INSTRUCTIONS & PARTS LIST

Yale® HOISTS

PUSH, HAND GEARED AND MOTOR DRIVEN

CRANE BRIDGE KITS

CATALOG NUMBERS 904535, 904536 & 904538

Follow all instructions and warnings in building this bridge.
The building of any bridge presents some risk of personal injury or property damage. That risk is greatly increased if proper instructions and warnings are not followed. Before starting construction the builder should become thoroughly familiar with all warnings, instructions and recommendations in this manual.
Retain this manual for future reference and use.

P/N 11353526 Rev AC January 2017

TO BUILD TOP RUNNING CRANE BRIDGES

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GENERAL

These crane bridge kits contain all parts needed, except the bridge beam, cross shaft (when required), and the trolley stop angles to build top running, single girder crane bridges in rated loads and spans (center-to center distance between runway beams) charted below.

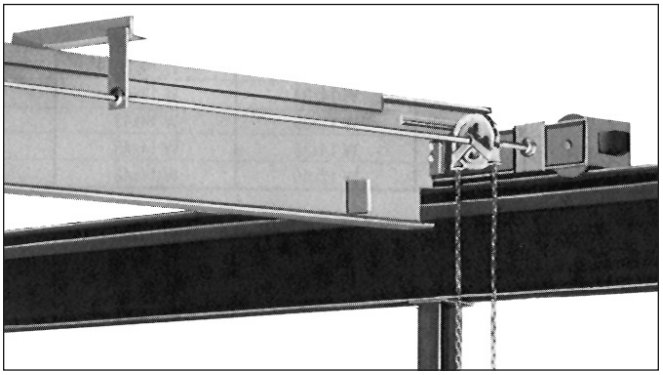


Figure 1. 12750

GIRDER SELECTION TABLE - S BEAMS

(**) BEAM SIZES FOR VARIOUS SPANS									
Spans To	(*) RATED LOAD IN TONS OF 2000#								Spans To
	1/4	1/2	1	1-1/2	2	3	4	5	
Push or Hand Geared Crane - 54" Wheelbase									
10 ft.	S 6x12.5	S 6x12.5	S 6x12.5	S 8x18.4	S 10x25.4	S 12x40.8	S 12x40.8	S 12x40.8	10 ft.
12 ft	S 6x12.5	S 6x12.5	S 7x15.3	S 10x25.4	S 10x25.4	S 12x'\0.8	S 12x40.8	S 18x54.7	12 ft.
14 ft.	S 6x12.5	S 6x12.5	S 7x15.3	S 10x25.4	S 12x31.8	S 12x40.8	S 12x40.8	S 18x54.7	14 ft.
16 ft.	S 6x12.5	S 7x15.3	S 8x18.4	S 10x25.4	S 12x31.8	S 12x40.8	S 12x40.8	S 18x54.7	16 ft.
18 ft.	S 7x 15.3	S 7x15.3	S 10x25.4	S 10x25.4	S 12x31.8	S 12x40.8	S 15x42.9	S 18x54.7	18 ft.
20 ft.	S 7x15.3	S 8X18.4	S 10x25.4	S 12x31.8	S 12x31.8	S 12x40.8	S 18x54.7	S 18x54.7	20 ft.
22 ft.	S 8x18.4	S 10x25.4	S 10x25.4	S 12x31.8	S 12x40.8	S 18x54.7	S 18x54.7	S 20x66	22 ft.
24 ft..	S 8x18.4	S 10x25.4	S 12x31.8	S 12x40.8	S 12x40.8	S 18x54.7	S 18x54.7	S 20x66	241t.
26 ft.	S 10x25.4	S 10x25.4	S 12x31.8	S 12x40.8	S 15x429	S 18x54.7	S 20x66	S 24x80	26 ft.
28 ft.	S 10x25.4	S 10x25.4	S 12x40.8	S 12x40.8	S 18x54.7	S 20x66	S 20x66	S 24x80	281t.
30 ft.	S 10x25.4	S 12x31.8	S 12x40.8	S 18x54.7	S 18x54.7	S 20x66	S 18x54.7 w/C 9x13.4	S 24x80	30 ft
32 ft.	S 10x25.4	S 12x31.8	S 12x40.8	S 18x54.7	S 15x42.9 w/C 8x11.5	S 18x54.7 w/C 9x13.4	S 18x54.7 w/C 9x13.4	S 20x66 w/C 9x13.4	32 ft
34 ft.	S 12x31.8	S 12x40.8	S 15x42.9	S 18x54.7	S 15x42.9 w/C 8x11.5	S 18x54.7 w/C 9x13.4	S 18x54.7 w/C 9x13.4	S 20x66 w/C 9x13.4	34 ft
36 ft.	S 12x31.8	S 12x40.8	S 18x54.7	S 15x42.9 w/C 8x11.5	S 15x42.9 w/C 8x11.5	S 18x54.7 w/C 9x13.4	S 20x66 w/C 9x13.4	S 20x66 w/C 9x13.4	36 ft
Motor Driven Crane - 54" Wheelbase									
10 ft.	S 6x12.5	S 6x12.5	S 6x12.5	S 10x25.4	S 10x25.4	S 12x40.8	S 12x40.8	S 12x40.8	10 lt.
12 ft.	S 6x12.5	S 6x.12.5	S 7x15.3	S 10x25.4	S 12x.31.8	S 12x40.8	S 12x40.8	S 18x54.7	12 lt.
14 ft.	S 6x12.5	S 6x12.5	S 7x15.3	S 10x25.4	S 12x31.8	S 12x40.8	S 12x40.8	S 18x54.7	14 ft.
16 ft.	S 6x12.5	S 7x15.3	S 8x18.4	S 10x25.4	S 12x31.8	S 12x40.8	S 18x54.7	S 18x54.7	16 ft.
18 ft	S 7x15.3	S 8x18.4	S 10x25.4	S 12x31.8	S 12x31.8	S 18x54.7	S 18x54.7	S 20x66	18 ft.
20 ft.	S 7x15.3	S 8x18.4	S 10x25.4	S 12x31.8	S 12x40.8	S 18x54.7	S 18x54.7	S 20x66	20 ft.
22 ft	S 8x18.4	S 10x25.4	S 12x31.8	S 12x40.8	S 12x40.8	S 18x54.7	S 20x66	S 20x66	22 ft.
24 ft.	S 10x25.4	S 10x25.4	S 12x31.8	S 12x40.8	S 18x54.7	S 20x66	S 20x66	S 24x80	24 ft.
26 ft.	S 10x25.4	S 10x25.4	S 12x40.8	S 18x54.7	S 18x54.7	S 20x66	S 18x54.7 w/C 9x13.4	S 24x80	26 ft.
28 ft.	S 10x25.4	S 12x31.8	S 12x40.8	S 18x54.7	S 12x40.8 w/C Bx11.5	S 18x54.7 wtc 9x13.4	S 18x54.7 wtc 9x13.4	S 20x66 w/C 9x13.4	28ft.
30 ft.	S 10x25-.4	S 12x31.8	S 12x40.8	S 18x54.7	S 12x40.8 w/C 8x11.5	S 18x54.7 w/C 9x13.4	S 18x54.7 w!C 9x.13.4	S 20x66 w/C 9X13.4	30 ft.
32 ft.	S 12x31.8	S 12x40.8	S 18x54.7	S 12x40.8 w/C ax11.S	S 15x.42.9 w/C 8x11.5	S 18x54.7 w/C 9x13.4	S 18x54.7 w/C10x15.3	S 20x66 w/C 9x.13.4	32 ft
34 ft.	S 12x40.8	S 12x40.8	S 18x54,7	S 15x42.9 w/C 8x11.5	S 15x42.9 w/C 8x11.5	S 18x54.7 w!C9x13.4	S 20x66 w/C 9x13.4	S 20x66 w/C 9x13.4	34 ft.
36 ft.	S 12x40.8	S 12x40.8	S 12x31.8 w/C 9x13.4	S 15x42.9· w/C ffx.11.5	S 15x429w/C8x11.5	S 18x54.7 w/C 20x20.7"	S20x66 w/C 9x13.4	S 20x66 w/C 12x20.7	36 ft

* Rated load is based on maximum combined hoist and trolley weights of: 500 pounds for 1/4, 1/2 and 1ton hoists; 1100 pounds for 1 1/2 and 2 ton hoists; 1600 pounds for 3 and 4 ton hoists; 2000 pounds for 5ton hoists. Bridge designed in accordance with latest edititon of CMAA Specification No. 74, using YALE trolleys.

** Beam sizes: listed are American Standard I-Beam and Channel sections. Use ASTM A36 grade steel, first quality, free of rust and excessive mill scale.

GIRDER SELECTION TABLE - WIDE FLANGE BEAMS

(**) BEAM SIZES FOR VARIOUS SPANS									
Spans To	(*) RATED LOAD IN TONS OF 2000#								Spans To
	1/4	1/2	1	1-1/2	2	3	4	5	
Push or Hand Geared Crane • 54" Wheelbase									
10 ft.	W 6x12	W 6x12	W 8x15	W 10x19	W 12x22	W 10x30	W 14x38	W 18x46	10 ft.
12 ft.	W 6x12	W 6x12	W 8x15	W 10x19	W 12x22	W 12x35	W 18x40	W 18x46	12 ft.
14 ft.	W 6x12	W 6x12	W 8x15	W 10x19	W 10x26	W 12x35	W 18x40	W 18x46	14 ft.
16 ft.	W 6x12	W 8x15	W 8x18	W 10x26	W 14x26	W 14x38	W 16x45	W 16x50	16 ft.
18 ft.	W 8x15	W 8x18	W 8x18	W 10x26	W 10x30	W 18x40	W 16x45	W 18x55	18 ft.
20 ft.	W 8x15	W 8x18	W 8x21	W 10x26	W 10x30	W 18x40	W 18x46	W 16x57	20 ft.
22 ft.	W 8x18	W 8x18	w 10x26	W 10x30	W 14x34	W 12x45	W 16x50	W 16x57	22 ft.
24 ft.	W 8x18	W 8x21	w 10x26	W 10x30	W 12x35	W 16x45	W 16x50	W 16x57	24 ft.
26 ft.	W 8x21	w 10x22	W 10x30	W 12x35	W 14x38	W 14x48	W 14x53	W 18x60	26 ft.
28 ft.	W 10x22	W 10x26	W 10x30	W 14x38	W 12x40	W 14x48	W 16x57	W 18x65	28 ft.
30 ft.	W 10x22	W 10x26	W 14x34	W 12x40	W 14x43	W 14x53	W 18x65	W 18x71	30 ft.
32 ft.	W 10x26	W 10x30	W 12x35	W 14x43	W 14x48	W 18x60	W 16x67	W 16x77	32 ft.
34 ft.	W 10x26	W 12x30	W 14x38	W 14x48	W 14x48	W 18x65	W 16x67	W 16x77	34 ft.
36 ft.	W 10x30	W 14x34	W 12x40	W 14x48	W 14x53	W 16x67	W 16x77	W 16x89	36 ft.
Motor Driven Crane • Single Drive • 36" and 54" Wheelbase									
10 ft.	W 6x12	W 6x12	W 8x15	W 10x19	W 12x22	W 12x35	W 18x40	W 18x46	10 ft.
12 ft.	W 6x12	W 6x12	W 8x15	W 10x19	W 10x26	W 12x35	W 18x40	W 18x46	12 ft.
14 ft.	W 6x12	W 6x12	W 8x18	W 10x26	W 14x26	W 14x38	W 10x45	W 16x50	14 ft.
16 ft.	W 6x12	W 8x15	W 8x18	W 10x26	W 10x30	W 18x40	W 16x45	W 14x53	16 ft.
18 ft.	W 8x15	W 8x18	W 8x21	W 10x26	W 10x30	W 18x40	W 18x46	W 16x57	18 ft.
20 ft.	W 8x18	W 8x18	W 8x21	W 10x30	W 10x30	W 10x45	W 12x50	W 16x57	20 ft.
22 ft.	W 8x18	w 8x21	w 10x26	W 10x30	W 12x35	W 16x45	W 16x50	W 16x57	22 ft.
24 ft.	W 8x18	W 8x21	w 10x26	W 14x34	W 14x38	W 14x48	W 14x53	W 18x65	24 ft.
26 ft.	W 8x21	W 10x26	W 10x30	W 12x35	W 12x40	W 12x50	W 16x57	W 18x65	26 ft.
28 ft.	W 10x22	W 10x26	W 10x33	W 12x40	W 12x40	W 14x53	W 18x65	W 18x71	28 ft.
30 ft.	W 10x26	W 10x30	W 12x35	W 12x40	W 12x45	W 14x53	W 16x67	W 14x74	30 ft.
32 ft.	W 10x26	W 10x30	W 14x38	w 12x45	W 14x48	W 14x61	W 16x67	W 16x77	32 ft.
34 ft.	W 10x30	W 14x34	W 12x40	W 14x48	W 14x53	W 16x67	W 16x67	W 16x89	34 ft.
36 ft.	W 10x30	W 12x35	W 12x40	W 14x53	W 14x61	W 16x67	W 16x77	W 16x89	36 ft.
Motor Driven Crane - Dual Drive • 72" Wheelbase									
38 ft.	W12x35	W12x40	W14x48	W14x61	W16x67	W16x77	W16x89	W18x97	38 ft.
40 ft.	W12x40	W12x45	W14x53	W16x67	W16x67	W16x89	W18x86	W21x101	40 ft.
42 ft.	W12x40	W14x48	W14x61	W16x67	W16x67	W18x86	W18x97	W21x101	42 ft.
44 ft.	W14x43	W14x48	W14x61	W16x67	W16x77	W18x86	W21x101	W21x111	44 ft.
46 ft.	W14x48	W14x53	W16x67	W16x77	W18x76	W18x97	W21x101	W21x111	46 ft.
48 ft.	W14x53	W14x61	W16x67	W18x76	W18x86	W21x101	W21x111	W21x122	48 ft.

* Rated load is based on maximum combined hoist and trolley weights of: 500 pounds for 1/4, 1/2 and 1ton hoists; 1100 pounds for 1 1/2 and 2 ton hoists; 1600 pounds for 3 and 4 ton hoists; 2000 pounds for 5ton hoists. Bridge designed in accordance with latest edititon of CMAA Specification No. 74, using YALE trolleys.

** Beam sizes: listed are American Standard I-Beam and Channel sections. Use ASTM A36 grade steel, first quality, free of rust and excessive mill scale.

CATALOG NUMBER REQUIRED TO BUILD A PUSH CRANE BRIDGE

	For Spans Thru (ft)	Rated Load Range (tons)	1 Pair of End Trucks (Catalog Number)
54" WB (STANDARD)	36	1/4 thru 5	904535
36" WB (OPTIONAL)	24	1/4 thru 5	904535S
72" WB (OPTIONAL)	36	1/4 thru 5	904535L

CATALOG NUMBERS REQUIRED TO BUILD A HAND GEARED CRANE BRIDGE

For Spans Thru (ft)	Rated Load Range (tons)	Catalog Number	Crosst Shaft Support		Cross Shaft Coupling	
			Number Req'd	Catalog Number	Number Req'd	Catalog Number
8	1/4 thru 5	904538 (54" WB STANDARD) Includes: 904536 End Trucks *904539 Chain Wheel & Guide **8282 Hand Chain	0	904540	0	905374
15	1/4 thru 5		0	904540	0	905374
22	1/4 thru 5		1	904540	0	905374
29	1/4 thru 5		2	904540	1	905374
36	1/4 thru 5		3	904540	1	905374
8	1/4 thru 5	904538S (36" WB OPTIONAL) Includes: 904536S End Trucks *904539 Chain Wheel & Guide **8282 Hand Chain	0	904540	0	905374
15	1/4 thru 5		0	904540	0	905374
22	1/4 thru 5		1	904540	0	905374
24	1/4 thru 5		2	904540	1	905374
8	1/4 thru 5	904538L (72" WB OPTIONAL) Includes: 904536L End Trucks *904539L Chain Wheel & Guide **8282 Hand Chain	0	904540L	0	905374
15	1/4 thru 5		0	904540L	0	905374
22	1/4 thru 5		1	904540L	0	905374
29	1/4 thru 5		2	904540L	1	905374
36	1/4 thru 5		3	904540L	1	905374

* Includes one Cross Shaft Support and two Cross Shaft Couplings.
** 36 Ft of hand chain

