Dave's Roller Drawers

&

tilting Engel Slide

Design by

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In response to Guy's request on the forum, and the others who have expressed interest on 4wd trips I decided to put together a bit of a how-to on making a set of full depth roller slide drawers for about $400.

The first thing I will say is that I have provided some measurements here that relate to my drawers. I have not provided others such as overall width and depth as that will vary from vehicle to vehicle. Any measurements provided are done as they are measurements you will have to think carefully about, either for clearance reasons, or to allow for carpet or for some other reason.

Now as I drew the attached drawings in the recliner with a scotch & dry, and didn't feel inclined to measure my drawers I worked from memory with the depth measurements. To confirm I have now measured them and the depths are as follows.

LEFT: 140mm overall depth (inc base) in 150mm deep box
RIGHT: 240mm overall depth (inc base) in 250mm deep box

The measurements on all other bearings, support bars and such are approximate but very close. I made my drawers non removable, (well not without a screw driver, and I carpeted over the screws for the stopper blocks,) from the box and I wasn't unscrewing the stopper blocks to remove them to measure stuff – sorry.

The bearings are as common as, 10mm dia inside for 10mm bolt, 30mm o/s dia and 8 or 9mm wide. They were about $1.67 inc GST from a bearing place and to do a two drawer unit you will need 28.

The two top bearings at the open end take the tilting load of the drawer. The bearings are mounted on steel straps to take the load rather than the ply, and the straps stop at the bottom of the sides to sit on the base so all load from the drawers is transferred to the load bed by the sides and the steel.

The steel straps on mine are routed into the ply sides and then glued and held in by the bearing bolts.

IT IS EXTREMELY IMPORTANT THAT EVERYTHING ENDS UP SQUARE. YOU ARE WORKING WITH FAIRLY SMALL TOLERANCES.

I worked out the main measurements for the top and base and the heights of the sides, back and dividers and had most of the initial cutting done by the timber supplier from three sheets of ply. They have a table saw and you get neat straight, square cuts. All further cutting was done by a compound mitre saw (Ryobi $280 – nothing flash but it's square) or carefully using a circular saw with the guide on.

The router was used for all the strapping rebates. All the joins on the box and the drawers were butt joined and screwed and glued.

THE BOX WAS ASSEMBLED USING SCREWS ONLY UNTIL I WAS HAPPY WITH TOLERANCES AND BEARING POSITIONS. Then it was disassembled

and the base and sides were screwed and glued, and the top just screwed back on. THE TOPS WEREN'T SCREWED AND GLUED UNTIL VERY LAST (after stopper blocks and anti rattle blocks were fixed in).

Then the whole lot was carpeted, checker plate drawer faces screwed on, locks installed and tie downs cut into carpet (carefully) and routed into ply. The last thing was the alloy angle around the corners.

The alloy angle came from a wholesaler who sold an 8 m length for about the same price as 2 1.5 metre lengths from Bunnings. The bolts for the bearings were all 10mm dia and came from a bolt place. Workout your lengths exactly, you don't have room for extra thread outside nuts. When you are sure it's right Loctite the nuts on prior to final assembly. There is only room for washers between the bearing and the wall. You don't need them between the bearing and bolt head/nut if you use loctite.

My drawers were not sealed and have been drowned in Toolangi upto a third of their depth. I emptied them and pulled them out to dry in the garage for a couple of days and they are as good as the day that I built them.

See notes about glue for carpet and carpet type in the drawings.

I use the space either side for storage and didn't close it in. It's up to you to fix that up if you choose to. I keep a 20litre gerry of water permanently next to the fridge. You can't get it out without taking the fridge out. To get around this I have a one way non return valve with a hose fitting in the lid, an air bleed valve in the top and where the tap would be which is now on the bottom there is a right angle fitting which brings the clear tube out from the bottom. (The gerry sits up on a 40mm high platform with cutout for exit hose.) The hose attaches up high on the roof rack support bars with a magnet. Open the bleed valve and lower the hose – running water. When it's empy plug on the fill hose and fill either from tap or 12v pump and river water.

If you make up a set please let me know. Pictures appreciated.

If you find any errors or make any improvements please let me know also.

Hope you enjoy it!

