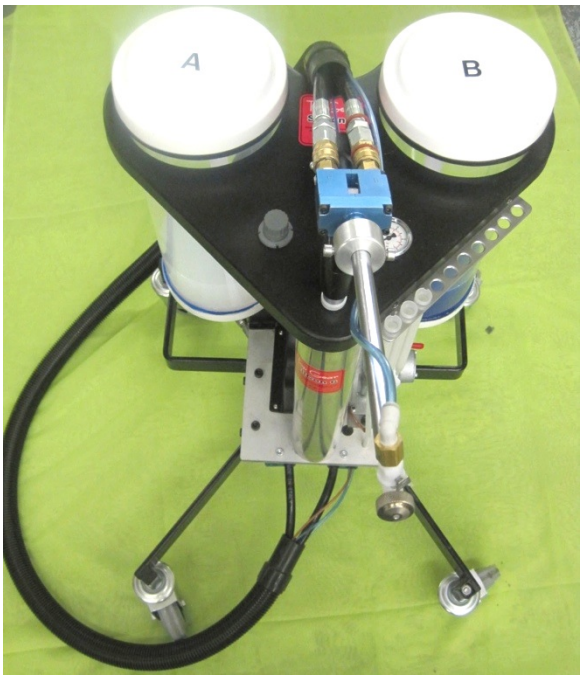
TopGear SilCon Six

Silicon 1:1 meter mix spray and dispense machine

Document TopGear Silcon six Instruction issue 1.doc (17 pages) June 2014

Instruction manual



Alan Harper Composites Ltd ,
4 Gwel Avon Business Park,
Gilston Road, Saltash, Cornwall, UK PL12 6TW
Tel +44 7768 335 600 +44 1752 841 222

www.fb.com/alanharpercomposites
www.alanharpercomposites.com

Contents

1/ Introduction

The TopGear SilCon Six spray and dispense meter mix machine represents a radical change in machine design to previous double acting positive displacement pump output machines. The TopGear Model uses high performance gear pumps designed specifically to provide a compact yet a powerful mixing machine for use with 1:1 platinum cured silicones.

Its lightweight hand held head gives with double fluid stream excellent operator maneuverability with highly flexible material feed hoses and swivel connections.

The light touch finger trigger starts the machine in an instant and simultaneously opens two head ball feed valves. On release of the trigger, the head ball valves close and the pump is signaled to stop. The head valves also indicate their correct open and closed positions.

Regulation of the the gear pump speed/flow is controlled from the machine top fascia panel and the spray air pressure is infinitely adjustable with a pressure regulator with indication .

All moving parts are guarded to European CE standards

Material feed tanks A and B, with secure covers, are crystal clear and feature easy to read calibrated tanks of 34 kg (75lbs) capacity of the Silicone. The two Silicone holding Tanks flow input to gear pump and A and B is kept to an absolute minimum thus preventing possible cavitation and ratio difficulties. The compact workspace footprint (0.46m2) of the castor wheeled machine frame provide easy maneuverability on the shop floor as the operator moves around the mould to spray each silicone bag.

2/ Familiarization And warnings

The TopGear SilCon Six is trolley mounted with 4 x 360 degree swivel castors. The spray/dispense head has two quick release fluid feed tubes marked A and B for the Silicone and are 3 m in length and two quick release 4 mm air pipes. A fifth 6 mm pipe provides the air pressure feed to the spray tip. This also has a quick release feature whereby the operator can instantly disengage from the tip without removing This allows non spray dispense operation.

If there is a need to prime the system or recirculate the fluid sections, the A and B head fluid pipes may be unplugged from the head and their outlets positioned

over open A and B tanks to return their fluid flows to the appropriate tanks. This may be done to eliminate any air voids in the lines on initial start up or material change. To operate recirculation with this set up it only requires the trigger to be operated and pump speed turned up to a desired recirculation rate.

The pump speed and spray pressures are adjusted by turning the appropriate regulator clockwise to increase pressure.

Warnings.

The following is a list of does and don'ts and must be observed for safety reasons and correct operation of the machine

DOES

a./ DO Ensure sufficient air pressure and volume is connected to the machine
b./DO Ensure your base Silicone A and B are closely matched viscosities.
c./DO Ensure flow from head outlets is equal
d./ DO Ensure gun Blue tip outlets are clean and not gelled internally before replacing with new disposable mixer.

