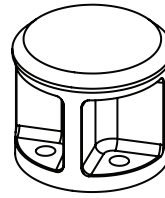


Diablo Bolted Splice™ (DBS)

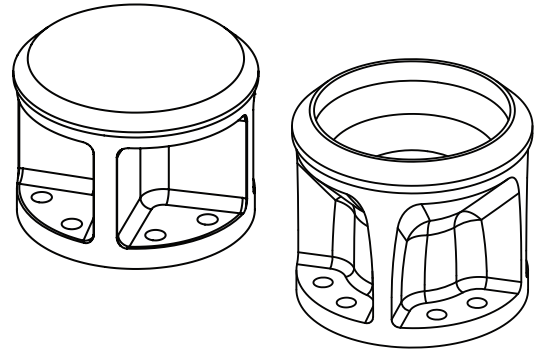
4-Bolt Configuration

Including DBS-5.000, DBS-5.563, DBS-6.625, DBS-8.625, DBS-10.75, and DBS-12.75. Dimensions and strengths are presented on **Page 2-3**.



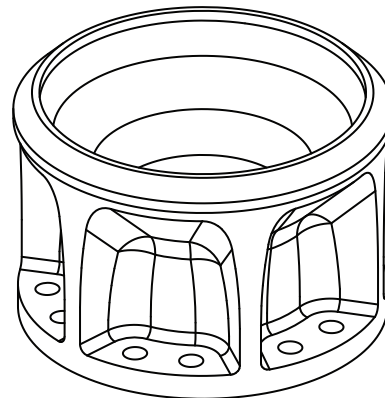
8-Bolt Configuration

Including DBS-12.75 and DBS-14.00. Dimensions and strengths are presented on **Page 4-5**.

