

Daifuku Chain Conveyors

Technical Selection Guide for Conveyor Components

- Power Only Overhead and Inverted Conveyors
- Hand Pushed Trolleys



DAIFUKU



ISO 9001 Certified

ISO 14001 Certified

ISO 45001 Certified

DAIFUKU

Our mission is to engineer, manufacture, and install material handling systems that increase productivity improve product quality, and provide production flexibility, all while decreasing lead time and inventory requirements.

NOTICE:

This catalog is intended to illustrate the various Daifuku overhead conveyor components and their application into a conveyor system. Environmental as well as many other conditions will vary with each installation. Daifuku does not represent or warrant that adherence to any guidelines or suggestions set forth in this catalog will necessarily result in proper selection, manufacture, installation and/or maintenance of conveyor equipment and/or a conveyor system. Daifuku disclaims responsibility for any equipment and/or system malfunction, property damage, personal injury or any other damages of any kind or nature, or violations of law resulting from component, equipment and/or system selection, design, installation, maintenance or operation performed by a contractor, user or any other person.

DESIGN CHANGES: Daifuku reserves the right to change the design or construction of its products at any time without obligation for replacement or refund on any products or parts thereof which may be in any customer's possession at the time such changes become effective.

In accordance with our established policy to constantly improve our products, the specifications in this manual are subject to change without notice.

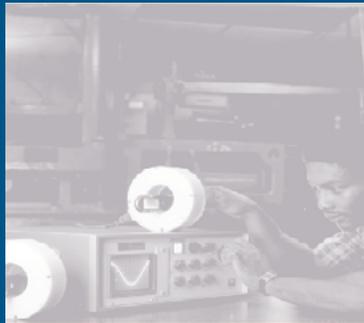
Chain Conveyors

Technical Selection Guide for Conveyor Components

Power Only Overhead and Inverted Conveyors
Hand Pushed Trolleys

Daifuku offers a complete line of 3", 4" & 6" Power Only and Power & Free Conveyor systems, components and accessories. Designed and built to industry standards, these conveyors offer some of the most cost effective and versatile methods for moving products from point to point and through manufacturing & processing operations.

These conveyors are easy to install and modify, and require minimum maintenance when compared to their durability and load carrying capabilities.



Daifuku is a worldwide leader in providing material handling system solutions. Since its founding in 1937, Daifuku has led the material handling industry for 80 over years.

Our mission is to engineer, manufacture, and install material handling systems that increase productivity, improve product quality, and provide production flexibility.

Our products are among the finest in the industry because of our people: the systems integration, design, engineering manufacturing sales, service, and support experts who make sure you get the system you want and need.

We offer comprehensive training - including detailed operations/maintenance manuals and complete system design documentation - to ensure that you fully understand all aspects of your system operation. Plus, our wide range of maintenance, service and support help meet your needs before, during, and after system implementation.

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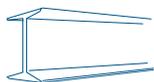
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Rivetless Chain Features

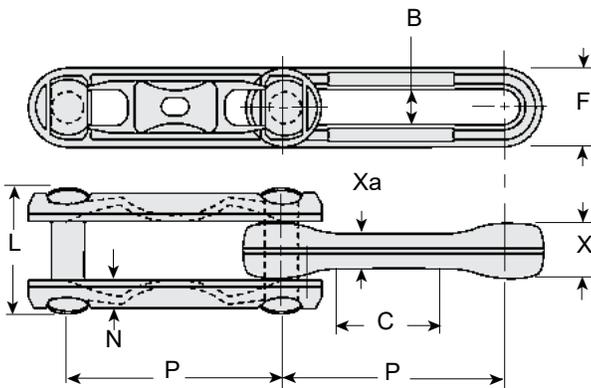
Quality Forged - Years of service and thousands of installations demonstrate the success of Daifuku rivetless chain.

Chain components are drop-forged from high strength Microloy™ steel, precision forged and finished, making them **20% stronger** than components made from standard carbon steel chain. Daifuku rivetless chain provides the smoothest chain pin bearing surface in the industry, minimizing the initial break-in period.

Performance - Quality materials and construction minimize chain stretch and maximize service life.

100% Inspection - Daifuku conducts 100% inspection of every X-458 and X-678 link to verify hardness. In addition, every piece is subjected to on-line dimensional inspection, and backed up by computerized data to satisfy our stringent quality assurance standards.

All chain parts are hardened to increase resistance to wear, corrosion, abrasive action and shock loads.



Assembled Weight & Ultimate Strength

Chain	Part No.	Part No. Includes:		Assy Wt	Avg. Ult. Str.*
X-348	13612	13607..... Pin	LB	2.25	40,000 lb
		13608..... Side Link 13606..... Center Link	KG	1.02	18,144 kg
X-458	13613	13610..... Pin	LB	3.10	68,000 lb
		13611..... Side Link 13609..... Center Link	KG	1.40	30,845 kg
X-658	77498	13610..... Pin	LB	2.7	48,000 lb
		4277..... Side Link 4276..... Center Link	KG	1.22	21,773 kg
X-678	13443	13442..... Pin	LB	6.5	125,000 lb
		13440..... Side Link 13441..... Center Link	KG	2.94	56,700 kg

Legend

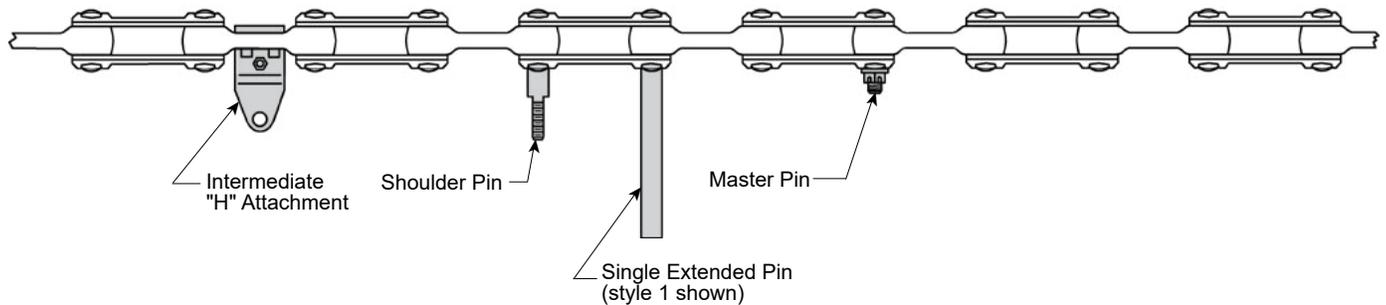
- P.....Nominal pitch
- X.....Height of center link
- F.....Width of chain
- Xa.....Height of chain at center of link
- L.....Overall length of pin
- D.....Diameter of pin
- C.....Length of flat on center link
- B.....Inside width of center link
- N.....Thickness of side link

Chain Dimensions

Chain	Part No.	P	X	F Max.	Xa	L	D	C	B	N
X-348	13612	3"	3/4"	1-5/64"	1/2"	1-3/4"	1/2"	1-11/16"	17/32"	3/8"
X-458	13613	4"	1"	1-27/64"	5/8"	2-1/4"	5/8"	2"	21/32"	15/32"
X-658	77498	6"	1-1/64"	1-13/32"	5/8"	2-1/4"	5/8"	2-1/4"	21/32"	15/32"
X-678	13443	6"	1-9/32"	2"	27/32"	3-1/8"	7/8"	3-1/4"	31/32"	3/4"
METRIC										
X-348	13612	76.2	19	27	13	44	13	43	13	10
X-458	13613	101.6	25	36	16	57	16	51	17	12
X-658	77498	152.4	26	36	16	57	16	57	17	12
X-678	13443	152.4	32.51	51	21	79	22	83	25	19

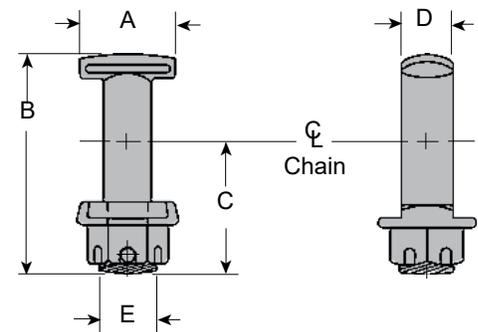
* Average ultimate strength values are arithmetical averages determined from current tensile test data.

Standard Intermediate Chain Attachments



Master Pin

Chain	Part No.	A	B	C	D	E	Weight
X-348	3362	1"	1-5/16"	1-7/16"	1/2"	3/8"	.20 lb
X-458	306997	1-7/32"	2-25/32"	1-11/16"	5/8"	1/2"	.25 lb
X-678	309900	1-7/8"	3-15/16"	2-7/16"	7/8"	5/8"	.90 lb
METRIC							
X-348	3362	25	59	36	13	9	.09 kg
X-458	306997	31	71	43	16	13	.11 kg
X-678	309900	48	100	61	22	16	.41 kg



3362 kit includes:

- 1- # 4284 ... Master Pin
- 1- # 4285 ... Washer
- 1- # 56549 . Hex. Nut
- 1- # 56054 . Cotter Pin

306997 kit includes:

- 1- Master Pin
- 1- Washer
- 1- M12 Castle Nut
- 1- Cotter Pin
- 1- M12 Washer, Plain
- 1- M12 Spring Washer

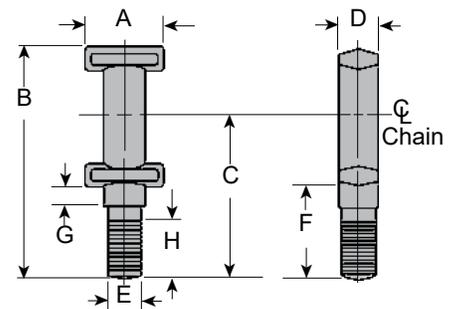
309900 kit includes:

- 1- Master Pin
- 1- Washer
- 1- M16 Castle Nut
- 1- Cotter Pin
- 1- M16 Washer, Plain
- 1- M16 Spring Washer

Single Extended Shoulder Pin

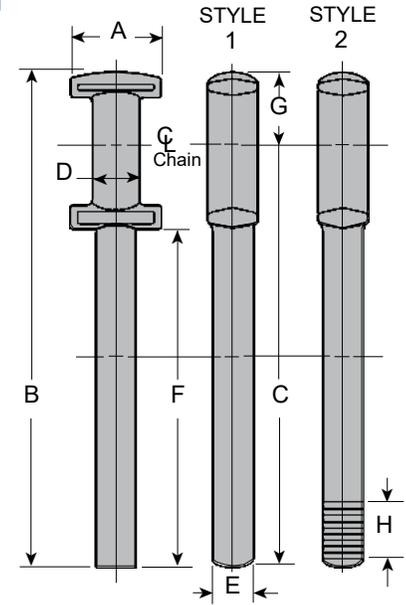
Chain	Part No.	A	B	C	D	E	F	G	H	Weight
X-458	8837	1-1/4"	3-3/4"	2-5/8"	5/8"	1/2"	1-1/2"	3/8"	7/8"	.33 lb
X-678	13215M2*	1-7/8"	4-3/4"	3-1/4"	7/8"	5/8"	1-3/4"	1/2"	7/8"	.81 lb
	13218M2*	1-7/8"	5-1/8"	3-5/8"	7/8"	5/8"	2-1/8"	1/2"	1"	.86 lb
METRIC										
X-458	8837	32	95	67	16	13	38	9	22	.15 kg
X-678	13215M2*	48	121	83	22	16	44	13	22	.37 kg
	13218M2*	48	130	92	22	16	54	13	25	.39 kg

* 4140 Alloy



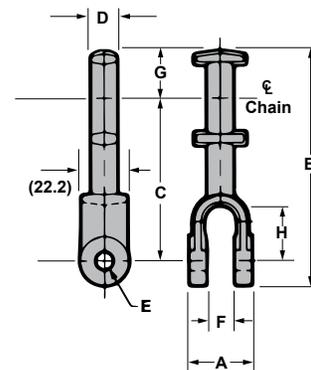
Single Extended Pin

Chain	Part No.	Style	A	B	C	D	E	F	G	H	Weight
X-348	4282	1	31/32"	3-7/8"	3"	1/2"	1/2"	2-1/8"	7/8"	-	.16 lb
	15588	1	31/32"	5-7/8"	5"	1/2"	1/2"	4-1/8"	7/8"	-	.34 lb
X-458	4075	2	1-1/4"	3-1/2"	2-3/8"	5/8"	1/2"	1-1/4"	1-1/8"	7/8"	.32 lb
	15585	1	1-7/32"	5-23/32"	4-5/8"	5/8"	5/8"	3-1/2"	1-3/32"	-	.55 lb
	8137	2	1-7/32"	4-25/32"	3-3/8"	5/8"	5/8"	2-1/4"	1-3/32"	3/4"	.50 lb
	4267	1	1-1/4"	4-25/32"	3-11/16"	5/8"	1/2"	1-1/2"	1-3/32"	-	.30 lb
	15586	2	1-7/32"	3-23/32"	2-5/8"	5/8"	1/2"	1-1/2"	1-3/32"	15/16"	.30 lb
X-678	4255	2	1-7/8"	5-1/4"	3-23/32"	7/8"	7/8"	2-1/4"	1-17/32"	2"	1.04 lb
METRIC											
X-348	4282	1	24.6	98.4	76.2	12.7	12.7	54.0	22.2	-	.07 kg
	15588	1	24.6	149.2	127.0	12.7	12.7	104.8	22.2	-	.15 kg
X-458	4075	2	31.8	88.9	60.3	15.9	12.7	31.8	28.6	22.2	.15 kg
	15585	1	31.0	145.3	117.5	15.9	15.9	88.9	27.8	-	.25 kg
	8137	2	31.0	113.5	85.7	15.9	15.9	57.2	27.8	19.1	.23 kg
	4267	1	31.8	121.4	93.7	15.9	12.7	65.1	27.8	-	.14 kg
	15586	2	31.0	94.5	66.7	15.9	12.7	38.1	27.8	23.8	.14 kg
X-678	4255	2	47.6	133.4	94.5	22.2	22.2	57.2	38.9	50.8	.47 kg



Clevis Pin

Chain	Part No.	A	B	C	D	E	F	G	H	Weight
X-348	4281	1-3/16"	3-7/8"	2-1/2"	1/2"	25/64"	9/16"	7/8"	3/4"	.40 lb
METRIC										
X-348	4281	30.2	98.4	63.5	12.7	9.9	14.3	22.2	19	.18 kg



Intermediate "H" Attachment

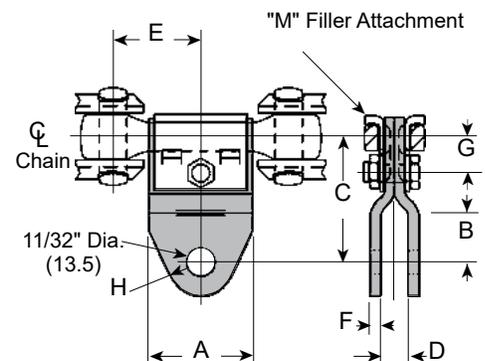
Chain	Part No.	A	B	C	D	E	F	G	H	Weight
X-348	15802	1-5/8"	1"	3-1/8"	9/16"	1-1/2"	1/8"	7/8"	17/32"	.60 lb
X-458	15276	2-1/4"	1"	2-7/8"	11/16"	2"	3/16"	13/16"	17/32"	1.09 lb
METRIC										
X-348	15802	41.3	25.4	79.4	14.3	38.1	3.2	22.2	13.5	.27 kg
X-458	15276	57.1	25.4	83.0	17.4	50.8	4.7	20.6	13.5	.49 kg

15802 kit includes:

- 2- #15573 Int. "H" Attachment
- 2- #5443 "M" Filler
- 1- #13434 Bolt
- 1- #57212 Nut

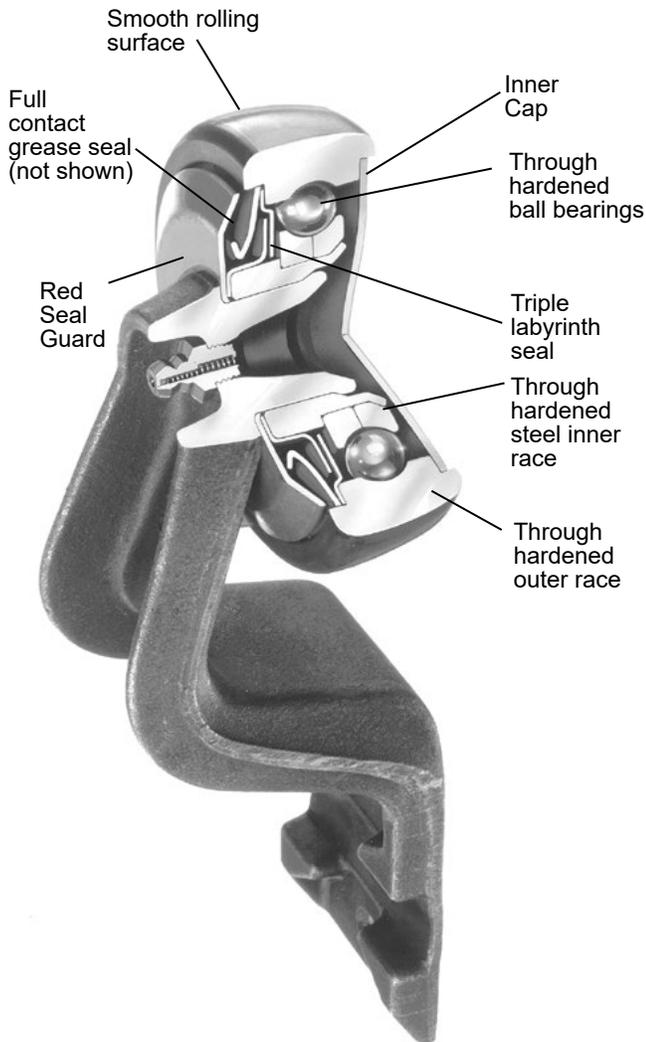
15276 kit includes:

- 2- #15577 Int. "H" Attachment
- 2- #4226 "M" Filler
- 1- #11979..... Bolt
- 1- #56494 Nut



Standard Red Seal® Trolley Wheels

Standard trolley wheels are available with full ball complement trolley wheels. The wheels have triple labyrinth seals with through hardened 52100 alloy steel races and ball bearings.



Standard full ball complement type wheels have a 41% greater load carrying capacity than the Retainer style. This is reflected in longer bearing life. Because the full complement trolley wheel contains no retainer or retaining ring in its assembly, it has become the preferred trolley wheel for use in applications where mechanical components are regularly subjected to dirt, grit, moisture, etc. No retainer lessens the likelihood of trolley wheel “freeze-up” due to the influx of contaminants. **Maximum temperature rating is 450°F (232.2°C).**

Optional retainer type wheels contain a Conrad type single row precision bearing in steel or composite retainer ring with components and clearances designed for the most adverse conveyor applications. **This wheel has a maximum temperature rating of 200°F (93.3°C).**

All wheels are available less the seals and inner caps for open bearing operation, when using injection or spray type automatic oil lubrication.

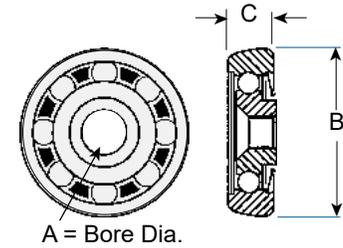
Trolley Wheel Options

Optional Full Contact Grease Seals - Additional protection from outside contaminants can be provided by fitting Red Seal Trolleys with a full contact grease seal. This grease seal is mounted around the formed channel of the Red Seal Guard and seats against the smooth inside surface of the guard. Seal material is available for high temperatures up to 450°F (232.2°C).

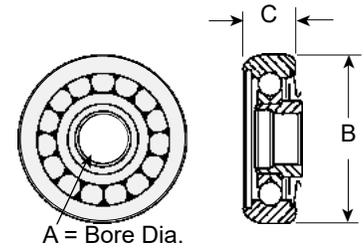
Optional Red Seal Guard™ - The Red Seal Guard is a contaminant resistant shield designed for use with the standard Red Seal 4" and 6" trolley wheels. Zinc-plated for extra protection against corrosion, this shield is recommended for trolleys that are subjected to extremely dirty, gritty, or wet operating conditions.

Convex Face Trolley Wheels

Wheel Size	Wheel Type	Part No.	A	B	C	Weight	Labyrinth Seals	Plain Inner Cap
3"	Full comp.	16011	3/8"	2-21/64"	53/64"	.60 lb	Yes	5189
3"	Retainer	6802	3/8"			.56 lb		
3"	Full comp.	16015	5/8"			.60 lb		
4"	Retainer	15908	1/2"	3-1/4"	1-5/32"	1.41 lb	No	15574
4"	Full comp.	15911	1/2"			1.28 lb		
4"	Full comp.	15917	1"			1.22 lb		
6"	Full comp.	15957	1"	4-15/16"	1-27/64"	5.06 lb	Yes	5195
6"	Full comp.	15964	1"					
METRIC								
3"	Full comp.	16011	9.5	59.13	21.1	.27 lb	Yes	5189
3"	Retainer	6802	16.9			.26 lb		
3"	Full comp.	16015	12.7			.27 lb		
4"	Retainer	15908	12.7	82.6	29.4	.64 lb	No	15574
4"	Full comp.	15911	25.4			.58 lb		
4"	Full comp.	15907	25.4			.55 lb		
6"	Full comp.	15957	25.4	125.4	36.1	2.30 lb	Yes	5195
6"	Full comp.	15964	25.4					



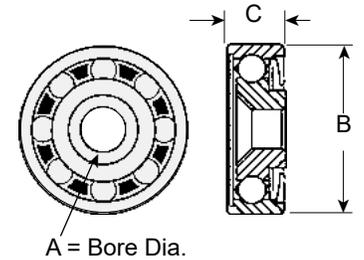
Retainer Type - Convex Face



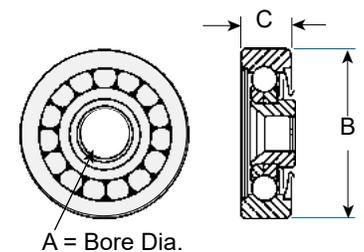
Full Complement - Convex Face

Flat Face Trolley Wheels

Wheel Size	Wheel Type	Part No.	A	B	C	Weight	Labyrinth Seals	Plain Inner Cap	
3"	Full comp.	16016	1.2"	2-1/8"	5-3/64"	.60 lb	Yes	5189	
4"	Retainer	9572	1"	2-15/16"	1-5/32"	1.06 lb		15574	
4"	Full comp.	10214	1"		1-11/64"	1.44 lb		5195	
6"	Retainer	15967	1"	4-9/16"	1-27/64"	4.19"	Yes	5195	
METRIC									
3"	Full comp.	16016	12.7	53.98	21.1	.27 lb		Yes	5189
4"	Retainer	9572	25.4	74.6	29.4	.48 lb	15574		
4"	Full comp.	10214	25.4			.65 lb			
6"	Retainer	15967	25.4	115.9	36.2	1.90 lb	Yes	5195	



Retainer Type - Flat Face



Full Complement - Flat Face

Inverted or free trolley wheels require an inner cap with grease fitting.

Part numbers are: 3" wheel - #15930

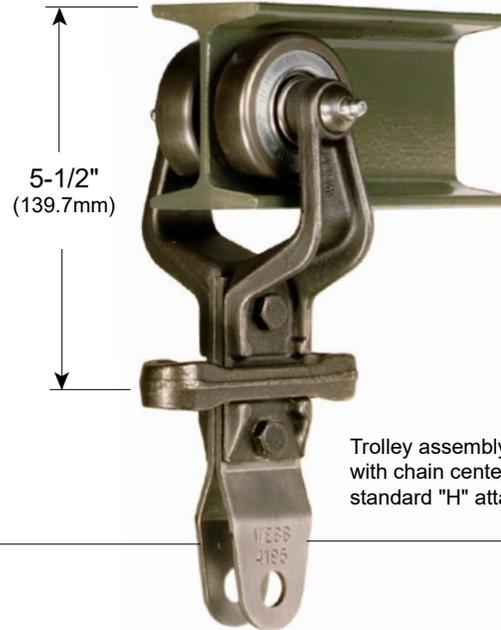
4" wheel - #15929

6" wheel - #8249

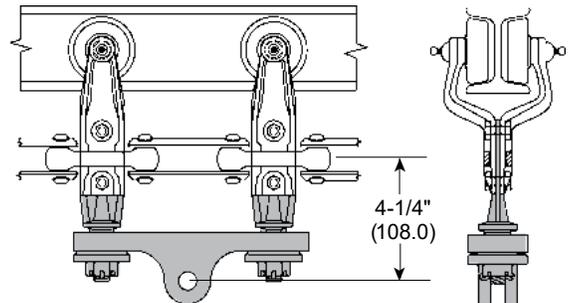
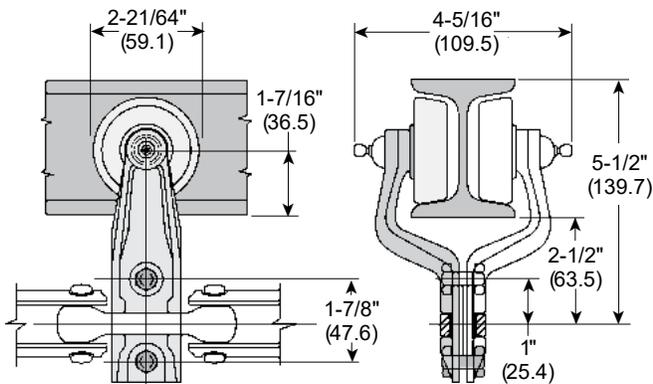
3" Trolley with 2-1/2" Drop

- Chain size..... X-348
- Trolley Center Spacing 6" min. (152mm)
36" max.(914mm)
- Single Trolley Load Capacity..... 200lb (91kg)
- Load Capacity W/Load Bar..... 400lb 181kg)

- Forged carbon steel brackets
- Standard triple labyrinth seal construction
- Rugged 2 bolt attachment connection
- Pressure type grease fittings
- Trolley wheels are riveted to the trolley bracket



Trolley assembly shown with chain center link and standard "H" attachment



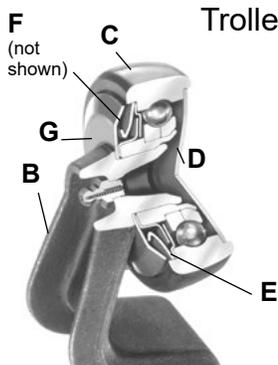
NOTE: Two half trolleys and two nut & bolt assemblies are required to make a complete trolley assembly.

4197 Bolt & Nut Assembly includes:

- 1- # 13434 Bolt
 - 1- # 57212 Nut
-

3516 3" Load Bar Assembly includes:

- 2 - # 4196 "B" Attachments
- 1 - # 4199 Load Bar
- 2 - # 5867 Spherical Washers
- 2 - # 8443 Tube Spacers
- 2 - # 56550 Slotted Hex. Nuts
- 2 - # 56065 Cotter Pins

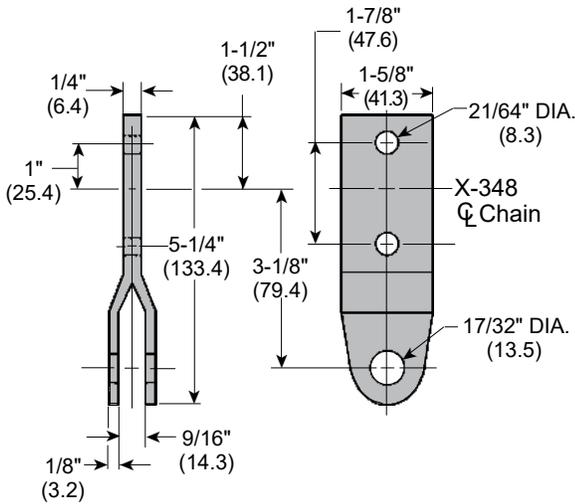


Trolley Option Specifications

	B	C	D	E	F	G
1/2 Trolley Part No.	Trolley Bracket	Load Wheel Type	Inner Cap	Triple Labyrinth Seal	Full Contact Grease Seal	Red Seal Guard
14631	3361	FC	Yes	Yes	No	No
69600	3361	FC	No	No	No	No
75916	3361	FC	No	Yes	No	No

4195 "H" Attachment

This attachment is the most widely used trolley attachment. It is a 2-piece formed steel construction suitable for almost any type of hook, rack or tray.

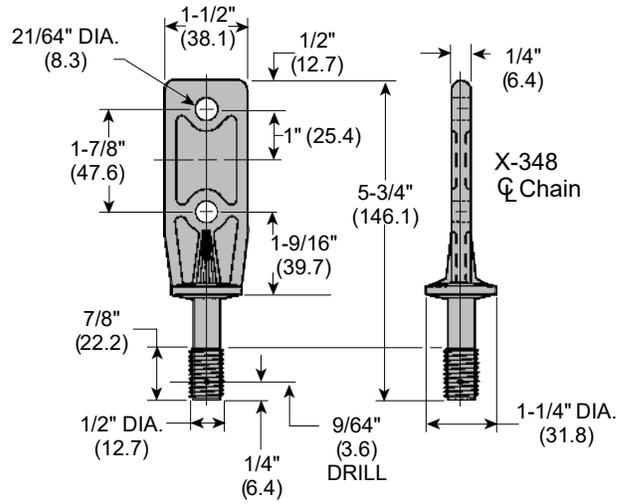


Wt: .44 lb .20 kg

4196 "B" Attachment

The primary use for this attachment is to support a 4199 load bar, but it is also used for many other applications. It is a steel forging with a threaded stud.

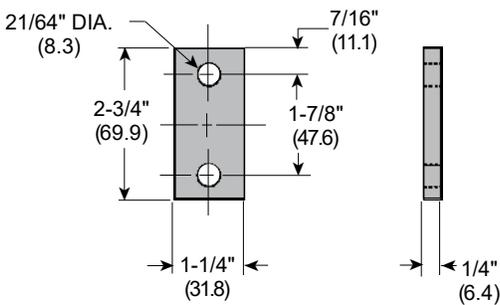
May require: 56550 Nut and 56065 Cotter pin



Wt: .44 lb (.20kg)

4194 "I" Attachment

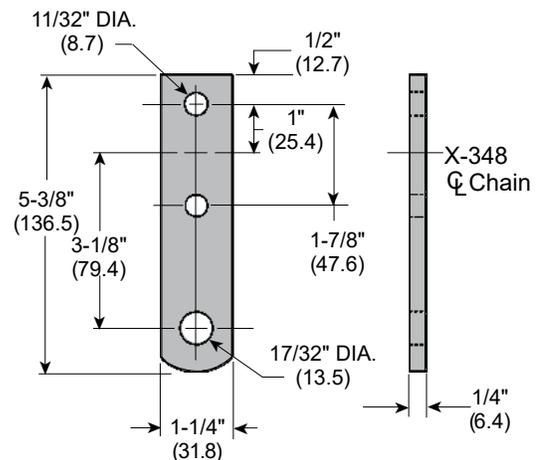
This attachment is used as a filler on intermediate trolleys that do not carry a load. Also available in non-metallic material for noise reduction.



Wt: .25 lb (11kg)

4193 "C" Attachment

This attachment is used when a carrier design includes a clevis. It can also be used with a bent rod hook to carry light parts.

