

Van Plumbing Build Guide

AU Build Spec + US Equivalent Parts Mapping

Version v4 — April 2026

45
NUMBERED
ITEMS

**AU +
US**
SOURCING
PATHS

**Step-by-
step**
INSTALL FLOW

v4
CURRENT
DRAFT





Full Van Plumbing Guide

Every part you need is listed, no matter what van you have.

My background

Seven house flips. One garage conversion. One van, rebuilt three times over six years. I've made the expensive mistakes so you don't have to. What's in this guide is what I'd tell myself on day one, starting with the thing that causes the most hidden damage in any build: the plumbing.

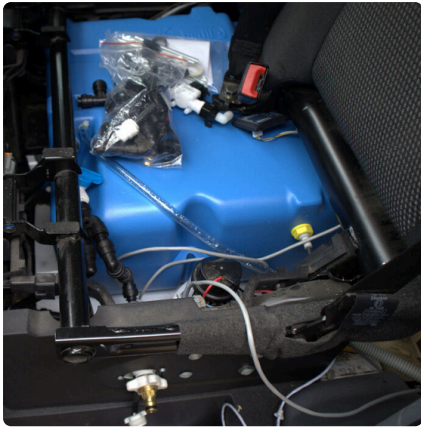
Start Here

This guide is written as a real install sequence. Follow this order and you avoid the two things that ruin most van plumbing jobs: inaccessible service points and hidden leaks behind finished walls.

How to use this correctly

1. Read the full guide once before cutting or drilling anything.
2. Physically mark tank, inlet, sink, shower, and hot-water locations in the van before ordering final parts.
3. Use the front and rear diagrams to plan your own line runs, count all parts required, and order them.
4. Test the system before closing in any walls.

My Van Visuals



Fresh water tank and pump.



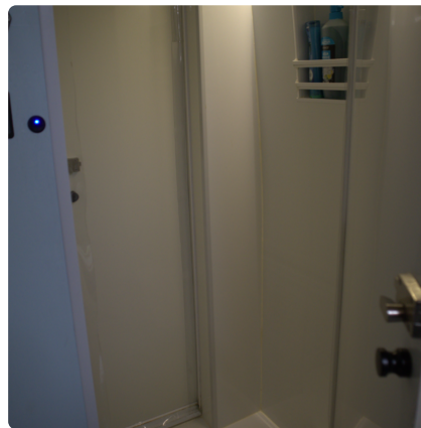
Water inlet.




Testing mode hot water tank.



The shower head and mixer.



Shower from the inside.

 Water gauge display

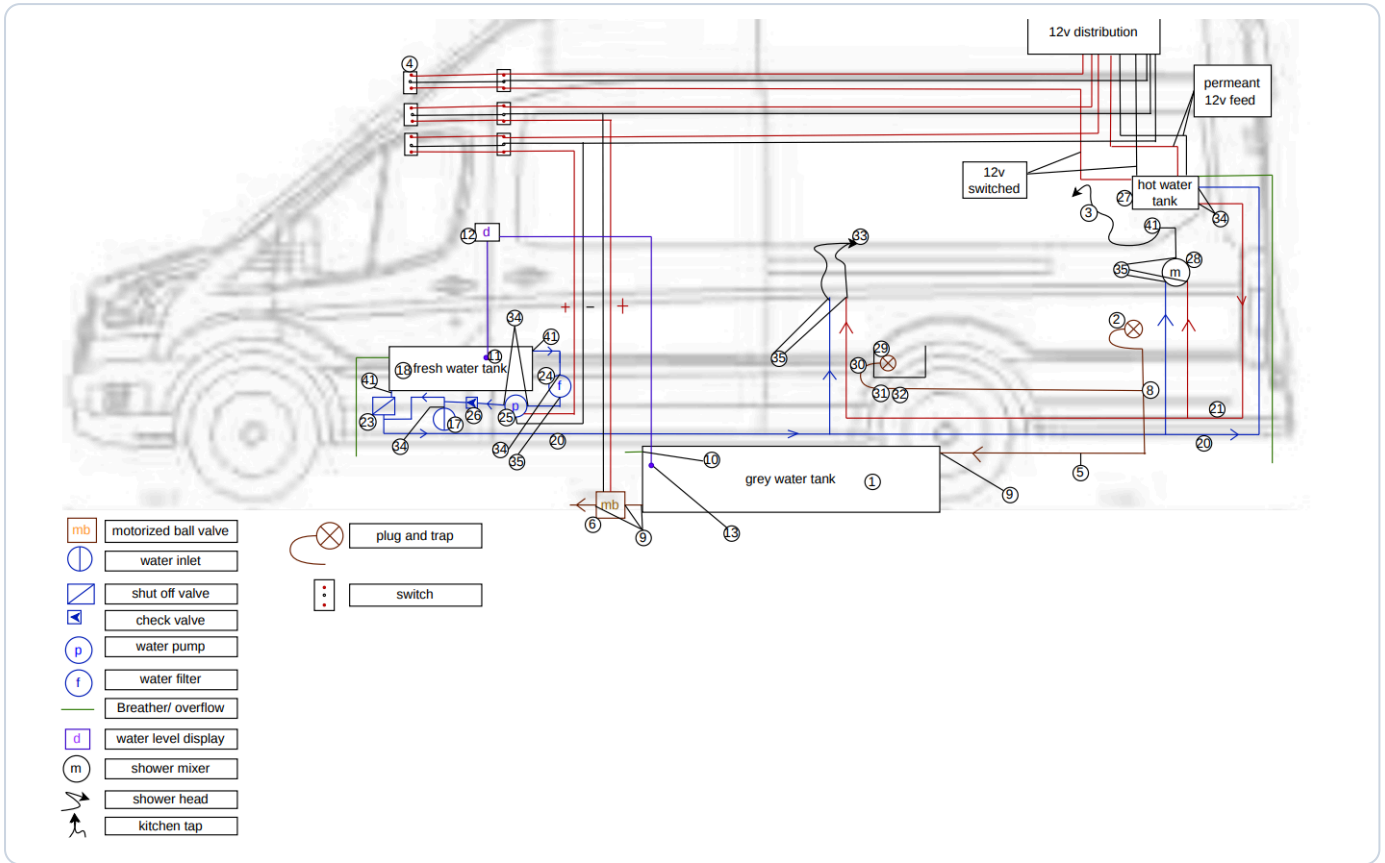
Water gauge display.

