TOM THUMB RESUSCITATION UNIT
TT 490

SERVICING MANUAL

CE 0086

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This manual is intended to provide information to help qualified maintenance personnel service and repair the Tom Thumb Infant Resuscitation Unit; TT490. General engineering knowledge and the ability to follow technical instructions are assumed, as are knowledge of oxygen flow rates and the characteristics of operational pressures.

The equipment needed to service the Tom Thumb is laid down in this Service manual. In addition, a calibrated manometer will be required for test and calibration of the unit.

Diagrammatic representations of disassembly and re-assembly are shown in this Service manual.

Servicing personnel must be aware of the potential clinical implications of incorrectly serviced equipment.

Service and calibration of units, to a flow of 5 Lpm, does not imply operational usage at this rate. Operational flow rate should be determined, at the time of usage, within the scope of individual organisations' resuscitation protocols, up to the maximum of 5 Lpm.

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1. Introduction.

Service of the Tom Thumb Resuscitation Unit.

The Tom Thumb has been designed to require minimal service with very few replaceable items. The accuracy of the pressure gauge, adjustable valve and precision valve should be checked at least every 12 months or when the gauge at zero pressure reads outside the black band.

It is recommended that all hoses be checked every 3 months, for connections, damage and possible degrading and / or rupture of hose and coatings. The hoses should be replaced, regardless of condition, every 4 years (maximum).

It is recommended that all O-rings should be replaced every 2-3 years.

The adjustable valve has no user replaceable parts or parts that should suffer from wear; adjustment by the user is not recommended as specialist tools are required to dismantle and reset.

Setting of the adjustable valve pressure when carried out in accordance with the relevant procedure will ensure accuracy to ± 2 cmH_20.

The precision valve is factory pre-set and sealed; adjustment by the user is not recommended, as specialist tools are required to dismantle and reset.

The precision valve pressure may have been set at manufacture to 20, 30, 40 & 50 cmH_20 to a tolerance of ± 2 cmH_20, dependent on customer requirements. Setting of the precision valve when carried out in accordance with the relevant procedure will ensure accuracy to ± 2 cmH_20.

If the setting of either the adjustable valve or the precision valve is proven to be outside the required tolerance, the Tom Thumb should be returned to Viamed for servicing. Both valves require specialist tooling to dismantle and reset.

The Tom Thumb pressure gauge is accurate to ± 6 cmH_20 subject to a reading within the black band at zero pressure. If the gauge is removed, a single-use diamond copper washer, part no. 0330212, must be replaced.

Do not re-use the original "Diamond Copper Washer".

2. 0310031 TT490 / 0310033 TT490 (1m & 3m hoses) Servicing.

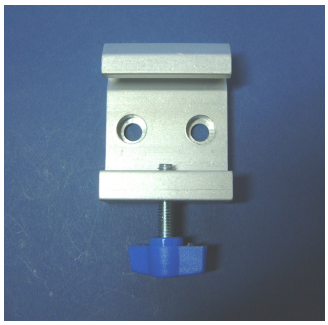
Important: Use only oxygen compatible grease during assembly of Tom Thumbs. Do not use or allow organic greases to enter the Tom Thumb. Ensure all parts are clean before assembly.

Equipment required. 14mm open-ended spanner, pick, isopropyl alcohol, kitchen tissue, adjustable spanner, PTFE tape, 3mm Allen key, Viamed adjustable valve tool.

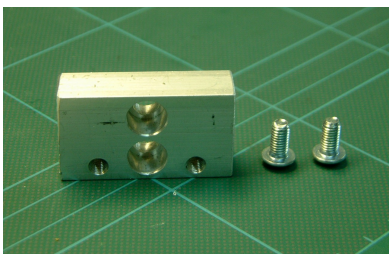
Parts list.		
Qty.	Description.	Part No.
If req'd	Body block	0330201
1	Diamond copper washer	0330212
If req'd	Pressure gauge	0330203
1	Thick O-ring – 3/32 section	0330213
6	Thin O-ring – 1/16 section	0330214
If req'd	Flowmeter bolt	0330205
If req'd	Flowmeter	0320060
If req'd	Precision valve	0330210
If req'd	Blanking bolt	0330207
If req'd	Adjustable valve	0330211
If req'd	15mm outlet	0330209
If req'd	Serial no. label	0390031 or 0390033
If req'd	Inlet hose right angle adapter	0330219
If req'd	Inlet hose (1m) Inlet hose (3m)	0330217 or 0330218
If req'd	Spacer block	0330215
If req'd	Rail Clamp	0330055
If req'd	M4x10mm hex drive bolts	0330216
If req'd	"Tom Thumb" label	0390015
If req'd	Flowmeter label	0390012
If req'd	Adjustable valve label	0390010
as req'd	Oxygen-compatible grease	0330220
as req'd	Oxygen-compatible adhesive	0330237

Servicing.

