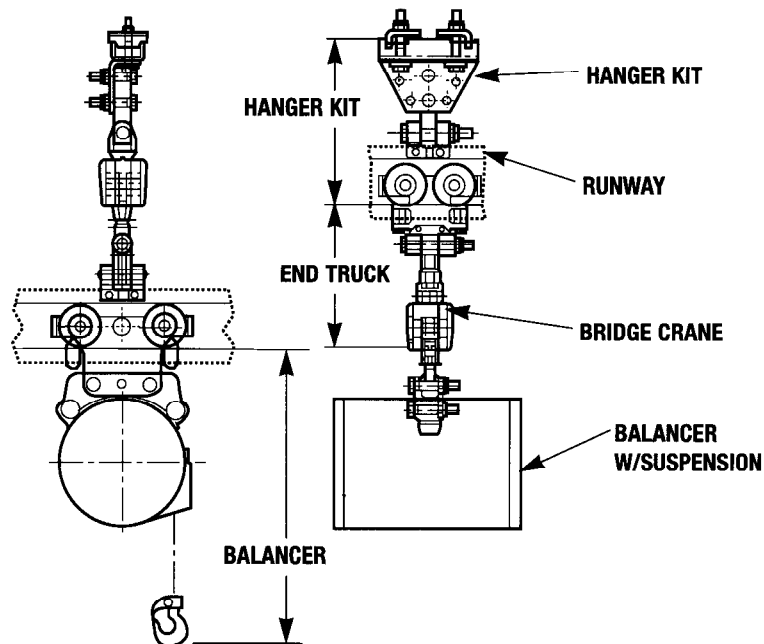


BALANCER STACK-UP DIMENSION • FOR ZRS2/3 STEEL RAIL



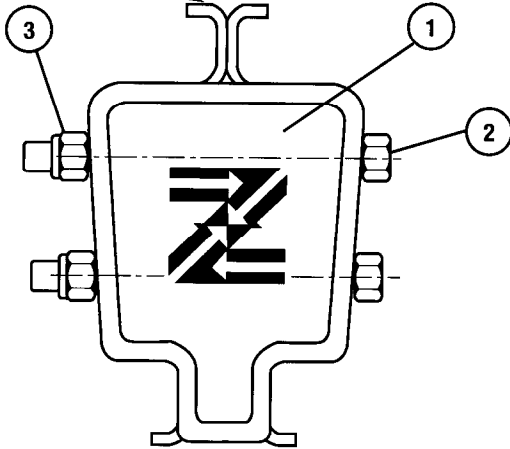
SYSTEM STACK-UP DIMENSION • ZRS2/3-QUICK REFERENCE

HANGER KITS	END TRUCKS	BALANCERS WITH SUSPENSION
30813 – 11.00"	30824 – 12.44"	SINGLE UNIT 6" – 18.93"
30813S – 11.00"	30825 – 12.44"	SINGLE CHAIN UNIT 10" – 21.50"
30816 – 11.00"	30828 – 10.88"	SINGLE UNIT 10" – 21.43"
30816S – 11.00"	30829 – 12.13"	SINGLE UNIT REEVED 10" – 27.50"
30819 – 12.88"	30835 – 12.63"	SINGLE UNIT WITH SERVO 10" – 36.68"
30819S – 12.88"	30836 – 13.94"	SINGLE UNIT REEVED WITH SERVO 10" – 40.43"
30820 – 12.88"	30822 – 10.94"	TANDEM UNIT 10" – 400 LBS. 38.18"
30820S – 12.88"	30823 – 10.63"	600 LBS. 43.18"
30817 – 12.88"	30826 – 9.38"	1000 LBS. 38.18"
30817S – 12.88"	30827 – 10.68"	TANDEM UNIT REEVED 10" – 800 LBS. 30.18"
30818 – 12.88"	30833 – 11.18"	1200 LBS. 40.18"
30818S – 12.88"	30834 – 12.50"	2000 LBS. 30.18"
30814 – (ADJUSTABLE)	30597 – 11.25"	TANDEM UNIT REEVED WITH SERVO 10" – 39.93"
30815 – (ADJUSTABLE)	30598 – 12.50"	
30840 – 10.94"	30599 – 11.25"	
30841 – 10.94"	30800 – 12.68"	
	30837 – 13.13"	
	30838 – 12.50"	
	30830 – 5.94"	
	30839 – 10.38"	

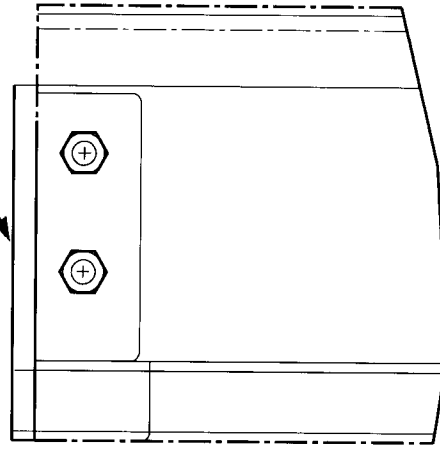


END STOPS • ZRS2 STEEL RAIL/PART NO. (SINGLE-30804) (REDUNDANT-30806)

ZRS2 RAIL
NO. 30500



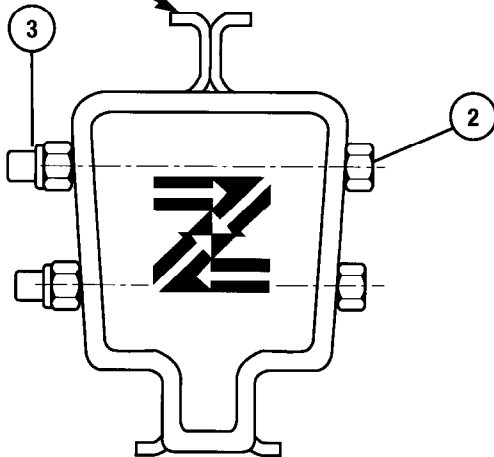
END STOP
NO. 30804



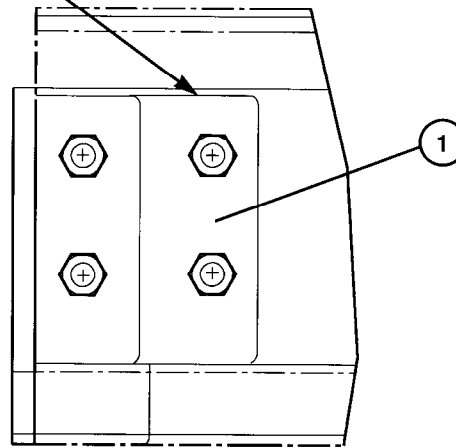
1.50"
REF.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30803	-	1	1	END STOP
71481	-	2	2	3/8-16 X 4.50 H.C.S.
75583	-	3	2	3/8-16 LOCK NUT

ZRS2 RAIL
NO. 30500



REDUNDANT
END STOP
NO. 30806

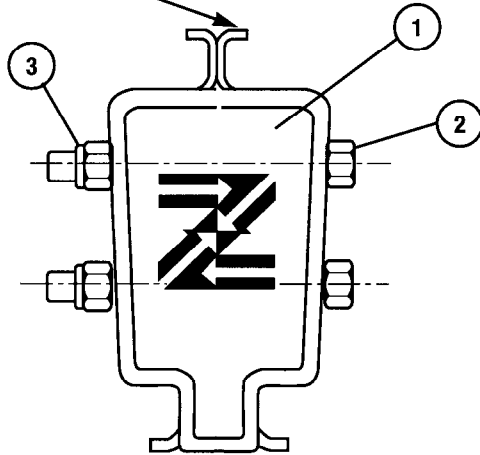


3.00"
REF.

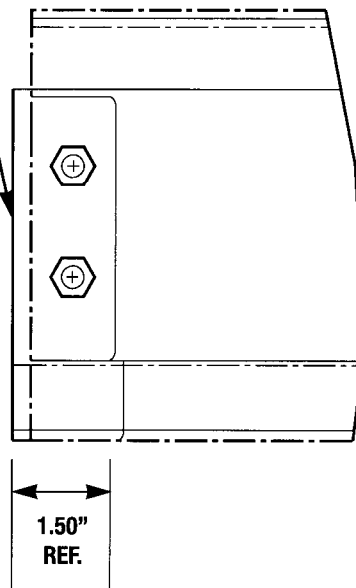
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30805	-	1	1	RED. END STOP
71481	-	2	2	3/8-16 X 4.50" H.C.S.
75583	-	3	2	3/8-16 LOCK NUT

END STOPS • ZRS3 STEEL RAIL/PART NO. (SINGLE-30808) (REDUNDANT-30810)

ZRS3 RAIL
NO. 30550

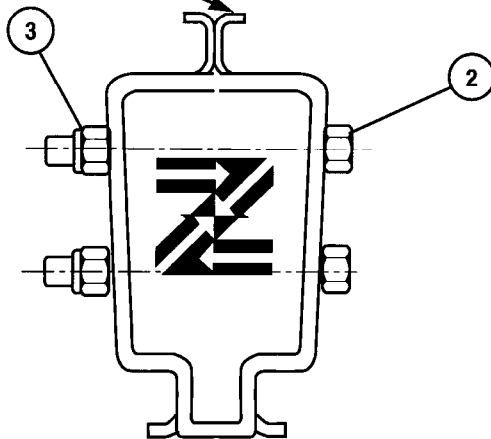


END STOP
NO. 30808

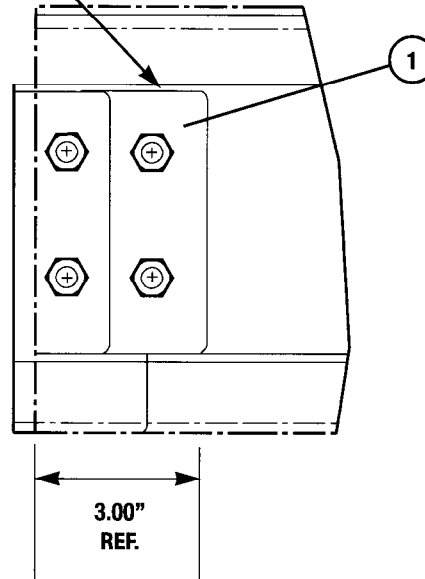


BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30807	-	1	1	END STOP
71481	-	2	2	3/8-16 X 4.50" H.C.S.
75583	-	3	2	3/8-16 LOCK NUT

ZRS3 RAIL
NO. 30550

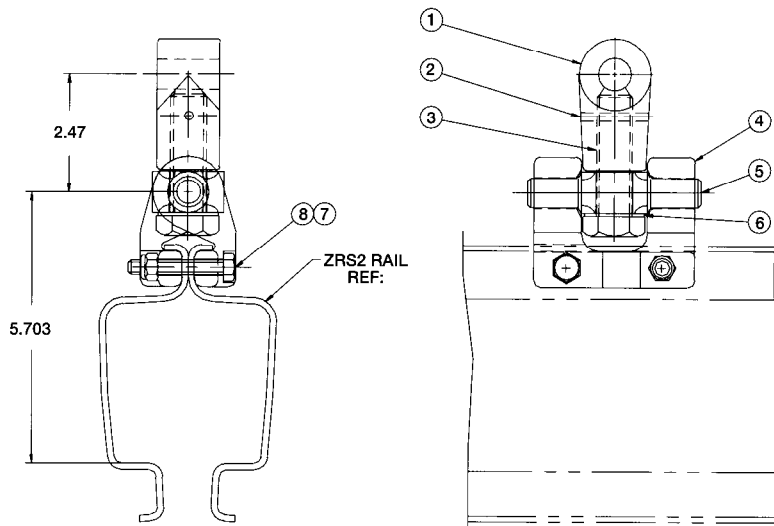


REDUNDANT
END STOP
NO. 30810



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
30809	-	1	1	RED. END STOP
71481	-	2	2	3/8-16 X 4.50" H.C.S.
75583	-	3	2	3/8-16 LOCK NUT

BRIDGE SUSPENSION • ZRS2/3 STEEL RAIL/PART NO. 30596



NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY, YOU MUST ORDER IT SEPARATELY.