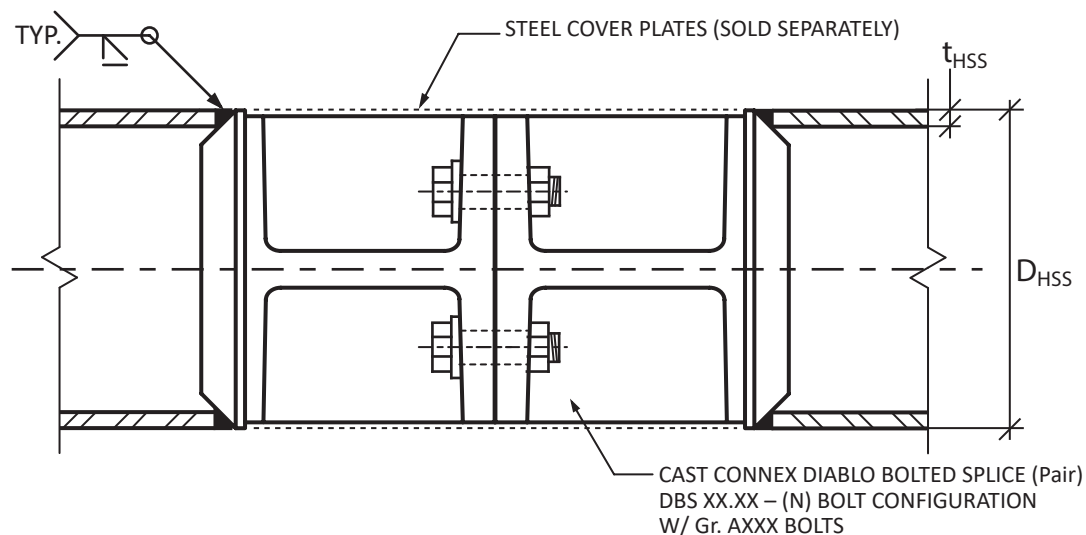


12-Bolt Configuration

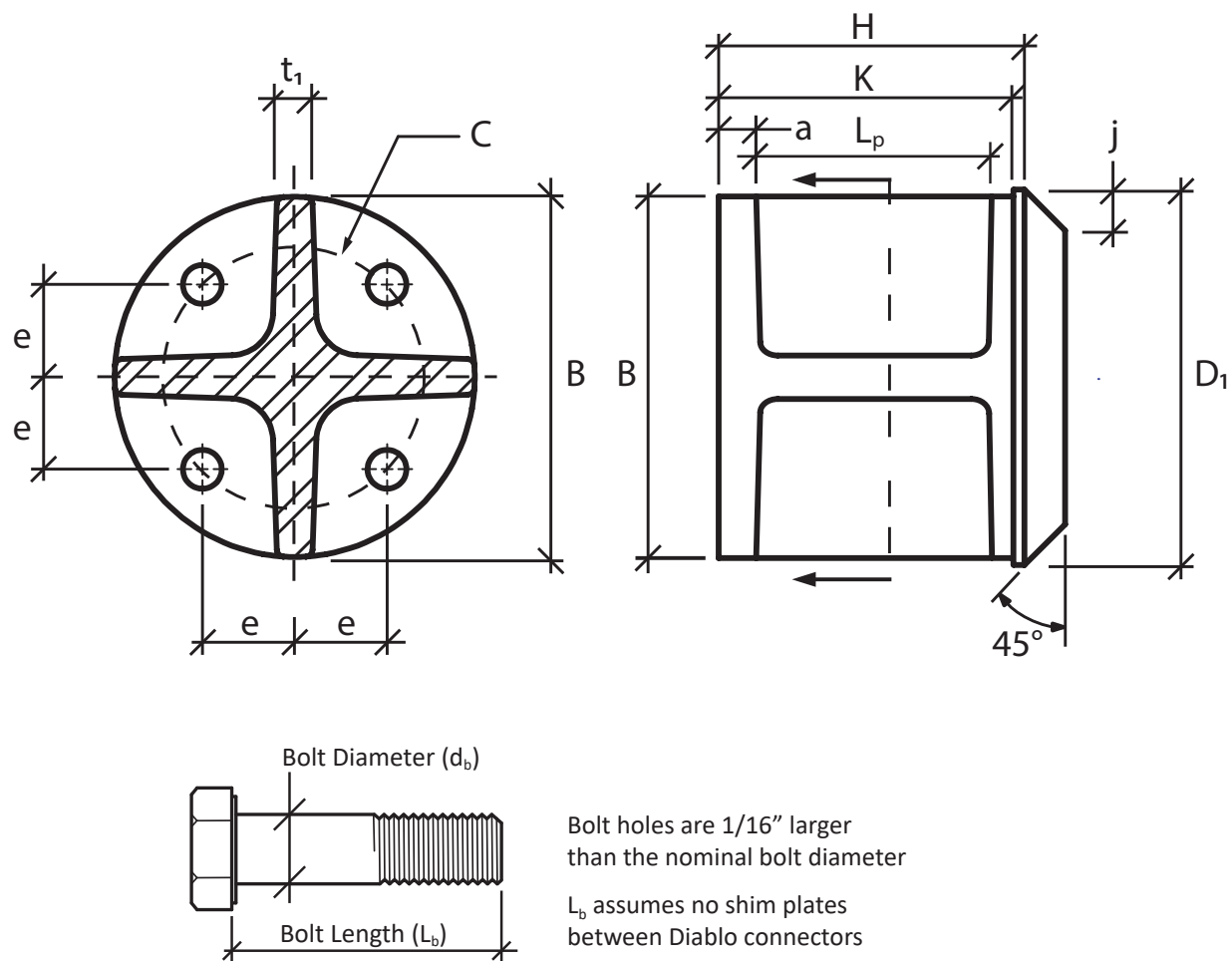
Including DBS-16.00, DBS-20.00, and DBS-24.00. Dimensions and strengths are presented on **Page 6**.



Typical Assembly



Nominal Connector Dimensions (4 Bolts)



