PURKEYS

CAPACITOR ACTUATED PORTABLE STARTER
CAPS™

USER GUIDE

INST048 Doc 3.01

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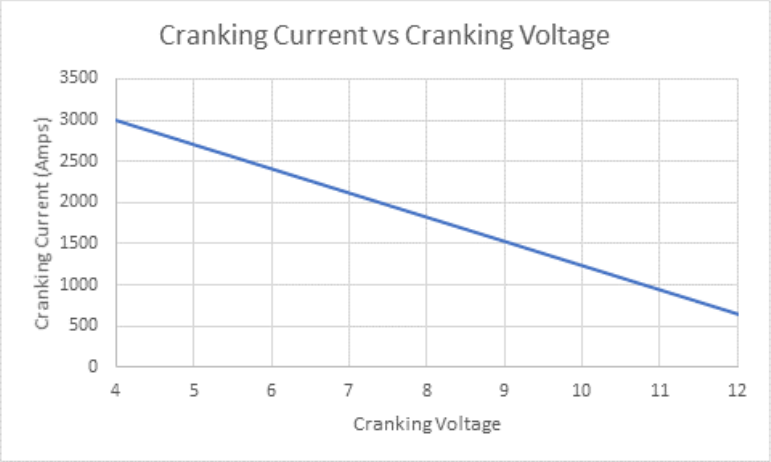
GENERAL INFORMATION

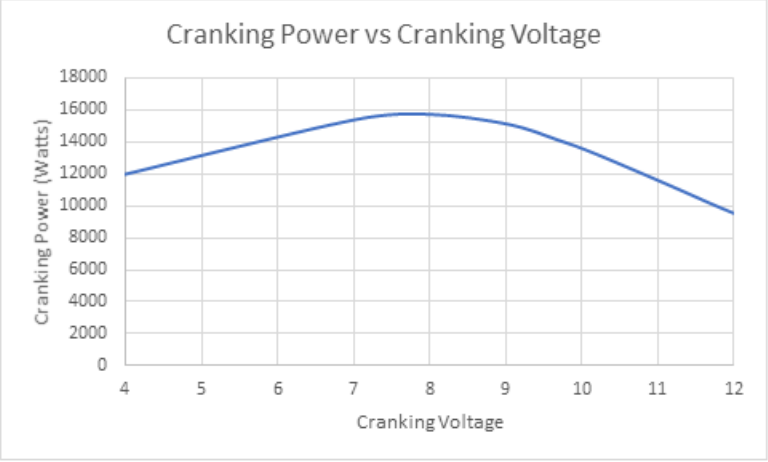
The Purkeys Capacitor Actuated Portable Starter (CAPS)™ jumpstart machine is a powerful, portable, and versatile solution that can be used to jumpstart all 12 V vehicles from heavy- to light-duty.

The CAPS uses a capacitor to provide the power needed for the jumpstart. This allows the unit to store a lot of energy, charge rapidly, and provide the necessary energy to the vehicle being started. Use of this energy is regulated by a Purkeys control module that allows the unit's internal battery to charge the capacitor and operates the magnetic switches that discharge the capacitor to complete the jumpstart.

CHARTS

Here are the Cranking Current and Cranking Power charts for the CAPS. The current is at the maximum (3000 A) at about 4.0 volts, and the power peaks (16 KW) at about 8.0 volts.





BEFORE FIRST USE

1. Carefully remove the unit from its packaging.

2. Open the case and locate the battery.

3. Find the cable that is disconnected from the battery positive terminal bolt.

4. Remove the positive terminal bolt and washers from the battery (leave washers on bolt).

5. Slide the terminal bolt into the positive cable ring terminal.

6. Place the terminal bolt back into the battery and tighten to 100 lbs./in. using a 10 mm wrench. **CAUTION:** Do not short the wrench between the battery posts.

7. Close the case and connect the charger to an outlet. Let the CAPS charge for approximately 30 minutes before first use.

SAFETY REQUIREMENTS

- Wear appropriate protective equipment as required by your company policy.
- Set the parking brake.
- Use proper lock-out tag-out procedures.
- Chock front and rear wheels.
- Remove all rings, watches, and any metal wear that could possibly create an electrical pathway and cause serious injury.