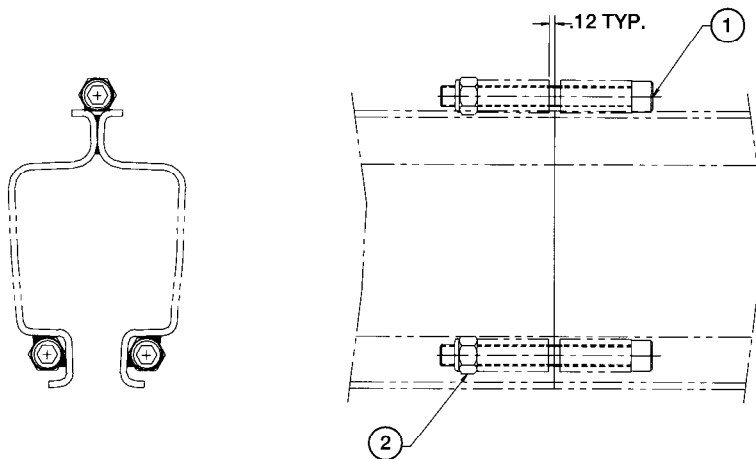
REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

ULTIMATE STRENGTH:.....17,250 LBS.
 YIELD STRENGTH:.....14,250 LBS.
 CAPACITY:.....2,000 LBS.
 WEIGHT OF ASSEMBLY:.....5 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
–	30163	1	1	MALE CLEVIS
99118	–	2	1	SCREW & NUT ASSY.
72647	–	3	1	5/8-18 X 2-1/2 H.H.B
–	30801	4	2	HANGER BRACKET
–	30802	5	1	GIMBLE
70967	–	6	2	5/16-18 X 2-1/4 H.H.B.
75582	–	7	2	5/16-18 LOCK NUT
65076	–	8	1	THRUST WASHER

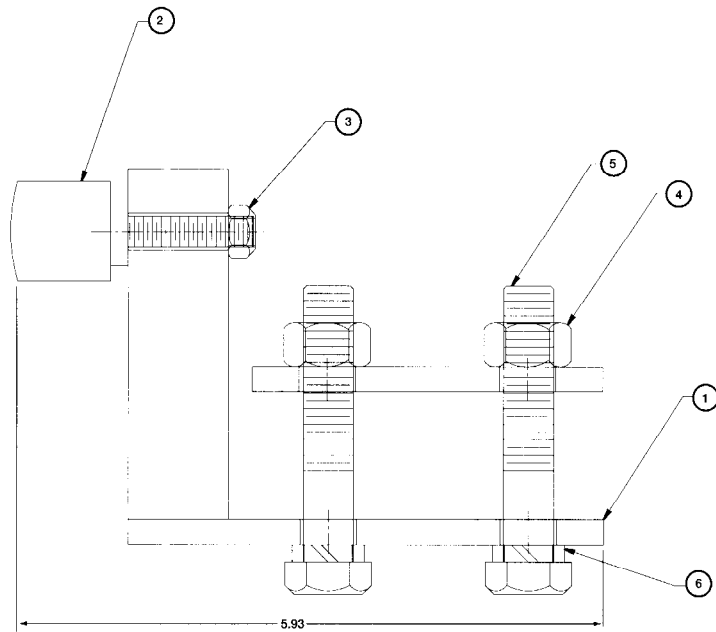
SPLICE BOLT KIT • ZRS2/3/PART NO. 30515



NOTE:
 THERE MUST BE A HANGER KIT WITHIN 12 IN. (305 MM) OF THE SPLICE JOINT ON THE RUNWAY.
 CONSULT THE FACTORY IF MODIFICATIONS NEED TO BE MADE TO SPLICE JOINTS THAT REQUIRE WELDING OF SPLICE LUGS.

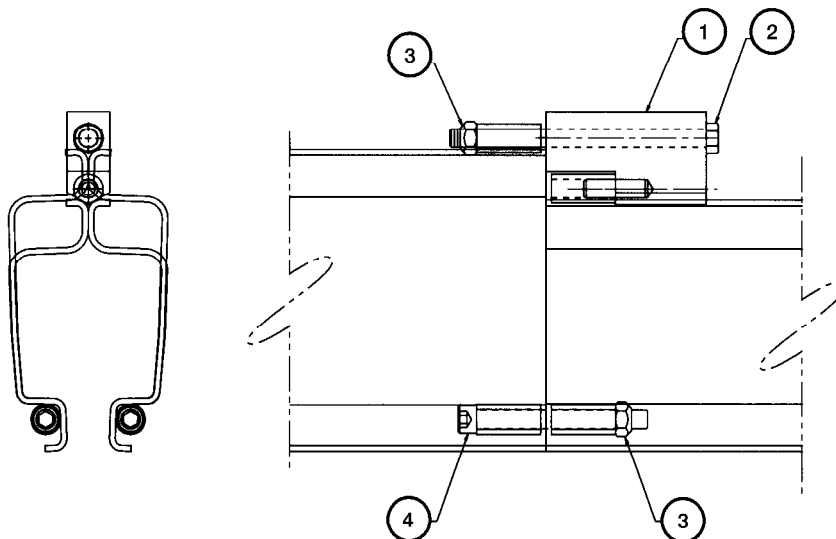
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
75532	–	1	3	7/16-14 LOCK NUT
71910	–	2	3	7/16-14 X 4" S.H.C.S.

ZRS2/3 RAIL • ADJUSTABLE STOP/PART NO. 30733



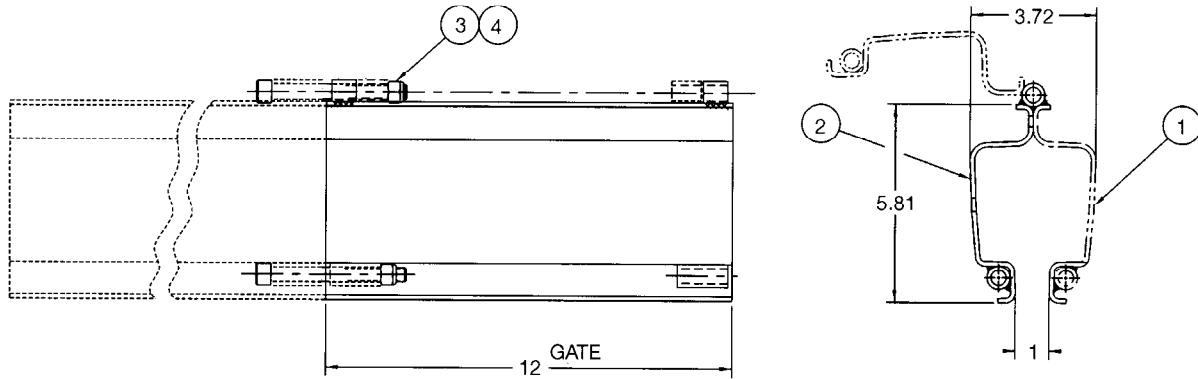
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30735	1	1	BAR WELDMENT
-	30744	2	1	THRD AND HEX SHOULDER
-	75582	3	1	5/16-18 PT LOCKNUT
-	30737	4	1	NUT WELDMENT
-	72002	5	2	1/2-13 X 2-3/4 HEX HEAD CAPSCREW
-	74513	6	2	1/2" MED SPRING LOCKWASHER

ZRS2 TO ZRS3 • SPLICE KIT/PART NO. 30723



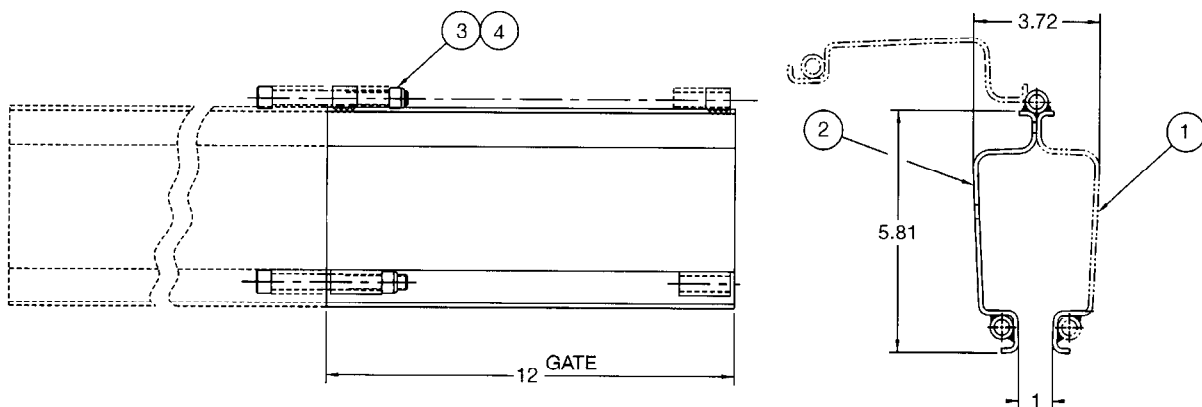
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30724	1	1	SPLICE KIT (ZRS2 TO ZRS3)
71919	-	2	1	7/16-14 X 6.00 HCS GRADE 5
75532	-	3	3	7/16-14 PT LOCKNUT
71910	-	4	2	7/16-14 X 4.00 SHCS