Do NOT's

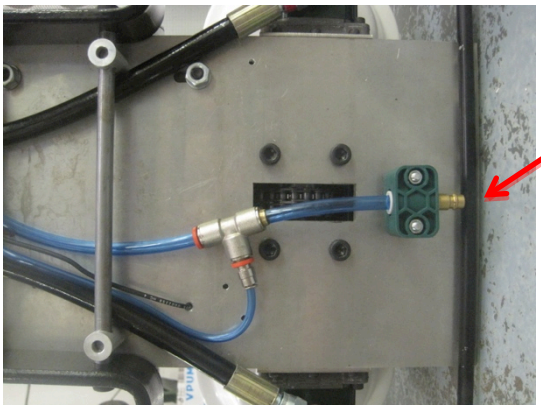
a./ Do NOT Clean the machine internally or externally with any form of solvent (i.e. acetone, MEK *****!!!! Do NOT USE). Solvents will result in irreversibly **damage** to the tanks and the pump seals and fluid lines.
The recommended cleaners are silicone oil or IPA (Iso propyl alcohol)
b./ Clean tanks out in situ. Before cleaning, pump empty the tank/tanks into holding containers. Ensure absolutely clean and no loose particles are present.
c./ Do NOT Change any pneumatic pipework connection locations.
e./ Do NOT Change the fluid lines for any form of non AHC Ltd genuine spare hose
e./ Do NOT Allow highly water or oil laden compressed air to be connected to the machine
f./ Do NOT attempt to disconnect fluid lines when under pressure. Always depressurize before disconnecting
g./ Do NOT Remove and run machine without pump guards fitted and fixed as designed .
h/ Do NOT use gun in gun rest pin to push or pull machine around workshop as this may result in too much tension on gun handle and cause shear breakage

3/ Silicone A and B Priming - Start up procedure –

Always operate the machine on a level workshop floor. The machine will freely follow the operator as the work position changes. For safety reasons do not operate this machine near downward steps or changes in floor level

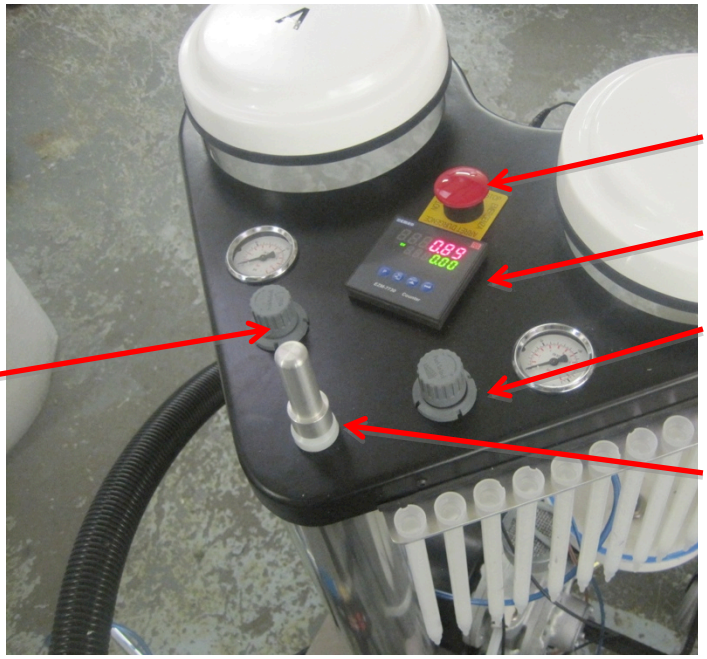
a/ Connect shop air supply at between 6 and 7 bar (87 to 104 psi) up to 200 l/m (10 CFM) to the rear of machine base underside male connector.

The machine is supplied with the gun rest pin . Install this as shown by screwing in by hand at the top of the machine front thread point .



Air In connector on the underside of the TopGear chassis rear.

b/ Ensure air supply is connected and is **<u>turned on</u>** at shop air line feed.
Adjust the spray pressure to desired level 2-5 bar as indicated on the gauge .
Turn regulator clockwise to increase , anti clockwise to decrease.



E Stop. Twist anti clockwise to release

Optional Output Counter.