Build Gate

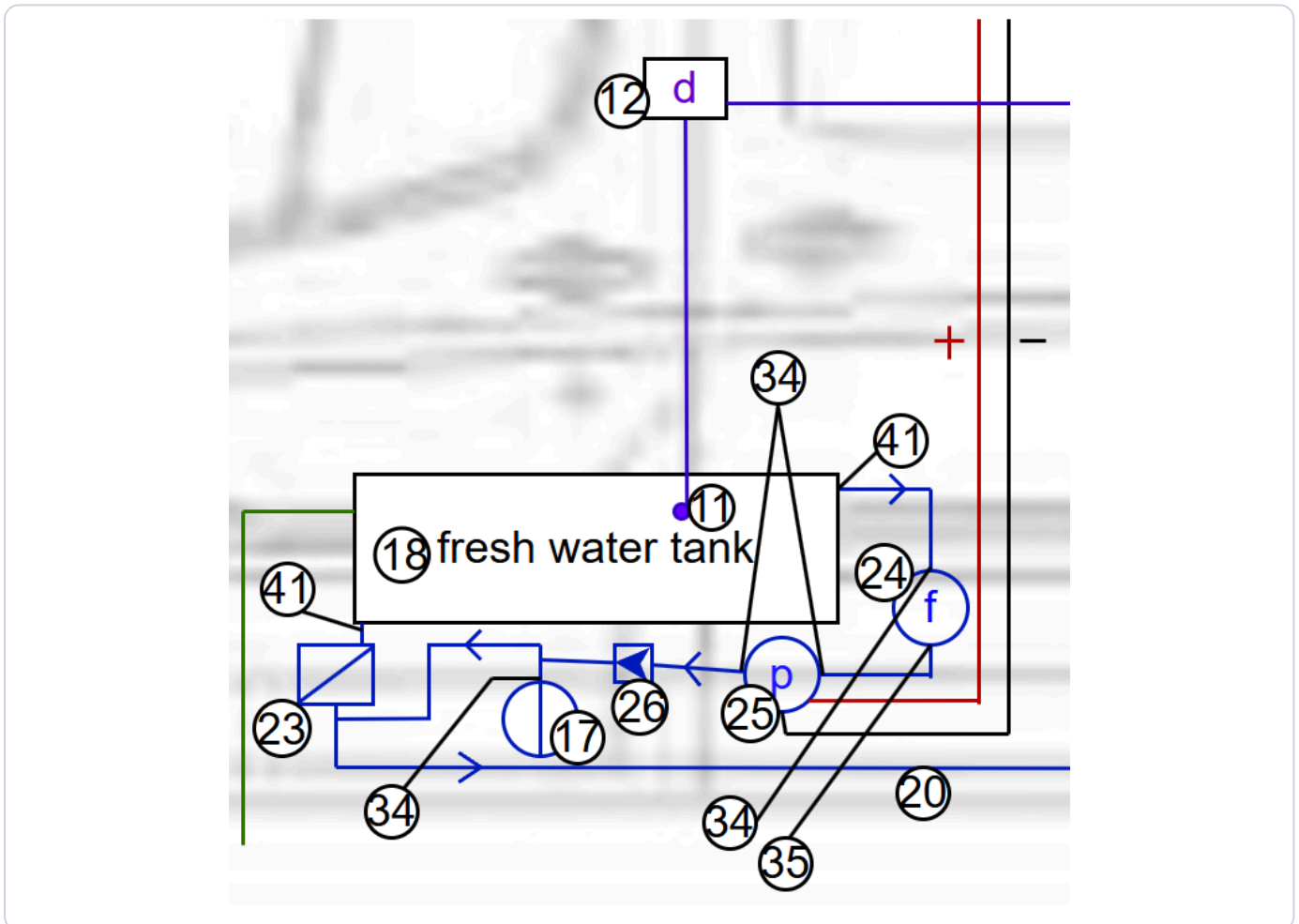
1. Tanks: measure tank areas and make sure the tank is secure and all connected parts are accessible. Grey tank needs protection from exhaust pipe underneath. Keep it as high as possible. If inside the van, keep it lower than all traps.
2. Work out placements of all main parts: filter, pump, check valve, water inlet, shut off valve, kitchen sink and tap, shower mixer and hose, hot water tank, grey tank, sink trap, shower drain and trap, motorized ball valve. After this, map all hot, cold, and waste pipe runs plus fittings.
3. Order parts based on final mechanical layout and line lengths.
4. Fit off plumbing (even temporary). If any parts are not ready, use stop end connectors. Confirm the full system works with no leaks.
5. Electrical side of plumbing last: switch placement and cable runs to hot water (if electrical), water pump, and motorized ball valve.

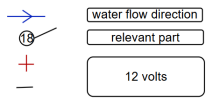
Install tip: Do plumbing and electrical before insulation. For pipes through the floor, use loom tube (43) and seal around with expanding foam can (48) applied with the foam gun (47). The foam gun gives better control than cheap cans.

Full Van Overview (for US see table section)



Front Zoomed Diagram





Legend to water tank.



Water tank (18).



Water inlet (17).



