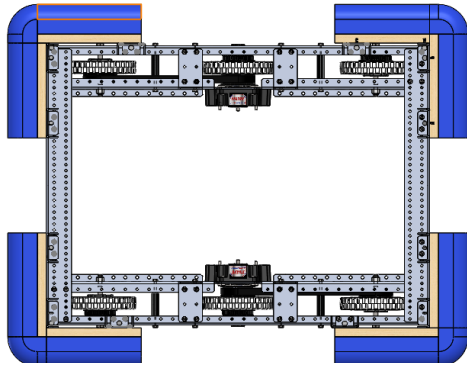


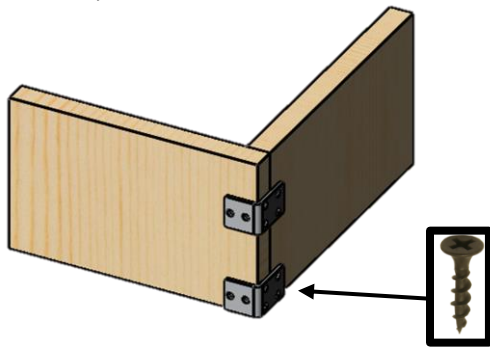
# AM14U3 Bumper Attachment Suggested Method

**NOTE:** Additional tools and materials are needed to complete these

**Step 1:** Plan out which edges of the drive base frame perimeter will be covered with bumpers. Ensure this design complies with all bumper rules. Brackets should be attached to the frame in the corners, at the ends of bumper segments, and behind any long bumper lengths.

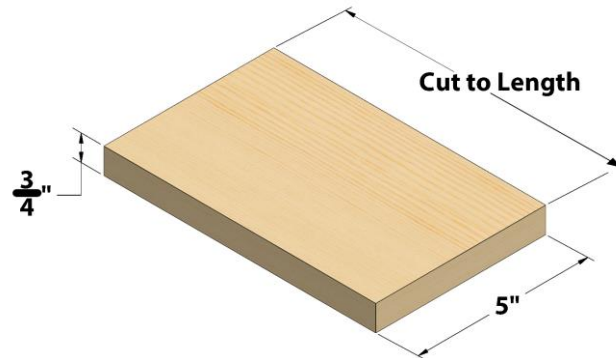


**Step 3:** Bumpers can either be made in straight sections or in sections that wrap around corners.

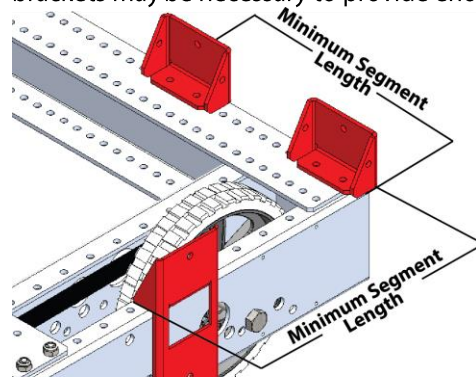


**Tip:** To ensure that bumpers designed to wrap around corners are rigid, it is recommended that the corner edge be strengthened with angled corner connectors such as am-3066 (not included).

**Step 2:** Cut  $\frac{3}{4}$ " wood into bumper planks that are 5" tall and to desired lengths ensuring it meets the minimum length according to the current rule manual. For corner sections that overlap, a longer plank may be needed to comply with bumper rules. For the corner bumper configuration, 8 planks are needed for each red set and blue set of bumpers.

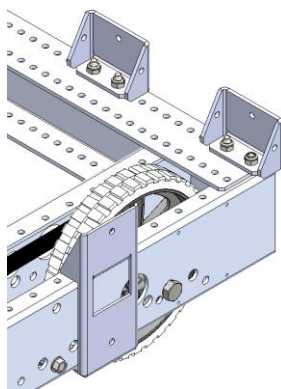


**Step 4:** Attach brackets as shown to the chassis. Brackets can be oriented to support both the corners of the chassis and the edges of the bumper planks. For longer bumper segments, additional brackets may be necessary to provide enough support.