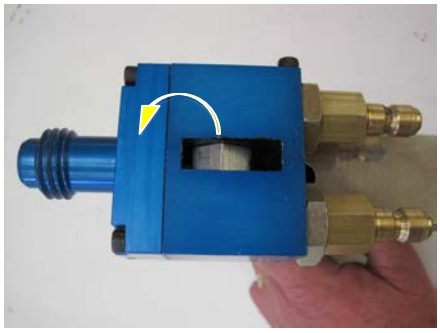
Pump output speed

Spray Tip pressure regulator

Gun Rest Point

c/ When the gun trigger is pressed the pumps should rotate if sufficient air pressure to the pump air motor is set. Check the pump air motor pressure regulator . Always start at maximum by screwing speed control fully inwards (Cloackwise)
Clockwise to increase. Make the adjustment accordingly whilst pulling the gun trigger

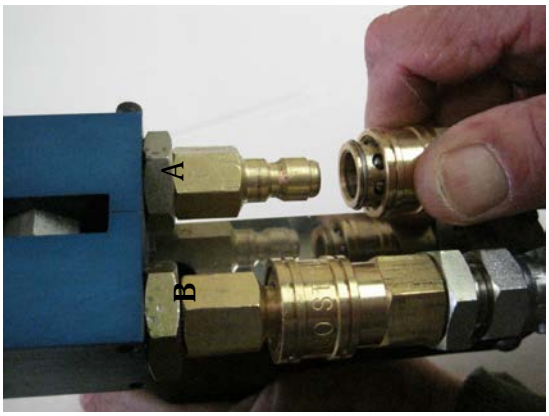
d/ Remove lid of tank A and fill up tank A from silicone supplier's A material container without exceeding the maximum level mark. <u>Replace tank lid A .</u>
Remove tank B lid and fill up from supplier's B material container as before for Tank A.



e/ With the chrome mixer shroud removed and no mixer fitted , direct the gun outlet to a safe waste container. Finger pull the gun trigger . You should observe in the top of the gun, the gun valve union rotate 90° forward which indicates the machine is "live" and the valves have opened.

f/ When both silicone streams are observed to **flow equally** from the gun tip without air entrapment the system is said to be primed and hydraulically tight and the trigger can be released to instantly stop the flow.

Note - An alternative less wasteful priming operation can be carried out by recirculating the two fluid streams. This is done by first disconnecting the A and B quick release brass couplers on the gun head pipe ends. These may be difficult to remove if there is any residual pressure so to begin with turning the pump speed regulator to zero (fully anticlockwise) and then operate the gun trigger to relieve any locked in silicone pressure whilst pointing the gun head (without mixer) safely into a waste container. The amount of material which may come out if the system is pressurized is only about 10 cc but this is enough to keep high pressure on the quick release couplings making them almost impossible to release before de pressurization by the method just described.



Caution NOTE. *On unused new machines some contaminating small particles may be present and may effect the initial flow silicone cure chemistry so it is recommended to purge at least the first few seconds of pump flow before spraying or recirculating back to the holding tanks.*

Once the two A and B quick release couplers have been released they should be hung over the top of the air motor from the front to support and positioned just inside the appropriate tanks A and B without their lids. The quick release couplers are stamped A and B so make sure they are replaced correctly. Place the open end of A into tank A and B into Tank B. Once these are secure simply pull the gun trigger to recirculate both A and B streams simultaneously.

Continue to recirculate until the streams are seen to be bubble free. Stop recirculating and refit the quick release couplers to the A and B male connectors on the gun head. Again take care to observe connectors A connects to A and B to B. Also be sure the quick coupler engages and clicks into the locked position. Test by pulling on the pipe fitting to confirm coupler is locked. Clean away any spilt silicone around fittings and gun top

g/ The system is now fully primed and ready for use.

4a/ Operation

1. Install a new plastic mixer into the chrome mixer tube and attach both to the gun tip by hand tightening the large alluminium ring onto the gun tip thread.

2. Fit the spray tip with a push on and clockwise turn bayonet action to lock into position.
3. Clip the 6 mm spray tip air feed onto the small plastic spigot. A click sound can be heard and felt as this is locked into position.

4. Direct the gun towards the sample surface to carry out a quick test spray and pull the trigger. If the flow of air from the tip needs adjusting adjust its regulator the same way as you do for the pump motor speed.