Connector	D_1 [in]	B [in]	a [in]	t_1 [in]	H [in]	K [in]	j [in]	L_p [in]	C [in]	e [in]	d_b [in]	L_b [in]	Unit Weight* [lb]
DBS-5.000	5	$4 \frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$5 \frac{1}{2}$	$5 \frac{5}{16}$	$\frac{3}{4}$	$3 \frac{5}{8}$	$3 \frac{1}{4}$	$1 \frac{5}{32}$	$\frac{5}{8}$	$2 \frac{3}{4}$	17
DBS-5.563	$5 \frac{9}{16}$	$5 \frac{3}{16}$	$\frac{3}{4}$	$\frac{9}{16}$	$5 \frac{1}{2}$	$5 \frac{5}{16}$	$\frac{3}{4}$	$3 \frac{5}{8}$	$3 \frac{5}{8}$	$1 \frac{9}{32}$	$\frac{5}{8}$	$2 \frac{3}{4}$	22
DBS-6.625	$6 \frac{5}{8}$	$6 \frac{1}{4}$	$\frac{13}{16}$	$\frac{5}{8}$	$5 \frac{3}{4}$	$5 \frac{9}{16}$	$\frac{3}{4}$	$3 \frac{15}{16}$	$4 \frac{5}{8}$	$1 \frac{5}{8}$	$\frac{5}{8}$	$2 \frac{3}{4}$	32
DBS-8.625	$8 \frac{5}{8}$	$8 \frac{1}{4}$	1	1	$7 \frac{1}{8}$	7	$\frac{3}{4}$	$5 \frac{1}{8}$	$5 \frac{7}{8}$	$2 \frac{1}{16}$	1	$3 \frac{3}{4}$	66
DBS-10.75	$10 \frac{3}{4}$	$10 \frac{3}{8}$	$1 \frac{1}{16}$	$1 \frac{1}{4}$	$8 \frac{1}{8}$	$7 \frac{13}{16}$	$\frac{3}{4}$	$5 \frac{7}{8}$	$7 \frac{1}{4}$	$2 \frac{9}{16}$	$1 \frac{1}{4}$	$4 \frac{1}{2}$	117
DBS-12.75	$12 \frac{3}{4}$	$12 \frac{3}{8}$	$1 \frac{1}{4}$	$1 \frac{1}{4}$	$8 \frac{5}{16}$	8	$\frac{3}{4}$	$5 \frac{7}{8}$	$9 \frac{1}{4}$	$3 \frac{9}{32}$	$1 \frac{1}{4}$	$4 \frac{1}{2}$	165

*Unit weight of single cast connector. Unit weight does not include fasteners and cover plates

Available Strength of Connector (4 Bolts)

Load and Resistance Factor Design (LRFD)

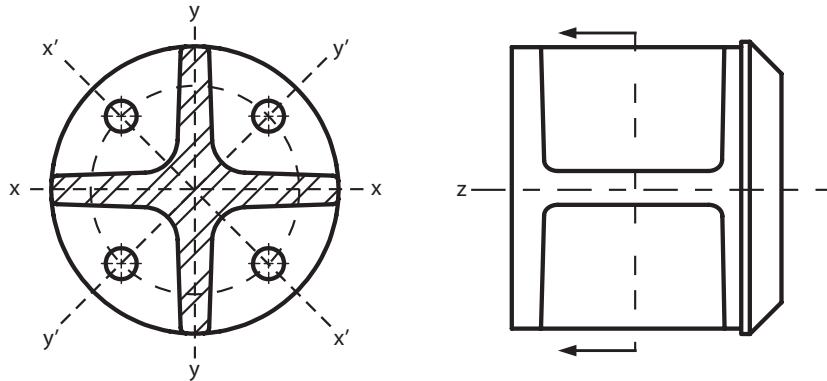
The joint detail shown offers a design strength equal to the lesser of:

- ϕR_n , $\phi M_{n,A}$, $\phi M_{n,B}$, and ϕV_n design strength in the table below with the qualifications indicated
- the design strength of the HSS-to-connector welded connection
- the design strength of the connected HSS member

Allowable Stress Design (ASD)

The joint detail shown offers an allowable strength equal to the lesser of:

- R_n/Ω , $M_{n,A}/\Omega$, $M_{n,B}/\Omega$ and V_n/Ω , allowable strength in the table below with the qualifications indicated
- the allowable strength of the HSS-to-connector welded connection
- the allowable strength of the connecting HSS member



