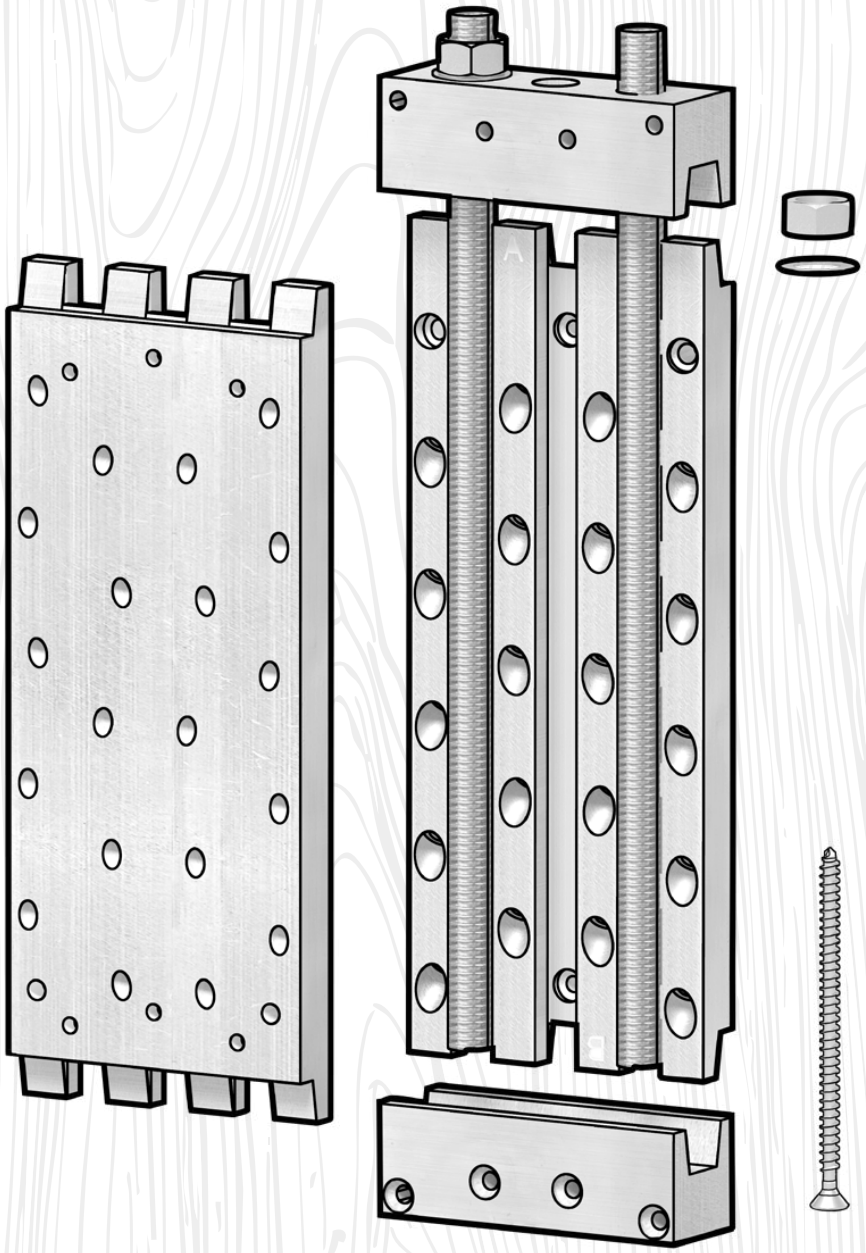
Installation Guide

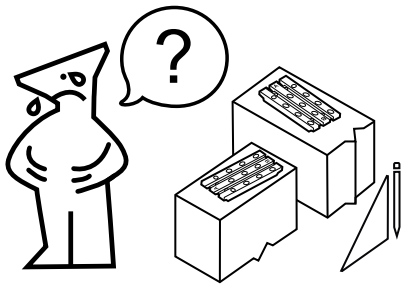
MTC SOLUTIONS

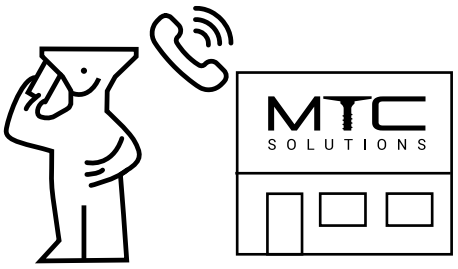
MEGANT

Version 1.01



info@mtcsolutions.com **1.866.899.4090** **www.mtcsolutions.com**





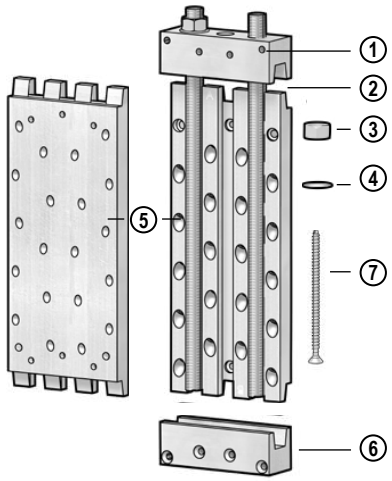
General Notes to the Installer

1. Carbon steel fasteners shall only be used in dry service conditions, as exposure to wet service conditions may lead to premature failure. Connections designed for dry service conditions should be protected from wetting and excessive moisture during construction.
2. During construction, mass timber elements may experience temporary surface wetting, potentially causing the timber surface moisture content (MC) to exceed 19%. In such cases, A3K electroplated carbon steel fasteners are acceptable for use, provided that the following three conditions are met. First, the surface wetting shall not exceed the moisture limits defined for dry service conditions for more than a few weeks per year. Second, the annual average MC during construction shall remain within the range of 10–16%. Third, the design must incorporate appropriate detailing to accommodate dimensional changes in the wood due to wetting and/or drying. If any of these conditions cannot be met, fasteners with enhanced corrosion resistance are recommended, and detailing must be adjusted accordingly.
3. Use a drill equipped with a feather (variable-speed) trigger to ensure proper torque management and mitigate the risk of overtorquing. Although impact guns are not expressly prohibited, their use is discouraged due to increased risk of overtorquing. If an impact gun is utilized, limit its use to short screws and maintain a continuous drive without pausing.
4. MEGANT connectors must be installed with the listed ASSY screws. Substitution of fasteners is not permitted.
5. If splitting of a wood member or fastener damage is observed prior to or during installation of the fasteners, the installation process must be stopped, and the Engineer of Record (EOR) must be contacted immediately to provide appropriate site instructions to rectify the issue.
6. Pilot holes may be used to facilitate fastener installation with greater precision. Pilot holes shall be 1 in. *[25 mm]* deep and their diameters shall not exceed the minor diameter, D_m, of the fastener.
7. For fasteners installed in a countersunk hole, a pilot hole using the Predrilling Jig is recommended to ensure proper installation of the fasteners.
8. Predrilling can help reduce the insertion torque of self-tapping fasteners. Predrilling is recommended for installation of fasteners into dry (<10% MC) Southern Yellow Pine (SYP) to reduce installation torque.
9. Screws should be fully driven in an uninterrupted process, from tip insertion to head seating. If necessary, a torque wrench may be used to complete installation immediately after initial insertion of the screw.
10. Refer to the project's approved shop drawings or details from the glulam manufacturer for the required connector position. For additional information on routing and housing requirements, refer to MTC beam hanger design guide.

