

TROUBLESHOOTING GUIDE

SUBURBAN TANKLESS ON DEMAND RV WATER HEATER



MODELS:
ST42A, ST60A
FOR RECREATIONAL
VEHICLE USE ONLY

To use this guide, look up the symptom in the FAULT column. Test each possible cause in the order listed using the steps provided to determine what corrective action to take.

If an ERROR code is present, look up the ERROR CODE using the column provided. Test each possible cause in the order listed using the steps provided to determine what corrective action to take.

ERROR CODES



FAULT INDICATION	CODE MEANING	FAULT CAUSE	FAULT CONDITION
E0	Outlet Temperature Probe Fault	Outlet temperature probe is open or shorted.	LOCKED
E1	Ignition Failure, No Ignition.	Flame signals undetectable after igniting three times.	LOCKED
E2	“False Fire Fault” “Residential Fire Fault”	Flame signals detected before start.	LOCKED
E3	High Limit Fault Detected	Limit switch off.	LOCKED
E4	Inlet Temperature Sensor Fault	Inlet temperature probe is open or shorted.	LOCKED
E5	Fan Failure	No fan speed signal detected.	LOCKED
E6	Over temperature Fault	Outlet water too hot.	LOCKED
E7	Gas Valve Wire Fault	Main Gas valve wire opens or shorts unexpectedly	LOCKED
E8	Pressure Switch Failure	Pressure switch abnormally closed or disconnected	LOCKED
E9	Recirculation Failure	Pump will not prime due to air in recirculation line	LOCKED
En	Water Heater Timeout	Water heater used for longer than 20 minutes	LOCKED
EC	Communication Failure	Line controller communication failure	LOCKED

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FAULT	STEP	POSSIBLE CAUSE	TEST	CORRECTIVE ACTION	IN COACH REPAIR?	ERROR CODE
Water heater will not start	1		Verify fuse is properly seated in both terminals	Remove fuse and insert properly into terminal	YES	N/A
	2	Blown fuse (either)	Check polarity of supply voltage - Black (-12 VDC), Red (+12 VDC)	Correct polarity if incorrect, replace fuse	YES	N/A
	3		Verify blue/black wires are not connected to supply voltage.	Verify they cannot make contact with any possible ground or supply voltage	YES	N/A
	4	Supply voltage	Check incoming voltage - should be 10.5-14 VDC	Troubleshoot RV power supply	YES	N/A
	5	Module Board	Unit keeps blowing fuses during fuse replacement	Verify polarity is correct and blue wires are not connected to supply voltage or ground, verify black wire is not connected to supply voltage or ground. If all this is still corrected, replace Module Board.	YES	N/A
	6	Water flow sensor	Turn one faucet to a very slow trickle of water, then measure voltage between pin #7 and pin #8. The voltage should be fluctuating, if not, try altering the water flow slightly and rechecking voltage.	If voltage remains constant regardless of the flow rate, replace flow sensor	YES	N/A
	7		Check terminals in all wiring harnesses accessible from control panel to verify each terminal is fully seated in harness and no debris is blocking connection between terminals	Reseat terminals in harness if loose, clean terminals if debris is found	YES	E5
	8	Blower not operating	Check voltage between pin #4 (red) and pin #1 (black) on fan input plug on control module board plug - should be 10.0-24.2 VDC Check voltage between pin #3(brown) and pin #1 (black) on input plug on fan control board input block - should be 1.5-3.5 VDC Check voltage between pin #2(white) and pin #1 (black) on input plug on fan control board input block - should be 0.8 VDC	If all voltage parameters are correct, replace Blower Assembly is faulty and water heater must be replaced. If any of these parameters fail, replace Module Board 521454 (ST60A) or 521453 (ST42A)	YES	E5
	9	Communication Error	User Control Panel will only Display EC	Replace Module Board Replace User Control Panel (UCP)	YES	EC

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FAULT	STEP	POSSIBLE CAUSE	TEST	CORRECTIVE ACTION	IN COACH REPAIR?	ERROR CODE
Fan comes on, no spark occurs, fan shuts down after a few seconds	1	Pressure Switch Adapter	Debris/blockage inside pressure tap port located inside exhaust port	Remove blockage from unit	YES	E5
	2	Pressure Switch Hose	Ensure hose connected on both ends, not damaged	Replace pressure switch hose	NO	E5
	3	Pressure switch won't close	Remove wire harness, and check continuity across pressure switch, pin #5(yellow) and pin #6(yellow)	Replace pressure switch	NO	E5
	4	Blower Assembly	Very low RPM (less than 200) is observed, can be tested by placing a small piece of paper approx. 4" from exhaust vent, if paper does not move, or moves very little, replace motor.	Replace water heater	NO	E5
	5	No spark	Check spark electrode gap. Should be 1/8" gap. Also search for cracks on electrode	Replace electrode	NO	E1
Fan comes on, spark occurs, unit fires but goes out, and then repeats	1	Gas Valve	Check brown and red wires going to valve from board. Verify no debris is impeding terminal connection and verify terminals are full seated and secured to spade on valve. Verify terminals on board are fully seated inside harness. Gas Valve resistance should be 80-85 Ohms for the large valve and 120-125 Ohms for the small valve	Correct terminal seating and clear terminal if needed	YES	E1
	1	RV Gas Supply	Verify unit has sufficient LP supply 11-14" W.C.	Troubleshoot RV fuel system.	YES	E1
Fan comes on, spark occurs, unit shuts down after a few seconds	2	Gas Valve	Check voltage at pin #5(red) and pin #6(white) of the gas valve plug on the control module board 521454 (ST60A) or 521453 (ST42A). Should modulate between 7 and 12 VDC considering demand, if 0 VDC is observed, then replace module board. Verify no debris is in terminals blocking connection and that all terminals are fully seated inside the wiring harness. If proper voltage is found, replace Gas Valve 161357	Replace Gas Valve 161357 or Modula Board 521454 (ST60A) or 521453 (ST42A)	Gas Valve No Module Board Yes	E1
			Verify wire plugged in and not damaged	Inspect Terminal and verify it is properly seated	NO	
	4	Flame sense	Verify flame impingement of electrode via viewing window	Clean with nonabrasive pad, make minor position adjustments to cross two flame paths in a perpendicular fashion. If sensor can't be adjusted to proper position, may have to replace flame sense probe	NO	N/A
			Use multimeter on μ A setting, depending on flow, it should read between 14-16 μ A while unit is in operation	Replace flame sense probe	NO	