LRFD	Bolt Group Strength ⁱ								Connector Strength ⁱ		
	Group 120 (A325)				Group 150 (A490)						
Connector	ϕR_n	$\phi M_{n,A}$	$\phi M_{n,B}$	ϕV_n^{ii}	ϕR_n	$\phi M_{n,A}$	$\phi M_{n,B}$	ϕV_n^{ii}	ϕP_n	ϕM_n	ϕV_n
	[kips]	[k-ft]	[k-ft]	[kips]	[kips]	[k-ft]	[k-ft]	[kips]	[kips]	[k-ft]	[kips]
DBS-5.000	82.8	8.23	6.12	62.6	104.0	8.23	7.69	77.3	226	11.35	66.1
DBS-5.563	82.8	10.98	7.00	62.6	104.0	11.06	8.79	77.3	294	16.20	87.8
DBS-6.625	82.8	13.73	8.86	62.6	104.0	16.69	11.12	77.3	381	25.4	111.1
DBS-8.625	212	45.5	28.9	160.2	266	47.6	36.2	197.9	790	70.2	238
DBS-10.75	331	88.8	56.2	250	416	92.8	71.0	309	1229	138.1	364
DBS-12.75	331	109.9	69.6	250	416	131.7	87.9	309	1484	197.7	430

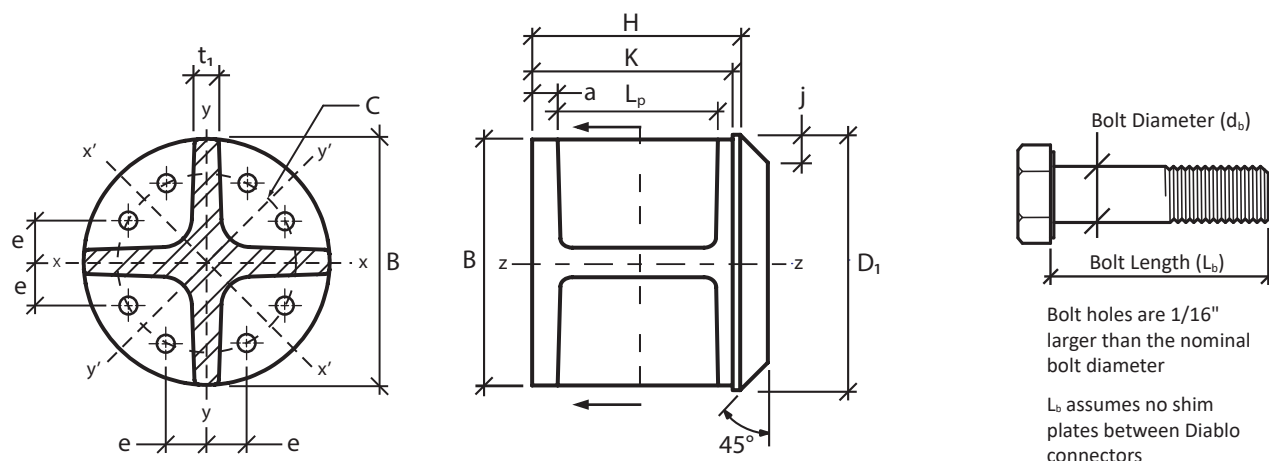
ASD	Bolt Group Strength ⁱ								Connector Strength ⁱ		
	Group 120 (A325)				Group 150 (A490)						
Connector	R_n/Ω	$M_{n,A}/\Omega$	$M_{n,B}/\Omega$	V_n/Ω^{ii}	R_n/Ω	$M_{n,A}/\Omega$	$M_{n,B}/\Omega$	V_n/Ω^{ii}	P_n/Ω	M_n/Ω	V_n/Ω
	[kips]	[k-ft]	[k-ft]	[kips]	[kips]	[k-ft]	[k-ft]	[kips]	[kips]	[k-ft]	[kips]
DBS-5.000	55.2	5.49	4.08	41.7	69.3	5.49	5.12	51.5	150.5	7.55	44.1
DBS-5.563	55.2	7.32	4.67	41.7	69.3	7.37	5.86	51.5	195.4	10.78	58.5
DBS-6.625	55.2	9.15	5.91	41.7	69.3	11.13	7.41	51.5	254	16.92	74.1
DBS-8.625	141	30.3	19.24	106.8	177.0	31.7	24.2	131.9	526	46.7	158.8
DBS-10.75	221	59.2	37.5	166.9	277	61.9	47.3	206	818	91.9	243
DBS-12.75	221	73.3	46.4	166.9	277	87.8	58.6	206	989	131.5	286

- Strengths reported are for single-action loading conditions (i.e. pure axial force, single-direction pure flexure, or pure shear). Strength values are given with respect to the axes shown above. Engineer shall confirm adequacy of joint under combined axial forces, shear forces and moments. Refer to **DBS Combined Loading User Guide-AISC 360-22** for additional information.
- Shear strength assumes bolt threads are excluded and no reduction has been applied for fillers / shims.