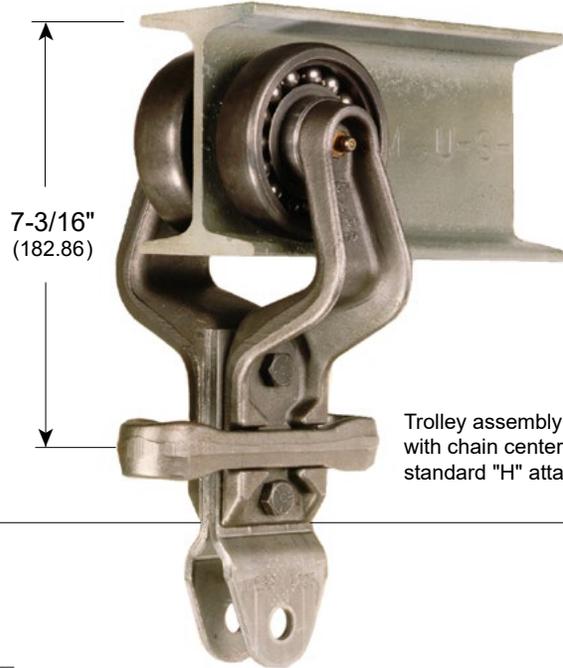


Wt: .48 lb .22 kg

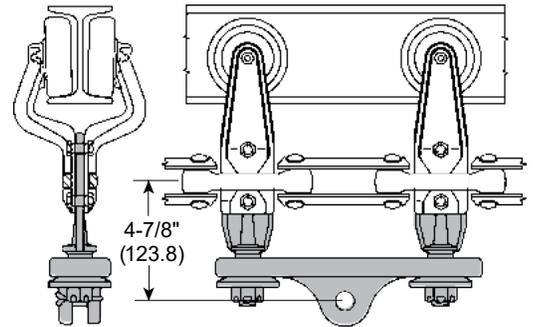
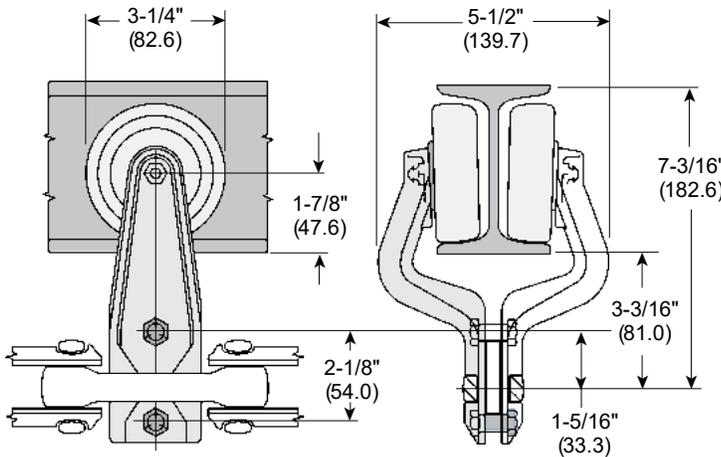
4" Trolley with 3-3/16" Drop

- Chain Size X-458
- Trolley Center Spacing 8" min. (202)
32" max. (813)
- Single Trolley Load Capacity 400lb (181kg)
- Load Capacity W/Load Bar 800lb (363kg)

- Forged carbon steel brackets
- Standard triple labyrinth seal construction
- Rugged 2 bolt attachment connection
- Pressure type grease fittings
- Trolley wheels are swaged to bracket
- Optional Red Seal Guard full contact grease seal



Trolley assembly shown with chain center link and standard "H" attachment

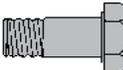


1325 4" Load Bar Assembly includes:

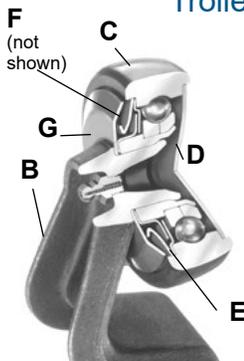
- 2 - # 4221 "B" Attachments
- 1 - # 4060 Load Bar
- 2 - # 4004 Spherical Washers
- 2 - # 6493 Tube Spacers
- 2 - # 56551 Slotted Hex. Nuts
- 2 - # 56074 Cotter Pins

NOTE: Two half trolleys and two nut & bolt assemblies are required to make a complete trolley assembly.

4213 Bolt & Nut Assembly includes:

- 1 - #11979 Bolt 
- 1 - # 56494 Nut 

Trolley Option Specifications

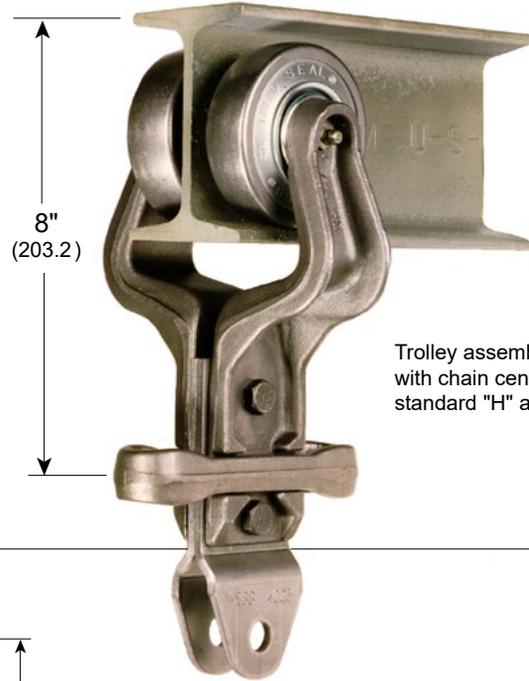


	B	C	D	E	F	G
1/2 Trolley Part No.	Trolley Bracket	Load Wheel Type	Inner Cap	Triple Labyrinth Seal	Full Contact Grease Seal	Red Seal Guard
15308M1	3377	FC	Yes	Yes	No	No
15308	3377	FC	No	Yes	No	No
74597	3377	FC	Yes	No	No	No
15309	3377	FC	No	No	No	No
15347M2	3377	FC	Yes	Yes	Yes	Yes

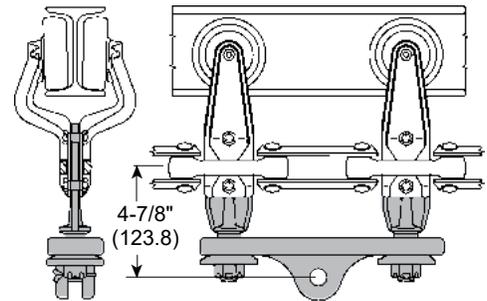
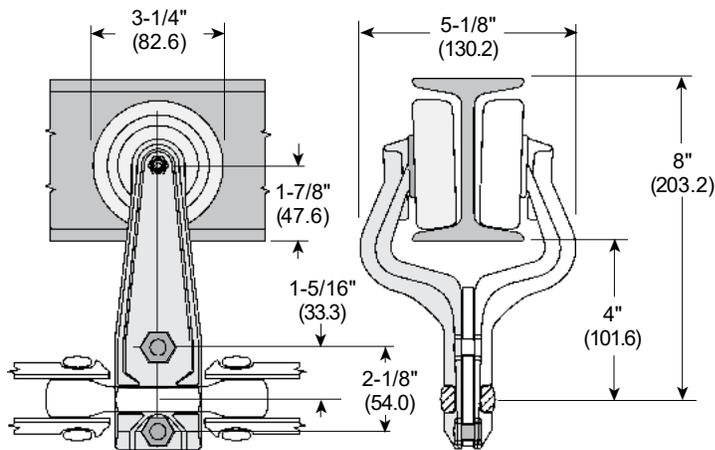
4" Trolley with 4" Drop

Chain Size X-458
 Trolley Center Spacing 8" min. (203.2)
 32" max. (812.8)
 Load Capacity..... 400lb (181kg)
 Load Capacity W/Load Bar..... 800lb (363kg)

- Forged carbon steel brackets
- Standard triple labyrinth seal construction
- Rugged 2 bolt attachment connection
- Pressure type grease fittings
- Trolley wheels are swaged to bracket
- Optional Red Seal Guard full contact grease seal



Trolley assembly shown with chain center link and standard "H" attachment



NOTE: Two half trolleys and two nut & bolt assemblies are required to make a complete trolley assembly.

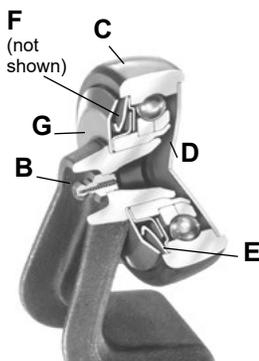
4213 Bolt & Nut Assembly includes:

- 1- # 11979 Bolt
 - 1- # 56494 Nut
-

1325 4" Load Bar Assembly includes:

- 2- # 4221 - "B" Attachments
- 1- # 4060 - Load Bar
- 2- # 4004- Spherical Washers
- 2- # 6493 - Tube Spacers
- 2- # 56551- Slotted Hex. Nuts
- 2- # 56074 - Cotter Pins

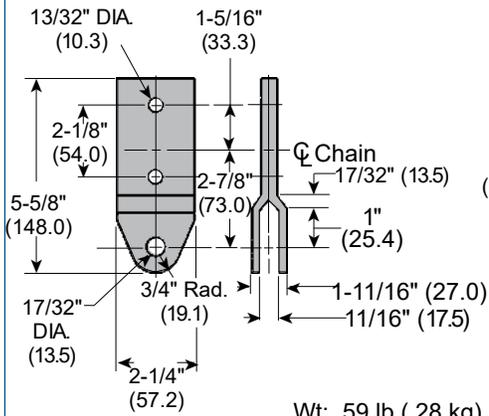
Trolley Option Specifications



	B	C	D	E	F	G	
	1/2 Trolley Part No.	Trolley Bracket	Load Wheel Type	Inner Cap	Triple Labyrinth Seal	Full Contact Grease Seal	Red Seal Guard
	14282	10984	FC	Yes	Yes	No	No
	77696	10984	FC	Yes	No	No	No
	86183	10984	FC	No	No	No	No
	77465	10984	FC	Yes	Yes	Yes	Yes
	87858	10984	FC	No	Yes	No	No

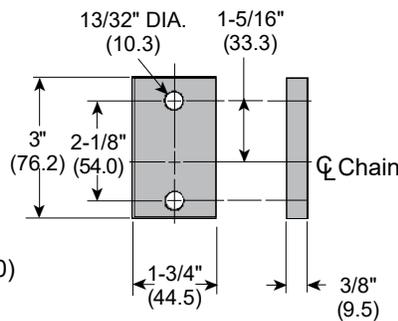
4223 "H" Attachment

The most widely used trolley attachment. It is a 2-piece formed steel construction suitable for almost any type of hook, rack or tray.



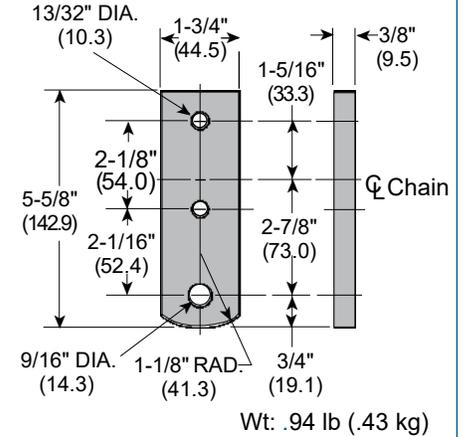
4224 "I" Attachment

Used as a filler on intermediate trolleys that do not carry a load. Also available in non-metallic material for noise reduction.



4222 "C" Attachment

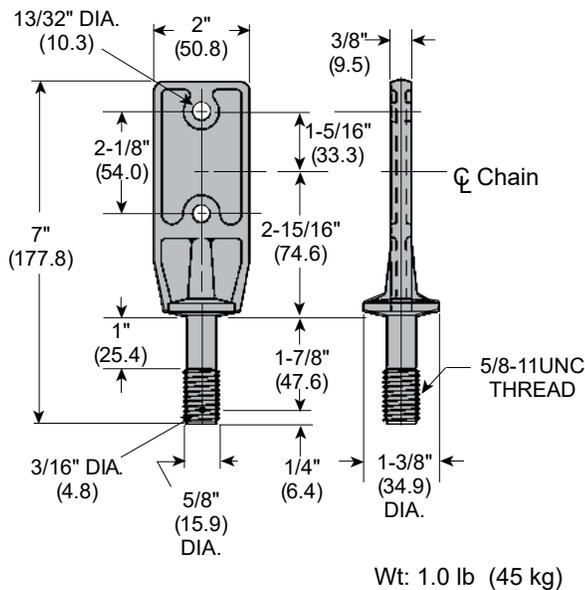
Used when a carrier design includes a clevis. It can also be used with a bent rod hook to carry light parts.



4221 "B" Attachment

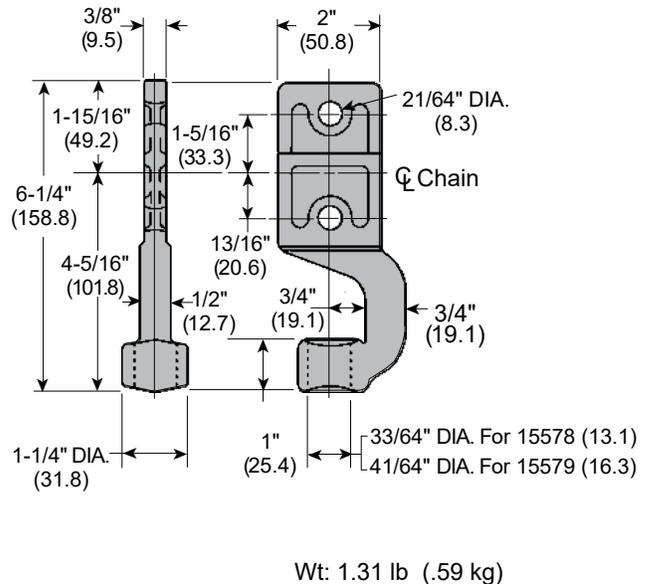
Primary use is to support a 4060 load bar, but it is also used for many other applications. It is a steel forging with a threaded stud.

May require: 56551 Nut and 56074 Cotter pin



15578, #15579 "J" Attachment

Used for suspending 1/2" or 5/8" diameter rods permitting periodic rotation of rod carriers. Specify rod diameter when ordering.

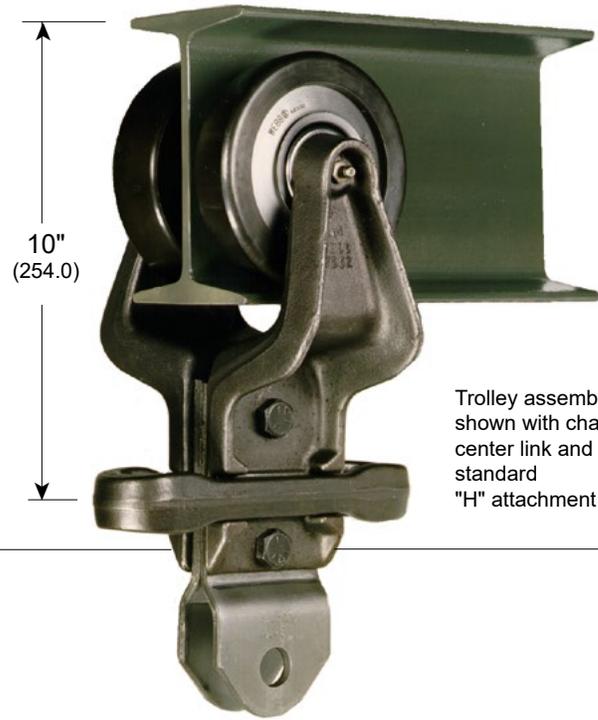


6" Trolley with 4" Drop

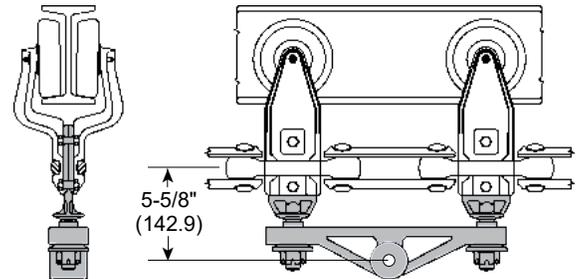
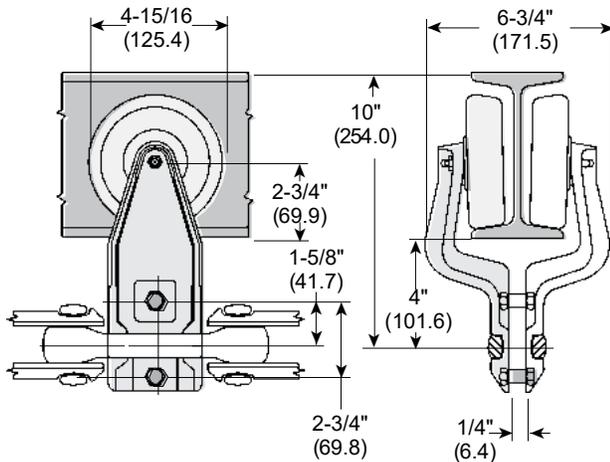
Chain Size X-678
 Trolley Center Spacing 12" min. (304.8)
 36" max. (914.4)

Load Capacity..... 1,200lb (544kg)
 Load Capacity W/Load Bar..... 2,400lb (1088kg)

- Forged carbon steel brackets
- Standard triple labyrinth seal construction
- Rugged 2 bolt attachment connection
- Pressure type grease fittings
- Trolley wheels are swaged to the trolley bracket
- Optional Red Seal Guard full contact grease seal



Trolley assembly shown with chain center link and standard "H" attachment



NOTE: Two half trolleys and two nut & bolt assemblies are required to make a complete trolley assembly.

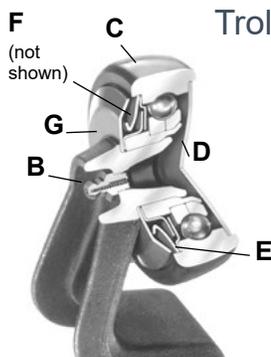
4243 Bolt & Nut Assembly includes:

- 1- # 13464 Bolt
- 1- # 56495 Nut



#3860 6" Load Bar Assembly includes:

- 2- # 4249 "B" Attachments
- 1- # 9484 Load Bar
- 2- # 4250 Spherical Washers
- 2- # 5687 Tube Spacers
- 2- # 56553 Slotted Hex. Nuts
- 2- # 56085 Cotter Pins

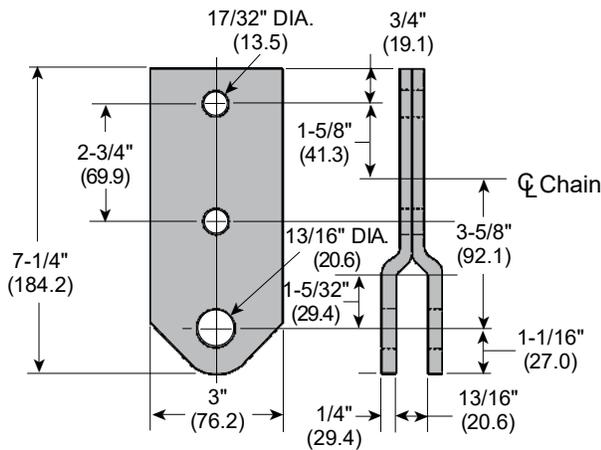


Trolley Option Specifications

	B	C	D	E	F	G
1/2 Trolley Part No.	Trolley Bracket	Load Wheel Type	Inner Cap	Triple Labrynth Seal	Full Contact Grease Seal	Red Seal Guard
100504	7662	FC	Yes	Yes	No	No
100504M1	7662	FC	No	Yes	No	No
100504M2	7662	FC	No	No	No	No

4246 "H" Attachment

This attachment is the most widely used trolley attachment. It is a 2-piece formed steel construction suitable for almost any type of hook, rack or tray.

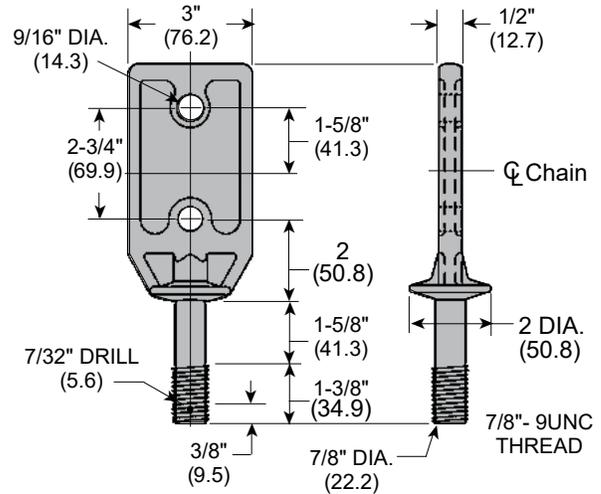


Wt: 1.6 lb (.7 kg)

4249 "B" Attachment

The primary use of this attachment is to support a 9484 load bar, but it is also used for many other applications. It is a steel forging with a threaded stud.

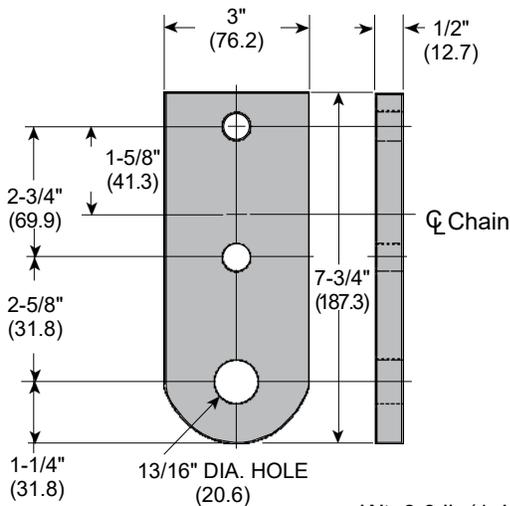
May require: 56553 Nut and 56085 Cotter pin



Wt: 2.25 lb (1.02 kg)

4245 "C" Attachment

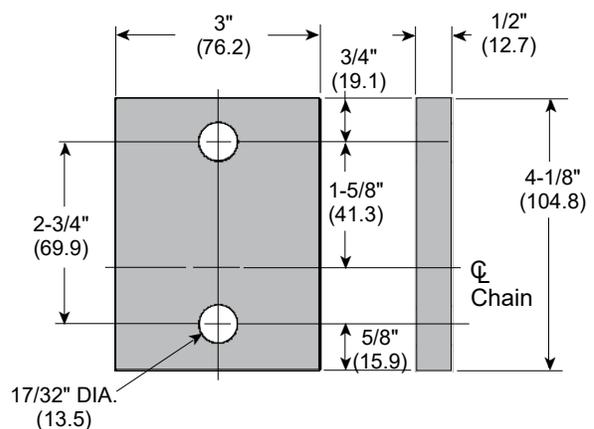
This attachment is used when a carrier design includes a clevis. It can also be used with a bent rod hook to carry light parts.



Wt: 3.0 lb (1.4 kg)

4247 "I" Attachment

This attachment is used as a filler on intermediate trolleys that do not carry a load. Also available in non-metallic material for noise reduction.

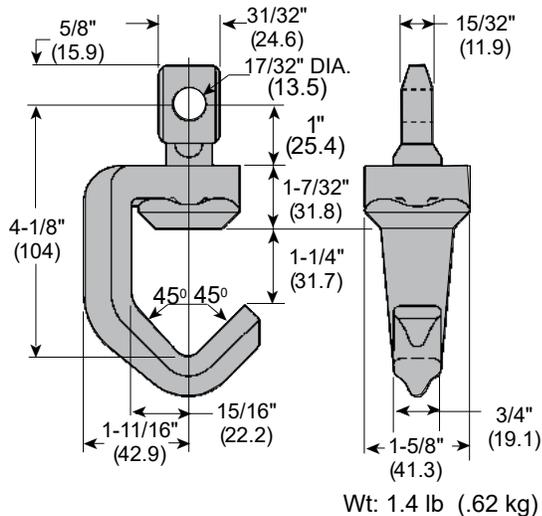


Wt: 1.59 lb (.7 kg)

252104 90° Indexing Swivel Hook Assy.

Made of malleable or ductile iron, this indexing swivel has a 125 lb (56.7kg) capacity rating. It is used with X-348 and X-458 trolley "H" attachments.

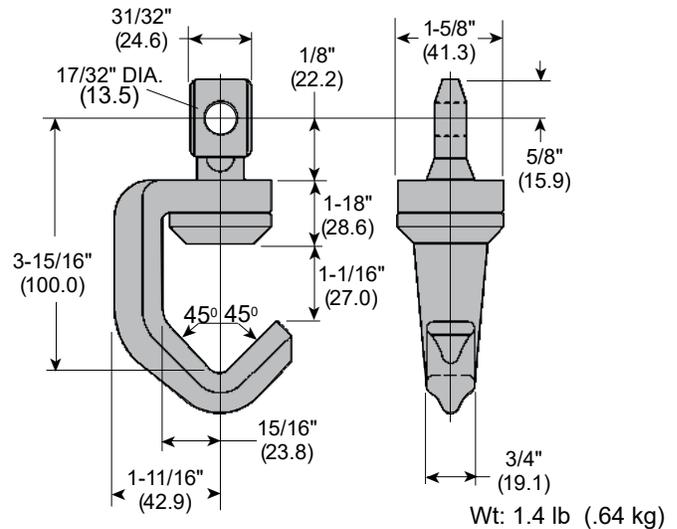
Assembly consists of:
6513 - Shank
16611 - Hook



252099 90° Non-Indexing Swivel Hook Assy.

Made of malleable or ductile iron, this swivel has a 125lb (56.7kg) capacity and is used with X-348 and X458 trolley "H" attachments.

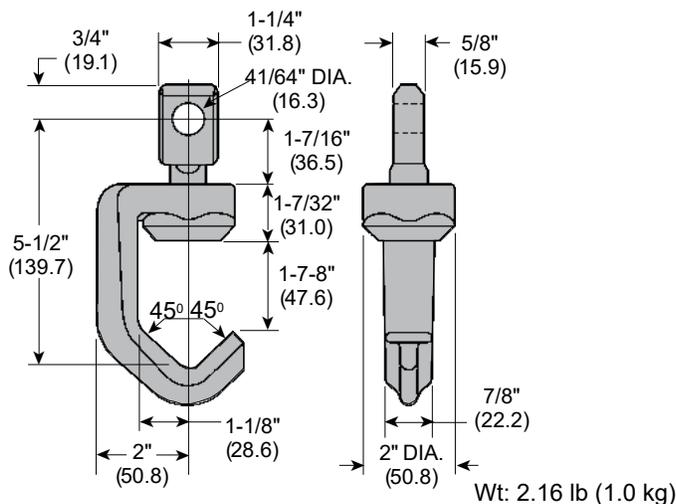
Assembly consists of:
10554 - Shank
16610 - Hook



252102 90° Indexing Swivel Hook Assy

Made of malleable iron, this indexing swivel has a 200lb (90.7kg) capacity rating. It is used with X-458 and X-678 trolley "H" attachments.

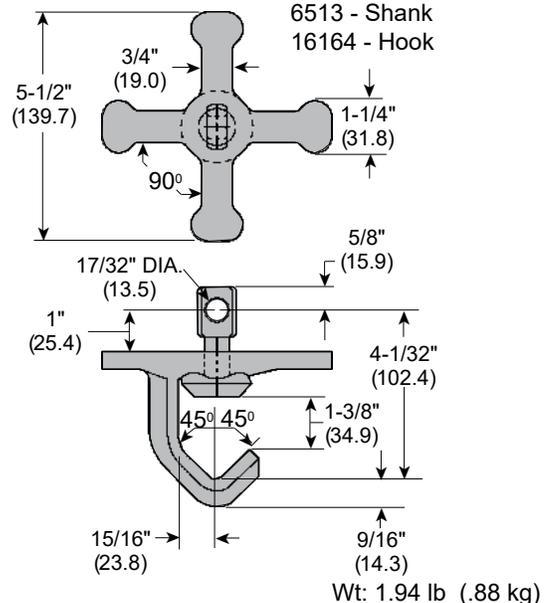
Assembly consists of:
8208 - Shank
8207 - Hook



252101 90° Star Wheel Indexing Swivel Assy.

Made of malleable or ductile iron, this swivel has a 125lb (56.7kg) capacity rating and is used with X-348 and X-458 trolley "H" attachments.

Assembly consists of:
6513 - Shank
16164 - Hook



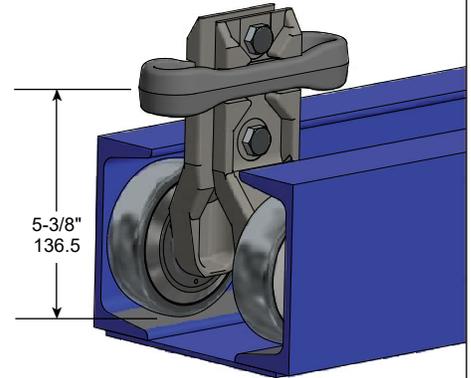
4" Trolley with 5-3/8" Drop

Chain Size X-458

Trolley Center Spacing 8" min. (203.2)
 36" max. (914.4)

Single Trolley Load Capacity 400 lb (181kg)

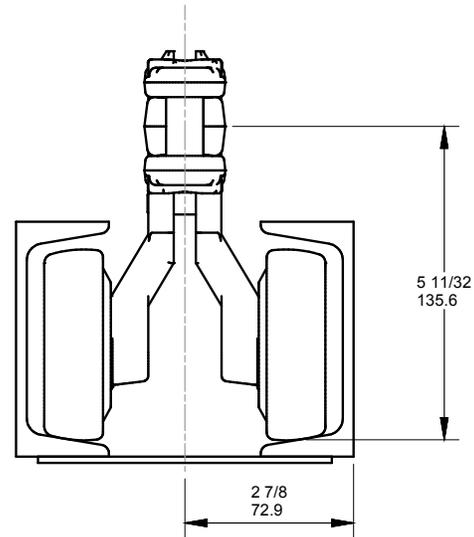
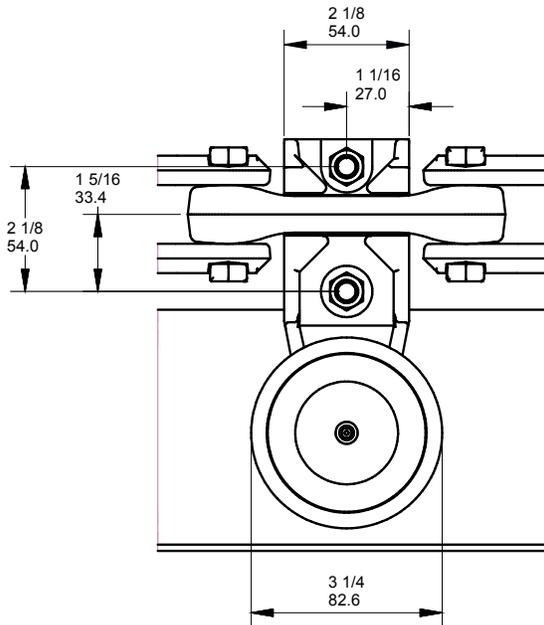
- Forged carbon steel brackets
- Standard triple labyrinth seal construction
- Rugged 2 bolt attachment connection
- Trolley wheels are swaged to the trolley bracket
- Optional Red Seal Guard full contact grease seal



Trolley assembly shown with chain center link and standard "I" attachment. Trolley wheel shown without inner cap.

4213 Bolt & Nut Assembly includes:

- 1- # 11979 Bolt
- 1- # 56494 Nut



Trolley Option Specifications

	B	C	D	E	F	G
1/2 Trolley Part No.	Trolley Bracket	Load Wheel Type	Inner Cap	Triple Labyrinth Seal	Full Contact Grease Seal	Red Seal Guard
14962	10980	FC	With G.F.	Yes	No	No
14959	10980	FC	No	Yes	No	No
14961	10980	FC	With G.F.	Yes	Yes	Yes

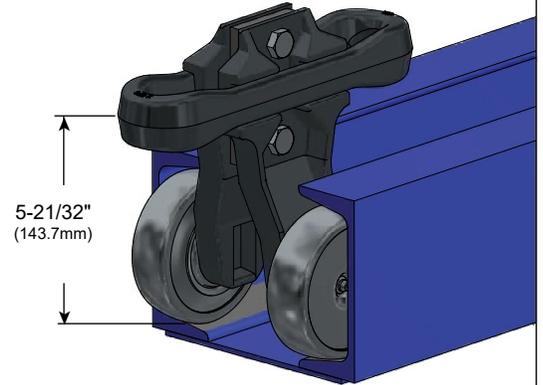
G.F. = Grease fitting

NOTE: Two half trolleys and two nut & bolt assemblies are required to make a complete trolley assembly.

