

R&M's RU & RH Demag's DHL & DHT

Under Running End Truck Technical Guide

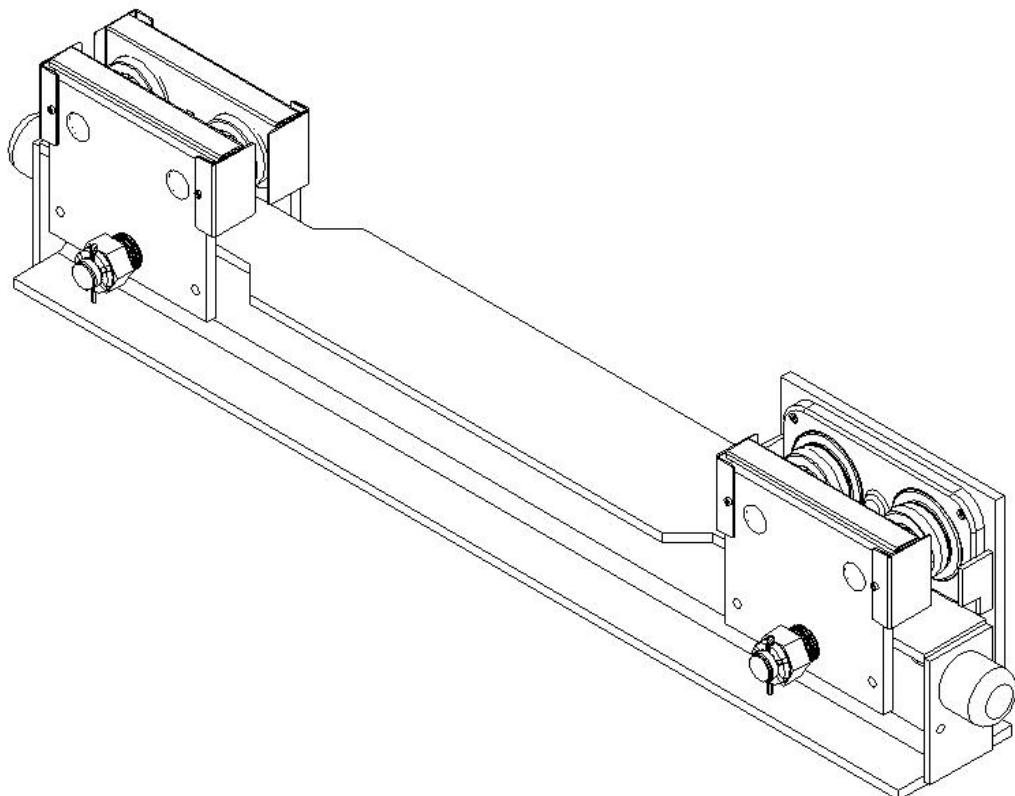


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1 General

The RU, DHL, and RH, DHT end trucks are a new series of under running end trucks designed to use the GEK gear drive.

The main difference between the RU, DHL end truck and the RH, DHT end truck is the design of the frame. The frame on the RU, DHL end truck is the traditional I-beam whereas the frame on the RH, DHT end truck is a fabricated U-shaped structure. RH, DHT end trucks offer better headroom.

A four-wheel articulating trolley is mounted to each end of the frame for an eight-wheel arrangement.

Model comparison between R&M and Demag

R&M	Demag
RU	DHL
RH	DHT

2 Selection Criteria

The maximum allowable wheel loads for the end trucks are determined by these criteria:

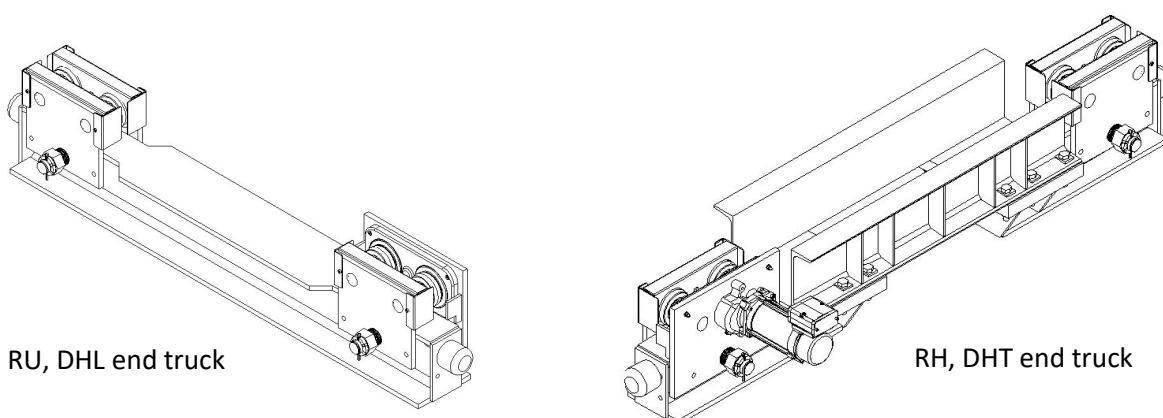
- Properties of the truck structure or frame
- Permissible surface pressure between wheel and rail
- Maximum bearing capacity
- Service life of the bearings