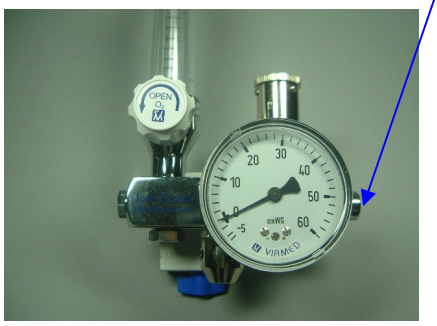
1. Detach rail clamp from the spacer block.



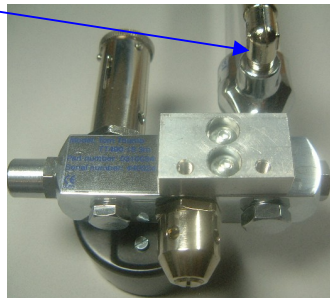
2. Detach the spacer block from the body block.



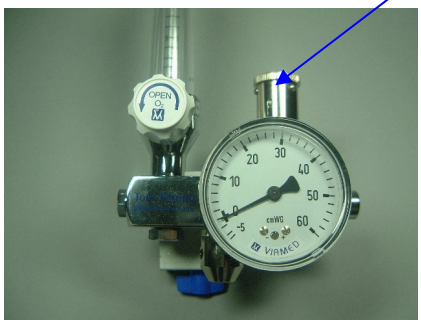
3. Unscrew the 15mm outlet from the threaded hole in the right face of the body block. Ensure the port, and threads, are free of foreign matter. Replace the thin O-ring (p/n 0330214) and refit the 15mm outlet.



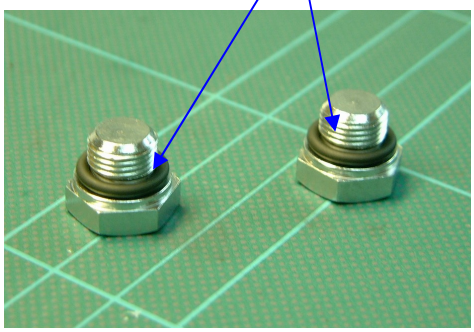
1. Unscrew the hose from the right angle adapter and the right angle adapter from the flowmeter. Remove the original PTFE tape from the right angle adapter, rewind with 2 complete layers of new PTFE tape and refit the adapter vertically into the flowmeter.

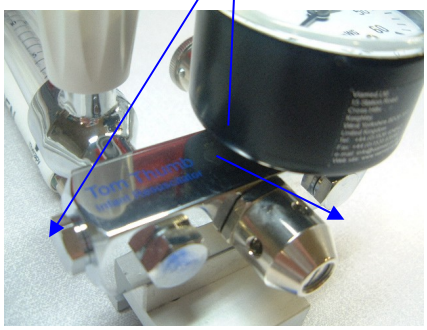


2. Unscrew the adjustable valve from the right hand threaded hole on the top face of the body block. Ensure the port, and threads, are free of foreign matter. Disassemble the adjustable valve and re-grease the valve seat and valve screw. Replace the thin O-ring (p/n 0330214) and refit the valve.

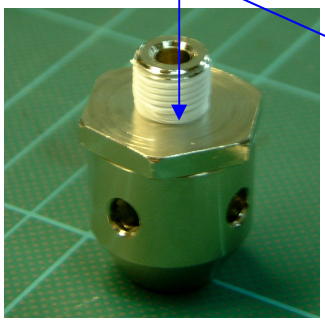
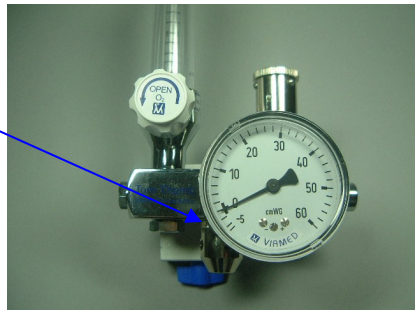


3. Unscrew the blanking bolts from the threaded left side hole and remaining threaded hole on the bottom face of the body block respectively. Ensure the ports, and threads, are free of foreign matter. Replace the thin O-rings (p/n 0330214) on the blanking bolts and refit into the body block.