4" Trolley with 5-21/32" Drop

- Chain Size X-678
- Trolley Center Spacing 12" min. (304.8)
36" max. (914.4)
- Single Trolley Load Capacity 400 lb (181 kg)

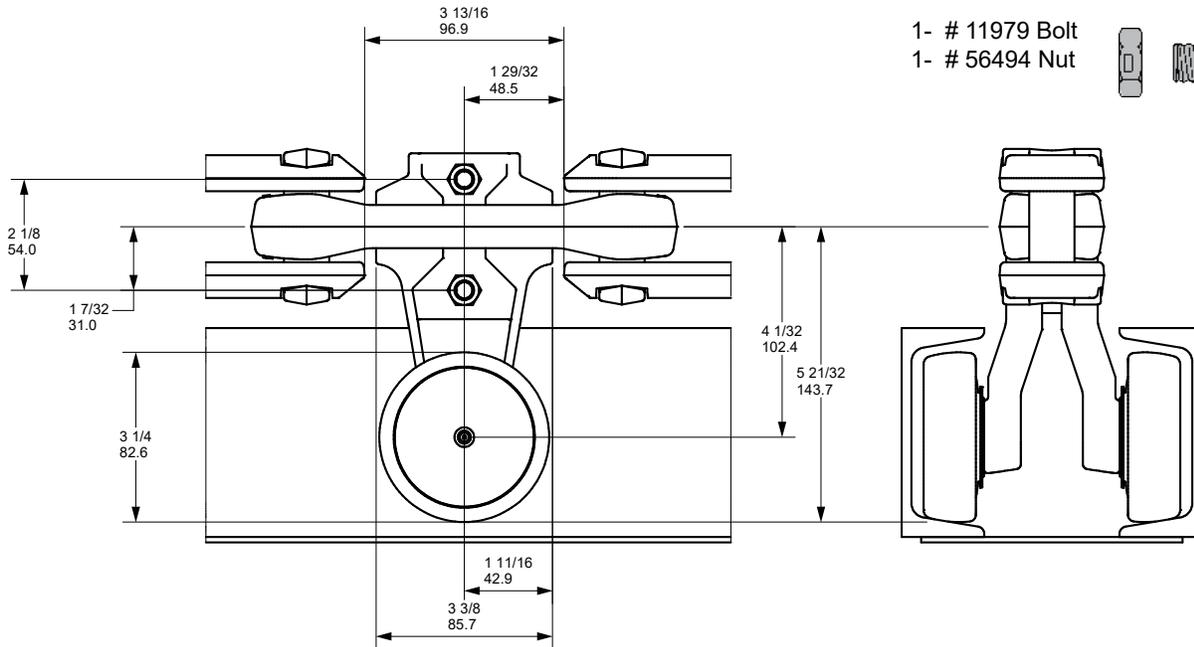
- Forged carbon steel brackets
- Standard triple labyrinth seal construction
- Rugged 2 bolt attachment connection
- Trolley wheels are swaged to the trolley bracket
- Optional Red Seal Guard full contact grease seal



Trolley assembly shown with chain center link and standard "I" attachment. Trolley wheel shown without inner cap.

4213 Bolt & Nut Assembly includes:

- 1- # 11979 Bolt
- 1- # 56494 Nut



Trolley Option Specifications

NOTE: Two half trolleys and two nut & bolt assemblies are required to make a complete trolley assembly.

1/2 Trolley Part No.	Trolley Bracket	Load Wheel Type	Inner Cap	Triple Labyrinth Seal	Full Contact Grease Seal	Red Seal Guard
16847	10985	FC	With G.F.	Yes	No	No
34728	10985	FC	No	Yes	No	No
85210	10985	FC	No	No	No	No
139946	10985	FC	With G.F.	Yes	Yes	Yes
75803	10985	FC	Plain	Yes	Yes	Yes

G.F. = Grease fitting

1/4 Ton



1/4 Ton



3/4 Ton



1 Ton



1 Ton



2 Ton



1/4 Ton Capacity Trolley

Part No. 5688

For 4" I-beam Only

Standard Features:

Side guide rollers prevent unnecessary wear on track & trolley.

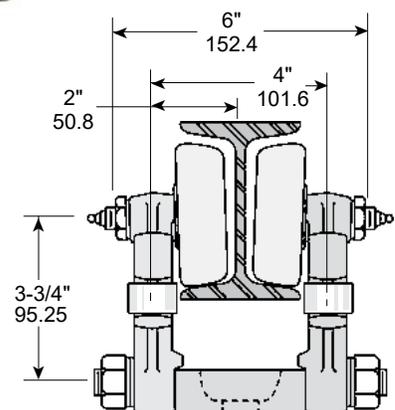
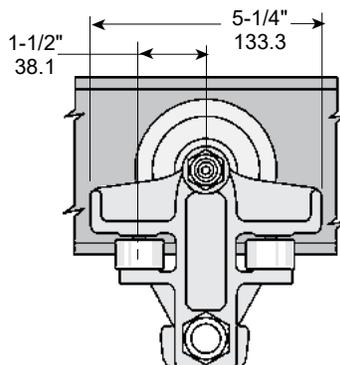
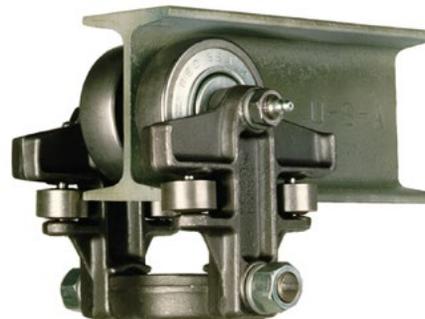
Rugged cast iron body construction.

Trolley wheels are equipped with standard triple labyrinth seals.

Wheels are bolted for easy replacement.

Available options:

Red Seal Guard with full contact grease seals.



1/4 Ton Capacity Trolley

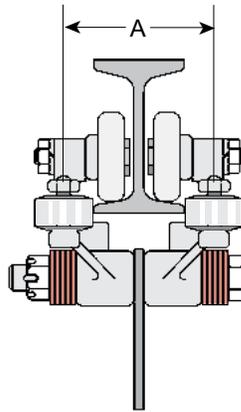
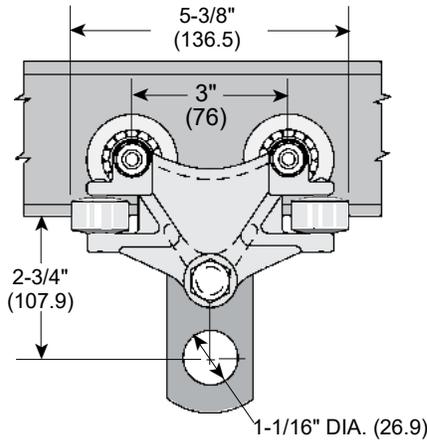
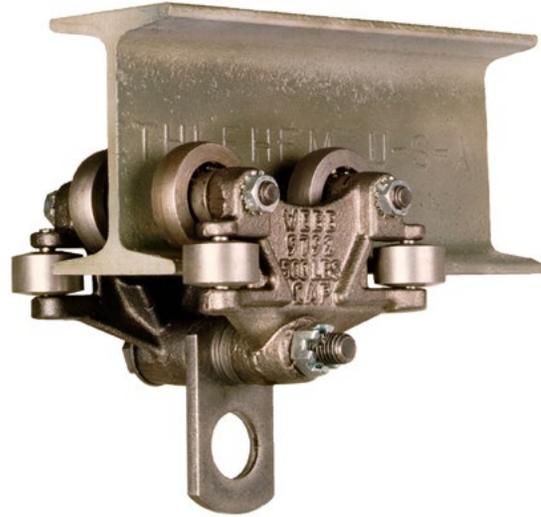
Part No. 9792

Adapts to: 3" & 4" I-beams

Standard Features:

Side guide rollers prevent unnecessary wear on track and trolley.

Rugged cast iron body construction.



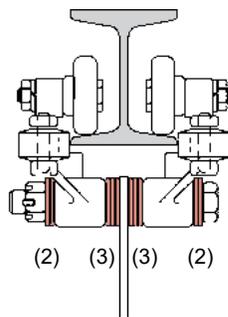
Min. horizontal radius 12" (304.8)
 Dia. of load link bolt 1/2" (12.7)
 Weight 8.63 pounds (3.9 kg)

I-beam Size	A	
	inch	mm
3"	3-9/16	90.5
4"	3-7/8	98.4

Washer Placement Guide

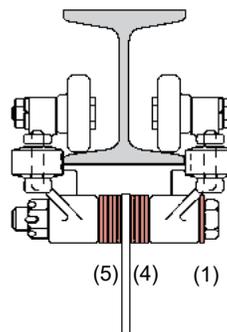
Caution: Maximum washer thickness for a 1/2" dia. (12.7) load bolt is 0.095" (2.4).

3" (76) I-beam



6 washers inside bolt
 4 washers outside bolt

4" (102) I-beam



9 washers inside bolt
 1 washer outside bolt

3/4 Ton Capacity Trolley

Part No. 10711

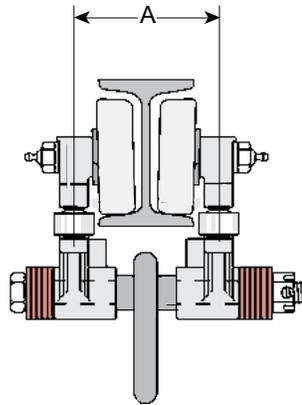
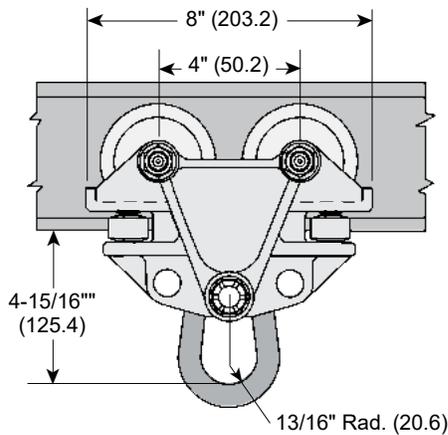
Adapts to: 4", 5" & 6" I-beams

Standard Features:

- Side guide rollers prevent unnecessary wear on track and trolley.
- Extended end flanges for added safety.
- Rugged cast iron body construction.
- Trolley wheels are equipped with standard triple labyrinth seals.
- Wheels are bolted for easy replacement.

Available options:

- Red Seal Guard with full contact grease seals.

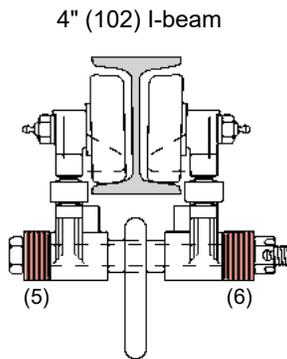


Min. horizontal radius 12" (304.8)
 Dia. of load link bolt 5/8" (15.9)
 Weight 17 pounds (7.71 kg)

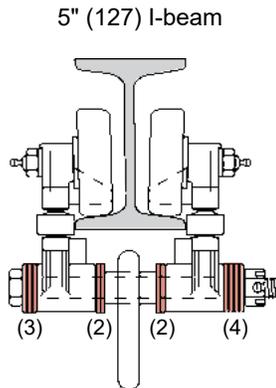
I-beam Size	A	
	inch	mm
4"	4	101.6
5"	4-3/8	111.7
6"	4-3/4	120.6

Washer Placement Guide

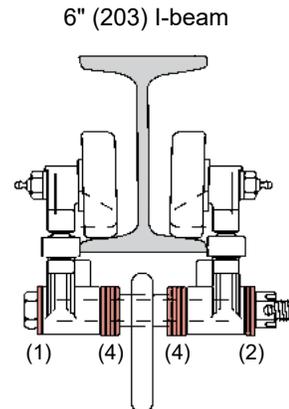
Caution: Maximum washer thickness for a 5/8" dia. (15.9) load bolt is 0.095" (2.4)



0 washers inside bolt
 11 washers outside bolt



4 washers inside bolt
 7 washers outside bolt



8 washers inside bolt
 3 washers outside bolt

1 Ton Capacity Trolley

Part No. 2633

Adapts to: 6", 7", & 8" I-beams

For 1 ton capacity on a 10" beam, use P/N 2637-0

For 1 ton capacity on a 15" beam, use P/N 2644-0

Standard Features:

Side guide rollers prevent unnecessary wear on track and trolley.

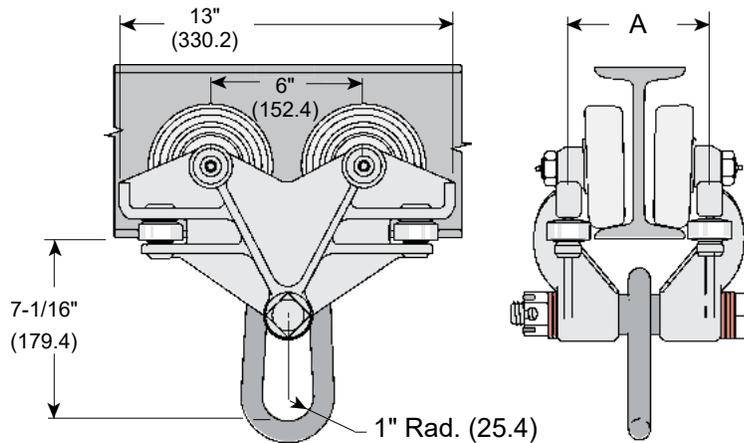
Extended end flanges for added safety.

Rugged cast iron body construction.

Trolley wheels are equipped with standard triple labyrinth seals. Wheels are bolted for easy replacement.

Available options:

Red Seal Guard with full contact grease seals.

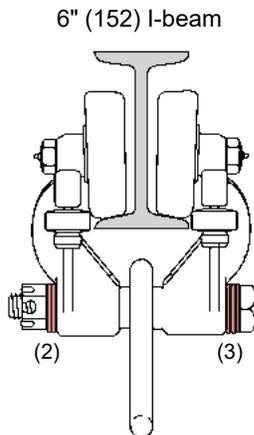


Min. horizontal radius 36" (914.4)
 Dia. of load link bolt 7/8" (22.2)
 Weight 48.4 pounds (21.96 kg)

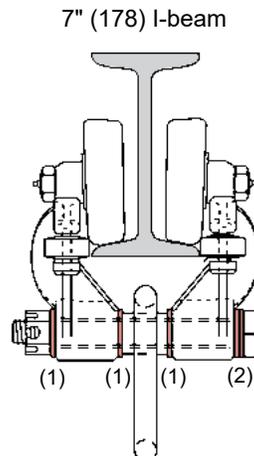
I-beam Size	A	
	inch	mm
6"	5-1/2	139.7
7"	5-3/4	146.0
8"	6-1/8	203.2

Washer Placement Guide

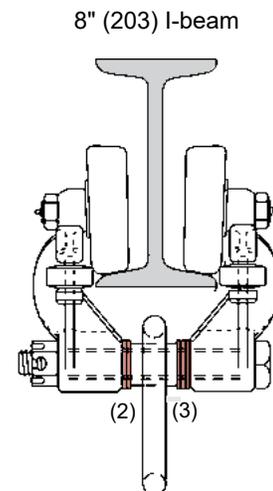
Caution: Maximum washer thickness for a 7/8" dia. (22.2) load bolt is 0.134" (3.4).



0 washers inside bolt
 5 washers outside bolt



2 washers inside bolt
 3 washers outside bolt



5 washers inside bolt
 0 washers outside bolt

1 Ton Capacity Trolley

Part No. 8360

Adapts to: 5", 6", 7" & 8" I-beams

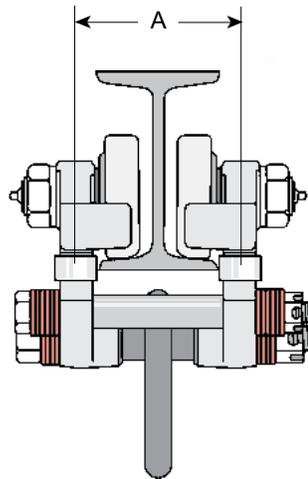
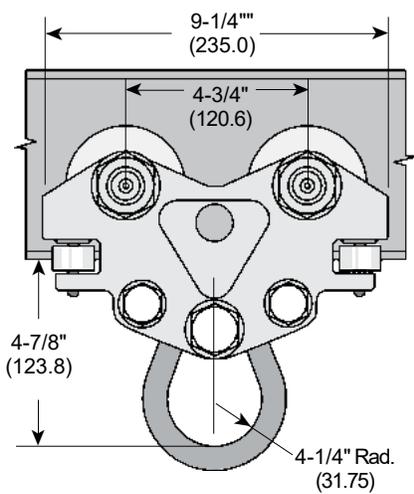
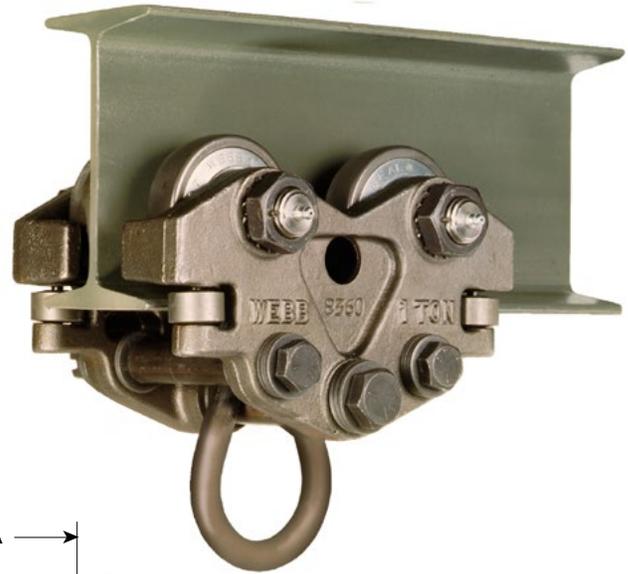
For use on 10" & 12" I-beams, contact DAC Sales for special assembly instructions.

Standard Features:

- Side guide rollers prevent unnecessary wear on track and trolley.
- Extended end flanges for added safety.
- Rugged cast iron body construction.
- Trolley wheels are equipped with standard triple labyrinth seals. Wheels are bolted for easy replacement.

Available options:

Red Seal Guard with full contact grease seals.



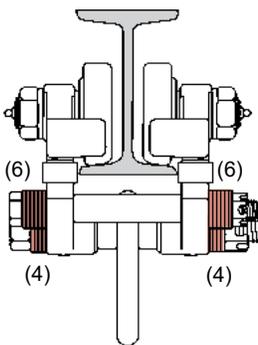
Min. horizontal radius 36" (914.4)
 Dia. of load link bolt 3/4" (19.1)
 Weight 27.75 pounds (12.58 kg)

I-beam Size	A	
	inch	mm
5"	4-5/16	109.5
6"	4-11/16	119.1
7"	4-15/16	125.4
8"	5-5/16	135.0

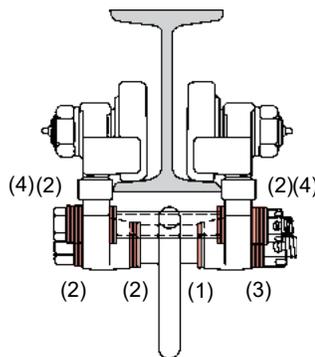
Washer Placement Guide

Caution: Maximum washer thickness for a 5/8" dia. (15.9) safety bolt is 0.095" (2.4)
 Maximum washer thickness for a 3/4" dia. (19.1) load bolt is 0.134" (3.4)

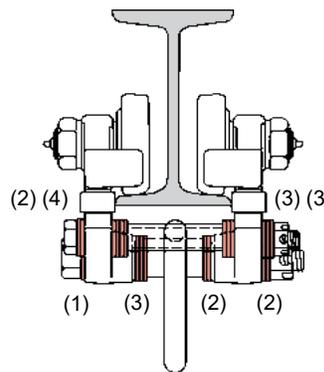
5" (127) I-beam



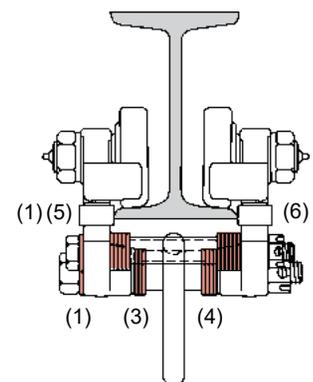
6" (152) I-beam



7" (178) I-beam



8" (203) I-beam



Load Bolts 0 washers per bolt inside
8 washers per bolt outside

3 washers per bolt inside
5 washers per bolt outside

5 washers per bolt inside
3 washers per bolt outside

7 washers per bolt inside
1 washers per bolt outside

Safety Bolts 0 washers per bolt inside
12 washers per bolt outside

4 washers per bolt inside
8 washers per bolt outside

7 washers per bolt inside
5 washers per bolt outside

11 washers per bolt inside
1 washer per bolt outside

2 Ton Capacity Trolley

Part No. 8363

Adapts to: 6", 8", 10" & 12" I-beams

Standard Features:

Side guide rollers prevent unnecessary wear on track and trolley.

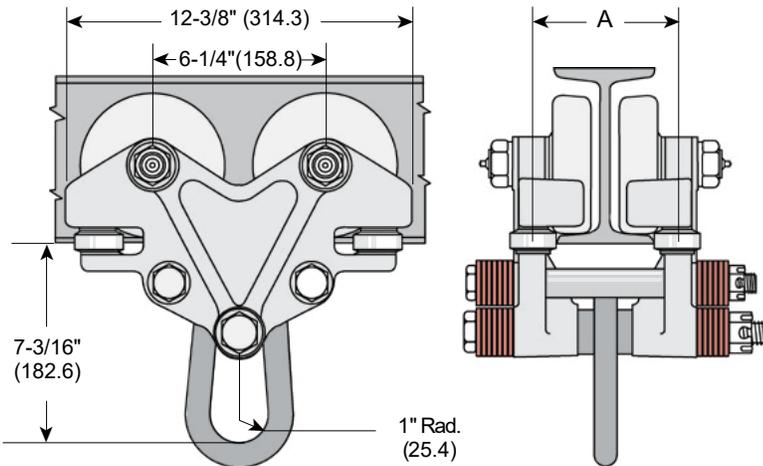
Extended end flanges for added safety.

Rugged cast iron body construction.

Trolley wheels are equipped with standard triple labyrinth seals. Wheels are bolted for easy replacement.

Available options:

Red Seal Guard with full contact grease seals.



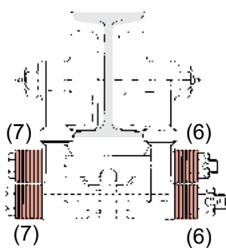
Min. horizontal radius 36" (304.8)
 Dia. of load link bolt 7/8" (22.2)
 Weight 66.5 pounds (30.16 kg)

I-beam Size	A	
	inch	mm
6"	5-5/16	135.0
8"	5-15/16	150.8
10"	6-9/16	166.6
12"	6-15/16	176.2

Washer Placement Guide

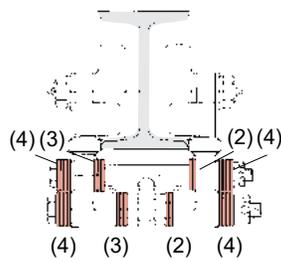
Caution: Maximum washer thickness for a 3/4" dia. (19.1) safety bolt is 0.134" (3.4)
 Maximum washer thickness for a 7/8" dia. (22.2) load bolt is 0.134" (3.4)

6" (152mm) I-beam



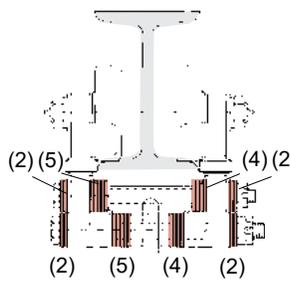
0 washers per bolt inside
 13 washers per bolt outside

8" (203mm) I-beam



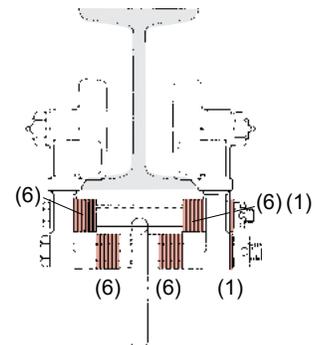
5 washers per bolt inside
 8 washers per bolt outside

10" (254mm) I-beam



9 washers per bolt inside
 4 washers per bolt outside

12" (304.8mm) I-beam



12 washers per bolt inside
 1 washer per bolt outside

#1045 High Carbon Steel Track

This track provides greater strength and wear qualities than track made from mild steel. Higher tolerance web to flange dimensions ensure that trolleys ride properly on the beam flanges. Track is stocked in 20 ft (6.1m) lengths.

Stocked unpainted with mill ends.

Track Dimensions

Part Number	A	B	C	D	Weight
18264	3"	2.33	.17	.17	5.7 lb per ft
18266	4"	2.66	.19	.19	7.7 lb per ft
18269	6"	3.33	.23	.23	12.5 lb per ft
METRIC					
18264	76.2	59.2	4.3	4.3	8.48 kg per m
18266	101.6	67.6	4.8	4.8	11.46 kg per m
18269	152.4	84.6	5.8	5.8	18.60 kg per m

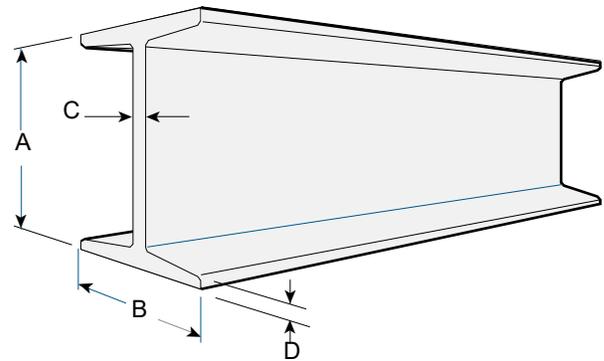
Maximum Load Limits On I-beam Track

I-Beam	Hanger Spacing			
	8'	10'	12'	15'
3"	1650 lb	1350 lb	1100 lb	700 lb
4"	3000 lb	2300 lb	1800 lb	1200 lb
6"	9000 lb	6200 lb	4600 lb	3000 lb
I-Beam	2.44m	3.05m	3.66m	4.57m
3"	748.4 kg	612.3 kg	499.0 kg	317.5 kg
4"	1360.8 kg	1043.3 kg	816.5 kg	544.3 kg
6"	4082.3 kg	2812.3 kg	2086.5 kg	1360.8 kg

Total Load Limit Equals:

$$\frac{\text{Carrier Weight} + \text{load}}{\text{X the number of carriers in a specified span}}$$

= Load in a specified span of I-beam track.



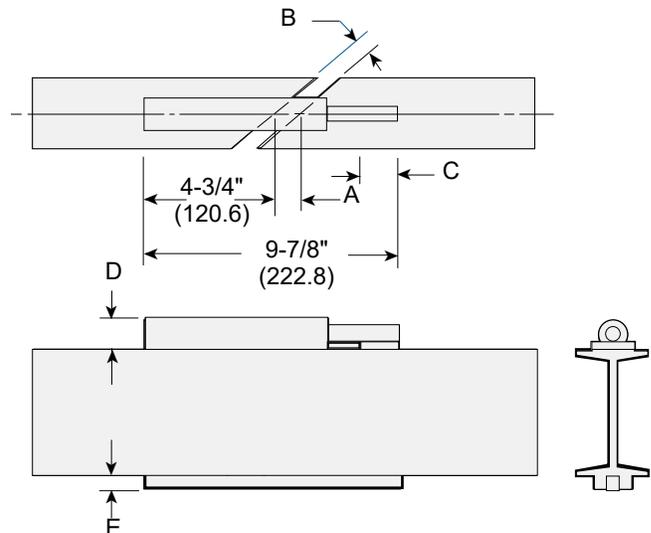
Expansion Joints

A conveyor of any length usually requires expansion joints in the take-up to compensate for chain slack or elongation caused by wear. They are used on all take-ups as the expandable link in the conveyor track.

To compensate for expansion caused by oven heat, any conveyor passing through an oven must have an expansion joint. Assume 3/4" expansion per 100 ft (30.48m) per 100°F (37.7°C) temperature rise. Conveyor expansion joints should be installed in line with all building expansion joints. For longer travel requirements, consult a Daifuku sales engineer.

3", 4" & 6" Oven Expansion Joint Dimensions

Part Number	Beam Size	A Travel	B	C	D	E
147174	3"	3/8"	1/4"	2"	7/8"	1/4"
139999	4"	1/2"	3/8"	1-7/8"	1-1/16"	3/8"
147173	6"	1/2"	3/8"	1-7/8"	1-1/8"	3/8"
METRIC						
147174	76.2	9.5	6.4	50.8	22.2	6.4
139999	101.6	12.7	9.5	47.6	27.0	9.5
147173	152.4	12.7	9.5	47.6	28.6	9.5

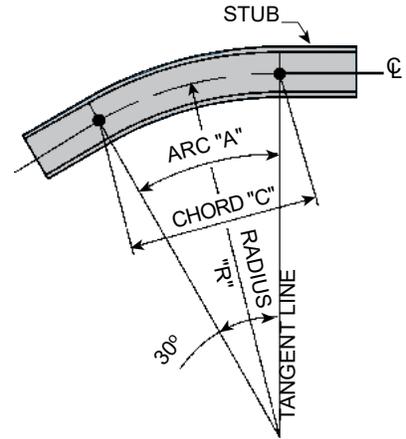


Single Vertical Curves (SVC)

These curves are used to make the upper and lower parts of reverse and compound vertical curves.

Standard Single Vertical Curves

I Beam	Angle	Radius	A	C	Part Number
3"	30°	8'	4' 2-1/4"	4' 1-11/16"	17699
4"	30°	8'	4' 2-1/2"	4' 1-11/16"	102253
4"	30°	10'	5' 2-3/16"	5' 2-1/8"	102255
6"	30°	15'	7' 10-1/4"	7' 9-3/16"	138788
6"	30°	20'	10' 5-11/16"	10' 4-1/4"	215948
METRIC					
76	30°	2438.4	1276.3	1261.8	17699
102	30°	2438.4	1282.7	1261.8	102253
102	30°	3048.0	1580.1	1577.8	102255
152	30°	4572.0	2393.9	2366.9	138788
152	30°	6096.0	3192.4	3155.9	215948

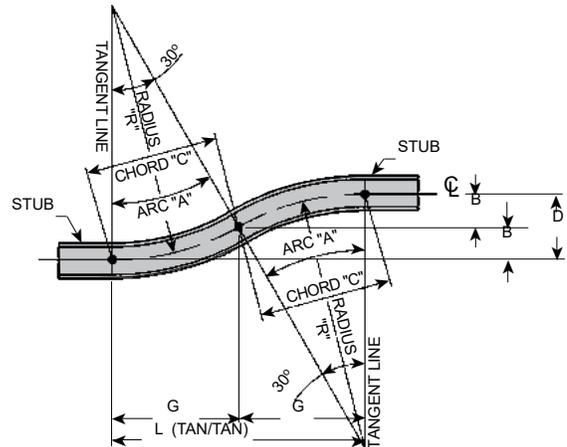


Single bend, reverse & compound vertical curve assemblies can be custom built to suit customer needs. Contact Daifuku Sales for availability and delivery.

Reverse Vertical Curves

These curves are assemblies consisting of two single vertical curves assembled with no straight track between curves to accomplish a change in elevation.

- D (Drop) - Overall change in elevation of vertical curve assembly.
- L (Length) - Overall length of vertical curve assembly - tangent to tangent.
- A (Arc) - True length of any single bend at centerline of track.
- C (Chord) - Straight length across any single bend at centerline - w/p to w/p.
- B (Rise) - Height or vertical change in elevation of any single bend.
- G (Run) - Horizontal length of any single bend.
- H (Bevel) - Run length of curve angle.