Table 1 - MEGANT Hardware Package Installation Overview

MEGANT		Plate Qty.	Fasteners		Threaded Rods		Installation Time
			Type	Qty.			
Series	Model				Type	Qty.	Min.
60	**MEGANT 310 x 60**	2	**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	24	**M20 x 340** [13-3/8"] *Grade 8.8*	1	**17**
	MEGANT 430 x 60		**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	32	**M20 x 460** [18-1/4"] *Grade 8.8*	1	**21**
	MEGANT 550 x 60		**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	40	**M20 x 580** [22-7/8"] *Grade 8.8*	1	**24**
100	**MEGANT 310 x 100**	2	**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	34	**M16 x 340** [13-3/8"] *Grade 8.8*	2	**23**
	MEGANT 430 x 100		**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	46	**M16 x 460** [18-1/4"] *Grade 8.8*	2	**27**
	MEGANT 550 x 100		**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	58	**M16 x 580** [22-7/8"] *Grade 8.8*	2	**32**
150	**MEGANT 310 x 150**	2	**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	48	**M20 x 340** [13-3/8"] *Grade 8.8*	1	**31**
	MEGANT 430 x 150		**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	64	**M20 x 460** [18-1/4"] *Grade 8.8*	2	**37**
	MEGANT 550 x 150		**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	80	**M20 x 580** [22-7/8"] *Grade 8.8*	3	**44**
	MEGANT 730 x 150		**VG CSK 5/16" x 6-1/4"** *[8 x 160 mm]*	104	**M20 x 760** [30"] *Grade 8.8*	3	**53**

One Installer
With Pilot Holes



1. **Threaded Rod**
2. **Threaded Clamping Jaw**
3. **Hex Nut**
4. **Washer**
5. **Connector Plates**
6. **Clamping Jaw**
7. **VG CSK**

Notes:

1. The estimated installation time is based on a time study and includes steps for layout and positioning, drilling a 1 in. *[25 mm]* deep pilot hole for each fastener, structural screw installation for both plates, clamping jaw installation, and threaded rod installation.

MEGANT Installation Procedure

Tool Requirements

Tools - Use the Correct Bit

MTC Solutions fasteners should only be driven using either RW bits or appropriately sized star bits. This ensures good centering and positioning with optimal torque transmission. For the MEGANT, use an RW 40 bit for 5/16 in. *[8 mm]* CSK screws.

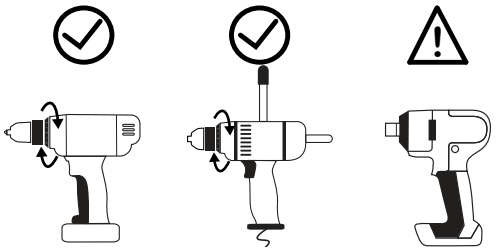
RW 40

Tools - Use the Correct Drill

Use low-RPM, high-torque drills equipped with a feather (variable speed) trigger to install fasteners. Avoid excessive acceleration and deceleration during the drive-in process. **Do not overtorque, spin out, or auger out fasteners**. Although impact guns are not expressly prohibited, their use is discouraged - particularly for beam hanger systems - due to an increased risk of overtorquing. Use the appropriate drill chuck size according to the fastener.

Table 2 - Recommended Torque, Drill Bits, and Power Drill

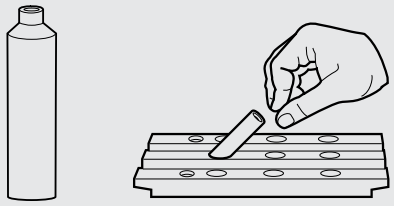
Nominal Fastener Diameter [D]		HSS Drill Bit Size		Power Drill Voltage	Allowable Insertion Torque	
in.	*[mm]*	in.	*[mm]*	V	lb. · ft.	*[N · m]*
5/16	*[8]*	3/16	*[4.8]*	20	12.3	*[16.67]*



Cordless Clutched Drill | **Double Handle Drill** | **Impact Drill**

Tools - Predrilling Jig 3/16 in. *[4.8 mm]*

The Predrilling Jig ensures precise alignment of the MEGANT 45° inclined fasteners. It guides the drill bit to create accurate pilot holes, and ensures proper fastener seating. The hole in the jig accommodates imperial and metric drill bit diameters. For the 5/16 in. *[8 mm]* inclined fasteners, pilot holes 3/16 in. *[4.8 mm]* in diameter and 1 in. *[25.4 mm]* long are recommended.