CATALOG NUMBERS REQUIRED TO BUILD A MOTOR DRIVEN SINGLE DRIVE CRANE BRIDGE SINGLE SPEED

For Spans Thru (ft)	Rated Load Range (tons)	1 Pair of End Trucks (Catalog Number)	Crosst Shaft Support		Cross Shaft Coupling		Gear Reducer			Motor		Control			Fused Disconnect Switch	
			No. Req'd	Catalog Number	No. Req'd	Catalog Number	10:1 Ratio 101 fpm)	15:1 Ratio (67 fpm)	20:1 Ratio (51 fpm)	208-230/460V	575V	208-230V	460V	575V	208-230V	460-575V
8	1/4 thru 5	904536 (54" WB STANDARD)	0	904540	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
15	1/4 thru 5		1	904540	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
22	1/4 thru 5		2	904540	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
29	1/4 thru 5		3	904540	3	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
36	1/4 thru 5		4	904540	3	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
8	1/4 thru 5	904536S (36" WB OPTIONAL)	0	904540	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
15	1/4 thru 5		1	904540	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
22	1/4 thru 5		2	904540	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
8	1/4 thru 5	904536L (72" WB OPTIONAL)	0	904540L	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
15	1/4 thru 5		1	904540L	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
22	1/4 thru 5		2	904540L	2	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
29	1/4 thru 5		3	904540L	3	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389
36	1/4 thru 5		4	904540L	3	905374	905376	905377	905378	32879532	32879533	44600381	44600383	44600384	905388	905389

CATALOG NUMBERS FOR OPTIONAL EQUIPMENT (SINGLE DRIVE CRANE BRIDGE)

Two Speed Motors and Controls

Motor			115V Control		
208-230V	460V	575V	208-230V	460V	575V
32879625	32879626	32879627	44600336	44600393	44600394

Single Phase Motors and Controls

Motor	115V Control	
120V-240V	120V	240V
32879722	44600305	44600315

Ballast Resistors		
208-230V	460V	575V
905391	905392	905393

Electronic Accelleration Control (208-230-460/3/60)	
Single Speed	904596
Two Speed	904598

Fused Disconnect Switch

Voltage	Switch
208-230/3/60	905388
460-575/3/60	905389
120/1/60	905366
240/1/60	905367

Bridge Brake

Voltage	Brake
120-240/1/60	904554
230-460/3/60	904555
575/3/60	904556

Bridge Bumpers	932000

Air Motor Drive Package	51526501

Girder Connection Kits

Bolted Uncoped Girder - 54" WB	912099
Bolted Uncoped Girder - 72" WB	912102
Coped Girder	912101

CATALOG NUMBERS REQUIRED TO BUILD A MOTOR DRIVEN DUAL DRIVE CRANE BRIDGE

Max Capacity (tons)	Max Span (ft)	Speed (fpm)	Rail Size (#/yd)	Kit Consists of				Approx. Shipping Weight	
				Kit Code Number	End truck Code number	Gear Reducer (Qty 2)	Controls & Motor	1 Speed	2 Speed
5	36	50	25 to 40	B05/36TD*50	904536 4' - 6" WB	905378	1 Each Control, 2 Each 1/2 hp Motor, 1 each Disconnect (See below)	575	615
5	36	70	25 to 40	B05/36TD*70		905377		575	615
5	36	100	25 to 40	B05/36TD*100		905376		575	615
5	48	50	40	Not Available					
5	48	70	40	B05/48TD*70	904549 6' - 0" WB	905377	1 Each Control, 2 Each 3/4 hp Motor, 1 each Disconnect (See below)	675	715
5	48	100	40	B05/48TD*100		905376		675	715

* Insert 1 for Single Speed or 2 for Two Speed

MOTORS AND CONTROLS - MOTOR DRIVEN - DUAL DRIVE TOP RUNNING CRANES

Max Span (ft)	Travel Speed (fpm)	No. of Speeds	200-208 Volt Power			230 Volt Power		
			Motor 2 Required	Control 1 Required	Disconnect Switch 1 Required	Motor 2 Required	Control 1 Required	Disconnect Switch 1 Required
36	50, 70 and 100	Single	1/2 hp 32879532	44600326	905388	1/2 hp 32879532	44600326	905388
		Two	1/2 hp 32879624	44600336	905388	1/2 hp 32879625	44600336	905388
48	50	–	Not Available			Not Available		
	70	Single	1/2 hp 32879532	44600326	905388	1/2 hp 32879532	44600326	905388
		Two	1/2 hp 32879624	44600336	905388	1/2 hp 32879625	44600336	905388
	100	Single	3/4 hp 32879542	44600329	905388	3/4 hp 32879542	44600329	905388
		Two	3/4 hp 32879634	44600339	905388	3/4 hp 32879635	44600339	905388

Max Span (ft)	Travel Speed (fpm)	No. of Speeds	460 Volt Power			575 Volt Power		
			Motor 2 Required	Control 1 Required	Disconnect Switch 1 Required	Motor 2 Required	Control 1 Required	Disconnect Switch 1 Required
36	50, 70 and 100	Single	1/2 hp 32879532	44600383	905389	1/2 hp 32879533	44600384	905389
		Two	1/2 hp 32879626	44600393	905389	1/2 hp 32879627	44600394	905389
48	50	–	Not Available			Not Available		
	70	Single	1/2 hp 32879532	44600383	905389	1/2 hp 32879533	44600384	905389
		Two	1/2 hp 32879626	44600393	905389	1/2 hp 32879627	44600394	905389
	100	Single	3/4 hp 32879542	44600327	905389	3/4 hp 32879543	44600328	905389
		Two	3/4 hp 32879636	44600337	905389	3/4 hp 32879637	44600338	905389

GENERAL CONTINUED

The proper catalog numbers must be ordered to build the crane required. For a push crane only one catalog number is required. Three are required for a hand geared crane, seven are required for a single motor driven crane and five are required for a dual drive motor driven crane. Options are also available. Catalog numbers are shown on pages 3 through 6.

End trucks have 8" diameter wheels.. Minimum recommended runway rail is ASCE 20#. Maximum size runway rail for minimum CMAA Specification No. 74 float of 3/4" is ASCE 45#. Maximum permissible rail size is ASCE 60# with a reduced float of 3/8". Width between wheel flanges is 2-3/4".

NOTICE

When installing a crane on existing runways, make sure rails are straight and parallel within tolerances shown below. Reposition rail if necessary.

Runway beams must be properly designed to support bridge, hoist, trolley and rated load. Runway rails must be level and parallel within ± 1/8". Maximum slope of runway must not be more than 1/16" in 1 foot. Rail separation at joints should not exceed 1/32". Runway stops must be positioned to contact both ends of the crane simultaneously.

Maximum allowable wheel load determined in accordance with CMAA Specification No. 74 is 6500 pounds. Weight of one 54" wheelbase end truck is 225 pounds and of one 72" wheelbase truck is 300 lbs.

MATERIAL TO BE PURCHASED LOCALLY TO COMPLETE A CRANE BRIDGE

Bridge Beam

Obtain one length of American Standard I-Beam Section at the size recommended (see chart on page 2) or American Standard Wide Flange Beam Section at the size recommended (see chart on page 3) for the required capacity and span of bridge. The beam selected should be reviewed by a structural engineer for the application. The beam that you order must be a minimum length of the span plus 9-1/4". The beam selected must be straight with flanges parallel to each other and flanges at 90 degrees to the web . See Figure 2. For long spans with the larger rated loads, a channel is also required. The channel must be a minimum length of the span minus 4'-0".

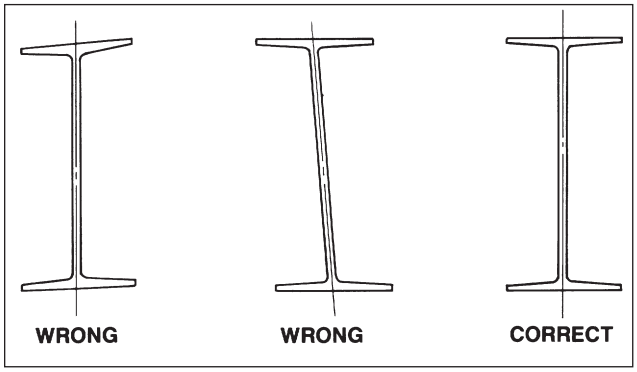


Figure 2. Correct Beam Selection

Trolley Stops

Four (4) angles must be cut to size and installed at the ends of the bridge girder per Figure 13.

⚠ WARNING

Trolley stops (clip angles) must be installed on both ends of bridge beam (see Figure 13) to prevent hoist · trolley from running off end of beam, which could result in injury to operator and others and damage to load and other property.

Cross Shaft

For hand geared and motor driven single drive cranes, cross shafts are also required. The cross shafts are to be 1" diameter AISI 1018 cold drawn steel with a standard mill tolerance of + .000", - .002". For spans thru 22'-0", only one length of cross shaft is required and the length required is the span minus 2'-2-1/2". For spans over 22'-0", two lengths of cross shaft are required. One length is to be 14'-9" and the other is to be the span minus 16'-11-5/8". Shaft lengths may be equalized if care is taken to clear supports.

NOTICE

A . All of the tables used in selection of structural steel beams have been produced by our engineering department using well established design guides for this type of crane bridge. IT IS IMPORTANT THAT ALL INSTRUCTIONS BE FOLLOWED AND THAT RECOMMENDED COMPONENT APPLICATION LIMITS NOT BE EXCEEDED.

B. Assembly of beam and channel requires welding. IT IS EXTREMELY IMPORTANT TO THE SAFETY OF THIS BRIDGE THAT THIS WELDING BE DONE BY A COMPETENT WELL TRAINED WELDER. It is our strong recommendation that the welder used in this construction be qualified as prescribed by the American Welding Society (AWS) Specification for Welding Industrial and Mill Cranes D14.1 - latest issue.

FABRICATION OF GIRDER FOR BRIDGE BEAM WITH CAPPING CHANNEL

Refer to Figure 3. Place channel on supports as shown in Step I. The I-beam is sighted for camber and placed with camber in direction shown in Step II. Weld one end of channel to the I-beam. Clamp, with "C" clamps, the channel to the I-beam flange - provide sufficient "C" clamps so as to hold channel in contact with the I-beam. Weld in accordance with the weld information given, starting at one end, staggering weld from side-to-side, proceeding to the opposite end without interruption. It is important to stagger weld from side-to-side in order to retain beam straightness. After welding, draw a taut string from end to end of beam as shown. Beam should either be parallel to string or have some camber. Camber should not exceed 1/800 of span.

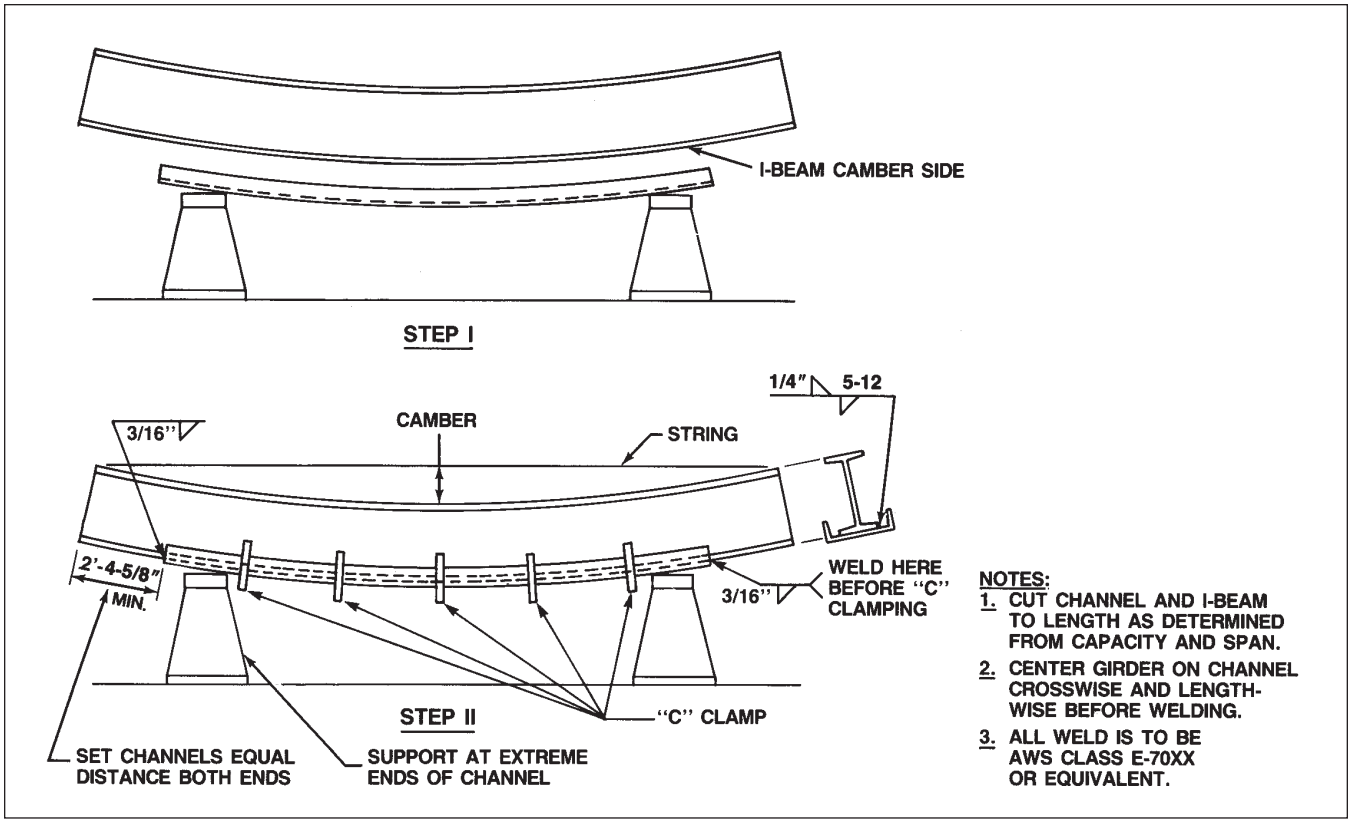


FIgure 3.

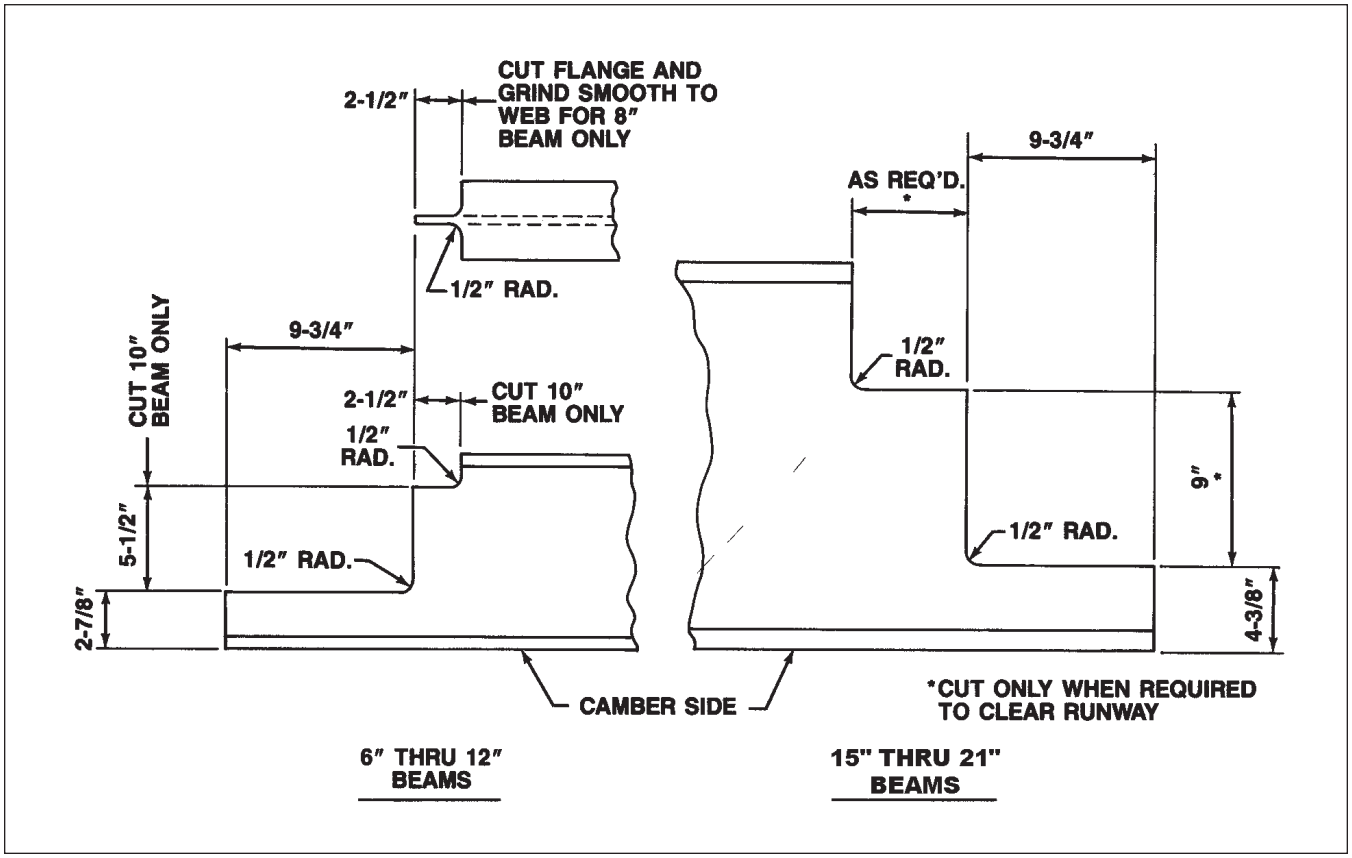


FIgure 4. Cutting Diagram

NOTCHING OF BRIDGE BEAM TO FIT END TRUCKS

Note the bridge beam end connections shown in Figure 11. If adequate headroom is available above the truck, there is an optional end connection shown for push cranes for 6", 7" and 8" beams only that does not require notching of the beam.