To calculate single vertical curve dimensions, the radius and drop or radius and angle are required.

$$D = (2 \times B) \quad L = (2 \times G)$$

$$A = \frac{\pi \times \text{Radius} \times \text{Angle}}{180}$$

$$C = 2 \times \text{Radius} \times \sin\left(\frac{\text{Angle}}{2}\right)$$

$$G = \text{Radius} \times \sin(\text{Angle})$$

or...

$$G = \sqrt{\text{Radius}^2 - (\text{Radius} - B)^2}$$

$$\text{Angle} = \frac{180 \times A}{\pi \times \text{Radius}}$$

$$\sin(\text{Angle}) = \frac{G}{\text{Radius}}$$

$$H = 12 \times \tan(\text{Angle})$$

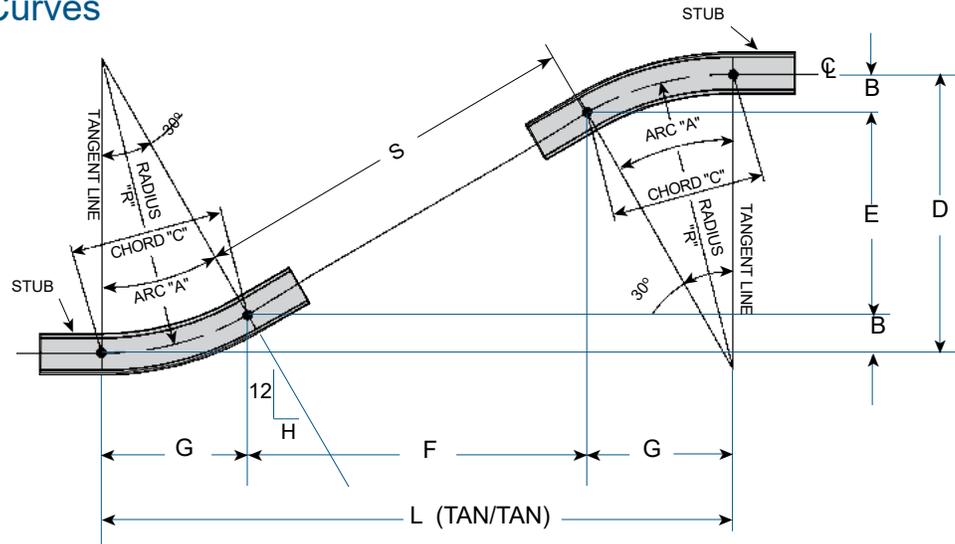
$$TL = (2 \times A)$$

$$B = \frac{D}{2} \quad \text{or...}$$

$$B = 2 \times \text{Radius} \times [1 - \cos(\text{Angle})]$$

Compound Vertical Curves

These curves consist of two single vertical curves and the necessary connecting straight track assembled to accomplish a change in elevation.



Recommended Vertical Curves Based on Trolley Spacing

Trolley Spacing	3" System		4" System		6" System	
	Min	Max	Min	Max	Min	Max
8"	-	-	3'-6"	6'-0"	-	-
12"	4'-0"	5'-0"	-	-	6'-0"	12'-0"
16"	-	-	5'-6"	8'-0"	-	-
18"	5'-0"	6'-6"	-	-	-	-
24"	6'-6"	8'-0"	7'-0"	1'-0"	11'-0"	15'-0"
30"	7'-8"	10'-0"	-	-	-	-
32"	-	-	9'-0"	12'-0"	-	-
36"	9'-0"	12'-0"	-	-	16'-0"	20'-0"
METRIC						
203.2	-	-	1066.8	1828.8	-	-
304.8	1219.2	1524.0	-	-	1828.8	3657.6
406.4	-	-	1676.4	2438.4	-	-
457.2	1524.0	1981.2	-	-	-	-
609.6	1981.12	2438.4	2133.6	3048.0	3352.8	4572.0
762.0	2336.8	3048.0	-	-	-	-
812.8	-	-	2743.2	3657.6	-	-
914.4	2743.2	3657.6	-	-	4876.8	6096.0

D (Drop) - Overall change in elevation of vertical curve assembly.
L (Length) - Overall length of vertical curve assembly - tangent to tangent.

A (Arc) - True length of any single bend at centerline of track.
C (Chord) - Straight length across any single bend at centerline - workpoint to workpoint.

B (Rise) - Height or vertical change in elevation of any single bend.

G (Run) - Horizontal length of any single bend.

H (Bevel) - Run length of curve angle.

S (Straight Section) - Section of track connecting two single bends to create a compound vertical curve.

E (Drop Remainder) - Height or vertical change in elevation of straight section.

F (Length Remainder) - Horizontal length of straight section.

To calculate compound vertical curve dimensions, the radius and drop or radius and angle are required.

$$D = (2 \times B) + E \quad L = (2 \times G) + F$$

$$A = \frac{\pi \times \text{Radius} \times \text{Angle}}{180}$$

$$C = 2 \times \text{Radius} \times \sin\left(\frac{\text{Angle}}{2}\right)$$

$$S = \frac{E}{\text{SIN}(\text{ANGLE})}$$

$$G = \text{Radius} \times \sin(\text{Angle})$$

or...

$$G = \sqrt{\text{Radius}^2 - (\text{Radius} - B)^2}$$

$$\text{Angle} = \frac{180 \times A}{\pi \times \text{Radius}}$$

$$\sin(\text{Angle}) = \frac{G}{\text{Radius}}$$

$$F = \frac{E}{\tan(\text{Angle})}$$

$$H = 12 \times \tan(\text{Angle})$$

$$TL = (2 \times A) + S$$

$$B = \frac{(D - E)}{2} \quad \text{or...}$$

$$B = 2 \times \text{Radius} \times [1 - \cos(\text{Angle})]$$

$$E = D - (2 \times B)$$

8' Radius (2.34m)

Angle - 30°

Arc - 4' 2-1/4" (1.28m)

Chord - 4' 1-11/16" (1.26m)

When ordering vertical curves you must specify:

- Radius
- Vertical Drop
- Degree of Turn
- I-Beam Size

INCH				METRIC			
Vertical Drop	Straight Track	True Length	Tan/Tan Length	Vertical Drop	Straight Track	True Length	Tan/Tan Length
26.00	0.56	101.06	96.50	660.40	14.29	2566.99	2451.10
27.00	2.56	103.06	98.19	685.80	65.09	2617.79	2493.96
28.00	4.56	105.06	99.94	711.20	115.89	2668.59	2538.41
29.00	6.56	107.06	101.69	736.60	166.69	2719.39	2582.86
30.00	8.56	109.06	103.44	762.00	217.49	2770.19	2627.31
31.00	10.56	111.06	105.13	787.40	268.29	2820.99	2670.18
32.00	12.56	113.06	106.88	812.80	319.09	2871.79	2714.63
33.00	14.56	115.06	108.63	838.20	369.89	2922.59	2759.08
34.00	16.56	117.06	110.31	863.60	420.69	2973.39	2801.94
35.00	18.56	119.06	112.06	889.00	471.49	3024.19	2846.39
36.00	20.56	121.06	113.19	914.40	522.29	3074.99	2874.96
37.00	22.56	123.06	115.56	939.80	573.09	3125.79	2935.29
38.00	24.56	125.06	117.25	965.20	623.89	3176.59	2978.15
39.00	26.56	127.06	119.00	990.60	674.69	3227.39	3022.60
40.00	28.56	129.06	120.75	1016.00	725.49	3278.19	3067.05
41.00	30.56	131.06	122.44	1041.40	776.29	3328.99	3109.91
42.00	32.56	133.06	124.19	1066.80	827.09	3379.79	3154.36
43.00	34.56	135.06	125.94	1092.20	877.89	3430.59	3198.81
44.00	36.56	137.06	127.69	1117.60	928.69	3481.39	3243.26
45.00	38.56	139.06	129.38	1143.00	979.49	3532.19	3286.13
46.00	40.56	141.06	131.13	1168.40	1030.29	3582.99	3330.58
47.00	42.56	143.06	132.88	1193.80	1081.09	3633.79	3375.03
48.00	44.56	145.06	134.56	1219.20	1131.89	3684.59	3417.89
49.00	46.56	147.06	136.31	1244.60	1182.69	3735.39	3462.34
50.00	48.56	149.06	138.06	1270.00	1233.42	3786.12	3506.79
51.00	50.56	151.06	139.75	1295.40	1284.22	3836.92	3549.65
52.00	52.56	153.06	141.50	1320.80	1335.02	3887.72	3594.10
53.00	54.56	155.06	143.25	1346.20	1385.82	3938.52	3638.55
54.00	56.56	157.06	145.00	1371.60	1436.62	3989.32	3683.00
55.00	58.56	159.06	146.69	1397.00	1487.42	4040.12	3725.86
56.00	60.56	161.06	148.44	1422.40	1538.22	4090.92	3770.31
57.00	62.56	163.06	150.19	1447.80	1589.02	4141.72	3814.76
58.00	64.56	165.06	151.88	1473.20	1639.82	4192.52	3857.63
59.00	66.56	167.06	153.63	1498.60	1690.62	4243.32	3902.08
60.00	68.56	169.06	155.38	1524.00	1741.42	4294.12	3946.53
61.00	70.56	171.06	157.13	1549.40	1792.22	4344.92	3990.98
62.00	72.56	173.06	158.81	1574.80	1843.02	4395.72	4033.84
63.00	74.56	175.06	160.56	1600.20	1893.82	4446.52	4078.29
64.00	76.56	177.06	162.31	1625.60	1944.62	4497.32	4122.74
65.00	78.56	179.06	164.00	1651.00	1995.42	4548.12	4165.60
66.00	80.56	181.06	165.75	1676.40	2046.22	4598.92	4210.05
67.00	82.56	183.06	167.50	1701.80	2097.02	4649.72	4254.50
68.00	84.56	185.06	169.25	1727.20	2147.82	4700.52	4298.95
69.00	86.56	187.06	170.94	1752.60	2198.62	4751.32	4341.81
70.00	88.56	189.06	172.69	1778.00	2249.42	4802.12	4386.26
71.00	90.56	191.06	174.44	1803.40	2300.22	4852.92	4430.71
72.00	92.56	193.06	176.13	1828.80	2351.02	4903.72	4473.58
73.00	94.56	195.06	177.88	1854.20	2401.82	4954.52	4518.03

8' Radius (2.34m)

Angle - 30°

Arc - 4' 2-1/4" (1.28m)

Chord - 4' 1-11/16" (1.26m)

When ordering vertical curves you must specify:

- Radius
- Vertical Drop
- Degree of Turn
- I-Beam Size

INCH				METRIC			
Vertical Drop	Straight Track	True Length	Tan/Tan Length	Vertical Drop	Straight Track	True Length	Tan/Tan Length
74.00	96.56	197.06	179.63	1879.60	2452.62	5005.32	4562.48
75.00	98.56	199.06	181.38	1905.00	2503.42	5056.12	4606.93
76.00	100.56	201.06	183.06	1930.40	2554.22	5106.92	4649.79
77.00	102.56	203.06	184.81	1955.80	2605.02	5157.72	4694.24
78.00	104.56	205.06	186.56	1981.20	2655.82	5208.52	4738.69
79.00	106.56	207.06	188.25	2006.60	2706.62	5259.32	4781.55
80.00	108.56	209.06	190.00	2032.00	2757.42	5310.12	4826.00
81.00	110.56	211.06	191.75	2057.40	2808.22	5360.92	4870.45
82.00	112.56	213.06	193.50	2082.80	2859.02	5411.72	4914.90
83.00	114.56	215.06	195.19	2108.20	2909.82	5462.52	4957.76
84.00	116.56	217.06	196.94	2133.60	2960.62	5513.32	5002.21
85.00	118.56	219.06	198.69	2159.00	3011.42	5564.12	5046.66
86.00	120.56	221.06	200.38	2184.40	3062.22	5614.92	5089.53
87.00	122.56	223.06	202.13	2209.80	3113.02	5665.72	5133.98
88.00	124.56	225.06	203.88	2235.20	3163.82	5716.52	5178.43
89.00	126.56	227.06	205.63	2260.60	3214.62	5767.32	5222.88
90.00	128.56	229.06	207.31	2286.00	3265.42	5818.12	5265.74
91.00	130.56	231.06	209.06	2311.40	3316.22	5868.92	5310.19
92.00	132.56	233.06	210.81	2336.80	3367.02	5919.72	5354.64
93.00	134.56	235.06	212.50	2362.20	3417.82	5970.52	5397.50
94.00	136.56	237.06	214.25	2387.60	3468.62	6021.32	5441.95
95.00	138.56	239.06	216.00	2413.00	3519.42	6072.12	5486.40
96.00	140.56	241.06	217.75	2438.40	3570.22	6122.92	5530.85
97.00	142.56	243.06	219.44	2463.80	3621.02	6173.72	5573.71
98.00	144.56	245.06	221.19	2489.20	3671.82	6224.52	5618.16
99.00	146.56	247.06	222.94	2514.60	3722.62	6275.32	5662.61
100.00	148.56	249.06	224.63	2540.00	3773.42	6326.12	5705.48
101.00	150.56	251.06	226.38	2565.40	3824.22	6376.92	5749.93
102.00	152.56	253.06	228.13	2590.80	3875.02	6427.72	5794.38
103.00	154.56	255.06	229.88	2616.20	3925.82	6478.52	5838.83
104.00	156.56	257.06	231.56	2641.60	3976.62	6529.32	5881.69
105.00	158.56	259.06	233.31	2667.00	4027.42	6580.12	5926.14
106.00	160.56	261.06	235.06	2692.40	4078.22	6630.92	5970.59
107.00	162.56	263.06	236.75	2717.80	4129.02	6681.72	6013.45
108.00	164.56	265.06	238.50	2743.20	4179.82	6732.52	6057.90
109.00	166.56	267.06	240.25	2768.60	4230.62	6783.32	6102.35
110.00	168.56	269.06	242.00	2794.00	4281.42	6834.12	6146.80
111.00	170.56	271.06	243.69	2819.40	4332.22	6884.92	6189.66
112.00	172.56	273.06	245.44	2844.80	4383.02	6935.72	6234.11
113.00	174.56	275.06	247.19	2870.20	4433.82	6986.52	6278.56
114.00	176.56	277.06	248.88	2895.60	4484.62	7037.32	6321.43
115.00	178.56	279.06	250.63	2921.00	4535.42	7088.12	6366.00
116.00	180.56	281.06	252.38	2946.40	4586.22	7138.92	6410.45
117.00	182.56	283.06	254.13	2971.80	4637.02	7189.72	6454.90
118.00	184.56	285.06	255.81	2997.20	4687.82	7240.52	6497.57
119.00	186.56	287.06	257.56	3022.60	4738.62	7291.32	6542.09
120.00	188.56	289.06	259.31	3048.00	4789.42	7342.12	6586.47

10' Radius (3.05m)

Angle - 30°

Arc - 5' 2-13/16" (1.60m)

Chord - 5' 2-1/8" (1.58m)

When ordering vertical curves you must specify:

- Radius
- Vertical Drop
- Degree of Turn
- I-Beam Size

INCH				METRIC			
Vertical Drop	Straight Track	True Length	Tan/Tan Length	Vertical Drop	Straight Track	True Length	Tan/Tan Length
32.00	0.19	125.88	120.19	812.80	4.76	3197.23	3052.76
33.00	1.69	127.38	121.44	838.20	42.86	3235.33	3084.51
34.00	3.69	129.38	123.19	863.60	93.66	3286.13	3128.96
35.00	5.69	131.38	124.94	889.00	144.46	3336.93	3173.41
36.00	7.69	133.38	126.69	914.40	195.26	3387.73	3217.86
37.00	9.69	135.38	128.38	939.80	246.06	3438.65	3260.73
38.00	11.69	137.38	130.13	965.20	296.93	3489.45	3305.18
39.00	13.69	139.38	131.88	990.60	347.73	3540.25	3349.63
40.00	15.69	141.38	133.56	1016.00	398.53	3591.05	3392.49
41.00	17.69	143.38	135.31	1041.40	449.33	3641.85	3436.94
42.00	19.69	145.38	137.06	1066.80	500.13	3692.65	3481.39
43.00	21.69	147.38	138.81	1092.20	550.93	3743.45	3525.84
44.00	23.69	149.38	140.50	1117.60	601.73	3794.25	3568.70
45.00	25.69	151.38	142.25	1143.00	652.53	3845.05	3613.15
46.00	27.69	153.38	144.00	1168.40	703.33	3895.85	3657.60
47.00	29.69	155.38	145.69	1193.80	754.13	3946.65	3700.46
48.00	31.69	157.38	147.44	1219.20	804.86	3997.45	3744.91
49.00	33.69	159.38	149.19	1244.60	855.73	4048.25	3789.36
50.00	35.69	161.38	150.94	1270.00	906.53	4099.05	3833.81
51.00	37.69	163.38	152.63	1295.40	957.33	4149.85	3876.68
52.00	39.69	165.38	154.38	1320.80	1008.13	4200.65	3921.13
53.00	41.69	167.38	156.13	1346.20	1058.93	4251.45	3965.58
54.00	43.69	169.38	157.81	1371.60	1109.73	4302.25	4008.44
55.00	45.69	171.38	159.56	1397.00	1160.53	4353.05	4052.89
56.00	47.69	173.38	161.31	1422.40	1211.33	4403.85	4097.34
57.00	49.69	175.38	163.06	1447.80	1262.13	4454.65	4141.79
58.00	51.69	177.38	164.75	1473.20	1312.93	4505.45	4184.65
59.00	53.69	179.38	166.50	1498.60	1363.73	4556.25	4229.10
60.00	55.69	181.38	168.25	1524.00	1414.53	4607.05	4273.55
61.00	57.69	183.38	169.94	1549.40	1465.33	4657.85	4316.41
62.00	59.69	185.38	171.69	1574.80	1516.13	4708.65	4360.86
63.00	61.69	187.38	173.44	1600.20	1566.93	4759.45	4405.31
64.00	63.69	189.38	175.19	1625.60	1617.73	4810.25	4449.76
65.00	65.69	191.38	176.88	1651.00	1668.53	4861.05	4492.63
66.00	67.69	193.38	178.63	1676.40	1719.33	4911.85	4537.08
67.00	69.69	195.38	180.38	1701.80	1770.13	4962.65	4581.53
68.00	71.69	197.38	182.06	1727.20	1820.93	5013.45	4624.39
69.00	73.69	199.38	183.81	1752.60	1871.73	5064.25	4668.84
70.00	75.69	201.38	185.56	1778.00	1922.53	5115.05	4713.29
71.00	77.69	203.38	187.31	1803.40	1973.33	5165.85	4757.74
72.00	79.69	205.38	189.00	1828.80	2024.13	5216.65	4800.60
73.00	81.69	207.38	190.75	1854.20	2074.93	5267.45	4845.05
74.00	83.69	209.38	192.50	1879.60	2125.73	5318.25	4889.50
75.00	85.69	211.38	194.19	1905.00	2176.53	5369.05	4932.36
76.00	87.69	213.38	195.94	1930.40	2227.33	5419.85	4976.81

10' Radius (3.05m)

Angle - 30°

Arc - 5' 2-13/16" (1.60m)

Chord - 5' 2-1/8" (1.59m)

When ordering vertical curves you must specify:

- Radius
- Vertical Drop
- Degree of Turn
- I-Beam Size

INCH				METRIC			
Vertical Drop	Straight Track	True Length	Tan/Tan Length	Vertical Drop	Straight Track	True Length	Tan/Tan Length
77.00	89.69	215.38	197.69	1955.80	2278.13	5470.65	5021.26
78.00	91.69	217.38	199.44	1981.20	2328.93	5521.45	5065.71
79.00	93.69	219.38	201.13	2006.60	2379.73	5572.25	5108.58
80.00	95.69	221.38	202.88	2032.00	2430.53	5623.05	5153.03
81.00	97.69	223.38	204.63	2057.40	2481.33	5673.85	5197.48
82.00	99.69	225.38	206.31	2082.80	2532.13	5724.65	5240.34
83.00	101.69	227.38	208.06	2108.20	2582.93	5775.45	5284.79
84.00	103.69	229.38	209.81	2133.60	2633.73	5826.25	5329.24
85.00	105.69	231.38	211.56	2159.00	2684.53	5877.05	5373.69
86.00	107.69	233.38	213.25	2184.40	2735.33	5927.85	5416.55
87.00	109.69	235.38	215.00	2209.80	2786.13	5978.65	5461.00
88.00	111.69	237.38	216.75	2235.20	2836.93	6029.45	5505.45
89.00	113.69	239.38	218.44	2260.60	2887.73	6080.25	5548.31
90.00	115.69	241.38	220.19	2286.00	2938.53	6131.05	5592.76
91.00	117.69	243.38	221.94	2311.40	2989.33	6181.85	5637.21
92.00	119.69	245.38	223.69	2336.80	3040.13	6232.65	5681.66
93.00	121.69	247.38	225.38	2362.20	3090.93	6283.45	5724.53
94.00	123.69	249.38	227.13	2387.60	3141.73	6334.25	5768.98
95.00	125.69	251.38	228.88	2413.00	3192.53	6385.05	5813.43
96.00	127.69	253.38	230.56	2438.40	3243.33	6435.85	5856.29
97.00	129.69	255.38	232.31	2463.80	3294.13	6486.65	5900.74
98.00	131.69	257.38	234.06	2489.20	3344.93	6537.45	5945.19
99.00	133.69	259.38	235.75	2514.60	3395.73	6588.25	5988.05
100.00	135.69	261.38	237.50	2540.00	3446.53	6639.05	6032.50
101.00	137.69	263.38	239.25	2565.40	3497.33	6689.85	6076.95
102.00	139.69	265.38	241.00	2590.80	3548.13	6740.65	6121.40
103.00	141.69	267.38	242.69	2616.20	3598.93	6791.45	6164.26
104.00	143.69	269.38	244.44	2641.60	3649.73	6842.25	6208.71
105.00	145.69	271.38	246.19	2667.00	3700.53	6893.05	6253.16
106.00	147.69	273.38	247.88	2692.40	3751.33	6943.85	6296.03
107.00	149.69	275.38	249.63	2717.80	3802.13	6994.65	6340.48
108.00	151.69	277.38	251.38	2743.20	3852.93	7045.33	6384.93
109.00	153.69	279.38	253.13	2768.60	3903.73	7096.25	6429.38
110.00	155.69	281.38	254.81	2794.00	3954.53	7147.05	6472.24
111.00	157.69	283.38	256.56	2819.40	4005.33	7197.85	6516.69
112.00	159.69	285.38	258.31	2844.80	4056.13	7248.65	6561.14
113.00	161.69	287.38	260.00	2870.20	4106.93	7299.45	6604.00
114.00	163.69	289.38	261.75	2895.60	4157.73	7350.25	6648.45
115.00	165.69	291.38	263.50	2921.00	4208.53	7401.05	6692.90
116.00	167.69	293.38	265.25	2946.40	4259.33	7451.85	6737.35
117.00	169.69	295.38	266.94	2971.80	4310.13	7502.65	6780.21
118.00	171.69	297.38	268.69	2997.20	4360.93	7553.45	6824.66
119.00	173.69	299.38	270.44	3022.60	4411.73	7604.25	6869.11
120.00	175.69	301.38	272.13	3048.00	4462.53	7655.05	6911.98

15' Radius (4.57m)

Angle - 30°

Arc - 7' 10-1/4" (2.39m)

Chord - 7' 9-3/16" (2.37m)

When ordering vertical curves you must specify:

- Radius
- Vertical Drop
- Degree of Turn
- I-Beam Size

INCH				METRIC			
Vertical Drop	Straight Track	True Length	Tan/Tan Length	Vertical Drop	Straight Track	True Length	Tan/Tan Length
49.00	1.56	190.06	181.31	1244.60	39.69	4827.59	4605.34
50.00	3.56	192.06	183.06	1270.00	90.49	4878.39	4649.79
51.00	5.56	194.06	184.81	1295.40	141.29	4929.19	4694.24
52.00	7.56	196.06	186.50	1320.80	192.02	4979.92	4737.10
53.00	9.56	198.06	188.25	1346.20	242.82	5030.72	4781.55
54.00	11.56	200.06	190.00	1371.60	293.62	5081.52	4826.00
55.00	13.56	202.06	191.75	1397.00	344.42	5132.32	4870.45
56.00	15.56	204.06	193.44	1422.40	395.22	5183.12	4913.31
57.00	17.56	206.06	195.19	1447.80	446.02	5233.92	4957.76
58.00	19.56	208.06	196.94	1473.20	496.82	5284.72	5002.21
59.00	21.56	210.06	198.63	1498.60	547.62	5335.52	5045.08
60.00	23.56	212.06	200.38	1524.00	598.42	5386.32	5089.53
61.00	25.56	214.06	202.13	1549.40	649.22	5437.12	5133.98
62.00	27.56	216.06	203.88	1574.80	700.02	5487.92	5178.43
63.00	29.56	218.06	205.56	1600.20	750.82	5538.72	5221.29
64.00	31.56	220.06	207.31	1625.60	801.62	5589.52	5265.74
65.00	33.56	222.06	209.06	1651.00	852.42	5640.32	5310.19
66.00	35.56	224.06	210.75	1676.40	903.29	5691.12	5353.05
67.00	37.56	226.06	212.50	1701.80	954.02	5741.92	5397.50
68.00	39.56	228.06	214.25	1727.20	1004.82	5792.72	5441.95
69.00	41.56	230.06	216.00	1752.60	1055.62	5843.52	5486.40
70.00	43.56	232.06	217.69	1778.00	1106.42	5894.32	5529.26
71.00	45.56	234.06	219.44	1803.40	1157.22	5945.12	5573.71
72.00	47.56	236.06	221.19	1828.80	1208.02	5995.92	5618.16
73.00	49.56	238.06	222.88	1854.20	1258.82	6046.72	5661.03
74.00	51.56	240.06	224.63	1879.60	1309.62	6097.52	5705.48
75.00	53.56	242.06	226.38	1905.00	1360.42	6148.32	5749.93
76.00	55.56	244.06	228.13	1930.40	1411.22	6199.12	5794.38
77.00	57.56	246.06	229.81	1955.80	1462.02	6249.92	5837.24
78.00	59.56	248.06	231.56	1981.20	1512.82	6300.72	5881.69
79.00	61.56	250.06	233.31	2006.60	1563.62	6351.52	5926.14
80.00	63.56	252.06	235.00	2032.00	1614.42	6402.32	5969.00
81.00	65.56	254.06	236.75	2057.40	1665.22	6453.12	6013.45
82.00	67.56	256.06	238.50	2082.80	1716.02	6503.92	6057.90
83.00	69.56	258.06	240.25	2108.20	1766.82	6554.72	6102.35
84.00	71.56	260.06	241.94	2133.60	1817.62	6605.52	6145.21

15' Radius (4.57m)

Angle - 30°

Arc - 7' 10-1/4" (2.39m)

Chord - 7' 9-3/16" (2.37)

When ordering vertical curves you must specify:

- Radius
- Vertical Drop
- Degree of Turn
- I-Beam Size

INCH				METRIC			
Vertical Drop	Straight Track	True Length	Tan/Tan Length	Vertical Drop	Straight Track	True Length	Tan/Tan Length
85.00	73.56	262.06	243.69	2159.00	1868.42	6656.32	6189.66
86.00	75.56	264.06	245.44	2184.40	1919.22	6707.12	6234.11
87.00	77.56	266.06	247.13	2209.80	1970.02	6757.92	6276.98
88.00	79.56	268.06	248.88	2235.20	2020.82	6808.72	6321.43
89.00	81.56	270.06	250.63	2260.60	2071.62	6859.52	6365.88
90.00	83.56	272.06	252.38	2286.00	2122.42	6910.32	6410.33
91.00	85.56	274.06	254.06	2311.40	2173.22	6961.12	6453.19
92.00	87.56	276.06	255.81	2336.80	2224.02	7011.92	6497.64
93.00	89.56	278.06	257.56	2362.20	2274.82	7062.72	6542.09
94.00	91.56	280.06	259.25	2387.60	2325.62	7113.52	6584.95
95.00	93.56	282.06	261.00	2413.00	2376.42	7164.32	6629.40
96.00	95.56	284.06	262.75	2438.40	2427.22	7215.12	6673.85
97.00	97.56	286.06	264.50	2463.80	2478.02	7265.92	6718.30
98.00	99.56	288.06	266.19	2489.20	2528.82	7316.72	6761.16
99.00	101.56	290.06	267.94	2514.60	2579.62	7367.52	6805.61
100.00	103.56	292.06	269.69	2540.00	2630.42	7418.32	6850.06
101.00	105.56	294.06	271.38	2565.40	2681.22	7469.12	6892.93
102.00	107.56	296.06	273.13	2590.80	2732.02	7519.92	6937.38
103.00	109.56	298.06	274.88	2616.20	2782.82	7570.72	6981.83
104.00	111.56	300.06	276.63	2641.60	2833.62	7621.52	7026.28
105.00	113.56	302.06	278.31	2667.00	2884.42	7672.32	7069.14
106.00	115.56	304.06	280.06	2692.40	2935.22	7723.12	7113.59
107.00	117.56	306.06	281.81	2717.80	2986.02	7773.92	7158.04
108.00	119.56	308.06	283.50	2743.20	3036.82	7824.72	7200.90
109.00	121.56	310.06	285.25	2768.60	3087.62	7875.52	7245.35
110.00	123.56	312.06	287.00	2794.00	3138.42	7926.32	7289.80
111.00	125.56	314.06	288.75	2819.40	3189.22	7977.12	7334.25
112.00	127.56	316.06	290.44	2844.80	3240.02	8027.92	7377.11
113.00	129.56	318.06	292.19	2870.20	3290.82	8078.72	7421.56
114.00	131.56	320.06	293.94	2895.60	3341.62	8129.52	7466.01
115.00	133.56	322.06	295.63	2921.00	3392.42	8180.32	7508.88
116.00	135.56	324.06	297.38	2946.40	3443.22	8231.12	7553.33
117.00	137.56	326.06	299.13	2971.80	3494.02	8281.92	7597.78
118.00	139.56	328.06	300.81	2997.20	3544.82	8332.72	7640.64
119.00	141.56	330.06	302.56	3022.60	3595.62	8383.52	7685.09
120.00	143.56	332.06	304.31	3048.00	3646.42	8434.32	7729.54

20' Radius (6.10m)

Angle - 30°

Arc - 10' 5-11/16" (3.19m)

Chord - 10' 4-1/4" (3.16m)

When ordering vertical curves you must specify:

- Radius
- Vertical Drop
- Degree of Turn
- I-Beam Size

INCH				METRIC			
Vertical Drop	Straight Track	True Length	Tan/Tan Length	Vertical Drop	Straight Track	True Length	Tan/Tan Length
65.00	1.38	252.69	241.19	1651.00	34.93	6418.26	6126.16
66.00	3.38	254.69	242.94	1676.40	85.73	6469.06	6170.61
67.00	5.38	256.69	244.69	1701.80	136.53	6519.86	6215.06
68.00	7.38	258.69	246.38	1727.20	187.45	6570.73	6257.93
69.00	9.38	260.69	248.13	1752.60	238.25	6621.53	6302.38
70.00	11.38	262.69	249.88	1778.00	289.05	6672.33	6346.83
71.00	13.38	264.69	251.56	1803.40	339.85	6723.13	6389.69
72.00	15.38	266.69	253.31	1828.80	390.65	6773.93	6434.14
73.00	17.38	268.69	255.06	1854.20	441.45	6824.73	6478.59
74.00	19.38	270.69	256.81	1879.60	492.25	6875.53	6523.04
75.00	21.38	272.69	258.50	1905.00	543.05	6926.33	6565.90
76.00	23.38	274.69	260.25	1930.40	593.85	6977.13	6610.35
77.00	25.38	276.69	262.00	1955.80	644.65	7027.93	6654.80
78.00	27.38	278.69	263.69	1981.20	695.45	7078.73	6697.66
79.00	29.38	280.69	265.44	2006.60	746.25	7129.53	6742.11
80.00	31.38	282.69	267.19	2032.00	797.05	7180.33	6786.56
81.00	33.38	284.69	268.94	2057.40	847.85	7231.13	6831.01
82.00	35.38	286.69	270.63	2082.80	898.65	7281.93	6873.88
83.00	37.38	288.69	272.38	2108.20	949.45	7332.73	6918.33
84.00	39.38	290.69	274.13	2133.60	1000.25	7383.53	6962.78
85.00	41.38	292.69	275.81	2159.00	1051.05	7434.33	7005.64
86.00	43.38	294.69	277.56	2184.40	1101.85	7485.13	7050.09
87.00	45.38	296.69	279.31	2209.80	1152.65	7535.93	7094.54
88.00	47.38	298.69	281.06	2235.20	1203.45	7586.73	7138.99
89.00	49.38	300.69	282.75	2260.60	1254.25	7637.53	7181.85
90.00	51.38	302.69	284.50	2286.00	1305.05	7688.33	7226.30
91.00	53.38	304.69	286.25	2311.40	1355.85	7739.13	7270.75
92.00	55.38	306.69	287.94	2336.80	1406.65	7789.93	7313.61