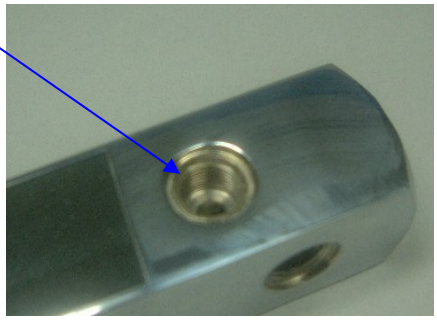
4. Remove the precision valve. Ensure the port, and threads, are free of foreign matter. Remove the original PTFE tape and the thin O-ring and replace with new tape and O-ring (p/n 0330214). Refit the precision valve into the centre bottom threaded hole.

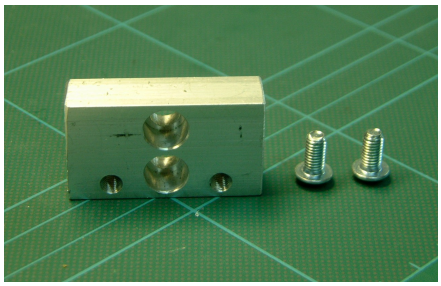
5. Unscrew the Flowmeter and remove the flowmeter bolt from the right hand non-threaded hole in the body block. Ensure the port, and threads, are free of foreign matter. Replace the thin O-ring (p/n 0330214) & thick O-ring (p/n 0330213) and refit the flowmeter bolt and flowmeter.



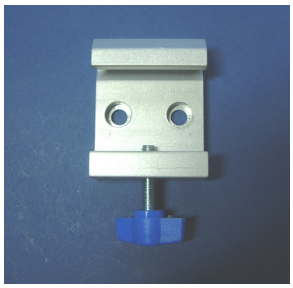
6. a). Unscrew the pressure gauge. b). Ensure the port and threads are free of foreign matter. c). Insert a new diamond copper washer into the single threaded hole on the label side of body block. d). Screw in the pressure gauge and use the 14mm open ended spanner to tighten; the gauge should appear straight in comparison to the block and not able to be removed without the aid of tools.

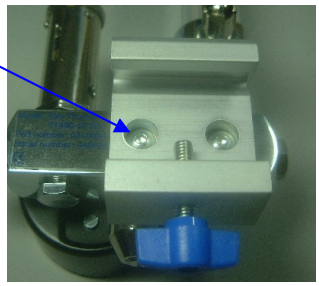



7. Attach the spacer block to the body block.

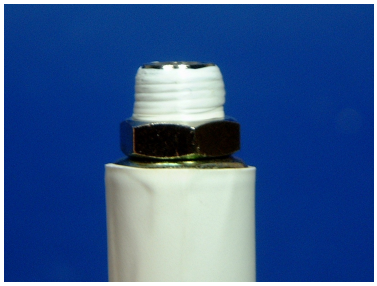


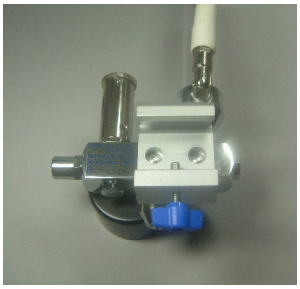

8. Attach rail clamp to the spacer block.





9. Remove the original PTFE from the inlet hose threads and right angle adapter. Line the thread of the inlet hose with two complete layers of new PTFE tape and refit the hose into the inlet hose right angle adapter using 12mm open-ended spanner ensuring it is tight.





Testing & Calibration: TT490.

1. Check the TT490 for damage.

2. Set the adjustable valve to minimum (fully counter clockwise) and the flowmeter to minimum (fully clockwise).

3. Connect the inlet hose to the oxygen supply at a pressure of 4 bar.

4. Connect the digital manometer (on 0-100.0 mbar range) with T piece adapter to the Tom Thumb outlet.

5. Set the flow meter to 5 Lpm.

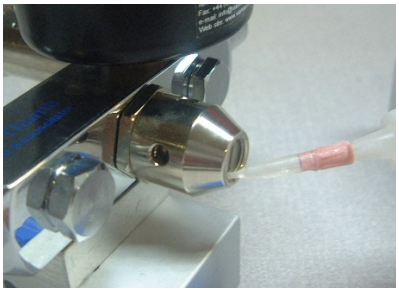
6. Check all mechanical connections between parts for leaks; use Snoop fluid and check for bubbling.

