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# Charging Liftgate Batteries – Part 4

“Automatic Single Pole, Dual Pole, or  
Seven Way Aux Pin Powered Circuit (TC-8)”

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*Proprietary Information*



## **Bruce Purkey**

**Founder & Chief Creative Engineer**

Bruce has over 40 years of experience servicing fleets' electrical needs. Widely recognized as the authority on electrical issues in the heavy-duty trucking industry, Bruce has worked closely with some of the largest fleets in North America.

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Several of his inventions have been awarded US patents and earned the Technology & Maintenance Council's Silver Spark Plug award, one of the highest honors awarded to members.



# TC-8 (P7000-K)



P7000-K OWNERS MANUAL

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DC/DC charger that can be powered from either a dual pole, single pole, or the aux of seven way cable from the tractor. The system is controlled by an electrical “extender” module



## Why this system?

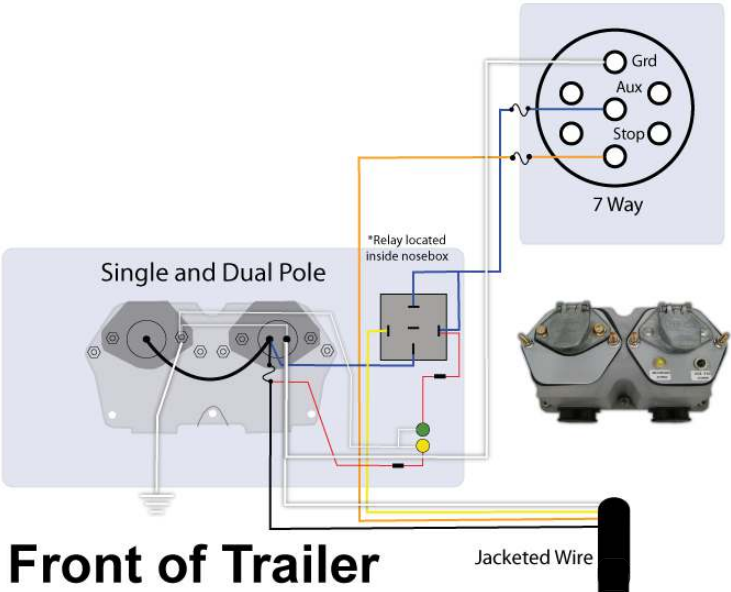
- A trailer leaser never knows what charging system the tractor is equipped with

## The Solution

- This 3 in 1 system gives maximum flexibility for charging the liftgate batteries from whatever source is available
  - The preference would be as follows:
    - Dual Pole
    - Single Pole
    - Aux Circuit of (Seven Way cord)

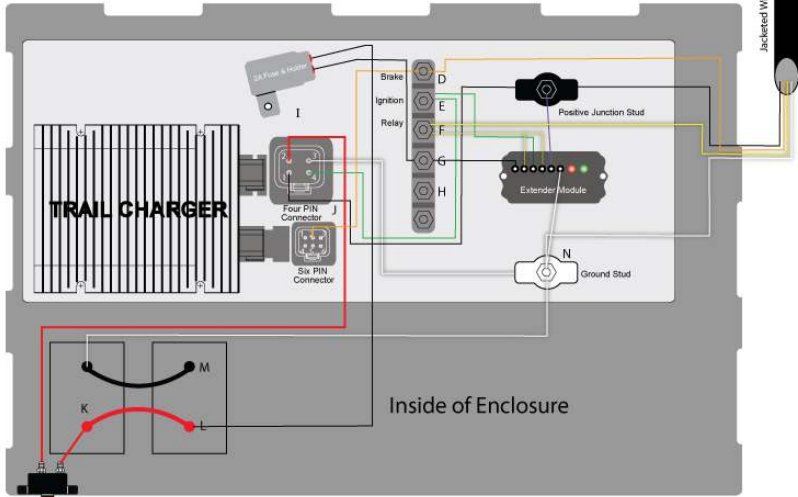


With the TC-8 (or P7000-K):  
Very flexible in selecting the charging source from a multitude of charging sources. When powered by either the single or dual pole, the extender module increases the charging time while maintaining the balance between the tractor or trailer.