Filter (24).



Water pump (25).



12mm check valve (26).



12mm shut off valve (23).



12mm equal tee (36).



12mm elbow (37).




12mm push on joiner (38).



12mm female adaptor (34).

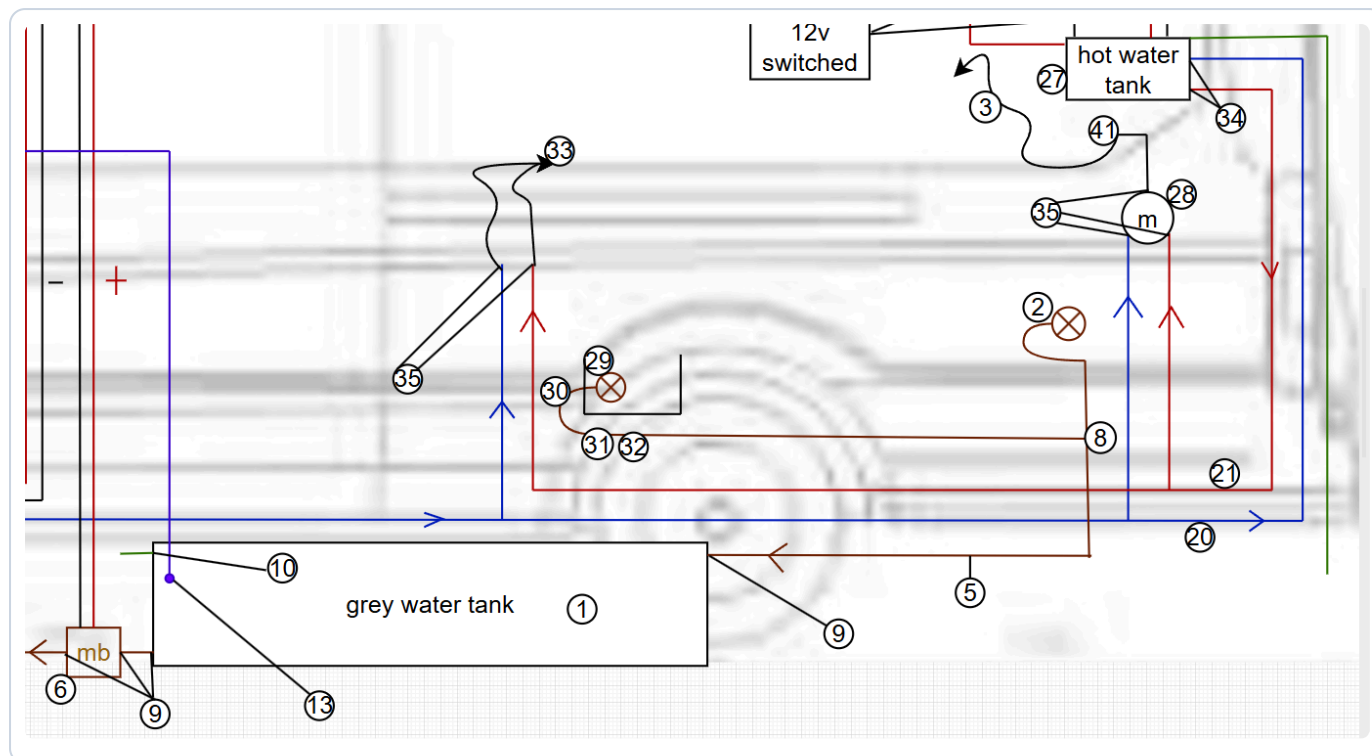


12mm male adaptor (35).



Sender probe (11).

Rear Zoomed Diagram



Sender probe (13).	Kitchen sink (29).	Kitchen sink trap (30).	Shower drain and trap (2).	Motorised ball valve (6).
Tank barb outlet (10).	Barbed director 25mm (9).	Barbed Y tee (8).	50mm to 25mm adaptor (32).	12mm bulkhead connector (41).
Blue hose.	Red hose (21).			

Parts list Australia

Note: When buying, follow the exact sizes written in the table. Some listings have selectable size options. All parts in this guide are listed below with clickable links. All hoses are toxic-free drinking water hoses. You can build cheaper with standard glued hardware-store plumbing, but a van moves and vibration can stress rigid glued pipe runs. The parts I listed are chosen for flexibility and are better suited to van life movement.