ZRS2 RAIL • INSPECTION GATE/PART NO. 30889



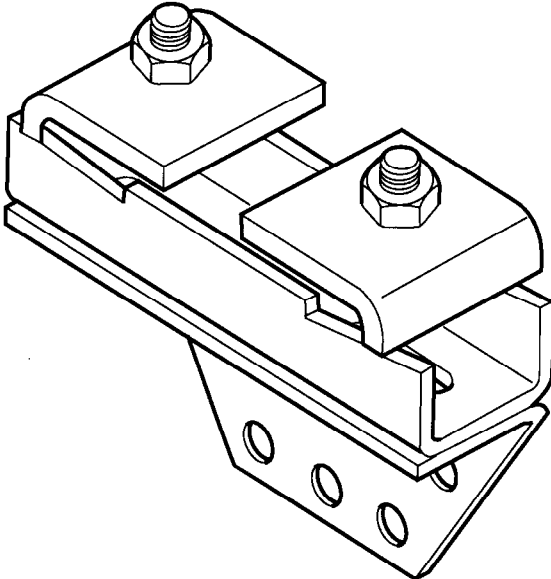
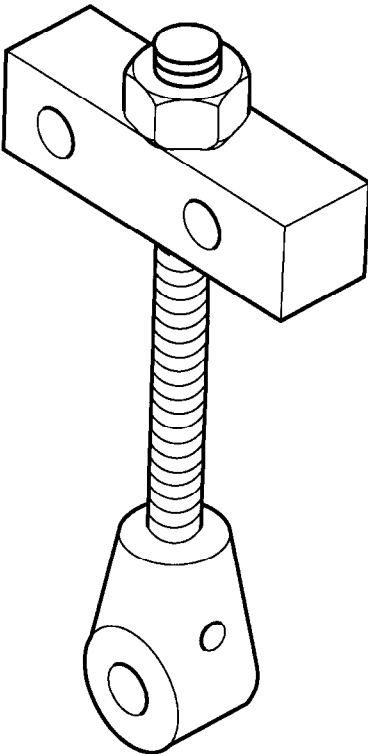
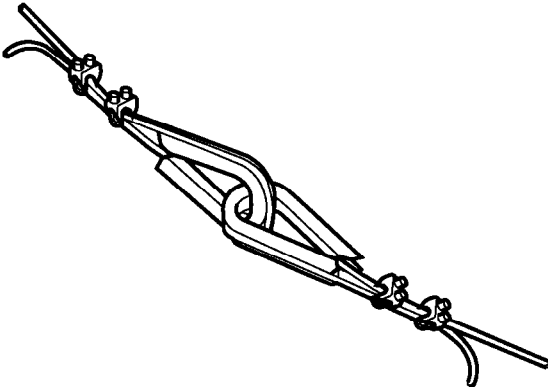
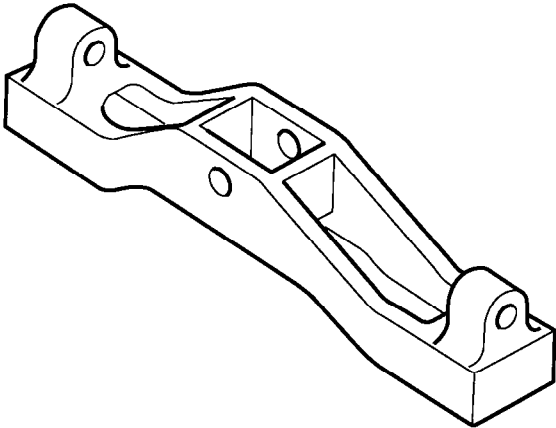
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30890	1	1	GATE LUG ASS'Y - ZRS2
-	30891	2	1	DOOR - ZRS2 GATE
71910	-	3	2	7/16-14 X 4" LG. S.H.C.S.
75532	-	4	2	7/16-14 LOCK NUT

ZRS3 • INSPECTION GATE/PART NO. 30892



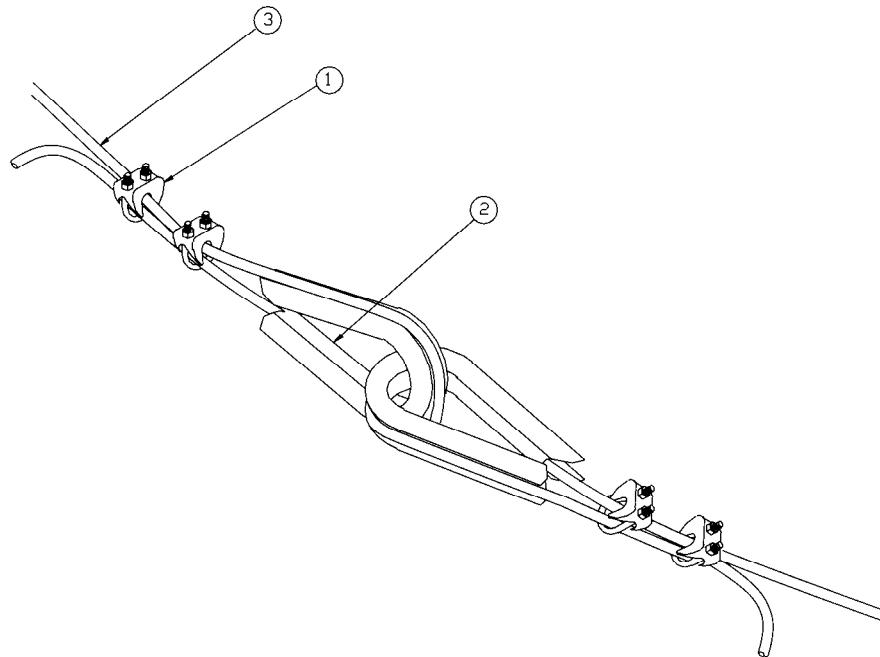
BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30893	1	1	GATE LUG ASS'Y - ZRS3
-	30894	2	1	DOOR - ZRS3 GATE
71910	-	3	2	7/16-14 X 4" LG. S.H.C.S.
75532	-	4	2	7/16-14 LOCK NUT

MISCELLANEOUS • COMPONENTS AND ACCESSORIES



SAFETY CABLE ASSEMBLY • PART NO. 30907-LENGTH IN FEET

EXAMPLE: 30907-06 = 6 FEET

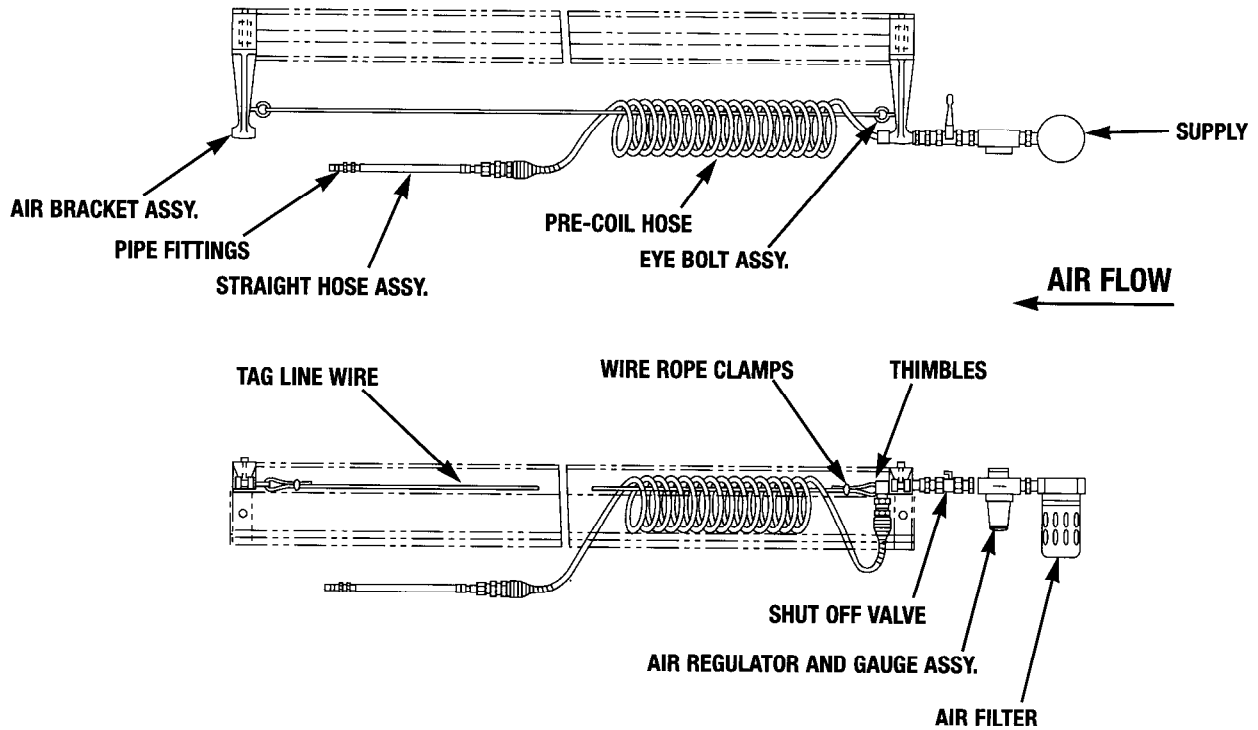


1. Safety cables are to be assembled as illustrated above and installed to allow free movement of the Hanger Kit, yet provide minimum free drop of the components if the primary support should fail.
2. The “U” bolt portion of the Wire Rope Clamp should be positioned on the dead end of the cable as shown.
3. Thimble must be used on both ends of the cable.
4. Inboard clamps should be positioned to retain thimble in place. Outboard clamps should be placed one clamp saddle width from dead end of cable.
5. If cable is too long, it should be cut to a suitable length.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
10235	-	1	4	WIRE ROPE CLAMP
10212	-	2	2	THIMBLE
10099	-	3	?-FEET	1/4" WIRE ROPE

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.