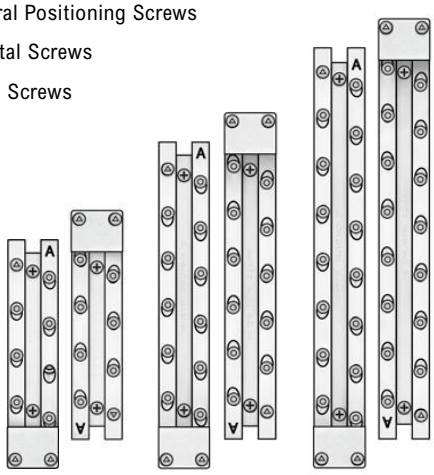


Predrilling Jig 3/16" *[4.8 mm]*

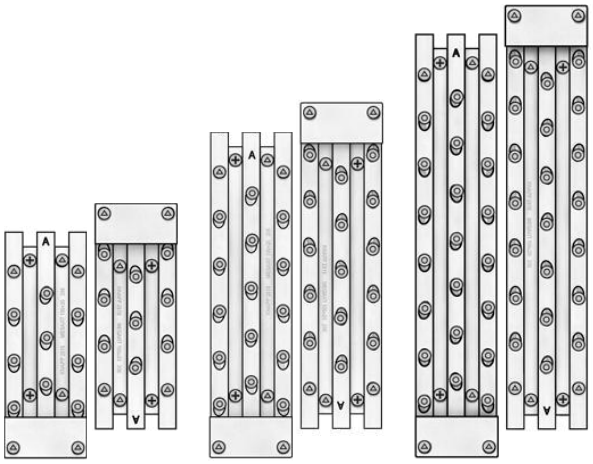
Fastener Layout

Fastener Orientation

- Structural Positioning Screws
- Horizontal Screws
- Inclined Screws



MEGANT 60 Series

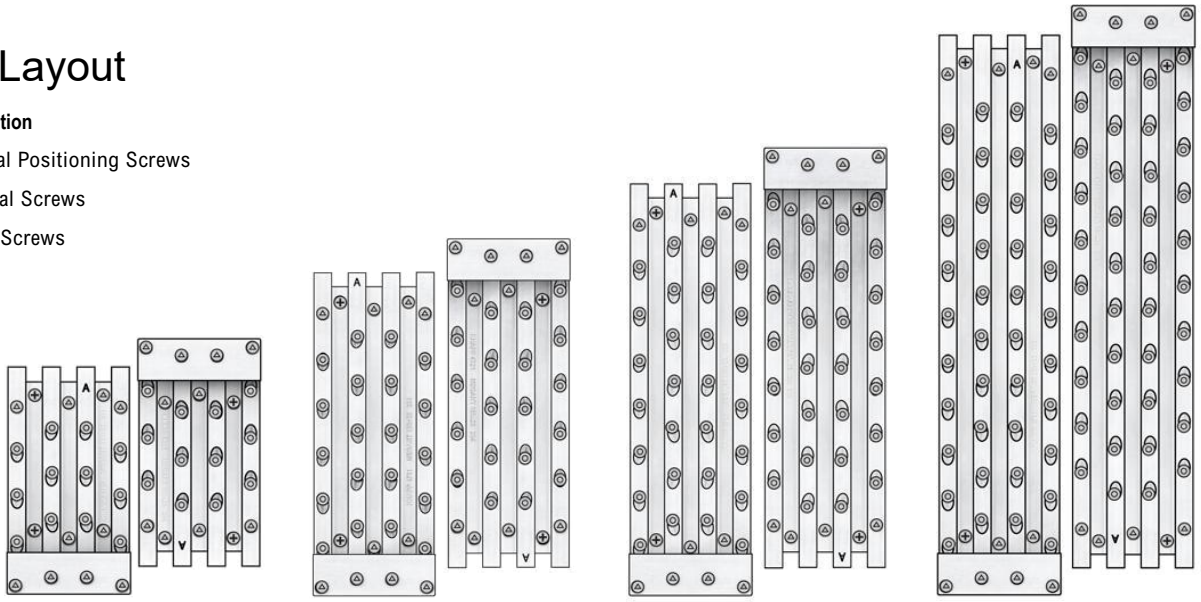


MEGANT 100 Series

Fastener Layout

Fastener Orientation

- Structural Positioning Screws
- Horizontal Screws
- Inclined Screws



MEGANT 150 Series

General Installation Steps

Estimated Installation Time

The estimated installation time for a single person to install a complete MEGANT product is shown in Table 3.