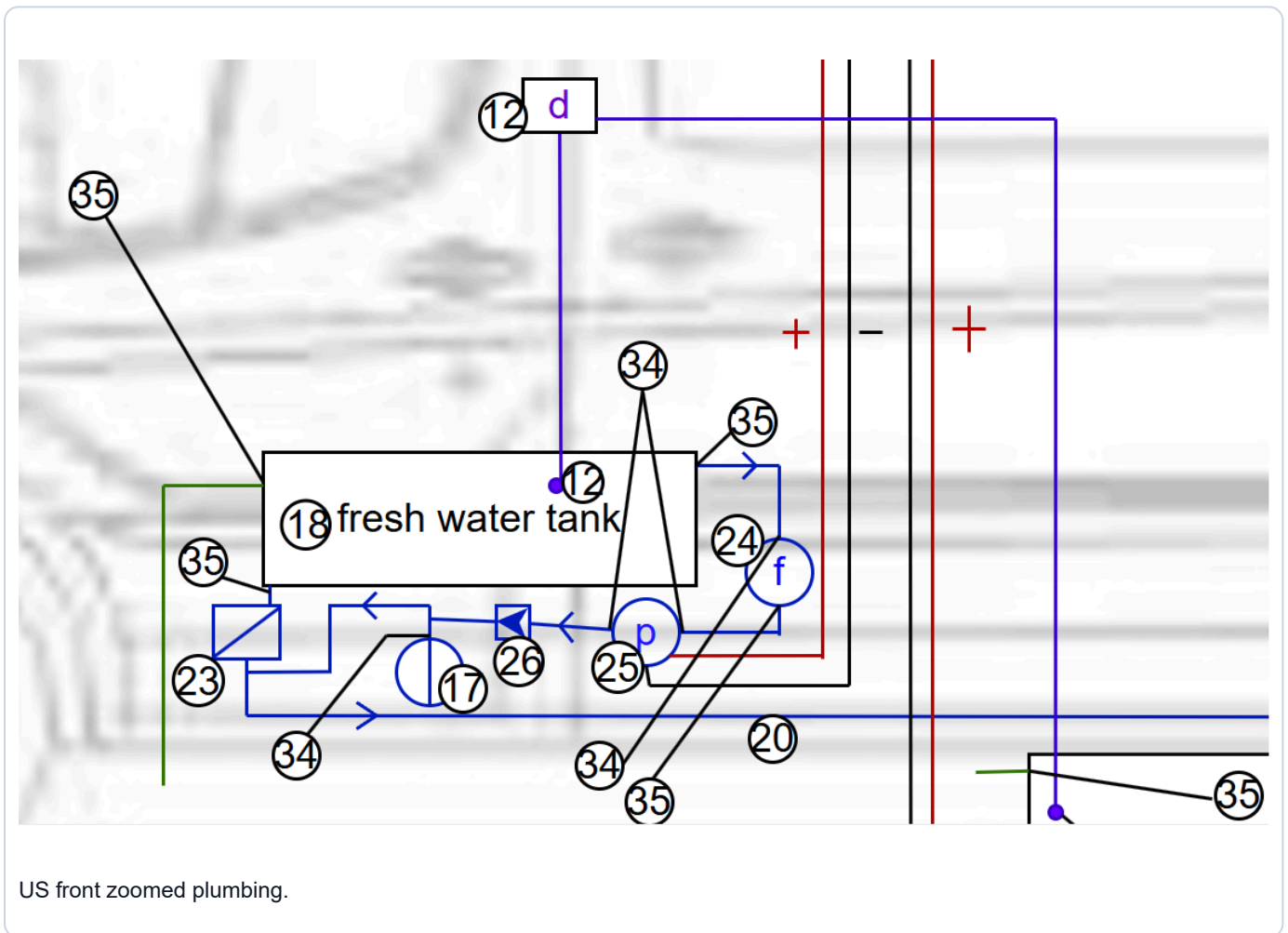
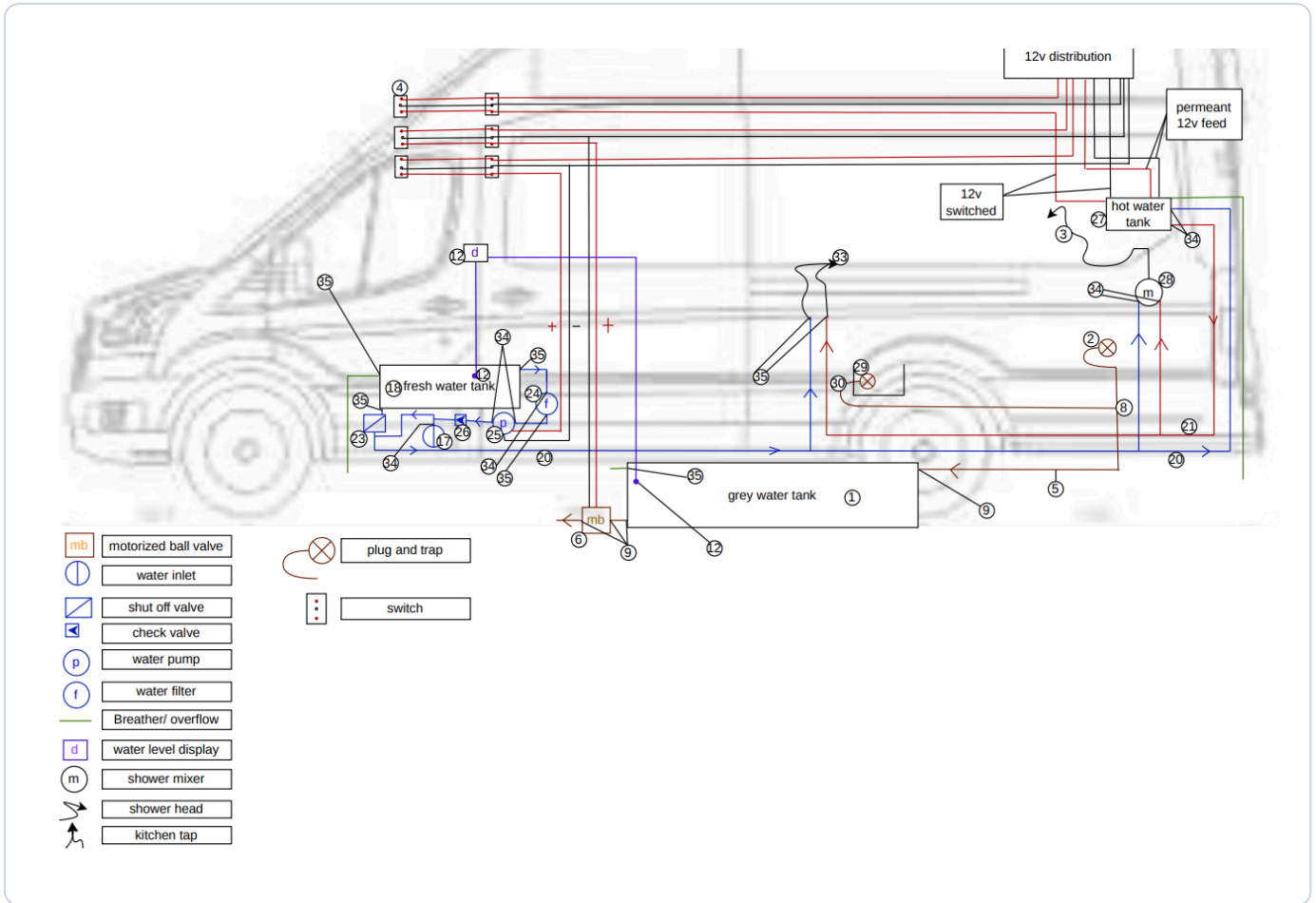
AU note: Atlas Tanks in Australia does molded tanks, and they have premolded options for certain vans.