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FAULT	STEP	POSSIBLE CAUSE	TEST	CORRECTIVE ACTION	IN COACH REPAIR?	ERROR CODE
Fan is in continuous operation regardless of demand	1	Module Board	Fan stays on	Replace Module Board	YES	E6
	1	On demand control center	Check set point	Adjust set point	YES	N/A
	3	Outlet water temperature probe (NTC)	Inspect seating of NTC probe Verify switch continuity. Resistance should be between 4kΩ and 5kΩ	Correct seating of NTC probe Replace NTC probe	NO	E9
Water too hot	4	Limit switch	Check continuity across pin #8(blue) and #8(blue). If not continuous, trace wiring to verify all connections are secure, and measure continuity across each individual limit switch. If the left one does not have continuity, replace it. If the right one has continuity, replace it.	Replace limit switch	NO	E6
	1	Water flow	Verify water flowrate (gallons per minute) at faucet using bucket and stopwatch. Must be greater than 0.7 gpm to function. Very high flowrates or very cold inlet water can also cause cold outlet water.	-	YES	N/A
Water too cold	2	On demand control center	Check set point	Adjust set point	YES	N/A
	4	Gas supply	Verify gas supply is turned on, with a pressure of 11 - 14 " WC	Troubleshoot RV gas supply	YES	E1
	5	Modulating gas valve	Check voltage at pin #5(red) and pin #6(white) of the gas valve plug on the control module board. Should modulate between 7 and 12 VDC considering demand	Replace gas valve	NO	N/A
	6	Manifold Solenoid valve	Open two devices (ex: faucet + shower) to full hot, check for number of flames in viewing port. Should be more than 2 flames present. If only 2 are present, check voltage at pin #1(black) and pin #2(blue) of the gas valve plug on the control module board. If voltage is present, replace valve, if no voltage is present, replace control module board	"Replace gas valve or Replace module board"	NO	N/A
	7	Flame sense	Verify wire plugged in and not damaged	Replace flame sensor	NO	E1
			Verify flame impingement of electrode			
	8	Clogged gas orifice	Use multimeter on μA setting, depending on flow, it should read between 14-16 μA while unit is in operation. Check gas orifice for clogs	Clear gas orifice of clogs	NO	E1

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FAULT	STEP	POSSIBLE CAUSE	TEST	CORRECTIVE ACTION	IN COACH REPAIR?	ERROR CODE
Water temperature repeats going from hot to cold	1	Module Board	Check voltage at pin #5(red) and pin #6(white) of the gas valve plus on the control module board. Voltage should not exceed 12 VDC	Replace module board	YES	N/A
	2	Gas Valve	Gas valve is fully engaged not modulating down	Replace gas valve	NO	N/A
Water inside cabinet	2	Leaking water line	Pinpoint leak location	Tighten components if leak occurs at threaded connection. Replace unit if not	YES	N/A
	1	Vent blocked	Check for blockage in vent	Remove blockage	YES	E5
Combustion/soot present of vent cap	2	Debris inside combustion chamber	Verify all drains are opened, not clogged. Remove side panel of unit and verify it is clean of any foreign contaminants.	Clean unit and drain lines	NO	N/A
	3	RV Regulator/Supply Hose	Verify regulator has sufficient output and supply hose has sufficient inside diameter with no kinks or obstructions	Replace regulator or supply house	YES	N/A
Low gas pressure	1	RV regulator	Check gas pressure	Replace RV regulator	YES	N/A
Excessive soot in exhaust	1	Erratic burner	Check sight glass: all or most of flame should be blue. If flame is mostly yellow, remove unit and clean the area around combustion chamber	Clean area surrounding combustion chamber	-	N/A
	1	Gas valve not sealing properly	Check voltage at pin #1(red) and pin #2(white) of the gas valve plug on the control module board while unit is in shutdown mode.	If voltage is 0 VDC - Replace gas valve If voltage is between 2-7 VDC - Replace control module board	NO YES	E2
Connection error fault	1	Bad User Control Panel	Water heater not functioning	Replace User Control Panel (UCO)	YES	EC
No instant hot water at faucet	1	Recirculation option not turned on at the User Control Panel (UCP)	Check that the recirculation feature is turned on at the UCP	Turn on the recirculation feature	YES	N/A
	2	Air in recirculation line	Check for E9 error	Bleed air from lines via faucets	YES	E9
	3	Pump failure	Check for E9 error	Replace pump	NO	

Using this table:

Look up symptom in "Fault" column, then test each possible cause in order to determine what corrective action to take

If error code is present, look it up in the "Error Code" column at right, then test each possible cause in order to determine what corrective action to take.