Nominal strengths have been determined using AISC 360-22

- R_n : Nominal tensile strength of the bolt group (z-axis).
 P_n : Nominal axial strength of the cross-section (z-axis).
 M_n : Nominal flexural strength of the cross-section (x or y axis).
 $M_{n,A}$: Nominal flexural strength of the bolt group (x or y axis).
 $M_{n,B}$: Nominal flexural strength of the bolt group (x' or y' axis).
 V_n : Nominal shear strength of the bolt group; nominal shear strength of the cross-section (x or y axis).

Nominal Connector Dimensions (8 Bolts)



Connector	D ₁ [in]	B [in]	a [in]	t ₁ [in]	H [in]	K [in]	j [in]	L _p [in]	C [in]	e [in]	d _b [in]	L _b [in]	Unit Weight* [lb]
DBS-12.75	12 3/4	12 3/8	1 1/4	1 1/4	8 5/16	8	3/4	5 7/8	10	2 1/4	1	4 1/4	165

*Unit weight of single cast connector. Unit weight does not include fasteners and cover plates

Available Strength of Connector (8 Bolts)

Load and Resistance Factor Design (LRFD)

The joint detail shown offers a design strength equal to the lesser of:

- ϕR_n , $\phi M_{n,A}$, $\phi M_{n,B}$, and ϕV_n design strength in the table below with the qualifications indicated
- the design strength of the HSS-to-connector welded connection
- the design strength of the connecting HSS member

Allowable Stress Design (ASD)

The joint detail shown offers an allowable strength equal to the lesser of:

- R_n/Ω , $M_{n,A}/\Omega$, $M_{n,B}/\Omega$ and V_n/Ω , in the table below with the qualifications indicated
- the allowable strength of the HSS-to-connector welded connection
- the allowable strength of the connecting HSS member

LRFD	Bolt Group Strength ⁱ								Connector Strength ⁱ		
	Group 120 (A325)				Group 150 (A490)				ϕP_n	ϕM_n	ϕV_n
Connector	ϕR_n [kips]	$\phi M_{n,A}$ [k-ft]	$\phi M_{n,B}$ [k-ft]	ϕV_n ⁱⁱ [kips]	ϕR_n [kips]	$\phi M_{n,A}$ [k-ft]	$\phi M_{n,B}$ [k-ft]	ϕV_n ⁱⁱ [kips]	[kips]	[k-ft]	[kips]
DBS-12.75	424	116.9	94.5	320	533	146.8	118.6	396	1484	197.7	430