WHAT TO EXPECT FROM THE CAPS

- The CAPS is designed to provide a power boost that will start a vehicle that has discharged batteries, but that is otherwise able to start and run.
- The CAPS will support a typical crank (up to 2000 amps) for 3–5 seconds. Vehicles that normally require a long crank to start or an inordinate amount of current (over 2000 amps) may not be suitable for use with the CAPS.
- A vehicle may not start if it requires cranking for more than 3–5 seconds. This may include vehicles with a fuel problem, an engine problem, or an electrical problem.
- The CAPS will not crank a vehicle if the Engine Control Unit (ECU) resets the instant the starter solenoid engages. This can occur if the vehicle's batteries are completely discharged and have sat in a discharged state for an extended period and/or if the battery inside the CAPS is weak or worn out.
- The CAPS must be charged to function effectively. After a vehicle is started, it is recommended to leave the CAPS attached to the vehicle for at least 3 minutes to allow the CAPS to recharge from the running vehicle. When the CAPS is not in use, it should be plugged in so that it charges and stays charged.

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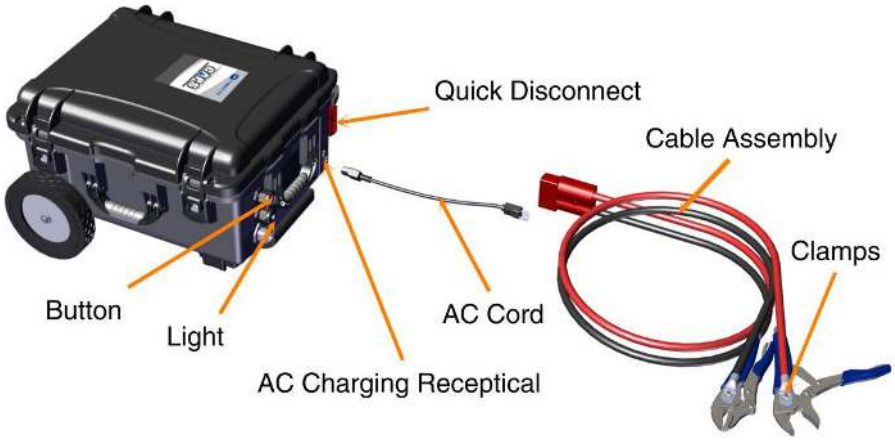
CAPS DIAGRAM



SERVICE TRUCK HARNESS

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OPERATING INSTRUCTIONS

Step 1: If the light is not flashing, press and release the CAPS button to turn on the CAPS.

Step 2. Connect the positive and negative clamps to the vehicle battery, observing polarity. (Keep clamps clean and in good condition.)

Step 3. Press and release the CAPS button. The light should turn green and the buzzer should sound, indicating the unit is armed and ready. DO NOT DISCONNECT THE CLAMPS WHILE THE BUZZER IS SOUNDING, AS ARCING MAY OCCUR AND CAUSE INJURY OR PROPERTY DAMAGE.

If the light flashes, refer to troubleshooting on page 10.

Step 4. Make sure ALL vehicle loads are turned off (lights, windshield wipers, radio, etc.). Turn the key switch to ON. Wait for the vehicle's gauges to cycle.

Step 5. Attempt to start the vehicle. If the vehicle starts, continue to step 6.

If the vehicle does not start within several seconds of cranking, turn the key switch to the "OFF" position, wait a few minutes, and repeat steps 2–5.

If the vehicle's Engine Control Unit (ECU) resets and does not allow the vehicle to crank, try repeating steps 2 through 5 several times.

If the light flashes red, see troubleshooting on page 10.

Step 6. Once the vehicle has been jumpstarted, the light on the CAPS will blink yellow, indicating that the CAPS is recharging from the vehicle's charging system (allow the CAPS to replenish its charge for 3–5 minutes).

Step 7. Once the CAPS has been allowed to charge for several minutes, complete the following disconnect procedures:

- If the buzzer is sounding, press the button to disarm the CAPS before disconnecting the clamps.

- Disconnect the clamps from the batteries.

NOTE: IF THE BUZZER IS SOUNDING, DO NOT DISCONNECT THE CLAMPS. ARCING MAY OCCUR AND CAUSE INJURY OR PROPERTY DAMAGE. PRESS AND RELEASE THE BUTTON TO RESET THE CAPS. IF THE BUZZER IS NOT SOUNDING, IT IS SAFE TO DISCONNECT THE CLAMPS.

SERVICE TRUCK HARNESS INSTALLATION

The CAPS includes a service truck harness so it can be charged while stowed in a service vehicle.

SAFETY REQUIREMENTS

- Wear appropriate protective equipment as required by your company policy.
- Set the parking brake.
- Remove the ignition key.
- Use proper lock-out tag-out procedures.
- Chock front and rear wheels on a level surface.
- Remove all rings, watches, and any metal wear that could possibly create an electrical pathway and cause serious injury.