If notching is required, set beam on supports as shown in Step 1 of Figure 3. If a channel has been welded to the beam, the beam is already in the proper position. Cut notches in both ends of the beam using cutting diagram of Figure 4 and the proper dimensions for the required beam size. Notch is made by cutting torch with the burned area smoothed by grinding.

INSTRUCTIONS FOR ASSEMBLING PUSH BRIDGE WITH COPED GIRDER

1. Turn beam over on supports with camber side up. When setting up beam on supports, make certain that the bottom flange is level as shown in Figure 5. The larger wheel flange goes inside the span.
2. Position long angles from kit as shown in Figure 11 and securely clamp into place.
3. Set up, square, block and securely clamp trucks into position as shown in Figure 11. Make certain trucks are level with each other and are level with bottom flange of bridge beam as shown in Figure 5 (it is possible that top flange of beam may not be level even though bottom flange is). When leveling trucks, use either the centerline of the wheel axles or the diameter of the wheels. DO NOT LEVEL FROM TRUCK STRUCTURE. Correct operation of hoist-trolley unit requires that the bottom flange be level.
4. For beams over 7" deep; when leveling the bottom flange of the bridge beam, clamp the short angle in position shown in Figure 6 to secure the position of the beam. Discard short angles for 6" and 7" beams.
5. Square end truck to end of bridge beam at one end of beam. Make sure trucks are parallel by measuring outside of wheel flanges across span at both ends of truck with end play for all wheels taken up in one direction.
6. Check center to center of trucks. This may be done by measuring from the inside edge of the truck at one end of the bridge to the outside corresponding edge of the truck at the other end of the bridge. This should equal the span length.
7. When all dimensions are confirmed, bottom flange of bridge beam is parallel to wheels of truck and truck is securely clamped to bridge beam, weld the two long angles at each end of the bridge beam to the web as shown in Figure 6.
8. Drill 4 holes 41/64" diameter thru truck flanges using holes in angles as a template at both ends of bridge.
9. For beams over 7" deep, weld the short angle at each end of the bridge beam to the web as shown in Figure 6.
10. Drill 2 holes 41/64" diameter thru bridge beam web, using holes in angle as a template, in locations shown in Figure 6, at both ends of bridge.
11. Assemble long angles to truck flange using eight (four at each end of bridge) 5/8" diameter bolts furnished with kit. Put one flat washer under bolt head and one under the self-locking nut.

Tighten all bolts and nuts using the turn-of-nut method. This is done by alternately bringing bolts and nuts to a "snug-tight" condition to ensure that mating surfaces are brought into full contact with each other. Then, make a final 1/2 turn on all bolts and nuts.

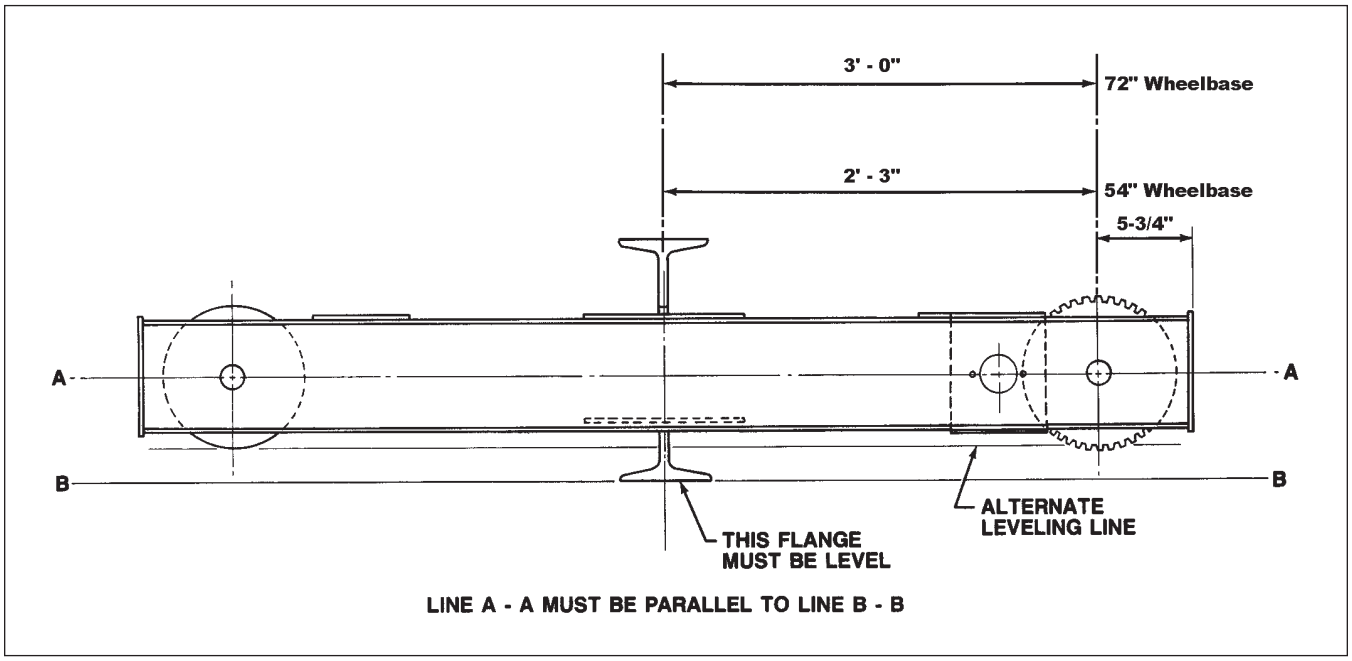


Figure 5. Method of Setting End Truck to Girder.

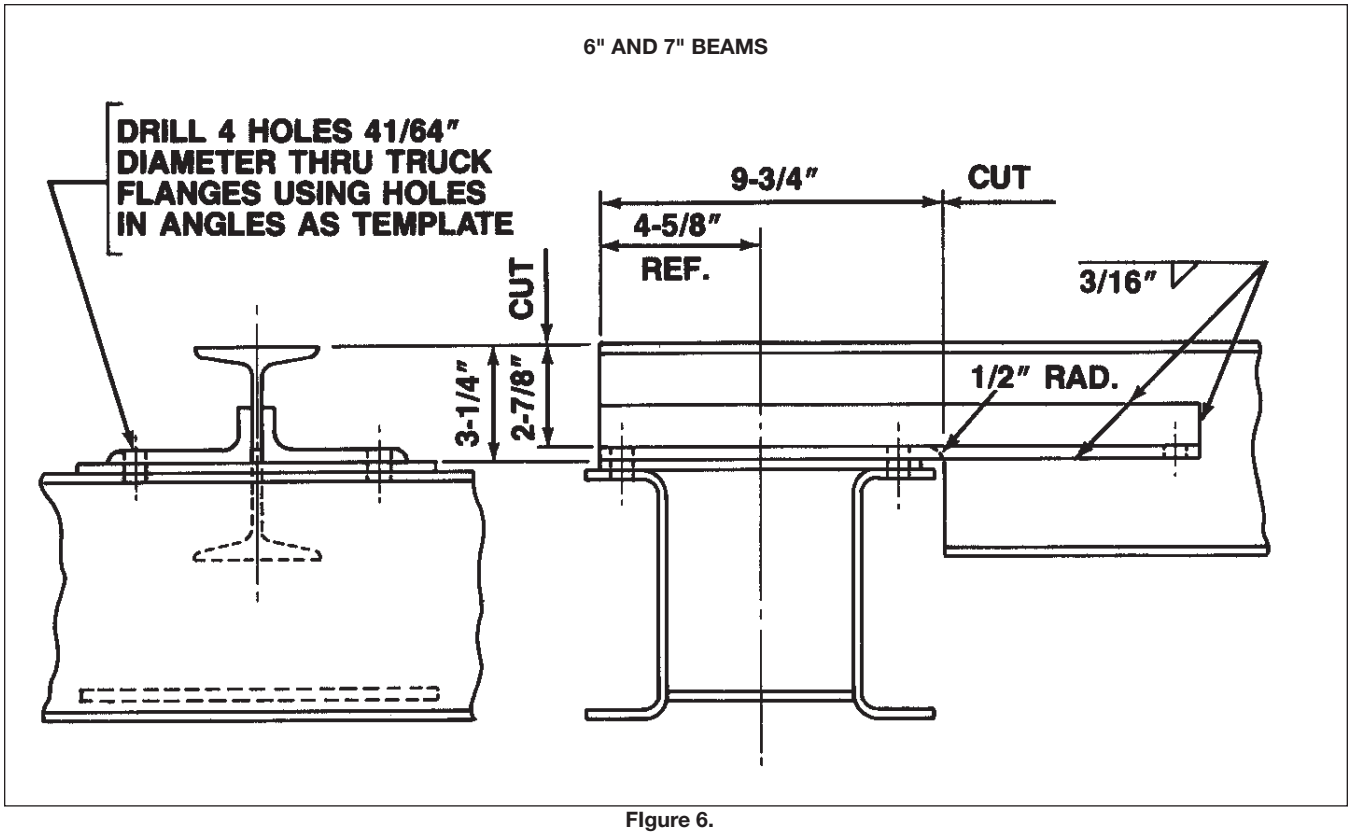


FIgure 6.

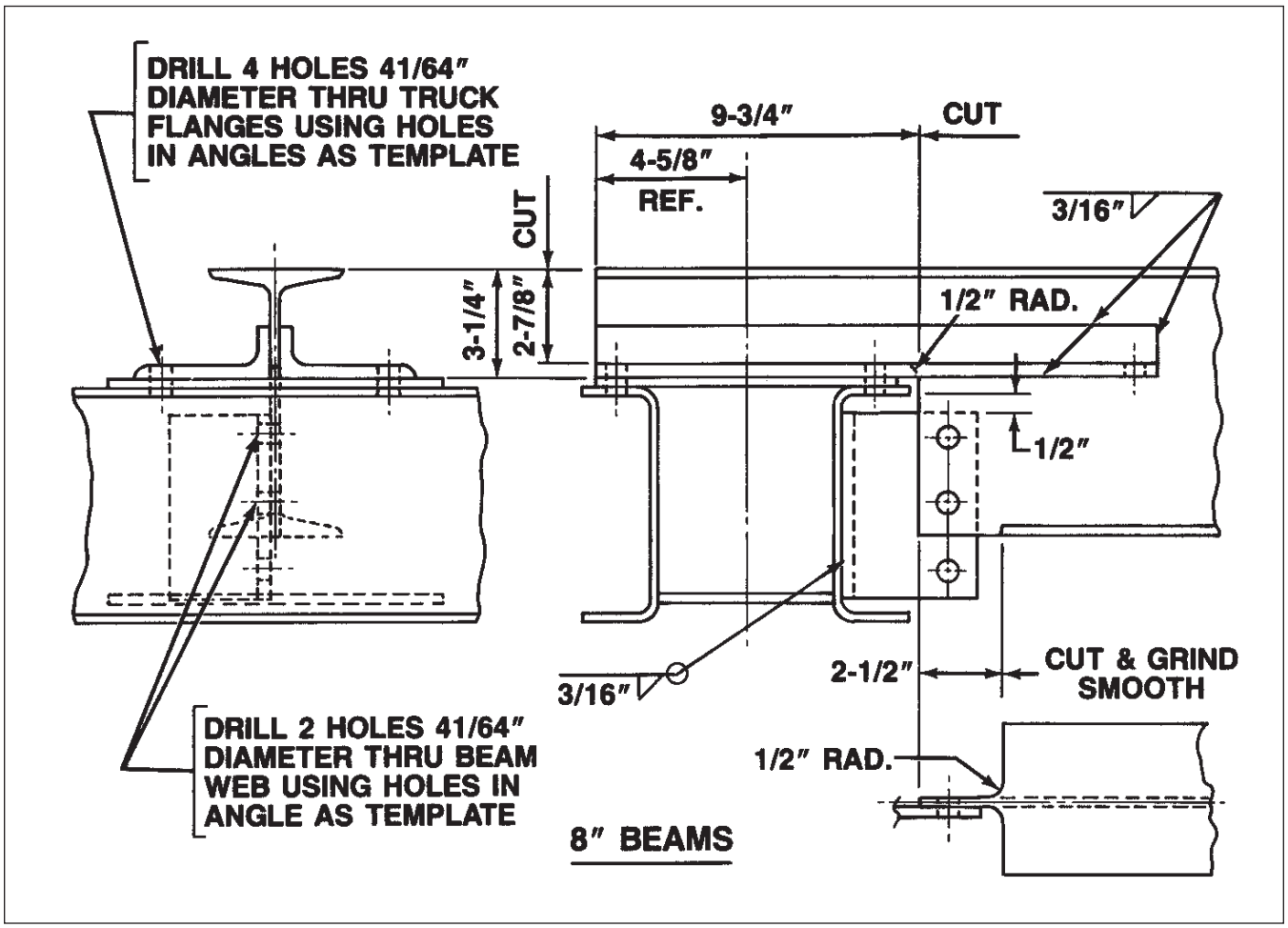


FIgure 7.

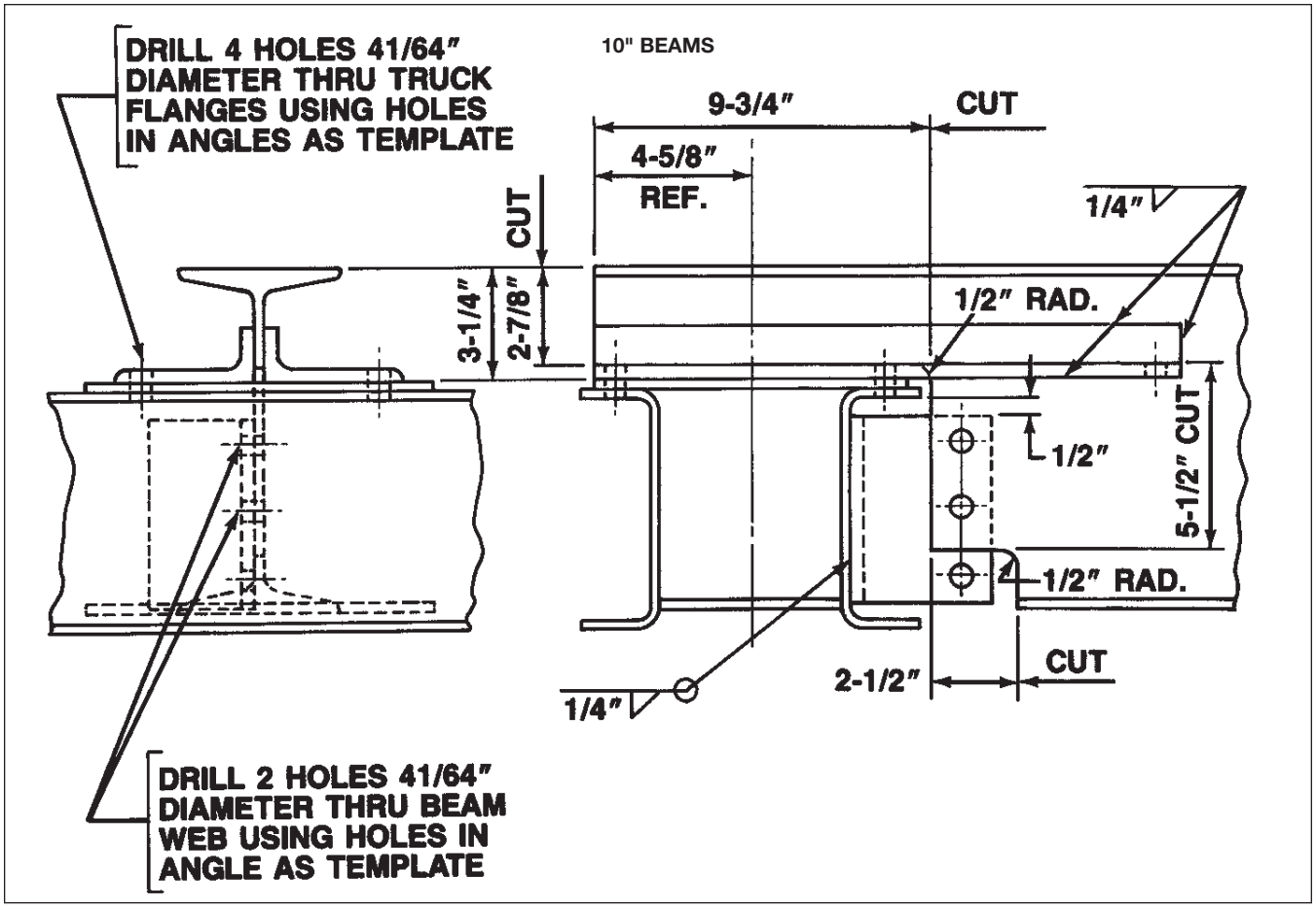


FIgure 8.