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Pictures

Drawers open nearly full depth.
1.5m deep & open 1.3m

Closed – checker plate is wider than drawer front to cover slides

Back of drawers easily accessible at full opening depth

Fridge untilted over low drawer

Tie down and alum corner stripping

Window sash lock and hole in slide rail

Top and bottom bearing

Two top bearings at open end

Fridge Slide tilt down and lock

Full tilt with lid held open by clip to window rod

Hinge frame (black) fixed to Engel slide – catch in background

Hinge frame from underneath – note bolted up from inside drawer, using countersunk cap screws to stop drawer contents grabbing bolt heads.

Catch – sprung catch for gate/trailer door to hold fridge slide down and prevent unwanted tilt or bouncing. The times it's been left undone it hasn't mattered so maybe it's not needed.

Catch open – can tilt

Catch closed – tilt locked down

Fridge out with tilt lock still engaged

Fridge out with tilt lock still engaged

Clearance either side of fridge slide – not much. Sliders run inside gal angle so gal angle just has to clear box side to allow tilt action.

WHY DON'T ENGEL MAKE THE CUTOUT WIDE ENOUGH FOR THE RIGHT ANGLE PLUGS BEFORE THEY GALVANISE IT?
Now I don't want to cut it out to the right width….

Nylon blocks act as bumpers on tailgate to clear slide lock mechanism in down position.
Drilled & tapped fridge frame to bolt on.

RHS welded on flat to reinforce & prevent flat bending instead of hinging. You could make the whole hinge frame out of RHS. I would next time.

Water tank and other accessories

Water tank and extinguisher. Black bar work supports roof rack.

Bleed valve in top of tank.

Fits – just…

Other pics of rig…

Yep. That's it.

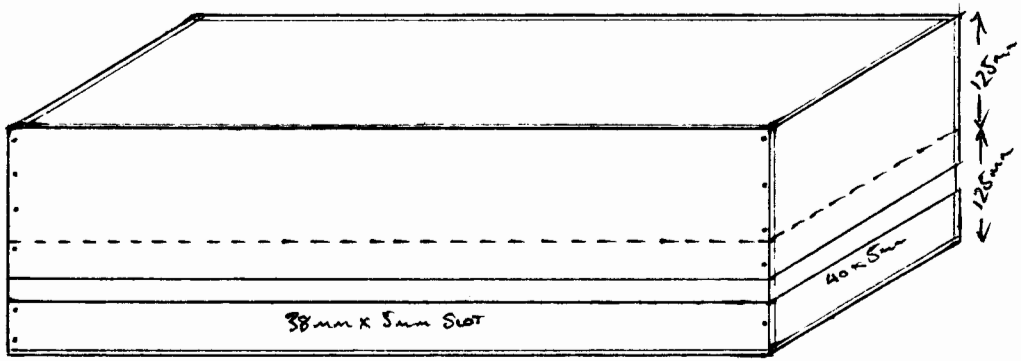
Roof bars – made them too.
Gal bar is topped with sail track for awning, and another bit plugs in to front to extend it over cab. Awning goes all way to a removable pole on bull bar.
Vent for pressure (reduce dust) and dog.

Jack mounts on bar work. Foot plate in recovery drawer. Jack and axe inside and locked up.

Bottom of a roof rack mount.
Spare HF radio tapped whip too.

Shovel mounts up there too. Bracket for mouth of shovel welded on front bar. Locating pin and clevis clip hold handle

DRAWER CONSTRUCTION DONE THE WAY IT WAS SO THAT WEIGHT OF DRAWERS IS TAKEN BY SIDES OF DRAWERS DUE TO REBATE, AS WELL AS SCREWS & GLUE.



