

FCB/MFCB Bypass Framing Fixed-Clip Connector



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The FCB/MFCB clip is an economical, high-performance fixed-clip connector that can be used for a variety of framing applications. It is rated for tension, compression, shear and in-plane loads and offers the designer the flexibility of specifying different screw and anchorage patterns that conform to desired load levels.

Features:

- Rated for tension, compression, shear and in-plane loads
- Provides design flexibility with varying screw and anchorage patterns that achieve different load levels
- Strategically placed stiffeners, embossments and anchor holes maximize connector performance

Material: FCB — 54 mil (16 ga.); MFCB — 68 mil (14 ga.)

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of anchors.
- Use the specified number of #12 self-drilling screws to CFS framing. Note that #10 self-drilling screws can be used per the load tables given on strongtie.com.
- For installations to wood framing, see Simpson Strong-Tie® engineering letter L-CF-FIXCLIPW at strongtie.com.

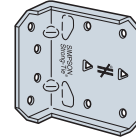
Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

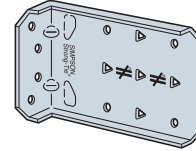
FCB43.5-R25, MFCB43.5-R25, FCB45.5-R25, MFCB45.5-R25, FCB47.5-R25, MFCB47.5-R25, FCB49.5-R25, FCB411.5-R25 contain:

- Box of 25 connectors (screws not included)

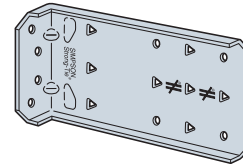
✓ FCB43.5
(MFCB43.5 similar)



✓ FCB45.5
(MFCB45.5 similar)

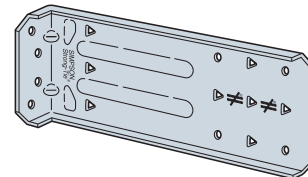


✓ FCB47.5
(MFCB47.5 similar)

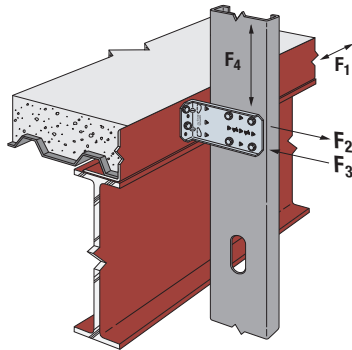
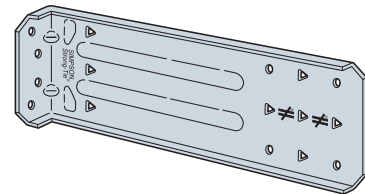


