

shade tree engineering™

Roofrack for a mean ol' Toyota Land Cruiser FJ62

Description:

A basic, sturdy roofrack suited to overland expedition work, and made from cheap and readily available parts. It's easy to build and repair.

A major feature is the 'gutter sled' which distributes the weight – and therefore the load – of the rack across the whole length of the rain gutters rather than concentrating them at 8 small points.

Parts List

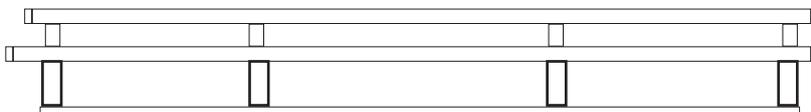
Mild Steel square tubing, 40x25mm; 1 - 1.6mm wall strength:
2x 210 cm
2x 205 cm
4x 135 cm
9x 10 cm
Mild Steel flat bar, 40x2mm:
2x 210 cm
Mild Steel rod, \varnothing 8mm:
2x 200 cm
Mounting brackets/crossmembers:
4 prefab roof brackets; Thule bars or equivalent
(we used roof tent mounting brackets by Eezi-Awn)

top view of the outside main frame, bottom layer:



The bottom of the outside main frame is made of the 40x20mm square tubing, welded together securely. The flat bar is across the middle in order to provide additional strength. It is important to have good strong welds, as roof racks undergo a lot of strain and abuse. If you can't produce good strong joins, get someone else who can get the results to do it. The entire frame is then welded to the crossmembers (ours happen to be 135 cm long, hence the rack's width). If you prefer to be able to dismantle the rack, consider bolting it together. Be warned however that this isn't nearly as strong, and long periods of driving on bad roads will shake the whole assembly loose. Basically, if you're overlanding, weld the thing. End of lecture.

side view of whole assembly (fairly schematic)



The upper 'layer' of the outer main frame does not need to be shorter, but the fact that it is allows a piece of aluminium diamond plate to be affixed across the front, making it a bit more 'aerodynamic' (an aerodynamic cruiser: yeah right...). Conveniently enough, a piece of diamond plate attached to the front also makes a good spot for mounting a zillion spotlights, which looks cool and lets you see at night.

The crossmembers should be welded on directly underneath the supports for the upper 'layer,' and these should be ideally positioned directly above the roof support pillars of the vehicle. Since the FJ62's rain gutter is actually slightly curved, the 'gutter sled' will not actually be straight. It's quite a fiddle making the legs of the crossmembers the right length, but once they're in place the gutter sled can be welded in place.

Legs: know how to use them...

The width of the rack as described above is narrower than the distance between the rain gutters on either side of the car. There are two solutions:

Option one: Since we're using prefab crossmembers and supports, simply position the supports so that they fit. Easy as pie.

Option two: make the rack precisely as wide as the gap between the rain gutters.

Surprise: you're going to have to fit and fiddle with the supports until they make sense one way or the other.

Flooring it:

Your new roofrack needs a 'floor'.

There are two basic ways to approach the problem: wood or metal.

In the case of wood, do not simply bolt down a piece of plywood and have done. The large bit of wood will develop an 'airfoil' effect, and while your Cruiser won't fly, it'll feel like it wants to. This is no good at all.

A much better idea is planks or slats, either about 15mm thick, and riveted in place with broad head poprivets.

Leaving gaps in between the slats will allow a multitude of places to secure rope, tie-downs and so forth.

In the case of metal: expanded metal is a good solution, as long as it's reasonably strong (1.5mm thick at least).

You'll have a basic infinity of places to tie things down, and it will be very strong. The downside to expanded metal

is that it's quite heavy, and will be very noisy as the vibrations of the vehicle, the road and the rest of the rack

make the expanded metal 'thrum' and rattle.

Either type of flooring is good; it's your call.

A question of Rust: Rust will devour your Cruiser in the end, but you can make your roofrack last by doing a couple of basic things:

1. Don't build it in a damp atmosphere if you can avoid it (Windhoek's nice and dry, and you can use my yard if you ask nicely and bribe me with beer);

2. Hot-dip Galvanise it;

3. Powdercoat it, or at least give it a couple of good coats of Hammerite or other suitably meaty paint;

4. Keep your roofrack sealed up in a climate controlled environment, preferably in a room or container pumped full of argon or other inert gas, or in a hard vacuum.

OK the last suggestion will severely limit your roofrack's utility, but there it is.

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disclaimer: don't blame me if it doesn't work for you. it works for me.