TOOLS REQUIRED

- Wire Stripper
- Wire Cutter
- Wire Crimpers
- Solder
- Soldering Iron
- Heat Gun or Equivalent

WIRING INSTALLATION INSTRUCTIONS

The 2-conductor harness in Figure 1 connects to the CAPS via the 4-pin deutsch plug. This harness needs to be run to the engine compartment of the service truck and connected to the truck battery.

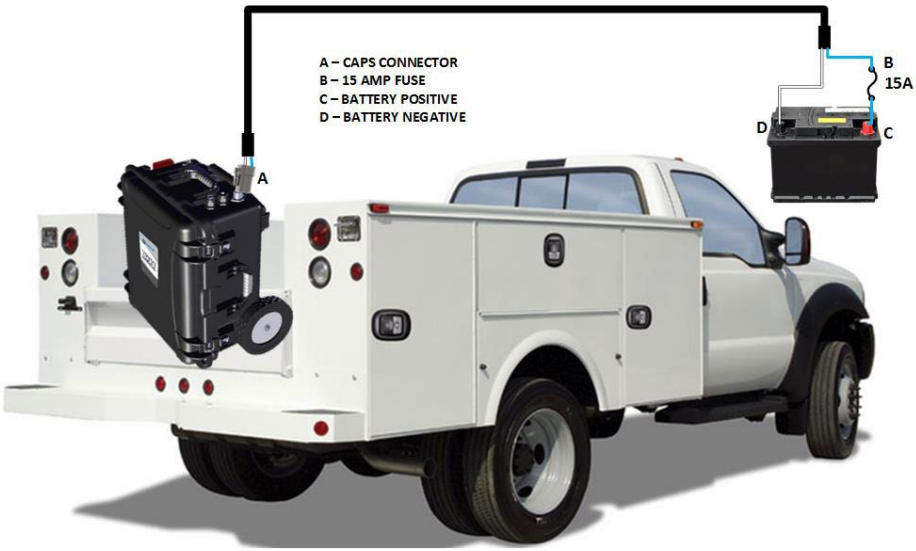


Figure 1

Figure 2

Step 1: Determine a suitable location to stow the CAPS machine in the service truck.

Step 2: Use the parts shown in Figure 2 and begin routing the bare end of the 2-conductor harness up to the engine compartment. Use the supplied zip ties to secure this cable to the truck along the way.

Step 3: Once inside the engine compartment, strip off enough of the 2-conductor insulating jacket harness to allow the ends to reach a battery positive and negative connection.

Step 4: Crimp the supplied 15 amp fuse holder to the positive blue wire on the 2-conductor harness. Solder and heat shrink this connection.

Step 5: Crimp the appropriate-sized ring terminal onto the protected side of the 15 amp fuse holder to allow the end to connect to battery positive.

Step 6: Crimp the appropriate-sized ring terminal onto the white battery negative wire of the 2-conductor harness. Solder and heat shrink this connection.

Step 7: Connect the positive 15 amp fused wire to battery positive and the white negative wire to battery negative.

Harness Wire Installation Complete

CHARGING THE CAPS

To charge the CAPS:

- From Outlet: Plug the CAPS into an AC outlet. Leave unit connected to AC outlet to maintain charge.

- From Vehicle: Connect jumpstart clamps to running vehicle and press button. Light will flash yellow and buzzer will sound while charging. CAPS will be sufficiently charged to perform multiple jumpstarts within 3–5 minutes. If the CAPS needs to be disconnected before it is fully charged, press the button to disarm it before removing the clamps.

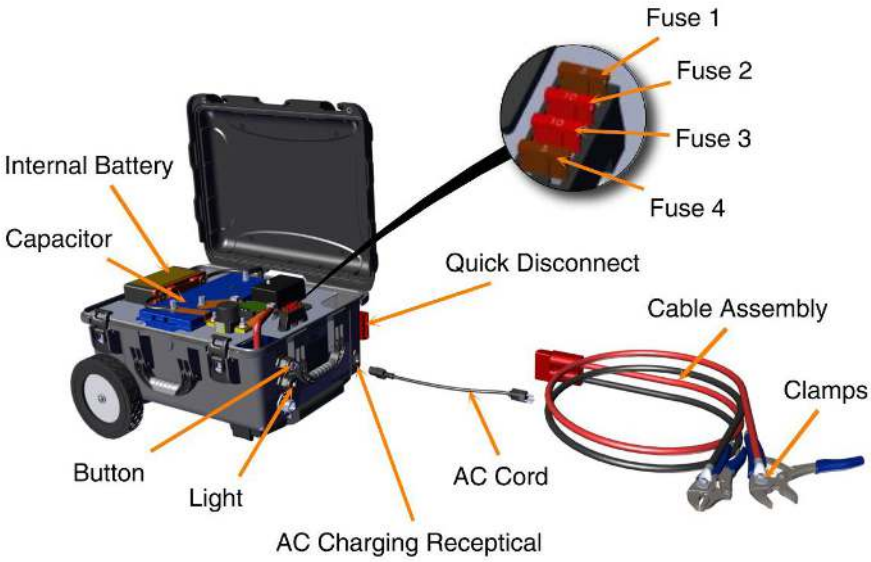
- From Service Truck: Permanently install the service truck charge harness into the service truck by connecting the harness to the 12 volt electrical system and routing the harness to a convenient storage location for the CAPS. Attach the harness to the CAPS to charge the unit.

