TROUBLESHOOTING

DANGER **Failure to follow the Warnings in this Manual can damage the Vehicle and/or cause SERIOUS INJURY OR DEATH.**
Service of the Controller Must be done by a trained golf car technician.

Before troubleshooting the Controller;

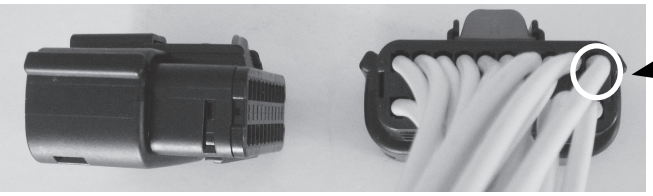
- Make sure the Run/Tow Switch is in the Tow position
- The Key is turned OFF
- Make sure ALL four wheels are off the ground and the vehicle is supported with jack stands.
- The Controller is sealed and can not be opened for service. Opening the Controller will Void the Warranty

PRELIMINARY TROUBLESHOOTING

Tools Required:

Digital Multimeter

Harness Connector



This Connector is part of the Harness that is attached to the Controller.

ISSUE	POSSIBLE CAUSES	HOW TO CHECK
Vehicle/ Controller does not power up.	• RUN/TOW off. • Discharged/ Bad Batteries • Wiring and Connectors	• RUN/TOW Switch in RUN position. • Check Battery Pack voltage (It needs to be at least 31V to power up) • Check All Wires for damage or loose connections. • Check that the pins are fully seated in the Connectors (by tugging lightly on the individual wires) and that the Connectors are fully seated and locked into place.
	• Correct voltage at Controller	• Check the voltage at the Controller between B+ and B- (it should be the pack voltage). • Check the voltage between Pin 10 of the Vehicle Module Harness's 20 Pin Connector and the B-. (it should be pack voltage).
	• Faulty Harness	• Replace Harness

If there is pack voltage at the Controller between B+, Pin 10 and B- replace the Controller and re-test.

FLASH CODE TROUBLESHOOTING

This Controller has both a **GREEN LED** and a **RED LED Status Light** that will indicate the status of the Controller.
It is located inside the Controller and is visible through the Top Cover when the Controller is powered.
Note: The vehicle's reverse buzzer will also chirp the flash code in the event of a fault.
Note: If the Optional "On the Fly" Programmer was purchased it is also equipped with a **GREEN LED Status Light**. This light will indicate the same Flash Codes except they will be in **GREEN** only.

LED STATUS LIGHT CHART

● = SOLID ✺ = FLASHING

GREEN LED

GREEN	VEHICLE STATE	MODE	STATUS	
✺ x2	KEY OFF	Standby	☑	Turn Key ON
●	KEY ON	Ready	☑	Ready to use!

RED LED

RED	VEHICLE STATE	MODE	STATUS	
✺	See Flash Code Chart Next Page	Error	☒	Fault!

RED LED Status Light contains a 2 digit code;

EXAMPLE: ✺ 1 SEC ✺✺ = 1 - 2 Flash Code

NOTE: There will be a 2 second pause before the error code repeats itself.

TROUBLESHOOTING

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
1 - 1	**Voltage Issue: Batteries**	Batteries are empty or too low.	• Recharge Batteries • Check for bad or damaged Batteries. • Check Battery Cables are not loose or damaged. • Check Solenoid	• Use a Battery Load Tester to verify Battery condition after charging. • Connect Volt Meter to Main ⊕ and ⊖ on the Batteries. (Use alligator clips). Measure the voltage while driving to see if the voltage drops. • Attach Volt Meter to ⊕ and ⊖ on the Controller if the voltage drops at the Controller and not at the Battery then the Solenoid may be bad.
1 - 1	**Voltage Issue: Batteries**	Batteries too full	• Batteries can not take a charge. Check the Batteries, one or more Batteries may be bad.	• Use a Battery Load Tester to verify Battery condition after charging.
1 - 1	**Voltage Issue: Solenoid (Contactor)**	Damaged Solenoid or loose Wiring	• Confirm the Solenoid is working properly. Change Solenoid if required.	• Put vehicle in Neutral. Measure Voltage on main posts (high current connections) of the solenoid. Depress throttle and listen for solenoid to click. If solenoid clicks and the voltage does not drop to zero between the main posts. Replace solenoid. • If Solenoid does NOT click measure the voltage across the Small Terminals of the Solenoid when the Throttle is depressed. It should read the Battery voltage. If it reads the Battery voltage the Solenoid is bad. If it does not read the Battery voltage check Vehicle Wiring.
1 - 2	**Temperature (Controller)**	Performance is limited because the Controller is Hot.	• Let Vehicle cool off; system is over worked.	• Check the temperature of the Controller with a non-contact temperature sensor.
1 - 3	**Charger Interlock**	Charger is connected. Vehicle Charging Port may be wet Club Car On Board Computer (OBC) is in sleep mode.	• Disconnect the Charger before trying to move. • Dry and clean the Charger Port • Depress the throttle twice to wake up OBC. • Replace Charger port on Vehicle	
1 - 4	**Temperature (Motor)**	Performance is limited because the Motor is Hot.	• Let Vehicle cool off; system is over worked.	• Check the temperature of the Motor with a non-contact temperature sensor.
1 - 5	**BDI (**Battery Discharge Indication)	The Battery level is less than 20% SOC (State Of Charge)	• Charge the Batteries	• The Vehicle will automatically be put into Low Speed Mode **Warning!** Continued use may damage the batteries.
2 - 1	**Switch Fault**	Both FWD & REV signal came on at the same time.	• Check and replace FWD & REV Switch	• Check the FNR Switch. Does the Switch feel the same when toggled from FWD to Neutral to REV? If so check continuity of the Switch.