US Patent:
8,555,592

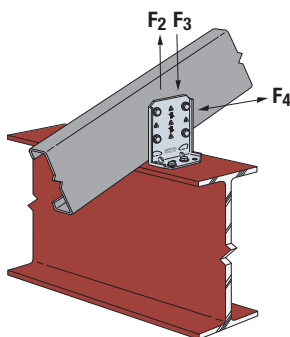
✓ FCB49.5



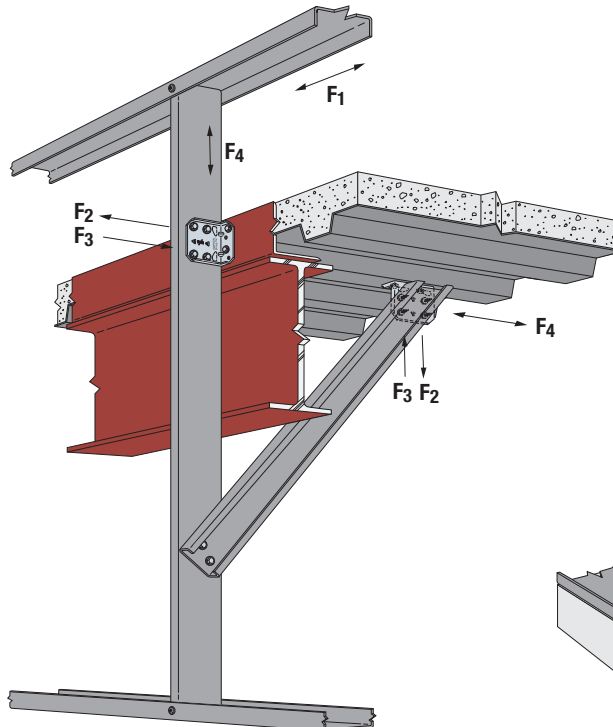
✓ FCB411.5



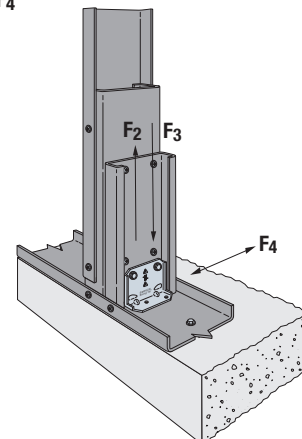
Typical FCB/MFCB Installation at Bypass Framing



Typical FCB/MFCB Installation for Roof Rafters



Typical FCB/MFCB Installation at Spandrel Studs and Kickers



Typical FCB/MFCB Installation at the Base of a 6" Jamb Stud

FCB/MFCB Bypass Framing Fixed-Clip Connector

Rigid Connectors

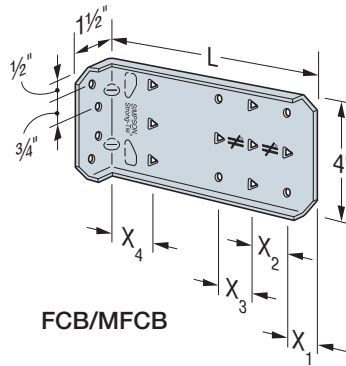
FCB/MFCB Allowable Connector Loads (lb.)

Model No.	Connector Material Thickness mil (ga.)	L (in.)	Min./Max.	No. of #12-14 Self-Drilling Screws	Stud Thickness												Code Ref.
					33 mil (20 ga.)				43 mil (18 ga.)				54 mil (16 ga.)				
					F ₁ ^{3,4}	F ₂	F ₃	F ₄	F ₁ ^{3,4}	F ₂	F ₃	F ₄	F ₁ ^{3,4}	F ₂	F ₃	F ₄	
FCB43.5	54 (16)	3½	Min.	4	140	755	755	755	175	1,105	905	1,055	330	1,250	905	1,235	IBC, FL, LA
			Max.	6	205	1,100	1,130	1,075	260	1,105	1,105	1,350	330	1,250	2,245	1,770	
MFCB43.5	68 (14)	3½	Min.	4	140	755	755	755	220	1,105	1,105	1,055	410	1,530	2,280	1,595	
			Max.	6	205	1,130	1,130	1,075	260	1,265	1,105	1,545	410	1,530	2,630	1,770	
FCB45.5	54 (16)	5½	Min.	4	120	755	755	700	150	1,105	905	875	285	1,105	905	1,100	
			Max.	9	155	1,100	1,260	1,095	195	1,105	1,105	1,380	330	1,105	2,245	1,785	
MFCB45.5	68 (14)	5½	Min.	4	170	755	755	700	220	1,105	1,105	1,030	410	1,530	2,280	1,595	
			Max.	9	170	1,265	1,260	1,695	220	1,265	1,105	2,315	410	1,605	3,205	2,315	
FCB47.5	54 (16)	7½	Min.	4	90	755	755	220	110	1,105	875	330	215	1,105	875	815	
			Max.	12	110	1,100	1,260	705	135	1,105	1,260	1,050	260	1,105	2,245	1,345	
MFCB47.5	68 (14)	7½	Min.	4	165	755	755	415	215	1,105	1,105	540	410	1,580	2,280	1,025	
			Max.	12	165	1,265	1,260	1,345	215	1,265	1,405	1,530	410	1,605	3,350	2,700	
FCB49.5	54 (16)	9½	Min.	4	—	755	755	170	—	1,105	905	255	—	1,105	905	340	
			Max.	12	—	1,100	1,260	750	—	1,105	1,260	1,115	—	1,105	2,245	1,200	
FCB411.5	54 (16)	11½	Min.	4	—	755	755	140	—	1,105	935	205	—	1,105	935	340	
			Max.	12	—	1,100	1,260	795	—	1,105	1,260	860	—	1,105	2,245	860	