When selecting the end trucks for the crane application, the following checks should be made:

- Wheel loading not to exceed allowable value.
- Structure loading not to exceed allowable loading value.
- Bridge girder connection
- Actual flange width of the runway beam must match the flange width range of the end truck.

3 Frame

The I-beam frame on the RU, DHL end truck sits below the bottom flange of the runway beam. The U-shaped frame on the RH, DHT end truck is designed in such a way that part of the frame will wrap around the lower part of the runway beam as this design shortens the headroom.



4 End Truck Drawing

Dimensional drawings as PDF are available on R&M's website (www.rmhoist.com) to download or to view. In addition, end truck drawings can be generated in several different drawing file formats through QuoteMaster® or Demag CraneExpert.

5 Articulating Trolleys and Wheels

The end truck is equipped with two four-wheel trolleys. In the standard arrangement, one of the trolleys includes the drive mounting plate with two drive wheels. The other wheels on the end truck are idler wheels. A second GEK gear drive can be added to the second trolley set on the end truck as an option. With this option, the idler wheels and side plate are replaced with drive wheels and a drive mounting plate.

The standard wheel has a single flange and crown tread. The crown tread on the wheel is suitable for flat or tapered beam flanges.

Patented track wheels can be furnished as an option. The flange width range for patented track wheels varies slightly from the flange width range for standard wheels. This is noted in the **Specifications** section. The wheel hardness for patented track wheels is 415 BHN.

The material for the standard wheel is GJS700-2 / EN-JS1070 (ductile iron) and the hardness is approximately 280 BHN. Ductile iron is graphite rich. Graphite is a dry lubricant that helps reduce wear of the wheel and the rail.

The wheel bearings are anti-friction and permanently lubricated.

Safety lugs that will prevent the end truck from dropping more than one inch [25 mm] in case of axle failure are integral part of the trolley plates.

Covers over the drive and idler wheel flanges are provided as standard.