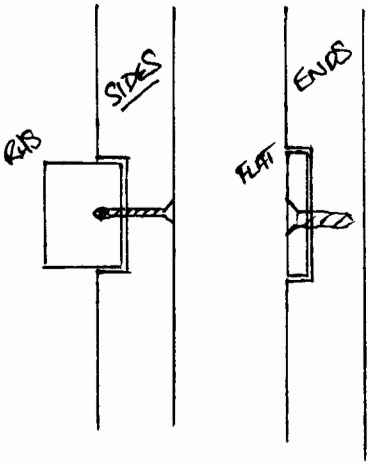
DRAWERS

2 BOXES MADE FROM 12mm PLY.
1 x 250mm DEEP
1 x 125mm DEEP

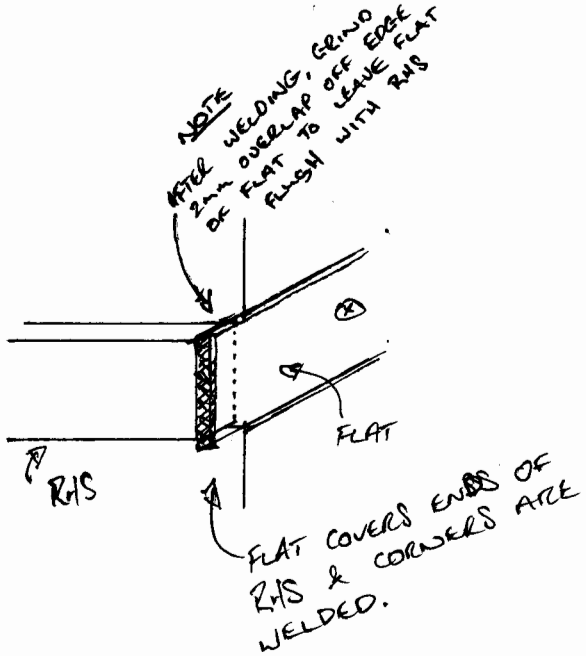
BOTH WITH TRENCH REBATED AT SAME HEIGHT ALL THE WAY AROUND. (USE ROUTER)
38mm x 5mm DEEP ALONG SIDES
40mm x 5mm DEEP FRONT & BACK.
ALL JOINTS GLUED & SCREWED

STEEL

38mm x 25mm R48 slide rail cut to suit length of side less depth of trenches each end
Check for fit & then glue steel into trench & screw with self drilling screws from inside drawer.



40mm x 3mm FLAT CUT TO WIDTH OF DRAWERS PLUS TWO RHS RUNNERS
3 OR 4 HOLES DRILLED IN STEEL & COUNTERSUNK. FLAT GLUED & SCREWED INTO REBATE USING 12mm x 4 C/S SCREWS



GLUED = LIQUID NAILS / CONSTRUCTION ADHESIVES
SCREWED = 30 x 4 COUNTERSUNK SCREWS - PREDRILLED WITH C/S DRILL BIT

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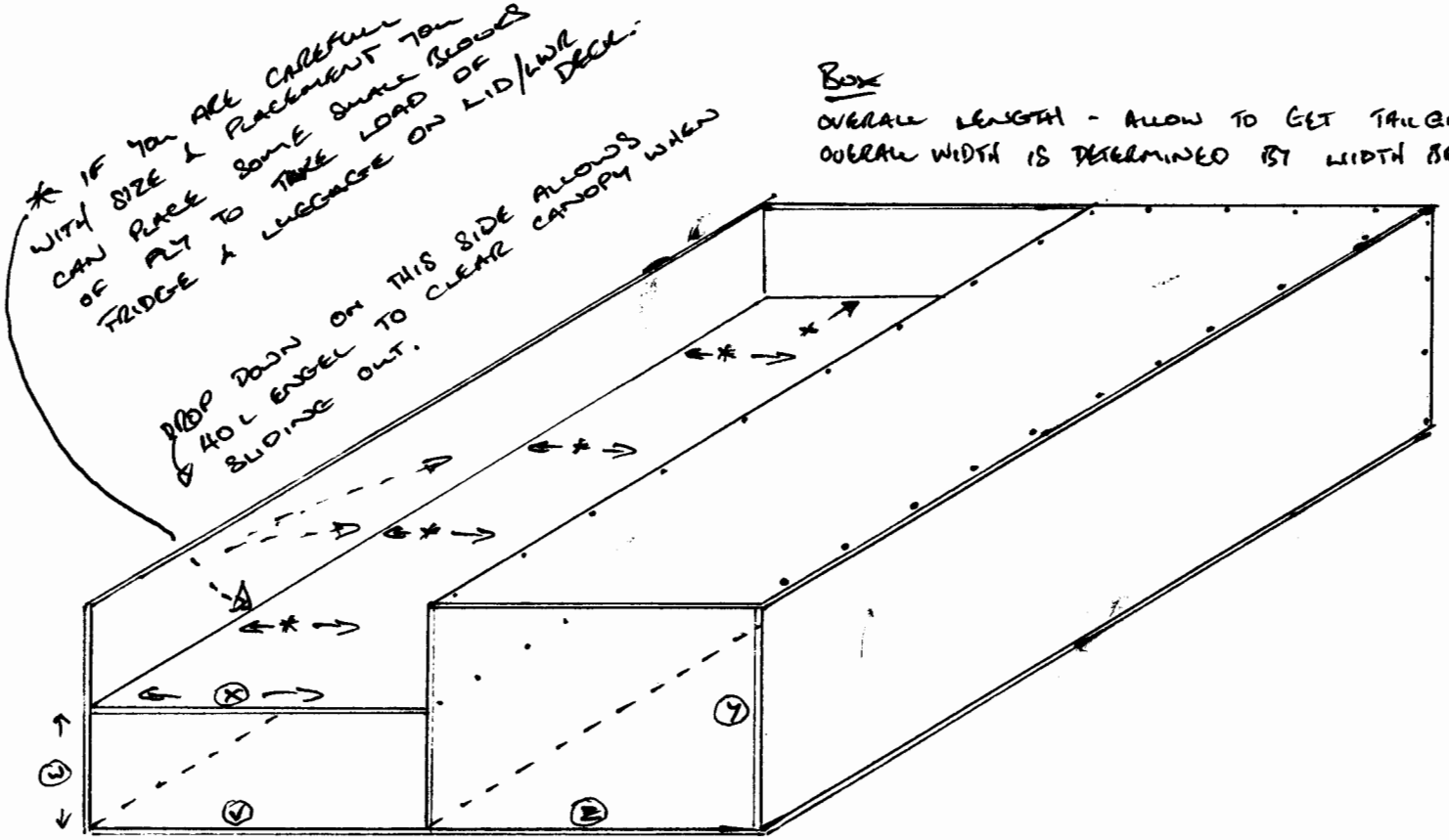

