

The Silhouette Owner	Data sheet
Building a trailer	Ref no: DS 3 Date: 19/4/90 Revised: 14/2/91 Page no. . 1

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A professionally built trailer for the Silhouette will cost in the region of £800, which is more than many boats change hands for. The accompanying drawings give the basic dimensions and construction details of a trailer suitable for any of the Silhouettes, provided that appropriate wheels and tyres are fitted, and with careful buying of parts and materials, the cost should not exceed £300.

Ideally, the trailer should be all welded and made from structural hollow section mild steel.

- 1) Buy the material from a small steel stockholder or fabrication firm, it should be sold by weight at so much per ton. They may not be willing to cut to the exact lengths required for the trailer.
- 2) Easier and probably cheaper and safer to buy the rest of the gear (wheels, axles etc) as new from a reputable supplier of trailer parts.

WHEELS AND AXLE

If you have the facilities and experience and are prepared to get rather dirty, then probably the cheapest wheel and axle assembly could be purchased from a car breakers and altered to suit. It is quite feasible to use the back axle assembly from one of the modern front wheel drive cars/van - one should remove the complete assembly including brake linkage although the shock absorbers (dampers) are not necessary - choose an axle assembly that used leaf springs (NOT coil springs) from a medium size vehicle i.e. Escort or larger.

TWO OR FOUR WHEELS?

The basic S111 weighs around 1300 lbs plus whatever extras are left on board. A trailer of this kind will weigh about 500 lbs, therefore one is looking at a trailer of 1800 lbs to 1 Ton capacity. A single pair of Mini wheels would not be up to carrying this weight, even with commercial (e.g. Toyota 'Hiace') tyres fitted. Building a close-coupled four wheel trailer requires more complicated brake linkages, and doubles the cost of suspension units, so it would probably be better to go for a single pair of 4 1/2 J x 13" rims with 6 ply tyres - 175 R13 are the best, if you can afford them.

If you are using a leaf spring assembly, you will need to allow 6" between the axle and trailer frame for movement. This may raise the chassis higher off the ground than you wish, and it may be necessary to lower the axle beam to pass under the trailer chassis to reduce the depth of water needed for launching. The feasibility of this method depends on how much one can beg, borrow or steal and how good a DIY mechanic one is. If it is necessary to pay someone to do these alterations it would be cheaper to buy the appropriate 'Indespension' or 'Towsure' units.

You will need to fit a 50mm double lock coupling with a 20 cwt capacity and complete with parking brake lever. (If you are towing abroad, only the hydraulic ones are legal, and they are twice as expensive).

It is also well worth fitting a wind down jockey wheel - but beware of the cheap pressed steel ones, they will soon buckle. You also need to fit a Breakaway cable - a short link between the brake lever and the tow hitch, which will activate the brakes should the trailer come adrift while in motion!

DOCKING ARMS & GUIDES

Towing the boat is one thing; launching and retrieving presents another set of problems. Fitting appropriate guides on to the trailer will make it easier to ensure that the boat slides into the correct position while you are up to your waist in water, unable to see what is going on down below.

Docking arms are two vertical posts fixed to the back of chassis (part c) and serve to position the boat over the trailer (For recovering the boat) when the trailer is submerged. An inverted goal post assembly from 1" steel water pipe serves very well. The corner joints should be strengthened with brackets, and the bottom tube fastened to the frame with U-bolts. When the trailer is used without the boat on, then the docking arms should be folded down after slackening the U-bolts or there will be a tendency for the arms to vibrate loose. Likewise, they should be lashed to the hull for the same reason when towing boat.

