

# Troubleshooting Guide – Touchscreen



This document provides a troubleshooting guide for LiquidSpring® **Smart Suspension** systems equipped with a touchscreen. The suspension includes on-board diagnostics to assist in pinpointing potential issues.

## System Alert Indicator:

When a fault in the system occurs, the System Alert Indicator, Diagnostics button, and Alert button will turn red as shown in **Figure 1**.

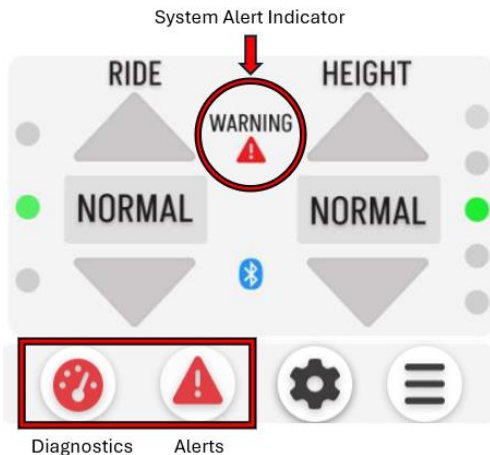


Figure 1. Active Alerts

## Diagnostics Button:

If there is an active alert, pressing the **Diagnostics** button will display the components that need attention as shown in **Figure 2**.

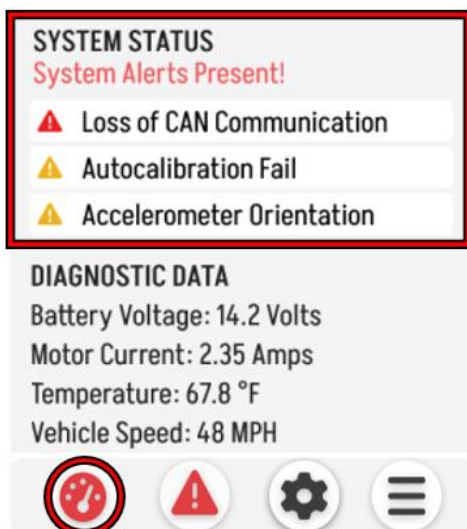


Figure 2. Diagnostics Screen with Active Alert

Clicking on an alert will display the alerts page as shown in **Figure 3**.

## Alerts Button:

Pressing the **Alerts** button will display all faults encountered during the current ignition cycle as shown in **Figure 3**.

Items in **Red** are active faults that have not been resolved.

Items in **Yellow** are past faults that have been resolved.

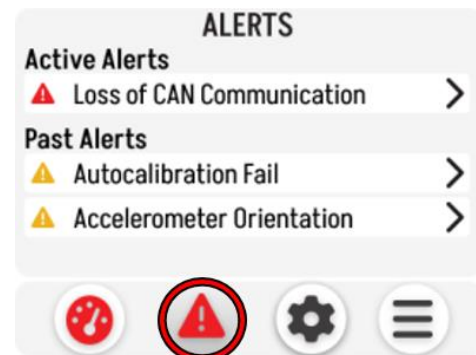


Figure 3. Alerts Screen

Selecting an alert will display a pop-up window that provides an explanation of the error as shown in **Figure 4**.

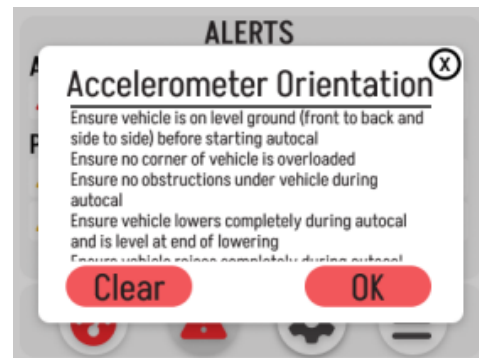


Figure 4. Alert Pop-up

Selecting **OK** will clear the fault message but retain the fault in the listing.

If the fault has been resolved, The **Clear** button will be shown. This button can be pressed to clear the fault message and remove the fault from the listing.