AIR SUPPLY ASSEMBLY • RUNWAY SYSTEM/PART NO. 90000

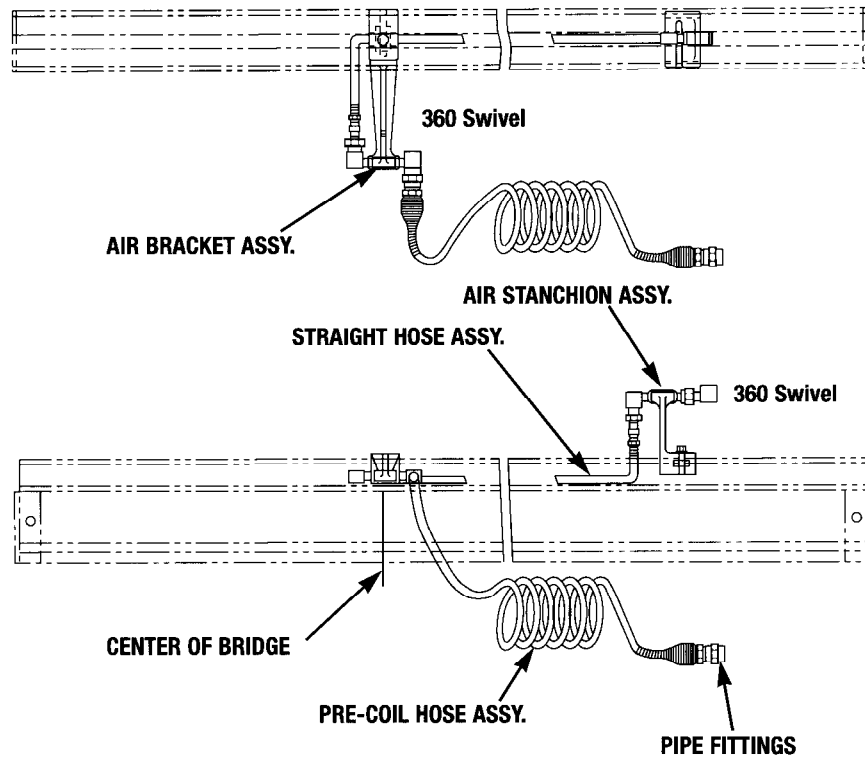


RAIL SYSTEM AIR SUPPLY KITS

Rail systems Air Supply kits are available in 3/8" and 1/2" Hose I.D. and in 50 Ft., 75 Ft. and 100 Ft. Coverage lengths. The 90000 (3/8") or 90001 (1/2") Component Package includes the above:

PART NUMBER	DESCRIPTION
90000-1	ALL RAIL SYSTEMS – 50 FOOT COVERAGE – 3/8" DIA. HOSE
90000-2	ALL RAIL SYSTEMS – 75 FOOT COVERAGE – 3/8" DIA. HOSE
90000-3	ALL RAIL SYSTEMS – 100 FOOT COVERAGE – 3/8" DIA. HOSE
90001-1	ALL RAIL SYSTEMS – 50 FOOT COVERAGE – 1/2" DIA. HOSE
90001-2	ALL RAIL SYSTEMS – 75 FOOT COVERAGE – 1/2" DIA. HOSE
90001-3	ALL RAIL SYSTEMS – 100 FOOT COVERAGE – 1/2" DIA. HOSE

AIR SUPPLY ASSEMBLY • BRIDGE SYSTEM/PART NO. 90020

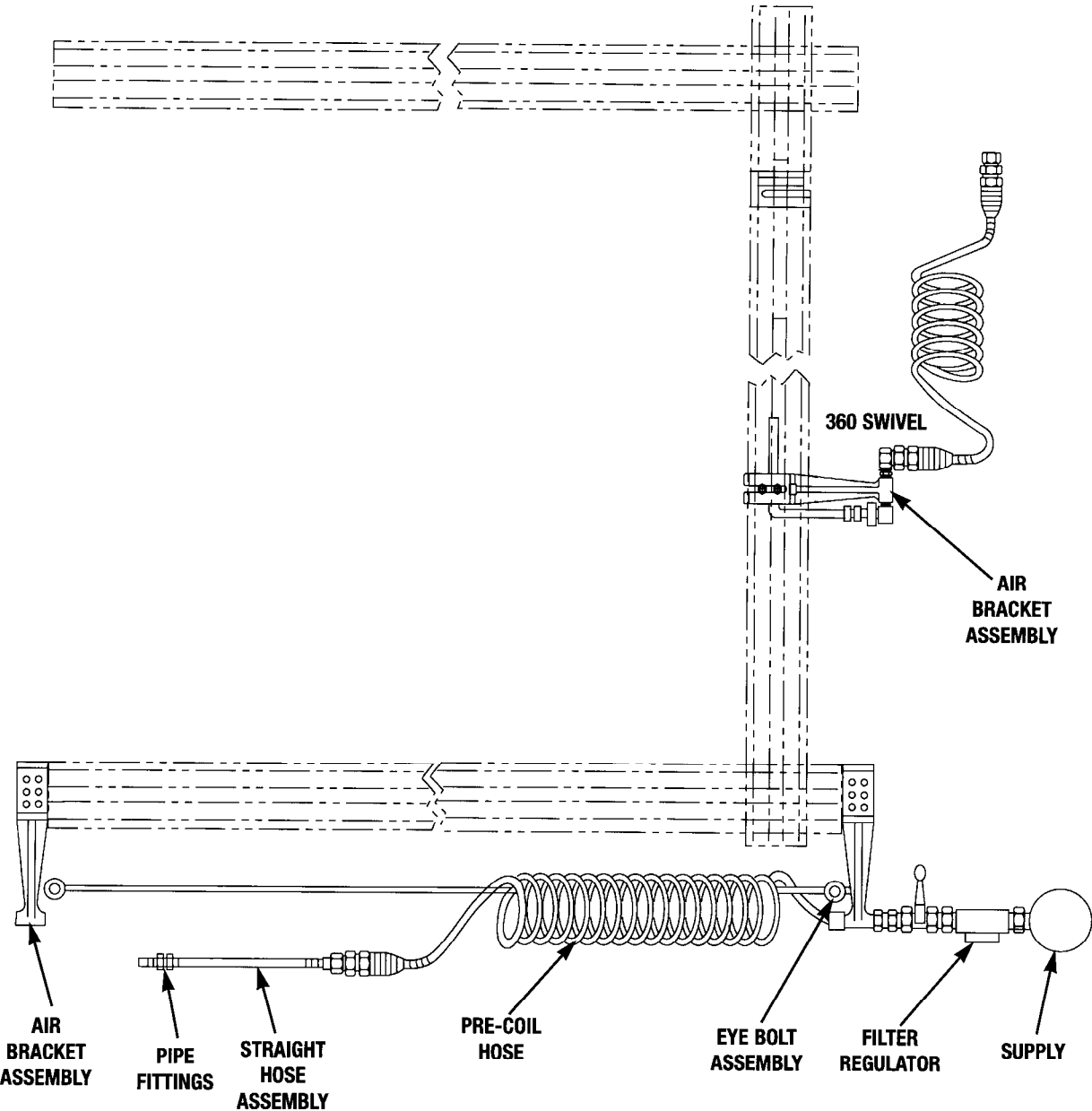


BRIDGE CRANE AIR SUPPLY KITS

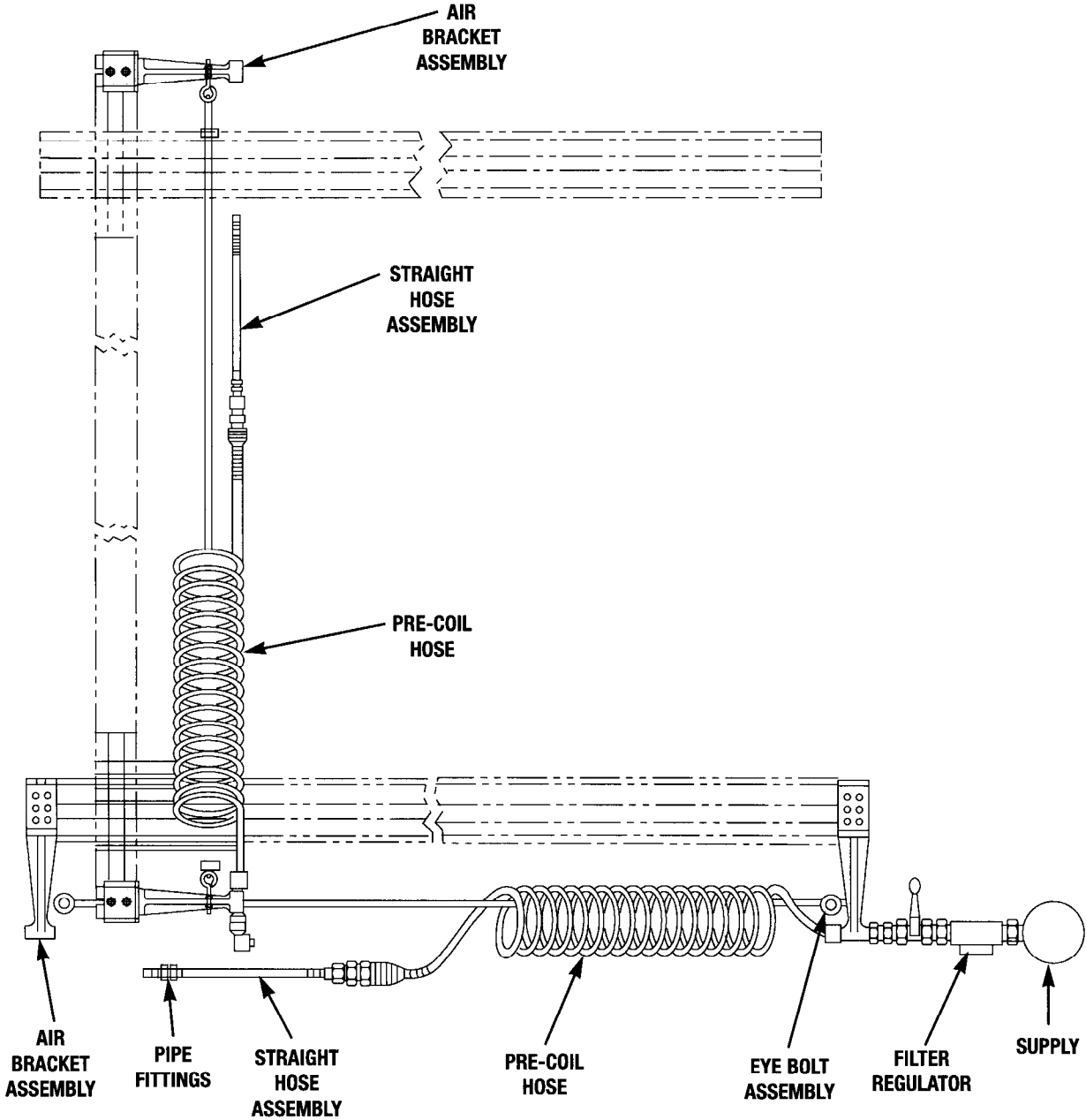
Bridge Crane Air Supply kits are available in 3/8" and 1/2" Hose I.D. and (5) lengths to suit standard bridge lengths. The 90020 (3/8") or 90021 (1/2") Component Package includes the above:

PART NUMBER	DESCRIPTION
90020-1	ALL BRIDGES – 5 FOOT TO 8 FOOT LENGTHS – 3/8" HOSE
90020-2	ALL BRIDGES – 9 FOOT TO 11 FOOT LENGTHS – 3/8" HOSE
90020-3	ALL BRIDGES – 12 FOOT TO 14 FOOT LENGTHS – 3/8" HOSE
90020-4	ALL BRIDGES – 15 FOOT TO 18 FOOT LENGTHS – 3/8" HOSE
90020-5	ALL BRIDGES – 19 FOOT TO 21 FOOT LENGTHS – 3/8" HOSE
90021-1	ALL BRIDGES – 5 FOOT TO 8 FOOT LENGTHS – 1/2" HOSE
90021-2	ALL BRIDGES – 9 FOOT TO 11 FOOT LENGTHS – 1/2" HOSE
90021-3	ALL BRIDGES – 12 FOOT TO 14 FOOT LENGTHS – 1/2" HOSE
90021-4	ALL BRIDGES – 15 FOOT TO 18 FOOT LENGTHS – 1/2" HOSE
90021-5	ALL BRIDGES – 19 FOOT TO 21 FOOT LENGTHS – 1/2" HOSE

