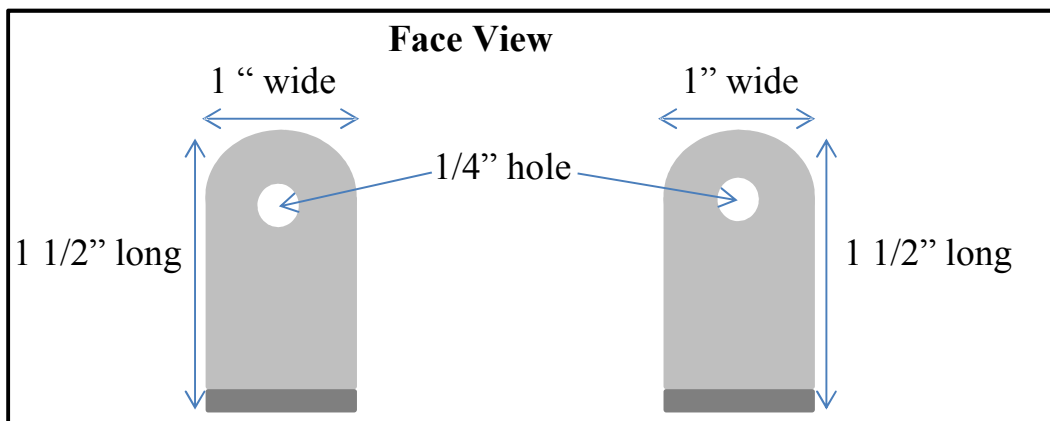




2010 43QGP Allegro Bus

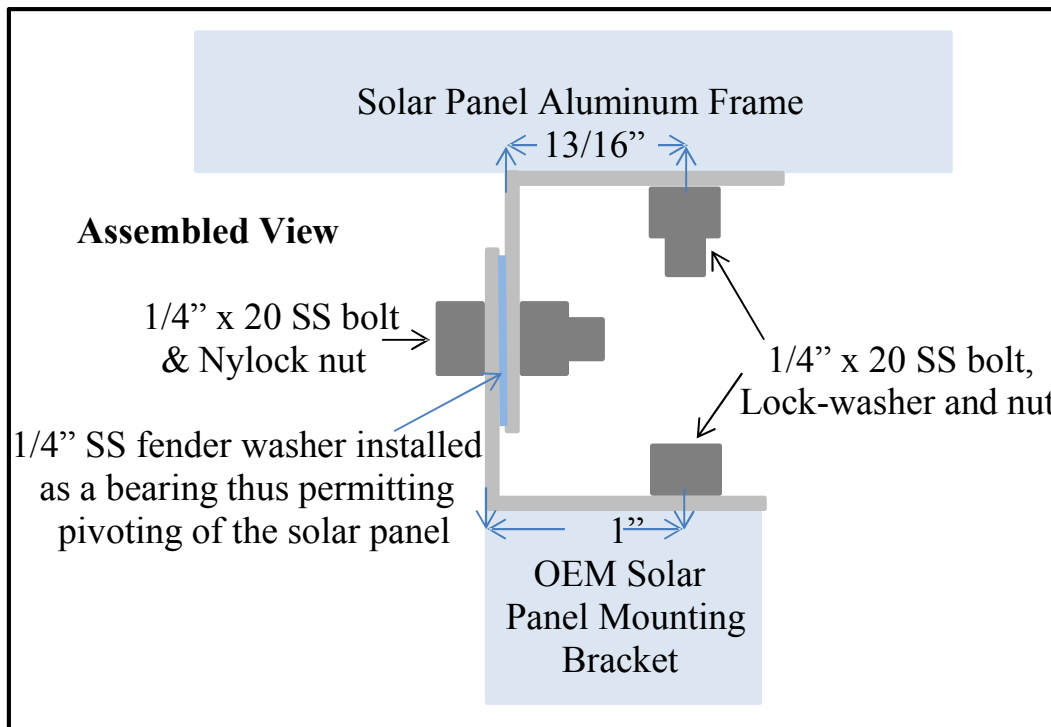
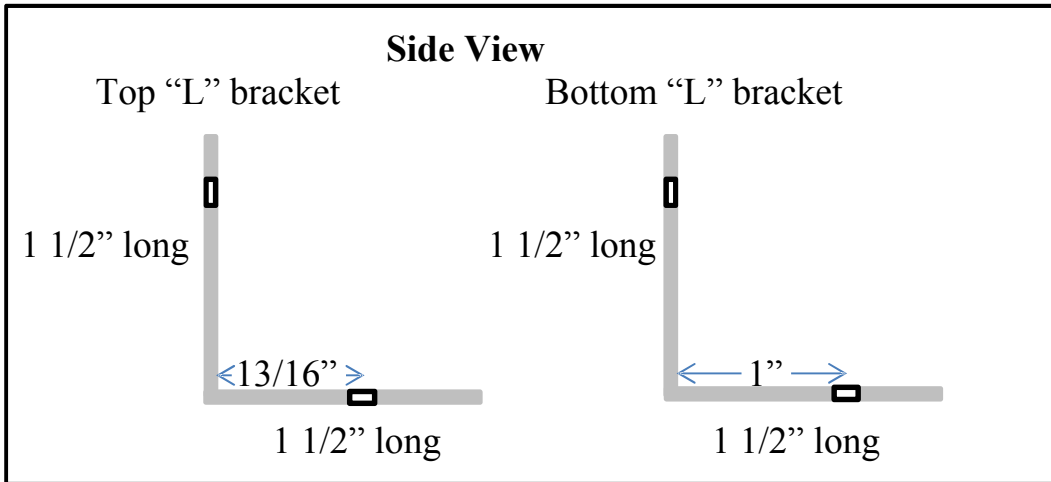
9/16/2013