# Troubleshooting Guide – Touchscreen

## Issues with Steering Sensor

Condition	Cause	Correction
Steering Sensor centering further than expected.	Mis-installed steering sensor and/or linkage.	Check steering sensor installation and linkage. Correct as necessary.
Steering Sensor out of range.	Steering sensor arm travels too far.	Check steering sensor installation and linkage. Correct as necessary.
No steering signal (reduced roll control when cornering).	Steering sensor wiring broke or incorrect.	Inspect wiring to steering sensor and correct as necessary.
	Steering sensor malfunction.	Replace sensor.
	Steering sensor not installed correctly.	Inspect installation and correct as necessary.
Steering angle from diagnostics screen is not within $\pm 10^\circ$ of $0^\circ$ with wheels pointing straight ahead.	Zero point of steering sensor incorrect.	Recalibrate the steering sensor.
	Steering sensor malfunction.	Replace sensor.
	Loose connector / wiring issue.	Check connector and wiring. Correct as necessary.
Intermittent steering sensor signal.	Loose connector / wire / sensor.	Check sensor and wiring between Steering sensor and Power module for loose connection.

## Issues with Height Sensors

Condition	Cause	Correction
Height Sensor out of range.	Sensor wiring not connected.	Inspect electrical connector and correct.
	Linkage not connected.	Inspect installation of height sensor and linkage. Correct as necessary.
	Height sensor arm traveled too far.	Inspect installation of height sensor and linkage. Correct as necessary.
	Height sensor malfunction.	Replace sensor.
Height Sensor HIGH/NORMAL/LOW values too similar.	Vehicle didn't raise enough during calibration.	Inspect power module and fluid level. Re-run calibration after correcting.
	Vehicle didn't lower enough during calibration.	Inspect for obstructions and inspect power module. Re-run calibration after correcting.
	Height sensor malfunction.	Replace sensor.
Height Sensor output inverted.	Height sensor/linkage/wiring mis-installed.	Inspect and correct installation of sensor/linkage/wiring. Re-run calibration after correcting.
	Incorrect ECU.	Check ECU part number and correct as necessary.
Vehicle or corner stops leveling at incorrect height.	Damaged height sensor and/or linkage.	Inspect height sensor components. Replace as necessary.
	Incorrect calibration.	Recalibrate vehicle – see System Operation section.
	Incorrect height sensor installation.	Inspect height sensor components and correct.
Corner height where leveling stops is inconsistent.	Sensor or Linkage loose.	Inspect installation of height sensor and linkages and tighten if necessary.
	Loose connector / wire / sensor.	Inspect height sensor and inspect wiring between sensor and power module for loose connection.
Vehicle will not level - no height sensor signal.	Height Sensor wiring shorted, broken, or disconnected.	Inspect wiring between sensor and power module.
	Malfunction in Sensor.	Replace sensor.
No Height Sensor Signal change while driving.	Linkage broken/disconnected.	Inspect installation of height sensor and linkages. Correct and/or replace.
	Malfunction in Sensor.	Replace sensor.
	Loose connector / wire / sensor.	Inspect height sensor and inspect wiring between sensor and power module for loose connection.

# Troubleshooting Guide – Touchscreen

## Issues with ECU

Condition	Cause	Correction
CAN communication malfunction between ECU and Touchscreen.	Loose/broken CAN wires.	Inspect White and White/Black wire connection between dash harness and main harness. Correct as necessary.
	Pinched wires.	Inspect White and White/Black wires. Correct as necessary.
	Loose ECU header connector / wires / pins.	Inspect ECU header connector and correct as necessary.
	Failed ECU.	Replace ECU.
No power to ECU.	Loose battery power wire.	Check Red wire on dash harness. Correct as necessary.
		Check Red wire on dash harness to main harness connection. Correct as necessary.
	Loose/missing ground connection.	Check ground (Black) wire on dash harness. Correct as necessary.
Internal ECU circuitry issue.	Loose battery power wire.	Check Red wire on dash harness. Correct as necessary.
		Check Red wire on dash harness to main harness connection. Correct as necessary.
	Loose/Improper ground wire.	Check ground (Black) wire on dash harness. Correct as necessary.
	Failed ECU.	Replace ECU.