This process includes the following steps:

1. Layout (~5-10%)
2. Positioning (~5-15%)
3. Pilot Holes (~20-30%)
4. Screw Installation (~40-50%)
5. Clamping Jaw Installation (~15-25%)
6. Optional Measures (not included in the time installation % breakdown)

Table 3 - MEGANT Estimated Installation Times

Megant Model	Average Installation Time [min.]
310 x 60	17
430 x 60	21
550 x 60	24
310 x 100	23
430 x 100	27
550 x 100	32

Megant Model	Average Installation Time [min.]
310 x 150	31
430 x 150	37
550 x 150	44
730 x 150	53

The estimated time can be improved upon with efficient fabrication and site practices such as:

1. Drilling pilot holes for the structural positioning screws at the time of fabrication
2. Utilizing templates to drill pilot holes for structural screws
3. Optimizing beam positioning to reduce work fatigue

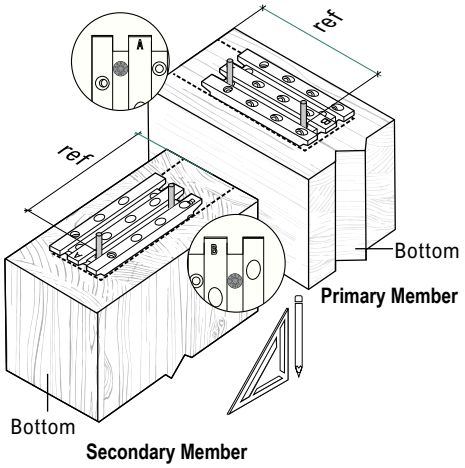
Step-by-Step Installation Guidelines

1.1 Layout - Reference Points

Begin by laying out the locations of the beam hanger on the primary and secondary members using a pencil and square. Position the MEGANT's plates for installation, ensuring the proper orientation is set on both the primary and secondary members. Each MEGANT plate is marked with an "A" on one end and a "B" on the opposite end.

- The "A" shall be oriented towards the top of the primary member
- The "B" shall be oriented towards the top of the secondary member

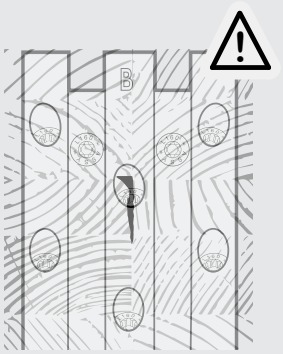
Note: When the inclined screws are installed, they will incline towards the end of the plate marked with an "A". It is critical to lay the pieces out in the correct orientation on both members, as the capacity of the hanger is dependent on the withdrawal of the fasteners in this orientation.



1.2 Layout - Split Lamination Considerations

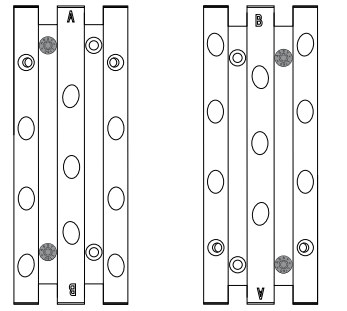
It is recommended that vertical joints in split lamination glulam beams be tight at the time of manufacturing. Gaps between adjacent plies may occur due to wood shrinkage. Gaps up to 1/8 in. *[3.2 mm]* are acceptable for typical MEGANT installation.

