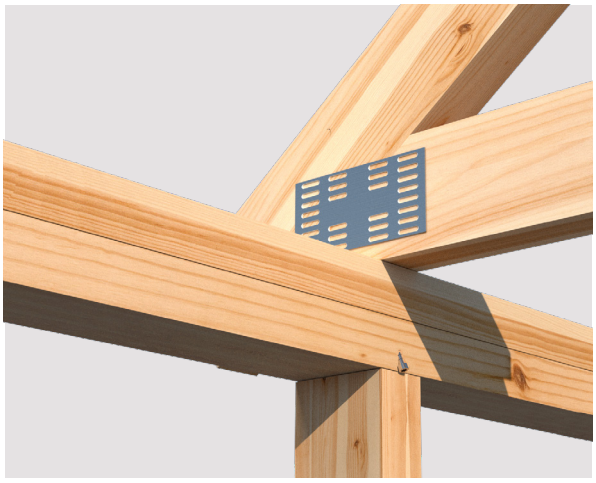
TRUSS / RAFTER TO TOP PLATE CONNECTION TECHNICAL BULLETIN



TRUSS & RAFTER TO TOP PLATE FASTENING SOLUTIONS WITH SPAX® POWERLAGS®

SPAX® #14 Cylindric Head POWERLAGS® have been evaluated to secure the critical connection between a wall's top plate and a truss or rafter. As an alternative fastening method to hurricane clips, straps and ties, this technical bulletin demonstrates how the #14 Cylindric Head POWERLAGS® are a quick and easy fastening solution between the top plate and truss or rafter and provides detailed guidelines for code compliance.

PRODUCT FEATURES

- Code listed per DrJ TER No. 1910-02.
- Patented thread serrations and Unique 4CUT™ Point allow for quick and easy installation with no pre-drilling.
- Exclusive T-STAR plus drive provides superior bit engagement to eliminate camming out and to facilitate single hand, overhead driving.
- Cylindric head easily countersinks into the plate and stud and provides a clean finish for drywall and finish trades.
- Proprietary WIROX® coating has been tested and is recognized for use in above ground contact, pressure-treated lumber.

INSTALLATION INSTRUCTIONS

1) Select the proper length fastener according to Table 1 and the wall connection details found in Figures 3 & 4. Ensure the fastener meets the required minimum penetration into the main member as specified in Table 2.
2) Install using a low rpm/high torque electric drill and T-30 T-Star plus driver bit provided. Pre-drilling is typically not required but can be used when lumber is prone to splitting. When pre-drilling, use a 1/8" bit.
3) Drive the fastener until the head is drawn flush to the surface with the wood member being connected. Do not overdrive the fastener.
4) Install the fastener per Figures 3 & 4 while meeting detail requirements for fastener angle and edge/end offset distances.

Figure 1: SPAX® #14 Cylindric Head Powerlag® Fastener

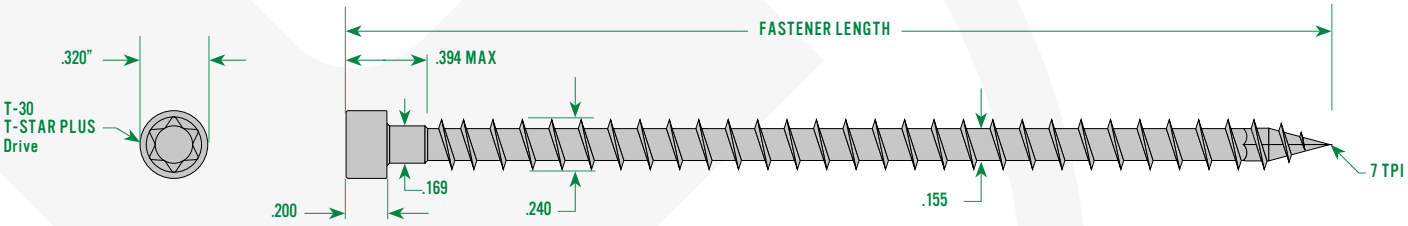


Table 1: SPAX® #14 Powerlag® Fastener Specifications and Strength Details

Fastener Name	Head (in)				Length (in)		Diameter (in)			Bending Yield Strength[3], f_{yb} (psi)	Allowable Steel Strength (lb)	
	Style	Marking	Diameter	Height	Fastener[1]	Thread[2]	Shank	Minor	Major		Tensile	Shear[4]
#14 x 4 ¾"	T-Star Plus Cylindric Head	None	0.320	0.200	4.750	4.356	0.169	0.155	0.240	160,000	990	750
#14 x 6 ¼"					6.250	5.856						