## Issues with Touchscreen

Condition	Cause	Correction
System Alert Indicator is lit, system appears to level.	CAN wires crossed or not connected.	Inspect wiring and repair/replace as necessary.
	Malfunctioning Touchscreen.	Inspect and replace as necessary.
System Alert Indicator is lit, system does not appear to operate (level).	No power to ECU (5A 18ga Red Wire).	Inspect wiring and repair/replace as necessary.
	No ignition signal to ECU (Yellow Wire).	Inspect wiring and repair/replace as necessary.
	CAN wires crossed or not connected.	Inspect wiring and repair/replace as necessary.
Touchscreen will not turn on.	Blown fuses.	Inspect fuses and replace as necessary.
	Unplugged connector.	Verify that the touchscreen is plugged into the dash wiring harness.

## Issues with Vehicle Speed Signal

Condition	Cause	Correction
System leveling excessively while driving.	Speed Sensor wiring shorted, broken, or disconnected.	Inspect wiring and repair/replace as necessary.
	Speed signal malfunction.	Replace OEM speed sensor. See OEM service manual.
	Malfunctioning Height Sensor.	Inspect Height Sensor, connector, and wiring. Repair / replace as necessary. Also see <i>Issues with Height Sensors</i> .
Intermittent speed sensor signal.	Loose connector / wire.	Check wiring between Speed sensor and Power module for loose connection.

# Troubleshooting Guide – Touchscreen

## Issues with Vehicle Raising/Pump

Condition	Cause	Correction
Vehicle Leveled, Pump continues to run.	Pump motor shorted out.	Contact LiquidSpring for further instructions.
	Software issue.	Turn off ignition, wait 30 seconds, restart vehicle.
	Excessive noise in height sensor.	See <i>Issues with Height Sensors</i> .
Vehicle Not Leveled (or Raised), Pump runs.	Reservoir fluid level low.	Fill reservoir to specified level.
	Hydraulic leak in system.	Check for fluid leaks and repair or replace.
	Vehicle overloaded.	Check vehicle loading and correct.
	Rate valve ground disconnected.	Connect J72A to J72B at the power module
	Air in pump.	Check fluid level in reservoir and fill accordingly. Fully depressurize system and restart leveling.
	Internal leak in power module.	Replace power module.
	Height sensor error.	See <i>Issues with Height Sensors</i> .
	Pump failed.	Contact LiquidSpring for further instructions.
Vehicle Not Leveled (or Raised), Pump does not run.	System not turned on.	Turn system on.
	Blown fuse.	Check system fuses.
	Loss of electrical power.	Check wiring between power module and battery.
	Motor failed.	Contact LiquidSpring for further instructions.
	ECU failed.	Contact LiquidSpring for further instructions.
Pump runs for short time then stops.	Motor controller over temperature.	Contact LiquidSpring for further instructions.
Pump runs intermittently.	Loose connector or wiring.	Check wiring harness connections and battery connections. Repair as necessary.

## Issues with Vehicle Lowering/Dump Valve

Condition	Cause	Correction
Vehicle does not lower (kneel).	System not turned on.	Turn system on.
	Blown fuse.	Check system fuses and replace as necessary.
	Obstacle under vehicle frame.	Remove obstacle.
	Wiring harness disconnected.	Check wiring harness connections and reconnect.
	Loss of electrical power.	Check wiring between power module and battery.
	Rate valve ground disconnected.	Connect J72A to J72B at the power module.
	Power module filters plugged.	Contact LiquidSpring for further instructions.
	Internal power module blockage.	Contact LiquidSpring for further instructions.
	Faulty door switch.	See <i>Issues with Door Switch</i> section.
	Door switch not wired correctly.	See <i>Issues with Door Switch</i> section.
	Faulty speed signal.	See <i>Issues with Vehicle Speed Signal</i> section.
Vehicle slow lowering (kneeling).	Partial internal power module blockage.	Contact LiquidSpring for further instructions.

## Issues with Vehicle Brake Signal

Condition	Cause	Correction
Vehicle will not level.	Brake signal wire not correctly tapped.	Inspect wiring and repair/replace as necessary.
	Brake switch malfunction.	Replace OEM brake sensor. See OEM service manual.
Intermittent leveling.	Loose connector / wire.	Inspect wiring and repair/replace as necessary.
Vehicle levels when stopped with brake pedal engaged.	Brake signal wire not correctly tapped.	Inspect wiring and repair/replace as necessary.