Box

OVERALL LENGTH - ALLOW TO GET TAILGATE SHUT WITH HANDLES.
OVERALL WIDTH IS DETERMINED BY WIDTH BETWEEN WHEEL ARCHES IN TRAY OF UTE LESS 10-15mm FOR CARPET CLEARANCE.

ALL MATERIAL IS 12mm PLY.

CENTRE DIVIDER & LOWER HALF TOP IS 12mm SHORTER THAN SIDES TO ALLOW BACK TO SIT FLUSH INSIDE SIDE SKINS & TOP & BOTTOM SO YOU CAN SCREW IT IN FROM SIDES.

DON'T FORGET:
MINIMUM WIDTH FOR
X = WIDTH OF FRIDGE
SLIDE +15mm TO ALLOW
CLEARANCE FOR CARPET
& STILL ALLOW SLIDING.

DRAWER - OUTSIDE DIMENSION
DRAWER WIDTH IS OPENING AT BOX MOUTH LESS 3-5mm CLEARANCE, LESS 2 x RHS RUNNER WIDTH.
DRAWER LENGTH IS OVERALL LENGTH OF BOX LESS 12mm REAR WALL.
ALLOW 5mm x 2 FOR CLEARANCE TOP & BOTTOM IN BOX FOR DRAWER TO SLIDE ALSO

TIP: INITIALLY DRY ASSEMBLE BOX - NO GLUE TO ALLOW DISASSEMBLY TO ROUTER REBATES FOR BEARING SUPPORTS & TO PUT IN BUMP STOPS/ANTI RATTLE BLOCKS PRIOR TO GLUING IT ALL. (DRY ASSEMBLE = DRILL, C/S & SCREW - NO GLUE.)

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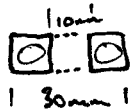
① DRY ASSEMBLE BOX