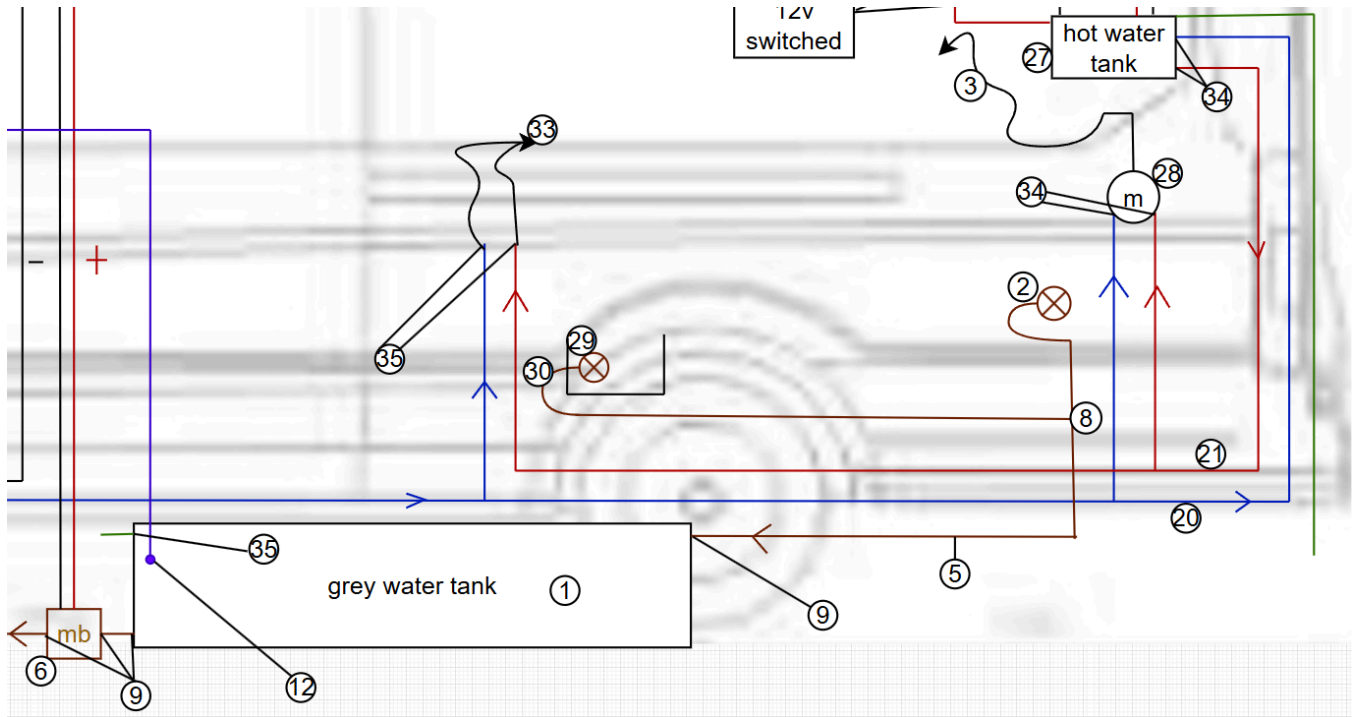
Number	Quantity	Price	Name of part	Click link
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1	1	\$129	Grey water tank	outback equipment
2	1	\$25.95	RV sink drain kit 25mm	Ebay
3	1	\$9.99	Shower head	Ebay
4	2	\$19.59	10 Blue light switches (only 6 required if following my plumbing setup)	Ebay
5	1	\$44.99	10m sullage hose 25mm	outback equipment
6	1	\$89.99	motorized ball valve 12v 1" BSP	Ebay
7	1	\$16.99	350 piece 19 types crimp connectors	Amazon
8	1	\$17.50	barbed Y tee 25mm	outback equipment
9	4	\$4.99	barbed director 25mm	outback equipment
10	1	\$5.99	tank barb outlet(for breather)	outback equipment
11	1	\$43.99	water sender probe 5m	outback equipment
12	1	\$64.95	double water tank gauge	outback equipment
13	1	\$79.95	water sender probe 7.5m	outback equipment
14	1	\$15.99	22 pcs 25mm cable clamp, rubber pipe strap	Amazon
15	1	\$19.02	20 pcs 10mm rubber lined pclips	Ebay
16	1	\$24.99	110ltr water tank fittings grey (if not using motorized ball valve)	outback equipment
17	1	\$80.40	shurflo water inlet	outback equipment
18	1	\$259	fiamma water tank	outback equipment
19	4	\$11	12mm tube inserts 10 pack	Ebay
20	2	\$63.99	blue hose 10m	outback
21	1	\$63.99	red hose 10m	outback
22	2	\$10.99	12mm speed fit locking clips	ebay
23	1	\$24.99	12mm shutoff valve	outback equipment
24	1	\$11.99	shurflo twist on filter	outback equipment
25	1	\$169.99	shurflo pump	outback equipment
26	1	\$34.99	12mm check valve (non return valve)	outback equipment
27	1	\$425	duoetto mk2 12/240v hot water tank (only 300w at 12v)	kick ass
28	1	\$31	estilo shower mixer	bunnings
29	1	\$70	single bowl sink 46 x 40 cm	ikea
30	1	\$9.36	caroma 50mm p trap	bunnings