6 Specifications

Wheelbase range	RU models	Wheelbase, mm	RH models	Wheelbase, mm
	RU08, DHL08	1200, 1400, 1800, 2300, 2800	RH10, DHT10	1400, 1800, 2300, 2800
	RU10, DHL10	1200, 1400, 1800, 2300, 2800, 3200, 3500	RH13, DHT13	1400, 1800, 2300, 2800, 3200, 3500
	RU13, DHL13	1200, 1400, 1800, 2300, 2800, 3200, 3500	RH20, DHT20	1800, 2300, 2800, 3200, 3500, 4000
	RU20, DHL20	1800, 2300, 2800, 3200, 3500, 4000		
Wheels	RU model	Wheel tread diameter	RH models	Wheel tread diameter
	RU08, DHL08	80 mm	RH10, DHT10	100 mm
	RU10, DHL10	100 mm	RH13, DHT13	125 mm
	RU13, DHL13	125 mm	RH20, DHT20	200 mm
	RU20, DHL20	200 mm		
	Ductile iron - material GJS700-2 (standard wheel), crown tread and flanged			
Runway beam flange width range	Model	Flange width range		
	RU08, DHL08	73-120 mm 2.87" – 4.72"	121-168 mm 4.76" – 6.61"	169-216 mm 6.65" – 8.5"
	RU10, DHL10	82-130 mm	131-178 mm	179-226 mm
	RH10, DHT10	3.23" – 5.12"	5.16" – 7"	7.05" – 8.9"
	RU13, DHL13	100-179 mm	180-259 mm	260-343 mm
	RH13, DHT13	3.93" – 7.03"	7.06" – 10.19"	10.23" – 13.5"
	RU20, DHL20	127-210 mm	211-314 mm	315-418 mm
	RH20, DHT20	5" – 8.25"	8.31" – 12.38"	12.43" – 16.5"
	Crown tread wheel accepts a flat or tapered flange			
Patented track	Model	Flange width range		
	RU08, DHL08	63-110 mm 2.48" – 4.33"	111-158 mm 4.37" – 6.22"	
	RU10, DHL10	61-109 mm	110-157 mm	
	RH10, DHT10	2.4" – 4.29"	4.33" – 6.18"	
	RU13, DHL13	64-143 mm	144-223 mm	
	RH13, DHT13	2.51" – 5.63"	5.67" – 8.78"	
	RU20, DHL20	No patented track		
	RH20, DHT20			
Truck frame construction	I-beam frame	U-shape, fabricated frame		
	RU08, RU10, RU13, RU20, DHL08, DHL10, DHL13, DHL20	RH10, RH13, RH20, DHT10, DHT13, DHT20		
	Integrated wheel axle failure support on wheel plates			
Gear Drive	RU08-RU13, DHL08-DHL13 and RH10, RH13, DHT10, DHT13: uses GEK gear and inverter-duty motor (The available bridge speeds are limited with two-speed pole change motors.) RU20, DHL20 and RH20, DHT20: uses GES3 gear and inverter-duty motor (The available bridge speeds are limited with two-speed pole change motors.) One drive (two wheels) per end truck as standard. Nominal VFD speeds: 65, 80, 100, 130 fpm [20, 25, 32, 40 m/min]			
Joint type	See Possible Girder Connections for more information			
See next page	Joint type	Bolted connection with joint plate	Applicable end truck	
	SA3	4-bolt connection, M16 bolt (flange width \leq 300 mm)	RU08, DHL08	
	SB4	4-bolt connection, M20 bolt (flange width \leq 410 mm)	RU10, DHL10	
	SC3	8-bolt connection, M20 bolt (flange width: 200 mm - 310 mm)	RU13, DHL13	
	SC4	8-bolt connection, M20 bolt (flange width: 300 mm - 410 mm)	RU13, DHL13	
	SC5	8-bolt connection, M20 bolt (flange width: 410 mm - 510 mm)	RU13, DHL13	
	SD3	12-bolt connection, M20 bolt (flange width: 200 mm - 310 mm)	RU20, DHL20	
	SD4	12-bolt connection, M20 bolt (flange width: 300 mm - 410 mm)	RU20, DHL20	
	SD5	12-bolt connection, M20 bolt (flange width: 410 mm - 510 mm)	RU20, DHL20	
	HB4	4-bolt connection, M20 bolt (flange width \leq 410 mm)	RH10, DHT10	
	HC3	8-bolt connection, M20 bolt (flange width: 200 mm - 310 mm)	RH13, DHT13	
	HC4	8-bolt connection, M20 bolt (flange width: 300 mm - 410 mm)	RH13, DHT13	
	HC5	8-bolt connection, M20 bolt (flange width: 410 mm - 510 mm)	RH13, DHT13	
	HD3	16-bolt connection, M20 bolt (flange width: 200 mm - 310 mm)	RH20, DHT20	
	HD4	16-bolt connection, M20 bolt (flange width: 300 mm - 410 mm)	RH20, DHT20	
	HD5	16-bolt connection, M20 bolt (flange width: 410 mm - 510 mm)	RH20, DHT20	
See next page	Joint type	Bolted connection without joint plate	Applicable end truck	
	BA1	4-bolt connection, M16 bolt, (flange width: 154 mm - 203 mm)	RU08, DHL08	
	BA2	4-bolt connection, M16 bolt, (flange width: 204 mm - 253 mm)	RU08, DHL08	
	BA3	4-bolt connection, M16 bolt, (flange width: 254 mm - 303 mm)	RU08, DHL08	
	BB2	4-bolt connection, M20 bolt, (flange width: 216 mm - 265 mm)	RU10, DHL10	
	BB3	4-bolt connection, M20 bolt, (flange width: 266 mm - 315 mm)	RU10, DHL10	
See next page	BB4	4-bolt connection, M20 bolt, (flange width: 316 mm - 415 mm)	RU10, DHL10	
	BB5	4-bolt connection, M20 bolt, (flange width: 416 mm - 450 mm)	RU10, DHL10	