Front of Trailer

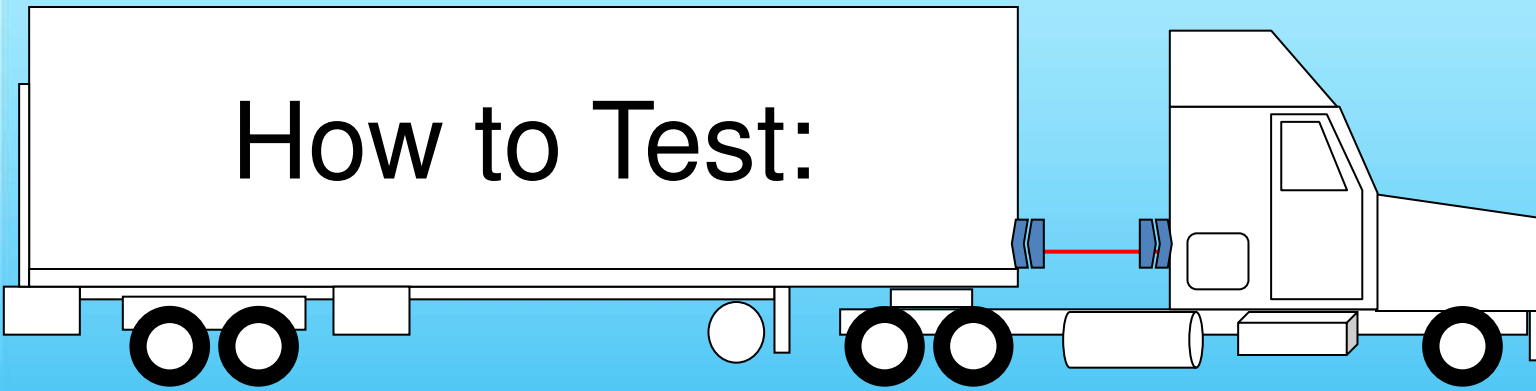
## P7000-K Diagram



Inside of Enclosure

# Verifying the Operation

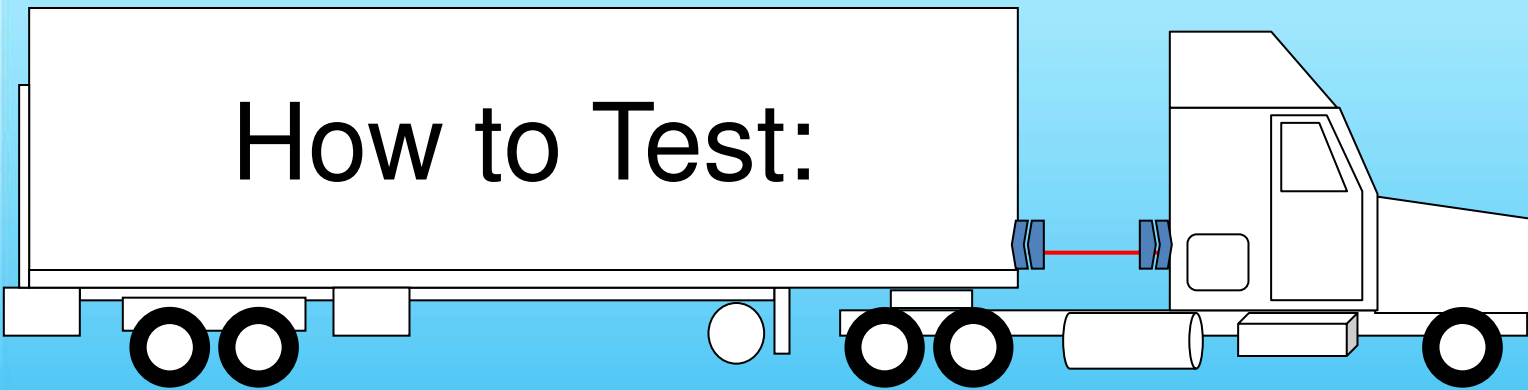
## How to Test:



Step 1: (Tractor off)

With a voltmeter, test the liftgate battery voltage



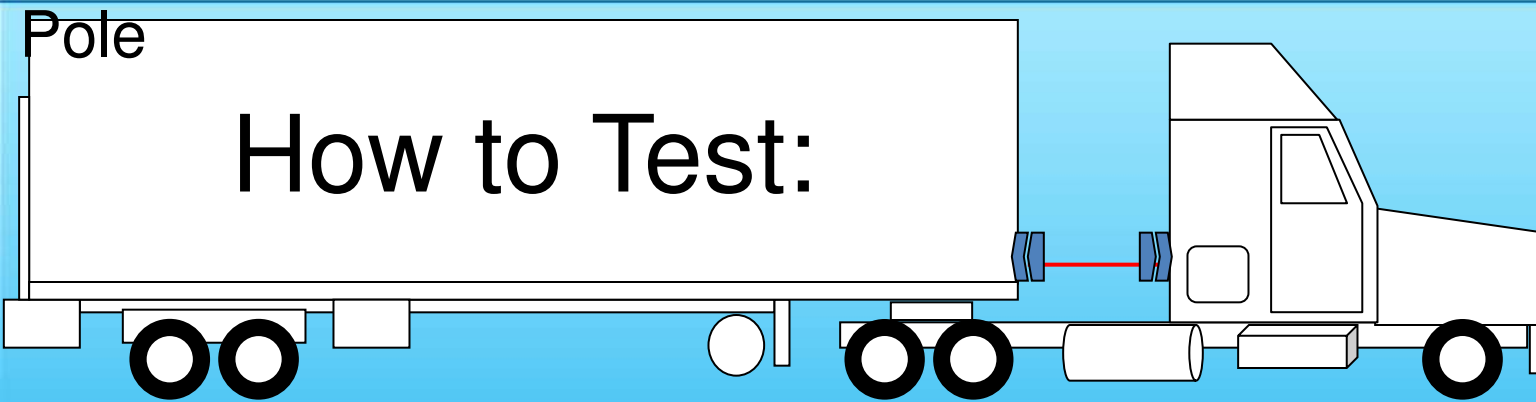


Step 2:

(Make sure the dual pole or single pole is plugged into the trailer)

Start the tractor

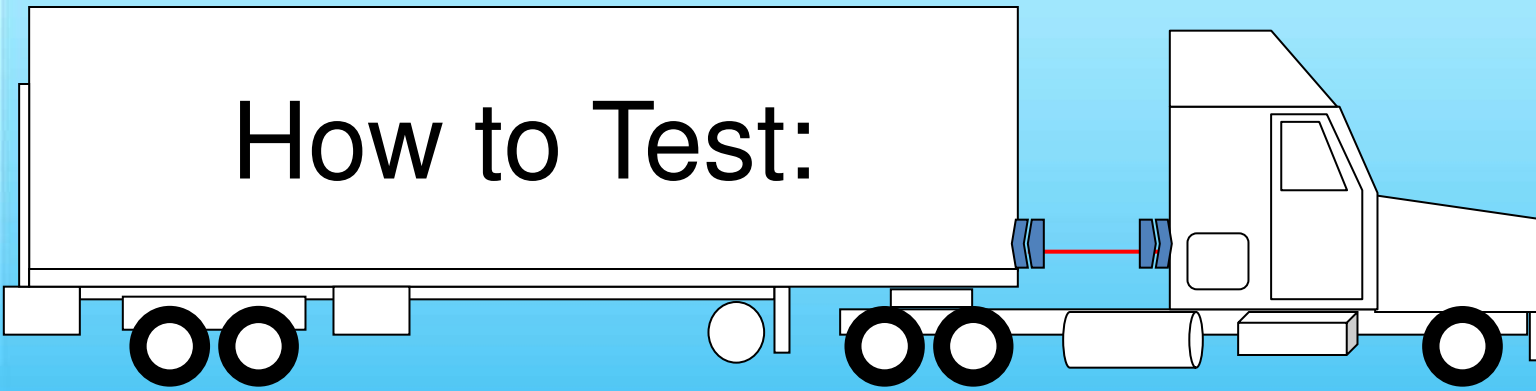
Check that the voltage is more than 13.3 volts