*  

Install disposable mixer into chrome tube and ensure mixer is fully pushed in before screwing to gun outlet. Clip on spray pressure connection

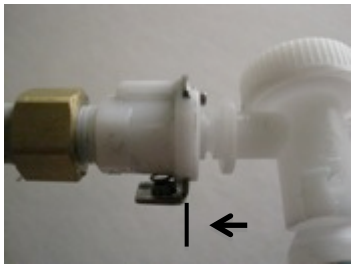
different outputs and spray pressure will need different settings for different silicone materials.

Also Note – Different suppliers materials can have different base viscosities and so output and spray pressure need to be adjusted as required for optimum settings. The lower the viscosity the higher achievable maximum output is gained.

IMPORTANT NOTE. Should you observe any mismatch in flow from A and B gun outlet without the mixer attached then do not use the machine until this mismatched flow is corrected.
Reasons for mismatch flow.
1/ The pump speed is set too fast for the silicone viscosity you have chosen.
Remedy – reduce pump speed regulator until flows are equal
2/ There is a fault/blockage/contamination in the stream which shows short flow streams
Remedy – Investigate flows on recirculation back into tanks and correct blockage
3/ The Silicone chosen is too high a viscosity on one or both of the streams.
Remedy – Slow pump or change silicone viscosity no greater than 22000 cps

The spray tip air will switch on only when pressure is set on panel and the quick release spray connector is fully plugged in, however silicone can be dispensed without spraying by simply releasing the spray tip air connector without removing it from the tip. To do this press the metal release on the spray tip air feed union and allow the union to slip backwards by about 6 mm (1/4") which will disengage the air feed during non spray applications..

Disengage spray tip air feed



Disengaged

Dispensing with No spray pressure

4b/ Further Operational notes and advice

Before starting a bag spray up manufacture calculate the developed surface area to be sprayed in m2
(1m2 roughly = 10 sq/ft) Assuming a silicone bag of 4 mm + thickness (0.117") is to be produced then for every 1 m2 it is necessary to spray 3 litres of material (2 l of A and 2 l of B). The supply tanks on SilCon machines are graduated in litres so it is easy to take note of the starting level in litres and observe when the calculated consumption amount from both tanks has been used and thus provides a reasonably accurate guide to confirm the thickness has been built up.

Using the *fi*RST seal system and technology and fittings add to your estimated usage at start up an extra 0.7 litre of mixed silicone for every 1.0 m of seal edge length.

Example .

A 3 m long jet ski boat hull has a developed surface area of 5 m2 plus 1.2 m2 of additional mould flange and a seal length of 6 metre

Total requirement of mixed silicone needed =

Hull area 4.0 m2
Flange area 1.2 m2
Total surface area 5.2 m2 at 3 mm + thickness = 5.2 x 4 = 20.8 litres

Add Seal length 6 usage = 0.7 x 6 = 4.2 litres

Therefore total expected usage 25 litres

Full Machine tank levels at start 14 litre (x 2 tanks = 28 litre total fill)
Therefore tank levels when spray bag is completed = 28 – 25 = **3** litres combined total in 2 tanks
So <u>each tank</u> should have emptied down to 1.5 litres.

5/ Maintenance

1:1 platinum cure Silicone is very machine friendly and gives rise to very little maintenance.

Other than changing the disposable mixing element for each new spray operation there is very little to maintain other than check regularly the condition of the two fluid feed hoses for damage and replace if suspected of damage is noticed, witnessed by uneven surface or abrasion cuts in the black plastic outer sheath.

The gun should **not be disassembled** when connected to the pressure feed lines OR, if needing any form of internal inspection. The whole gun can be unplugged from all pipes without the use of tools after <u>depressurizing the lines</u>, as already discussed, and disconnecting the shop air feed before disconnecting the remaining 4 mm blue and red pneumatic pipes at the gun handle rear.

To remove gun complete from feed lines
1/ depressurize silicone feed lines and disconnect A and B unions.
2/ Disconnect/ shop air feed to machine
3/ Disconnect both the red and blue 4mm pneumatic pipes from gun rear.