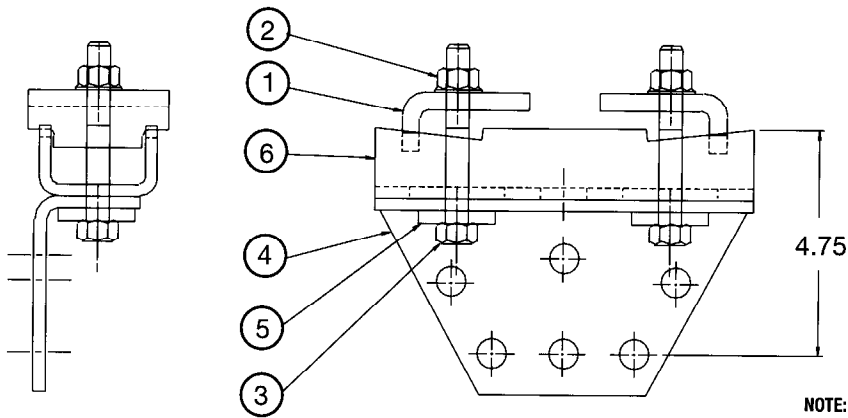
TYPICAL BRIDGE/RUNWAY CENTER STATION AIR SYSTEM



TYPICAL BRIDGE/RUNWAY AIR SYSTEM



BEAM CLAMP • STANDARD FLANGE/PART NO. 30186

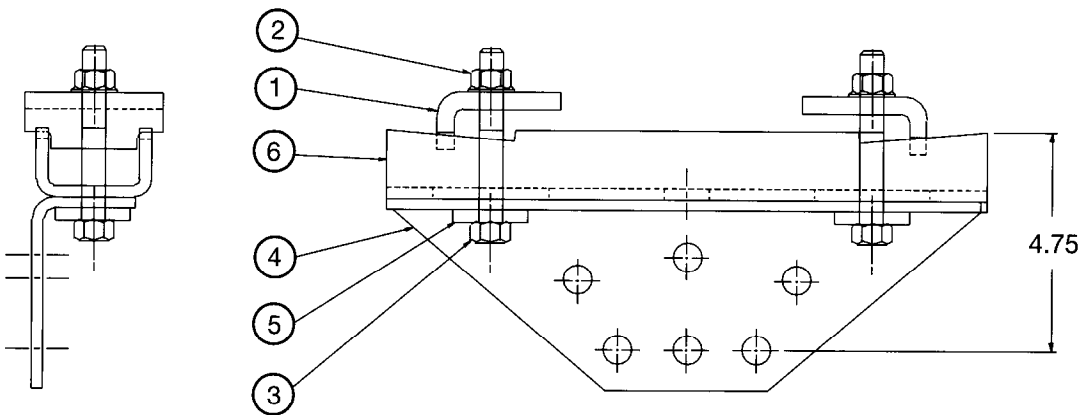


NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.

NOTE: STANDARD FLANGE BEAM CLAMP WILL ACCOMMODATE FROM 2.5" TO 5" FLANGE WIDTH.
 ULTIMATE STRENGTH:.....24,200 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....6 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30062	1	2	TOE CLAMP
75589	-	2	2	1/2-13 STOVER FLANGE NUT
72037	-	3	2	1/2-13 X 4.00" H.H.B.
-	30188	4	1	HANGER BRACKET
-	30094	5	2	WASHER
-	30091	6	1	BEAM CLAMP

BEAM CLAMP • WIDE FLANGE/PART NO. 30187



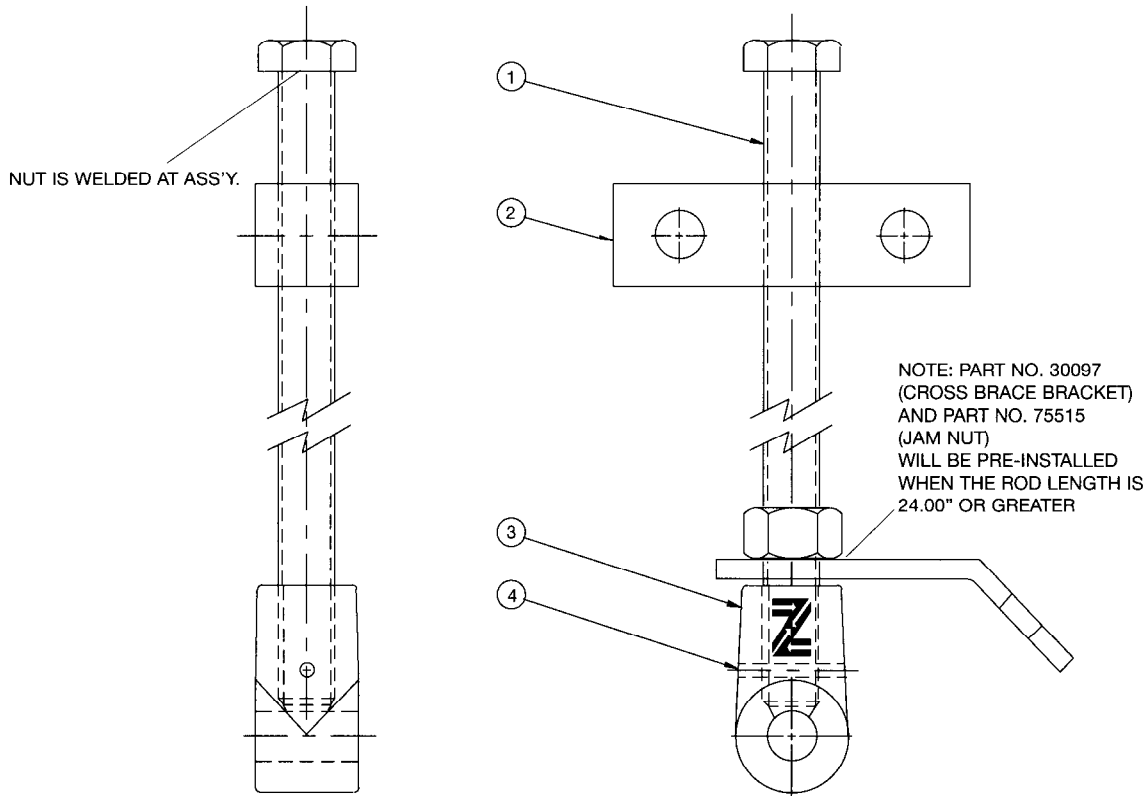
NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.

NOTE: WIDE FLANGE BEAM CLAMP WILL ACCOMMODATE FROM 5" TO 10" FLANGE WIDTHS.
 ULTIMATE STRENGTH:.....24,200 LBS.
 YIELD STRENGTH:.....15,000 LBS.
 CAPACITY:.....3,000 LBS.
 WEIGHT OF ASSEMBLY:.....7 LBS.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30062	1	2	TOE CLAMP
75589	-	2	2	1/2-13 STOVER FLANGE NUT
72037	-	3	2	1/2-13 X 4.00" H.H.B.
-	30189	4	1	HANGER BRACKET
-	30094	5	2	WASHER
-	30154	6	1	BEAM CLAMP

HANGER ADJUSTMENT ASSEMBLY • PART NO. 30190



ROD LENGTH	REF. ROD NUMBER	REF. SAFETY CABLE ASS'Y NO.	ORDER NUMBER FOR SUB-ASS'Y.
6.00"	30192-006	30907-06	30190-006
12.00"	30192-012	30907-08	30190-012
18.00"	30192-018	30907-10	30190-018
*24.00"	30192-024	30907-10	30190-024
*36.00"	30192-036	30907-12	30190-036
*48.00"	30192-048	30907-14	30190-048
*60.00"	30192-060	30907-16	30190-060
*72.00"	30192-072	30907-18	30190-072

NOTE: SEE INSTALLATION MANUAL FOR EXPLODED VIEW.
 ULTIMATE STRENGTH:.....19,000 LBS.
 YIELD STRENGTH:.....14,000 LBS.
 WEIGHT OF ASSEMBLY:.....14 LBS.
 CAPACITY:.....2,000 LBS.
 MINIMUM RAIL RADIUS:.....36"
 *ROD LENGTHS 24.00" AND LONGER REQUIRE CROSS BRACING.

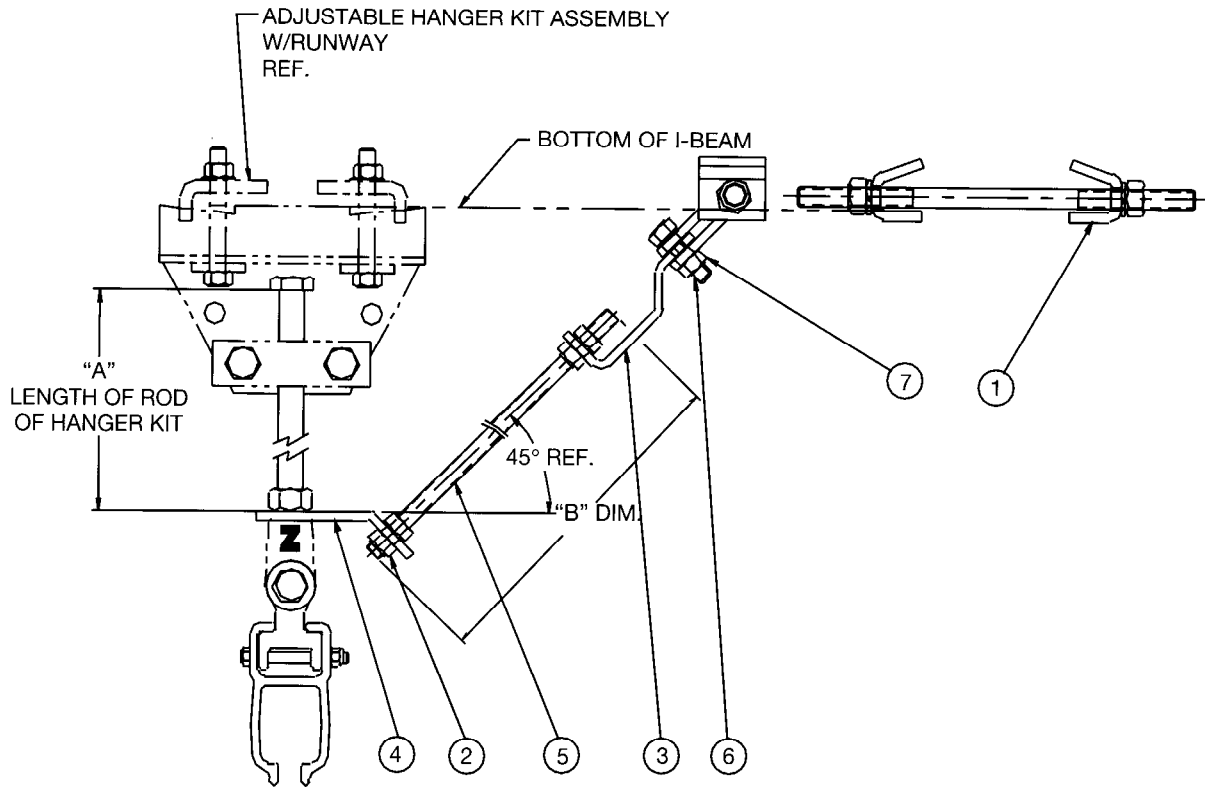
BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30192	1	1	ADJUSTMENT ROD	
-	30194	2	1	ADJUSTMENT BLOCK	
-	30163	3	1	MALE CLEVIS	
77058	-	4	1	3/16 DIA. X 1.50" ROLL PIN	

NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

CROSS BRACING KIT • PART NO. 30081/ "A" DIMENSION LENGTH IN INCHES

EXAMPLE: 30081-3200 = (CROSS BRACE KIT FOR AN ADJUSTABLE HANGER KIT WITH A ROD LENGTH OF 32.00")



HOW TO ORDER CROSS BRACE KITS		
IF "A" DIMENSION IS:	"B" DIMENSION WILL BE	ORDER THIS CROSS BRACE KIT NO.
24.00"	32-1/8"	30081-24
36.00"	48-5/16"	30081-36
40.00"	56-5/16"	30081-40
48.00"	64-7/16"	30081-48
60.00"	80-9/16"	30081-60
72.00"	96-11/16"	30081-72

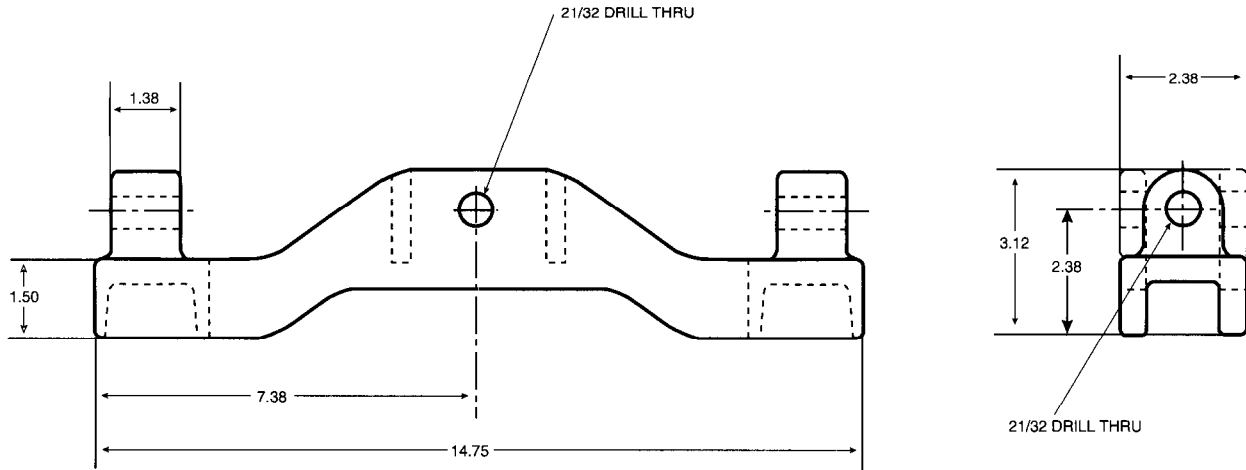
NOTE:
THE CROSS BRACE ROD LENGTH ("B" DIMENSION) IS BASED ON A 45 DEGREE ANGLE AND CLAMPING TO THE HEADER STEEL AT THE SAME ELEVATION AS THE ADJUSTABLE HANGER KIT.

BILL OF MATERIALS					
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION	
-	30097	1	1	BRACING CONNECTOR (REF.)	
75515	-	-	-	5/8-18 LOCK NUT (REF.)	
75558	-	2	4	1/2-13 LOCK NUT	
30522-3200	-	3	1	1/2-13 THREADED ROD - 32-1/8"	
30522-4800	-	-	-	1/2-13 THREADED ROD - 48-5/16"	
30522-6400	-	-	-	1/2-13 THREADED ROD - 64-7/16"	
30522-8000	-	-	-	1/2-13 THREADED ROD - 80-9/16"	
30522-9600	-	-	-	1/2-13 THREADED ROD - 96-11/16"	
-	30099	4	1	HANGER BRACKET	
72021	-	5	1	1/2-13 X 1-3/4 BOLT	
75512	-	6	1	1/2-13 LOCK NUT	
-	30098	7	2	BEAM CLAMP ASS'Y.	

NOTE: BRACING CONNECTOR (#4) AND 5/8-18 LOCK NUT WILL BE PRE-INSTALLED AT THE FACTORY FOR ADJUSTABLE HANGER KITS WITH ROD LENGTHS OF 24.00" AND LONGER.

*FOR LONGER CROSS BRACING KIT LENGTHS CONSULT THE FACTORY.

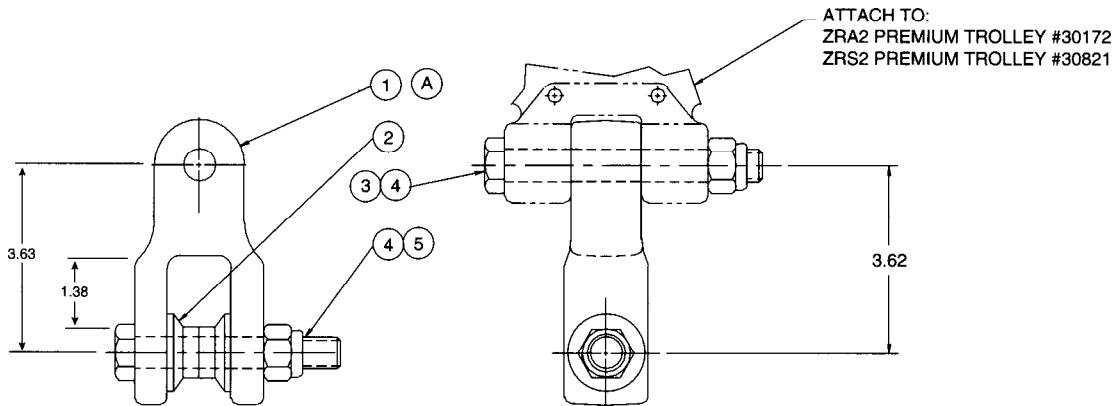
DUAL TROLLEY • TIE BAR/PART NO. 30173



NOTE: A SAFETY CABLE ASSEMBLY IS NOT INCLUDED WITH THIS SUB-ASSEMBLY. YOU MUST ORDER IT SEPARATELY.
 REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

ULTIMATE STRENGTH:13,250 LBS.
 YIELD STRENGTH:10,600 LBS.
 CAPACITY:2,000 LBS.
 WEIGHT OF ASSEMBLY:5 LBS.

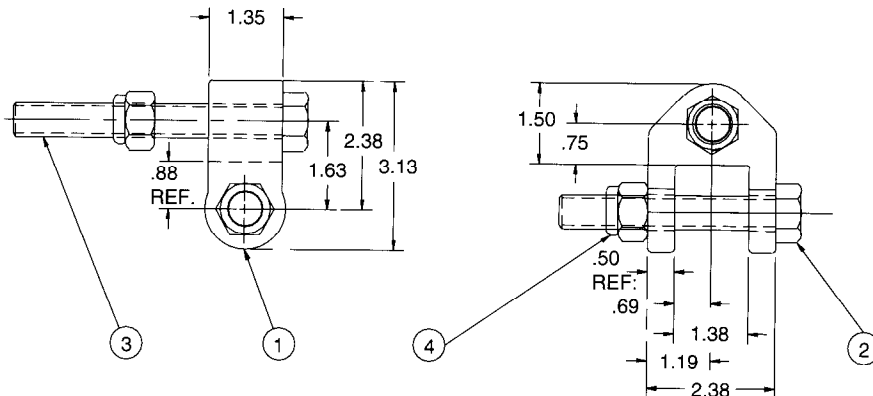
HOIST HOOK BRACKET • UNIVERSAL/PART NO. 30903



WEIGHT OF ASSEMBLY:.....2 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30904	1	1	HOOK BRACKET
-	30905	2	2	HOOK ROLLER
72644	-	3	1	5/8-11 X 4" H.H.B.
75587	-	4	1	5/8-11 LOCK NUT

FEMALE CLEVIS • SUB-ASSEMBLY/PART NO. 30312



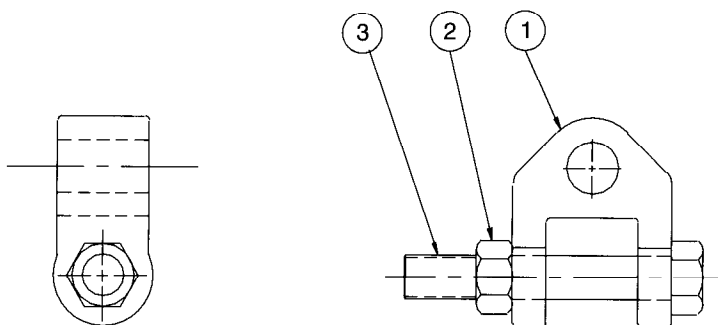
NOTE: SAFETY CABLE ASSEMBLIES ARE NOT INCLUDED IN THIS SUB-ASSEMBLY. YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

WEIGHT OF ASSEMBLY:4 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
75587	-	1	2	5/8-11 LOCK NUT
72644	-	2	1	5/8-11 X 4.00" H.H.B.
72646	-	3	1	5/8-11 X 5.00" H.H.B.
-	30166	4	1	FEMALE CLEVIS

3/4 FEMALE CLEVIS ADAPTER • SUB-ASSEMBLY/PART NO. 30321



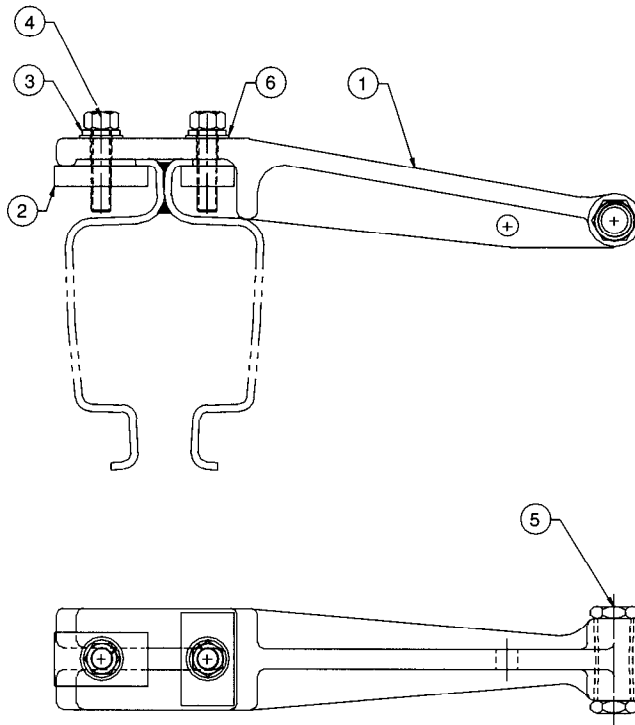
NOTE: SAFETY CABLE ASSEMBLIES ARE NOT INCLUDED IN THIS SUB-ASSEMBLY. YOU MUST ALSO ORDER A SAFETY CABLE ASSEMBLY.