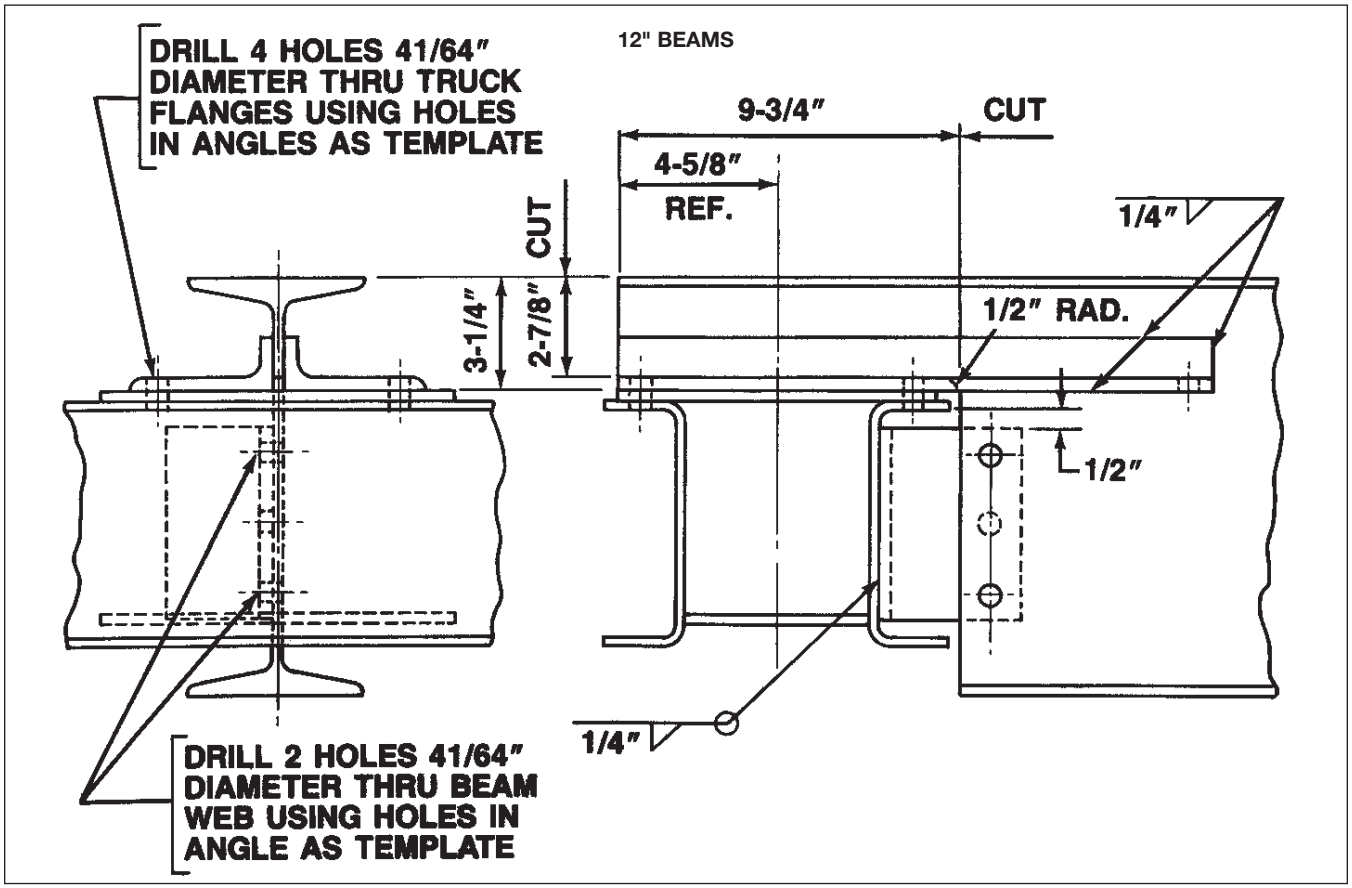


FIgure 9.

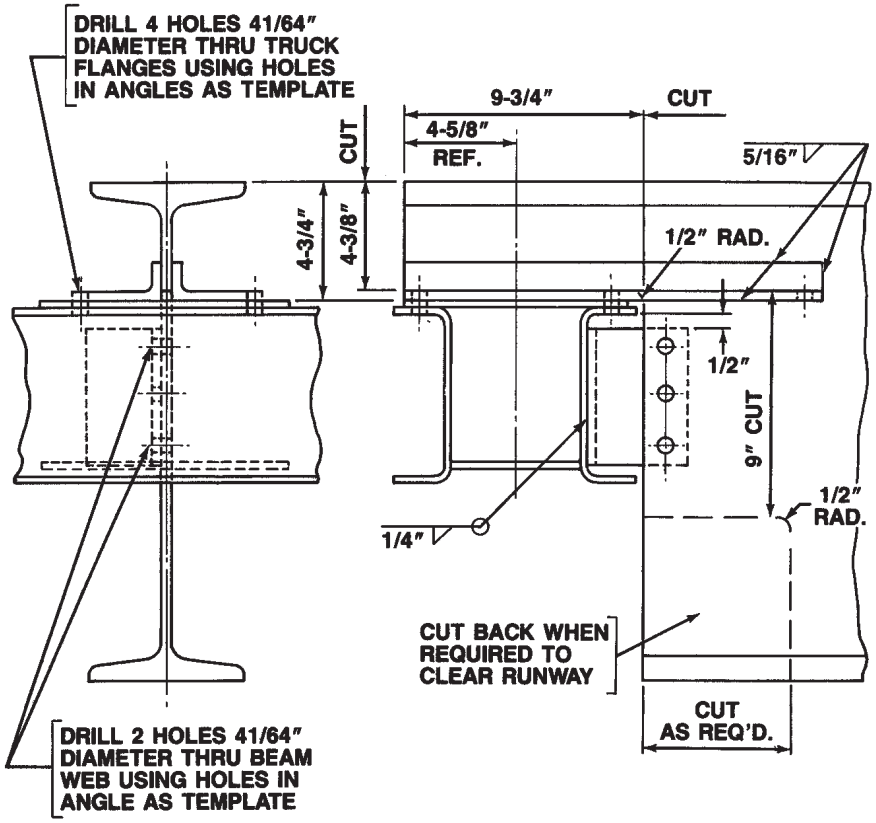


FIgure 10.

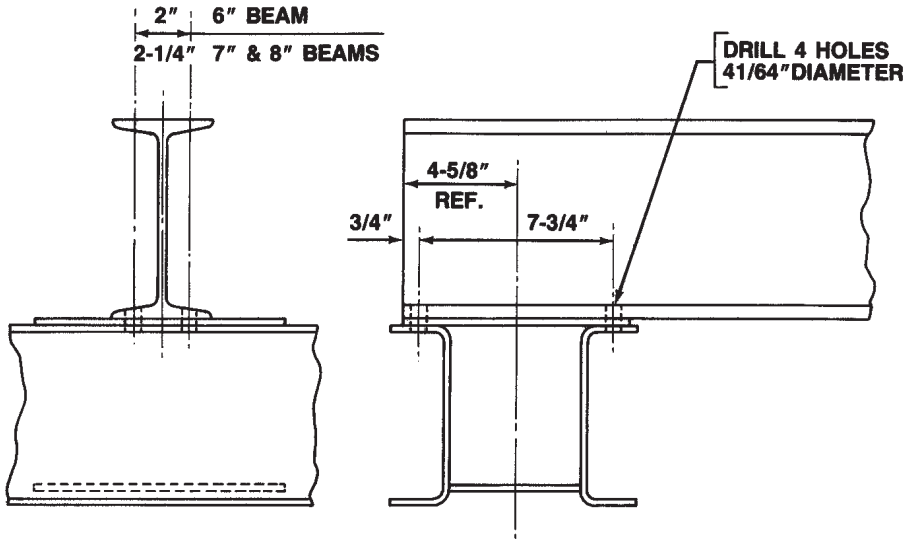
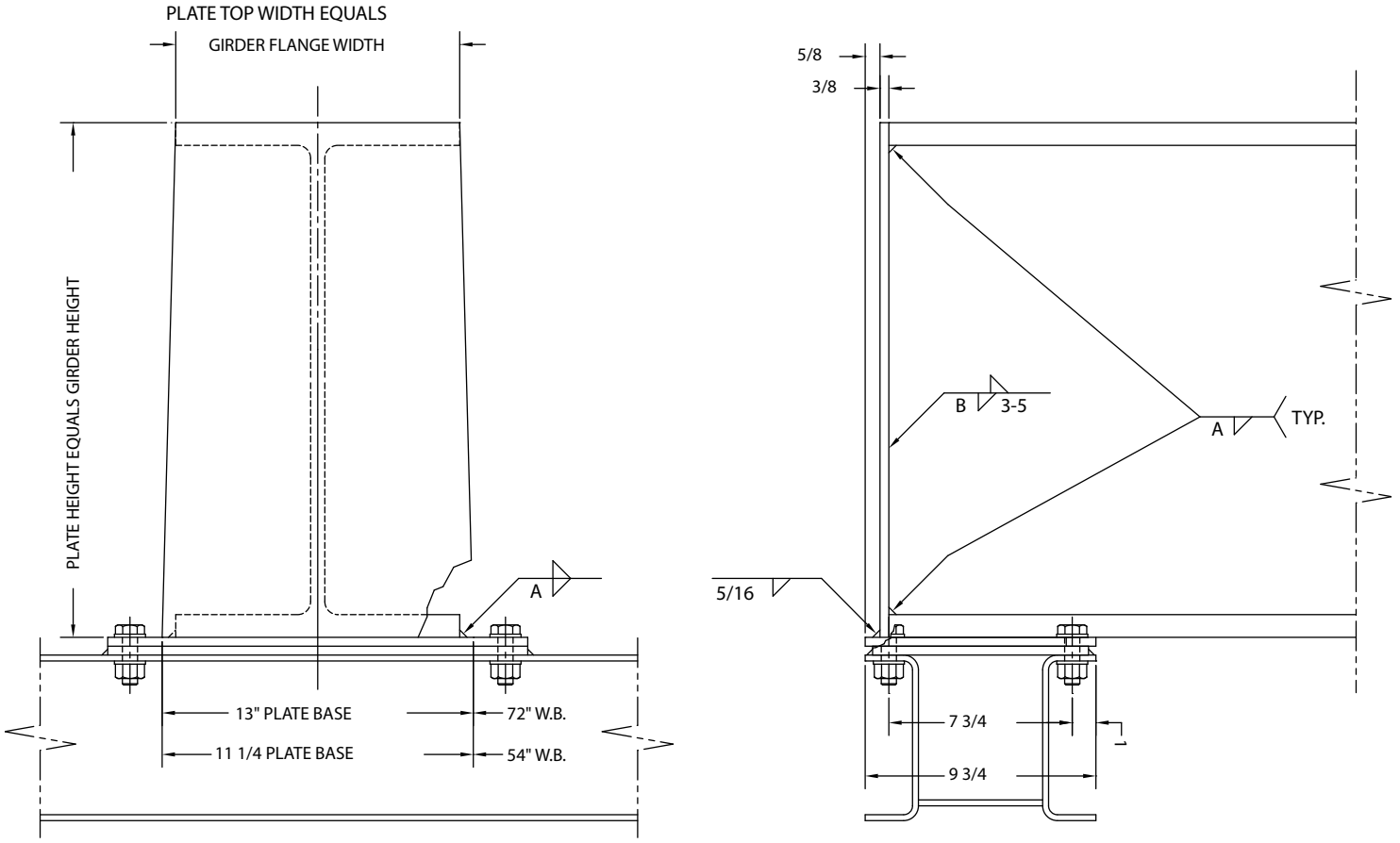


Figure 11. Bridge Beam End Connections.
All weld is to be AWS Class E-70XX or equivalent.



Weld Size 'A' - Girder Flange Thickness Minus 1/16" But not greater than 5/16"
Weld Size 'B' - Girder Web Thickness Minus 1/16" But not greater than 5/16"

Figure 11a. Bridge Beam End Connections.
All weld is to be AWS Class E-70XX or equivalent.

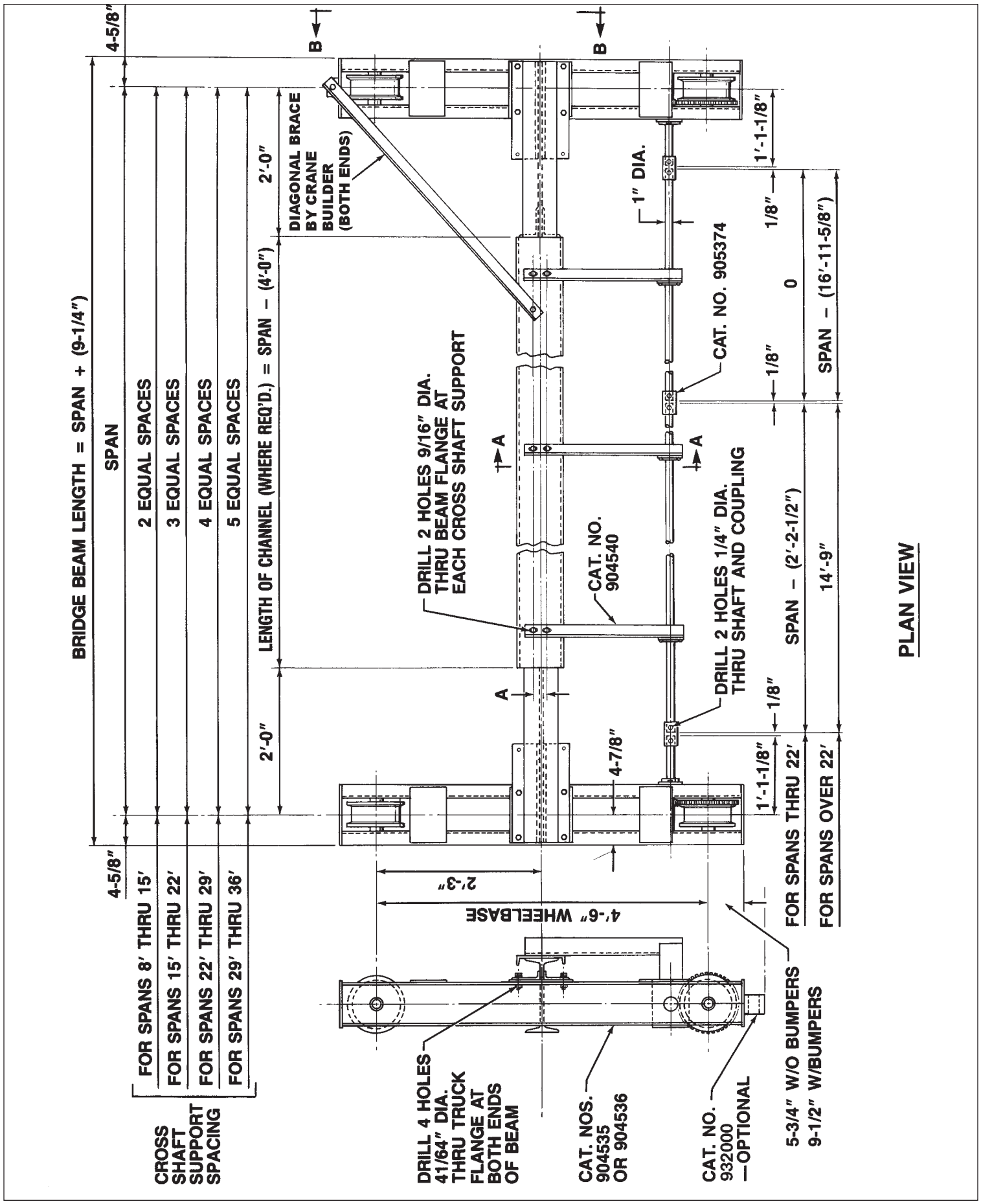
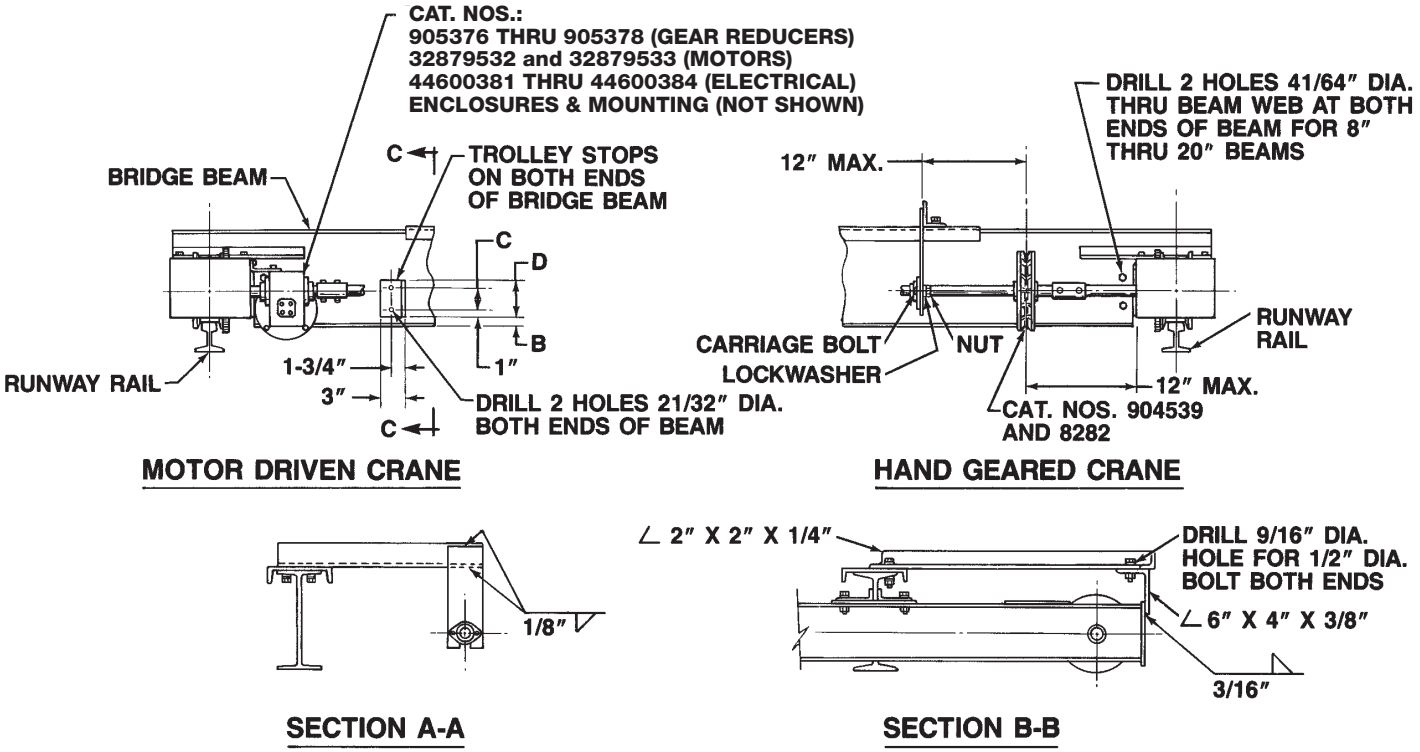
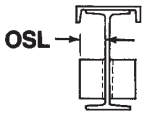