Note to disconnect any of the pneumatic pipes first push and hold the pipe towards the fitting, then push the fitting rear ring into the fitting at the same time pull the pipe out . To replace simply push the pipe firmly back into the fitting and pull back to ensure it is locked

If for any reason the gun needs internal disassembly please consult Alan Harper Composites Ltd direct or your dealer first as there exist very small 2 mm

air tubes piped within the housing and a reasonable amount of knowledge is required before removing any part of this assembly without potential damage caused to these small pipe connections.

If a blockage is suspected within the gun fluid section there is absolutely no need to disassemble the blue block from the black gun trigger housing as all fluid sections can be accessed from the top .

Please refer to head cross section illustration below .

Note . The two ball valves A and B may be accessed by first removing the 3/8" rear fitting and hooking out the black spacer and O ring rear ball seal . With the ball held in the closed position as illustrated it is possible to push the ball out using a 4 mm diameter push rod though the front hole on the valve body. This is accessed by removing the front head mixer body after removing the 4 -M4 x 16 and two long front lower M4 countersunk head screws accessed under the gun handle . Replace in the reverse order. Any gelled silicone within the front head mixer body galleries can be can be pushed out with a 4 mm diameter rod .

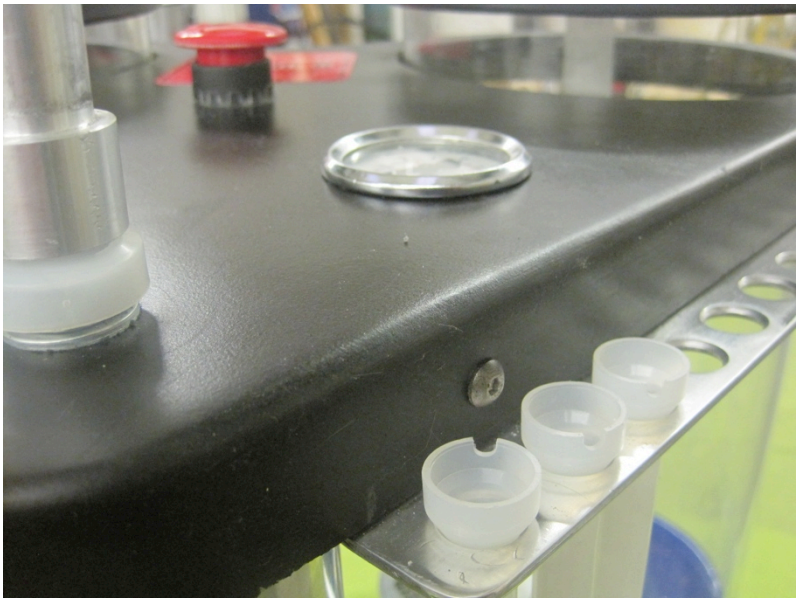
Pumps – The SilCon TopGear Six pumps are 1.2 cc /rotation high grade Gear pumps

No periodic maintenance is necessary however if either is noted not to provide an output of material please replace for re conditioning.

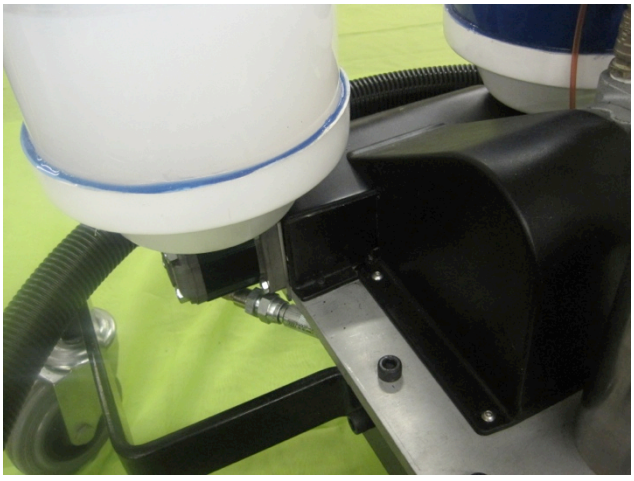
Specifications

Pumps -. Gear pump
Capacity - 1.2 cc per rotation
Combined output - 2.4 cc per rotation
Power supply- compressed air
Supply Pressure – 6 -7 bar
Air Volume - up to 200 l/m
Maximum output at 1000 rpm – 2.4l/min
Mixer – Static type part number 102114
Height – 1.2 m

Floor space – 0.46 m2
Weight – 42 kg when tanks empty
Options available .
a/ Tank level alarm
b/ Output digital counter hi res. 10cc increments .