Joint type	BC3	8-bolt connection, M20 bolt, (flange width: 266 mm - 315 mm)	RU13, DHL13
	BC4	8-bolt connection, M20 bolt, (flange width: 316 mm - 415 mm)	RU13, DHL13
	BC5	8-bolt connection, M20 bolt, (flange width: 416 mm - 450 mm)	RU13, DHL13
	BD3	12-bolt connection, M20 bolt, (flange width: 300 mm - 399 mm)	RU20, DHL20
	BD4	12-bolt connection, M20 bolt, (flange width: 400 mm - 499 mm)	RU20, DHL20
	BD5	12-bolt connection, M20 bolt, (flange width: 500 mm - 600 mm)	RU20, DHL20
	<u>Joint type</u>	<u>Bolted connection without joint plate</u>	<u>Applicable end truck</u>
	KB2	4-bolt connection, M20 bolt, (flange width: 216 mm - 265 mm)	RH10, DHT10
	KB3	4-bolt connection, M20 bolt, (flange width: 266 mm - 315 mm)	RH10, DHT10
	KB4	4-bolt connection, M20 bolt, (flange width: 316 mm - 415 mm)	RH10, DHT10
	KB5	4-bolt connection, M20 bolt, (flange width: 416 mm - 450 mm)	RH10, DHT10
	KC3	8-bolt connection, M20 bolt, (flange width: 266 mm - 315 mm)	RH13, DHT13
	KC4	8-bolt connection, M20 bolt, (flange width: 316 mm - 415 mm)	RH13, DHT13
	KC5	8-bolt connection, M20 bolt, (flange width: 416 mm - 450 mm)	RH13, DHT13
	KD3	16-bolt connection, M20 bolt, (flange width: 266 mm - 315 mm)	RH20, DHT20
	KD4	16-bolt connection, M20 bolt, (flange width: 316 mm - 415 mm)	RH20, DHT20
	KD5	16-bolt connection, M20 bolt, (flange width: 416 mm - 450 mm)	RH20, DHT20
	<u>Joint type</u>	<u>Welded connection without joint plate</u>	<u>Applicable end truck</u>
	WA_		RU08, DHL08
	WB_		RU10, DHL10
	WC_		RU13, DHL13
	WD_		RU20, DHL20
	<u>Joint type</u>	<u>Special joint</u>	<u>Applicable end truck</u>
	000	Special joint - design required by others	RU08, RU10, RU13, RU20 DHL08, DHL10, DHL13, DHL20 RH10, RH13, RH20 DHT10, DHT13, DHT20
Bumpers	Bumpers are a standard feature and sized by QuoteMaster® or Demag CraneExpert.		
Options	Patented track wheel Anti-tipping rollers	Rail cleaning device Second drive for end truck	Guide rollers (bolt on)
Surface treatment	Primer only (RAL 7038 gray for frame)		

Product Code Description

RU	08	-	23	080	-	SA3	0000	C	0000	-	N
1	2	3	4	5	6	7	8	9	10	11	12

Pos.	Description	Pos.	Description
1	End truck type (RU, RH, DHL, DHT)	7	Joint plate type and size code
2	Wheel diameter code	8	Bolt joint distance dimension, mm
3	Defines bogey (B) or 2-wheel style (-)	9	Bumper size and type code
4	Wheel base code (code x 100 = WB, mm)	10	Inner wheel distance dimension, mm
5	Flange width dimension, mm	11	Color code (- primary paint)
6	Number of drive wheels per truck or bogey truck	12	Special properties

7 Possible Girder Connections

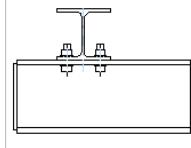
7.1 RU, DHL End Trucks

The RU, DHL end trucks do not come with joint plates unless specified. Profile girders can be mounted to the RU, DHL end truck without a joint plate (B or W joint type) or with a joint plate (S joint type). Box girders will always mount to the end truck with a joint plate (S joint type). QuoteMaster® or Demag CraneExpert will suggest the joint type for the girder connection for the crane application.

7.1.1 B Joint Type – Bolted Connection, No Joint Plate

The B joint type is when the profile girder gets bolted directly to the frame of the RU, DHL end truck without a joint plate. Box girders cannot be mounted to the RU, DHL end truck without a joint plate.