REF: PART NO. 30907 – LENGTH IN FEET (EXAMPLE: 06 = 6 FEET)

WEIGHT OF ASSEMBLY:4 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
75587	-	1	1	5/8-11 LOCK NUT
72644	-	2	1	5/8-11 X 4.00" H.H.B.
-	30166	3	1	FEMALE CLEVIS

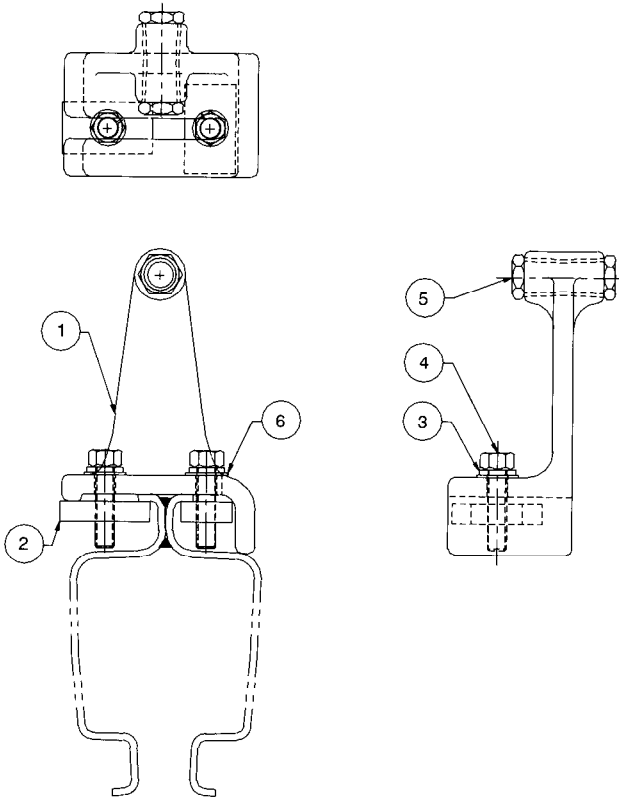
AIR BRACKET ASSEMBLY • PART NO. 30517



WEIGHT OF ASSEMBLY:.....3 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
71480	-	1	2	3/8-24 X 1-1/2" BOLT
74507	-	2	2	3/8 LOCK WASHER
74540	-	3	2	3/8 FLAT WASHER
30114	-	4	1	AIR BRACKET
30038	-	5	2	3/8 X 1 X 1-1/2 C.R.S. NUT
10744	-	6	2	1/2 - 3/8 BRASS REDUCER

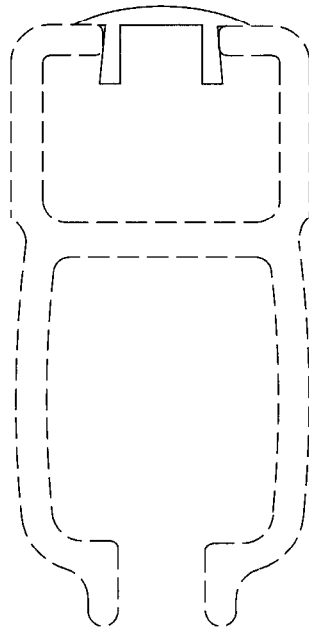
AIR STANCHION ASSEMBLY • PART NO. 30519



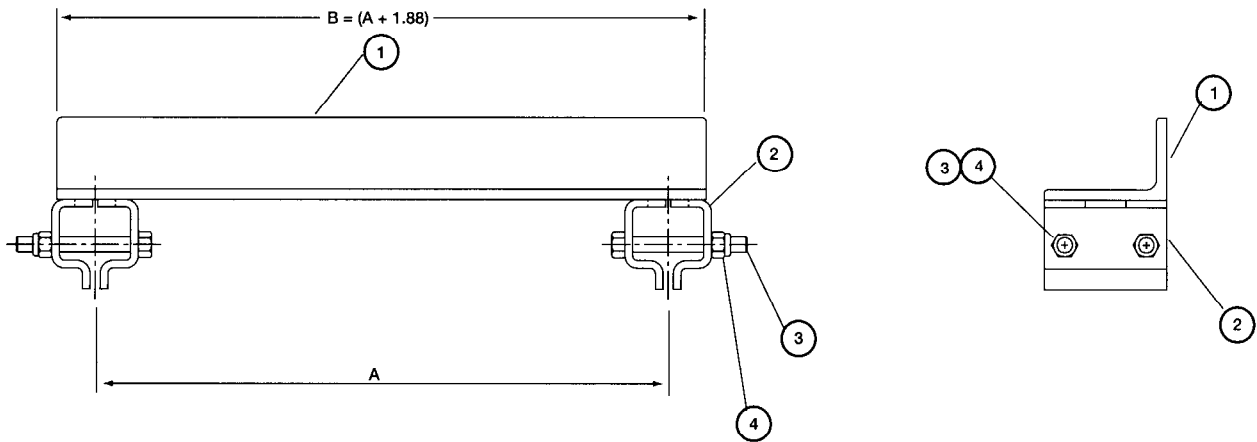
WEIGHT OF ASSEMBLY:.....3 LBS.

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
71480	-	1	2	3/8-24 X 1-1/2" BOLT
74507	-	2	2	3/8 LOCK WASHER
74540	-	3	2	3/8 FLAT WASHER
30116	-	4	1	AIR BRACKET
30038	-	5	2	3/8 X 1 X 1-1/2 C.R.S. NUT
10744	-	6	2	1/2 - 3/8 BRASS REDUCER

DUST CAP FOR ZRAT, ZRA1 AND ZRA2 • RAIL/PART NO. 30729



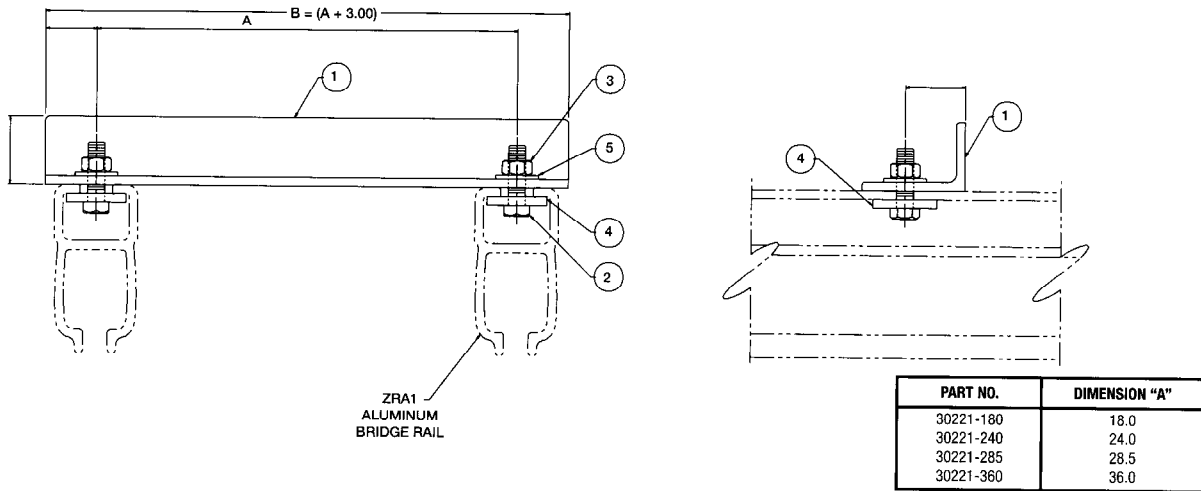
ZRS2/3 DUAL BRIDGE TIE BAR/PART NO. 30535



BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
80232	-	1	1	L-3 X 2 X 1/4" X "B" A36 HRS
-	30502	2	4	SIDE PLATE
71479	-	3	4	5/8-16 X 3.00 HEX HEAD CAPSCREW GRADE 5
75583	-	4	4	3/8-16 PT LOCKNUT

PART NO.	DIMENSION "A"
30535-180	18.0
30535-240	24.0
30535-285	28.5
30535-360	36.0

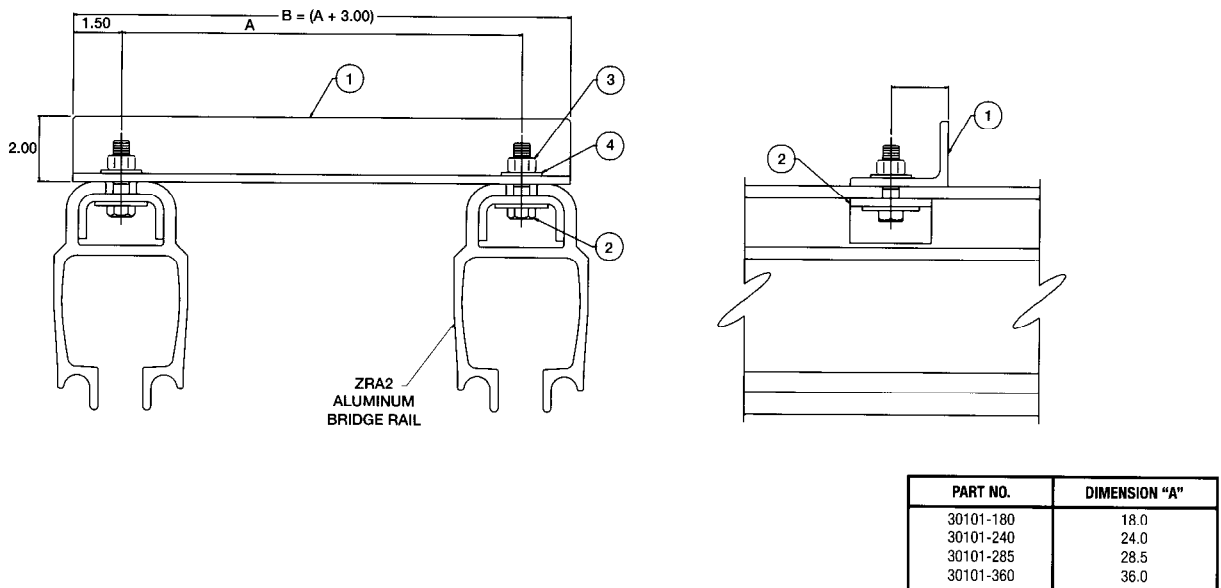
ZRA1 DUAL BRIDGE TIE BAR/PART NO. 30221



PART NO.	DIMENSION "A"
30221-180	18.0
30221-240	24.0
30221-285	28.5
30221-360	36.0

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
80232	-	1	1	L-3 X 2 X 1/4" X "B" A36 HRS
72021	-	2	2	1/2-13 X 3/4" HEX HEAD CAPSCREW GRADE 5
75585	-	3	2	1/2-13 PT LOCKNUT
-	30094	4	2	RECTANGULAR WASHER
74511	-	5	2	1/2" U.S. FLAT WASHER

