APPENDIX SIX: PUMP REPAIR WORKSHOP June 2025

Pump Repair Workshop

Jun 17 – 22





The morning of the first day: reviewing how to wire and care for the pumps properly. Thomson Ngupete (with red hat), who normally conducts interviews of solar pump customers, teaches the technicians how to tie a tripod of sticks (Ndodo Zitatu) to hang the pump vertically in the water to increase its' operating life. Other important tips: never hang the pump by its wire (only by its handle) and never run the pump when in the air (only when in the water). The technicians promise to teach the customers these key tricks to ensure longevity.


Afternoon of the first day: Gilbert demonstrates the repair of the 2024 series small pump. Repairing the small pumps is intricate work, involving many steps.


Testing Gilbert's repaired pump in the test pond, using two 18V Forever Batteries in series to simulate full sun on this cloudy day.

Learning how to fix the other year (2022, 2023, 2025) small pumps on the second day of the workshop.




Each technician, fixing a pump on their own, with coaching, but no hands-on help.




The first challenge: fixing a pump on your own.







Testing their own repaired pumps in the test pond. Middle Photo Above: Agness' repaired pump worked so well, she got soaked!






On the third day, fixing the brushless "big" pumps with electronic innards. Compared to the small brushed pumps, they were easier to repair. Update: immediately after this workshop, we completed our tests on twelve models of brushless pumps, and picked the top two performers, the ones that run well on just one solar panel, even in cloudy conditions. The first 200 of these new pumps arrive in just a few days by shipping container (end of October, 2025), along with one thousand 370W solar panels.


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Hope Chisale / Operations Manager, and Rachael Kanyere / Solar Shops Distribution Manager (bottom right photo).

At the end of the third day the technicians were awarded Solar Pump Repair Technician Certificates (see separate album). The day was topped off with an evening visit to Jacaranda Cultural Center to hear the Sounds of Malawi musician Agorosso. Dancing and much joy ensued.

We originally planned only a three day workshop, but Agness Makwale spoke on behalf of many of the technicians, asking for a longer workshop to solidify their skills. 10 of the 13 technicians stayed for the spontaneously added fourth day.

Fourth day was a review, disassembling and re-assembling a new 2025 pump, as well as repairing all the remaining broken small and big pumps to take back to the village shops.
In the afternoon we had a good discussion with the four shop chairpersons (Agness Makwale/Jali, Rhoda Chizenga/Chikwawa, Annie Jimu/Nsanje, Shawa Kapata/Machinga) about the possibility that a representative from each shop could form the Membership of the Affordable Solar for Villagers (AS4V) NGO. Legally, the Membership needs to meet once a year to advise the Board of the NGO. All the chairpersons, as well as the other technicians, liked this idea. The AS4V Board of Directors met the next day and endorsed this plan; the Board Administrative Committee will work out the details. Another idea from the afternoon discussion: Mavuto and Shawa proposed a travelling demonstration kit of SolarKuMidzi products, to increase the market "watershed" area around each village shop.

The technicians were sent home with repair parts and tool kits:
Below Left: the pump repair parts kit: Lower gasket, upper pipe outlet gasket, two brushes, the spring-loaded shaft seal, the bearings, two short bolts and nuts (for the pipe outlet gasket) and six long bolts and nuts (for the main gasket). For the start, each technician gets three repair parts kits, one for 2024 pumps and two for other years. The village shops will stock replacement parts kits. Next week we will receive and air shipment of 1,000 upper main gaskets, 100 - 2024 impellers and 200 other-year impellers. These supplemental parts will also get bagged up and sent out to the shops.
Below Right: the pump repair technician's tool kit: sandpaper, 8mm T-wrench, screw driver, electrical tape, small hammer, permanent marker (for putting customer's name on the pump to be repaired), RTV silicone sealant, pliers, 8mm wrench, voltage display and resisters (for continuity and voltage testing) and 3 repair parts kits (two for typical years, one for 2024). Not shown: rebar rod with ground round end, devised by Gilbert to create a punch to hammer recalcitrant bearings out of their pump frame sockets.

Afterword: Thomson Ngupete organized a WhatsApp group chat for those technicians with cell phones (all but three). It's a lively chat, with techs sharing repair tips with each other almost every day. Annie is especially active on it, proudly sending short videos of working pumps that she has repaired. Trevor, Mavuto, Hellenes, Mr. Shawa, Rhoda and McFord are also quite "noisy" on the chat (Malawians use "noisy" as a compliment for being actively engaged).