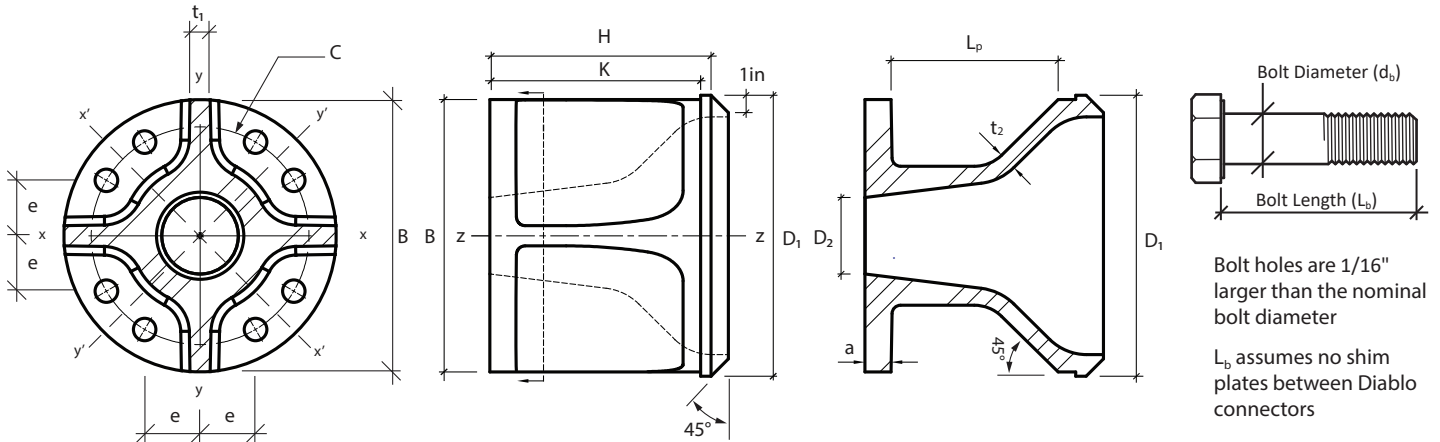
ASD	Bolt Group Strength ⁱ								Connector Strength ⁱ		
	Group 120 (A325)				Group 150 (A490)				P_n/Ω	M_n/Ω	V_n/Ω
Connector	R_n/Ω [kips]	$M_{n,A}/\Omega$ [k-ft]	$M_{n,B}/\Omega$ [k-ft]	V_n/Ω ⁱⁱ [kips]	R_n/Ω [kips]	$M_{n,A}/\Omega$ [k-ft]	$M_{n,B}/\Omega$ [k-ft]	V_n/Ω ⁱⁱ [kips]	[kips]	[k-ft]	[kips]
DBS-12.75	283	77.9	63.0	214	355	97.9	79.1	264	987	131.5	286

- Strengths reported are for single-action loading conditions (i.e. pure axial force, single-direction pure flexure, or pure shear). Strength values are given with respect to the axes shown above. Engineer shall confirm adequacy of joint under combined axial forces, shear forces and moments. Refer to **DBS Combined Loading User Guide-AISC 360-22** for additional information.
- Shear strength assumes bolt threads are excluded and no reduction has been applied for fillers / shims.

Nominal strengths have been determined using AISC 360-22

- R_n : Nominal tensile strength of the bolt group (z-axis).
 P_n : Nominal axial strength of the cross-section (z-axis).
 M_n : Nominal flexural strength of the cross-section (x or y axis).
 $M_{n,A}$: Nominal flexural strength of the bolt group (x or y axis).
 $M_{n,B}$: Nominal flexural strength of the bolt group (x' or y' axis).
 V_n : Nominal shear strength of the bolt group; nominal shear strength of the cross-section (x or y axis).

Nominal Connector Dimensions (8 Bolts)



Connector	D_1 [in]	B [in]	D_2 [in]	a [in]	t_1 [in]	t_2 [in]	H [in]	K [in]	L_p [in]	C [in]	e [in]	d_b [in]	L_b [in]	Unit Weight* [lb]
DBS-14.00	14	13 ⁵ / ₈	3 ⁹ / ₁₆	1 ¹ / ₂	1 ³ / ₈	1	11	10 ¹ / ₂	8 ⁵ / ₁₆	10 ⁷ / ₈	2 ⁵ / ₈	1 ¹ / ₈	4 ³ / ₄	186

*Unit weight of single cast connector. Unit weight does not include fasteners and cover plates

Available Strength of Connector (8 Bolts)

Load and Resistance Factor Design (LRFD)

The joint detail shown offers a design strength equal to the lesser of:

- ϕR_n , $\phi M_{n,A}$, $\phi M_{n,B}$, and ϕV_n design strength in the table below with the qualifications indicated
- the design strength of the HSS-to-connector welded connection
- the design strength of the connecting HSS member

Allowable Stress Design (ASD)

The joint detail shown offers an allowable strength equal to the lesser of:

- R_n/Ω , $M_{n,A}/\Omega$, $M_{n,B}/\Omega$ and V_n/Ω , in the table below with the qualifications indicated
- the allowable strength of the HSS-to-connector welded connection
- the allowable strength of the connecting HSS member