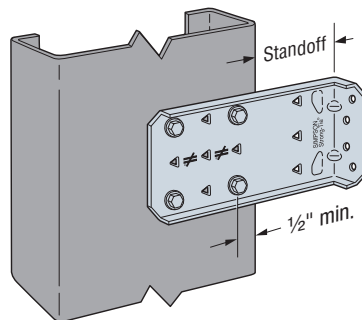
1. Min. fastener quantity and load values — fill all round holes; max. fastener quantity and load values — fill all round and triangular holes.
2. Allowable loads are based on clip capacity only and do not consider anchorage. The capacity of the connection system will be the minimum of the tabulated value and the allowable load from the FCB/MFCB Allowable Anchorage Loads table on p. 75.
3. Anchorage to the supporting structure using welds or a minimum of (2) #12-24 self-drilling screws is required.
4. Tabulated F₁ loads are based on assembly tests with the load through the centerline of stud. Tested failure modes were due to screw pullout; therefore compare F₁ against F_D calculated per ASCE 7-16 Chapter 13 with a_p = 1.25 and R_p = 1.0.
5. Tabulated values for 54 mil (16 ga.) CFS framing may be used for 68 mil (14 ga.) and greater steel thickness.

FCB/MFCB Standoff Distances

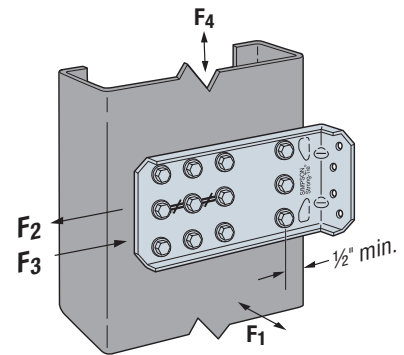
Model No.	L (in.)	Min./Max.	No. of #12-14 Self-Drilling Screws	Maximum Standoff (in.)
FCB43.5	3½	Min.	4	1
		Max.	6	1
MFCB43.5	3½	Min.	4	1
		Max.	6	1
FCB45.5	5½	Min.	4	1½
		Max.	9	1
MFCB45.5	5½	Min.	4	1½
		Max.	9	1
FCB47.5	7½	Min.	4	3½
		Max.	12	1
MFCB47.5	7½	Min.	4	3½
		Max.	12	1
FCB49.5	9½	Min.	4	5½
		Max.	12	1
FCB411.5	11½	Min.	4	7½
		Max.	12	1



Variable	Dimensions (in.)				
	FCB/MFCB				
	43.5	45.5	47.5	49.5	411.5
X ₁	¾	1	1	1	1
X ₂	1¼	1¼	1¼	1¼	1¼
X ₃	—	1¼	1¼	1¼	1¼
X ₄	—	—	1½	1½	1½
L	3½	5½	7½	9½	11½



FCB/MFCB Installation with Min. Fasteners



FCB/MFCB Installation with Max. Fasteners

FCB/MFCB Bypass Framing Fixed-Clip Connector

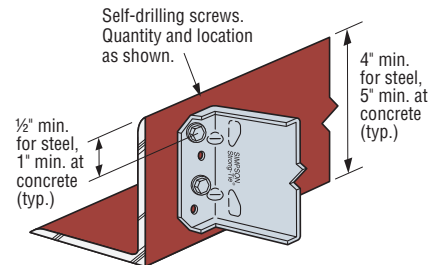
FCB Allowable Anchorage Loads (lb.)