20' Radius (6.10m)

Angle - 30°

Arc - 10' 5-11/16" (3.19m)

Chord - 10' 4-1/4 "(3.16m)

When ordering vertical curves you must specify:

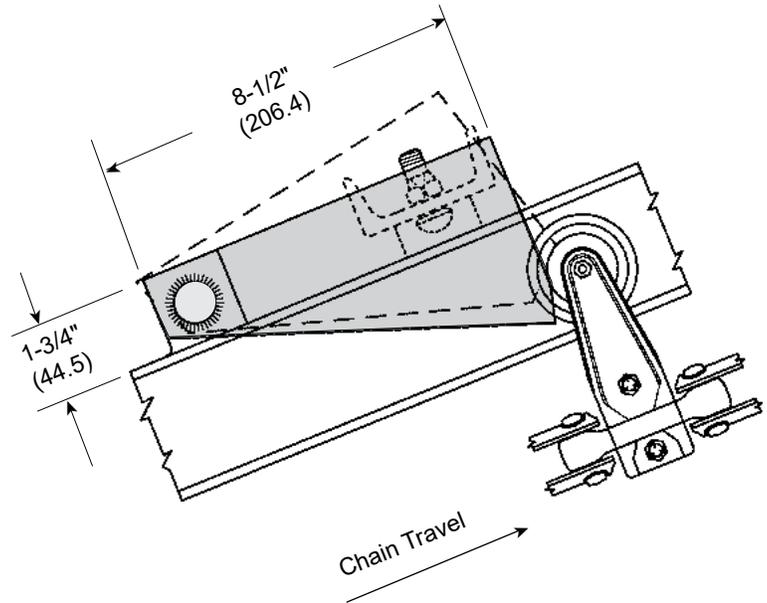
- Radius
- Vertical Drop
- Degree of Turn
- I-Beam Size

INCH				METRIC			
Vertical Drop	Straight Track	True Length	Tan/Tan Length	Vertical Drop	Straight Track	True Length	Tan/Tan Length
93.00	57.38	308.69	289.69	2362.20	1457.45	7840.73	7358.06
94.00	59.38	310.69	291.44	2387.60	1508.25	7891.53	7402.51
95.00	61.38	312.69	293.19	2413.00	1559.05	7942.33	7446.96
96.00	63.38	314.69	294.88	2438.40	1609.85	7993.13	7489.83
97.00	65.38	316.69	296.63	2463.80	1660.65	8043.93	7534.28
98.00	67.38	318.69	298.38	2489.20	1711.45	8094.73	7578.73
99.00	69.38	320.69	300.06	2514.60	1762.25	8145.53	7621.59
100.00	71.38	322.69	301.81	2540.00	1813.05	8196.33	7666.04
101.00	73.38	324.69	303.56	2565.40	1863.85	8247.13	7710.49
102.00	75.38	326.69	305.31	2590.80	1914.65	8297.93	7754.94
103.00	77.38	328.69	307.00	2616.20	1965.45	8348.73	7797.80
104.00	79.38	330.69	308.75	2641.60	2016.25	8399.53	7842.25
105.00	81.38	332.69	310.50	2667.00	2067.05	8450.33	7886.70
106.00	83.38	334.69	312.19	2692.40	2117.85	8501.13	7929.56
107.00	85.38	336.69	313.94	2717.80	2168.65	8551.93	7974.01
108.00	87.38	338.69	315.69	2743.20	2219.45	8602.73	8018.46
109.00	89.38	340.69	317.44	2768.60	2270.25	8653.53	8062.91
110.00	91.38	342.69	319.13	2794.00	2321.05	8704.33	8105.78
111.00	93.38	344.69	320.88	2819.40	2371.85	8755.13	8150.23
112.00	95.38	346.69	322.63	2844.80	2422.65	8805.93	8194.68
113.00	97.38	348.69	324.31	2870.20	2473.45	8856.73	8237.54
114.00	99.38	350.69	326.06	2895.60	2524.25	8907.53	8281.99
115.00	101.38	352.69	327.81	2921.00	2575.05	8958.33	8326.44
116.00	103.38	354.69	329.56	2946.40	2625.85	9009.13	8370.89
117.00	105.38	356.69	331.25	2971.80	2676.65	9059.93	8413.75
118.00	107.38	358.69	333.00	2997.20	2727.45	9110.73	8458.20
119.00	109.38	360.69	334.75	3022.60	2778.25	9161.53	8502.65
120.00	111.38	362.69	336.44	3048.00	2829.05	9212.33	8545.51

Anti-Backup Devices

Anti-Backup devices prevent trolleys from rolling backwards on vertical inclines. The anti-backup stop arms are mechanically lifted by the passing trolley brackets as they ride up the incline. Should the power chain fail, the stop arms will provide a positive stop. Stop arms are equipped with rubber bumpers to reduce noise.

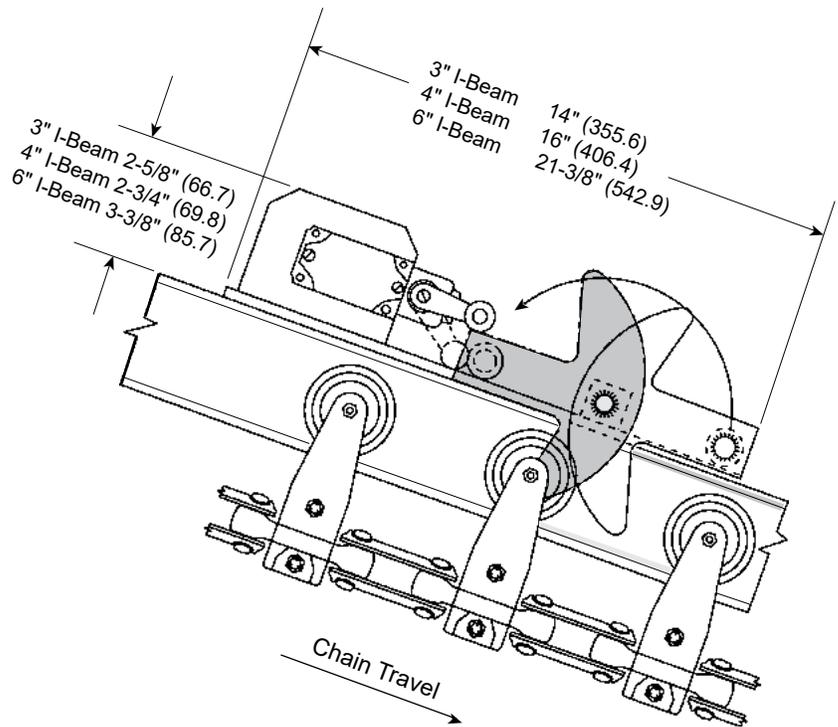
- # 8704 For 3" I-beam
- # 8702 For 4" I-beam
- # 8703 For 6" I-beam



Anti-Runaway Devices

Anti-Runaway devices are installed on the decline portion of a vertical curve. At normal conveyor speed, the counterweighted design of the stop arm allows it to ride up and over each trolley as it passes the stop arm. Increased chain speed from chain failure causes the trolley to impact the stop arm with sufficient force to rotate the shank 180° into the actuated position, thus stopping the next trolley. Anti-runaway devices are available with or without a limit switch.

- With Limit Switch**
- # 16787 3" I-beam
 - # 101879 4" I-beam
 - # 16789 6" I-beam
- Without Limit Switch**
- # 10717 3" I-beam
 - # 101878 4" I-beam
 - # 10719 6" I-beam



ANSI B20.1 Safety consideration:

In areas where the parted chain, cable, or other linkage would permit a runaway condition on an inclined or declined section, and where personnel are present, anti-runaway devices shall be provided. The conveyor path may be arranged so that travel of the uncontrolled conveyor will be arrested before it enters an area where personnel are present.

Traction Wheel Turn Features

This type of turn is designed to keep the power chain & trolleys in proper alignment when negotiating horizontal turns. They are available in 30°, 45°, 90° and 180° increments. Custom radii and curve increments can be fabricated upon request.

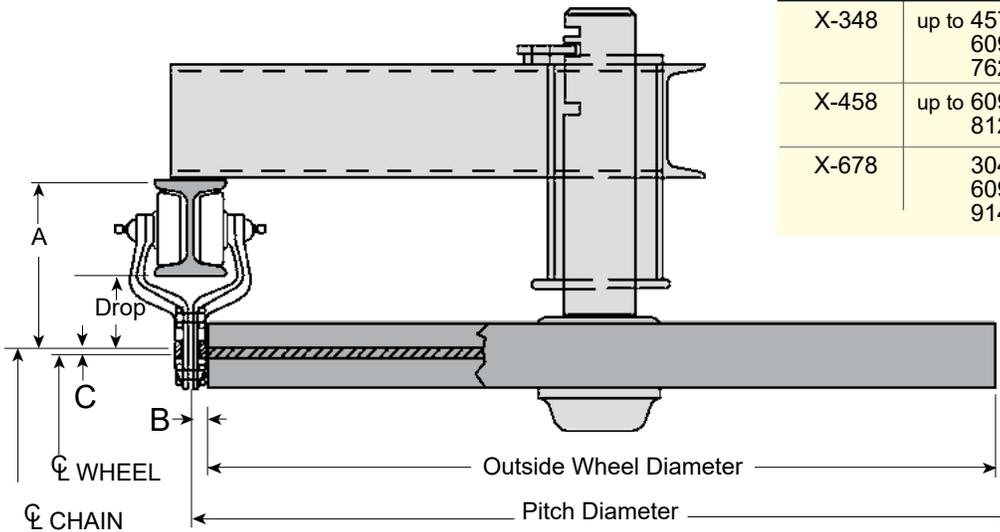
All traction wheel turns are constructed with a separate mounting frame from which both the conveyor track and the traction wheel shaft mounts are supported. All turns are made of solid plate construction for diameters up to 48" (1219.2). For diameters over 48" (1219.2) a spoke type construction is used.

Although more expensive than roller turns, traction wheels require less maintenance, provide smoother operation at higher conveyor speeds, reduced chain pull, and reduced chain wear. Traction wheels have a single lubrication point for easy maintenance. Traction wheel turns are best suited for dirty, corrosive or high temperature applications.



Minimum Recommended Traction Wheel Diameters

Chain Size	Recommended Trolley Spacing	Traction Wheel Dia.	Roller Turn Radius
X-348	up to 18"	24"	18"
	24"	30"	18"
	30"	36"	18"
X-458	up to 24"	30"	24"
	32"	36"	24"
X-678	12"	36"	36"
	24"	42"	36"
	36"	48"	36"
METRIC			
X-348	up to 457.2	609.6	457.2
	609.6	762.0	457.2
	762.0	914.4	457.2
X-458	up to 609.6	762.0	609.6
	812.8	914.4	609.6
X-678	304.8	914.4	914.4
	609.6	1066.8	914.4
	914.4	1219.2	914.4



Traction Wheel Dimensions

Normal Diameters

Chain & Rail	A	B	C	Chain Drop	Plate Size	Spoke Type				
3" I-beam / X348	5-1/2"	139.7	1/2"	12.6	-	-	2-1/2"	63.5	24" to 48"	Over 48"
4" I-beam / X458	7-3/16"	182.6	11/16"	.687	5/16"	17.5	3-3/16"	81.0		
4" I-beam / X458	8"	203.3	11/16"	.687	5/16"	17.5	4"	101.6	36" to 48"	
4" I-beam / X678	7-7/16"	188.9	1"	25.4	1/4"	6.4	3-7/16"	87.3	914.4 to 1219.2	
6" I-beam / X678	10"	254.0	1"	25.4	-	-	4"	101.6		

Special sizes and types of traction wheel turns can be furnished upon request.

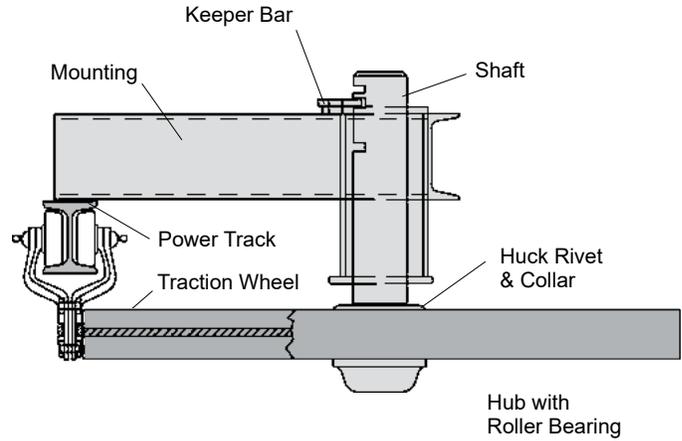
Two Bearing Styles

To cover a wide range of application requirements, traction wheels are available with either anti-friction roller bearings for normal room temperatures or carbon bushed bearings for use in ovens with temperatures up to 450°F (232.2°C).

Two ample size roller bearings are pressed into machined recesses in the traction wheel hub, and are lubricated through the hub cap. These bearings have a large storage space for lubricant that extends the time interval between required maintenance lubrications.

Bearings are protected against entrance of dirt or loss of lubricant by adequate seals. When properly lubricated, tapered roller bearing hubs will operate efficiently in temperatures up to 270°F (132.2°C).

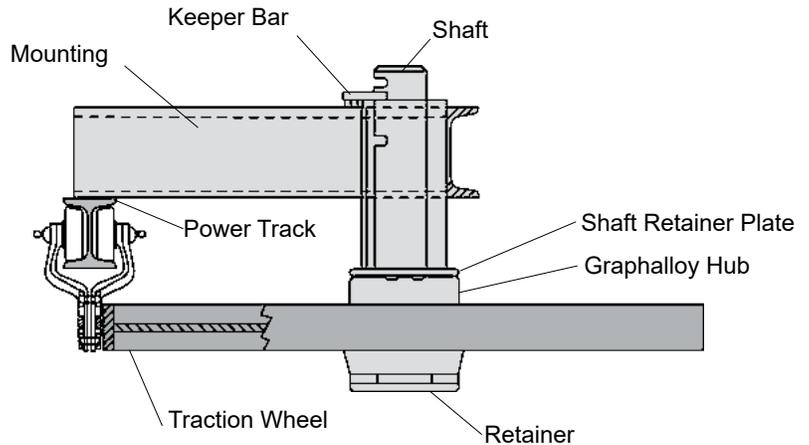
A removable shaft cast block type hub with tapered roller bearings is also available.



Tapered Roller Bearing Hub

Carbon Bushed Bearing

The heavy walled, carbon bushings successfully resist temperatures up to 450°F (232.2°C) with no lubrication required, as graphite is a natural lubricant. Carbon bushed bearings are not recommended for applications below 270°F (132.2°C).



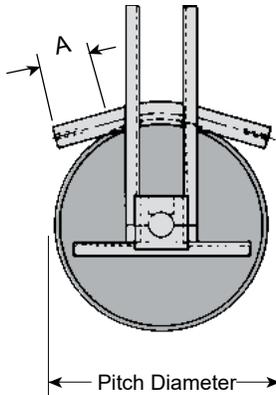
NOTE: All traction wheels less than or equal to 48" pitch diameter have plate type wheel construction. All traction wheels greater than 48" pitch diameter will have spoke type wheel construction.

X348 Chain

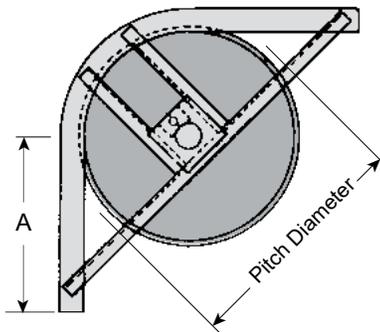
3" I-beam (76.2mm)

2-1/2" Drop (63.5mm)

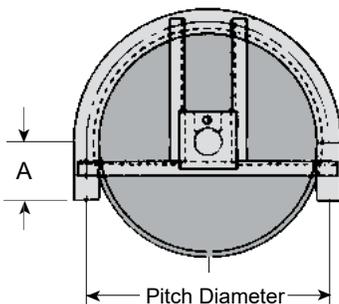
30°, 45° & 60° Turns



90° Turn



180° Turn



Pitch Diameter	Degree	Part No. Roller	Part No. Carbon	Part No. Dodge	Weight		* A - Stub Length		
					Lb	Kg			
18"	457.2	30	10300	10416	10036	270	122	7-9/16"	192.1
		45	10301	10417	10038	275	125	11-3/8"	288.9
		60	10302	10418	10040	280	127	10-1/4"	260.4
		90	10303	10419	10042	285	129	22"	565.2
		180	10304	10420	10044	290	132	16"	412.8
24"	609.6	30	10305	10421	10046	295	134	11-3/4"	298.5
		45	10306	10422	10048	295	134	10-1/4"	260.4
		60	10307	10423	10050	300	136	8-11/16"	220.7
		90	10308	10424	10052	300	136	24-1/8"	612.8
		180	10309	10425	10054	315	143	11-5/16"	287.3
30"	762.0	30	10310	10426	10056	325	147	11"	279.4
		45	10311	10427	10058	330	150	9-1/16"	230.2
		60	10312	10428	10060	330	150	12-1/8"	308.0
		90	10313	10429	10062	335	152	28-1/4"	717.6
		180	10314	10430	10064	350	159	16-5/8"	412.8
36"	914.4	30	10315	10431	10066	365	166	5-1/4"	133.4
		45	10316	10432	10068	370	168	7-7/8"	200.0
		60	10317	10433	10070	370	168	5-9/16"	141.3
		90	10318	10434	10072	375	170	30-1/4"	768.4
		180	10319	10435	10074	395	179	11-7/8"	301.6
42"	1066.8	30	10320	10436	10076	410	186	9-7/16"	239.7
		45	10321	10437	10078	410	186	11-11/16"	296.9
		60	10322	10438	10080	415	188	8-15/16"	227.0
		90	10323	10439	10082	420	191	33-1/4"	844.6
		180	10324	10440	10084	440	200	10-3/8"	263.5
48"	1219.2	30	10325	10441	10086	440	200	8-5/8"	219.1
		45	10326	10442	10088	460	209	5-9/16"	141.3
		60	10327	10443	10090	465	211	7-7/16"	188.9
		90	10328	10444	10092	470	213	36-1/4"	920.8
		180	10329	10445	10094	495	215	10-1/2"	266.7

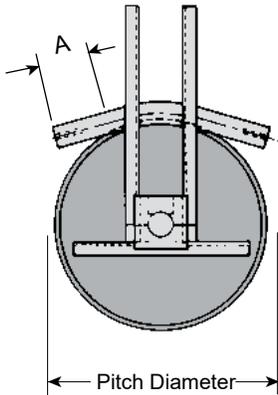
* The stub lengths given are for reference only. They are meant to be used as a design guide.

X458 Chain

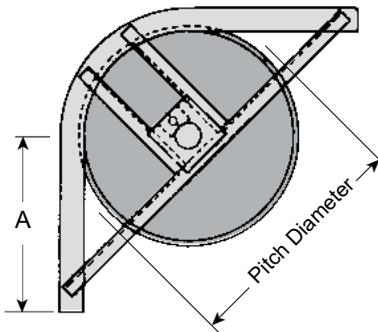
4" I-beam (101.6mm)

3-3/16" Drop (81.0mm)

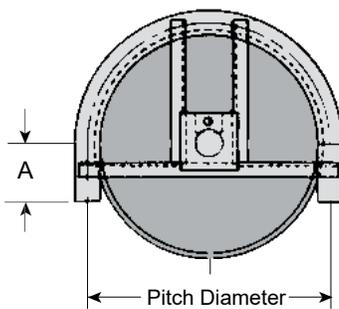
30°, 45° & 60° Turns



90° Turn



180° Turn



Pitch Diameter	Degree	Part No. Roller	Part No. Carbon	Part No. Dodge	Weight		* A - Stub Length		
					Lb	Kg			
18"	457.2	30	10334	10450	10130	350	159	7-9/16"	192.1
		45	10335	10451	10132	360	163	11-3/8"	288.9
		60	10336	10452	10134	365	166	10-1/4"	260.4
		90	10337	10453	100983	370	168	22"	565.2
		180	10338	10454	100984	375	170	16"	412.8
24"	609.6	30	10339	10455	10136	375	170	11-3/4"	298.5
		45	10340	10456	10138	380	172	10-1/4"	260.4
		60	10341	10457	10140	385	175	8-11/16"	220.7
		90	10342	10458	10142	385	175	24-1/8"	612.8
		180	10343	10459	10144	400	181	11-5/16"	287.3
30"	762.0	30	10344	10460	10146	440	200	11"	279.4
		45	10345	10461	10148	440	200	9-1/16"	230.2
		60	10346	10462	10150	445	202	12-1/8"	308.0
		90	10347	10463	10152	450	204	28-1/4"	717.6
		180	10348	10464	10154	465	211	16-5/8"	412.8
36"	914.4	30	10349	10465	10156	520	236	5-1/4"	133.4
		45	10350	10466	10158	525	238	7-7/8"	200.0
		60	10351	10467	10160	530	240	5-9/16"	141.3
		90	10352	10468	10162	535	243	30-1/4"	768.4
		180	10353	10469	10164	555	252	11-7/8"	301.6
42"	1066.8	30	10354	10470	10165	615	279	9-7/16"	239.7
		45	10355	10471	10168	620	281	11-11/16"	296.9
		60	10356	10472	10170	625	283	8-15/16"	227.0
		90	10357	10473	10172	630	286	33-1/4"	844.6
		180	10358	10474	10174	650	295	10-3/8"	263.5
48"	1219.2	30	10359	10475	10176	720	327	8-5/8"	219.1
		45	10360	10476	10178	725	329	5-9/16"	141.3
		60	10361	10477	10180	730	331	7-7/16"	188.9
		90	10362	10478	10182	735	333	36-1/4"	920.8
		180	10363	10479	10184	760	345	10-1/2"	266.7

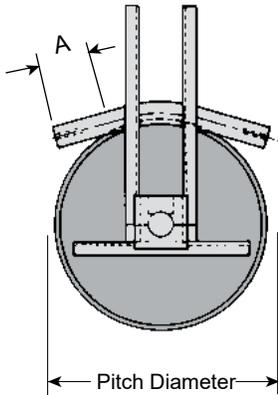
* The stub lengths given are for reference only. They are meant to be used as a design guide.

X458 Chain

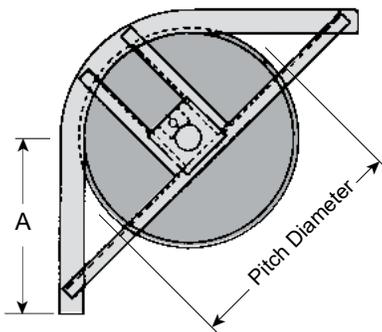
4" I-beam (101.6mm)

4" Drop (101.6mm)

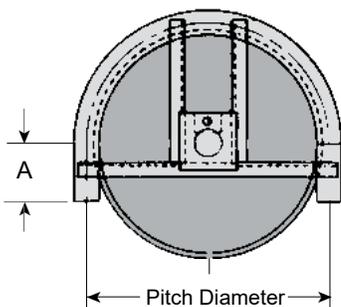
30°, 45° & 60° Turns



90° Turn



180° Turn



Pitch Diameter	Degree	Part No. Roller	Part No. Carbon	Part No. Dodge	Weight		*A - Stub Length		
					Lb	Kg			
18"	457.2	30	100740	100741	100742	350	159	7-9/16"	192.1
		45	100743	100744	100745	360	163	11-3/8"	288.9
		60	100746	100747	100748	365	166	10-1/4"	260.4
		90	100749	100750	100997	370	168	22"	565.2
		180	100751	100752	100998	375	170	16"	412.8
24"	609.6	30	100753	100754	100755	375	170	11-3/4"	298.5
		45	100756	100757	100758	380	172	10-1/4"	260.4
		60	100759	100760	100761	385	175	8-11/16"	220.7
		90	14901	100762	100763	385	175	24-1/8"	612.8
		180	14902	100764	100765	400	181	11-5/16"	287.3
30"	762.0	30	100766	100767	100768	440	200	11"	279.4
		45	100769	100770	100771	440	200	9-1/16"	230.2
		60	100772	100773	100774	445	202	12-1/8"	308.0
		90	14965	100775	100776	450	204	28-1/4"	717.6
		180	14966	100777	100778	465	211	16-5/8"	412.8
36"	914.4	30	100779	100780	100781	520	236	5-1/4"	133.4
		45	100598	100782	100783	525	238	7-7/8"	200.0
		60	100784	100785	100786	530	240	5-9/16"	141.3
		90	14603	100597	100787	535	243	30-1/4"	768.4
		180	14199	100788	100789	555	252	11-7/8"	301.6
42"	1066.8	30	100790	100791	100792	615	279	9-7/16"	239.7
		45	100793	100794	100795	620	281	11-11/16"	296.9
		60	100796	100797	100798	625	283	8-15/16"	227.0
		90	100799	100800	100801	630	286	33-1/4"	844.6
		180	100802	100803	100804	650	295	10-3/8"	263.5
48"	1219.2	30	100805	100806	100807	720	327	8-5/8"	219.1
		45	100808	100809	100810	725	329	5-9/16"	141.3
		60	100811	100812	100813	730	331	7-7/16"	188.9
		90	100393	100814	100815	735	333	36-1/4"	920.8
		180	14967	100816	100817	760	345	10-1/2"	266.7

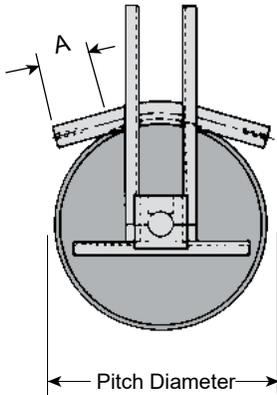
* The stub lengths given are for reference only. They are meant to be used as a design guide.

X678 Chain

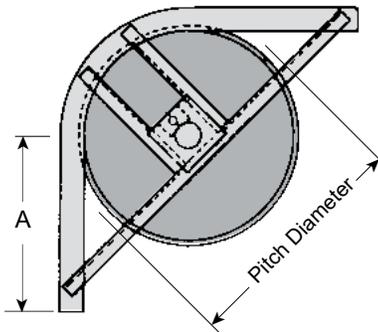
4" I-beam (101.6mm)

3-7/16" Drop (87.29mm)

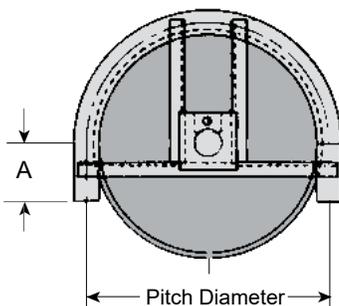
30°, 45° & 60° Turns



90° Turn



180° Turn



Pitch Diameter	Degree	Part No. Roller	Part No. Carbon	Part No. Dodge	Weight		*A - Stub Length		
					Lb	Kg			
36"	914.4	30	10372	10488	101043	540	245	5-1/4"	133.4
		45	10373	10489	101044	545	247	7-7/8"	200.0
		60	10374	10490	101045	550	249	5-9/16"	141.3
		90	10375	10491	101046	555	252	30-1/4"	768.4
		180	10376	10492	101047	570	259	11-7/8"	301.6
42"	1066.8	30	10377	10493	101048	635	288	9-7/16"	239.7
		45	10378	10494	101049	640	290	11-11/16"	296.9
		60	10379	10495	101050	645	293	8-15/16"	227.0
		90	10380	10496	101051	650	295	33-1/4"	844.6
		180	10381	10497	101052	670	304	10-3/8"	263.5
48"	1219.2	30	10382	10498	10186	740	336	8-5/8"	219.1
		45	10383	10499	10180	745	338	5-9/16"	141.3
		60	10384	10500	10190	750	340	7-7/16"	188.9
		90	10385	10501	10192	755	342	36-1/4"	920.8
		180	10386	10502	10194	780	354	10-1/2"	266.7
60"	1524.0	30	101023	101024	101053	860	390	8-1/2"	215.9
		45	101025	101026	101054	865	392	8-1/2"	215.9
		60	101027	101028	101055	870	395	8-1/2"	215.9
		90	101029	101030	101056	875	397	40"	1016.0
		180	101031	101032	101057	890	404	10"	254.0
72"	1828.8	30	101033	101034	101058	1100	499	8-1/2"	215.9
		45	101035	101036	101059	1105	501	8-1/2"	215.9
		60	101037	101038	101060	1120	508	8-1/2"	215.9
		90	101039	101040	101061	1125	510	48"	1219.2
		180	101041	101042	101062	1150	522	10"	254.0

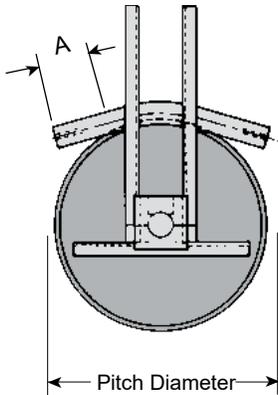
* The stub lengths given are for reference only. They are meant to be used as a design guide.

X678 Chain

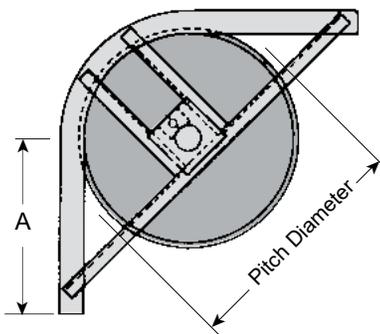
6" I-beam (152.4mm)

4" Drop (152.4mm)

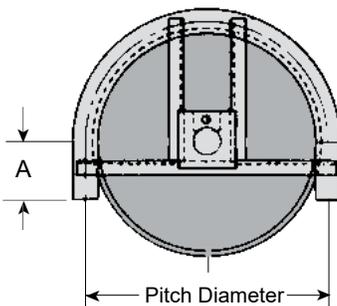
30°, 45° & 60° Turns



90° Turn



180° Turn



Pitch Diameter	Degree	Part No. Roller	Part No. Carbon	Part No. Dodge	Weight		*A - Stub Length		
					Lb	Kg			
36"	914.4	30	10393	10503	10096	605	274	5-1/4"	133.4
		45	10394	10504	10098	610	277	7-7/8"	200.0
		60	10395	10505	10100	615	279	5-9/16"	141.3
		90	10396	10506	10102	625	283	30-1/4"	768.4
		180	10397	10507	10104	655	297	11-7/8"	301.6
42"	1066.8	30	10398	10508	10106	695	315	9-7/16"	239.7
		45	10399	10509	10108	700	318	11-11/16"	296.9
		60	10400	10510	10110	705	320	8-15/16"	227.0
		90	10401	10511	10112	715	324	33-1/4"	844.6
		180	10402	10512	10114	750	340	10-3/8"	263.5
48"	1219.2	30	10403	10513	10116	785	356	8-5/8"	219.1
		45	10404	10514	10118	790	358	5-9/16"	141.3
		60	10405	10515	10120	800	363	7-7/16"	188.9
		90	10406	10516	10122	810	367	36-1/4"	920.8
		180	10407	10517	10124	850	386	10-1/2"	266.7
60"	1524.0	30	101011	101012	101063	900	408	8-1/2"	215.9
		45	101013	101014	101064	905	411	12"	304.8
		60	101015	101016	101065	920	417	12"	304.8
		90	10410	10520	101066	925	420	40"	111.76
		180	10411	10521	101067	950	321	10"	254.0
72"	1828.8	30	101017	101018	101068	1230	558	8-1/2"	215.9
		45	101019	101020	101069	1240	562	12"	304.8
		60	101021	101022	101070	1250	567	12"	304.8
		90	101039	101040	101071	1265	574	48"	1219.2
		180	101041	101042	101072	1305	592	10"	254.0

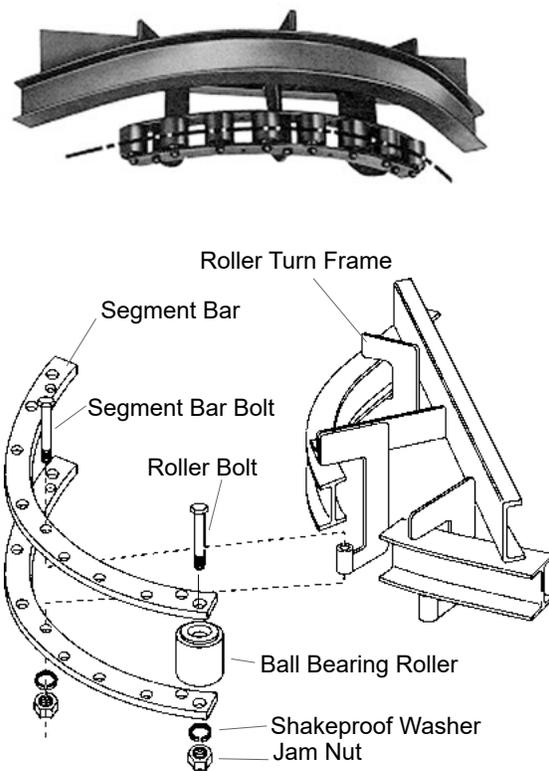
* The stub lengths given are for reference only. They are meant to be used as a design guide.