② WORK OUT WIDTHS FOR DRAWERS WITH CLEARANCE FOR RAILS A TOP & BOTTOM

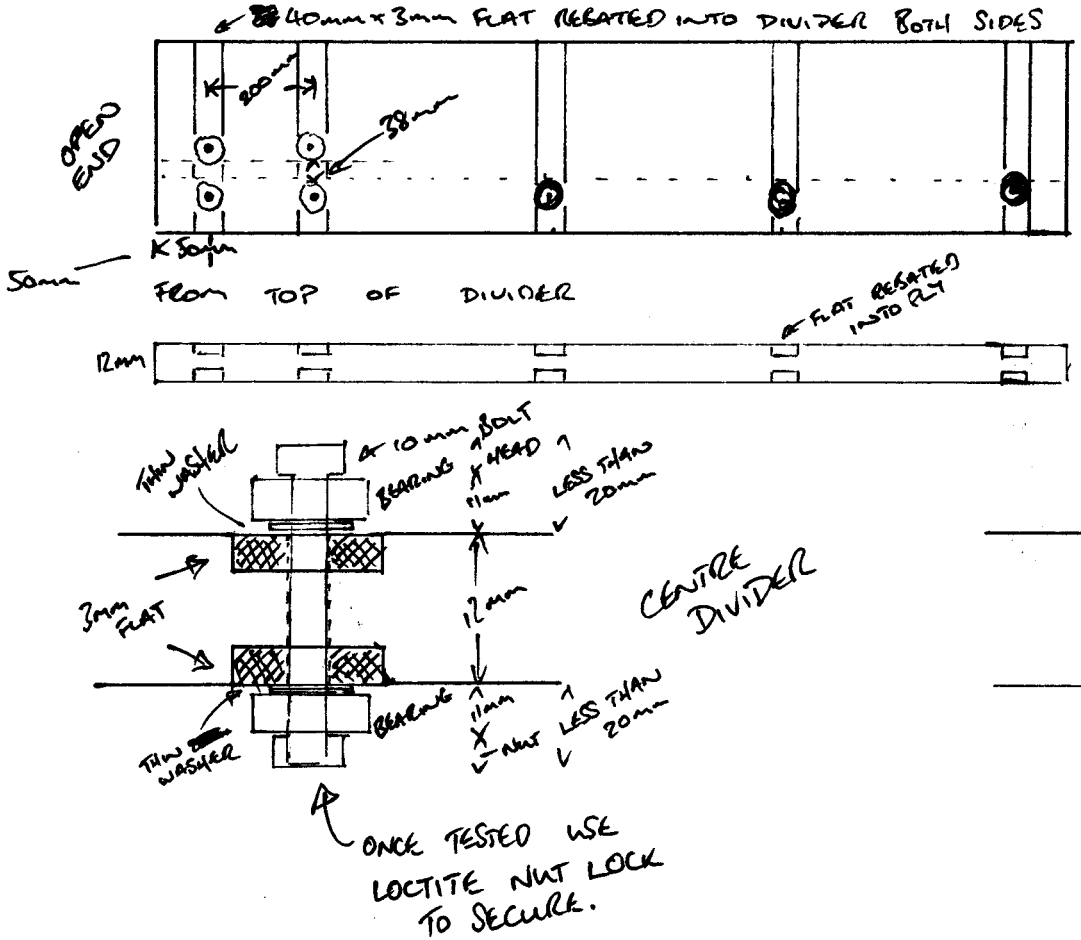
DRAWER DEPTH = Y - 10mm OR W - 10mm
WIDTH = Z - 5mm - (2 x 20mm) OR V - 5mm - (2 x 20mm)

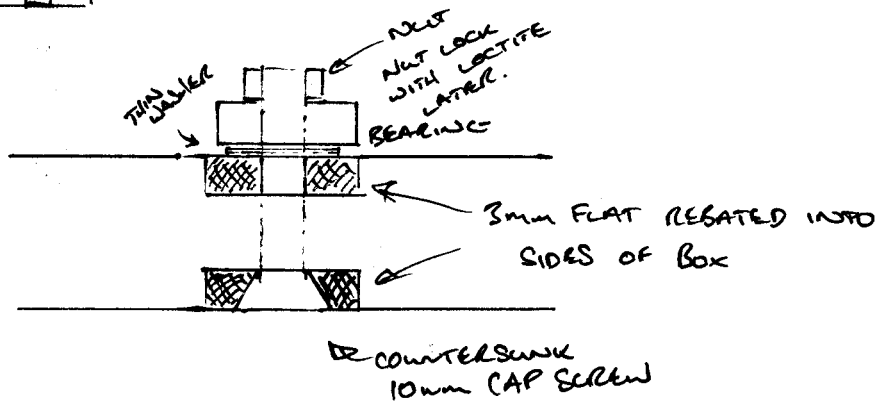
BEARINGS WERE A REALLY COMMON SIZE.

SOMETHING LIKE ?6200 SERIES.



@ about $1.67 ea inc GST.