NINETY-SECOND coach modification, **SOLAR PANEL PIVOT BRACKETS**. Two plus years after the installation of additional solar panels I've found cleaning the fiberglass roof under the solar panels is an impossible task with ONLY a one inch clearance between the panel and roof. After thinking about various methods to achieve cleaning the roof I've decided to design, manufacture and install brackets which are capable of pivoting on a single bolt. With the new brackets installed between the two OEM solar mounting brackets, removal of two pivot bolts on one side of any panel allows that panel to be tilted upward as much as 90 °. 30 inch long supports were cut from 1/2" EMT (Electrical Metal Tubing) these supports can be installed between the two halves of the new pivot bracket after removing the pivot bolt. The installation of the new pivot brackets increased the distance between the panel and roof from one inch to three inches, more than enough space to make cleaning the fiberglass roof little or no problem. A 36" piece of 1/8" thick by 1 1/2" Aluminum angle purchased from Lowe's was used to manufacture 24 of the 1" wide by 1 1/2" long "L" shaped brackets. A 1/4" hole was drilled on one end of the "L", centered 1/2" from one end and 1/2" from both sides. Both corners on the same end of the 24 brackets were rounded as seen in the below pictorial.



In order to mount the top half of the pivot bracket to the OEM solar panel bracket a 1/4" hole was drilled centered and 13/16" from the brackets outside corner. To mount the lower half of the pivot bracket to the OEM roof

bracket a 1/4" hole was drilled centered 1" from the brackets outside corner. Both 1/4" holes can be seen in the **assembled view** below.

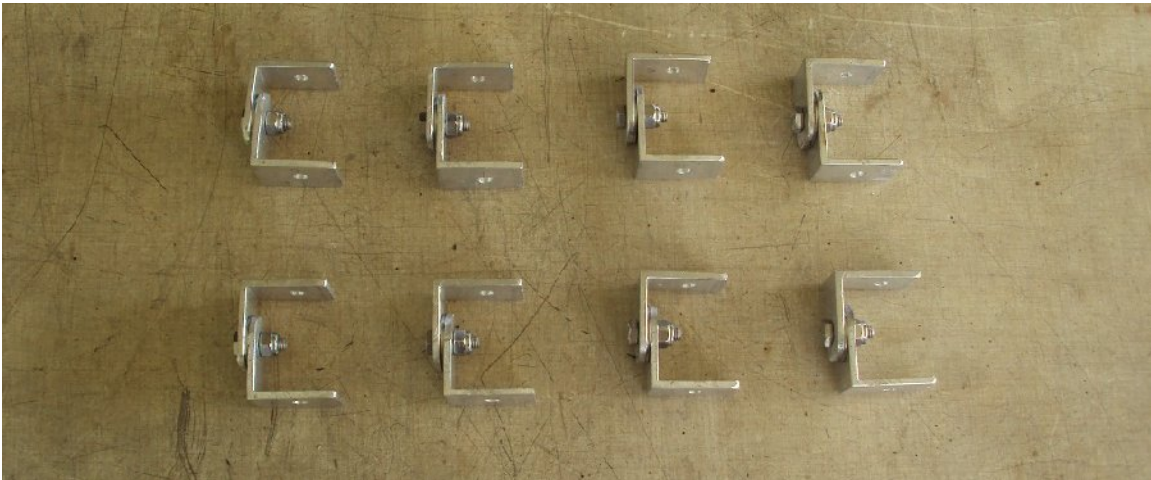


During assembly of the bracket the pivot Nylock nut was first securely tighten then the Nylock nut was loosened an 1/8 of a turn to allow the pivot action to occur.

Our solar system consists of three solar panels with four OEM mounts on each panel, requiring construction and installation of 12 of the above pivoting brackets for the three solar panels.

The cost for each assembled aluminum bracket and its stainless steel hardware was about \$ 2.20, making the total cost of this solar panel modification \$ 26.40.

Now when I desire to clean under the solar panels, I can remove two bolts from one side of any solar panel, lift the panel, install two temporary supports per panel to keep the panel tilted up to as much as 90 °.



The assembled Pivot Brackets were constructed of 1/8 inch thick aluminum 1 1/2" angle and 1/4 inch stainless steel bolts, fender washers and Nylock nuts resulting in a pivot bracket 2 inches tall.



Black nylon zip ties were installed around the pivot brackets where the PVC electrical tubing passed by them to prevent the tubing from shifting around making marks on the roof and also making noise.