

Back Country Times

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Schedule of Events

- * **August 9th** ~ General Meeting @ 7:00pm, Pizza Ranch by Sam's Club
- * **August 23rd** ~ Board Meeting @ 7:00pm, Pizza Ranch by Sam's Club
- * **September 1st-5th** ~ 2011 Dakota Territory Challenge
- * **September 16-17th** ~ Wild West 100 Baja Race - Columbus, MT

Meeting of the Minds

Some tidbits from last meeting:

1. Well it's getting close to Challenge time. Lots of things to get ready for.
2. New meeting location is going to be at Pizza Ranch behind Sam's Club for the foreseeable future. Room will be ready by 6:30pm to eat before the meeting.
3. Again this is a double issue. I'm pretty much doing these letters myself so unless club member are willing to pitch in some articles then deal with it. ☺
4. We are starting to look into some grass roots Baja racing and it looks like initially there is quite a bit of interest. We will discussing rules and classes in the new few weeks and work on finding some land for such events.



Trail Runs:

Well we have had a few trails run in the past couple of months. First was Brad Rigger's Run on his private land. Great even as always. It didn't rain quite like normal but there was plenty of water in the ground that made everything crazy slick. Nearly everyone made it out to the top except for one unfortunate vehicle that had its steering box separate from the vehicle. So we got the truck turned around and somewhere around 12-1am we got the rig mostly back to the trail head or close enough that repairs could be done in the morning.



The second run was at Farmingdale run mid-July. Despite the predicated hot weather and slight breeze kept the temperatures to a somewhat comfortable level. Around 2:30 the breeze stopped and the temps seemed to rise another 10 degree, by this time everyone had had enough and we headed back towards town.





The third run was at Brad William's place, or the Burnout in commemoration of the wildfire that burned through that area 3-4 years ago. After a quick morning tree clean up the wheeling began.



Tech Ramblings:

This month we will go back to fasteners, bolts, and look at some of the technical aspects that make up a bolt and how to select the proper length. This is probably pretty basic to most of you but it never hurts to go back and review the basics and maybe remember something you had forgotten or learn something new. Or maybe it will help you in jeopardy or trivia.

Starting with the bolt we will look at the parts of a bolt. Reverting to Figure 1 we can see there are several different parts to the simple bolt. As indicated there is a bolt head, bearing surface, point, shank, length, grip length, and thread length.

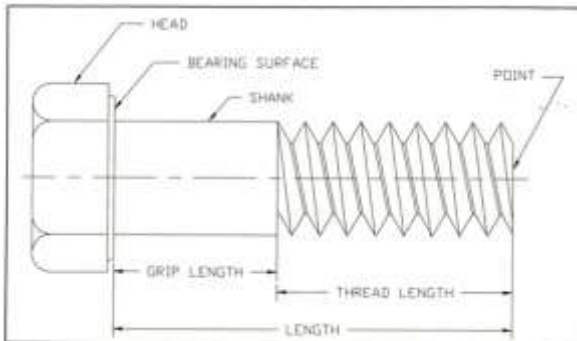


Figure 1: Parts of a bolt

Bolt Head - the enlarged shape that is formed on one end of the bolt to provide a bearing surface and a method of turning or holding the bolt
Bearing Surface - the supports or locating surface of a fastener with respect to the part that it fastens. A bolt is loaded through its bearing surface.
Point - the extreme end of the threaded portion of the bolt.
Shank - the cylindrical part of a bolt that extends from the underside of the head to the point
Length - the distance from the bearing surface of the head and the extreme point, measured along the axis of the bolt.
Grip Length - length of the unthreaded portion of the bolt shank.
Thread length - length of the threaded portion on the bolt.

There are also parts to a bolt's thread. These are shown in Figure 2 and consist of the major diameter, pitch diameter, minor diameter, root, crest, flank, angle, and pitch.

Major Diameter - largest diameter of a bolt thread

Pitch Diameter - for practical purposes it's halfway between the major and minor diameters

Minor Diameter - smallest diameter of the bolt thread

Thread Root - the bottom or valley of the threads

Thread Crest - top or the peak of the thread

Thread Flank - the surface of the thread and bears the load

Thread Angle - the angle between the adjacent flanks of a bolt, measured on the axial plane.

Pitch - the linear distance from the point of one thread to the next as measured along the axis of the thread. So a 24 TPI is equal to 24 threads per inch

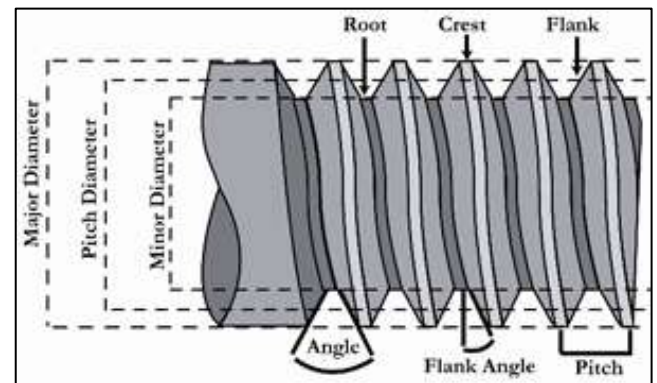


Figure 2: Thread parts

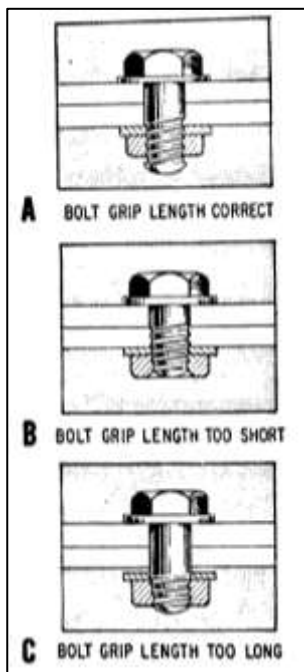


Figure 3: Correct Bolt Lengths

The next step in using some of this information to be helpful would be in getting the correct grip length. Now obviously if the grip length is too long the nut will not be able to fully clamp the two pieces of material as shown in Figure 3, C. Now it may not be obvious why B in Figure 3 would be an issue but there are 2 aspects that could cause issues. The first is there is not sufficient threads through the nut. Rule of thumb when we built our SAE cars is the fastener must have 2 threads showing beyond the end of the nut. This ensures the nut and bolt threads are fully engaged and will not vibrate loose or pull out. The second issue with this setup is that the threaded portion of the fastener is now loaded in shear. Since threads are basically large machined or formed cracks created into the bolt surface we do not want to place them in shear. When the bolt fails it will fail at the minor diameter of the thread and usually at a lower load than the shank would have. If at all possible on critical bolted parts we want the grip length to extend past the middle of the two clamped pieces as shown in A of Figure 3. If the grip length is too long a washer can be used under the nut, typically not more than 3 washers are allowed in aerospace applications.

So nothing groundbreaking but hopefully it's something interesting. Thanks for reading