7. Check for minimum pressure out: Cover the T piece adapter port. Check the TT pressure gauge is less than 8.0 cmH_2O. Check that the digital manometer reading is less than 7.8 mbar and record.

8. Set up the adjustable valve: Set the adjustable valve control to maximum. Cover the holes in the precision valve and the T piece adapter port. Alter the adjustable valve collar until a reading of 43 - 47 cmH_2O is achieved on the TT pressure gauge. Ensure a reading of 42.2 – 46.1 mbar on the digital manometer and record. Slightly unscrew the adjustable valve and apply oxygen-compatible adhesive to the exposed threads. Retighten the adjustable valve with the adjustable spanner.

9. Check for TT pressure gauge sticking: Release and cover the T piece adapter port a number of times, ensuring that TT pressure gauge returns to 43 - 47 cmH_2O. Uncover the precision valve holes.

10. Set up the precision valve: Cover the holes in the adjustable valve and the T piece adapter port. Ensure a reading on the TT pressure gauge of 3.0 cmH_2O greater than the reading recorded at (8). Record the digital manometer reading. If a valid reading cannot be obtained, slightly unscrew the precision valve adjustable screw and apply oxygen-compatible adhesive to the exposed threads. Screw into the precision valve body until flush. Cover the holes in the adjustable valve and the T piece adapter port. Carefully adjust the precision valve screw in quarter turns to achieve a reading on the TT pressure gauge of 3.0 cmH_2O greater than the reading recorded at (8) (Clockwise adjustment on precision valve screw to increase). Record the digital manometer reading.



11. TT pressure gauge accuracy check: Cover the T piece adapter port and increase the flow of gas to achieve a displayed reading of 50 cmH_2O on the TT pressure gauge. Ensure a reading of ± 2% of the Precision Valve Reading on the digital manometer and record.

12. With the Flowmeter set at 15Lpm, gently shake the unit to check that the ball remains at the correct reading (not sticking), and then turn the Flowmeter and adjustable valve to minimum. Disconnect from oxygen supply and disconnect the digital manometer.

13. Clean the Tom Thumb with isopropyl alcohol.

14. Attach the TT490 Instructions for Use card (p/n 0390007).

TOM THUMB CALIBRATION / SERVICE SHEET.

Description.	Tom Thumb.	**Serial No.**	
Model.	TT 490.	**Time & Date of Service / Calibration.**	

Record the manometer reading in millibars below, ensuring the TT490 meets the limits specified.

Test Equipment	**Test**	**Specification**	**Reading** / **Calibration**	**P/F**
Snoop liquid.	Check all ports / connections for leaks.	No bubbling.		
Manometer	Adjustable Valve: @ 5 Lpm	Minimum: $\leqslant$ 4.8 cmH_2O.		
Manometer	Adjustable Valve: @ 5 Lpm.	Tolerance: $\geqslant$ 43 & $\leqslant$ 47 cmH_2O.		
Manometer	Precision Valve: @ 5 Lpm.	Maximum: +3.0 cmH_2O over the adjustable valve setting.		
Manometer	Pressure Gauge Test: @ 50 cmH_2O.	Tolerance: ± 2% of Precision Valve Reading		
Visual check.	Flowmeter readings remain stable after shake test.			
Visual check.	Gauge cannot be removed without tools.			
Visual check.	Gauge appears straight.			
Visual check.	All adjustable settings are set to a minimum.			
Visual check.	Labels are attached.	CE Label.		
		Viamed Flowmeter Label.		
		Serial Number Label.		
		Tom Thumb Label.		

Service.		**Parts Replaced.**	
Changed O-Rings		Diamond Copper Washer	
Re-greased Adjustable Valve Internal Parts		Adjustable Valve	
Re-calibrated Tom Thumb		Adjustable Valve Internal Parts	
		Safety Valve	
		Safety Valve Internal Parts	
		Pressure gauge	
		Pressure Gauge Face	
		O-Rings	
		Flow Gauge	
		Flow Gauge Cover	
		Outlet	
		Inlet	
		Blanking Bolts	
		Rail Clamp	
		Main Body Block	

Calibration: …… **Signed:** ……