

Family Roll Cage

Jon Darrow

As many of you may know GLLC members Jon and Kelly Darrow had an addition to their family last April when their son Jack Darrow was born. Our future wheeler was too young to wheel this past summer, but he would be old enough this coming Summer to ride along, . The FJ40 factory cage only has two short hoops in the rear of the vehicle. These hoops would not offer Jack enough protection from the extreme wheeling that was planned for this season This past Fall Jon's Cruiser was brought into the garage for a make over, for the 2004 season. A cage with more protection in the rear was needed. As it is said by those who have NOT kept the rubber side down "It is not if you have rolled over, it is a question of when".

Work on the new family roll cage got underway with the help of master fabricator and GLLC member Ron Maximoff at RPM. We began with the fabricating and the design of the cage.. DOM (Drawn Over Mandrel) tubing was the material of choice. DOM tubing was chosen over HREW (Hot Rolled Electric Welded) tubing for its increased strength.

In order to get the DOM it has to be specified. DOM costs more but you may only get one chance to test a roll cage! **Never use Black Pipe. In my opinion it's not worth the risk.** This is the pipe that is available at most home improvement stores. It's material make up is not suited for roll cages.

2 inch diameter DOM tubing was chosen for the bulk of the cage because the original roll bar is close to 2 inches in diameter. This keeps the look similar to the stock configuration. Smaller diameter tubing was used for the seat mounts and handles.

The cage was built with:

4 sticks of 2-inch 0.120 wall DOM steel tubing, and 2 sticks of 1 5/8 inch 0.120 DOM tubing.

The major design criteria was more headroom for the driver, integrated front seat mounts and protection in the rear for the young cruisers head. Keeping this criteria in mind the design phase was started. The design of a family cage is a difficult task. The challenge is to make it functional, yet pleasing to the eye. With the seasoned experience of RPM fabricating, a totally custom and unique roll cage design was sketched down on paper. All measurements were laid out using Ron's CAD (calk aided design) system, and appropriate marks were made on the tubing to determine where to start the bends. The bender that was used was a manual Pro Tools mandrel bender that was upgraded by Ron to a hydraulic bender. Ron's bender performed flawlessly. It bent the 2 inch 0.120 wall tubing with no effort, and produced exact and repeatable bends.

The front hoop was bent first, then the drivers hoop. A dash bar was added to give additional strength. To simulate a Halo bar, Jon and Ron chose to flare the front outside bars into the second hoop. This involved major "fish mouthing" or cutting the tube to and exact fit for a weld joint. "Fish Mouthing" gives a very fluid joint appearance. The tubes look like they seamlessly flow from one tube to the other. After the front hoop and the top bars were tacked in place the rear section was fabricated.

To maintain the flow of the design the rear upper bars were also flared in similar fashion to the front bars. To add strength in the way of triangulation and functionality, 1-inch DOM handles were added at 6 points along the top of the cage. The cage was welded to ¼ inch steel plate at the body interface. A matching plate was attached to the bottom side of the body, which in turn was attached to the frame. This tied the cage to the frame for a super strong assembly. To finish things off Jon chose to paint the cage with Rustoleum's black hammer tone finish paint. Now Jack and mom and dad can safely wheel even the most challenging trails this Summer , with peace of mind.



Left
Side view of roll cage

Right
DOM 1 inch
Grab handles

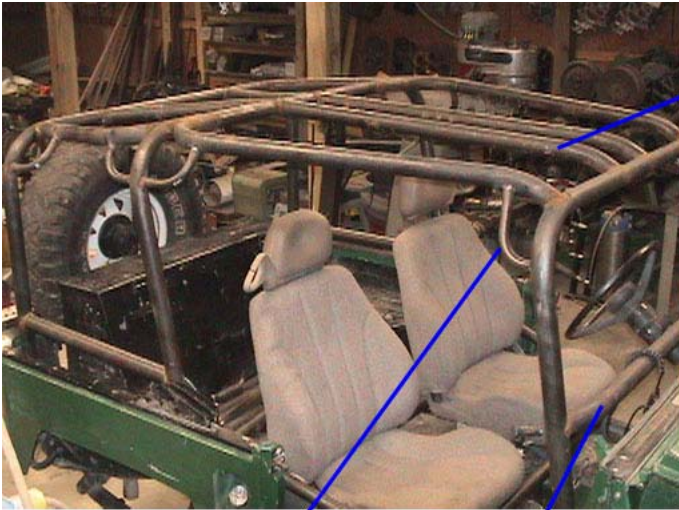




Fish Mouth Weld



Seat Mounts



Arched tubing
for extra head
room

1 inch DOM Handles

Dash Bar for extra strength