Roller Turn Features

Roller turn rollers are designed to keep the power chain & trolleys in proper alignment when negotiating horizontal turns. They are available in 30°, 45°, 90° and 180° segments. Custom radii and curve segments can be fabricated upon request.

A roller turn assembly consists of a frame, I-beam rail, segment bar assembly and rollers. The frame is a welded steel construction designed to minimize deflection from chain pull. The roller segment bar assembly is bolted to the frame. This feature allows for easy replacement of either the complete roller assembly or individual rollers.

Rollers are available with either ball or tapered roller bearings. When selecting conveyor system roller turns, be aware of load to load clearances on turns. Also, larger radii roller turns reduce friction and wear. They are recommended for systems where heavy chain pull is encountered.



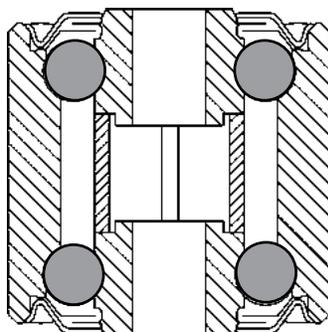
Minimum Recommended Roller Turn Radii

Chain Size	Recommended Trolley Spacing	Traction Wheel Dia.	Roller Turn Radius
X-348	up to 18"	24"	18"
	24"	30"	18"
	30"	36"	18"
X-458	up to 24"	30"	24"
	32"	36"	24"
X-678	12"	36"	36"
	24"	42"	36"
	36"	48"	36"
METRIC			
X-348	up to 457.2	609.6	457.2
	609.6	762.0	457.2
	762.0	914.4	457.2
X-458	up to 609.6	762.0	609.6
	812.8	914.4	609.6
X-678	304.8	914.4	914.4
	609.6	1066.8	914.4
	914.4	1219.2	914.4

Two Bearing Styles Available

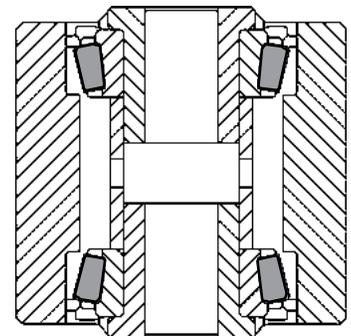
Ball Bearing Roller

Ball bearing roller turn rollers have labyrinth seals and are lubricated with grease during manufacture. These rollers can be used with either plain bolts or bolts with grease fittings.



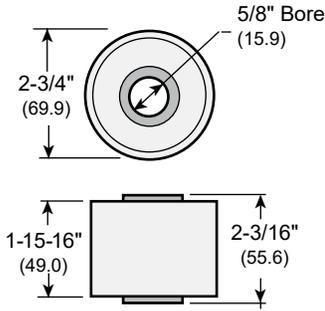
Tapered Roller Bearing Roller

This heavy-duty roller turn roller has precision type tapered roller bearings and full contact grease seals. It is especially designed for heavy duty applications using 4" or 6" chain.



Roller & Roller Bolt Selection Guide

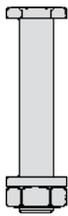
**2-3/4" (69.9) Dia. x 5/8" (15.9) Bore
Ball Bearing Roller**



#16493 Ball Bearing Roller

Bolt Options

#14172
5/8" x 3-1/2"
(15.9 x 88.9)



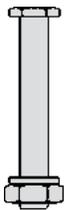
Assy. Includes:
9624 Bolt
57015 S.P. Washer
56567 Jam Nut

#14185
5/8" x 3-1/2"
(15.9 x 88.9)



Assy. Includes:
16487 Bolt
57015 S.P. Washer
56567 Jam Nut

#14186
1/2" x 3-1/2"
(12.7 x 88.9)



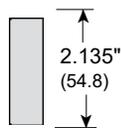
Assy. Includes:
7964 Bolt
57014 S.P. Washer
56563 Jam Nut

#14187
1/2" x 3-1/2"
(12.7x 88.9)



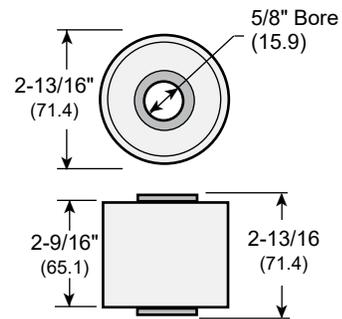
Assy. Includes:
16125 Bolt
57014 S.P. Washer
56563 Jam Nut

#16830
Spacer



Allows 16493
roller to accept
a 1/2" (12.7)
dia. bolt.

**2-13/16" (71.4) Dia. x 5/8" (15.9) Bore
Ball or Tapered Roller Bearing Roller**

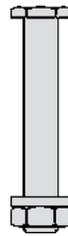


#16472 Ball Bearing Roller
#16490 Tapered Roller Bearing Roller

Note: # 10216 dust caps sold separately

Bolt Options

#14179
5/8" x 4- 1/8"
(15.9 x 104.8)



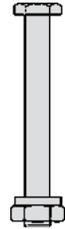
Assy. Includes:
9577 Bolt
57015 S.P. Washer
56567 Jam Nut

#14180
5/8" x 4-1/8"
(15.9 x 104.8)



Assy. Includes:
16468 Bolt
57015 S.P. Washer
56567 Jam Nut

#14181
1/2" x 4-1/8"
(12.7 x 104.8)



Assy. Includes:
7963 Bolt
57014 S.P. Washer
56563 Jam Nut

#14182
1/2" x 4-1/8"
(12.7 x 104.8)



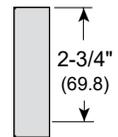
Assy. Includes:
16122 Bolt
57014 S.P. Washer
56563 Jam Nut

#14183
1/2" x 4-1/8"
(12.7 x 104.8)



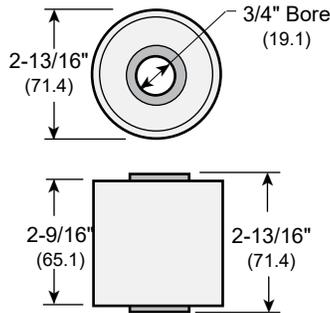
Assy. Includes:
5200 Bolt
57014 S.P. Washer
56563 Jam Nut

#16831
Spacer



Allows 16472
& 16580 roller
to accept a
1/2" dia. bolt.

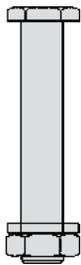
**2-13/16" (71.4) Dia. x 3/4" (19.1) Bore
Tapered Roller Bearing Roller**



#16580 Tapered Roller Bearing Roller

Note: # 10216 dust caps sold separately

#14175
3/4" x 4-1/4"
(19.1 x 108.0)



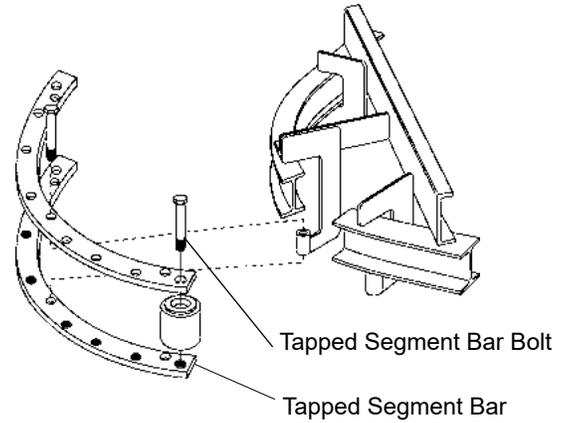
Assy. Includes:
10217 Bolt
57016 L.Washer
56570 Jam Nut

#14178
3/4" x 4-1/2"
(19.1 x 114.3)

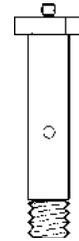


Assy. Includes:
16589 Bolt
57016 L.Washer
56570 Jam Nut

**Roller Turn Roller Bolts
For Tapped Segment Bars**



#11817
5/8" x 3-11/16"
(15.9 x 93.7)



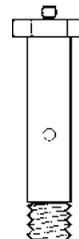
With
Grease Fitting

#11816
5/8" x 3-11/16"
(15.9 x 93.7)



Without
Grease Fitting

#11834
3/4" x 3-11/16"
(19.1 x 93.7)



With
Grease Fitting

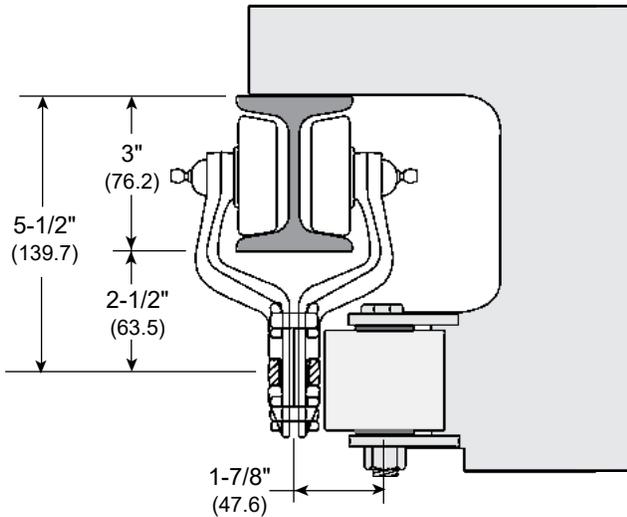
#11832
3/4" x 3-11/16"
(19.1 x 93.7)



Without
Grease Fitting

X-348 Roller Turn

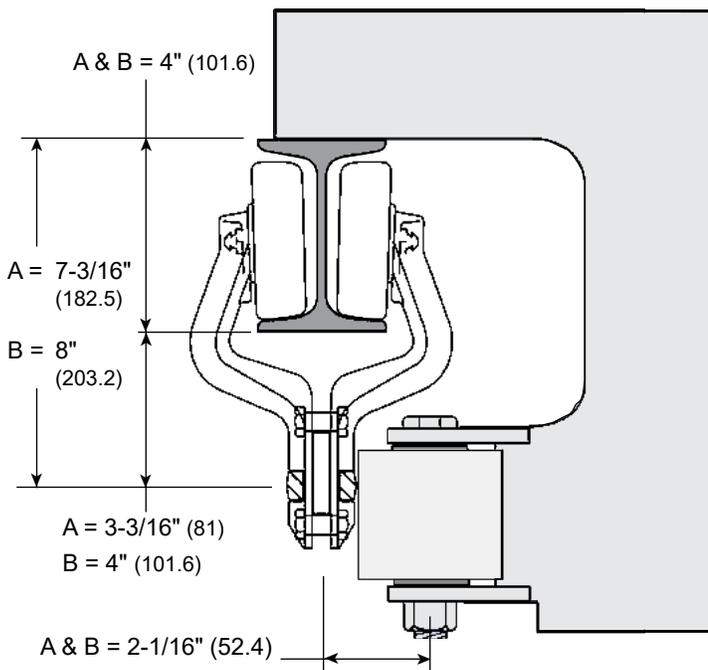
Roller Bearing Type..... Standard
 Roller Bolt Dia..... 5/8" (15.9)
 Chain Drop..... 2-1/2" (63.5)



Turn Radius	Part No.	Degree of turn	# of Rollers	Weight	
				lb	kg
18"	9658	30°	2	80	36
	9656	45°	3	85	39
	9652	90°	6	90	41
	9650	180°	12	185	84
24"	9668	30°	3	80	36
	9666	45°	4	85	39
	9662	90°	8	115	52
	9660	180°	16	210	95
30"	9678	30°	4	85	39
	9676	45°	5	90	41
	9672	90°	10	135	61
	9670	180°	20	245	111
36"	9688	30°	4	90	41
	9686	45°	6	100	45
	9682	90°	12	150	68
	9680	180°	24	300	136

X-458 Roller Turn

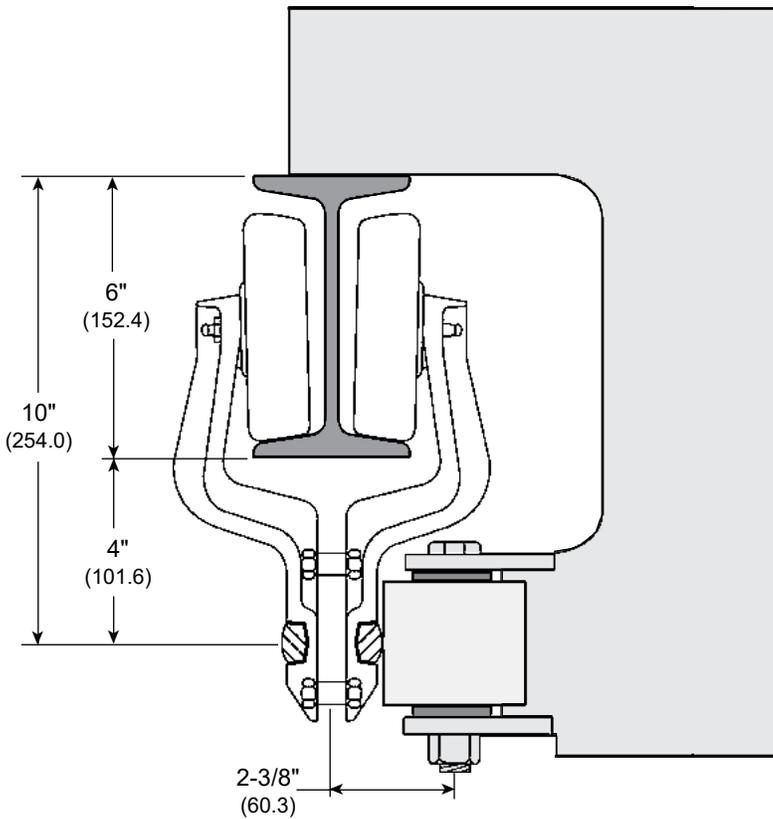
Roller Bearing Type..... Standard
 Roller Bolt Dia..... 5/8" (15.9)
 A - Chain Drop..... 3-3/16" (81)
 B - Chain Drop..... 4" (101.6)



Turn Radius	Drop		Degree of turn	# of Rollers	Weight	
	A Part No.	B Part No.			lb	kg
24"	9718	14215	30°	3	95	43
	9716	14217	45°	4	110	50
	9712	14213	90°	8	175	79
	9710	14218	180°	16	285	129
30"	9728	100710	30°	4	110	50
	9726	14829	45°	5	115	52
	9722	100708	90°	10	195	88
	9720	100711	180°	20	345	156
36"	9738	14591	30°	4	110	50
	9736	14601	45°	6	135	61
	9732	13668	90°	12	215	98
	9730	100716	180°	24	400	181
42"	9748	100712	30°	5	130	59
	9746	100713	45°	7	180	82
	9742	100714	90°	14	250	113
	9740	100715	180°	28	490	222
48"	9758	100640	30°	6	160	73
	9756	100709	45°	8	230	104
	9752	100641	90°	16	295	134
	9750	100643	180°	32	620	281
60"	9768	100717	30°	7	195	88
	9766	100718	45°	10	245	111
	9762	100719	90°	20	390	177
	9760	100720	180°	40	815	370
72"	9778	100721	30°	8	220	100
	9776	100722	45°	12	285	129
	9772	100723	90°	22	360	163
	9770	100724	180°	44	950	431

X-678 Roller Turn

Roller Bearing Type..... Standard
 Roller Bolt Dia..... 5/8" (15.9)
 Chain Drop..... 4" (101.6)



Turn Radius	Part No.	Degree of turn	# of Rollers	Weight	
				lb	kg
24"	10868	30°	3	125	57
	10866	45°	4	145	66
	10862	90°	8	220	100
	10860	180°	16	365	166
30"	10878	30°	4	140	64
	10876	45°	5	150	68
	10872	90°	10	255	116
	10870	180°	20	470	213
36"	10888	30°	4	140	64
	10886	45°	6	180	82
	10882	90°	12	285	129
	10880	180°	24	530	240
42"	10898	30°	5	160	73
	10896	45°	7	195	88
	10892	90°	14	310	141
	10890	180°	28	610	277
46"	10908	30°	6	190	86
	10906	45°	8	240	109
	10902	90°	16	370	168
	10900	180°	32	720	327

Industrial Class (Non-Automotive) Drives

DAC has developed a UniFrame rotary caterpillar drive assembly to satisfy the reliable performance needs of today’s modern manufacturing facilities. The following are the principal features of the UniFrame Drive:

The UniFrame Drive is a rotary type unit with limit switch overload protection. The rotary design can sense jam conditions within the drive and activate the overload limit switch. Linear drives cannot sense a jam within the unit.

Time-tested subcomponents such as the Webb caterpillar chain, backup bar, and drive sprocket have been incorporated into the new design.

SEW Eurodrive gearmotors are used, eliminating the need for belts, sheaves or additional guards. The helical-gear arrangement operates with higher efficiencies and at lower temperatures than worm gear reducers. SEW also provides 24-7 parts support. (The major factor in Webb’s choice of the SEW unit.)

The reducer is a hollow shaft style unit that allows simplification of the drive/reducer connection. The entire reducer can be removed by removing a few bolts without disassembling the sprocket and caterpillar chain arrangement.

The reducers/gear motor arrangement simplifies preventive maintenance by eliminating belts and sheaves, which require periodic adjustment/replacement.

Brake motors are standard on the UniFrame Drive. (Note: Brakes must be wired separately when used with VFDs).

Frames are stocked for chain pull capacities of 2000 lb and 3000 lb.

4000 lb capacity units are available by special order.

Standard units are designed for use with VFD controllers. Webb offers three speeds of 15, 45 and 60 feet per minute. Inverter duty motors can operate within 3:1 turn down ratios allowing speed ranges of 5-15, 15-45 and 20-60 feet per minute based on constant torque. Higher turn down ratios are achievable with slight variances in torque.



X-348 Systems

Chain Pull Capacity	Part Number	Conveyor Speed	Description
1000 Lb	947384	15 FPM	UniFrame X-348 rotary constant speed caterpillar drive assembly 1000 lb. Chain pull capacity c/w 1.5 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 15 FPM.
1000 Lb	947382	45 FPM	UniFrame X-348 rotary constant speed caterpillar Drive assembly 1000 lb. Chain pull capacity c/w 2 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 45 FPM.
1000 Lb	947381	60 FPM	UniFrame X-348 rotary constant speed caterpillar Drive assembly 1000 lb. Chain pull capacity c/w 3 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 60 FPM.

Industrial Class (Non-Automotive) Drives

X-348 Systems

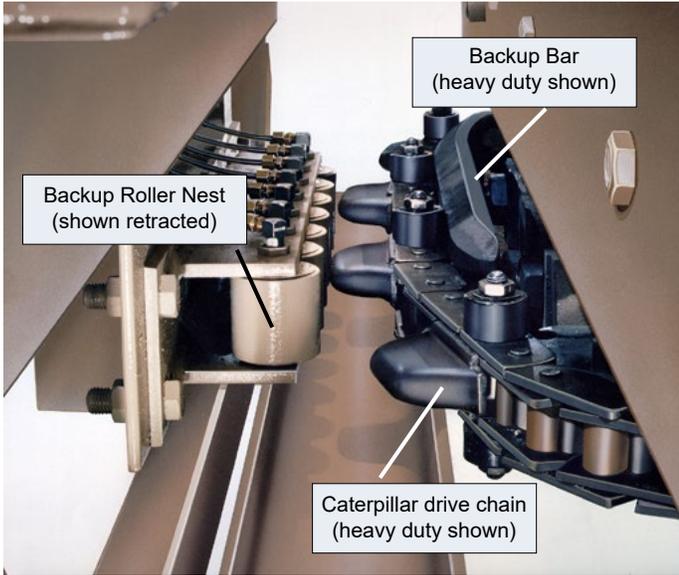
Chain Pull Capacity	Part Number	Conveyor Speed	Description
2000 Lb	947159	15 FPM	UniFrame X-348 rotary constant speed caterpillar drive assembly 2000 lb. Chain pull capacity c/w 1.5 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 15 FPM.
2000 Lb	947158	45 FPM	UniFrame X-348 rotary constant speed caterpillar Drive assembly 2000 lb. Chain pull capacity c/w 3 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 45 FPM.
2000 Lb	947157	60 FPM	UniFrame X-348 rotary constant speed caterpillar Drive assembly 2000 lb. Chain pull capacity c/w 5 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 60 FPM.

X-458 Systems

Chain Pull Capacity	Part Number	Conveyor Speed	Description
2000 Lb	947166	15 FPM	UniFrame X-458 rotary constant speed caterpillar Drive assembly 2000 lb. Chain pull capacity c/w 1.5 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 15 FPM.
2000 Lb	947165	45 FPM	UniFrame X-458 rotary constant speed caterpillar Drive assembly 2000 lb. Chain pull capacity c/w 3 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 45 FPM.
2000 Lb	947164	60 FPM	UniFrame X-458 rotary constant speed caterpillar Drive assembly 2000 lb. Chain pull capacity c/w 5 HP, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 60 FPM.

X-458 Systems

Chain Pull Capacity	Part Number	Conveyor Speed	Description
3000 Lb	947163	15 FPM	UniFrame X-458 rotary constant speed caterpillar Drive assembly 3000 lb. Chain pull capacity c/w 1.5 hp, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 15 FPM.
3000 Lb	947162	45 FPM	UniFrame X-458 rotary constant speed caterpillar Drive assembly 3000 lb. Chain pull capacity c/w 5 hp, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 45 FPM.
3000 Lb	947133	60 FPM	UniFrame X-458 rotary constant speed caterpillar Drive assembly 3000 lb. Chain pull capacity c/w 7.5 hp, 230/460 Volt AC, TEFC inverter duty gear motor, 3:1 turn-down ratio, 460 Volt AC brake and limit switch overload protection. Nominal speed 60 FPM.



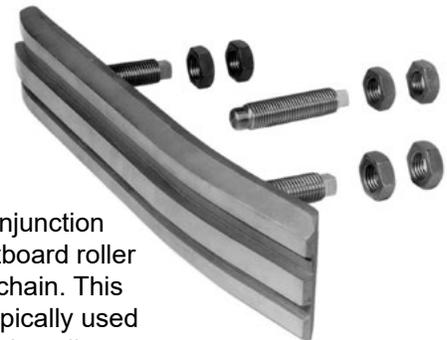
Standard Backup Bar Assembly



Backup bars support the engagement of the drive caterpillar chain into the conveyor chain.

- #14191 Assembly includes:
 #100371 - Backup Bar (1)
 #10694 - Backup bar studs (2)
 # 56576 - Backup bar nuts (4)

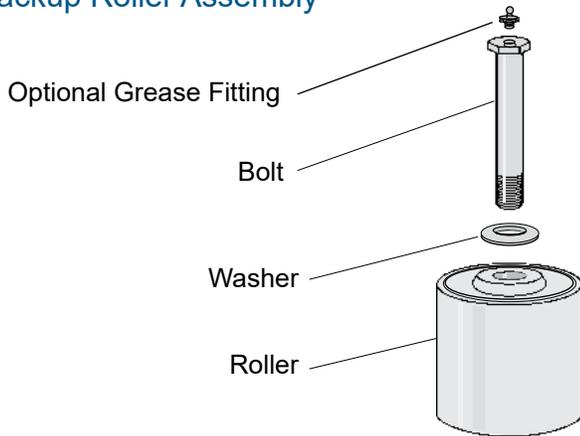
Heavy-duty Backup Bar Assembly



Used in conjunction with an outboard roller caterpillar chain. This option is typically used on high chain pull conveyors.

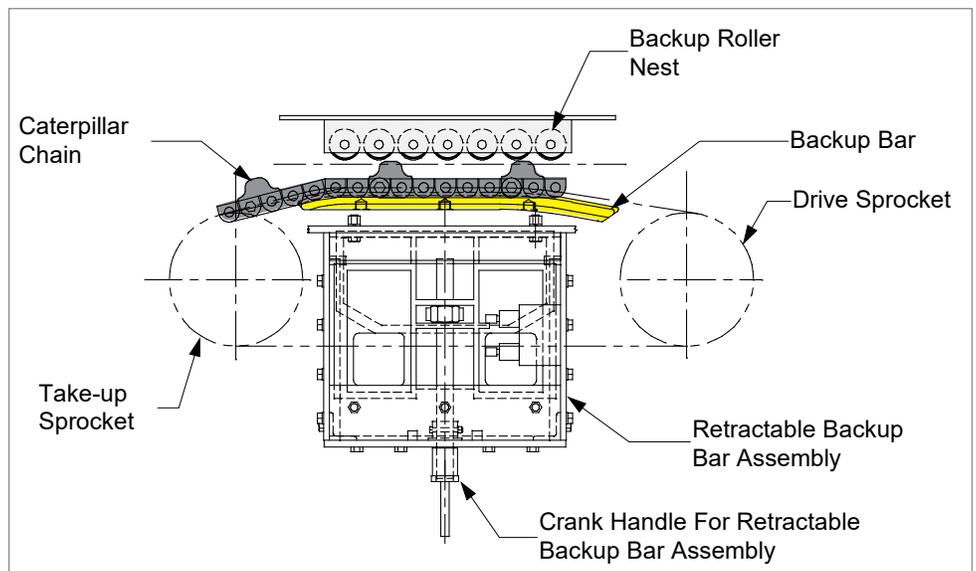
- #14193 Assembly includes:
 #13332 - Backup bar (1)
 #10694 - Backup bar studs (3)
 #56576 - Backup bar nuts (6)

Backup Roller Assembly



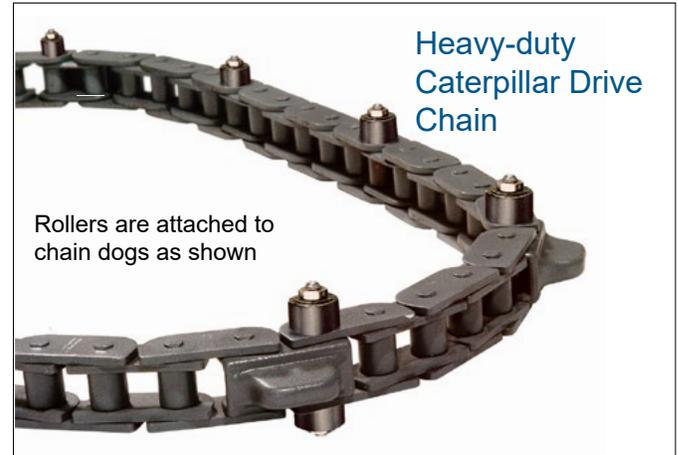
#13061 Retractable Backup Bar

The optional retractable backup bar is a support system for the backup bar which allows the caterpillar chain to be quickly disengaged from the conveyor chain. Retractable backup bars are typically used on conveyors utilizing backup drive units.



Drive Chains

Caterpillar drive chains are available in four standard and two heavy-duty sizes. Drive chain components are forged from high carbon steel and heat treated for longer life. The chain incorporates a straight side bar design which will not allow the chain to collapse on itself - a potential cause of drive jams. Heavy-duty drive chains are equipped with rollers on the outboard side of the chain links. This chain is used on systems with high chain pull.



Caterpillar Drive Chain Specifications

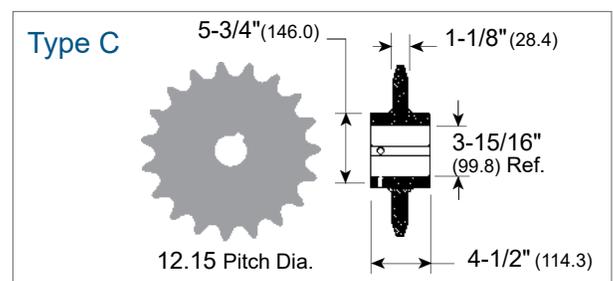
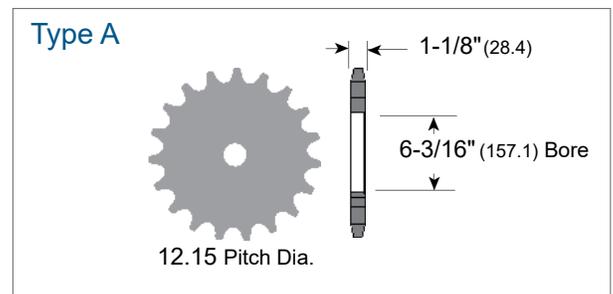
System Chain Size	Caterpillar Chain Length		Dog Centers		Standard Caterpillar Chain	Outboard Roller Assembly
X-348	10'	3.05m	12"	3.66m	8388	N/A
X-458	10'	3.05m	8"	2.44m	8389	10781WS
X-678	10'	3.05m	12"	3.66m	16185	16278WS
X-658	11'	2.79m	12"	3.66m	19206	N/A

Drive Sprockets

Drive sprockets transmit power from the motor reducer to the caterpillar chain. Sprockets are 19 tooth, 2" pitch, with 12.151 pitch diameter, for RC 160 chain.