Anchorage Type	Minimum Base Material	No. of Anchors	Allowable Load (lb.)									
			F ₁	F ₂ and F ₃	F ₄							
					FCB43.5 Min./Max.	FCB45.5 Min./Max.	FCB47.5 Min. Max.		FCB49.5 Min. Max.		FCB411.5 Min. Max.	
#12-24 self-drilling screws Simpson Strong-Tie® X and XL Metal screws	A36 steel 3/16" thick	2	165	795	645	895	555	1,075	535	535	370	535
		3	250	1,120	970	1,340	830	1,610	545	560	370	560
		4	330	1,590	1,290	1,785	1,105	2,145	545	560	370	560
Simpson Strong-Tie 0.157" x 5/8" power-actuated fasteners PDPAT-62KP	A36, A572 or A992 steel 3/16" thick	2	—	390	535				535	535	370	535
		3	—	715	560				545	560	370	560
		4	—	970	560				545	560	370	560
Simpson Strong-Tie 1/4" x 1 3/4" Titen Turbo™ TNT25134H	Concrete f' _c = 2,500 psi	2	—	380	415	315	195	315	140	205	140	150
		3	—	525	470	470	290	470	210	305	210	225
		4	—	675	645	630	390	630	280	410	280	300
Weld E70XX electrodes	A36 steel 3/16" thick	Hard side: 2"	1,205	1,740	1,770	1,840	1,105	2,650	450	1,200	450	860
		Free side: 1"										

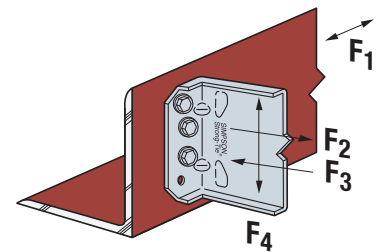
See footnotes below.

MFCB Allowable Anchorage Loads (lb.)

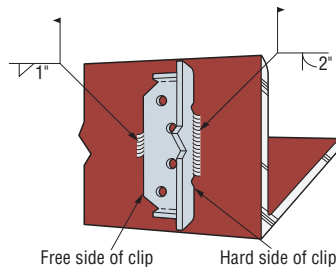
Anchorage Type	Minimum Base Material	No. of Anchors	Allowable Load (lb.)					
			F ₁	F ₂ and F ₃	F ₄			
					MFCB43.5 Min./Max.	MFCB45.5 Min./Max.	MFCB47.5 Min. Max.	
#12-24 self-drilling screws Simpson Strong-Tie X and XL Metal screws	A36 steel 3/16" thick	2	205	1,045	800	1,160	695	1,350
		3	310	1,725	1,195	1,735	1,045	2,025
		4	410	2,090	1,595	2,315	1,390	2,700
Simpson Strong-Tie 0.157" x 5/8" power-actuated fasteners PDPAT-62KP	A36, A572 or A992 steel 3/16" thick	2	—	390	535			
		3	—	715	560			
		4	—	970	560			
Simpson Strong-Tie 1/4" x 1 3/4" Titen Turbo TNT25134H	Concrete f' _c = 2,500 psi	2	—	380	415	315	195	315
		3	—	525	470	470	290	470
		4	—	675	645	630	390	630
Weld E70XX electrodes	A36 steel 3/16" thick	Hard side: 2"	1,485	4,570	1,770	2,315	1,390	3,335
		Free side: 1"						