SI: 1 in. = 25.4 mm, 1 lb. = 4.45 N, 1 psi = 0.00689 MPa
1. Fastener length is measured from the topside of the head to the tip.
2. Thread length includes tapered tip (see Figure 1).
3. Bending yield strength, F_{yb}, is determined in accordance with *ASTM F1575* using minor thread diameter when fastener is tested in threaded section.
4. Shear strength is determined in accordance with *AISI S904* using minor thread diameter when fastener is tested in threaded section.
5. Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are larger due to the proprietary coatings added.

TRUSS/RAFTER/JOIST TO TOP PLATE CONNECTION

Figure 2: Uplift & Lateral Load (F1 and F2) Directions (Single and Double Top Plate Applications)

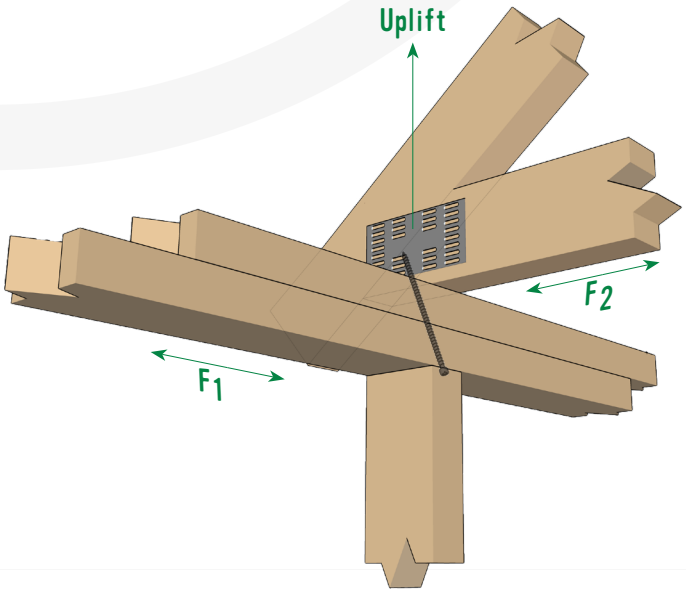


Figure 3: Installation of Fasteners at an Angle in Single and Double Top Plate to Truss/Rafter When Stud is Aligned

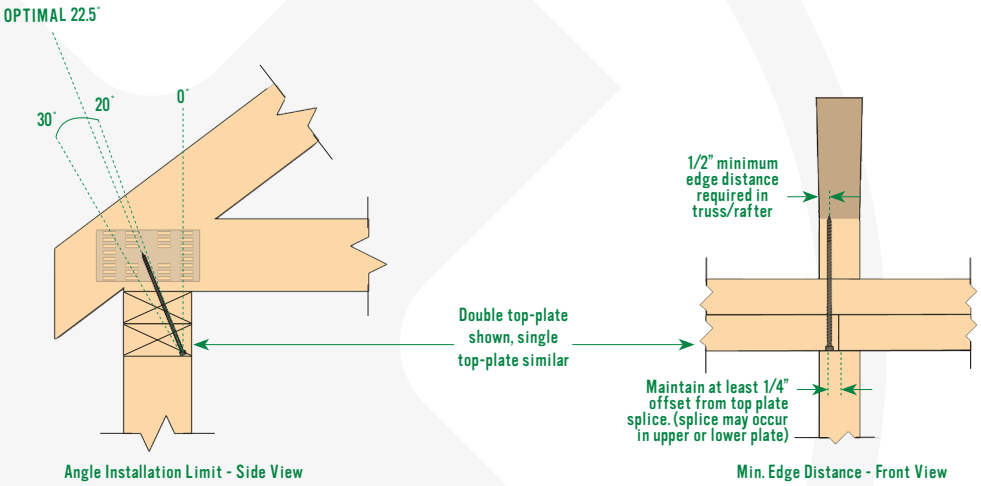


Figure 4: Installation of Fasteners Perpendicular in Single and Double Top Plate to Truss/Rafter When Stud is Offset