NOTE: IF THE BUZZER IS SOUNDING, DO NOT DISCONNECT THE CLAMPS. ARCING MAY OCCUR AND CAUSE INJURY OR PROPERTY DAMAGE. PRESS AND RELEASE THE BUTTON TO RESET THE CAPS. IF THE BUZZER IS NOT SOUNDING, IT IS SAFE TO DISCONNECT THE CLAMPS.

KEEP CAPS CHARGING FROM AC OUTLET OR SERVICE TRUCK HARNESS WHEN NOT IN USE.

TROUBLESHOOTING

INTERNAL DIAGRAM



CONDITIONS INDICATED BY LIGHTS

After Turning on the CAPS

Light Status	Condition	Action Needed
Flashing Red	Internal battery at low state of charge.	Charge the CAPS.
Flashing Red and Buzzing	Internal battery at very low state of charge. (CAPS will not enter jumpstart mode.)	Charge the CAPS.
Flashing Orange and Buzzing	Internal battery is being overcharged.	If condition persists for more than 5 minutes, disconnect charger.
No Light	Internal battery at extremely low state of charge.	Charge the CAPS.
	Multiple blown fuses.	Check all fuses. Replace as necessary.
	Defective controller, wire harness, battery, or capacitor.	Contact Purkeys Customer Service.

After Pressing Button to Arm the CAPS:

Light Status	Condition	Action Needed
Flashing Red	Reverse polarity, clamps not connected, or clamps shorted.	Ensure that clamps are properly connected.
Fast-Flashing Yellow	Internal battery is charging capacitor. (CAPS is not ready to jumpstart.)	Wait until capacitor has charged. Buzzer will sound once when charge is complete. *
Flashing Green and Red	Internal battery at very low state of charge. (CAPS will not enter jumpstart mode.)	Charge the CAPS.
Flashing Yellow and Buzzing	Vehicle is charging CAPS capacitor and internal battery.	Allow CAPS to charge for several minutes. Press button before disconnecting from vehicle.

*If after an hour of charging the light still flashes yellow, the capactior inside the CAPS may need to be reset. Open the CAPS and press the black button on the capacitor to test the capacitor. If there is an error, press and hold the button for 10 seconds to reset the capacitor.

OTHER CONDITIONS

NOTE: Challenges may be experienced during jumpstart attempts due to many factors, such as: vehicle batteries being severely discharged, cold temperatures, etc. Multiple jumpstart attempts may be necessary to achieve a successful crank.

Symptom	Condition	Action Needed
While attempting a jumpstart, the CAPS shuts off abruptly and then resets.	Blown fuse	Check fuse 1. See diagram on page 10. Replace as necessary.
CAPS is connected to AC outlet, but will not charge (charge indicator light on, charger not on).	Blown fuse	Check fuse 2. See diagram on page 10. Replace as necessary.
	Defective charger	Contact Purkeys Customer Service.
After typical capacitor recharge time, capacitor is still not charged. (Yellow light flashes after pressing button.)	Blown fuse	Check fuse 3. See diagram on page 10. Replace as necessary.
Weak crank during jumpstart attempt. Before typical capacitor recharge time has elapsed, pressing the button arms the CAPS. (Green light and buzzer sounds.)	Blown fuse	Check fuse 4. See diagram on page 10. Replace as necessary.
Visual inspection of cable assembly shows dirty or worn condition.	Dirty or worn cable assembly	Maintain cable assembly clean and in good condition. Replace as necessary.
Fewer jumpstarts can be performed on a single charge. Jumpstart attempts may seem weaker.	Internal battery is close to end of life	Remove the CAPS internal battery and perform a BCI test. Replace battery as necessary.
Leads are “live” before pressing button. After pressing button, with leads not connected, light is green and buzzer sounds.	An internal mag switch is shorted.	Disconnect leads at the quick disconnect and contact Purkeys Customer Service.