If split lamination gaps greater than 1/8 in. *[3.2 mm]* exist in the beam-end an alternative screw pattern will be required



2.1 Positioning - Structural Positioning Screw Installation

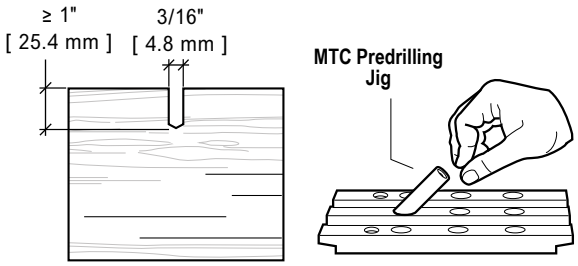
Positioning screws ensure accurate placement of the MEGANT connector. To facilitate accuracy and installation time, it is recommended to predrill the structural positioning screw locations during member fabrication. Note that structural screws cannot be reused if the connector requires adjustment. Install one structural positioning screw into the hole highlighted at the top of the plate. Check to ensure alignment is maintained, and then install the second structural positioning screw into the hole highlighted at the bottom of the plate.



Primary Member **Secondary Member**

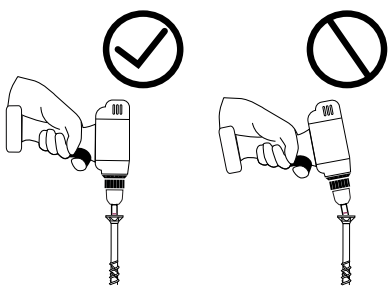
3.1 Pilot Holes - Recommendations

Pilot holes are optional; however, they allow for faster screw thread engagement, help reduce splitting risks, ensure a proper penetration path which reduces screw wandering, and reduce insertion torque. For the structural fasteners used with the MEGANT series, pilot holes 3/16 in. *[4.8 mm]* in diameter and 1 in. *[25.4 mm]* in length are recommended. The use of MTC Predrilling Jig for the inclined screws is recommended to ensure proper hole placement.



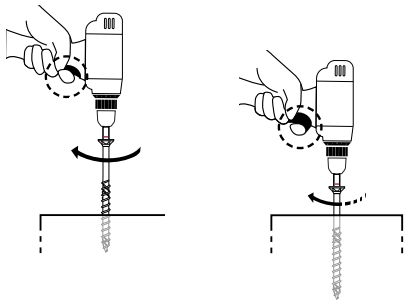
4.1 Screw Installation - Align Drill Bit Axis

Align the drill bit axis parallel to the fastener axis during installation to allow proper torque transmission and to avoid stripping.



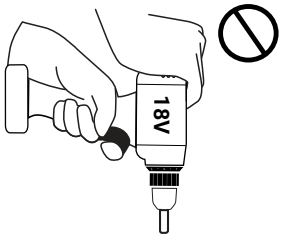
4.2 Screw Installation - Decrease RPM

To avoid overtorquing the screw, decrease the rotation speed about 1/2 in. *[13 mm]* away from the final installed position. This is crucial to prevent wood crushing due to overtorquing, which can impact beam hanger tolerances, potentially impeding overall connection assembly. This is especially important when using an impact drill.



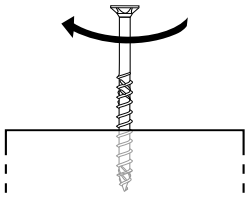
4.3 Screw Installation - Drill Pressure

Do not apply excessive pressure on the drill while driving the fastener to prevent fastener buckling or deviation during installation. Only apply the required force or use the recommended holder case to eliminate cam-out effects.



4.4 Screw Installation - One-Step Process

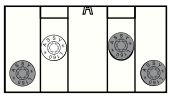
To avoid increased torque peaks caused by stopping and restarting the drive-in process, install the screw in one run until the head is lightly seated against the side member. If necessary, a torque wrench may be used to complete installation immediately after the screw has been driven.