LRFD	Bolt Group Strength ⁱ								Connector Strength ⁱ		
	Group 120 (A325)				Group 150 (A490)				ϕP_n	ϕM_n	ϕV_n
Connector	ϕR_n [kips]	$\phi M_{n,A}$ [k-ft]	$\phi M_{n,B}$ [k-ft]	ϕV_n ⁱⁱ [kips]	ϕR_n [kips]	$\phi M_{n,A}$ [k-ft]	$\phi M_{n,B}$ [k-ft]	ϕV_n ⁱⁱ [kips]	[kips]	[k-ft]	[kips]
DBS-14.00	537	159.7	127.2	406	674	200	159.7	501	1742	288	390

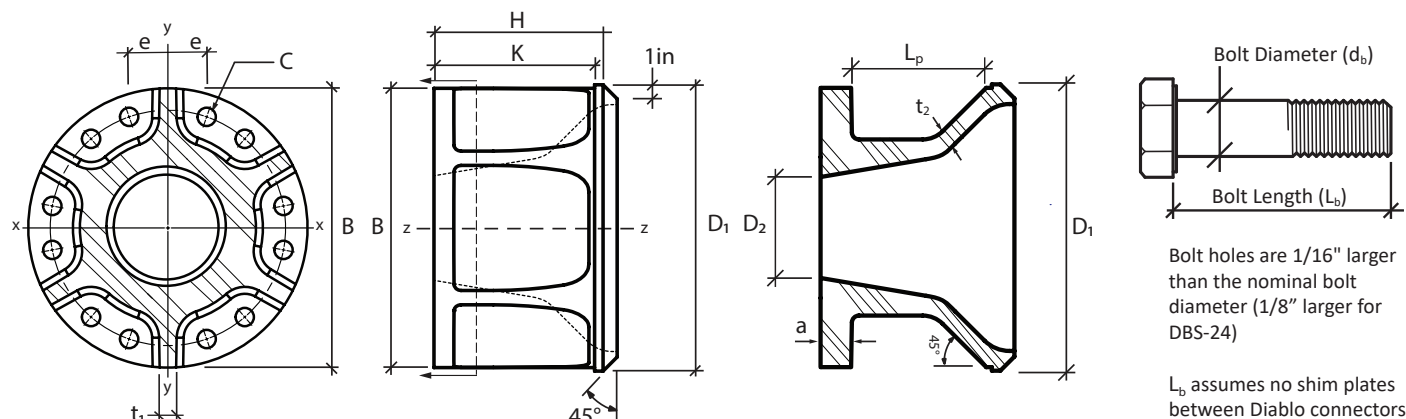
ASD	Bolt Group Strength ⁱ								Connector Strength ⁱ		
	Group 120 (A325)				Group 150 (A490)				P_n/Ω	M_n/Ω	V_n/Ω
Connector	R_n/Ω [kips]	$M_{n,A}/\Omega$ [k-ft]	$M_{n,B}/\Omega$ [k-ft]	V_n/Ω ⁱⁱ [kips]	R_n/Ω [kips]	$M_{n,A}/\Omega$ [k-ft]	$M_{n,B}/\Omega$ [k-ft]	V_n/Ω ⁱⁱ [kips]	[kips]	[k-ft]	[kips]
DBS-14.00	358	106.5	84.8	270	449	133.7	106.5	334	1159	191.7	260

- Strengths reported are for single-action loading conditions (i.e. pure axial force, single-direction pure flexure, or pure shear). Strength values are given with respect to the axes shown above. Engineer shall confirm adequacy of joint under combined axial forces, shear forces and moments. Refer to **DBS Combined Loading User Guide-AISC 360-22** for additional information.
- Shear strength assumes bolt threads are excluded, and no reduction has been applied for fillers / shims.

Nominal strengths have been determined using AISC 360-22

- R_n : Nominal tensile strength of the bolt group (z-axis).
 P_n : Nominal axial strength of the cross-section (z-axis).
 M_n : Nominal flexural strength of the cross-section (x or y axis).
 $M_{n,A}$: Nominal flexural strength of the bolt group (x or y axis).
 $M_{n,B}$: Nominal flexural strength of the bolt group (x' or y' axis).
 V_n : Nominal shear strength of the bolt group; nominal shear strength of the cross-section (x or y axis).