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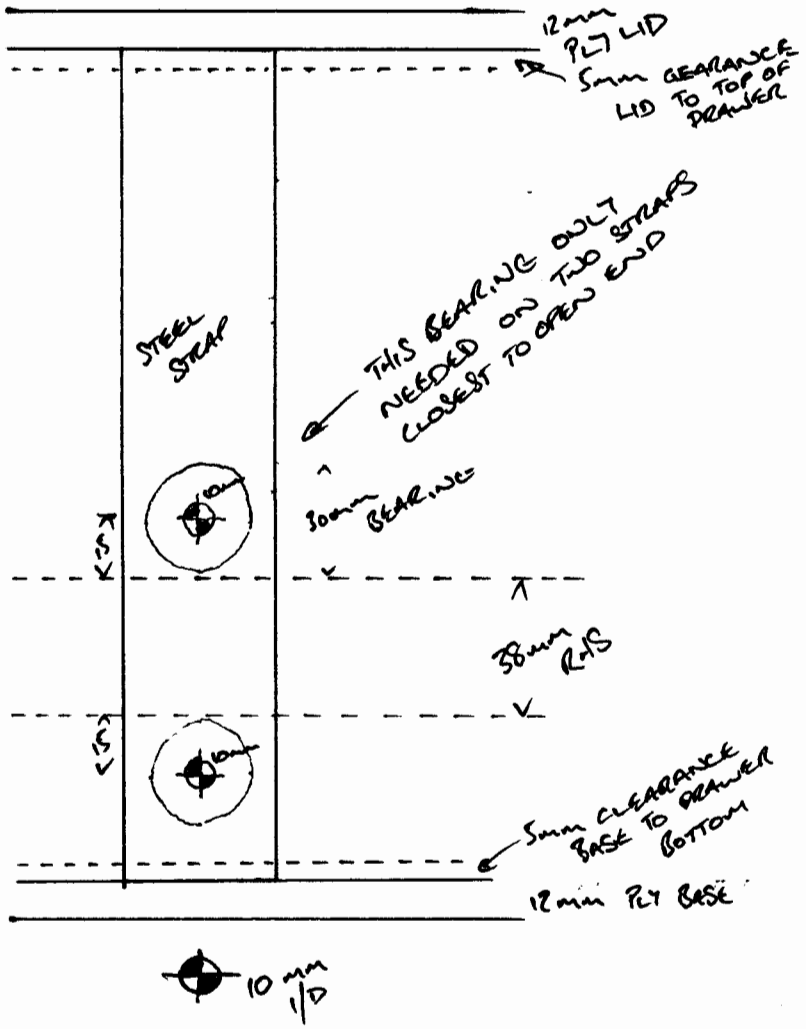


YOU NEED TO THINK ABOUT THE HEIGHT THAT YOU FIX THE RAILS TO THE SIDE OF BOTH DRAWERS. IT NEEDS TO BE THE SAME ON BOTH. THE HEIGHT IS NOT CRUCIAL IF YOU ARE DOING TWO DEEP DRAWERS BUT IF DOING A SHALLOW DRAWER YOU NEED TO ALLOW FOR A BEARING PLUS CLEARANCE ABOVE & BELOW RAILS (RAILS)