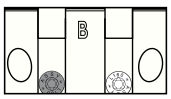
4.5 Screw Installation - Remaining Shear Screws

Install 5/16" x 6-1/4" *[8 mm x 160 mm]* VG CSK screws in the remaining horizontal holes, beginning adjacent to the structural positioning screws.

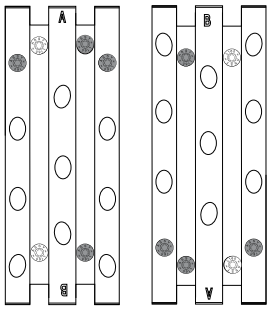
Note that some of the horizontal screws are angled inward by 15°.



Horizontal Screws for Primary Member

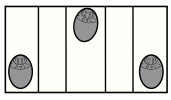


Horizontal Screws for Secondary Member

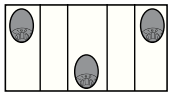


4.6 Screw Installation - Inclined Screws

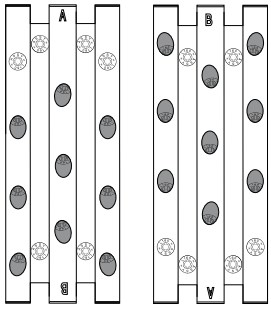
Install 5/16" x 6-1/4" *[8 mm x 160 mm]* VG CSK screws in all inclined holes after all perpendicular screws have been installed.



45° Screws for Primary Member



45° Screws for Secondary Member



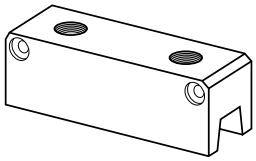
5.1 Clamping Jaws - General Information

Clamping jaws should be installed on each end of the connector plates with the countersunk holes facing away from the beam. Each MEGANT product kit comes with:

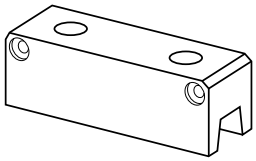
- One clamping jaw with threaded holes
- One clamping jaw with smooth/unthreaded holes

The threaded rods, without tightening, may be used to ensure both jaws are correctly positioned.

The unthreaded clamping jaw must remain accessible for tightening the connector plates together.

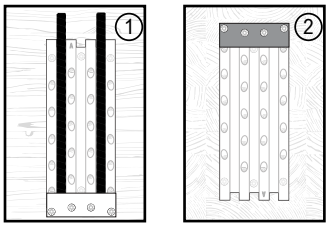


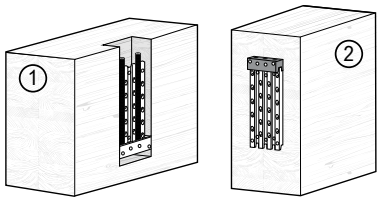
Threaded Clamping Jaw



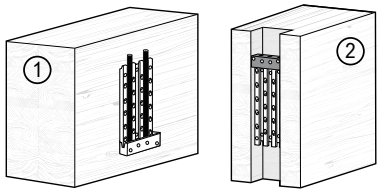
Unthreaded Clamping Jaw

Drop-down Installation

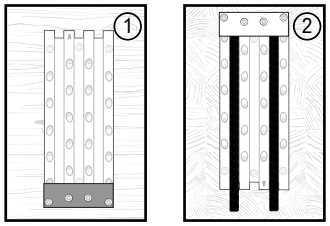


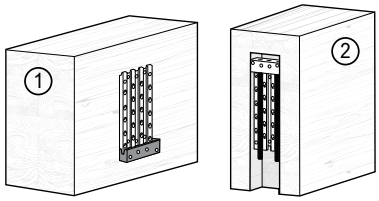


Primary Member Housing



Secondary Member Through Housing





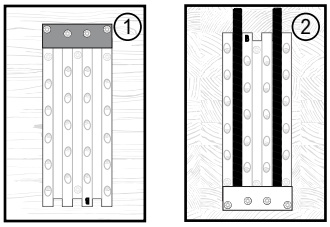
Secondary Member Bottom Housing

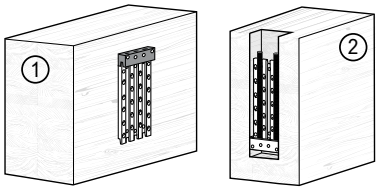
- Unthreaded Clamping Jaw
- ① Primary Member
- ② Secondary Member