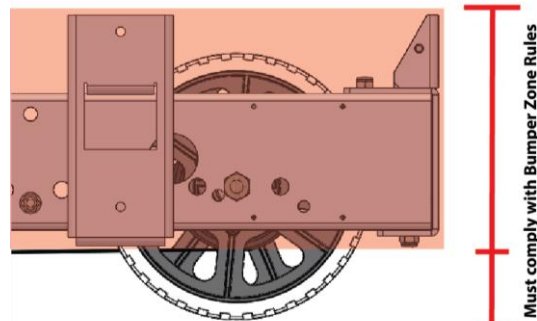


**NOTE:** Screws holding the chassis corner will need to be removed to install brackets on the corner.

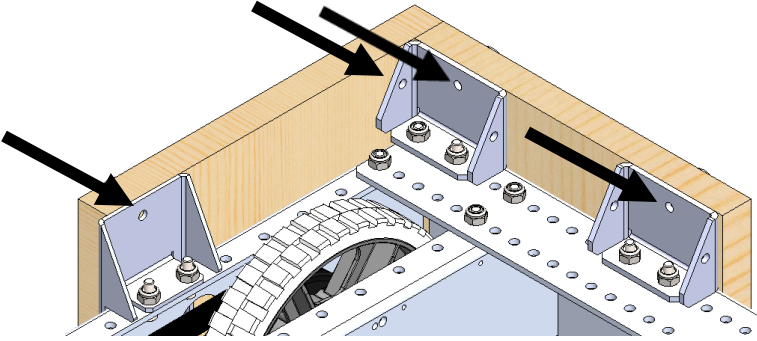
**Step 5:** Attach each bracket to the chassis frame using #10-32 x 0.625" SHCS (am-1007) and Nylock Nuts (am-1042). Each bracket should have two screws each securing the bracket to the top of each rail.



**Step 6:** Place the wood on the edge of the frame at the desired bumper height. Ensure bumper height complies with all bumper rules. For 2018, when using 6" wheels the top edge of the wood planks can be aligned with the top edge of the side and front/corner brackets.

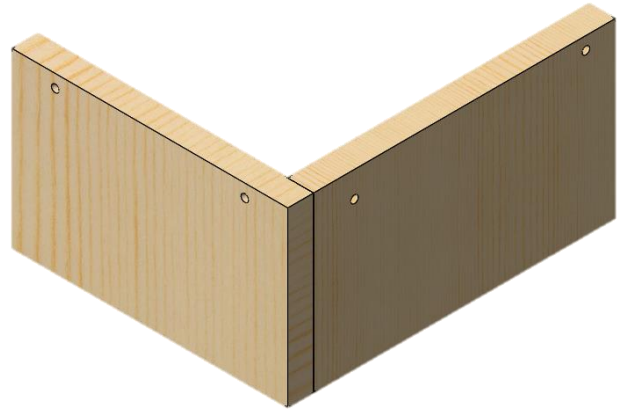


**Step 7:** Securely hold the planks and ensure the edges are flush with the side of the chassis. Mark the location where your holes should be. Then use a 13/64" drill bit to drill through the wood plank.

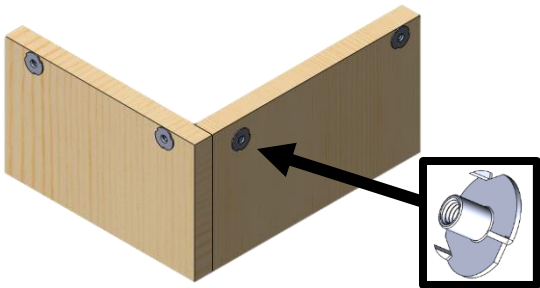


**Tip:** After drilling, it is helpful to label which bumper plank goes to each location on the chassis in order to easily re-attach later.

**Step 8:** Remove the planks from the chassis and drill out the 13/64" holes with a 7/32" drill bit. This will allow the tee nuts (am-1143) to fit inside the hole.



**Step 9:** Pound in the tee nuts into the outside faces of the bumper plank using a hammer. The face of the tee nut should be approximately flat with the wood.



**Step 10:** Cut noodles to a length that matches the wood planks. Cut fabric large enough to wrap around noodles and wood with enough extra for stapling. If adding team numbers onto fabric it may be useful to do this before adding to bumper segments.

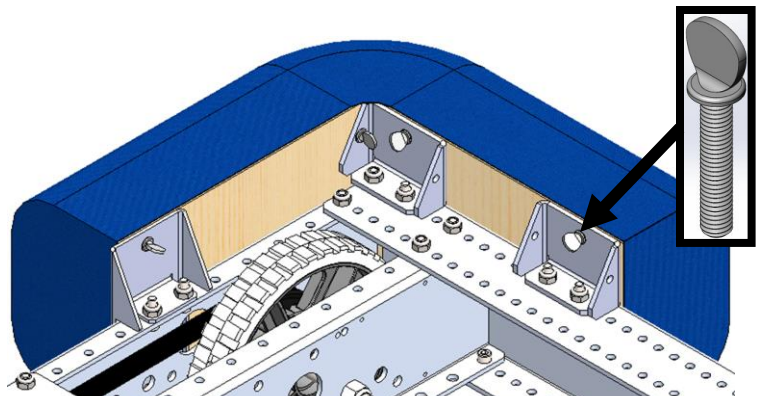


**Step 11:** Wrap fabric tightly around noodles. No noodles should be showing after wrapping. Staple fabric evenly along edge of bumper and trim any extra fabric. You will need to access the holes and hardware to attach bumpers frequently.



Repeat steps 4-11 for all bumper sets.

**Step 12:** Attach bumpers in the locations marked on the bumper planks with the thumb screws (am-1390) for easy removal.



**Tip:** Alternatively you can use #10-32 x 1.00" SHCS (am-1056) to attach your bumpers to the robot frame.