BRIDGE BEAM LENGTH = SPAN + (9-1/4")
SPAN
4-5/8"
4-5/8"
CROSS SHAFT SUPPORT SPACING
FOR SPANS 8' THRU 15'
2 EQUAL SPACES
FOR SPANS 15' THRU 22'
3 EQUAL SPACES
FOR SPANS 22' THRU 29'
4 EQUAL SPACES
FOR SPANS 29' THRU 36'
5 EQUAL SPACES
LENGTH OF CHANNEL (WHERE REQ'D.) = SPAN – (4'-0")
2'-0"
2'-0"
DIAGONAL BRACE BY CRANE BUILDER (BOTH ENDS)
B
B
A
A
A
DRILL 2 HOLES 9/16" DIA. THRU BEAM FLANGE AT EACH CROSS SHAFT SUPPORT
CAT. NO. 904540
DRILL 2 HOLES 1/4" DIA. THRU SHAFT AND COUPLING
1" DIA.
CAT. NO. 905374
1'-1-1/8"
1/8"
0
1/8"
SPAN – (16'-11-5/8")
SPAN – (2'-2-1/2")
14'-9"
1/8"
1'-1-1/8"
4-7/8"
FOR SPANS THRU 22'
FOR SPANS OVER 22'
2'-3"
4'-6" WHEELBASE
DRILL 4 HOLES 41/64" DIA. THRU TRUCK FLANGE AT BOTH ENDS OF BEAM
CAT. NOS. 904535 OR 904536
CAT. NO. 932000 —OPTIONAL
5-3/4" W/O BUMPERS
9-1/2" W/BUMPERS
PLAN VIEW

FIgure 12.



Size of Bridge Beam	A	Trolley Stop Angle Size* (4 Req'd.)	B	C	D	OSL
6" x 12.5	2"	3x 3 x 3/8	1"	2"	4"	1-1/2"
7" x 15.3	2-1/4"	3x 3 x 3/8	1·	3•	5"	1-5/8'
8" x 18.4	2-1/4'	3x 3 x 3/8	1'	3•	5'	1-3/4'
10''x 25.4	2-3/4'	3-1/2 x 3 x 3/8	1-1/4'	3'	5•	2-1/8'
12" x 31.8	3'	3-1/2 x 3 x 3/8	1-1/4'	3•	5'	2-1/4'
15" x 42.9	3-1/2'	4 x 3x 3/8	1-1/2'	3"	5'	2-112'
18" x 54.7	3-1/2'	4 x 3x 3/8	1-1/2"	3"	5'	2-3/4'
20· x 66	3-1/2'	5 x 3 x 3/8	1-3/4'	3"	5'	2-3/4'

•Trolley frame or bumpers should contact trolley stops. If not, cut out standing leg (OSL) back to dimension shown.



SECTION C-C

Figure 13

TYPICAL REQUIRED UNCOPED GIRDER END BRACING
PROVIDED AND INSTALLED BY CRANE BUILDER

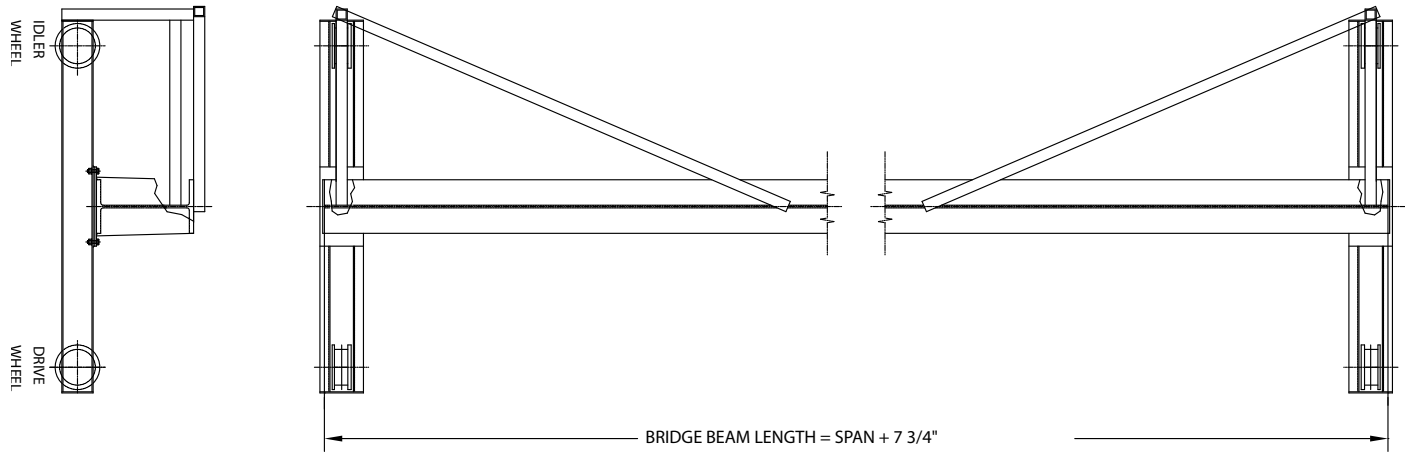


Figure 13a.

⚠ CAUTION

Do not substitute standard bolts and nuts for the special truck connecting bolts and nuts furnished with kit. Only high-strength bolts (S.A.E., grade 5) and elastic collared self-locking nuts, as furnished, are acceptable for attaching truck frames to bridge beam. High strength bolts are identified on the top of the head by three radial lines, equally spaced at 120 degrees. Self-locking nuts must have two threads, minimum extending thru nut. If necessary, discard flat washer to get two threads.

12. For bridge beams over 7", bolt short angle welded at truck to bridge beam web with four (two at each end of bridge) 5/8" diameter bolts furnished with kit. Tighten using turn-of-nut method.
13. Optional End Connection for 6", 7" and 8" Beams Only.
    a. Drill 4 holes 41/64" diameter thru bridge beam lower flange and truck flanges in locations shown in Figure 11 at both ends of bridge.
    b. Assemble beam to truck using eight (four at each end of bridge) 5/8" diameter bolts furnished with kit. Put beveled washer under bolt head and against I-beam flange .Use self-locking nut (no flat washer) and tighten using turn-of-nut method.
14. Mount trolley stops to I-beam web in position shown in Figure 13. Stops may be welded or bolted in place. If bolted, drill holes using 21/32" diameter drill as indicated in Figure 13. 5/8" diameter bolts with self-locking nuts should be used to secure stops.
15. If it is desired to increase the rigidity of the bridge, four angles (one to each corner) may be added in the position shown as "Optional" (at 45° to the bridge I-beam) in Figure 12. On a motor driven crane it may be necessary to move the electrical enclosure for clearance reasons.

INSTRUCTIONS FOR ASSEMBLING PUSH BRIDGE WITH UNCOPED GIRDER

1. Turn Beam over on supports with camber side up. When setting up beam on supports, make certain that the bottom flange is level as shown in Figure 5.The larger wheel flange goes inside the span.
2. Position girder mounting plates on top of each truck center plate and clamp securely. Drill 4 holes 41/64" diameter through truck center plate and flanges of truck channels using holes in girder mounting plate as template.
3. Assemble girder mounting plate to top plate of each truck using eight (four at each end of bridge) 5/8" diameter high strength grade 5 bolts furnished with end connection kit. Put one flat washer under bolt head and one under the self-locking nut.

   Tighten all bolts and nuts using the turn-of-nut method. This is done by alternately bringing bolts and nuts to a "snug-tight" condition to ensure that mating surfaces are brought into full contact with each other. Then, make a final 1/2 tum on all bolts and nuts.
4. Set up, square, block and securely clamp trucks into position as shown in Figure 11a. Make certain trucks are level with each other and are level with bottom flange of bridge beam as shown in Figure 5 (it is possible that top flange of bean may not be level even though bottom flange is). When leveling trucks use either the centerline of the wheel axles or the diameter of the wheels.

   DO NOT LEVEL FROM TRUCK STRUCTURE .Correct operation of hoist-trolley requires that the bottom flange be level.
5. Square end truck to end of bridge beam at one end of beam. Make sure trucks are parallel by measuring outside of wheel flanges across span at both ends of truck with end play for all wheels taken up in one direction.
6. Check center to center of trucks. This may be done by measuring from the inside edge of the truck at one end of the bridge to the outside corresponding edge of the truck at the other end of the bridge. This should equal the span length.
7. When all dimensions are confirmed, bottom flange of bridge beam is parallel to wheels of truck and truck is securely clamped to bridge beam, weld the girder bottom flange to the girder mounting plate as shown in Figure 11a.
8. Cut 3/8" girder end cap plate and weld to end of girder and girder mounting plate as shown in Figure 11a.
9. To provide rigidity to the bridge, four braces (one to each corner and one to girder web parallel to truck) shall be added in the position shown in Figure 13a. On a motor driven crane it may be necessary to move the electrical enclosure for clearance.
10. Mount trolley stops to beam girder web in position shown in Figure 13. Stops may be welded or bolted in place. If bolted, drill holes using 21/32" diameter drill as indicated in Figure 13. 5/8" diameter bolts with self-locking nuts should be used to secure stops. Stop material by customer.

INSTRUCTIONS FOR ASSEMBLING HAND GEARED CRANE BRIDGE

1. Follow instructions for assembling the appropriate push crane bridge.
2. Locate and drill holes for cross shaft supports.
3. Bolt the cross shaft support angles to the bridge beam. The flat washer goes under the bolt head and the beveled washer goes between the beam flange and the lockwasher and nut.
4. Attach a flange bearing to each cross shaft support plate with two carriage bolts, lockwashers and hex nuts. The carriage bolt head locks in the bearing (see Figure 18).
5. Place the proper number of bearings and couplings on the cross shaft, set the unit in place and clamp the cross shaft support plates to the cross shaft support angles. The hand chain wheel and chain guide must also be placed on the cross shaft before placing. They may be positioned anywhere across the span, but must be within 12" of a cross shaft support or truck.
6. Check horizontal alignment of the cross shaft by using a taut line. Weld plates to angles when alignment is complete. Weld as shown in Section A-A of Figure 13.
7. Check the space between ends of cross shafts; it should be 1/8". Position the couplings and drill 1/4" diameter holes through the shaft and coupling using the holes in one side of the coupling as a guide. Shaft and coupling is secured by socket head cap screws with flat washers and self-locking hex nuts (see Figure 19). Tighten set screws in flange bearings.
8. Set position of hand chain wheel and chain guide (within 12" of cross shaft bracket or truck) with set screw on hand chain wheel. Determine length of operating hand chain (chain should hang about 2 feet 6 inches above floor},cut chain and make it endless by installing and closing open link. furnished with chain.

INSTRUCTIONS FOR ASSEMBLING MOTOR DRIVEN SINGLE DRIVE CRANE BRIDGE

1. Follow instructions for assembling push crane bridge.
2. Locate and drill holes for cross shaft supports.
3. Bolt the cross shaft support angles to the bridge beam. The flat washer goes under the bolt head and the beveled washer goes between the beam flange and the lockwasher and nut.
4. Bolt the motor to the gear reducer with four hex head bolts and lockwashers and bolt the support plate to the gear reducer with two hex socket head cap screws and lockwashers. The drive may go on either end of the bridge. Optional motor-gear reducer locations are shown in Figure 14.
5. Place key in truck drive shaft, slide gear reducer into place over shaft and bolt support plate to side of truck with two hex socket head cap screws and lockwashers. Maximum allowable torque is 10 pound feet. Tighten six set screws in gear reducer hollow shaft.
6. Using the 9/32" diameter hole in the support plate as a guide, drill a 5/16" diameter hole through the support plate and truck side and drive the groove pin, furnished, into the hole (Ref. No. 4 in Figure 21).
7. Attach a flange bearing to each cross shaft support plate with two carriage bolts, lockwashers and hex nuts. The carriage bolt head locks in the bearing (see Figure 18).
8. Place the proper number of bearings and couplings on the cross shaft, set the unit in place and clamp the cross shaft support plates to the cross shaft support angles.
9. Check horizontal alignment of the cross shaft by using a taut line. Weld plates to angles when alignment is complete. Weld as shown in Section A-A of Figure 13.
10. Check the space between cross shafts; it should be 1/8". Position the couplings and drill 1/4" diameter holes through the shaft and coupling using the holes in one side of the coupling as a guide. Shaft and coupling is secured by socket head cap screws with flat washers and self-locking hex nuts (see Figure 19). Tighten set screws in flange bearings.
11. The electrical enclosure is typically mounted on the inside of the truck over the gear reducer. The connecting bracket may be mounted in any of 3 vertical locations on the enclosure bracket when oriented as shown in Figure 23. It may also be rotated 180° (outstanding leg at top) giving 3 additional positions. The enclosure bracket may also be adjusted horizontally on the enclosure. The connecting bracket may be welded to a truck or to the girder. If the bracket rests on the supporting member, a 1" minimum overlap is required. Weld as shown in Figure 15. If the bracket is to be supported by weld at the toe only, a stiffener plate must be furnished by the crane fabricator. Weld as shown in the alternate view in Figure 15.
12. Mount fused disconnect switch in any safe, convenient location.

INSTRUCTIONS FOR ASSEMBLING MOTOR DRIVEN DUAL DRIVE CRANE BRIDGE

1. Follow instructions for assembling push crane bridge.
2. Bolt the motors to the gear reducers with four hex head bolts and lockwashers orienting the motor junction boxes appropriately after selecting the motor-gear reducer location from the options illustrated in Figure 14. Bolt the support plate to the gear reducer with two hex socket head cap screws and lockwashers .
3. Place the key in the truck drive shaft and slide the gear reducer hollow shaft onto the drive shaft over the key. Bolt the support plate to the side of the truck with two hex socket head cap screws and lockwashers . Maximum allowable bolt torque is 10 pound feet.
4. Repeat instruction 3 at the opposite end truck.
5. The electrical enclosure is typically mounted on the inside of the truck over the gear reducer. The connecting bracket may be mounted in any of 3 vertical locations on the enclosure bracket when oriented as shown. It may also be rotated 180° (outstanding leg at top) giving 3 additional positions. The enclosure bracket may also be adjusted horizontally on the enclosure. The connecting bracket may be welded to a truck or to the girder. If the bracket rests on the supporting member; a 1" minimum overlap is required. Weld as shown in Figure 15. If the bracket is to be supported by weld at the toe only, a stiffener plate must be furnished by the crane bridge fabricator. Weld as shown in the alternate view in Figure 15.
6. Mount fused disconnect switch in any safe convenient location.

PAINTING

After assembly, all plain steel surfaces should be painted. Thoroughly clean surfaces of oily spots and rust using a suitable solvent. It is recommended that a national brand zinc-chromate primer be applied before a finish coat of high gloss enamel especially suited for steel surfaces.