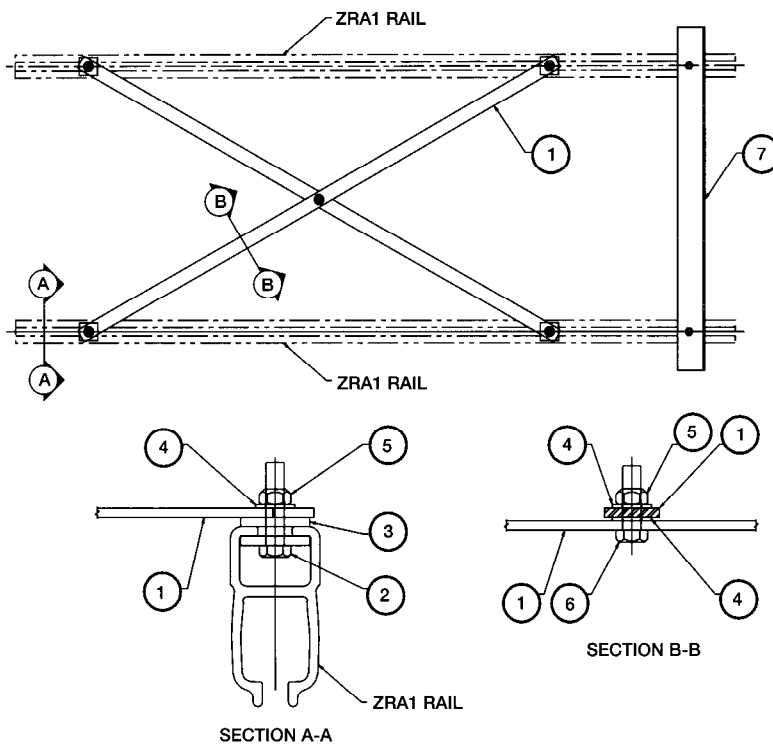
ZRA2 DUAL BRIDGE TIE BAR/PART NO. 30101



PART NO.	DIMENSION "A"
30101-180	18.0
30101-240	24.0
30101-285	28.5
30101-360	36.0

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
80232	-	1	1	L-3 X 2 X 1/4" X "B" A36 HRS
-	30109	2	2	SUSPENSION PLATE ASSEMBLY
75585	-	3	2	1/2-13 PT LOCKNUT
74511	-	4	2	1/2" U.S. FLAT WASHER

ZRA1 DUAL BRIDGE CROSS BRACE KIT/PART NO. 30718

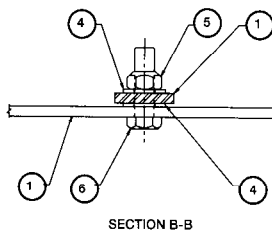
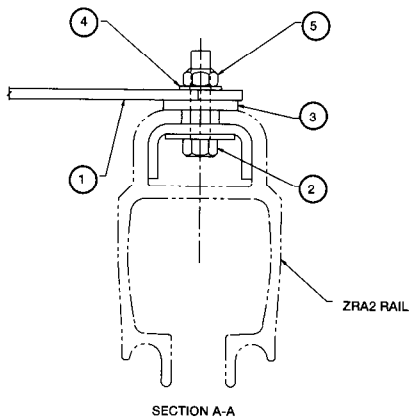
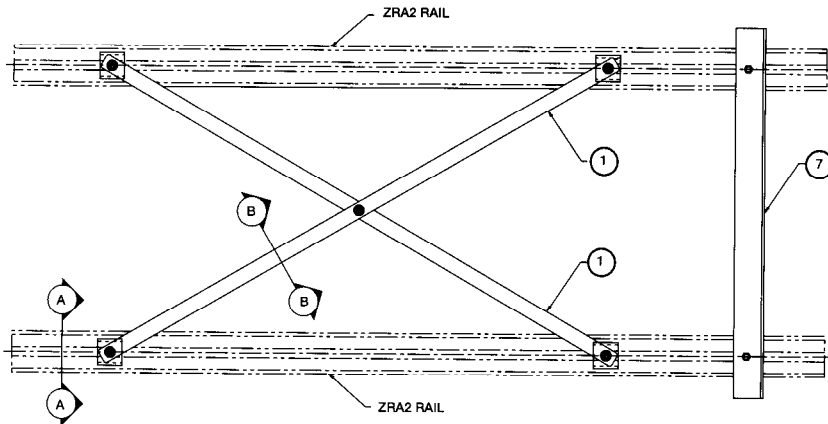


NOTE: CROSS BRACE KITS SHOULD BE USED ON ANY BRIDGE SPANS OVER 10'-0".

PART NO.	BRIDGE LENGTH
30718-100	10'-0
30718-120	12'-0
30718-140	14'-0
30718-160	16'-0
30718-180	18'-0
30718-200	20'-0
30718-220	22'-0
30718-240	24'-0
30718-260	26'-0
30718-280	28'-0

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30717	1	2	CROSS BRACE BAR
-	30218	2	4	SUSPENSION PLATE ASSEMBLY
-	30094	3	4	TOE CLAMP PLATE
74517	-	4	6	1/2 SAE FLAT WASHER
75585	-	5	5	1/2-13 PT LOCKNUT
72010	-	6	1	1/2-13 X 1.50 HCS GRADE 5
-	30221	7	1	BRIDGE TIE BAR KIT-ZRA1

ZRA2 DUAL BRIDGE CROSS BRACE KIT/PART NO. 30719

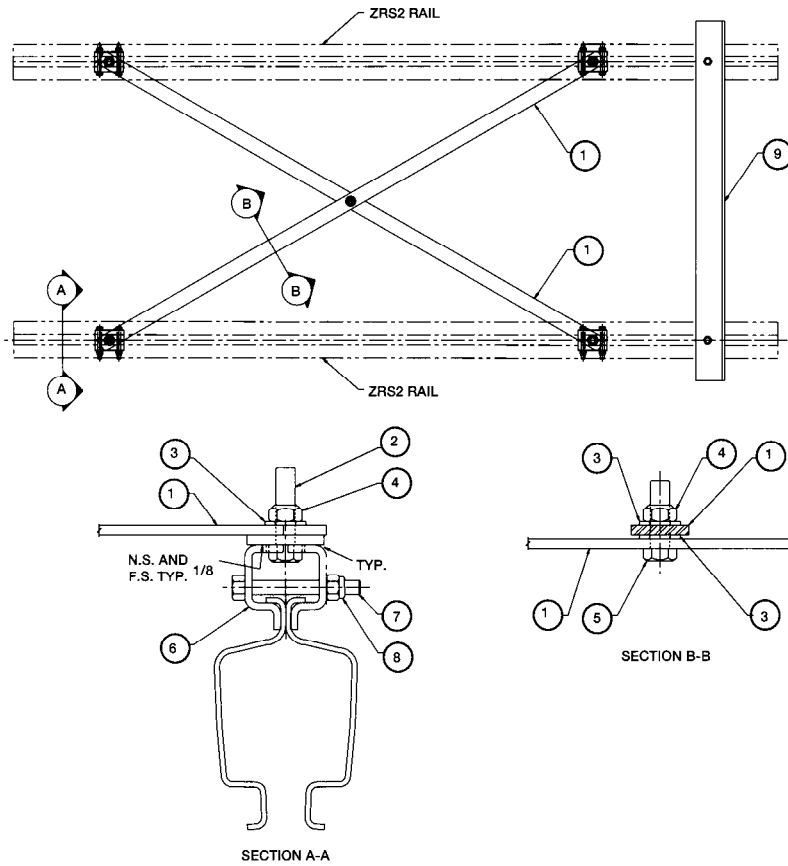


NOTE: CROSS BRACE KITS SHOULD BE USED ON ANY BRIDGE SPANS OVER 10'-0".

PART NO.	BRIDGE LENGTH
30719-100	10'-0
30719-120	12'-0
30719-140	14'-0
30719-160	16'-0
30719-180	18'-0
30719-200	20'-0
30719-220	22'-0
30719-240	24'-0
30719-260	26'-0
30719-280	28'-0

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30717	1	2	CROSS BRACE BAR
-	30109	2	4	SUSPENSION PLATE ASSEMBLY
-	30094	3	4	TOE CLAMP PLATE
74517	-	4	6	1/2 SAE FLAT WASHER
75585	-	5	5	1/2-13 PT LOCKNUT
72010	-	6	1	1/2-13 X 1.50 HCS GRADE 5
-	30101	7	1	BRIDGE TIE BAR KIT-ZRA2

ZRS2 DUAL BRIDGE CROSS BRACE KIT/PART NO. 30720



NOTE: CROSS BRACE KITS SHOULD BE USED ON ANY BRIDGE SPANS OVER 10'-0".

PART NO.	BRIDGE LENGTH
30720-100	10'-0
30720-120	12'-0
30720-140	14'-0
30720-160	16'-0
30720-180	18'-0
30720-200	20'-0
30720-220	22'-0
30720-240	24'-0
30720-260	26'-0
30720-280	28'-0

BILL OF MATERIALS				
PART NO.	DRAWING NO.	ITEM	AMT.	DESCRIPTION
-	30717	1	2	CROSS BRACE BAR
-	30218	2	4	SUSPENSION PLATE ASSEMBLY
74517	-	3	6	1/2 SAE FLAT WASHER
75585	-	4	5	1/2-13 PT LOCKNUT
72010	-	5	1	1/2-13 X 1.50 HCS GRADE 5
-	30502	6	8	SIDE PLATE
71479	-	7	4	3/8-16 X 3.00 HEX HEAD CAPSCREW GRADE 5
75583	-	8	4	3/8-16 PT LOCKNUT
-	30535	9	1	BRIDGE TIE BAR KIT - ZRS2