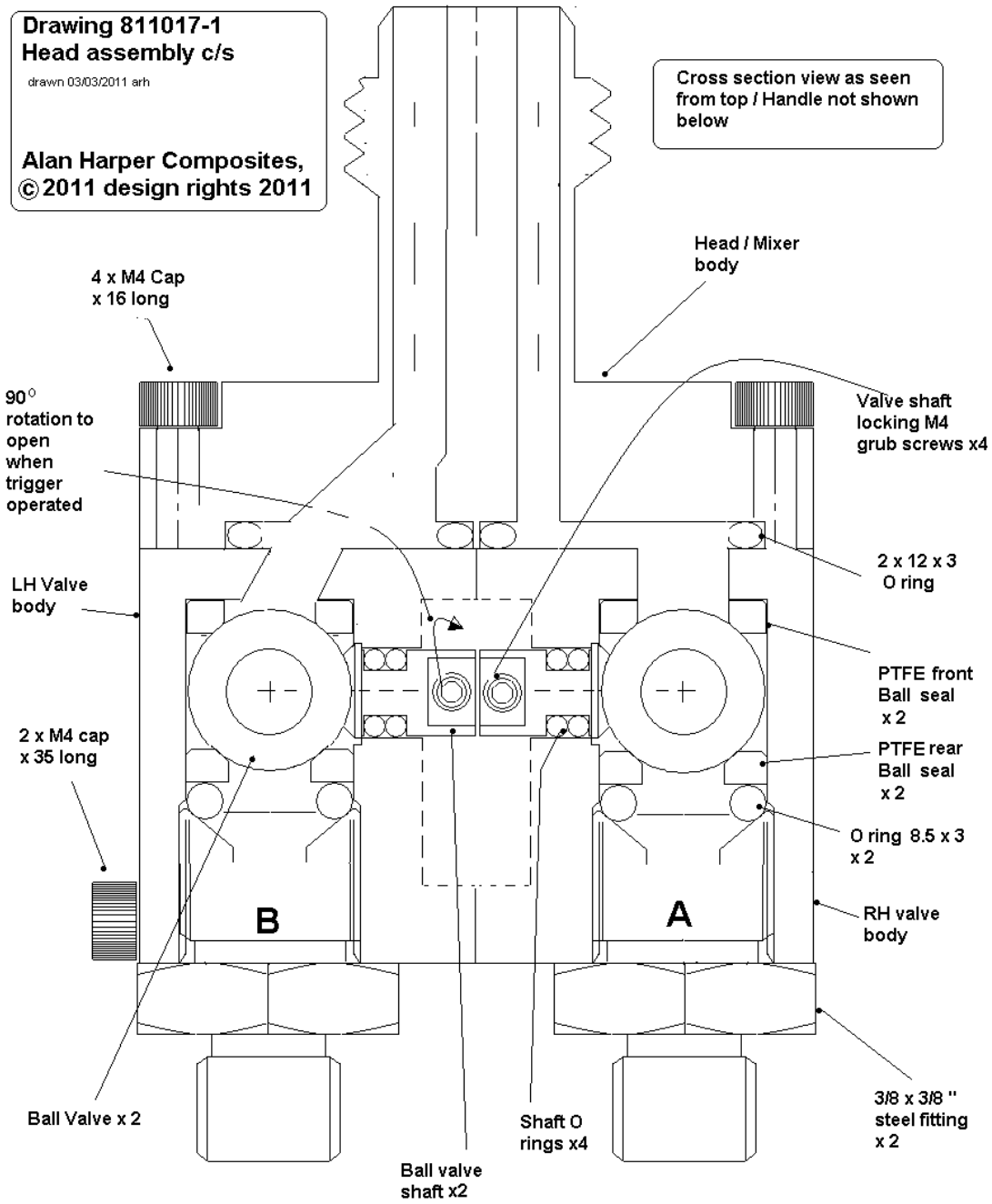


Useful mixer rack for convenient storage of new and used mixers



Machine guards over 4 HP (3kw) motor drive and chain link to gear motors .
These guards must be secured in place at all times during operational use

Optional Digital counter fitted . Power supply 24 VAC plugs into rear of instrument panel



Cross section of mixing head fluid section. Ball valves shown in closed position.