# Troubleshooting Guide – Touchscreen

## Issues with One Corner Not Leveling Properly

Condition	Cause	Correction
One side will not raise or lower.	Internal power module blockage.	Contact LiquidSpring for further instructions.
	Low voltage.	Check battery voltage.
	Wiring harness disconnected.	Check wiring harness connections and reconnect.
	Obstacle under vehicle frame.	Remove obstacle.
	Power module filters plugged.	Contact LiquidSpring for further instructions.
	Height sensor error.	See <i>Issues with Height Sensors</i> .
	Leakage at Strut or Strut failure.	See <i>Issues with Strut Assembly</i> .
	Vehicle is overloaded on one side.	Weigh all 4 corners of vehicle and redistribute weight as needed.
One corner raises and lowers slower than other corners.	Internal power module blockage.	Contact LiquidSpring for further instructions.
	Filter partially clogged.	Contact LiquidSpring for further instructions.
	Vehicle is unevenly loaded.	Weigh all 4 corners of vehicle and redistribute weight as needed.

## Issues with Ride/Handling

Condition	Cause	Correction
Vehicle rolls side to side excessively.	Strut bushings worn.	Inspect and replace as necessary.
	Control arm bushings worn.	Inspect and replace as necessary.
	Sway bar bushings worn.	Inspect and replace as necessary.
	Strut mounting loose.	Inspect and replace as necessary.
	Rate Valve Poppet Jammed open.	Contact LiquidSpring for further instructions.
Excessive stiffness when on flat, straight road.	No vehicle speed signal.	See <i>Issues with Vehicle Speed Signal</i> section.
	No steering signal.	See <i>Issues with Steering Sensor</i> section.
	Voltage to Rate Valve solenoid too low.	Check battery voltage.
	Rate Valve wiring shorted, broken, or disconnected.	Inspect wiring and correct/replace as necessary. Verify J72A is connected to J72B at power module.
	No electrical power to system.	Inspect and replace as necessary.
	System inactive (Touchscreen dark).	Turn system on (tap screen and press On/Off button).
	Wiring to Rate Valve incorrect.	Inspect wiring and correct as necessary. Verify J72A is connected to J72B at power module.
	Steering not zeroed correctly.	See <i>Issues with Steering Sensor</i> section.

## Issues with Door Switch

Condition	Cause	Correction
Vehicle will not kneel when rear door opened.	Ignition is off.	Turn ignition on to enable door switch functionality.
	Short or break in wiring between door switch and power module.	Inspect wiring and repair/replace as necessary.
	Door switch malfunction.	Inspect door switch and repair/replace as necessary.
Vehicle kneels whenever speed below 10mph.	Short or break in wiring between door switch and power module.	Inspect wiring and repair/replace as necessary.
	Door Switch out of adjustment.	Check installation of door switch and adjust as necessary.
	Door switch malfunction.	Inspect and replace per body builder instructions.
Intermittent door switch signal.	Loose connector / wire.	Inspect wiring and repair/replace as necessary.

# Troubleshooting Guide – Touchscreen

## Issues with Vehicle Ignition Signal

Condition	Cause	Correction
System does not turn on (no leveling or stiffness control).	No ignition signal to controller or Touchscreen.	Inspect wiring and repair/replace as necessary.
	Ignition "sensor" malfunction.	Inspect and replace per OEM service manual.
System does not turn off once ignition switched off.	Signal side short to battery.	Inspect wiring and repair/replace as necessary.
	Ignition "sensor" malfunction.	Inspect and replace per OEM service manual.
	No ignition signal.	Connect the IGN wire in the LS dash harness to vehicle Ignition.
System intermittently works.	Loose connector / wire.	Inspect wiring and repair/replace as necessary.