MARKING

Codes require that the capacity of the bridge be shown on both sides of crane bridge, legible from the floor. Normal practice for marking is to use capacity in tons, for example: 1 TON, 2 TON, etc. Stencil forms are readily available that may be used with brush-on or pressurized spray-can paint.

NOTICE
The crane builder and user are responsible for marking crane and also to check for compliance with all local, state and national codes.

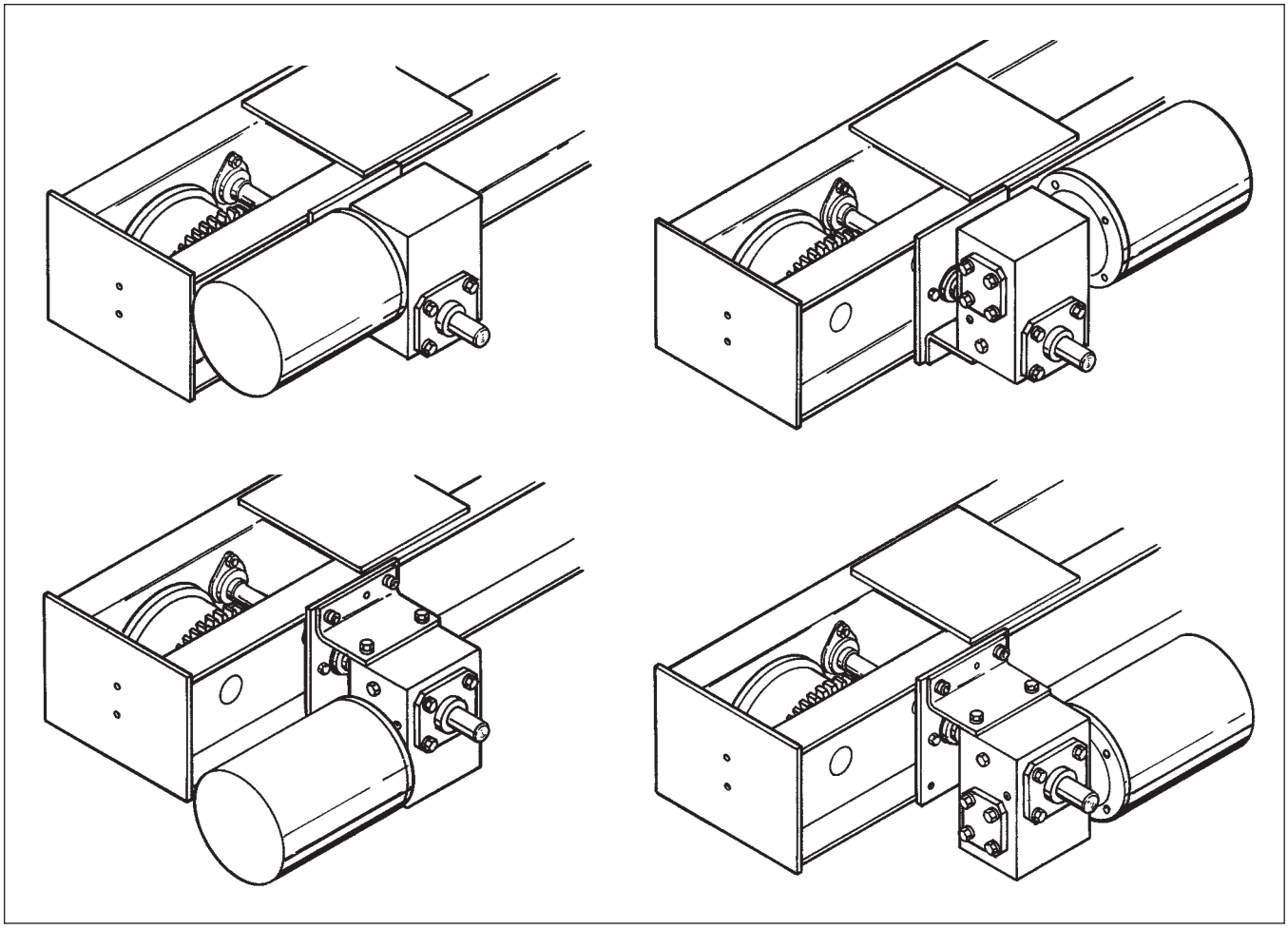


Figure 14

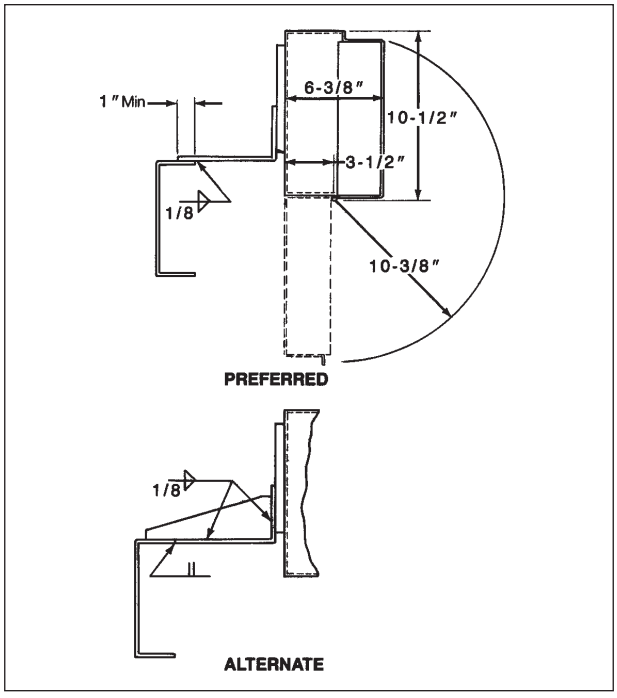


Figure 15

INSTALLATION OF CRANE BRIDGE

⚠ WARNING

Be certain that electrical power supply to runway current conductors {if used) is "off' and locked in the open position.

1. Assure lifting equipment is adequate to lift total weight of crane.
2. Carefully set crane bridge onto runway. Check to see that runway stops have been installed and that they engage the ends of the end trucks simultaneously.

⚠ WARNING

Runway stops must be installed to prevent crane bridge from running off the end of the runway rail resulting in injury to the operator and others and damages to load and other property.

3. After crane is placed on runway rail, check wheel flange clearances to rail. Clearance between side of rail head and inside flange of wheel will vary from 1-3/8" for an ASCE 20# runway rail (minimum recommended rail size) to 3/8" for an ASCE 60# runway rail (maximum recommended rail size).
4. When applicable follow National, State and Local electrical codes when providing electrical service to crane bridge. Make electrical connections according to the wiring diagrams furnished with the crane bridge.

⚠ CAUTION

Power supply must be same voltage, phase and frequency as specified on crane bridge motor nameplate.

⚠ CAUTION

Do not attempt to operate crane bridge before completing tests and adjustments.

⚠ WARNING

This equipment must be effectively grounded according to the National Electrical Code, or other applicable codes. Certain environments may prevent proper grounding by this means and in this case a separate grounding conductor should be provided.

FUSE AND MAINLINE DISCONNECT PANELS

Mainline disconnect panels and fused bridge control panels are provided as options to assist users in complying with OSHA and NEC codes. When ordered with crane bridge kits, they will be completely installed inside of electrical enclosures.

Electrical service shall be connected to crane equipped with fuse panels and mainline disconnect panels as shown in wiring diagram.

OPERATING PRECAUTIONS

DO NOT load bridge beyond rated capacity .

DO NOT subject bridge to side loads. Always center trolley over load when hoisting.

DO NOT stand on and **DO NOT** cause or allow others to stand on or get under any load the bridge is supporting. **DO** keep clear, and make sure others keep clear, of any load the bridge is supporting.

DO NOT ram bridge into runway stops, another bridge, or any obstruction on runway rails. Improper and careless operation can result in a hazardous condition for operator and load.

ALWAYS be sure load is clear of obstruction before traversing load.

⚠ WARNING

These crane bridges are not designed nor intended to be used for support or transport of people or for transporting loads over people.

If crane bridge is mounted on an open-end runway rail, then runway stops must be installed to prevent crane bridge from running off the end of the runway rail resulting in injury to the operator and others and damages to load and other property.

Refer to hoist and trolley instruction manuals for safety warnings on hoists and trolleys.

Read and comply with ANSI B30.16 Overhead Hoists (Underhung) and ANSI B30.17 Overhead and Gantry Cranes (Top running bridge, Single Girder, Underhung Hoist), latest editions.

MAINTENANCE AND LUBRICATION

1. Inspect the bridge on a regular maintenance schedule. Check to make sure wheel axle bolts and all connections are tight. Check wheel tread surfaces for wear or damage. Check truck sides for any evidence of overload or damage. Replace any worn or damaged parts using only factory approved replacement parts.
2. Lubrication requirements:
   a. Wheel bearings are permanently lubricated and require no additional lubricant.
   b. Drive wheel gears are to be lubricated with an open type gear grease which is heavy, plastic, extreme pressure and tacky; such as MOBILTAC 275 or equal.
   c. The hollow shaft worm gear reducer lubricant should be changed every year or 2000 hours of service for moderate usage. The lubricant should be changed more frequently if the service is more severe. Use one pint of AGMA lubricant number 7, compounded, if the ambient temperature is 15° to 60° F or AGMA lubricant number 8, compounded, if the ambient temperature is 50° to 125° F.
   d. It is recommended that the areas of the cross shaft covered by gear reducers, bearings and couplings be coated with FEL-PRO C5-A, or equal, anti-seize lubricant.

      Before crane operation the gear reducer(s) vent plug, if so equipped, must be in the proper location in the gear reducer. The vent plug replaces the pipe plug in the highest location on the end of the gear reducer.
3. If it becomes necessary to remove the cross shaft (Ref. No. 22 in Figure 17) from the geared truck, proceed as follows:
   a. Remove gear reducer support plate screws (Ref. No. 3 in Figure 21).
   b. Loosen hollow shaft set screws and slide gear reducer off cross shaft.
   c. Loosen set screw in outer flange bearing (Ref. No. 19 in Figure 17) (mounted on truck channel).
   d. Remove bolts (Ref. Nos. 18, 20 and 21 in Figure 17) holding inner flange bearing (mounted on vertical plate on truck).
   e. Remove outer (nearest truck center) pinion retaining ring (Ref. No. 16 in Figure 17).
   f. Slide cross shaft out of outer flange bearing (sliding toward center of crane) and remove retaining ring (Ref. No.15 in Figure 17) by sliding ring over end of cross shaft.
   g. Slide cross shaft out of pinion (Ref. No.17 in Figure 17) and out of truck.
   h. Clean and inspect all parts before reassembly. Replace all parts that are worn or damaged.
   i. Reassemble following a reverse procedure of the disassembly steps listed above.
   j. Lubricate drive wheel gears per paragraph 2.b above.
4. After 3 months of initial crane operation, re-torque beam to truck bolts as called for in the assembly instructions and tighten all other bolts.

REPAIR PARTS LIST

⚠ WARNING

Using "Commercial" or other manufacturer's parts to repair the Push, Hand-Geared or Motor Driven Crane Bridge Kits may cause load loss.

TO AVOID INJURY:

Use only YALE supplied replacement parts. Parts may look alike but YALE parts are made of specific materials or processed to achieve specific properties.

PARTS STAR™ BY COLUMBUS McKINNON

ORDERING INSTRUCTIONS

The following information must accompany all correspondence orders for replacement parts:

1. Hoist Model Number from identification plate.
2. Original Sales Order and/or Serial Number of the hoist stamped below identification plate.
3. Voltage, phase, hertz from the identification plate.
4. Length of lift.
5. Part number of part from parts list.
6. Number of parts required.
7. Part name from parts list.

NOTE: When ordering replacement parts, it is recommended that consideration be given to the need for also ordering such items as gaskets, fasteners, insulators, etc. These items may be damaged or lost during disassembly or just unfit for future use because of deterioration from age or service.

The following parts list and illustrations cover standard model crane bridges. Typical units are used as the basis for the exploded parts illustrations; therefore, certain variations may occur from the parts information given. For this reason always give the catalog number, model number, motor horsepower, voltage, phase and frequency when ordering replacement parts. For motors, gearboxes, and electrical components, give complete nameplate data.

The factory recommends complete replacement of the motor or gearbox.

INDEX OF PARTS ILLUSTRATIONS

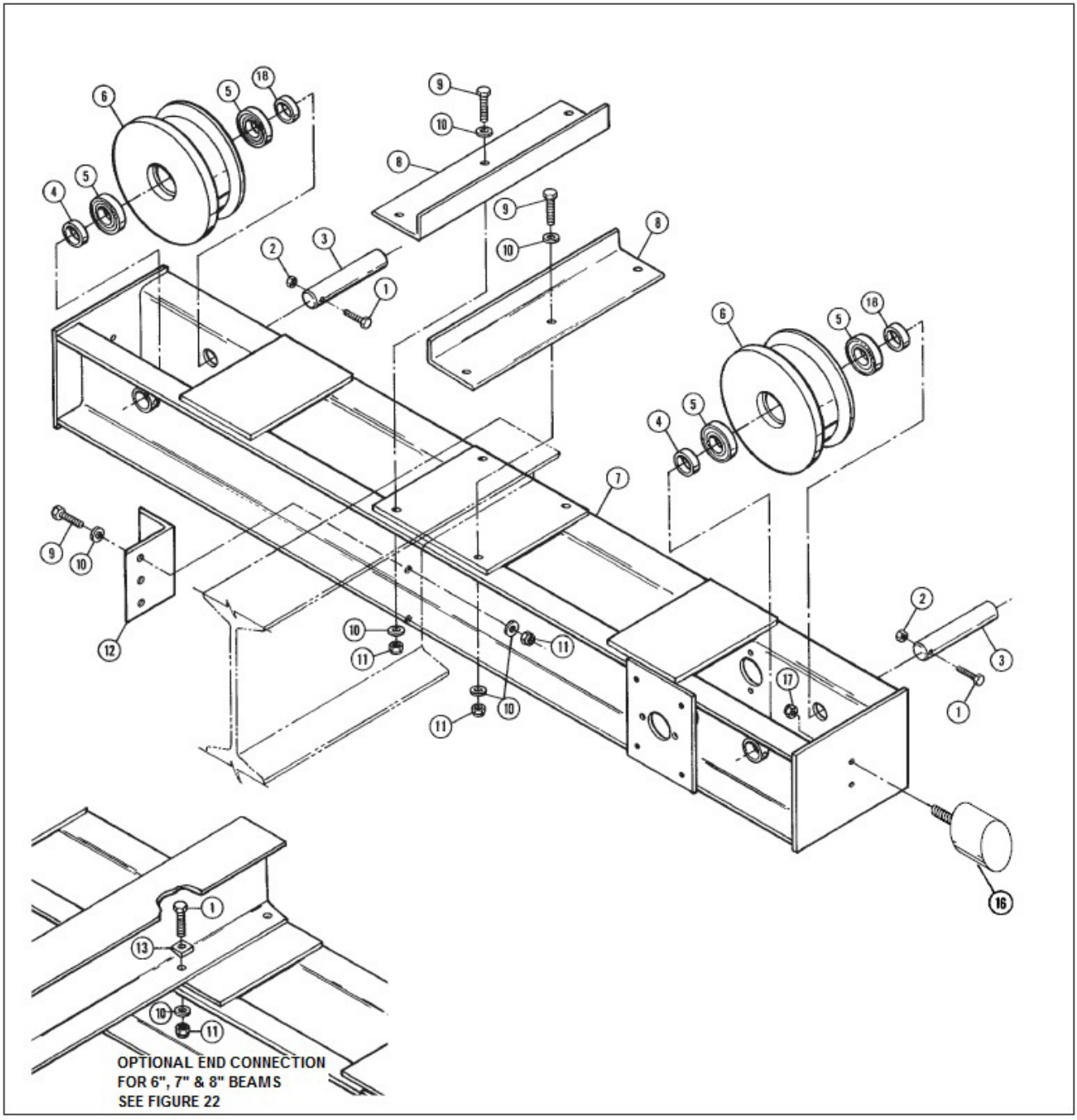


Figure 16. Push Truck – Catalog Number 904535. (Only 1 Truck Shown)
(Bumper is Optional. Catalog Number is 932000)

Figure 16. Push Truck – Catalog Number 904535. (Continued)
(Bumper is Optional. Catalog Number is 932000)