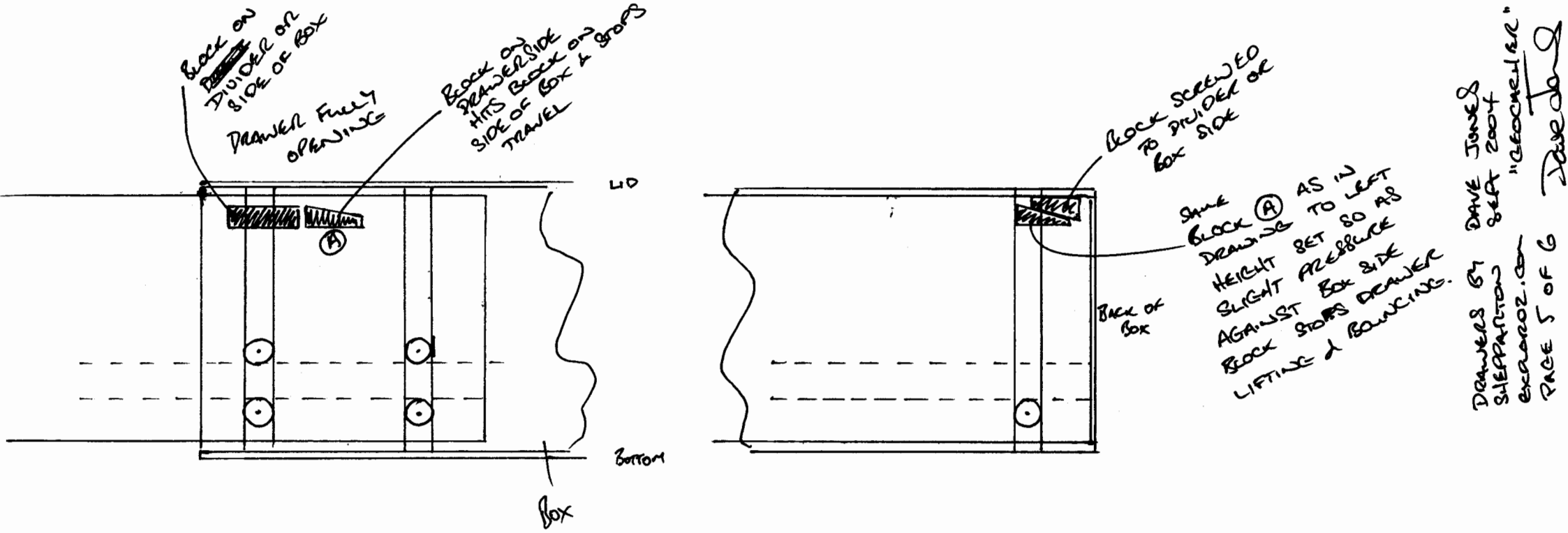
38mm + (2 × 30mm) + 10mm = 108mm

RAILS + BEARINGS + CLEARANCE = MINIMUM DRAWER OPENING

(AS 100mm IS A PRETTY SHALLOW DRAWER. DEEPER IS BETTER BUT FRIDGE STILL HAS TO CLEAR CANOPY OPENING TOO!)

ONCE I CALCULATED THE CENTRES OF HOLES FOR 10 mm BOLTS I SET UP DRILL PRESS WITH VICE BOLTED TO BED & A STOP SO THAT I COULD CLAMP 3mm FLAT IN VICE & DRILL ALL BOTTOM BEARING HOLES IN FLAT TO GET SAME HEIGHT. THEN 68mm ABOVE THAT I DRILLED THE 18 STRAPS THAT HAVE 2 BEARINGS ON THEM.

ONCE ALL DRILLED YOU CAN USE THE STEEL STRAPS TO DRILL HOLES IN PLY



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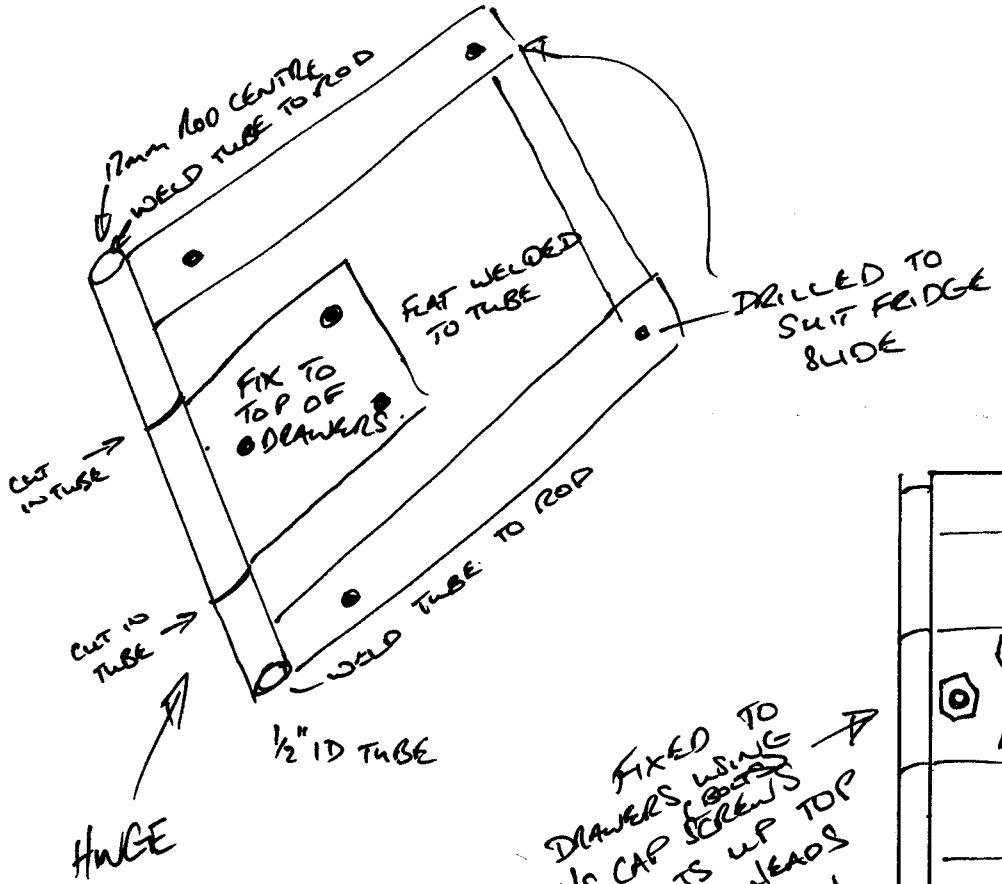
ONCE YOU HAVE ASSEMBLED BOX & GLUED BASE & SIDES TOGETHER WITH BEARINGS MOUNTED & CAN SLIDE DRAWERS SUCCESSFULLY FIX STOP & ANTI RATTLE BLOCKS IN PLACE (I USED NYLON BLOCKS - TIMBER WOULD PROBABLY DO). ONCE EVERYTHING WORKS SCREW & GLUE THE 2 LIDS ON. THE LOWER LID FIXES TO THE SUPPORT BLOCKS MARKED WITH ←✱→ ON PAGE 2, & IS SCREWED FROM SIDES OF BOX ON OUTER SIDE.