Keel guides are 'walls' made of something like 10" x 3/4" planking built on to the top of the angle iron in which the bilge keels fit. The guides are angled outwards to help the keels seat properly, and there should be a positive stop at the front end. The correct position for this will be one where the boat is comfortably 'nose heavy' on the trailer - 40 lbs weight on the towing hitch is reasonable, and may be increased, depending on the strength of your car's

suspension. If the trailer is for an SII, it will be necessary to fit a central channel made of 5 x3" (internal) RSJ to take the weight of the stub keel, on which the boat rests. Do not be tempted to support an SII on its bilge keels alone. This may be alright when the boat is stationary, but the hull will not take the strain in transit. This channel should project a foot or so in front of the bilge keel supports, and it might be worth while making a 'funnel' guide at the rear end, to feed the nose of the boat into. Some early Silhouette trailers had the two central chassis members extended backwards two or three feet, ostensibly for the same purpose, but these can be positively dangerous when launching or retrieving in a rough sea, when the boat is likely to bounce down on to the extended forks, puncturing the hull.

The front steady should be correctly angled to fit the stem of the boat, and will need to be padded with rubber or old carpeting to protect the hull.

NOTES

Do not skimp by using smaller or cheaper materials and fittings.

- If in doubt go for robustness. If using an Indespension type of suspension unit beware of cheaper ones - often there is no positive location inside the rubber spring box part, and when the rubbers wear it could all come apart. Do not be tempted to weld these suspension units directly to the chassis. Weld an additional 2 1/2" x 1 1/2" box section across, with a plate at each end, and bolt on the suspension units so that they can be removed or replaced if necessary at a later date. Addresses of towing equipment suppliers are listed at the back of the handbook.

TYRE PRESSURES

As a rough guide to pressures needed to carry the weight of an average SII, Maxi tyres will need about 35 psi, Mini tyres 50 psi

COSTS

Below is a rough guide to costs of the essential components, as bought from Towsure of Sheffield in 1989. This is a very reputable firm who will accept orders by credit card, and arrange delivery.

Suspension units -

Stub axle suspension units for reclaimed Maxi rear bearings. S.U.39	51.00
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Brake fittings-

Coupling - braked with handle. (20 cwt). C11	32.50
Cable adjuster. C1	4.40
Cable @ 30p per metre. C5.	2.00
Cable attachments. C4.	2.40
Compensator. C32	6.60
Mudguards. 1 pair steel, 1100 M7	4.25
Stays. M32 6 @ 25p	1.50
Jockey wheel. HD and Clamp. T40	19.35
Suspension unit mounting beam 4'6" and 15cwt plates	10.50

Mild steel section from local steel stockist -

34 ft x 2 x 2 box section @ £1.20 per ft.	40.80
2 off, 4' x 5 x 3" x 3/8" angle	15.00
1 off 5' x 5 x 3" x 3/8" channel	10.00

Car parts from breakers' yard -

2 second-hand Maxi wheels @ £15	30.00
2 second-hand Maxi hubs, with brakes*	15.00

Total	£245.30
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*Note. It is illegal to use reclaimed car brakes on new trailers, but OK if you are replacing existing ones.

Supplementary notes:

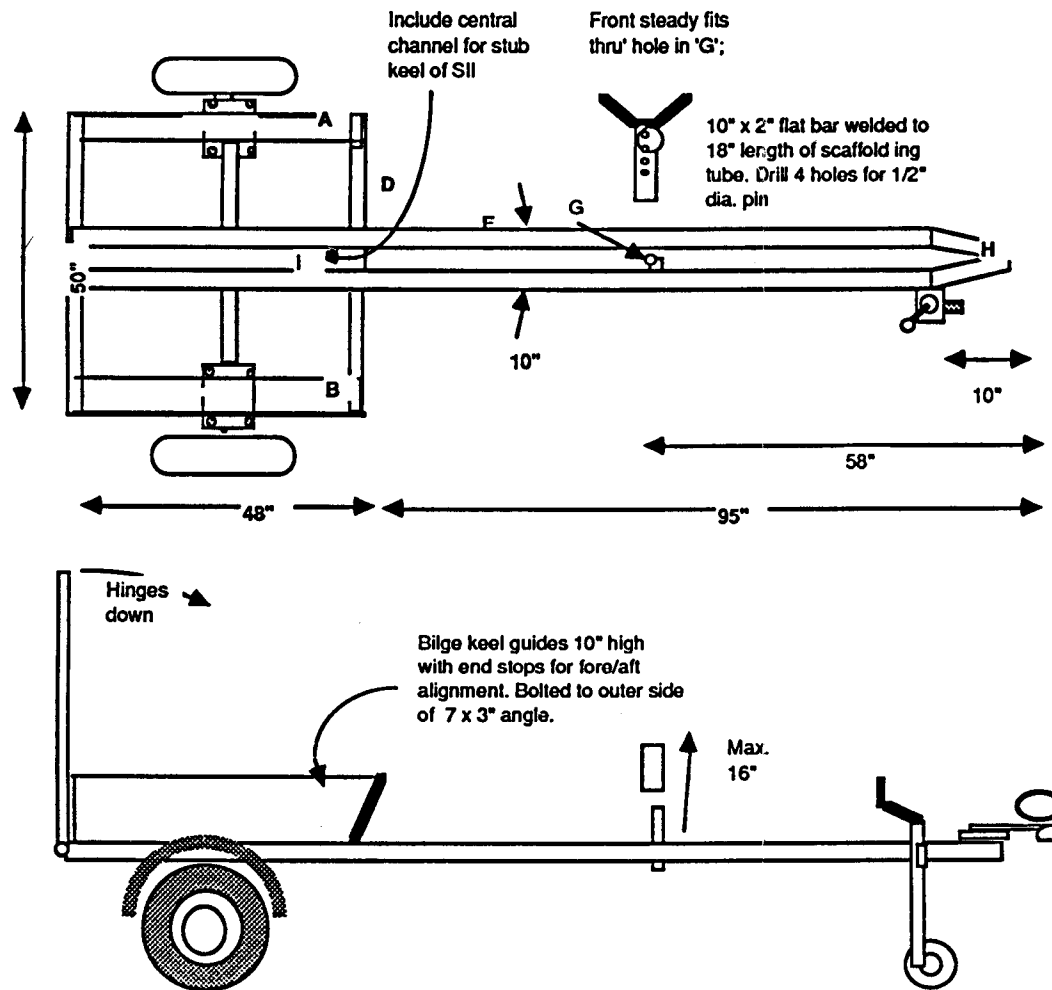
More information about trailer wheels and tyres is available on Data Sheet DS1

Useful information about buying tyres -including remoulds - appears in the 1990 April issue of 'Which?' Magazine.

Cutting steel section.

Mild steel box section of the size required is easily carried out with an ordinary hacksaw - use a new blade with 24 teeth per inch (tpi). The blue coloured blades by 'Eclipse' at about £1 each (other makes available) are better than the cheap black blades. There should be an arrow on the blade showing the direction of cut. This arrow should point away from the handle. Mark the cutting lines on all four sides of the box section before starting. Make the cutting stroke the full length of the blade. Keep the blade at about 45° to the faces you are cutting. Working at right angles to the metal increases the risk of breaking the blade. Don't hurry, and don't force the blade into the metal. It will cut quicker and better with gentle pressure and long strokes.

BASIC TRAILER CHASSIS FOR Mk II or Mk III SILHOUETTE



Chassis to be welded up - all welds min. 1/4" continuous fillet.

Note. If Indespension type units fitted, do not weld direct to chassis. Weld attachment plates to frame, then bolt on suspension units

All materials mild steel

A & B 7 x 3 1/2 x 3/8" angle x 48" long.

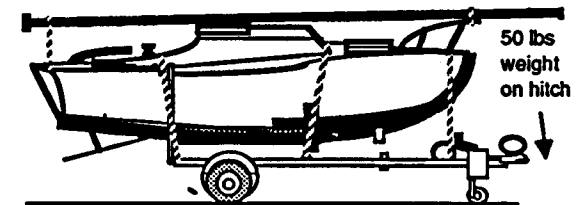
C & D 2 1/2 x 1 1/2" box section x 50" long.

E & F 2 1/2 x 1 1/2" box section x 143" long.

G 4 x 2" box section x 7" long. Drill 2" dia. hole centrally thru' both faces.

H 1/4" thick plate on top of frame - drill holes to suit 50mm hitch.