Step 3: Trail Charger's green light turns on  
Extender Module's green light turn on



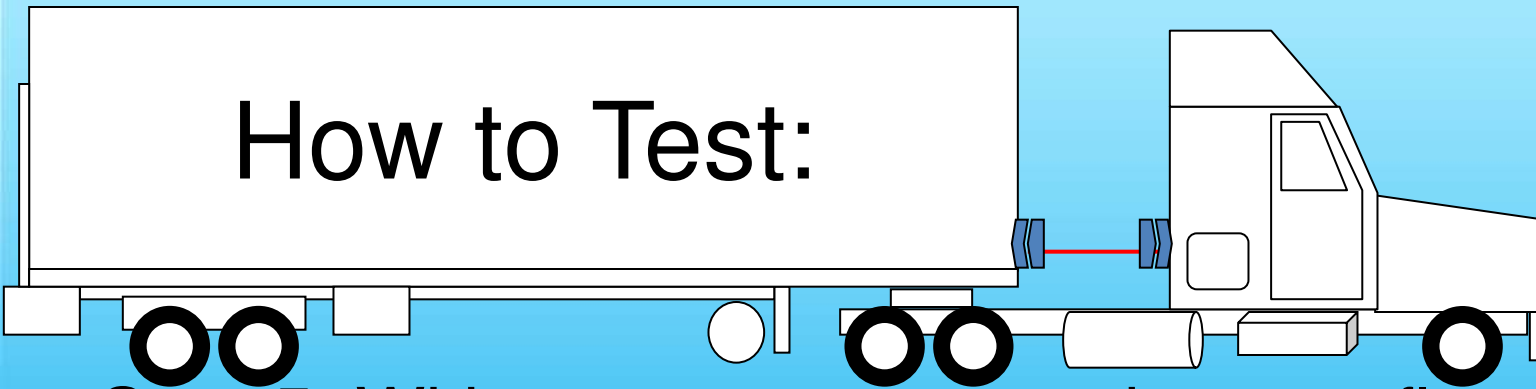
## How to Test:



Step 4: With a voltmeter, test the liftgate battery voltage  
You should see an increase in voltage



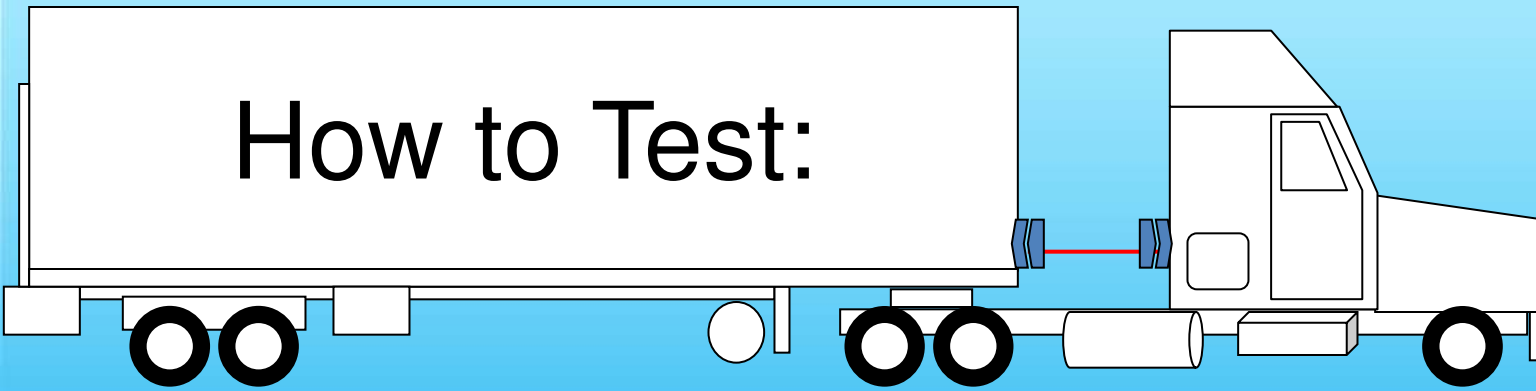
## How to Test:



Step 5: With an ammeter, test the amp flow from the #2 pin of the DC/DC converter that connects to the circuit protection lead to the liftgate batteries



## How to Test:



Step 6: If you see an increase in voltage and amp flow, the system is working

In this example,  
voltage increased from 12.5 to 14.02  
amp flow increased from 0 to 23.79



Step 1: Unplug Dual or Single Pole

Step 2: Plug in the tractor's Seven Way cable into the trailer nose loop

Step 3: Start the tractor

## Testing Seven Way



Step 4: Red & Green LED lights of control module should turn on, (should have green LED on the TC)





# Testing Seven Way



Voltmeter should show increased voltage  
Ammeter should show amps







If you see an increase in voltage and amp flow,  
the system is working

In this example,  
voltage increased from 12.5 to 14.02  
amp flow increased from 0 to 23.79

# Troubleshooting

**DC/DC Indicator Light:**  
No Light

**Condition:**  
No Voltage from Tractor

**Test and Repair/Fix:**  
With Voltmeter, test the single or dual pole receptacle (at trailer end)

Repair or replace single or dual pole



**DC/DC Indicator Light:**  
No Light

**Condition:**  
No Voltage from Tractor

**Test and Repair/Fix:**  
Check input in liftgate battery box

Check and replace fuse as needed  
Repair the trailer wiring as needed



## DC/DC Indicator Light:

Green light then two red lights,  
(then it repeats) or amber light

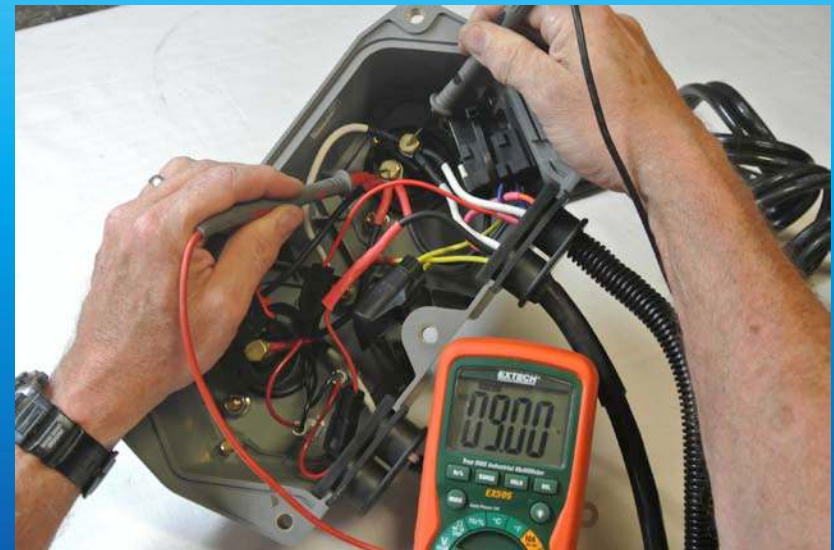
## Condition:

Excessive voltage drop within the system

## Test and Repair/Fix:

Check voltage while under load  
at single or dual pole nose box

Repair or replace as needed  
Test trailer wiring and repair as necessary





## DC/DC Indicator Light:

Green light on, but no voltage increase at liftgate batteries or any current flow