I USED A WINDOW SASH LOCK MOUNTED ON THE OUTSIDE EDGES OF THE BOX & THE PIN PUSHES INTO A HOLE IN THE RHS SIDE RAILS. BOTH ARE KEYED ALIKE.

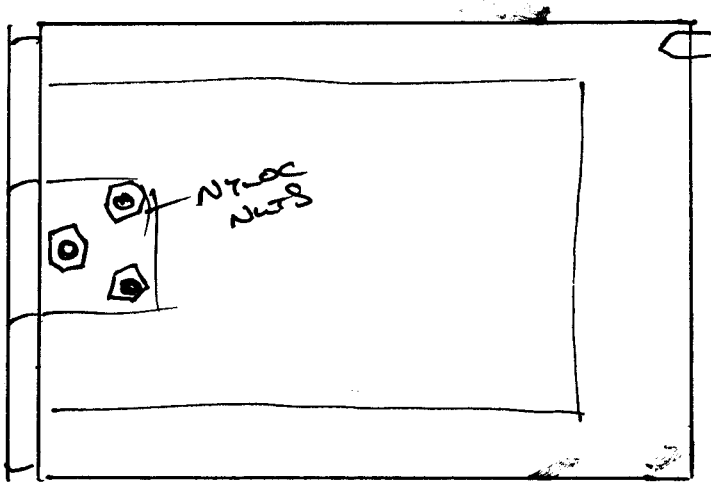
I WOULD USE A DIFFERENT ADHESIVE TO FIX CARPET NEXT TIME. TRY 3M SPRAY ADHESIVE NO 77 (OFFICEWORKS) & USE AS A CONTACT ADHESIVE.
CARPET IN DRAWERS IS VERY SOFT & UNBACKED SO IT PUSHES EASILY INTO CORNERS, CARPET ON OUTSIDE IS MORE DURABLE BUT STILL PLIABLE TO GO EASILY AROUND CORNERS)

ALUMINIUM ANGLE FINISHES ALL EXPOSED CORNERS FOR DURABILITY & IS COUNTER SUNK SCREWED IN PLACE. CHECKER PLATE ALUMINIUM CUT TO COVER ENDS OF DRAWER RHS RAILS MAKES REALLY NICE END CAPS & DROP DOWN BOX HANDLES SIT FLUSH TO MAXIMISE LENGTH OF DRAWERS.

TILT FRIDGE SLIDE IS DETAILED BELOW AS A CONCEPT. OUTER FIXING POINT DEPENDS ON YOUR FRIDGE SLIDE.



AS FRIDGE SLIDES OUT IT PIVOTS OVER GENTLY UNDER OWN WEIGHT. COMES TO REST ON TAILGATE. PUSHING IN IT PIVOTS BACK UNDER OWN WEIGHT.



FIXED TO DRAWERS USING C/S CAP SCREWS WITH NUTS UP TOP C/S BOLT HEADS DON'T CATCH ON STUFF WHEN DRAWERS GO IN & OUT.

SPRING LOADED UTE TRAY OR TRAILER LOCK PIN.

FIXES FRONT OF FRIDGE SLIDE TO PREVENT BOUNCING (UNLOCKED BY REACHING IN CANOPY SIDE WINDOW)

LOCKING PIN IS PROBABLY UNNECESSARY I'VE NEVER HAD PROBLEMS WHEN I'VE FORGOTTEN TO LOCK IT.

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