TROUBLESHOOTING

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
2 - 2	**Main Solenoid (Contactor)**	Solenoid Coil takes too much current.	• Check for loose Wires or a short across Small Terminals on the Solenoid. • Replace main Solenoid.	• Check for loose Wires. If there is a Diode across the Solenoid check that it is not shorted. • Test Solenoid by measuring resistance across the Small Terminals of the Solenoid. The resistance should be greater than 48 OHMS if it is a single coil solenoid and greater than 20 OHMS if it is a double coil solenoid.
2 - 3	**Reverse Buzzer / OTF LED**	Over current on the Reverse Buzzer / OTF LED circuit.	• Find and correct the short circuit. • Replace the Reverse Buzzer • Replace the OTF • Replace the Main Solenoid	• Unplug OTF and check if the Flash Code Error stops on the Controller. • Check for a short circuit in the wiring near the Reverse Buzzer or in the Buzzer itself.
2 - 4	**Controller not pre-charging**	Abnormally low voltage on the Controller between B+ and B-.	• Clean and dry off the Controller • Check voltage	• Visually check for debris or moisture on Controller Terminals and Wires (There may be a short across the B+ and B- posts). • Check the voltage between B+ and B- on the Controller. It should equal the Battery Pack Voltage.
			• Check all Wires connected to the Controller	• Check that the Wires are not damaged. • Check that the B+ and Field Wires are not shorted to the Frame or each other. (B+ -/F1, B+/F2, F1/F2) • Check that no accessories (Light Kits, Stereos, etc.) are using the Frame as a ground.
2 - 5	**Controller not pre-charging**	Cables /Controller	• Test Cables at the Controller **<u>DO NOT</u> replace the Controller until all of the "How to Check" diagnostics regarding Flash Code 2 - 4 have been completed and the Motor has been tested for short circuits!**	• Remove all Cables except B- from the Controller. • Tape Cables so they do not touch each other or the Vehicle Frame. Controller Harness should remain pluggedinto the Controller. • Move Run/Tow Switch to Run, Turn on Key Switch, depress the throttle. If 2-4 Flash Code returns replace the Controller. • Otherwise there is a Wiring problem. Reconnect Wires one at a time (Turn off RUN/TOW Switch each time) until 2-4 Flash Code returns. This will indicate where the Wiring issue is located.
2 - 6	**Accelerator**	The Accelerator signal is out of range. This can be caused by a faulty connection or a defective Accelerator Assembly	• Check Accelerator Wires, Harness and Accelerator	• Check Accelerator Wires and Connections. • Measure the voltage between the main B- and Pin # 2 (center pin) on the 3 pin 4WD connector in the Harness. The Voltage should start near 0Vand move up to a maximum of 5V. If notreplace Throttle Sensor. i.e. MCOR, ITS, etc.

TROUBLESHOOTING

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
2 - 7	**Loss of Field Current**	Controller is unable to create field current in the Motor.	• Check your Motor field (F1 & F2) Wiring.	• Check that the Field Wires (F1 & F2) on the Motor and Controller are tight and not damaged. • Measure the voltage across F1 & F2 while trying to drive the Vehicle. If Meter shows full Battery Voltage across F1 & F2 then check Wires and resistance across F1 & F2 of Motor with Wires disconnected. Should show a resistance of around 1 ohm. High ohm reading suggest faulty Motor and/or Wiring.
2 - 8	**Internal**	Internal Issue	• Reset the Controller by turning off the key and moving the Run/Tow switch to Tow then back to Run. Test the vehicle to see if issue continues. • Return the Controller to your Dealer / Navitas Vehicle Systems Ltd. for a Complimentary Diagnostic.	

NON-FLASH CODE TROUBLESHOOTING

NON-FLASH CODE ERRORS. Note: The list below shows some possible issues when the Controller does not show a Flash Code Error. These issues are mainly related to the Vehicle. Always check the Manufacturers Service Manual.