## Condition:

Blown fuse or tripped circuit breaker on output lead from DC/DC converter

## Test and Repair/Fix:

Make sure the output lead is not grounded, then replace fuse or reset the circuit breaker



**DC/DC Indicator Light:**  
Green only on the module  
Green only on the TC

**Condition:**  
Deeply discharged or  
defective liftgate batteries

**Test and Repair/Fix:**  
Charge, then test each of the liftgate  
batteries and replace as needed



## DC/DC Indicator Light:

Green Light Off  
Controller Lights Off

## Condition:

Controller has to see 13.3 volts at the relay junction stud to pull relay to ground

## Test and Repair/Fix:

With seven-way plugged in and truck running, check the voltage at the relay junction stud

Repair the trailer wiring as needed





**DC/DC Indicator Light:**  
No Light

**Condition:**  
No Voltage from Tractor

**Test and Repair/Fix:**  
With a voltmeter, test the seven way Aux  
and ground circuit receptacle  
(at trailer end)  
Check the fuse in the aux circuit  
in the tractor  
Repair or replace the seven way cord



## DC/DC Indicator Light:

No Module Light  
No DC/DC Light

## Condition:

No Operation

## Test and Repair/Fix:

Check fuse from aux to relay  
Replace if blown

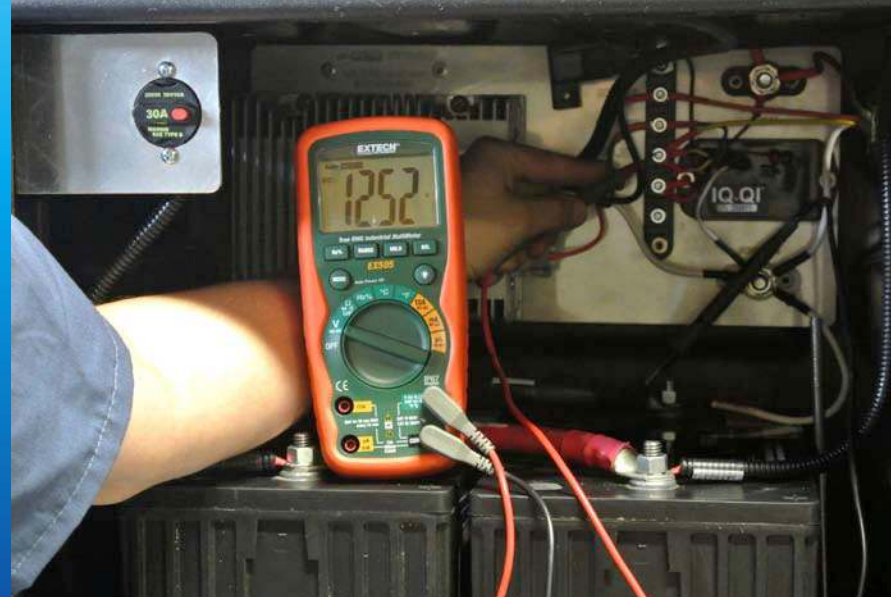
Replace or repair yellow wire



**DC/DC Indicator Light:**  
No Lights

**Condition:**  
Voltage too low to turn on

**Test and Repair/Fix:**  
Start Tractor



**DC/DC Indicator Light:**  
Lights Off

**Condition:**  
Correct Input Voltage

**Test and Repair/Fix:**  
Wait two minutes for  
module lights to illuminate





## DC/DC Indicator Light:

Green light on, but no voltage increase at liftgate batteries or any current flow

## Condition:

Blown fuse or tripped circuit breaker on output lead from DC/DC converter

## Test and Repair/Fix:

Make sure the output lead is not grounded, then replace fuse or reset the circuit breaker



## DC/DC Indicator Light:

Green light on with low voltage and high current

## Condition:

Deeply discharged or defective liftgate batteries

## Test and Repair/Fix:

Charge, then test each of the liftgate batteries and replace as needed



# *Thank You!*



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