Nominal Connector Dimensions (12 Bolts)



Connector	D ₁ [in]	B [in]	D ₂ [in]	a [in]	t ₁ [in]	t ₂ [in]	H [in]	K [in]	L _p [in]	C [in]	e [in]	d _b [in]	L _b [in]	Unit Weight* [lb]
DBS-16.00	16	15 1/2	6 3/16	1 3/8	7/8	1	10 1/4	9 3/4	7 13/16	13	2	1	4 1/2	197
DBS-20.00	20	19 1/2	8	1 1/2	1 1/4	1 1/4	11	10 1/2	8 3/8	16 3/4	2 13/16	1 1/8	4 3/4	340
DBS-24.00	24	23 1/2	9 1/2	2	1 1/2	1 1/2	14 1/2	14	11 1/8	20	3 1/8	1 1/2	6	688

*Unit weight of single cast connector. Unit weight does not include fasteners and cover plates

Available Strength of Connector (12 Bolts)

Load and Resistance Factor Design (LRFD)	Allowable Stress Design (ASD)
The joint detail shown offers a design strength equal to the lesser of:	The joint detail shown offers an allowable strength equal to the lesser of:
a. ϕR_n , $\phi M_{n,A}$, $\phi M_{n,B}$, and ϕV_n design strength in the table below with the qualifications indicated	a. R_n/Ω , $M_{n,A}/\Omega$, $M_{n,B}/\Omega$ and V_n/Ω , in the table below with the qualifications indicated
b. the design strength of the HSS-to-connector welded connection	b. the allowable strength of the HSS-to-connector welded connection
c. the design strength of the connecting HSS member	c. the allowable strength of the connecting HSS member

LRFD	Bolt Group Strength ⁱ								Connector Strength ⁱ		
	Group 120 (A325)				Group 150 (A490)				ϕP_n	ϕM_n	ϕV_n
Connector	ϕR_n [kips]	$\phi M_{n,A}$ [k-ft]	$\phi M_{n,B}$ [k-ft]	ϕV_n ⁱⁱ [kips]	ϕR_n [kips]	$\phi M_{n,A}$ [k-ft]	$\phi M_{n,B}$ [k-ft]	ϕV_n ⁱⁱ [kips]	[kips]	[k-ft]	[kips]
DBS-16.00	636	194.3	191.7	481	799	244	242	594	1895	475	496
DBS-20.00	805	325	318	608	1011	408	399	752	2760	988	783
DBS-24.00	1431	674	667	1081	1797	846	837	1336	3940	1720	1138

ASD	Bolt Group Strength ⁱ								Connector Strength ⁱ		
	Group 120 (A325)				Group 150 (A490)				P_n/Ω	M_n/Ω	V_n/Ω
Connector	R_n/Ω [kips]	$M_{n,A}/\Omega$ [k-ft]	$M_{n,B}/\Omega$ [k-ft]	V_n/Ω ⁱⁱ [kips]	R_n/Ω [kips]	$M_{n,A}/\Omega$ [k-ft]	$M_{n,B}/\Omega$ [k-ft]	V_n/Ω ⁱⁱ [kips]	[kips]	[k-ft]	[kips]
DBS-16.00	424	129.5	128.5	320	533	162.6	161.3	396	1261	316	331
DBS-20.00	537	217	212	406	674	272	266	501	1836	657	522
DBS-24.00	954	449	445	721	1198	564	558	891	2620	1140	758

- i. Strengths reported are for single-action loading conditions (i.e. pure axial force, single-direction pure flexure, or pure shear). Strength values are given with respect to the axes shown above. Engineer shall confirm adequacy of joint under combined axial forces, shear forces and moments. Refer to **DBS Combined Loading User Guide-AISC 360-22** for additional information.
- ii. Shear strength assumes bolt threads are excluded, and no reduction has been applied for fillers / shims.

Nominal strengths have been determined using AISC 360-22

- R_n : Nominal tensile strength of the bolt group (z-axis).
 P_n : Nominal axial strength of the cross-section (z-axis).
 M_n : Nominal flexural strength of the cross-section (x or y axis).
 $M_{n,A}$: Nominal flexural strength of the bolt group (x or y axis).
 $M_{n,B}$: Nominal flexural strength of the bolt group (x' or y' axis).
 V_n : Nominal shear strength of the bolt group; nominal shear strength of the cross-section (x or y axis).