NAVITAS TAC 2

440A and 600A 48V-72V CONTROLLERS

Error Code and Troubleshooting Guide

Includes All Models Of TAC2 Including:

E-Z-GO®RXV® 48V (CURTIS®)
E-Z-GO® RXV® 23 48V (DANAHER®)
E-Z-GO® TXT® 48V Conversion
CLUB CAR® Precedent® Conversion
YAMAHA® YDRE2® TOYOTA® (NEOS®)
YAMAHA® G29® Conversion (MORIC®)

NAVITAS

TROUBLESHOOTING

* Check the 'Caution' icon on app first for fault descriptions or refer to the chart below

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
1-1	Throttle Fault	The foot switch is not engaged and the throttle signal voltage is above minimum throttle parameter. This indicates the foot switch is not coming on or the throttle has broken where its off voltage is to high	• Check wiring • Replace throttle	• The diagnostic page of the App will give you readings for the throttle voltage and foot switch. • Put the vehicle in neutral and slowly depress the throttle. • The foot switch should change from Off to On before the throttle voltage reaches around 1V. • Standard throttles usually read 0.5V when off. The minimum voltage to start the vehicle is usually 1V. The maximum when depressed should read around 4V.
1-2	Brake Fault	The analog brake signal is higher than the high voltage threshold which is 4.64V. These types of brake pedals are only installed on certain types of vehicles such as RXV's.	• Check wiring • Replace brake switch	• The diagnostic page of the App will give you readings for the brake voltage • Put the vehicle in neutral and slowly depress the brake. • Standard analog brakes usually read 0.5V when off. The minimum voltage to stop the vehicle is usually 1V. The maximum when depressed should read around 3V to 4V
1-3	Charger Interlock	Charger is connected and the vehicle is not in neutral. 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	• The diagnostic page of the App will give you readings for the charger input connected signal. • The charger input will read off when there is no charger connected.
1-4	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 - 5	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.

TROUBLESHOOTING cont'd

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
1 - 6	Solenoid High Resistance	Voltage across solenoid (battery side (logic power) to controller side measured (B+ terminal)) is greater than the hard coded 5V.	• Replace solenoid	• Test the solenoid by measuring ohms across the large terminals. • The error usually only occurs when drawing large currents (200A) through the solenoid. The solenoid may be under rated or oxidizing with ag
1 - 7	Flash Memory Error	Code updates from the App may force this error so cause the user to press the Initialize button and Save button.	• Press the Initialize button and Save button in the App.	• Contact dealer as they have a "Dealer/ Technician" version of the App.
1 - 8	Brake Check Fault	Brake failed to hold vehicle still during start up tests. Vehicle should not move during brake check.	• Check motor brake	• Turn key off and disconnect brake harness from motor brake. Try pushing vehicle, you should not be able to push vehicle. • If new brake has been installed, check installation, over/under torquing brake can cause issues
1- 9	Brake Hold Fault	Brake failed to hold vehicle still when stopped. Wheels are still turning with Parking Brake set.	• Check motor brake	• Turn key off and disconnect brake harness from motor brake. Try pushing vehicle, you should not be able to push vehicle. • If new brake has been installed, check installation, over/under torquing brake can cause issues
1- 10	Resistor Missing	The large external power resistor was not detected during start up tests.	• Check resistor wiring	• Resistor wires should go to switched side of solenoid and to the 'R' terminal on the controller
2 - 1	Direction Switch Fault	Both FWD & REV signal came on at the same time.	• Check and replace FWD & REV switch	• The diagnostic page of the App will give you readings for the Forward switch and Reverse switch • Check the Switch. Does the Switch feel the same when toggled from FWD to Neutral to REV? If so check continuity of the switch.

TROUBLESHOOTNG cont'd

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
2 - 2	Main Solenoid	Voltage across solenoid (battery side to controller side measured B+ terminal) is greater than the hard coded 1V after solenoid has closed	• Confirm the solenoid is working properly. Change solenoid if required.	• Put vehicle in Neutral. Measure voltage on main terminals (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 terminals. 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
2 - 3	Controller not pre-charging	Abnormally low voltage on the controller between B+ and B-.	• Clean and dry off the controller • Check voltage • Check all wires are connected to controller • DO NOT 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!	• The dashboard page of the App will give you readings for the battery voltage. • Visually check for debris or moisture on controller terminals and wires (There may be a short across the B+ and B- terminals). • Check the voltage between B+ and B- on the controller. It should equal the battery pack voltage. • Check that the wires are not damaged. • Check that no accessories (light kits, stereos, etc.) are using the frame as a ground. • 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 plugged into the controller. • Move Run/Tow switch to Run, turn on key switch, depress the throttle. If Flash Code 2-4 returns replace the controller. • Otherwise there is a wiring problem. Reconnect wires one at a time (turn off RUN/TOW switch each time) until Flash Code 2-4 returns. This will indicate where the wiring issue is located.