31	1	\$12.95	50mm x 1m pipe	bunnings
32	1	\$5.42	50mm x 25mm water hose adaptor	bunnings
33	1	\$159.99	kitchen tap spray mode	ebay
34	van specific (count as needed)	\$12.99	12mm x 1/2" bsp FEMALE ADAPTOR	outback equipment
35	van specific (count as needed)	\$12.99	straight 12MM X 1/2" BSP male adaptor	outback equipment
36	van specific (count as needed)	\$13.99	12mm equal tee	outback equipment
37	van specific (count as needed)	\$12.99	12mm elbow (90 degree corner)	outback equipment
38	van specific (count as needed)	\$9.99	12mm push on joiner (as a just in case)	outback equipment
39	1	\$49	metal strapping	bunnings
40	1	\$42.99	drinking water hose 10m (to fill up the van)	outback equipment
41	3	\$17.99	12mm bulkhead connector (for shower hose and the 2 x entry points in fresh water tank)	outback equipment
42	1	\$29.99	tube cutter	outback equipment
43	1	\$22.95	loom tube 20mm	outback equipment
44	4	\$9	Reducing bush for grey tank	outback equipment
45	1	\$5.45	glue for the 50mm pipe reducing to 25mm fitting	bunnings
46	9	\$1.68	Toledo 21-38mm perforated clamp	bunnings
47	1	\$67.95	expanding foam gun	bunnings
48	1	\$32.10	expanding foam can	bunnings

US plumbing diagrams





US rear zoomed plumbing parts.

Parts list US

Note: When buying, follow the exact sizes written in the table. Some listings have selectable size options. You can build cheaper with standard glued hardware-store plumbing, but a van moves and vibration can stress rigid glued pipe runs. The parts listed in this guide are chosen for flexibility and are better suited to van life movement. For US builds using SharkBite fittings, locking clips and tube inserts are not required.

US finding: I could not find dual-voltage low-wattage heaters in US listings for this setup, so this guide uses AUS J as the source for the Duoetto Gen 3 (12V/120V).

Number	Quantity	Price	Name of part	Click link
1	1	\$192.13	Grey water tank	Tank Mart
2	1	\$47.95	RV sink drain kit 1-1/2"	Amazon
3	1	\$20.00	Shower head	Amazon
4	2	\$12.00	10 Blue light switches (only 6 required if following my plumbing setup)	Amazon
5	1	\$113.08	Flexible PVC waste pipe 1-1/2" 25ft	Amazon
6	1	\$110.27	Motorized ball valve 12v 1-1/2" NPT	Amazon
7	1	\$30.00	Crimp connectors kit (840pc)	Amazon
8	1	\$17.50	Barbed Y tee 1-1/2"	Amazon
9	4	\$31.54	Barbed director 1-1/2"	Amazon
10	1	\$31.54	Barbed director 1-1/2"	Amazon
12	1	See link	Water tank gauge (dual)	Amazon
14	1	\$24.01	Rubber cushioned cable clamp 1-1/2" (20 pack)	Amazon

15	1	\$10.00	Rubber cushioned cable clamp 1/2" (20 pack)	Amazon
17	1	\$50.00	Shurflo water inlet	Amazon
18	1	See link	RecPro RV fresh water tank 16 gallon	Amazon
20	2	\$18.00 each	SharkBite 1/2" PEX tubing 25ft	Amazon
21	1	\$18.00	SharkBite 1/2" PEX tubing 25ft	Amazon
23	1	\$15.00	1/2" shutoff valve	Amazon
24	1	\$12.00	Shurflo twist-on inline filter	Amazon
25	1	\$75.00	Shurflo pump	Amazon
26	1	\$14.00	1/2" check valve (non-return)	Amazon
27	1	~\$475 USD	Duoetto Gen 3 Dual 12V/120V water heater (only 300W at 12V)	AUS J
28	1	\$35.00	Shower mixer	Amazon
29	1	\$40.00	Single bowl sink (Fyndig size 46x40cm)	IKEA
30	1	\$10.00	Keeney polypropylene P-trap 1-1/2"	Amazon
33	1	\$35.00	Kitchen tap spray mode	Amazon
34	1	\$12.00	SharkBite 1/2 x 1/2 female adapter	Amazon
35	1	\$12.00	SharkBite 1/2 male adapter	Amazon
36	1	\$32.00	SharkBite tee	Amazon
37	1	\$24.00	SharkBite 1/2" 90 degree elbow pack	Amazon
38	1	\$9.99	SharkBite 1/2" straight coupling pack	Amazon
39	1	\$18.00	Metal strapping (grey tank support)	Amazon
40	1	\$20.00	Drinking water hose 25ft	Amazon
42	1	\$15.00	Tube cutter	Amazon
43	1	\$12.00	Loom tube 3/4"	Amazon
46	1	\$18.00	Hose clamp assortment kit 1/4"-1-1/2"	Amazon
47	1	\$50.00	Expanding foam gun kit	Amazon

Fitment warning: Thread standards can differ (BSP vs NPT). Confirm thread type and size before ordering threaded fittings.

US note: If sender probe/gauge parts are unavailable locally, you can use the Australian links and select international shipping.

Fresh water tank

Measure your available install area first for both fresh and grey tanks so the selected tanks fit your van when measured correctly. The listed tanks are examples of sizes and setup used in this build, not van-specific mandatory parts.