ISSUE	CAUSE	HOW TO CHECK
The Vehicle is moving slower than normal.	• Batteries are discharged • Bad or damaged Motor • Faulty Speed Sensor • Faulty Throttle • OTF programmer is locked at low speed	• Re-charge the Batteries • Check Motor • Unplug Speed Sensor • Raise the Vehicle so all wheels are off the ground. Depress Throttle and look for green flash on OTF Programmer when the Throttle is almost completely depressed. • Connect the OTF Programmer, unlock it and adjust to desired speed. Note: Lock OTF Programmer before removing it or the settings may change.
Vehicle is shutting down.	• Check Vehicle Wiring for loose connections • Check the OBC (On Board Computer)	• Check the OBC by referring to the "OBC section" in the manufacturers service manual.
Oscillations or bumpy feel when driving.	• Motor compatibility	• Check that the Motor is on the Navitas recommended Motors list
Vehicle feels sluggish after driving for a while.	• Battery Cables are undersized	• Upgrade the Power Cables to at least 4AWG.
Faulty Controller	• Controller malfunction	• Use a Digital Multimeter set to Diode mode →| • Remove all Wires and Cables on Controller • Use "Controller Diode Test" Chart below to test the Controller

CONTROLLER DIODE TEST CHART

BLACK LEAD ⊖	RED LEAD ⊕	VOLTAGE →|	BLACK LEAD ⊖	RED LEAD ⊕	VOLTAGE →|
B+	M	0.42V approx.	F2	B-	0.48V approx.
M	B-	0.42V approx.	B+	F1	0.48V approx.
F1	B-	0.48V approx.	B+	F2	0.48V approx.

TROUBLESHOOTING

OTF TROUBLESHOOTING

ISSUE	CAUSE	HOW TO CHECK
OTF Knobs do not change the Controller settings.	• OTF is Locked 🔒 • OTF Connector • • OTF Faulty	• Use Key to unlock 🔓 OTF to adjust Controller settings. • Check that the 8 Pin Connector on the OTF is plugged in to the Harness • Replace OTF or return for service.
Settings are not changing	• OTF not locking in new settings	• After adjusting the knobs to the desired settings, move the OTF Key from the 🔓 UNLOCK to the 🔒 LOCK position. The 🔒 LOCK position saves the current settings to the Controller. The OTF may now be unplugged and removed from the Vehicle.

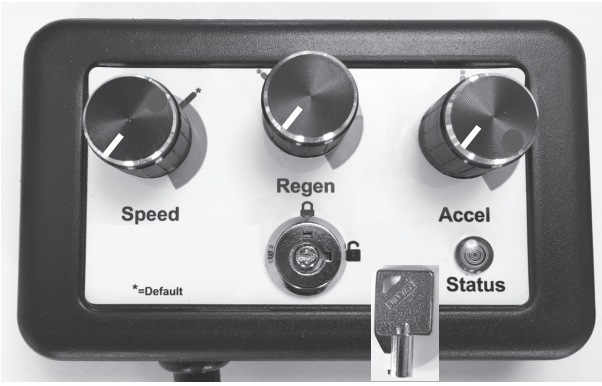
NOTE: The Maximum Speed of the Golf Cart will depend on the following;
- Tire size (Bigger tires will increase speed)
- Motor type/Condition (Is it a High Speed or Heavy Duty Motor)
- Batteries/condition of the battery pack.
- Battery Cables and Connections (resistance points on the connections) ie thick enough cables and good clean connections)

To prevent corrosion it is recommended to protect the Vehicle Module and Battery Cable Connections with Dielectric Grease.

OTF/CONTROLLER CONFIGURATION INSTRUCTIONS

1 SWITCHING THE CONTROLLER TO CONFIGURATION MODE:

Note: This can only be done on Controllers with SW 8.2 or greater.



A) The RUN/TOW Switch is in RUN, Key Switch is ON and the Vehicle is in Neutral.

B) Turn the Lock Out Key from the 🔒 Lock position to the 🔓 Unlock position.

C) Turn all Knobs down to the **Minimum** settings.

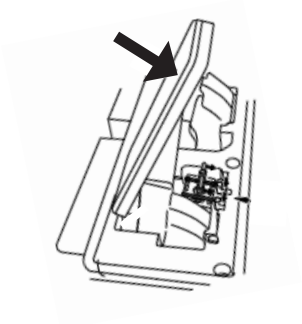
D) Turn the Lock Out Key from the 🔓 Unlock position to the 🔒 Lock position **5** times. Stop at the 🔓 Unlock position.

E) The Green OTF Status Light will flash ✺ **5** times. Note: the Reverse Buzzer will also Beep 5 times.

The OTF is now in Configuration Mode.

2 CALIBRATING THE THROTTLE:

Recommended for best Throttle response on all Carts.



A) Depress the Throttle **5** times. Smoothly through its entire motion.

B) The Green OTF Status Light will flash ✺ **3** times to confirm Throttle calibration.

C) Turn the Lock Out Key from the 🔓 Unlock position to the 🔒 Lock position.
The OTF LED will flash ✺ **2** times to confirm that the Controller has saved the new settings and is no longer in the Configuration mode.

⚠ **The OTF has been set to Factory Settings. When changing the settings it must be done in small increments and tested in an open area away from people, pets or large objects.**