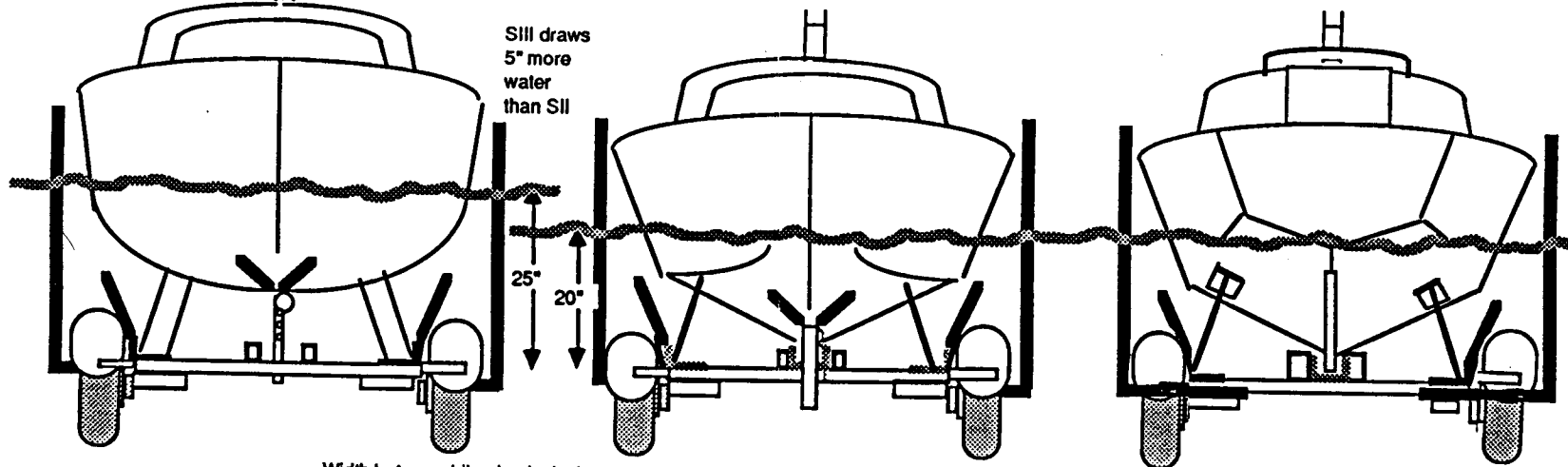
I 5 x 3 (internal) channel RSJ to accept stub keel 48" long (required for SII only).



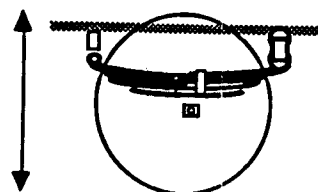
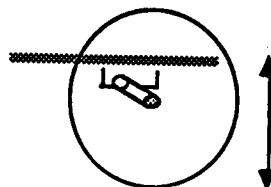
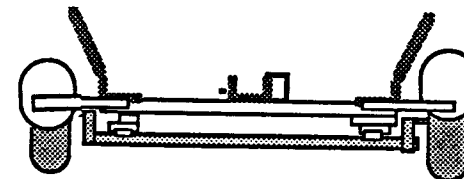
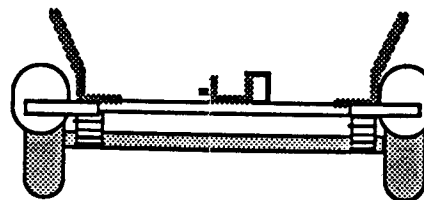
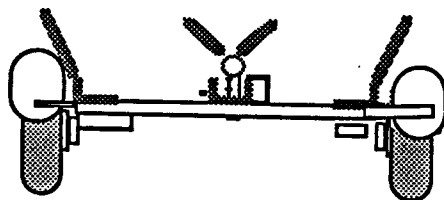
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SIII Stands on bilge keels only

SII Main weight is taken by centre stub keel.



Width between bilge keels is the same on both SII and SIII



Indespension type units allow lower ground clearance than leaf springs.

Cranking the axle overcomes this, but may increase the track of the trailer unacceptably.

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