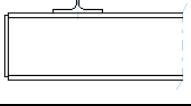
B Joint Type

		RU08 DHL08	RU10 DHL10	RU13 DHL13	RU20 DHL20
Girder Position	Joint Illustration	Joint types (BA1, BA2, BA3, BB2, BB3, BB4, BB5, BC3, BC4, BC5, BD3) no joint plates			
	No joint plate bolted connection	Profile girder	Profile girder	Profile girder	Profile girder
STD		Joint type: BA1 Max flange width, 203 mm	Joint type: BB2 Max flange width, 265 mm	Joint type: BC3 Max flange width, 315 mm	Joint type: BD3 Max flange width, 400 mm
		Joint type: BA2 Max flange width, 253 mm	Joint type: BB3 Max flange width, 315 mm	Joint type: BC4 Max flange width, 415 mm	Joint type: BD4 Max flange width, 500 mm
		Joint type: BA3 Max flange width, 320 mm	Joint type: BB4 Max flange width, 415 mm	Joint type: BC5 Max flange width, 450 mm	Joint type: BD5 Max flange width, 600 mm
			Joint type: BB5 Max flange width, 450 mm		

7.1.2 W Joint Type – Welded Connection, No Joint Plate

The W joint type is when the profile girder gets welded directly to the frame of the RU end truck without a joint plate. Box girders cannot be mounted to the RU, DHL end truck without a joint plate.

W Joint Type

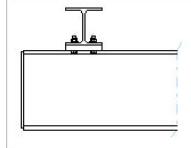
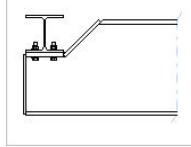
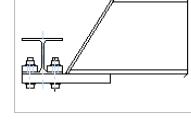
		RU08 DHL08	RU10 DHL10	RU13 DHL13	RU20 DHL20
Girder Position	Joint Illustration	Joint types (WA_, WB_, WC_, WD_) no joint plates			
	No joint plate; welded connection	Profile girder	Profile girder	Profile girder	Profile girder
STD		Joint type: WA_	Joint type: WB_	Joint type: WC_	Joint type: WD_

7.1.3 S Joint Type - Joint Plate

A joint plate could be needed to reinforce the connection between the girder and the end truck. The joint plate also allows for more girder mounting positions like those illustrated in the table below. The S joint type can be used for profile or box girders.

The girder gets welded to the joint plate.

The joint plate will be mounted to the end truck when joint plates are specified. Any other plates needed to reinforce the connection are not included.

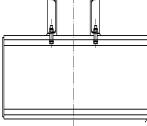
		RU08 DHL08		RU10 DHL10		RU13 DHL13		RU20 DHL20	
Girder	Joint Illustration	Profile girder	Box girder	Profile girder	Box girder	Profile girder	Box girder	Profile girder	Box girder
		Position	Bolted joint plate	Yes	Yes	Yes	Yes	Yes	Yes
STD		Joint type: SA3 Max flange width, 300 mm		Joint type: SB4 Max flange width, 410 mm		Joint type: SC3 Max flange width, 310 mm		Joint type: SD3 Max flange width, 310 mm	
						Joint type: SC4 Max flange width, 410 mm		Joint type: SD4 Max flange width, 410 mm	
						Joint type: SC5 Max flange width, 510 mm		Joint type: SD5 Max flange width, 510 mm	
MED		Joint type: SA3 Max flange width, 300 mm		Joint type: SB4 Max flange width, 410 mm		Joint type: SC3 Max flange width, 310 mm		Joint type: SD3 Max flange width, 310 mm	
						Joint type: SC4 Max flange width, 410 mm		Joint type: SD4 Max flange width, 410 mm	
						Joint type: SC5 Max flange width, 510 mm		Joint type: SD5 Max flange width, 510 mm	
HIGH		Joint type: SA3 Max flange width, 300 mm		Not available		Not available		Not available	

7.2 RH, DHT End Trucks

The RH, DHT end trucks do not come with joint plates unless specified. Profile girders can be mounted to the RH, DHT end truck without a joint plate (K joint type) or with a joint plate (H joint type). Box girders will always use H type plate to mount the beam to the end truck. QuoteMaster® or Demag CraneExpert will suggest the joint type for the girder connection for the crane application.

7.2.1 K Joint Type – Bolted Connection, No Joint Plate

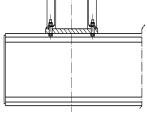
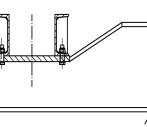
The K joint type is when the profile girder gets bolted directly to the frame of the RH, DHT end truck without a joint plate. Profile girders cannot be welded directly to the RH, DHT end truck frame without the joint plate. The K joint type is not for box girders.