This is the highest-risk section for hidden leaks, so do it in sequence:

1. Prepare the tank before install: total 4 penetrations. Top fitting is the vent/overflow line, sender probe is (11), and for the Australian fresh tank use bulkhead adaptors (41) to fit the inlet and outlet at the top of the tank. For the Australian fresh water tank, the breather line comes with the tank. On the outlet side, run pipe into the tank on one side of the adaptor, with the other side continuing to filter (24).
2. Drill probe hole to exact sender spec, install with supplied grommets, then clean all plastic debris out of tank before mounting.
3. Route the vent/overflow line from the top fitting down below the van. During mains filling this line is your full indicator: once it expels water steadily, stop mains flow.
4. Run plumbing in this order: tank outlet -> filter (24) -> pump (25) -> check valve (26) -> tee (36). From there branch to taps/hot water, and branch to shut-off valve (23) for mains fill return to tank.
5. Shut-off valve logic: keep valve (23) closed in normal pump mode. Open only while filling from mains, then close again when filling is complete.

Safety: isolate 12V power before wiring/rewiring pump or hot water feeds.

Water quality: use potable/drinking-water-rated hose for all fresh-water runs (20/21). Sanitise tank and lines before first drinking use, then flush fully.

Kitchen sink

Run pipes so they are accessible under the sink for final fit-off. Same for the sullage hose (5). Fit sink trap (30) so the water seal stays in place and blocks grey odour return.

Shower

Select where mixer (28) is going. Leave external wall skin off until mixer and bulkhead connector (41) are fixed and tested. Shower drain kit (2) is a drain-and-trap unit; install as one complete assembly so the trap seal is active from day one.

Hot water tank

Secure on a level surface as close as possible to shower so you do not waste water waiting for heat. Connect overflow as per hot water system diagram. Hot water unit requires a permanent 12V feed and a switched feed. This system runs on 12V, draws about 27 amps while heating, and usually takes around 1 to 2 hours to get hot depending on the temperature setting.

For terminal assignment, fuse size, cable gauge, and isolation method, see my Electrical Guide for this build. It is a separate required companion document for the hot water wiring section.

Switch bank (electrical)

Use switch banks for pump, motorized ball valve (6), and hot water controls. I used 3 switches in house area and 3 in cab area for convenience. Keep labels clear and include the fresh-water fill reminder: valve (23) open for fill only, closed for normal pump operation.

Grey tank

Before install, drill/connect holes like fresh tank. Use 25mm director at top for inlet. For outlet in this design use a barbed outlet at lowest point, drill out fully as needed, then connect flexible hose to motorized ball valve (6). Use fitting (10) at the top as the grey tank vent/overflow connection, routed externally. Connect sender probe and display unit (12). Clean tank before final install. Under van, secure with metal strapping (39) in multiple points.

Australia setup note: the listed grey tank (1) uses 40mm inlet and outlet ports. Fit reducing bush (44), then screw in the 25mm director (9). Chain order is reducer bush (44) -> director (9) -> 25mm hose (5) -> motorized ball valve (6), with jubilee clips (46) on all barbed joins. US setup note: use equivalent tank sizes and confirm the grey tank inlet/outlet are 1-1/2"; also verify the breather fitting size before ordering.

Heat and placement warning: keep grey tank and hoses clear of exhaust heat paths. Add shielding/spacing where needed before final clamp-down.

Legal warning: do not dump grey water while driving or in prohibited areas. Use only legal dump points and local-compliant release practices.

Fixing pipes






Secure under-van pipes using clips for 12mm hose (15) and clips for 25mm sullage hose (14).

Freezing weather warning: if the van will be used in freezing temperatures, insulate all external pipes to help prevent freezing and pipe damage.

Do not force drain geometry late. If routing feels wrong at any point, stop and re-route before clipping lines. Fixing drain fall problems after close-up is one of the most disruptive repairs in a van build.

Pipe Join Method (No-Leak Standard)

This is the repeatable method that keeps push-fit systems reliable long term. A bad join looks fine at install and fails under vibration or pressure weeks later. For US SharkBite builds, locking clips are not required.

				
<p>1. Measure run and mark cut point precisely.</p>	<p>2. Square cut only -- tube cutter, not a saw.</p>	<p>3. AU speed-fit/JG: push tube insert fully into pipe end until flush. US SharkBite: do not add a separate tube insert; SharkBite Max has no separate insert, and older U-series has a pre-loaded stiffener you leave in place.</p>	<p>4. Push pipe fully into fitting until it bottoms out.</p>	<p>5. AU speed-fit/JG: seat locking clip and tug-test the join. US SharkBite: locking clip not required, but still do the tug-test.</p>

No angled cuts. No partial insertion. A push-fit join not fully seated will leak under vibration even if it holds during a bench test. If a join feels questionable, pull it apart and redo it now.

Routing and protection rules

- Loom tube on every floor pass-through -- no exceptions.
- Clip lines so they cannot rub on sharp edges or sheet metal cuts.
- Keep hot lines separated from wiring looms on long parallel runs.
- Leave a service loop near pump and filter connections -- enough slack to disconnect and reconnect without unclipping the whole run.
- Keep hose runs short and direct. Long detoured runs lose pressure and make fault-finding harder.

Threaded fittings (pump, check valve, filter)

- Hand-start all threaded fittings before tool-tightening. Cross-threading a plastic body is a common failure point.
- Use PTFE tape on all male threads -- 2 wraps minimum, clockwise onto the thread direction.
- Snug is enough. Over-tightening plastic fittings cracks bodies or distorts the seat. If it weeps after 2 wraps and snug, add one more wrap -- do not over-torque.

Noise and vibration: mount pump on rubber isolation pads and ensure hose runs have at least 50mm of flex near the pump ports. Rigid pipe directly into pump ports transmits vibration through the full line and works push-fit joins loose over long road distances.