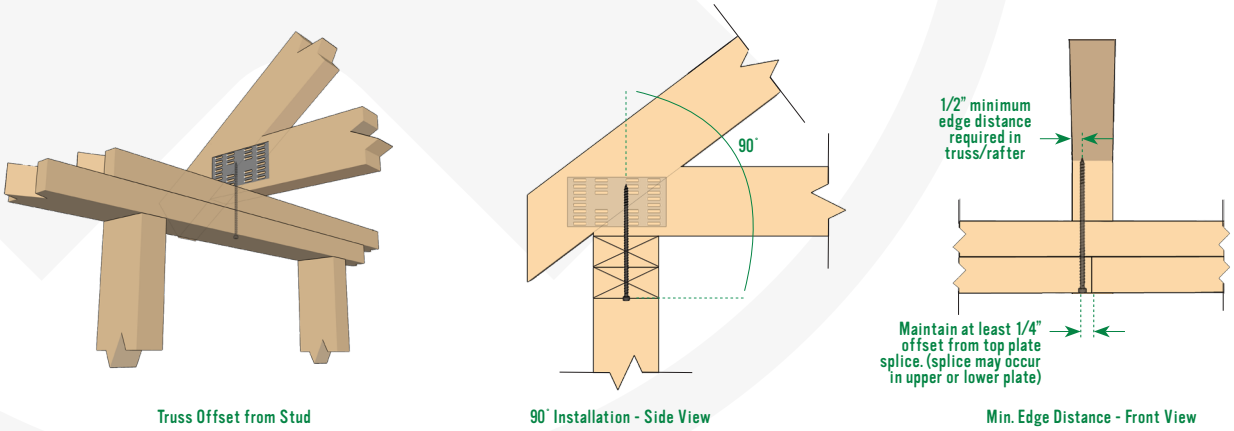


Table 2: Allowable Uplift & Lateral Loads For Fasteners in Truss/Rafter/Joist to Top Plate Connections

Fastener Length	Min. Penetration into Truss/Rafter/Joist[1] (in)	Top Plate(s)	Fastener Angle to Vertical[7]	Allowable Loads [2,3,4,5,6] (lb)					
				DF-L/SP (0.50)			SPF/HF (0.42)		
				Uplift	F1	F2	Uplift	F1	F2
4.75	2 1/2"	Single	22.5	350	285	285	290	240	240
			90	455			375		
6.25		Single or Double	22.5	350			290		
			90	455			375		

S1: 1 in. = 25.4 mm, 1 lb. = 4.45 N

1. Wood truss, rafter, or floor joist members shall be a minimum of 2" nominal thickness. Design of truss, rafter, or floor joist is by others.
2. Equivalent specific gravity of structural composite lumber (SCL) shall be equal to or grater than the specific gravities provided in this table. Refer to product information from SCL manufacturer.
3. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for a specific gravcity of 0.42. For wood species with an assigned specific gracity greater than or equal to 0.50, use the tabulated value for specific gravity of 0.50.
4. For applications involving members with different specific gravities, use the allowable load corresponding to the lowest specific gravity.
5. Includes 1.6 duration of load increase for wind and seismic. No further duration of load increases permitted. Reduce design values for other load durations as applicable.
6. See figure 2 for load directions. See Figure 3 and Figure 4 installation details.
7. Install fastener at an upward angle from the vertical of 20 to 30 (22.5 is optimal) or 90 (See figure 3 and Figure 4). For installation between 20 and 30, design values for 22.5 may be used.