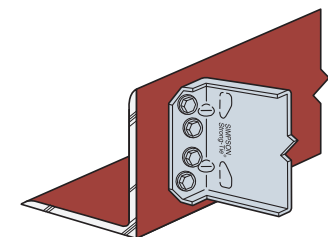
Two Anchors



Three Anchors



Weld



Four Anchors

FCB/MFCB Anchor Layout

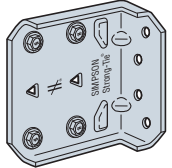
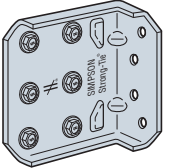
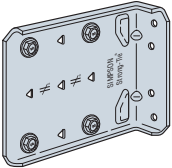
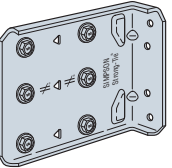
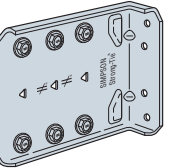
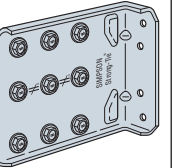
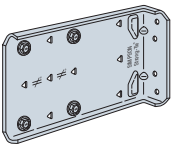
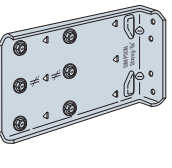
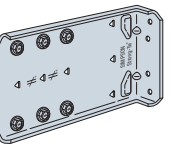
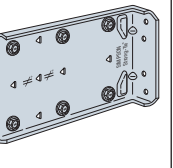
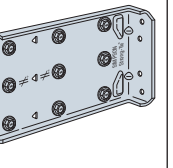
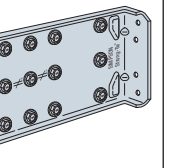
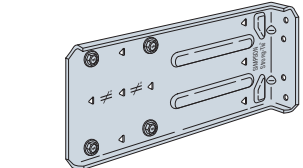
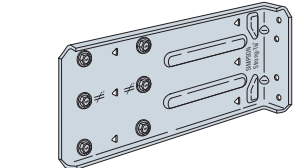
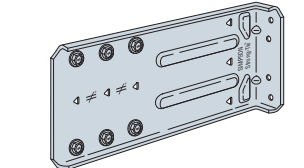
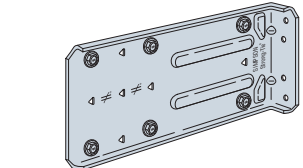
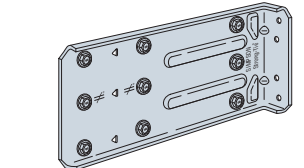
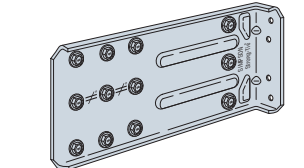
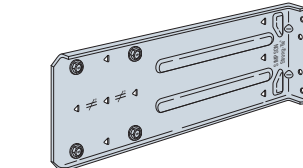
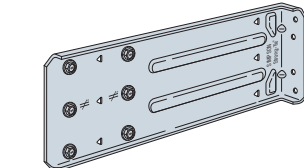
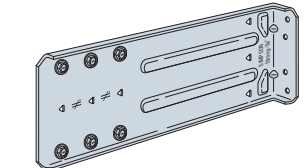
- For additional important information, see General Information and Notes on p. 26.
- Min. fastener quantity and load values — fill all round holes; max. fastener quantity and load values — fill all round and triangular holes.
- Allowable loads are for clip anchorage only. The capacity of the connection system will be the minimum of the tabulated allowable anchorage loads the allowable load from the FCB/MFCB Allowable Connector Load table on p. 74.
- Allowable loads for #12-24 self-drilling screws and PDPAT powder-actuated fasteners are based on installation in minimum 3/16"-thick structural steel with F_y = 36 ksi. PDPAT values are also provided for A572 steel. Values listed above maybe used where other thicknesses of steel are encountered or other manufacturers are used, provided that the fastener has equal or better tested values (see p. 26). It is the responsibility of the designer to select the proper length fasteners based on the steel thickness installation.
- For attachment with 0.157" x 5/8" PDPAT-62KP to 3/16" thick, A572 or A992 steel, F₂ and F₃ allowable loads can increase to 585 lb., 800 lb. and 1,170 lb. for two, three and four fasteners, respectively.
- For screw fastener installation into steel backed by concrete, predrilling of both the steel and the concrete is suggested. For predrilling use a maximum 3/16"-diameter drill bit.

FCB/MFCB Bypass Framing Fixed-Clip Connector

The following FCB/MFCB supplemental information is given to help designers with value-engineered solutions for our FCB/MFCB connectors. Loads are given on our website for fastener patterns other than our standard “min.” (fill all round holes) and “max.” (fill all round and triangle holes). In addition, the tables on the website give LRFD loads and loads for #10 screws as well as #12 screws. Please visit strongtie.com/cfs and reference FCB/MFCB clip.

Rigid Connectors

Table 1: FCB/MFCB Screw Patterns

FCB43.5 MFCB43.5	Pattern “Min.”	Pattern “Max.”				
			For load capacities for patterns 1 through 10, refer to FCB/MFCB clip on strongtie.com .			
FCB45.5 MFCB45.5	Pattern “Min.”	Pattern 1	Pattern 2	Pattern “Max.”		
						
FCB47.5 MFCB47.5	Pattern “Min.”	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Pattern “Max.”
						
FCB49.5	Pattern “Min.”		Pattern 7		Pattern 8	
						
	Pattern 9		Pattern 10		Pattern “Max.”	
						
FCB411.5	Pattern “Min.”		Pattern 11		Pattern 12	
						
	Pattern 13		Pattern 14		Pattern “Max.”	
	