Staged Testing Protocol

Do not run a single end-of-build test. Test at each stage so problems are isolated to the zone just completed. A leak found before walls are closed is a 10-minute fix. The same leak found after close-up is a half-day teardown.

STAGE T1 -- FILL TEST (BEFORE PUMP RUNS)

Partially fill fresh tank to 30-40%. Do not run pump yet. Inspect every tank fitting, vent port, and fill fitting for seepage. Fill at realistic speed and confirm vent behaviour -- the vent should exhale freely and not dribble back through the fill port.

Pass: zero seepage at all tank fittings after 10 minutes standing. Vent breathes freely at fill speed.

STAGE T2 -- PUMP PRIME AND AIR PURGE

Power the pump with all fixtures open. Water will sputter then flow as air is purged branch by branch. Open one outlet at a time, wait for solid flow, close, move to next. Do not let the pump run dry for more than 30 seconds.

Pass: solid continuous flow from every fixture. No sputtering on second run through all outlets.

STAGE T3 -- PUMP CYCLE TEST (CRITICAL GATE)

Close all fixtures and taps. The pump should reach cutoff pressure and stop. It must then remain off. If it short-cycles (runs briefly every 20-60 seconds with no taps open) there is a pressure-side leak or a check valve fault. Do not proceed until this passes.

Pass: pump stops within 10 seconds of all taps closed and stays off for at least 3 minutes.

STAGE T4 -- PRESSURE HOLD AND TISSUE TEST

With pump stopped and system pressurised from T3, go around every push-fit joint, threaded fitting, and valve with a dry tissue. Press gently for 3 seconds each. Any moisture means pull and redo that joint before continuing. Pay extra attention to elbow and tee joins -- they carry more stress than straight runs.

Pass: every tissue dry. No visible pressure drop over 5 minutes with no taps open.

STAGE T5 -- DRAIN SLOPE TEST

Run sink and shower at full flow for 30 seconds each. Inspect the drain run with a torch -- water must move continuously toward the grey tank with no stalling. Let each fixture run to empty and confirm nothing pools in the drain line.

Pass: continuous flow from fixture to grey tank. No standing water in drain run after 60 seconds idle.

STAGE T6 -- DRIVE CHECK (BEFORE WALL CLOSE-UP)

Take a 10-15 minute drive over mixed road surfaces. Return and re-run T3 (pump cycle test) and T4 (tissue test). Vibration loosens push-fit joints that were only partially seated -- this is the last chance to find them before walls close.

Pass: pump cycle and tissue test both clear after drive. All clips and mounts still secure.

Final rule: do not close walls or seal floor runs until all six stages above are clean. A single damp tissue during T4 means stop and fix. After walls are closed, a leak investigation means panel removal and often partial interior teardown.

Troubleshooting -- Plain Language Diagnosis

Work through each path in sequence. Do not jump straight to replacing parts -- most faults are positioning or seating problems, not component failures.

Pump runs but weak or no flow

1. Check tank level first -- pump running dry sounds similar to a blocked line.
2. Confirm the shutoff between tank and pump is fully open.
3. Unscrew the filter bowl and check for blockage or collapsed cartridge.
4. Inspect the inlet strainer on the pump body for debris.
5. Walk the full line from tank to fixture looking for a kink or a clip compressing the hose.
6. If all above are clear, check pump output pressure at the pump outlet -- low pressure here indicates a failed diaphragm or worn internal valves.

Pump short-cycles with all taps closed

1. Confirm all taps and valves are fully closed -- a dripping tap is enough to hold the pressure switch open.
2. Check check valve orientation and seat -- a stuck or backwards check valve allows backflow that triggers cycling.
3. Inspect all pressure-side push-fit joins for tiny weeps with a dry tissue -- a join that leaks only under pressure will not show at atmospheric pressure.
4. If cycling continues with all joins confirmed tight, test the pump pressure switch by manually blocking the outlet and checking if pressure holds.

Airlock symptoms after tank refill

1. Open the fixture furthest from the pump first. Run until solid flow, then work back toward the pump.
2. If the pump cycles rapidly and water is intermittent, air is trapped in the pump body -- power off, wait 60 seconds, then restart slowly with one tap open.
3. Check the tank vent/overflow line is not blocked or pinched -- a sealed tank creates a vacuum that starves the pump.
4. If airlocks happen repeatedly after every fill, the vent/overflow path has a persistent problem -- re-inspect full route from tank top fitting and clear.

Slow sink or shower drain + grey tank odour

1. Check the trap under the fixture for blockage -- remove and clear if needed.
2. Confirm the trap water seal is present -- a dried-out trap allows grey tank gas back into the van.
3. Walk the drain run and look for a sag or kink creating a standing-water pocket.
4. If slope looks correct but flow is still slow, check the grey tank vent/overflow line from top fitting (10) is clear -- a sealed grey tank cannot accept flow freely.
5. Persistent odour with correct trap and slope: sanitize grey tank with dilute bleach flush, then rinse completely.

Unexpected leak after driving

1. Almost always a push-fit join that was only partially seated at install -- vibration finishes what pressure started.
2. Identify the damp area and work upstream to find the source join.
3. Isolate using the inline shutoff, release pressure, pull the join, and fully reseal with a new tube insert if the pipe end shows any oval deformation.
4. Check all adjacent joins -- if one moved, nearby joins may have shifted too. Re-tug-test the full zone.
5. If leaks recur in the same area, add a bracket or additional clip to reduce movement at that point in the run.

When to stop and re-route: if you have fixed the same symptom more than twice in the same location, the issue is layout geometry -- not component quality. A short re-route is faster than repeated repairs to a poorly routed section.

Guide version v4 -- April 2026. Adapt all specifications to your van geometry before ordering final parts. AU part numbers and pricing correct as of build snapshot date.