Drive Sprocket Specifications

Sprocket Part #	Type	Bore	Diameter
6670	C	2-7/16"	61.9
6671	C	2-15/16"	74.6
6672	C	3-7/16"	87.3
6673	C	3-15/16"	100.0
16133	A	1-3/4"	44.5
10578	A	6-1/4"	158.8
8776	offset	1-15/16"	49.2



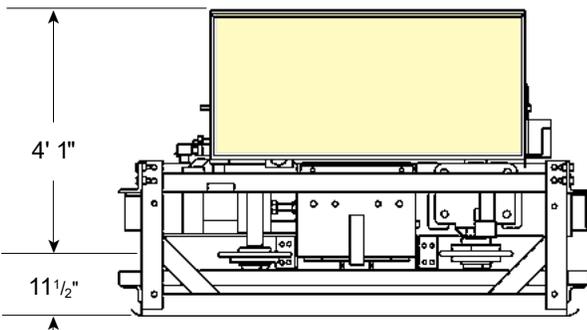
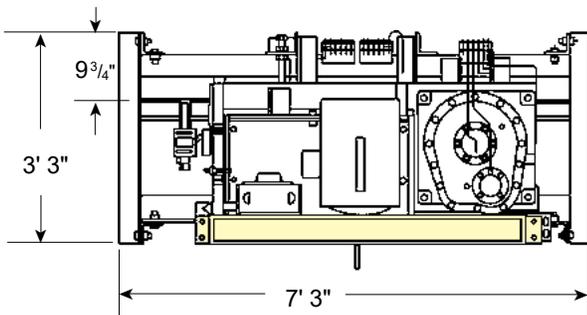
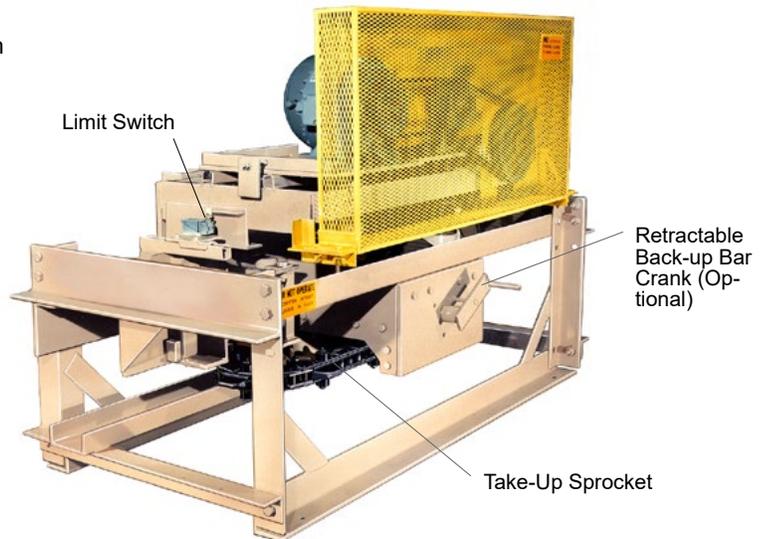
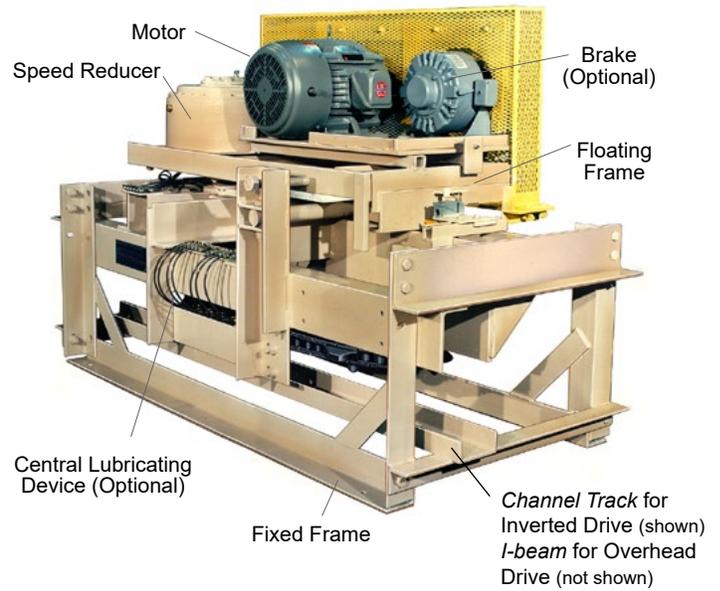
Automotive Class

The most important component of a conveyor system is the drive. Production depends on drive reliability.

A caterpillar drive transmits its driving force to the conveyor by means of a caterpillar chain made of precision steel rollers with driving dogs that mesh with the links of the conveyor chain. Caterpillar drives are installed along any horizontal straight run of track. Drives are available in both constant speed and variable speed designs.

Caterpillar drives are mounted on an inner floating frame that pivots around the reducer output shaft, acting as a torque arm against the fixed outer frame. Compact coil springs counterbalance the normal chain pull and control the movement of the floating frame.

Increased chain tension due to heavier loading compresses the springs, which then changes the relative position of the floating frame to the fixed frame. If excessive loading should occur, the floating frame will move to its overload point, tripping a limit switch that will stop the drive motor, preventing damage to the system.



Drive Dimensions

Standard Drive Features Include:

- All components are easily accessible from one side without frame obstruction.
- The rotary design will protect against jams within the caterpillar drive assembly.
- Removable roller nest assembly

Optional Drive Features Include:

- Retractable Backup Bar
- Heavy-Duty Backup Bar
- Outboard Roller Caterpillar Chain
- Central Lubrication System - Automatically dispenses lubricant to specific areas.

Rotary Caterpillar Drive Selection Chart

Max Conveyor Speed (FPM)	Drive Size A			Drive Size B			Drive Size C		
	Chain pull*		HP	Chain pull*		HP	Chain pull*		HP
	lbs.	kg		lbs.	kg		lbs.	kg	
1-10	2700-3400	1225-1524	1-2	6500-7400	2948-3357	1-5	10000-11500	4536-5216	3-5
11-20	2100-3400	953-1524	2-3	4900-7300	2223-3311	5-7-1/2	7400-11300	3357-5216	5-10
30	2400-3300	1089-1497	5	5900-7000	2676-3175	10	9000-10900	4082-4944	15
40	2400-3200	1089-1452	5	5400-7000	2449-3175	15	8200-10800	3719-4899	20
50	2400-2900	1089-1315	7-1/2	5400-6900	2449-3130	15	8300-10700	3765-4835	20
60	2400-2800	1089-1270	7-1/2	5700-6700	2586-3039	15	8600-10600	3901-4808	25
70	2200-2700	998-1225	7-1/2	5100-6600	2313-2994	20	9100-10300	4128-4672	30
80	2400-2600	1089-1179	10	5600-6200	2540-2812	20	8500-9600	3856-4355	30
90	2200-2400	998-1089	10	5200-5900	2359-2676	20	8100-9000	3674-4082	30
100	2100-2300	953-1043	10	4900-5500	2223-2495	25	7600-8300	3447-3765	30
110	1900-2200	862-998	10	5200	2359	25	8000	3629	40
120	2200	998	10	5000	2268	25	7600	3447	40

* Maximum chain pull or Drive capacities:

X348 system - 2000 lbs

X458 system - 3300 lbs

X678 system with a B Size Drive - 6400 lbs

X678 system with a C size drive - 10,000 lbs

Note: Exceeding maximum system size chain pull may reduce system component life.

Drive Formulas

Speed:

$$\text{Motor RPM} \times \frac{\text{Motor Sheave Dia.}}{\text{Reducer Sheave Dia.}} \times \frac{1}{\text{Reducer Ratio}} \times \frac{\text{\# of teeth per sprocket}}{12} \times \frac{\text{Tooth Pitch Dimension}}{12} = \text{Drive Speed (FPM)}$$

Horsepower:

$$\frac{\text{Conv. speed} \times \text{drive capacity (chain pull)}}{33,000 \times (\text{efficiency factor}) \cdot 75}$$

Take-up Features

These devices are used to provide a means of compensating for chain wear resulting in chain stretch.

Take-ups for overhead conveyors consist of a fixed outer frame and a moveable inner frame. The inner frame is mounted on rollers and incorporates two expansion sections in the conveyor track. The inner frame rolls within the stationary frame and is designed to take up slack in the conveyor chain due to wear or stretch.

Take-ups can be furnished with either roller turns or traction wheels. Roller turns are normally furnished with a continuous 180° arc, but are available at an optional cost as a spread take-up where two 90° arcs are employed with a section of straight track between them.

Take-ups are made in several styles. The most common styles are spring and air types. However, counterweight types are available upon request.

Spring Take-ups

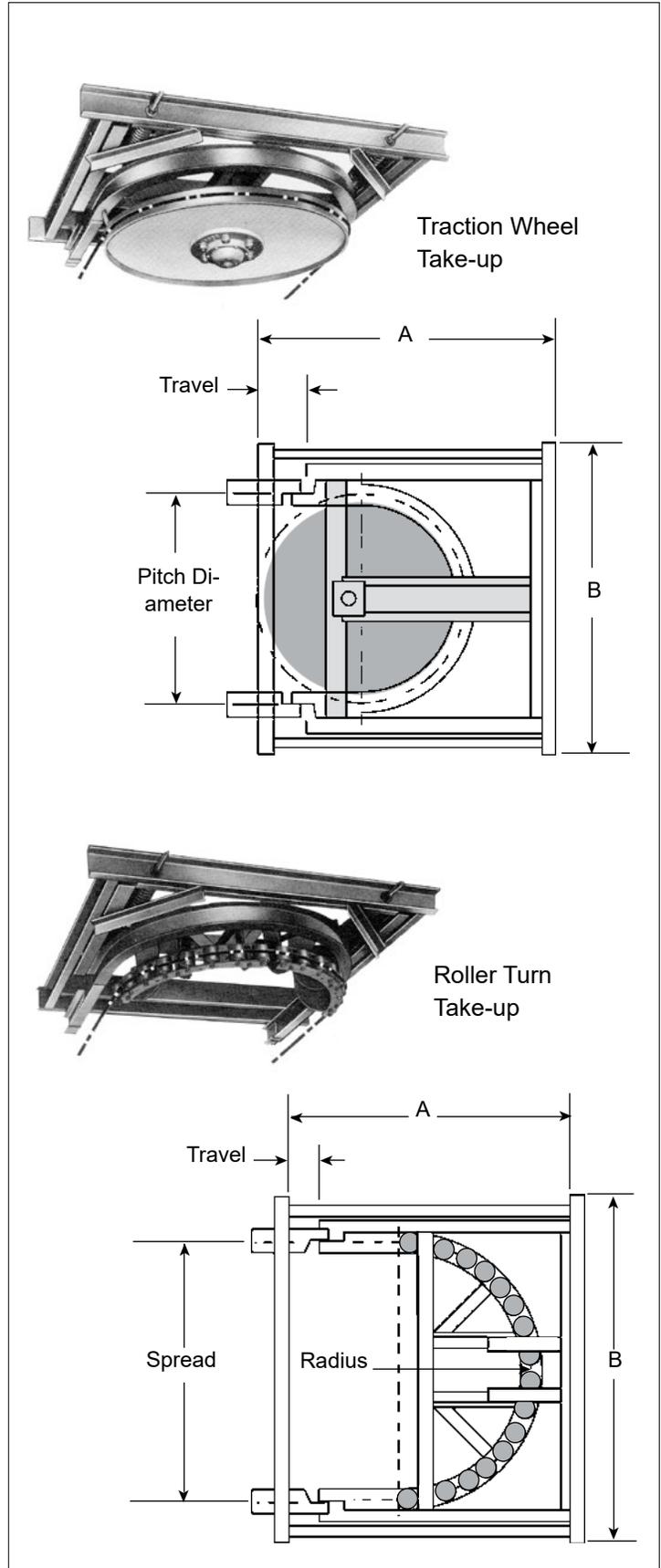
Because the spring take-up is automatic and requires very little maintenance, it is the most popular. The spring type take-up is generally satisfactory for non-reversing systems where it can be located immediately beyond the drive or where a relatively small amount of tension is required.

Air Take-ups

Air cylinder operated take-ups are recommended for conveyors that require a constant take-up tension. The tension in an air operated take-up can be readily adjusted at any time by regulating the air pressure through the use of suitable air control valves. The air operated take-up is particularly advantageous where it must be located at some distance from the unit.

Counterweight Take-ups

Counterweight type take-ups can be furnished on special order. On this type of take-up constant tension is applied to the moveable inner frame by means of counterweights through sheaves and cables.



Traction Wheel Takeup

Spring Operated, 8" Travel (203.2mm)

Turn Specs	Pitch Diameter		Part #	A - Length		B - Width	
I-beam 3"	36"	914.4	16506	4' 5-3/4"	1365.3	4' 6-3/4"	1390.7
Chain 3"	48"	1219.2	16523	4' 11-3/4"	1517.7	5' 6-3/4"	1695.5
Drop 2-1/2"	60"	1524.0	16540	5' 5-3/4"	1670.1	6' 6-3/4"	2000.3
I-beam 4"	36"	914.4	16497	4' 5-3/4"	1365.3	4' 6-3/4"	1390.7
Chain 4"	48"	1219.2	16508	4' 11-3/4"	1517.7	5' 6-3/4"	1695.5
Drop 3-3/16"	60"	1524.0	16525	5' 5-3/4"	1670.1	6' 6-3/4"	2000.3
	72"	1828.2	16542	5' 11-3/4"	1822.5	7' 6-3/4"	2305.5
I-beam 4"	36"	914.4	100836	4' 5-3/4"	1365.3	4' 6-3/4"	1390.7
Chain 4"	48"	1219.2	100837	4' 11-3/4"	1517.7	5' 6-3/4"	1695.5
Drop 4"	60"	1524.0	100835	5' 5-3/4"	1670.1	6' 6-3/4"	2000.3
	72"	1828.2	100834	5' 11-3/4"	1822.5	7' 6-3/4"	2305.5
I-beam 4"	36"	914.4	100938	4' 5-3/4"	1365.3	4' 6-3/4"	1390.7
Chain 6"	48"	1219.2	62282	4' 11-3/4"	1517.7	5' 6-3/4"	1695.5
Drop 3-7/16"	60"	1524.0	100940	5' 5-3/4"	1670.1	6' 6-3/4"	2000.3
	72"	1828.2	100941	5' 11-3/4"	1822.5	7' 6-3/4"	2305.5
I-beam 6"	48"	1219.2	16509	4' 11-3/4"	1365.3	5' 6-3/4"	1695.5
Chain 6"	60"	1524.0	16526	5' 5-3/4"	1517.7	6' 6-3/4"	2000.3
Drop 4"	72"	1828.2	16543	5' 11-3/4"	1670.1	7' 6-3/4"	2305.5

Traction Wheel Takeup

Spring Operated - 30" Travel (762.0mm)

Turn Specs	Pitch Diameter		Part #	A - Length		B - Width	
I-beam 3"	36"	914.4	9923	12' 6-3/8"	3819.5	5'-0"	1524.0
Chain 3"	48"	1219.2	9927	12' 10-3/8"	3921.1	6'-0"	1828.8
Drop 2-1/2"	60"	1524.0	100978	13' 2-3/8"	4022.7	7'-0"	2133.6
I-beam 4"	36"	914.4	9925	12' 6-3/8"	3819.5	5'-0"	1524.1
Chain 4"	48"	1219.2	9929	12' 10-3/8"	3921.1	6'-0"	1828.1
Drop 3-3/16"	60"	1524.0	100979	13' 2-3/8"	4022.7	7'-0"	2133.6
	72"	1828.2	9934	13' 6-3/8"	4124.3	8'-0"	2438.4
I-beam 4"	36"	914.4	100974	12' 6-3/8"	3819.5	5'-0"	1523.1
Chain 4"	48"	1219.2	100975	12' 10-3/8"	3921.1	6'-0"	1828.1
Drop 4"	60"	1524.0	100976	13' 2-3/8"	4022.7	7'-0"	2133.6
	72"	1828.2	100977	13' 6-3/8"	4124.3	8'-0"	2438.4
I-beam 4"	36"	914.4	10249	12' 6-3/8"	3819.5	5'-0"	1523.1
Chain 6"	48"	1219.2	10210	12' 10-3/8"	3921.1	6'-0"	1828.1
Drop 3-7/16"	60"	1524.0	100981	13' 2-3/8"	4022.7	7'-0"	2133.6
	72"	1828.2	100982	13' 6-3/8"	4124.3	8'-0"	2438.4
I-beam 6"	48"	1219.2	9931	12' 10-3/8"	3921.1	6'-0"	1828.1
Chain 6"	60"	1524.0	100980	13' 2-3/8"	4022.7	7'-0"	2133.6
Drop 4"	72"	1828.2	9936	13' 6-3/8"	4124.3	8'-0"	2438.4

Traction Wheel Takeup
Air Operated, 8" Travel (203.2mm)

Turn Specs	Pitch Diameter		Part #	A - Length		B - Width	
I-beam 3"	36"	914.4	100902	4' 5-3/4"	1365.3	4' 6-3/4"	1390.7
Chain 3"	48"	1219.2	100903	4' 11-3/4"	1517.7	5' 6-3/4"	1695.5
Drop..... 2-1/2"	60"	1524.0	100904	5' 5-3/4"	1670.1	6' 6-3/4"	2000.3
I-beam 4"	36"	914.4	100905	4' 5-3/4"	1365.3	4' 6-3/4"	1390.7
Chain 4"	48"	1219.2	100906	4' 11-3/4"	1517.7	5' 6-3/4"	1695.5
Drop..... 3-3/16"	60"	1524.0	100907	5' 5-3/4"	1670.1	6' 6-3/4"	2000.3
	72"	1828.2	100908	5' 11-3/4"	1822.5	7' 6-3/4"	2305.5
I-beam 4"	36"	914.4	100909	4' 5-3/4"	1365.3	4' 6-3/4"	1390.7
Chain 4"	48"	1219.2	100910	4' 11-3/4"	1517.7	5' 6-3/4"	1695.5
Drop..... 4"	60"	1524.0	100911	5' 5-3/4"	1670.1	6' 6-3/4"	2000.3
	72"	1828.2	100912	5' 11-3/4"	1822.5	7' 6-3/4"	2305.5
I-beam 4"	36"	914.4	100916	4' 5-3/4"	1365.3	4' 6-3/4"	1390.7
Chain 6"	48"	1219.2	100917	4' 11-3/4"	1517.7	5' 6-3/4"	1695.5
Drop..... 3-7/16"	60"	1524.0	100918	5' 5-3/4"	1670.1	6' 6-3/4"	2000.3
	72"	1828.2	100919	5' 11-3/4"	1822.5	7' 6-3/4"	2305.5
I-beam 6"	48"	1219.2	100913	4' 11-3/4"	1365.3	5' 6-3/4"	1695.5
Chain 6"	60"	1524.0	100914	5' 5-3/4"	1517.7	6' 6-3/4"	2000.3
Drop..... 4"	72"	1828.2	100915	5' 11-3/4"	1670.1	7' 6-3/4"	2305.5

Traction Wheel Takeup
Air Operated, 30" Travel (762.0mm)

Turn Specs	Pitch Diameter		Part #	A - Length		B - Width	
I-beam 3"	36"	914.4	124646	12' 6-3/8"	3819.5	5'-0"	1524.0
Chain 3"	48"	1219.2	100921	12' 10-3/8"	3921.1	6'-0"	1828.8
Drop..... 2-1/2"	60"	1524.0	100922	13' 2-3/8"	4022.7	7'-0"	2133.6
I-beam 4"	36"	914.4	100923	12' 6-3/8"	3819.5	5'-0"	1524.1
Chain 4"	48"	1219.2	100924	12' 10-3/8"	3921.1	6'-0"	1828.1
Drop..... 3-3/16"	60"	1524.0	100925	13' 2-3/8"	4022.7	7'-0"	2133.6
	72"	1828.2	100926	13' 6-3/8"	4124.3	8'	2438.4
I-beam 4"	36"	914.4	100927	12' 6-3/8"	3819.5	5'-0"	1523.1
Chain 4"	48"	1219.2	100928	12' 10-3/8"	3921.1	6'-0"	1828.1
Drop..... 4"	60"	1524.0	100929	13' 2-3/8"	4022.7	7'-0"	2133.6
	72"	1828.2	100930	13' 6-3/8"	4124.3	8'-0"	2438.4
I-beam 4"	36"	914.4	100934	12' 6-3/8"	3819.5	5'-0"	1523.1
Chain 6"	48"	1219.2	100935	12' 10-3/8"	3921.1	6'-0"	1828.1
Drop..... 3-7/16"	60"	1524.0	100936	13' 2-3/8"	4022.7	7'-0"	2133.6
	72"	1828.2	100937	13' 6-3/8"	4124.3	8'-0"	2438.4
I-beam 6"	48"	1219.2	100931	12' 10-3/8"	3921.1	6'-0"	1828.1
Chain 6"	60"	1524.0	100932	13' 2-3/8"	4022.7	7'-0"	2133.6
Drop..... 4"	72"	1828.2	100933	13' 6-3/8"	4124.3	8'-0"	2438.4

Roller Turn Takeup Spring Operated, 8" Travel (203.2mm)

Turn Specs	Radius		Part #	A - Length		B - Width	
I-beam 3" Chain 3" Drop..... 2-1/2"	18"	457.2	9640	53-3/4"	1365.0	54-3/4"	1390.0
	24"	609.6	9641	59-3/4"	1517.6	66-3/4"	1695.4
	30"	762.0	9642	65-3/4"	1670.0	78-3/4"	2000.25
	36"	914.4	9643	71-3/4"	1822.4	90-3/4"	2305.0
I-beam 4" Chain 4" Drop..... 3-3/16"	18"	457.2	16496	53-3/4"	1365.0	54-3/4"	1390.0
	24"	609.6	16507	59-3/4"	1517.6	66-3/4"	1695.4
	30"	762.0	16524	65-3/4"	1670.0	78-3/4"	2000.25
	36"	914.4	16541	71-3/4"	1822.4	90-3/4"	2305.0
	42"	1066.8	9644	77-3/4"	1974.8	102-3/4"	2609.8
	48"	1219.2	16560	83-3/4"	2127.2	114-3/4"	2914.6
	60"	1524.0	9646	95-3/4"	2432.0	138-3/4"	3524.3
72"	1828.8	9647	107-3/4"	2736.8	162-3/4"	4133.8	
I-beam 4" Chain 4" Drop..... 4"	24"	609.6	100833	59-3/4"	1517.6	66-3/4"	1695.4
	30"	762.0	100832	65-3/4"	1670.0	78-3/4"	2000.25
	36"	914.4	100831	71-3/4"	1822.4	90-3/4"	2305.0
	42"	1066.8	100829	77-3/4"	1974.8	102-3/4"	2609.8
	48"	1219.2	100828	83-3/4"	2127.2	114-3/4"	2914.6
	60"	1524.0	100827	95-3/4"	2432.0	138-3/4"	3524.3
72"	1828.8	100826	107-3/4"	2736.8	162-3/4"	4133.8	
I-beam 4" Chain 6" Drop..... 3-7/16"	36"	914.4	100944	71-3/4"	1822.4	90-3/4"	2305.0
	42"	1066.8	100945	77-3/4"	1974.8	102-3/4"	2609.8
	48"	1219.2	100946	83-3/4"	2127.2	114-3/4"	2914.6
	60"	1524.0	100947	95-3/4"	2432.0	138-3/4"	3524.3
	72"	1828.8	100948	107-3/4"	2736.8	162-3/4"	4133.8
I-beam 6" Chain 6" Drop..... 4"	36"	914.4	16548	71-3/4"	1822.4	90-3/4"	2305.0
	42"	1066.8	16555	77-3/4"	1974.2	102-3/4"	2609.8
	48"	1219.2	16561	83-3/4"	2127.2	114-3/4"	2914.6
	60"	1524.0	16568	95-3/4"	2432.0	138-3/4"	3524.3
	72"	1828.8	16573	107-3/4"	2736.8	162-3/4"	4133.8

Roller Turn Takeup

Spring Operated, 30" Travel (762.0mm)

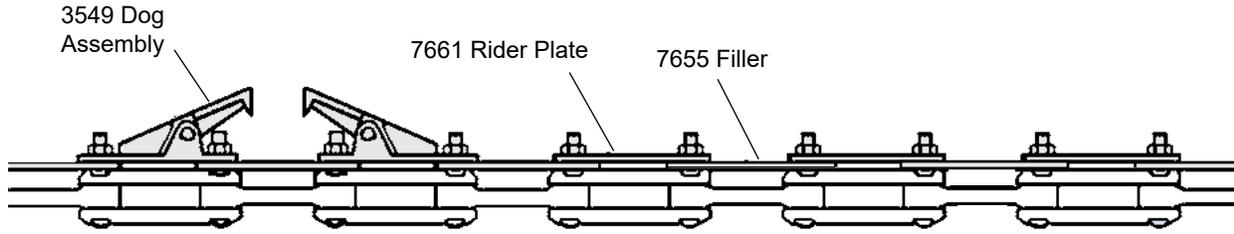
Turn Specs.	Radius		Part #	A - Length		B - Width	
I-beam 3" Chain 3" Drop..... 2-1/2"	18"	457.2	9922	75-3/4"	1924.0	54-3/4"	1390.6
	24"	609.6	9926	81-3/4"	2076.4	66-3/4"	1695.4
	30"	762.0	100957	87-3/4"	2228.8	78-3/4"	2000.2
	36"	914.4	9932	93-3/4"	2381.2	90-3/4"	2305.0
I-beam 4" Chain 4" Drop..... 3-3/16"	18"	457.2	9924	75-3/4"	1924.0	54-3/4"	1390.6
	24"	609.6	9928	81-3/4"	2076.4	66-3/4"	1695.4
	30"	762.0	100958	87-3/4"	2228.8	78-3/4"	2000.2
	36"	914.4	9933	93-3/4"	2381.2	90-3/4"	2305.0
	42"	1066.8	100959	99-3/4"	2533.6	102-3/4"	2609.8
	48"	1219.2	100960	105-3/4"	2686.0	114-3/4"	2914.4
	60"	1524.0	100961	117-3/4"	2990.8	138-3/4"	3524.2
72"	1828.8	100962	129-3/4"	3295.6	162-3/4"	4133.8	
I-beam 4" Chain 4" Drop..... 4"	24"	609.6	100949	81-3/4"	2076.4	66-3/4"	1695.4
	30"	762.0	100950	87-3/4"	2228.8	78-3/4"	2000.2
	36"	914.4	100951	93-3/4"	2381.2	90-3/4"	2305.0
	42"	1066.8	100952	99-3/4"	2533.6	102-3/4"	2609.8
	48"	1219.2	100953	105-3/4"	2686.0	114-3/4"	2914.4
	60"	1524.0	100954	117-3/4"	2990.8	138-3/4"	3524.2
	72"	1828.8	100955	129-3/4"	3295.6	162-3/4"	4133.8
I-beam 4" Chain 6" Drop..... 3-7/16"	36"	914.4	9937	93-3/4"	2381.2	90-3/4"	2305.0
	42"	1066.8	100953	99-3/4"	2533.6	102-3/4"	2609.8
	48"	1219.2	100971	105-3/4"	2686.0	114-3/4"	2914.4
	60"	1524.0	100972	117-3/4"	2990.8	138-3/4"	3524.2
	72"	1828.8	100973	129-3/4"	3295.6	162-3/4"	4133.8
I-beam 6" Chain 6" Drop..... 4"	36"	914.4	9935	93-3/4"	2381.2	90-3/4"	2305.0
	42"	1066.8	100964	99-3/4"	2533.6	102-3/4"	2609.8
	48"	1219.2	100965	105-3/4"	2686.0	114-3/4"	2914.4
	60"	1524.0	100966	117-3/4"	2990.8	138-3/4"	3524.2
	72"	1828.8	100967	129-3/4"	3295.6	162-3/4"	4133.8

Roller Turn Takeup Air Operated, 8" Travel

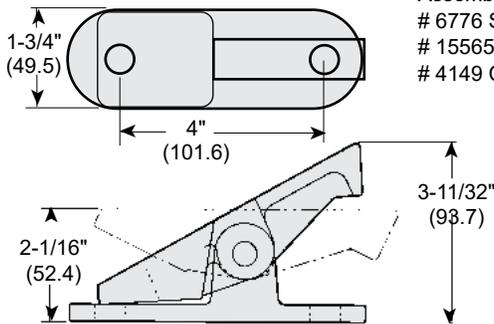
Turn Specs.	Radius		Part #	A - Length		B - Width	
I-beam 3" Chain 3" Drop..... 2-1/2"	18"	457.2	100870	53-3/4"	1365.0	54-3/4"	1390.0
	24"	609.6	100871	59-3/4"	1517.6	66-3/4"	1695.4
	30"	762.0	100872	65-3/4"	1670.0	78-3/4"	2000.25
	36"	914.4	100873	71-3/4"	1822.4	90-3/4"	2305.0
I-beam 4" Chain 4" Drop..... 3-3/16"	24"	609.6	100874	59-3/4"	1517.6	66-3/4"	1695.4
	30"	762.0	100875	65-3/4"	1670.0	78-3/4"	2000.25
	36"	914.4	100876	71-3/4"	1822.4	90-3/4"	2305.0
	42"	1066.8	100877	77-3/4"	1974.8	102-3/4"	2609.8
	48"	1219.2	100878	83-3/4"	2127.2	114-3/4"	2914.6
	60"	1524.0	100879	95-3/4"	2432.0	138-3/4"	3524.3
I-beam 4" Chain 4" Drop..... 4"	72"	1828.8	100880	107-3/4"	2736.8	162-3/4"	4133.8
	24"	609.6	100881	59-3/4"	1517.6	66-3/4"	1695.4
	30"	762.0	100882	65-3/4"	1670.0	78-3/4"	2000.25
	36"	914.4	100883	71-3/4"	1822.4	90-3/4"	2305.0
	42"	1066.8	100884	77-3/4"	1974.8	102-3/4"	2609.8
	48"	1219.2	100885	83-3/4"	2127.2	114-3/4"	2914.6
I-beam 4" Chain 6" Drop..... 3-7/16"	60"	1524.0	100886	95-3/4"	2432.0	138-3/4"	3524.3
	72"	1828.8	100887	107-3/4"	2736.8	162-3/4"	4133.8
	36"	914.4	100897	71-3/4"	1822.4	90-3/4"	2305.0
	42"	1066.8	100898	77-3/4"	1974.8	102-3/4"	2609.8
	48"	1219.2	100899	83-3/4"	2127.2	114-3/4"	2914.6
I-beam 6" Chain 6" Drop..... 4"	60"	1524.0	100900	95-3/4"	2432.0	138-3/4"	3524.3
	72"	1828.8	100901	107-3/4"	2736.8	162-3/4"	4133.8
	36"	914.4	100890	71-3/4"	1822.4	90-3/4"	2305.0
	42"	1066.8	100891	77-3/4"	1974.2	102-3/4"	2609.8
I-beam 6" Chain 6" Drop..... 4"	48"	1219.2	100892	83-3/4"	2127.2	114-3/4"	2914.6
	60"	1524.0	100893	95-3/4"	2432.0	138-3/4"	3524.3
	72"	1828.8	100894	107-3/4"	2736.8	162-3/4"	4133.8

Roller Turn Takeup
Air Operated, 30" Travel

Turn Specs.	Radius		Part #	A - Length		B - Width	
I-beam 3" Chain 3" Drop 2-1/2"	18"	457.2	100838	75-3/4"	1924.0	54-3/4"	1390.6
	24"	609.6	100839	81-3/4"	2076.4	66-3/4"	1695.4
	30"	762.0	100840	87-3/4"	2228.8	78-3/4"	2000.2
	36"	914.4	100841	93-3/4"	2381.2	90-3/4"	2305.0
I-beam 4" Chain 4" Drop 3-3/16"	24"	609.6	100842	81-3/4"	2076.4	66-3/4"	1695.4
	30"	762.0	100843	87-3/4"	2228.8	78-3/4"	2000.2
	36"	914.4	100844	93-3/4"	2381.2	90-3/4"	2305.0
	42"	1066.8	100845	99-3/4"	2533.6	102-3/4"	2609.8
	48"	1219.2	100846	105-3/4"	2686.0	114-3/4"	2914.4
	60"	1524.0	100847	117-3/4"	2990.8	138-3/4"	3524.2
I-beam 4" Chain 4" Drop 4"	72"	1828.8	100848	129-3/4"	3295.6	162-3/4"	4133.8
	24"	609.6	100849	81-3/4"	2076.4	66-3/4"	1695.4
	30"	762.0	100850	87-3/4"	2228.8	78-3/4"	2000.2
	36"	914.4	100851	93-3/4"	2381.2	90-3/4"	2305.0
	42"	1066.8	100852	99-3/4"	2533.6	102-3/4"	2609.8
	48"	1219.2	100853	105-3/4"	2686.0	114-3/4"	2914.4
I-beam 4" Chain 6" Drop 3-7/16"	60"	1524.0	100854	117-3/4"	2990.8	138-3/4"	3524.2
	72"	1828.8	100855	129-3/4"	3295.6	162-3/4"	4133.8
	36"	914.4	100865	93-3/4"	2381.2	90-3/4"	2305.0
	42"	1066.8	100866	99-3/4"	2533.6	102-3/4"	2609.8
	48"	1219.2	100867	105-3/4"	2686.0	114-3/4"	2914.4
I-beam 6" Chain 6" Drop 4"	60"	1524.0	100868	117-3/4"	2990.8	138-3/4"	3524.2
	72"	1828.8	100869	129-3/4"	3295.6	162-3/4"	4133.8
	36"	914.4	100858	93-3/4"	2381.2	90-3/4"	2305.0
	42"	1066.8	100859	99-3/4"	2533.6	102-3/4"	2609.8
Chain 6" Drop 4"	48"	1219.2	100860	105-3/4"	2686.0	114-3/4"	2914.4
	60"	1524.0	100861	117-3/4"	2990.8	138-3/4"	3524.2
	72"	1828.8	100862	129-3/4"	3295.6	162-3/4"	4133.8

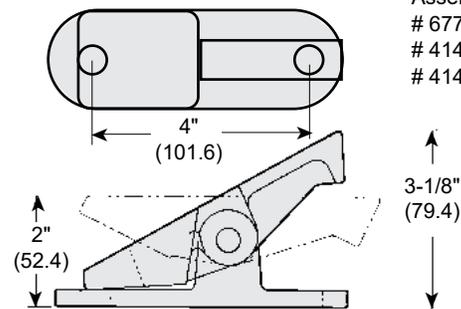


15420 Chain-on-Edge Pusher



Assembly includes:
 # 6776 Swage Shaft
 # 15565 Pusher Dog
 # 4149 Clevis

3549 Chain-on-Edge Pusher

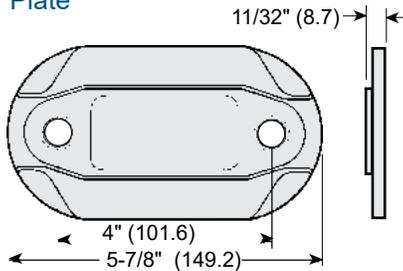


Assembly includes:
 # 6776 Swage Shaft
 # 4148 Pusher Dog
 # 4149 Clevis

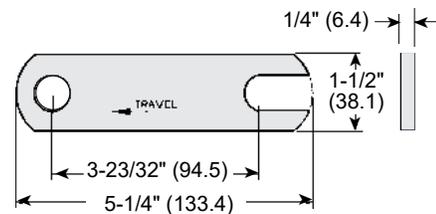
Pusher assemblies attach to the extended pins that hold the rider plates and dog assemblies to the chain.