TROUBLESHOOTING cont'd

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
2 - 4	Main Solenoid Current Fault	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 - 4	Parking Brake Solenoid (Connected to motor) Current Fault	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.
2-8	Precharging Too fast	1. Main solenoid may be welded. 2. (External Resistor Option Only) Regen resistor may be incorrectly connected to battery side of main solenoid.	• Check Main Solenoid • Check resistor wiring	• 1. Turn Key off and place in Tow. Measure voltage across large terminals of solenoid. If you measure 0V, the solenoid is welded • 2a. Check Resistor wiring. Resistor wires should go to switched side of solenoid (controller side) and to the 'R' terminal on the controller. • 2b. Turn Key off and place in Tow. Disconnect controller 'B+' and 'R' cables. Make sure to isolate them with electrical tape. Place in Run and turn Key on check to see if error changes. If error changes, turn key off and place in Tow again. Then reconnect 'B+' cable and repeat. If error does not reappear, repeat process again and reconnect resistor to 'R' terminal. If the problem reappears, recheck the resistor wiring.

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
3 - 1	Battery Under Voltage	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 batteries. (Use alligator clips). Measure the voltage while driving to see if the voltage drops. • Connect Volt meter to the controller if the voltage drops at the controller and not at the battery then the solenoid may be bad.
3 - 2	Battery Over Voltage	Batteries are over charged or not excepting any more regenerative currents	• 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 batteries. (Use alligator clips). Measure the voltage while driving to see if the voltage rises. • Connect volt meter to the controller if the voltage rises at the controller and not at the battery then the solenoid may be bad.
3 - 3	Motor Over Current	Motor current has risen above the maximum motor current parameter.	• Check Motor U,V,W cables are not shorted to ground See diode chart below	• The diagnostics page of the App will give you readings for the U phase voltage, V phase voltage, W phase voltage • The phases should read around half the battery voltage. • Disconnect phases at controller and check readings again
4-5	Over Current Fault	Motor current has exceeded controller current limit.	• Release throttle and reapply to drive	• Error code will clear when key is off and in Tow.

FLASH CODES	FLASH CODE MESSAGE	DESCRIPTION	SOLUTION	HOW TO CHECK
4-7	Power Stage Fault	Controller has failed power check on startup	• Check motor connections	• Turn Key off, place in Tow. • Disconnect U,V,W from controller. • Place in Run, turn on Key. • Check if error message now shows that motor is not connected. If error continues to show, contact Navitas Support. Please take screenshot of error message to provide to Navitas Support
4-8	Encoder A input Fault	Speed input A is not changing when Motor Current is Applied	• Check speed sensor	• With Key off and vehicle in Tow, disconnect speed encoder harness from motor. (4 pin connector at motor) • Place vehicle in Run and turn Key on. • Using a volt meter, measure the voltage at each of the pins. You should read 5V, 3V, 3V, 0V on the wires. • Reconnect to controller with app. Go to Diagnostics page and look for Encoder A & B inputs. • With a piece of wire or a paperclip, short the 3V wires to the 0V wire and check on the app if the input has gone from high to low. If it has, the inputs at the controller are working and the sensor may be at fault.
4-9	Encoder B input Fault	Speed input A is not changing when Motor Current is Applied	• Check speed sensor	

TROUBLESHOOTING cont'd

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 brakes are releasing properly and vehicle is easy to push • Check motor • With the App verify throttle reaches maximum value • 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 manufacturer's service manual.
Vehicle feels sluggish after driving for a while.	• Battery cables are undersized	• Upgrade the power cables to recommended 4AWG
Faulty Controller	• Controller malfunction	• Use a digital multi-meter set to diode mode • Remove all wires and cables on controller • Use "Controller Diode Test" chart below to test the controller
Car Stutters	• Motor cables are not connected properly	• Check motor cables properly connected U-U< V-V, W-W • Check speed sensor wires not crossed.

Table 1 Controller Test Diode Chart

BLACK LEAD ⊖	RED LEAD ⊕	VOLTAGE →|
B+	U	0.42 V approx.
U	B-	0.42V approx.
B+	V	0.48V approx.
V	B-	0.48V approx.
B+	W	0.48V approx.
W	B-	0.48V approx.