		RH10 DHT10		RH13 DHT13		RH20 DHT20	
Girder	Joint Illustration	Profile girder	Box girder	Profile girder	Box girder	Profile girder	Box girder
		Position	Bolted connection; no joint plate	Yes	No	Yes	No
STD		Joint type: KB2 Max flange width, 265 mm	Joint type: KC3 Max flange width, 347 mm	Joint type: KD3 Max flange width, 400 mm			
		Joint type: KB3 Max flange width, 315 mm	Joint type: KC4 Max flange width, 447 mm	Joint type: KD4 Max flange width, 500 mm			
		Joint type: KB4 Max flange width, 415 mm	Joint type: KC5 Max flange width, 500 mm	Joint type: KD5 Max flange width, 600 mm			
		Joint type: KB5 Max flange width, 450 mm					

7.2.2 H Joint Type - Joint Plate

A joint plate could be needed to reinforce the connection between the girder and the end truck. The joint plate also allows for more girder mounting positions like those illustrated in the table below. The H joint type can be used for profile or box girders.

The bridge girder gets welded to the joint plate. The joint plate will be mounted to the end truck when joint plates are specified. Any other plates needed to reinforce the connection are not included.

		RH10, DHT10		RH13, DHT13		RH20, DHT20	
Girder	Joint Illustration	Profile girder	Box girder	Profile girder	Box girder	Profile girder	Box girder
		Position	Bolted joint plate	Yes	Yes	Yes	Yes
STD		Joint type: HB4 Max flange width, 410 mm	Joint type: HC3 Max flange width, 310 mm	Joint type: HD3 Max flange width, 310 mm			
			Joint type: HC4 Max flange width, 410 mm	Joint type: HD4 Max flange width, 410 mm			
			Joint type: HC5 Max flange width, 510 mm	Joint type: HD5 Max flange width, 510 mm			
MED		Joint type: HB4 Max flange width, 410 mm	Joint type: HC3 Max flange width, 310 mm	Joint type: HD3 Max flange width, 310 mm			
			Joint type: HC4 Max flange width, 410 mm	Joint type: HD4 Max flange width, 410 mm			
			Joint type: HC5 Max flange width, 510 mm	Joint type: HD5 Max flange width, 510 mm			

8 Bumpers (Buffers)

Bumpers are sized to meet the crane specifications.

Bumpers bolt to each end of the end truck frame and are available in rubber or polyurethane.

The bumper code is included as part of the product code for the end truck.

Suitable Bumper types for RH, DHT and RU, DHL end trucks

Code	Description	Dia. mm	Length mm	Material	End truck
A	D1801	63	53	Rubber	RU08 - RU20, RH10 - RH20, DHL08 - DHL20, DHT10 - DHT20
B	D2240	80	68	Rubber	RU08 - RU20, RH10 - RH20, DHL08 - DHL20, DHT10 - DHT20
C	D2241	100	85	Rubber	RU08 - RU20, RH10 - RH20, DHL08 - DHL20, DHT10 - DHT20
D	D2242	125	105	Rubber	RU13, RH13, RU20, RH20, DHL13, DHT13, DHL20, DHT20
K	PUR80*80	80	80	Polyurethane	RU08 - RU20, RH10 - RH20, DHL08 - DHL20, DHT10 - DHT20
G	PUR100*100	100	100	Polyurethane	RU08 - RU20, RH10 - RH20, DHL08 - DHL20, DHT10 - DHT20
E	PUR100*150	100	150	Polyurethane	RU08 - RU20, RH10 - RH20, DHL08 - DHL20, DHT10 - DHT20
M	PUR125*125	125	125	Polyurethane	RU13, RH13, RU20, RH20, DHL13, DHT13, DHL20, DHT20
F	PUR125*190	125	190	Polyurethane	RU13, RH13, RU20, RH20, DHL13, DHT13, DHL20, DHT20

9 Recommended Bolt Tightening Torque

See the table in the **Specifications** section for the bolt sized used for the joint type.

M16 bolt: 220 ft-lb (300 Nm)

M20 bolt: 425 ft-lb (580 Nm)

10 Joint Sample Drawing

A joint sample drawing can be obtained by running the crane calculation through QuoteMaster® or Demag CraneExpert. The information in the joint sample drawing will be specific to the joint type that is called out in the calculation. It will include the dimensions for any other plates needed for the connection, the location of the bolt holes, and the weld callouts as needed.

A joint sample drawing is not available for any special joint design.