## Issues with Power Module

Condition	Cause	Correction
Battery Voltage greater than 16VDC.	Incorrect supply voltage.	Connect to 12VDC supply.
Battery Voltage less than 9VDC (without motor running).	Incorrect supply voltage source.	Connect to 12VDC supply.
	Improper/loose battery connection.	Inspect and correct.
	Blown 80A fuse.	Inspect and correct.
	Wiring issue (missing, broken, pinched, corrosion).	Inspect and correct.
	Inadequate ground connection.	Inspect and correct.
Battery Voltage less than 9VDC (with motor running).	Inadequate supply current.	Connect to 12VDC supply with at least 100A available.
	80A fuse blows during motor running.	Inspect and correct.
	Inadequate ground connection.	Inspect and correct.
	Motor connections loose or damaged.	Inspect and correct.
Pump exhibits high pitch whine or “chirp” immediately after pump turns off or when vehicle is lowering.	Pump pressure relief valve worn or dirty.	Replace pressure relief valve.
Pump running under heavy load and leveling slow.	Pump filter clogged.	Clean or replace filter.
	Improper/loose battery connection.	Inspect and correct.
	Inadequate ground connection.	Inspect and correct.
	Weak motor.	Replace motor or power module.
Pump running under heavy load and no leveling.	The Check valve is stuck closed.	Replace power module.
	Pump pressure relief valve stuck open.	Replace pressure relief valve.
	Vehicle overloaded.	Correct vehicle loading.
Hydraulic fluid leaking from Power Module.	O-ring failure.	Replace O-ring.
	Manifold cracked.	Replace power module.
	Fitting loose.	Tighten fittings.
	Valve loose.	Tighten valves to correct torque.
	Hydraulic line loose.	Tighten hydraulic line correctly.
	Bolts between reservoir and manifold loose/broken.	Replace and/or tighten bolts to required torque.
	Broken / cracked reservoir.	Replace reservoir.

# Troubleshooting Guide – Touchscreen

## Issues with Strut Assembly

Condition	Cause	Correction
Hydraulic Leak.	Weld failure between cylinder and end.	Replace strut.
	Cylinder fracture.	Replace strut.
	Threads stripped between cylinder and gland.	Replace strut.
	Seals worn out.	Replace strut.
	Rod severely scratched or dented.	Replace strut.
	Fitting loose.	Tighten or replace fittings.
	Hose failure.	Replace failed hose.
	Hose cut.	Replace failed hose.
Rod broken at bushing housing.	Weld failure.	Replace strut.
Rod doesn't move freely in/out cylinder.	Piston jammed in cylinder.	Replace strut.
Rod moves very easily in/out cylinder.	Piston broken therefore no damping.	Replace strut.
Reduced damping level.	Damping components broken/worn out.	Replace strut.
Strut upper mount not securely attached to frame or Strut.	Bolts attaching bracket to frame broken / came out.	Replace bolts and tighten to required torque.
	Bolt attaching strut to bracket broke / came out.	Replace bolts and tighten to required torque.
	Weld Failure.	Replace strut upper mount.
	Structural failure.	Replace strut upper mount.
Strut lower mount not securely attached to axle or strut.	Bolts attaching bracket to axle broken / came out.	Replace bolts and tighten to required torque.
	Bolt attaching strut to bracket broke / came out.	Replace bolts and tighten to required torque.
	Weld Failure.	Replace strut lower mount.
	Structural failure.	Replace strut lower mount.

## Issues with Secondary Volume Assembly

Condition	Cause	Correction
Hydraulic Leak.	Weld failure between tube and end.	Replace secondary volume welded assembly.
	Weld failure between tube and manifold.	Replace secondary volume welded assembly.
	Cylinder fracture.	Replace secondary volume welded assembly.
	Bleed screw loose.	Tighten bleed screws to appropriate torque.
	Fitting loose.	Tighten all fittings.
	Hose failure.	Replace failed hose.
	Hose cut.	Replace failed hose.
Loose or no longer attached.	Bolts attaching bracket to frame broken / came out.	Replace bolts and tighten to required torque.
	Bolt attaching volumes to bracket broke / came out.	Replace bolts and tighten to required torque.
	Weld Failure.	Replace brackets.
	Structural failure.	Replace brackets.

# Troubleshooting Guide – Touchscreen

## **LiquidSpring LLC**

4899 E 400 S | Lafayette, IN 47905

Phone: 765-474-7816

Fax: 765-474-7826

Web: [www.liquidspring.com](http://www.liquidspring.com)

Email: [service@liquidspring.com](mailto:service@liquidspring.com)

Information contained in this publication is subject to change without notice or liability. LiquidSpring® LLC reserves the right to revise the information presented or discontinue the production of parts described at any time.