Notes:

1. With through housing, the unthreaded jaw can be at either the top or bottom depending on access

Bottom-up Installation



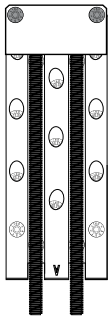


Secondary Member Top Housing

5.2 Clamping Jaws - Threaded Jaw Installation

Install the threaded clamping jaw on the housed member at the closed end with the grooved side seated firmly against the tongue of the connector plate. Insert the threaded rod(s) to help position the jaw on the connector plate.

Drill 3/16 in. x 1 in. *[4.8 mm x 25.4 mm]* pilot holes at the jaw screw locations, and then install VG CSK screws to secure the clamping jaw. Remove the threaded rod(s) and retain them for Step 5.3.



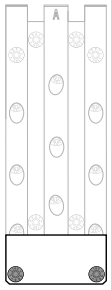
Secondary Member
Bottom Housing
Example

Clamping Jaw Screws, Secondary Member

5.3 Clamping Jaws - Unthreaded Jaw Installation

Install the unthreaded clamping jaw on the unhoused member at the same plate label (i.e., both jaws will be installed on either "A" end or "B" end). Insert the threaded rod(s) to help position the jaw on the connector plate.

Drill 3/16 in. x 1 in. *[4.8 mm x 25.4 mm]* pilot holes at the jaw screw locations, and then install VG CSK screws to secure the clamping jaw. Remove the threaded rod(s) and retain them for Step 5.4.

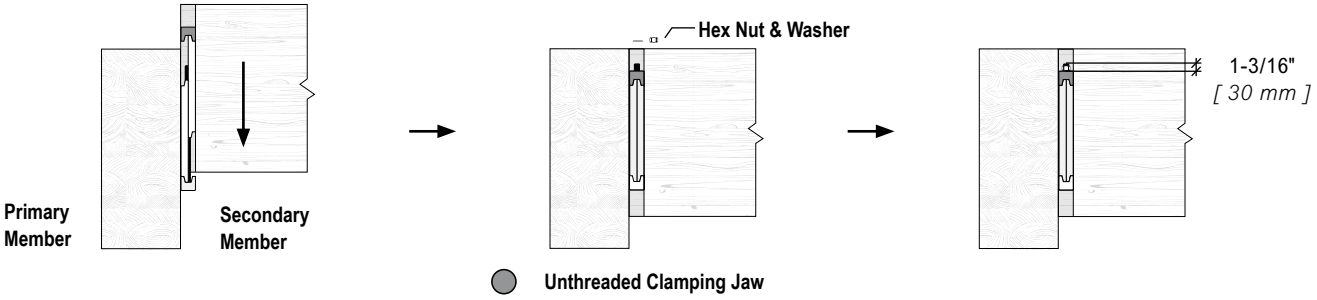


Secondary Member
Bottom Housing
Example

Clamping Jaw Screws, Primary Member

5.4 Clamping Jaws - Connecting the MEGANT Plates

Slide the two connector plates together. While the beam is unloaded, insert the rods through the unthreaded clamping jaw and until they are flush with the surface of the jaw. At this point, the threaded rod will be 1-3/16 in. *[30 mm]* proud of the unthreaded jaw. Each threaded rod is equipped with a hexagonal recess at one end. The end without this recess must be inserted into the threaded clamping jaw, allowing the accessible end to be turned using a hex key. Install the washer and nut on each rod. Tighten the nut to the recommended installation torque of 29.5 lb.·ft. *[40.0 N · m]*.



6.1 Optional Measures - Wood Plug

Where connectors are housed in the secondary beam, it is recommended to plug in the routed void below the connector for aesthetics and fire protection. A wood plug may be used, and installation instructions shall be provided by the Engineer of Record.