If your center line of chain to top of dog dimensions can not be met by the pusher dog assemblies shown, please contact Sales.

7661 Rider Plate



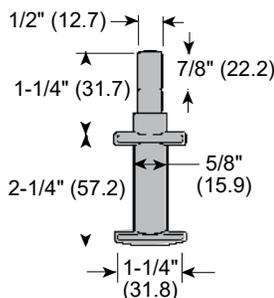
7655 Filler Bar



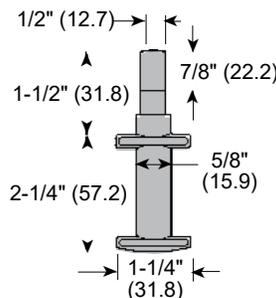
Rider Plates and Filler Bars are also available in UHMW

Chain Pins

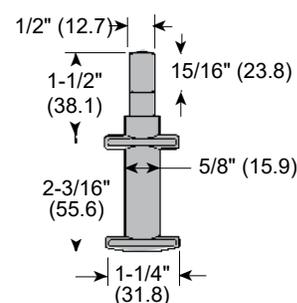
4075

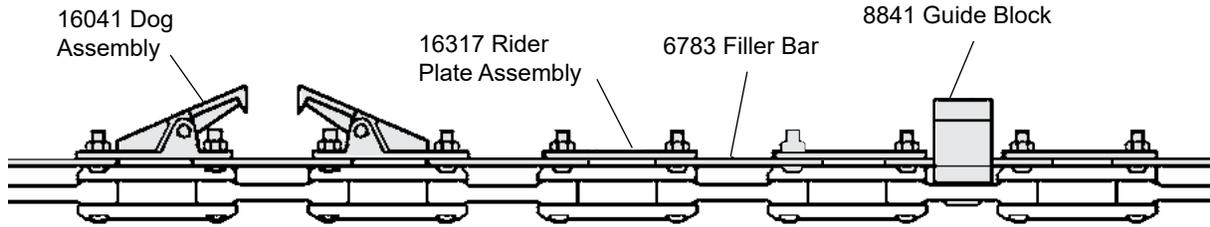


8837



15586

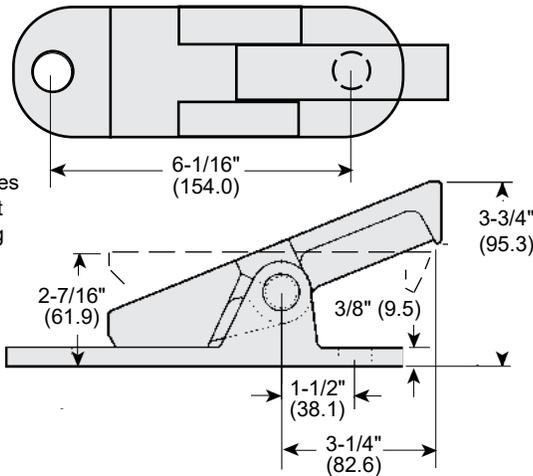




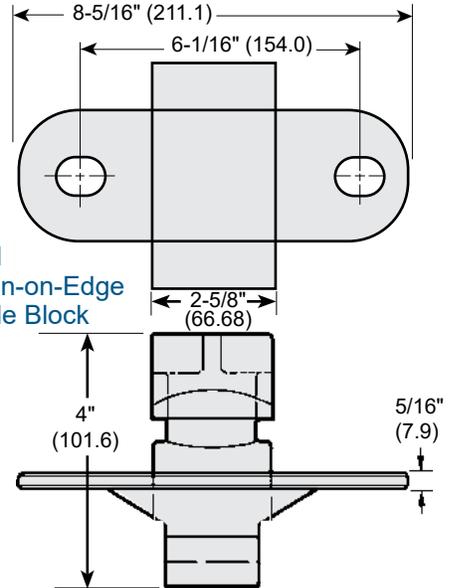
16041 Chain-on-Edge Pusher

Assembly includes:
 # 6779 Swage Shaft
 #16038 Push Dog
 #16039 Clevis

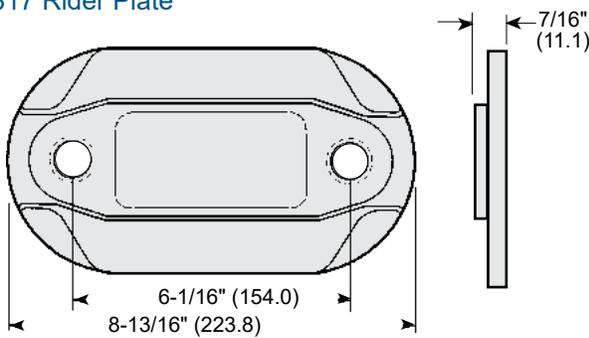
Pusher assembly attaches to the extended pins that hold rider plates and dog assemblies to the chain.



8841 Chain-on-Edge Guide Block

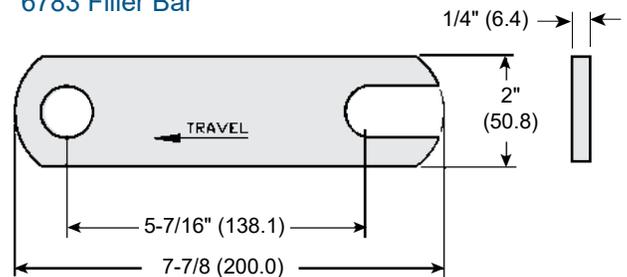


16317 Rider Plate



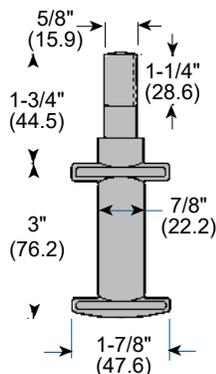
Rider Plates and Filler Bars are also available in UHMW

6783 Filler Bar

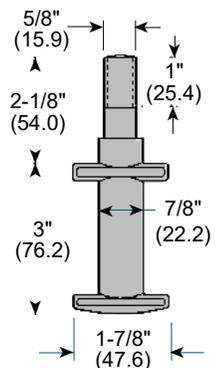


Chain Pins

13215M2
 4140 material



13218M2
 4140 material



Systematic care, inspection, and service of equipment performed on a regular basis will lead to early detection of minor problems.

- **Upon completion** of erection of an Overhead Trolley Conveyor by Daifuku and before operation of the conveyor, the customer's Maintenance Department shall properly lubricate all moving parts. Many customers prefer to use their own choice of lubricants and lubricating intervals. The following charts and suggestions are therefore offered as a guide.
- **Trolley wheel bearings** receive a minimum application of rust-proof spindle oil at the factory for protection during shipment only.
- **Trolley wheels** operating through bonderite, steam, elevated temperatures, caustic and abnormal conditions should be baffled for protection and require special consideration. Refer to chart or your local lubricant specialist for recommendations.
- **Trolley wheels operating in elevated temperatures** (above 250°F, 121°C) should have an automatic lubricator of positive connection type located at a reasonable distance from oven exit to allow parts to cool down to approximately 200°F (93°C). Lubricators should apply a minimum of mist or fog of light penetrating oil that will leave a minimum of residue.
- **Inspect** as recommended for sluggish wheels, dry chain, etc.
- **Sluggish or frozen wheels** must be removed from conveyor and thoroughly cleaned and inspected for later replacement use. The cost of a new trolley is sometimes less than the cost of cleaning the components.
- **A quantity of spare parts** should be on hand for replacement, especially half trolley assemblies, attachments, and inner caps.
- **To remove welsh plugs**, pierce with a sharp tool and pry loose, or remove lubrication fitting and force inner cap loose with thin tool. Replace with new plug, which must be pressed in place with a blunt tool.
- **Do not over lubricate.** Wheels running smoothly require no additional lubricant.
- **Trolley brackets** that may become bent in service should be replaced. Do not attempt to straighten.
- **Chain should be lubricated at drive** on slack chain side to ensure lubricant reaches bearing point of pin and link.
- **Traction wheels with carbon bushing must never be lubricated.**
- **The rotary type drive** is furnished with a chain pull indicator. Above normal (red zone) chain pull indicates a possible lack of lubrication.
- **I-beam track should be inspected** at regular intervals for wear and peening of flanges at vertical curves and wear on I-beam webs.
- **Conveyors operating in extremely low temperatures** should be allowed to run at reduced speed continuously overnight to prevent freezing of lubricants.
- **Lubricants shown** in chart on page 9.5, or equal, are suggested.
DO NOT OVER LUBRICATE.

Trouble

Probable Causes

Remedy

CHAIN		
<p>Excessive chain wear.</p> <p><i>(Note: The chain will elongate due to wear; this is normal wear and is no fault of the system.)</i></p>	<p>Lack of lubrication.</p> <p>Sluggish or frozen trolley wheels.</p> <p>Roller turn roller frozen.</p> <p>Obstruction in chain path.</p> <p>Conveyor overloaded.</p>	<p>Lubricate chain.</p> <p>Lubricate or replace trolleys.</p> <p>Replace roller turn rollers.</p> <p>Remove obstruction and remove and replace chain if damaged.</p> <p>Conveyor should not be loaded beyond its designed capacities.</p>
<p>Excessive slack chain.</p>	<p>Chain growth through normal wear.</p>	<p>Adjust take-up and if necessary remove links of chain.</p>

TROLLEYS		
<p>Sluggish or frozen trolley wheels.</p>	<p>Residue accumulated from over lubrication.</p> <p>Bearings corroded or worn out.</p>	<p>Remove from conveyor and clean. Remove welsh plug to clean and press on new plug with blunt tool.</p> <p>Replace wheels.</p>
<p>Bent trolley brackets</p>	<p>Damaged in jam or by obstruction.</p>	<p>Remove obstruction and replace damaged trolley bracket with new bracket. Do not attempt to straighten bent brackets.)</p>

ROLLER TURNS		
<p>Sluggish or frozen roller turn rollers</p>	<p>Dirt or grease residue.</p>	<p>Clean thoroughly or replace if bearings are damaged. See lubrication chart.</p>

I-BEAM TURNS		
<p>Excessive wear or peening of flanges at vertical curves.</p>	<p>Excessive chain tension.</p>	<p>Adjust chain tension.</p>
<p>Excessive wear on I-beam web.</p>	<p>Bent trolley brackets.</p> <p>Eccentric Loading.</p>	<p>Replace trolleys.</p> <p>Load carriers symmetrically.</p>

Trouble

Probable Causes

Remedy

TAKE-UP		
Floating frame movement sluggish or frozen	Spring compression, air pressure or counterweight load too great.	Reduce the spring, air or counterweight loading.
	Dry or damaged expansion joints.	Lubricate if dry and replace with new expansion joints if damaged.
	Guide wheels worn or frozen with dirt and grease residue.	Clean thoroughly or replace if worn.

DRIVE		
Decrease in conveyor speed	Belt slippage	Adjust belt until snug.
	Set screws on pulley are loose and causing pulley to rotate on shaft.	Align pulley and tighten set screws.
Drive stops	Overload limit switch	Locate and eliminate cause of conveyor jam and restart conveyor.
	Power failure	Check power supply
Excessive noise in reducer/gearmotor	Lack of lubrication	Fill reducer with oil to oil level plate; or, if needed, change oil. Grease all fittings.
	Oil leak	Tighten all grease fittings and pipe plugs, clear breather tube opening and add lubricant.
	Worn or broken gear or bearing	Disassemble reducer and replace damaged part.
Motor running above normal temperature	Conveyor chain pull excessive	Inspect chain & trolley lubrication
	Electrical	Inspect electrical wiring and controls.
	Bearing failure	Inspect and replace motor.
	Motor ventilation obstructed	Clean motor of dust and dirt.
Slapping or pulsating caterpillar chain	Chain too loose	Adjust drive take-up unit until chain is snug. (Do not remove any links of caterpillar chain or dogs.)
	Conveyor chain or caterpillar chain worn beyond use	Replace
Floating frames sluggish or frozen (Automotive Class)	Obstruction	Remove obstruction and repair or replace any damaged equipment.
	Guide wheels worn or frozen with dirt or grease residue	Clean thoroughly or replace if worn too badly.

Lubricant Guide for Operating Temperatures up to 250°F (121°C)

See local lubrication specialist for temperatures above 250°

	Inspect	Lubricant	Remarks
Chain	60 Days or as required	AGMA #3	
Trolley Wheels	30 Days	NLGI #2 Gr.*	
Roller Turn Rollers Zerk Fittings No Fittings		NLGI #2 Gr. SAE #30 Oil	Generally not used above 250°F
Traction Wheels Anti-Friction Carbon Bush		NLGI #2 Gr. None	Never lubricate carbon bushed traction wheels
Motor			See Instructions on motor
Transmission		NLGI #2 Gr. or Oil	See instructions on transmission
Countershaft Bearings		NLGI #2 Gr.	
Reeves Vari-Pulley		None	Prepacked at factory
Caterpillar Chain		SAE #90 Oil	
Caterpillar Chain Dogs		NLGI #2 Gr.	Apply to face of Dog
Takeup Bearings		NLGI #2 Gr.	
Idler Sprocket		NLGI #2 Gr.	
Back-up Rollers		SAE #30 Oil or Nlgl #2 Gr.	
Back-up Bar		NLGI #2 Gr.	
Track		None	Inspect wear
Floating Frame Wheels		None	Prepacked
Reducers & Fittings		50° to 125°F (10° to 52°C) NLGI #2 Gr.	See instructions on unit
Gear Case		AGMA #8 Comp. Oil** For use with bronze worm gear reducer	

*Lithium Complex Base Recommended

**Temperature 15° to 60° (-9° to 16°C). Use AGMA #7 Comp. oil for use with Bronze Worm Gear Reducer.

Oil Capacities For Drive Reducers (Automotive Class)

Unit No.	Reducer Shaft Position	Capacity		Weight
		GALLONS	LITERS	
Size A	Primary Down	2.5	9.5	810 lbs (367.4kg)
	Primary Up	3.5	9.5	
	Secondary Down	7.5	28.4	
	Secondary Up	3	11.4	
Size B	Primary Down	3.5	13.2	810 lbs (367.4kg)
	Primary Up	4.5	17.0	
	Secondary Down	10	37.9	
	Secondary Up	6.5	24.6	
Size C	Primary Down	6	22.7	1330 lbs (603.3kg)
	Primary Up	10	37.9	
	Secondary Down	17	68.2	
	Secondary Up	9	34.1	

Suggested Inspection Checklist for Webb Overhead Trolley Conveyors

Chain

- Lubrication
- Excessive wear
- Slack Chain

Trolleys

- Lubrication
- Sluggish or frozen wheels
- Bent bracket
- Loose bracket bolts

I-Beam

- Wear and peening on flanges at vertical curves
- Wear on web at load or unload points, horizontal and vertical curves
- Obstacles on track interfering with trolley path

Roller Turns

- Lubrication
- Roller bearing wear
- Roller face wear
- Loose roller bolts
- Loose bracket bolts

Takeup

- Lubrication
- Limit switches
- Roller bearing wear
- Roller face wear
- Loose roller bolts
- Loose bracket bolts
- Travel remaining
- Spring (screw) adjustment
- Expansion joint conditions
 - Lubrication
 - Wear
 - Free movement
- Ease of floating frame travel

Traction Wheels

- Lubrication
- Bearings
- Rim wear
- Check bolts
- Alignment

Drive

- Lubrication
 - Cat chain
 - Machinery components
 - Bearings
 - Oil level in reducer
- Wear
 - Cat chain
 - Back-up bar
 - Back-up rollers
 - Cat unit sprockets
- Adjustments
 - Cat unit take-up (Cat chain should be tight)
 - Back-up bar
 - Limit switch cut-off tripper bar
- Overload condition
 - Chain pull indicator reading in overload zone
 - Motor, reducer, or gearmotor running at excessive temperature
- Belt drive condition (Automotive Class)
 - Pulleys are aligned and set screws are tight
 - Belts are in good condition and are not slipping
- Excessive oil leakage from reducer
- Loose mounting bolts
- Ease of floating frame travel

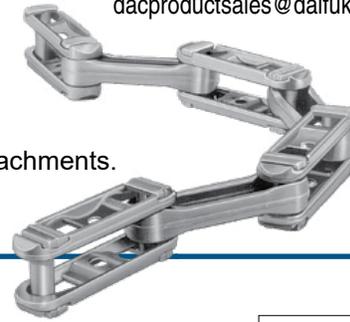
Safety

- All applicable safety procedures followed during inspection
- Proper installation of all safety devices

To Order a Chain Assembly:

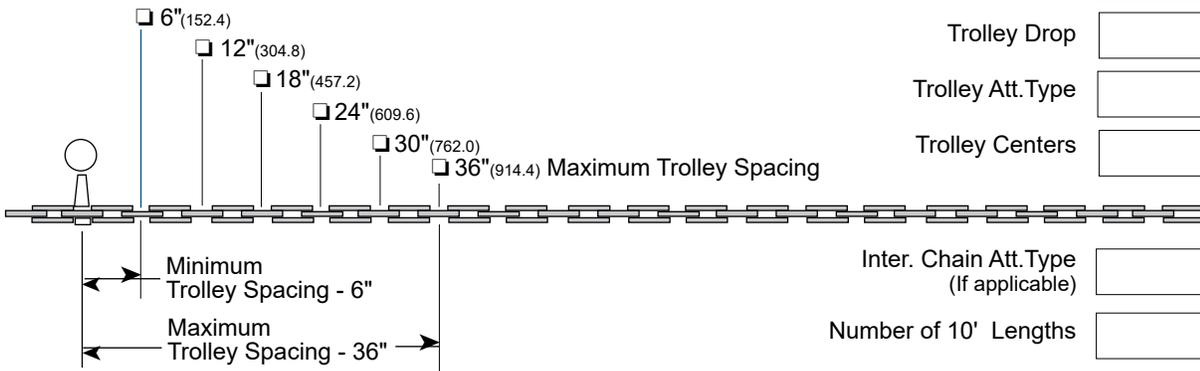
Complete the information requested below.

Refer to section 1 for chain load ratings and intermediate chain attachments and sections 2 & 3 for trolley specifications and trolley attachments.



X-348 Chain: Quote Order

A 10' section has 40 Side Links and 20 Center Links



Trolley Size

Trolley Drop

Trolley Att. Type

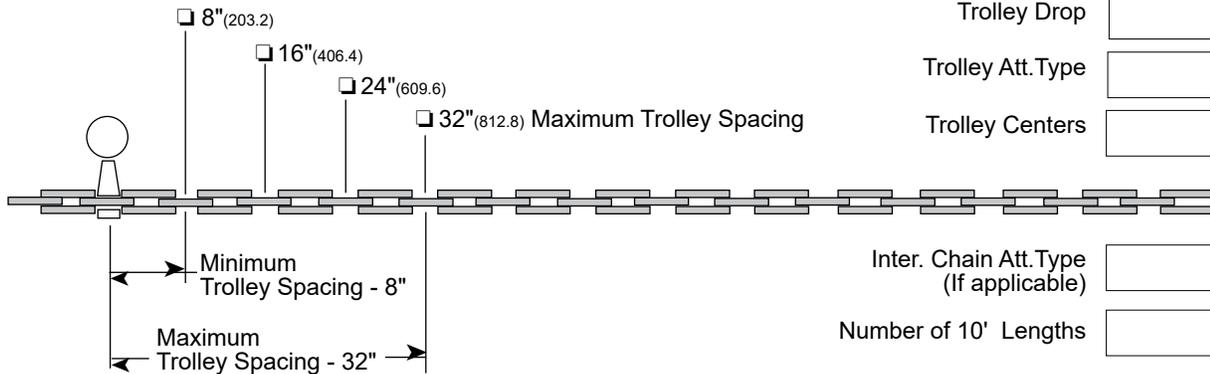
Trolley Centers

Inter. Chain Att. Type (If applicable)

Number of 10' Lengths

X-458 Chain: Quote Order

A 10' section has 30 Side Links and 15 Center Links



Trolley Size

Trolley Drop

Trolley Att. Type

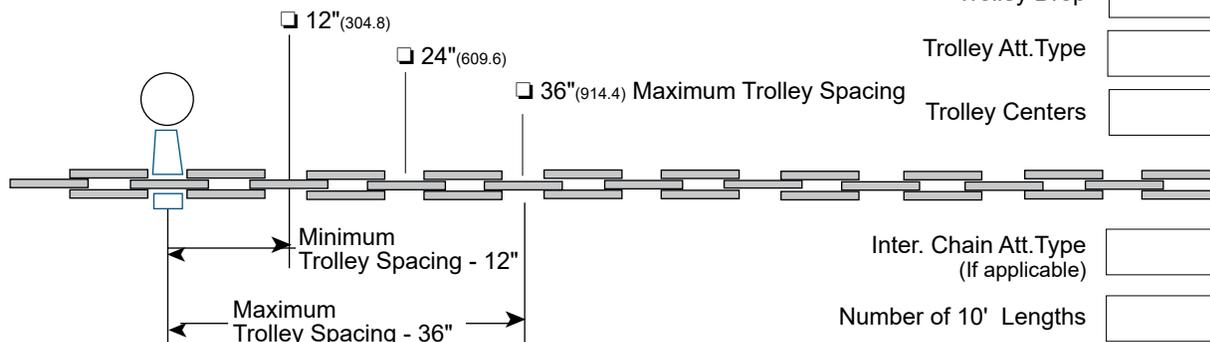
Trolley Centers

Inter. Chain Att. Type (If applicable)

Number of 10' Lengths

X-678 Chain: Quote Order

A 10' section has 20 Side Links and 10 Center Links



Trolley Size

Trolley Drop

Trolley Att. Type

Trolley Centers

Inter. Chain Att. Type (If applicable)

Number of 10' Lengths

Overhead Trolley Assembly: Quote Order

Complete the information requested below.

Inner Cap
 Yes No

Wheel Style

 Refer to section 2.1 for wheel styles

Trolley Bracket Size

 2 Trolley Brackets must be ordered to make one trolley assembly.

Chain Size

Attachment Type

 "H" Attachment shown. See section 2 for a complete trolley attachment listing

I-beam size

Optional Red Seal Guard & Full Contact Grease Seal Yes No

Bracket Nut & Bolt
 2 Nut & Bolt assemblies must be ordered to make one Trolley assembly.

Trolley Drop

Inverted Trolley Assembly: Quote Order

Complete the information requested below.

Bracket Nut & Bolt
 2 Nut & Bolt assemblies must be ordered to make one Trolley assembly.

Trolley Bracket Size

 2 Trolley Brackets must be ordered to make one trolley assembly.

Chain Size

Wheel Style

 Refer to section 2.1 for wheel styles

Inner Cap
 Yes No

Optional Red Seal Guard & Full Contact Grease Seal Yes No

Channel Track

Trolley Drop

Drives, Takeups, Turns



Daifuku America Corporation

Call Toll Free: 1-800-932-2178

Fax: 1-248-553-1253

dacproductsales@daifukuamerica.com

Caterpillar Drives: Quote Order

Overhead Drive Inverted Drive

Constant speed VFD

Chain pull _____ Conveyor speed (fpm) _____

I-beam and chain size _____ Trolley part no _____

Trolley Drop _____ Motor size (or without motor)

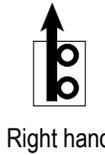
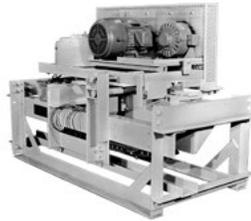
Voltage _____ Hertz _____ Phase & Motor requirements

Optional features:

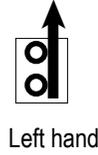
Retractable backup bar Heavy-duty backup bar

Outboard roller cat. chain Automotive spec. motor

Inverter duty motor Brake Type



Right hand



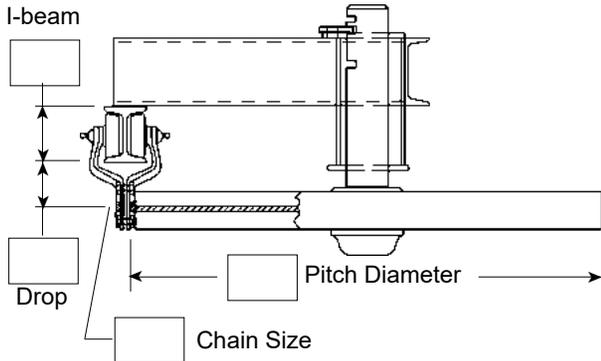
Left hand

To determine the hand of the drive, look in the direction of chain travel, with the chain moving away from you. If the caterpillar unit is to be placed on the right side of the chain, it is a right hand drive. If it is on the left side of the chain, it is a left hand drive. Right hand drives will be furnished unless otherwise specified.

Refer to section 6.1 for minimum recommended Traction Wheel diameters.

Traction Wheel Turn: Quote Order

Pitch Diameter Degree of Turn Qty.



Hub Bearing Style:

Roller Bearing Dodge Hub Carbon

Traction Wheel Takeup: Quote Order

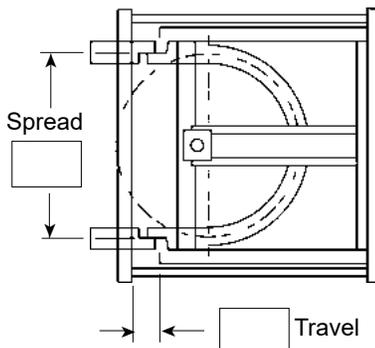
Type: Spring Air Counterweight

Pitch Diameter Degree of Turn Qty.

I-beam Trolley Drop. Chain Size

Hub Bearing Style

Roller Bearing
 Dodge Hub
 Carbon



Refer to section 6.8 for minimum recommended Roller Turn radii.

Roller Turn: Quote Order

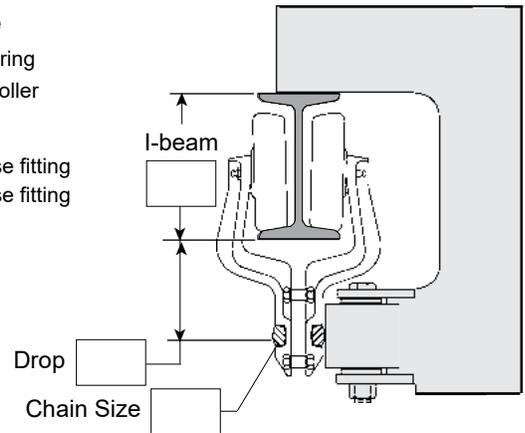
Radius Degree of Turn Qty.

Roller Style

Roller Bearing
 Tapered Roller

Bolt Style

With grease fitting
 W/O grease fitting



Roller Turn Takeup: Quote Order

Type: Spring Air Counterweight

Radius Degree of Turn Qty.

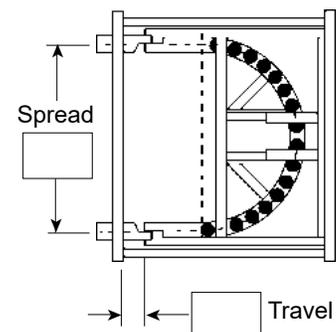
I-Beam Trolley Drop. Chain Size

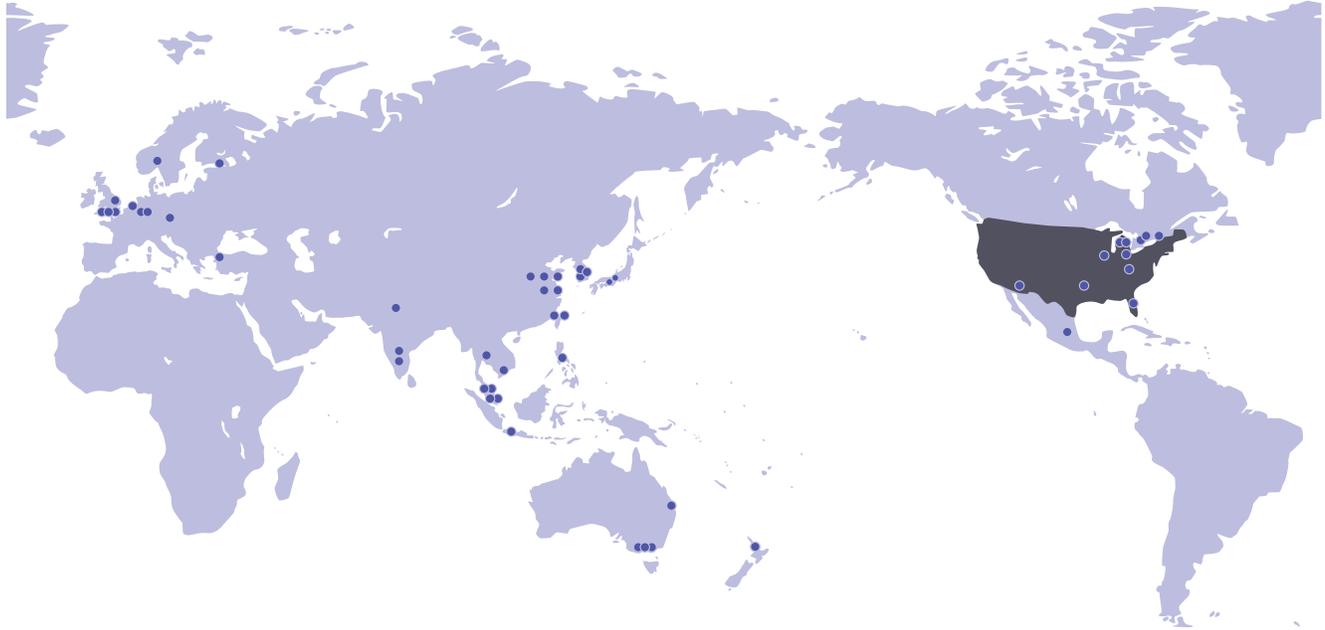
Roller Style

Roller Bearing
 Tapered Roller

Bolt Style

With grease fitting
 W/O grease fitting





Engineering, Sales and Manufacturing Facilities

Daifuku America Corporation
6700 Tussing Road
Reynoldsburg, OH 43068 USA
Tel: 1-614-863-1888

Daifuku North America Holding Company
30100 Cabot Drive
Novi, MI 48377 USA
Tel: 1-248-553-1000

Hamilton, Ontario Plant
1647 Burlington Street, East
POB 3428 Station "C", Hamilton,
Ontario, L8H 3L2 CANADA
Tel: 1-905-547-0411
Fax: 1-905-549-3798

Carlisle Plant
P.O. Box 400
Carlisle, SC 29031 USA
Tel: 1-864-427-8421
Fax: 1-864-427-8425

DAIFUKU

Reynoldsburg
Tel: 1-248-553-1232
www.Daifuku.com/us
E-mail: dacproductsales@daifukuamerica.com