Ref No.	Part Number	Description	Qty. Req
1	10853806	Hex Head Bolt - High Strength	2
2	10024810	Self-Locking Nut	2
3	11572403	Axle	2
4	11572502	Bearing Retainer (Long)	2
5	10377705	Bearing	4
6	32925302	Wheel	2
7	43963101	Truck Weldment, R.H. (54" WB) - Shown	1
	43963102	Truck Weldment, L.H. (54" WB)	1
	43963111	Truck Weldment, R.H. (36" WB)	1
	43963112	Truck Weldment, L.H. (36" WB)	1
	43963141	Truck Weldment, R.H. (72" WB)	1
	43963142	Truck Weldment, L.H. (72" WB)	1
		Optional Coped Girder Connection Kit - Catalog Number 51525050 Consists of Ref. Nos. 8 thru 12	
8	11572801	Angle Connector	4
9	10854003	Hex Head Bolt - High Strength	12
10	10402704	Flat Washer	24
11	10327208	Self-Locking Nut	12
12	11572901	Angle Connector	2
		Optional Bumper - Catalog Number 932000 Consists of Ref. Nos. 16 thru 17	
16	11680701	Bumper - Includes Ref. No. 17	4
17		Self-Locking Nut	4
18	11572501	Bearing Retainer (Short)	2

NOTES

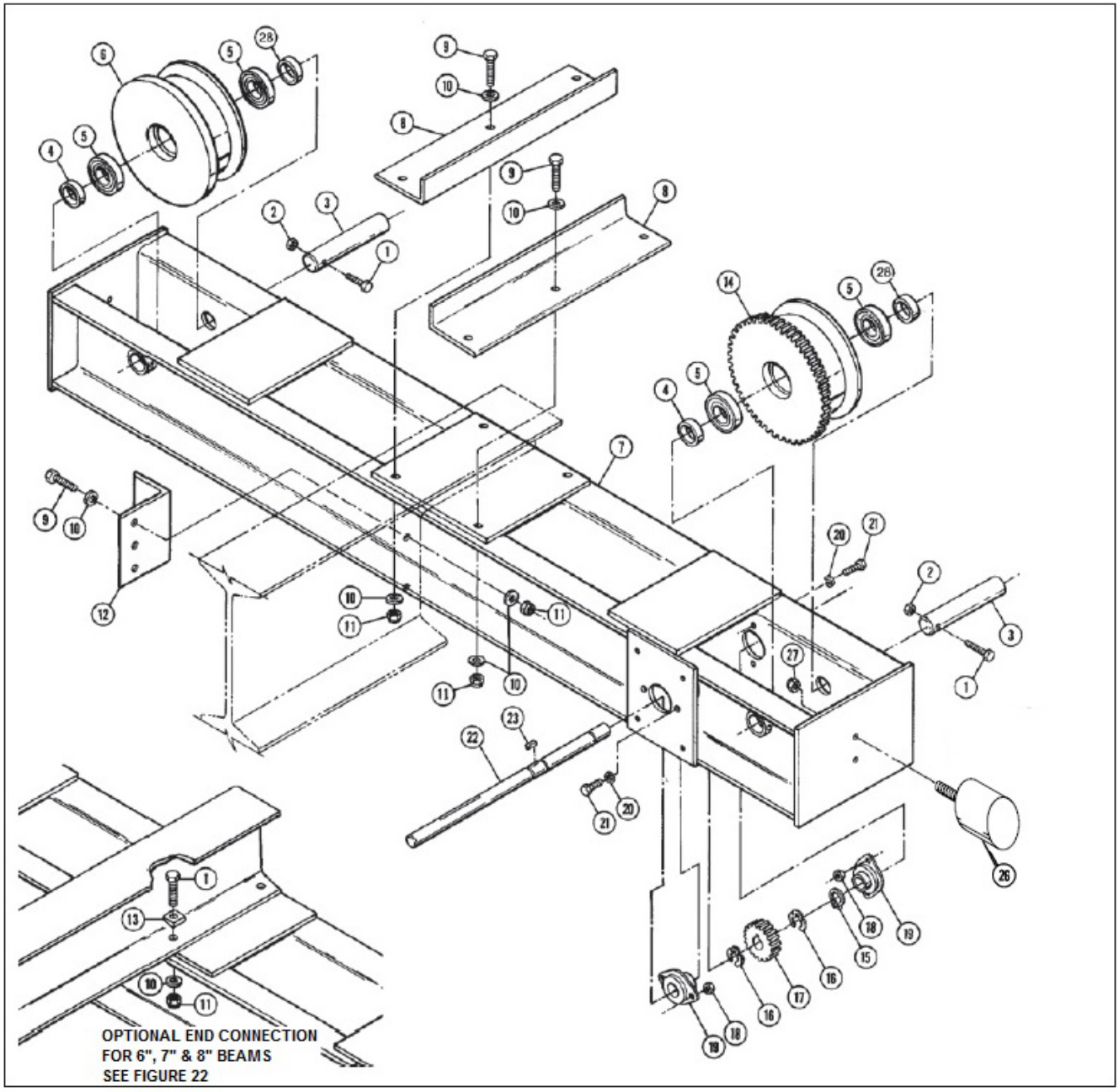


Figure 17. Geared Truck – Catalog Number 904536. (Only 1 Truck Shown)
(Bumper is Optional. Catalog Number is 932000)

Figure 17. Geared Truck – Catalog Number 904536. (Continued)
(Bumper is Optional. Catalog Number is 932000)

Ref No.	Part Number	Description	Qty. Req
1	10853806	Hex Head Bolt - High Strength	2
2	10024810	Self-Locking Nut	2
3	11572403	Axle	2
4	11572502	Bearing Retainer (Long)	2
5	10377705	Bearing	4
6	32925302	Plain Wheel	2
7	43963101	Truck Weldment, R.H. (54" WB) - Shown	1
	43963102	Truck Weldment, L.H. (54" WB)	1
	43963111	Truck Weldment, R.H. (36" WB)	1
	43963112	Truck Weldment, L.H. (36" WB)	1
	43963141	Truck Weldment, R.H. (72" WB)	1
	43963142	Truck Weldment, L.H. (72" WB)	1
		Optional Coped Girder Connection Kit - Catalog Number 51525050 Consists of Ref. Nos. 8 thru 12	
8	11572801	Angle Connector	4
9	10854003	Hex Head Bolt - High Strength	12
10	10402704	Flat Washer	24
11	10327208	Self-Locking Nut	12
12	11572901	Angle Connector	2
14	32925301	Geared Wheel	1
15	10846007	Retaining Ring	1
16	43963321	Retaining Ring	2
17	22741601	Pinion	1
18	N0828	Hex Nut	4
19	43940516	Flange Bearing	2
20	N08526	Lockwasher	4
21	N03985	Hex head Bolt	4
22	22741701	Cross Shaft	1
23	10450712	Key	1
		Optional Bumper - Catalog Number 932000 Consists of Ref. Nos. 26 thru 27	
26	11680701	Bumper - Includes Ref. No. 27	2
27		Self-Locking Nut	4
28	11572501	Bearing Retainer (Short)	2

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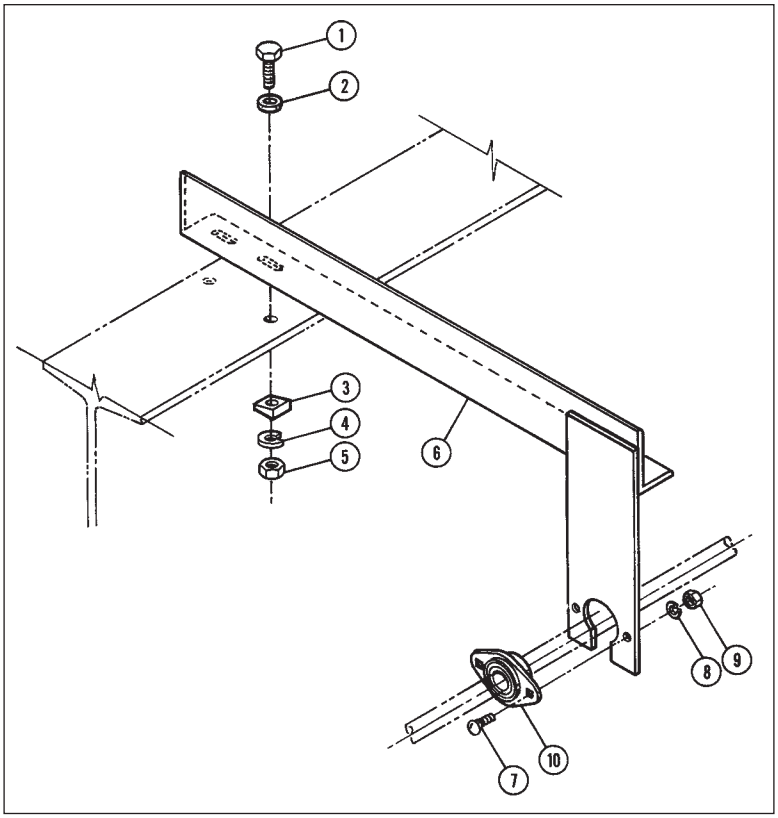

Figure 18. Cross Shaft Support – Catalog Number 904540 (54" & 36"WB), 904540L (72" WB)

Ref No.	Part Number	Description	Qty. Req
1	N0859	Hex Head Bolt	2
2	10402701	Flat Washer	2
3	N0625	Beveled Washer	2
4	10404501	Lockwasher	2
5	N02912	Hex Nut	2
6	22741901	Cross Shaft Support - for 36" and 54" WB End Trucks	1
	22741905	Cross Shaft Support - for 72" WB End Trucks	1
7	N03985	Hex Head Bolt	2
8	N08526	Lockwasher	2
9	N02054	Hex Nut	2
10	43940516	Flange Bearing	1

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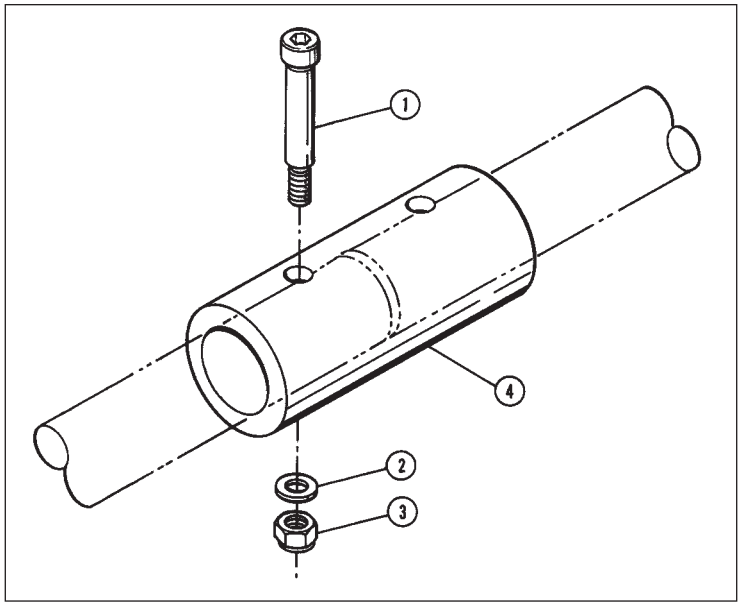

Figure 19. Couping – Catalog Number 905374

Ref No.	Part Number	Description	Qty. Req
1	11567707	Socket Head Shoulder Screw	2
2	10402712	Flat Washer	2
3	10024807	Self-Locking Nut	2
4	11556601	Coupling	1

NOTES

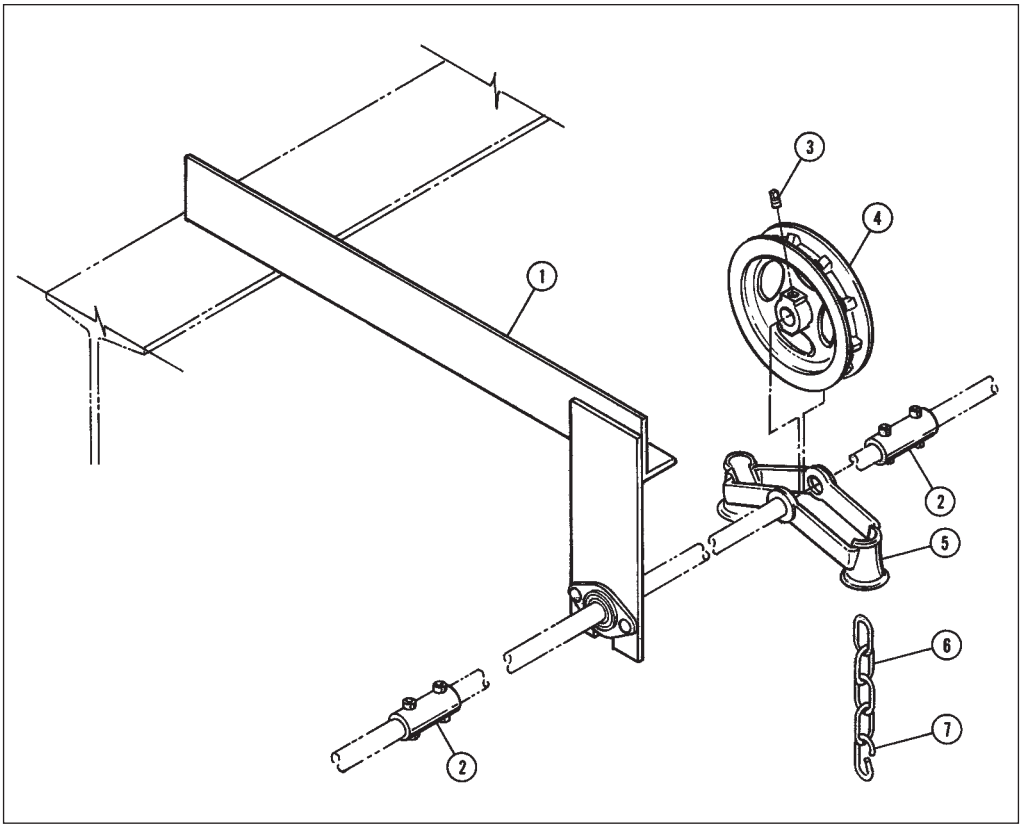

Figure 20. Hand Chain Drive – Catalog Number 904539 and 8282 (54" & 36" WB), 904539L & 8282 (72" WB)

Ref No.	Part Number	Description	Qty. Req
1		Catalog Number 904539 Consists of Ref. Nos 1 thru 5:	
		Catalog Number 904540 For 36" & 54" WB	1
		Catalog Number 904540L For 72" WB	1
2		Catalog Number 905374	2
3	10380803	Square Head Set Screw	1
4	30333011	Hand Chain Wheel	1
5	30200701	Chain Wheel Guide	1
		Catalog Number 8282 Consists of Ref. Nos. 6 and 7:	
6	20401301	Hand Chain	36 Ft.
7	20401403	Connecting Link	1

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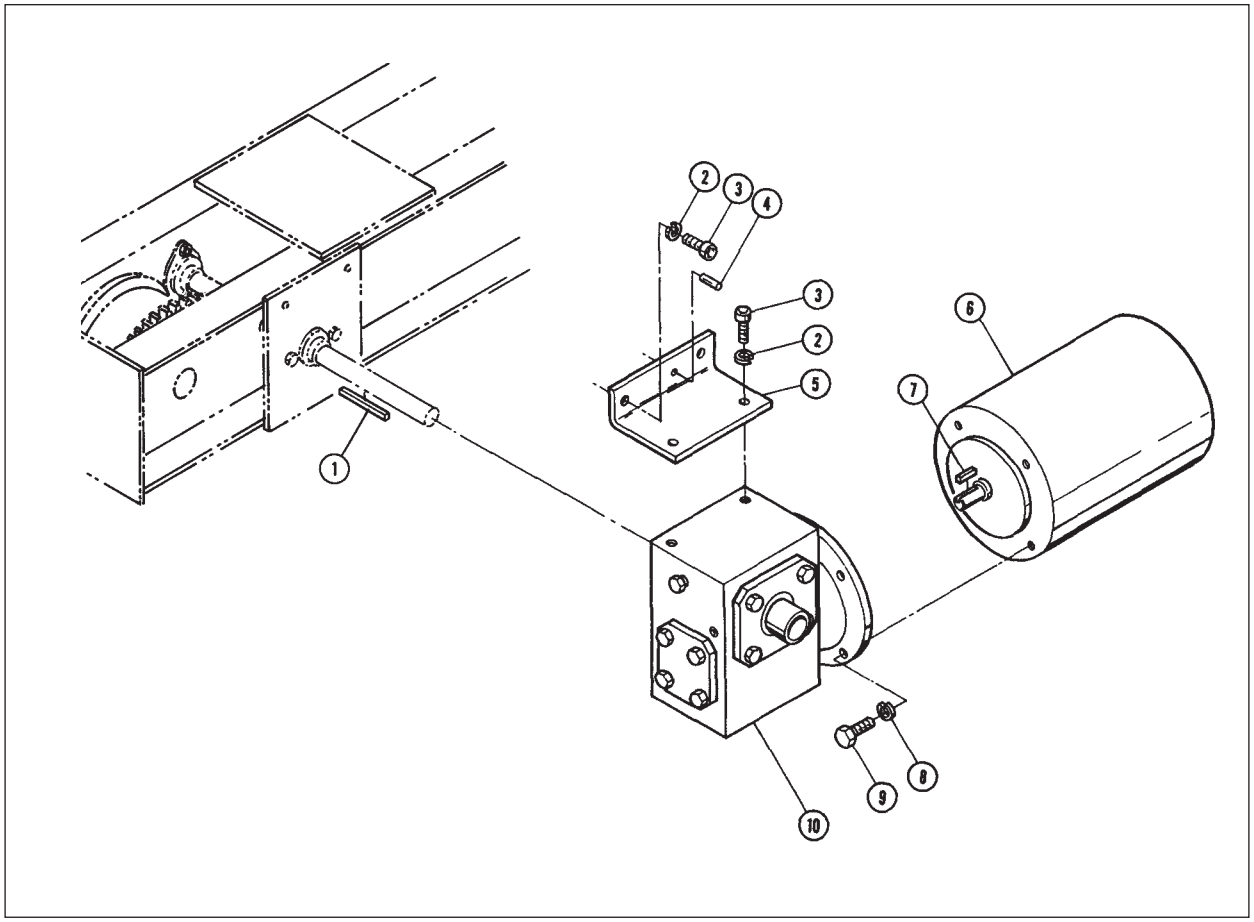

Figure 21. Gear Reducer – Catalog Numbers 905376-905378 and Motor – Catalog Numbers 905381 and 905382

Ref No.	Part Number	Description	Qty. Req
1	11781105	Key	1
2	NO8526	Spring Lock Washer (5/16)	4
3	10392029	Hex Socket Head Self-Locking Cap Screw (5/16-18 x 1)	4
4	10099682	Grooved Pin (Type A 5/16 x 5/8 Pltd.)	1
5	22727701	Support Plate	1
6		Motor 1/2 HP	
		Single Speed	1
	32879722	115/230V - 1 Phase - 60 Hz	
	32879532	200-230/460V - 3 Phase - 60 Hz	
	32879533	575V - 3 Phase - 60 Hz	
		Two Speed	
	32879624	200V - 3 Phase - 60 Hz	
	32879625	230V - 3 Phase - 60 Hz	
	32879626	460V - 3 Phase - 60 Hz	
	32879627	575V - 3 Phase - 60 Hz	
7	10930656	Key	1
8	NO1951	Spring Lock Washer (3/8)	4
9	10791731	Hex Head Bolt (3/8-16 x 1)	4
10		Gear Reducer	1
	905376	10:1 Gear Ratio	
	905377	15:1 Gear Ratio	
	905378	20:1 Gear Ratio	

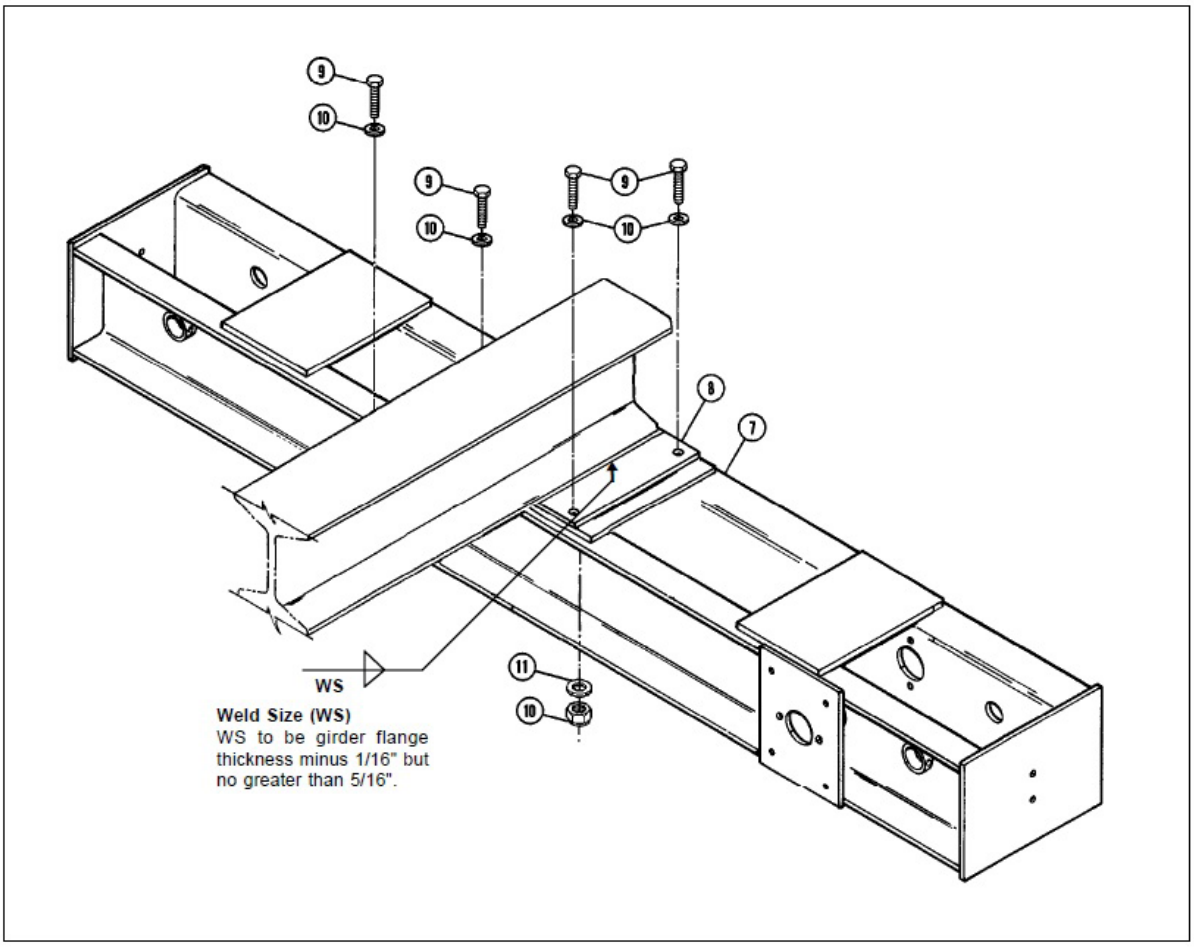

Figure 22. Bolted Uncoped Girder Connection (Only 1 Connection Shown)
Catalog Number 912099 - For 36" and 54" WB
Catalog Number 912102 - For 72" WB

Ref No.	Part Number	Description	Qty. Req
7		Truck Weldment - 36", 54" or 72" Wheelbase	
		As Shown (Right Hand)	1
		Opposite Hand (Left Hand)	1
8		Mounting Plate	2
	23429901	36" and 54" Wheelbase	
	23429801	72" Wheelbase	
9	10854003	Hex Head Bolt - High Strength	8
10	10402704	Flat Washer	16
11	10327208	Self Locking Nut	8

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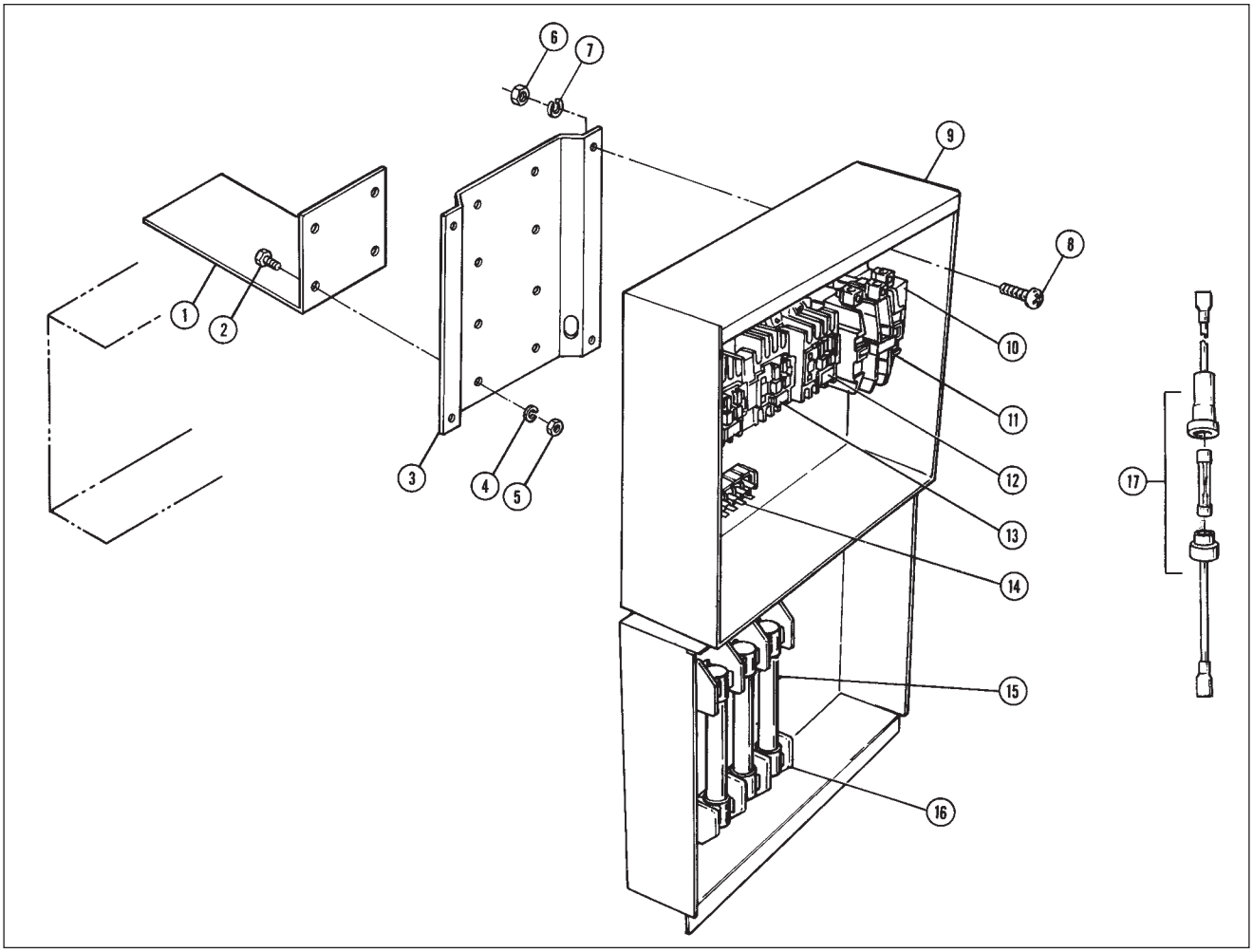

Figure 23. Electrical Enclosure and Mounting – Catalog Numbers 904541-904543

Ref No.	Part Number	Description	Qty. Req
1	32928212	Connecting Bracket	1
2	10412305	Hex Head Bolt	4
3	32928202	Enclosure Bracket	1
4	NO8526	Lockwasher	4
5	NO2054	Hex Nut	4
6	NO157	Hex Nut	4
7	NO51	Lockwasher	4
8	10381403	Phillips Screw	4
9	43905501	Electrical Enclosure	1
10		Transformer	1
	20991904	208/24V or 230/24V	
	20991902	460/24V	
	20991903	575/24V	
	20991911	208/115V or 230/115V	
	20991906	460/115V	
	20991910	575/115V	
11		Mainline Contactor	1
	32723813	24V Control	
	32723811	115V Control	
12		Accelerating Contactor (For 2 Speed Cranes Only)	1
	22845432	24V Control	
	22845431	115V Control	

Figure 23. Electrical Enclosure and Mounting – Catalog Numbers 904541-904543 (Continued)

Ref No.	Part Number	Description	Qty. Req
13		Reversing Contactor	1
	22845412	24V Control	
	22845411	115V Control	
14	11537801	Terminal Board	1
15		Fuses	3
	10348783	3A, 250V	
	10348883	3A, 600V	
16		Fuse Base	1
	NO7447	30A, 250V	
	10808402	30A, 600V	
17		Fuse, Fuse Holder and Wire Assembly (Control Circuit)	1
	22506108	3A, 24V	
	22506102	1/2A, 115V	
		*Fuse Only (Control Circuit)	1
	11322107	3A, 250V Rating	
	11322101	1/2A , 250V Rating	

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WARRANTY

LIMITATION OF WARRANTIES, REMEDIES AND DAMAGES

THE WARRANTY STATED BELOW IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, NO PROMISE OR AFFIRMATION OF FACT MADE BY ANY AGENT OR REPRESENTATIVE OF SELLER SHALL CONSTITUTE A WARRANTY BY SELLER OR GIVE RISE TO ANY LIABILITY OR OBLIGATION.

Seller warrants that on the date of delivery to carrier the goods are free from defects in workmanship and materials.

SELLER'S SOLE OBLIGATION IN THE EVENT OF BREACH OF

WARRANTY OR CONTRACT OR FOR NEGLIGENCE OR OTHERWISE WITH RESPECT TO GOODS SOLD SHALL BE EXCLUSIVELY LIMITED TO REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY PARTS WHICH SELLER DETERMINES TO HAVE BEEN DEFECTIVE or if Seller determines that such repair or replacement is not feasible, to a refund of the purchase price upon return of the goods to Seller.

Any action against Seller for breach of warranty, negligence or otherwise, must be commenced within one year after such cause of action occurs.

NO CLAIM AGAINST SELLER FOR ANY DEFECT IN THE GOODS SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE YEAR FROM THE DATE OF SHIPMENT. Seller shall not be liable for any damage, injury or loss arising out of the use of the goods if, prior to such damage, injury or loss, such goods are (1) damaged or misused following Seller's delivery to carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified without compliance with such law, instructions or recommendations.

UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN SECTION 2-715 OF THE UNIFORM COMMERCIAL CODE.

INDEMNIFICATION AND SAFE OPERATION

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the goods. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the goods. In the event of personal injury or damage to property or business arising from the use of the goods, Buyer shall within 48 hours thereafter give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the goods.

CMCO Warranty (HOISTS)

A. Columbus McKinnon Corporation ("Seller") warrants to the original end user ("Buyer") that: (a) for a period of one (1) year from the date of Seller's delivery of the goods (collectively, the "Goods") to the carrier, the electrical components of the Goods will be free from defects in workmanship and materials; and (b) for the life of the Goods, the mechanical components of the Goods will be free from defects in workmanship and materials.

B. IN THE EVENT OF ANY BREACH OF SUCH WARRANTY, SELLER'S SOLE OBLIGATION SHALL BE EXCLUSIVELY LIMITED TO, AT THE OPTION OF SELLER, REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY GOODS THAT SELLER DETERMINES TO HAVE BEEN DEFECTIVE OR, IF SELLER DETERMINES THAT SUCH REPAIR OR REPLACEMENT IS NOT FEASIBLE, TO A REFUND OF THE PURCHASE PRICE UPON RETURN OF THE GOODS TO SELLER. NO CLAIM AGAINST SELLER FOR ANY BREACH OF (i) SUCH WARRANTY WITH RESPECT TO THE ELECTRICAL COMPONENTS OF ANY GOOD SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE (1) YEAR FROM THE DATE OF SELLER'S DELIVERY TO THE CARRIER AND (ii) SUCH WARRANTY WITH RESPECT TO THE MECHANICAL COMPONENTS OF ANY GOOD SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE (1) YEAR FROM THE DATE THE DATE ANY ALLEGED CLAIM ACCRUES. EXCEPT FOR THE WARRANTY SET FORTH ABOVE, SELLER MAKES NO OTHER WARRANTIES WITH RESPECT TO THE GOODS, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUALITY AND/OR THOSE ARISING BY STATUTE OR OTHERWISE BY LAW OR FROM ANY COURSE OF DEALING OR USE OF TRADE, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED.

C. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY THIRD PARTY WITH RESPECT TO ANY GOOD, WHETHER IN CONTRACT, TORT OR OTHER THEORY OF LAW, FOR LOSS OF PROFITS OR LOSS OF USE, OR FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, DIRECT OR INDIRECT DAMAGES, HOWSOEVER CAUSED. SELLER'S MAXIMUM LIABILITY TO BUYER WITH RESPECT TO THE GOODS SHALL IN NO EVENT EXCEED THE PRICE PAID BY BUYER FOR THE GOODS THAT ARE THE SUBJECT OF THE APPLICABLE CLAIM.

D. Seller shall not be liable for any damage, injury or loss arising out of the use of the Goods if, prior to such damage, injury or loss, such Goods are: (1) damaged or misused following Seller's delivery to the carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified without compliance with such laws, instructions or recommendations.

E. This warranty is limited and provided only to the original end user. **Each Good must be registered within sixty (60) days of receipt of each product to establish eligibility.** Please register at www.cmworks.com/hoist-warranty-registration or submit registration card via US mail.

F. Any action against Seller for breach of warranty, negligence or otherwise in connection with the electrical components of any Good must be commenced by Buyer within one (1) year after: (a) the date any alleged claim accrues; or (b) the date of delivery of the Goods to Buyer, whichever is earlier. Any action against Seller for breach of warranty, negligence or otherwise in connection with the mechanical components of any Good must be commenced by Buyer within one (1) year after the date any alleged claim accrues.

⚠ WARNING

Alterations or modifications of equipment and use of non-factory repair parts can lead to dangerous operation and injury.

TO AVOID INJURY:
- **Do not alter or modify equipment.**
- **Do use only factory replacement parts.**

COLUMBUS McKINNON
CORPORATION

FAMILY OF BRANDS

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