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QUICK REFERENCE GUIDE

Step 1: If the light is not flashing, press and release the CAPS button to turn on the CAPS.

Step 2. Connect positive and negative clamps to vehicle, observing polarity.

Step 3. Press and release the CAPS button; the light should turn green and the buzzer should sound. If the light flashes, refer to the light indications guide on page 11.

Step 4. Make sure ALL vehicle loads are turned off. Turn the key switch to ON. Wait for the vehicle's gauges to cycle.

Step 5. Attempt to start the vehicle.

- If the vehicle does not start within a few seconds of cranking, wait for the capacitor inside the CAPS to recharge and repeat steps 3–5.
- If the vehicle starts, allow CAPS to recharge from the vehicle's charging system for a few minutes. Then press and release the CAPS button and disconnect the clamps.

NOTE: If the CAPS buzzer is sounding, press and release the button before disconnecting the clamps. DO NOT DISCONNECT THE CLAMPS WHILE THE BUZZER IS SOUNDING, AS ARCING MAY OCCUR AND CAUSE INJURY OR PROPERTY DAMAGE.

Connect the CAPS to AC power or service truck harness when not in use.

LIGHT INDICATIONS

After Turning On the CAPS:

Light	Status
	Internal battery at good state of charge
	Internal battery at low state of charge
	Overcharging internal battery

After Pressing Button to Arm the CAPS:

Light	Status
	Unit is armed and ready
	Reverse polarity, clamps not connected, or clamps shorted
	Capacitor is charging
	Internal battery is too low to function
	Internal CAPS battery is charging, press button before disconnecting from vehicle

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PART LIST

Refer to CAPS Internal Diagram on page 10 for details.

Description	Part Number	Quantity
CAPS	PJM-100	1
Cable Assembly	CA00139	1
Internal Battery	PC925	1
5 amp ATC fuses	F00005	2
10 amp ATC fuses	F00007	2
Service Truck Harness	H-00491	1
Internal Charger	CHRG-011	1
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LIMITED COMMERCIAL WARRANTY POLICY

Purkeys Fleet Electric, Inc. (hereafter “Purkeys”), warrants each product to be free of defects in material or workmanship under normal use and service. This warranty is for the benefit of Original Equipment Manufacturers, Dealers, Warehouse Distributors, Fleets, or other End Users (hereafter “Customers”) and covers products manufactured by Purkeys and sold new to Customers either directly by Purkeys or by its authorized dealers, distributors, or agents. The length of the Warranty Period is 24 months.

The warranty period commences on the in-service or install date and is not transferable. Failure to provide the in-service or install date on the warranty claim form will cause the warranty period to begin on the date the part was manufactured or date of sale recorded on the original sales invoice, whichever is earlier.

A completed warranty claim form should accompany all parts submitted to Purkeys for consideration for repair or replacement under warranty. The submitted claim form should contain all of the information required. Lack of a properly or fully completed claim form will result in delay or denial of warranty claim. Claims must be submitted no later than 30 days after part is removed.

This warranty does not apply if, in sole judgement of Purkeys, the product has been damaged or subjected to accident, faulty repair, improper adjustment, improper installation or wiring, neglect, misuse, or alteration or if the product failure is caused by defects in peripheral vehicle components or components attached to the Product or failure of a part not manufactured by Purkeys.

This warranty shall not apply if any Purkeys product is used for a purpose for which it is not designed or is in any way altered without the specific prior written consent of Purkeys. ANY Product alleged by a Customer to be defective must be inspected by Purkeys as a part of the warranty claims process in order to confirm that the part has failed as a result of a defect in material or workmanship.

Transportation for products and parts submitted to Purkeys for warranty consideration must be prepaid by Customer. Repaired or replaced products and or components will be returned to Customer pre-paid by Customer or “freight collect” to the address provided by Customer in the warranty claim form. No charge will be made for labor or material in effecting such repairs.

The Warranty provided by Purkeys hereunder is specifically limited to repair or replacement of the Product as Purkeys deems most appropriate in its sole discretion. Purkeys neither assumes nor authorizes any other person to assume on its behalf any other warranty or liabilities in connection with Purkeys products. The Warranty does not apply to fuses or other “consumable” or maintenance items which are or may be a part of any Purkeys product.

THIS WARRANTY DOES NOT APPLY TO LOSS OF VEHICLE OR EQUIPMENT, LOSS OF TIME, INCONVENIENCE, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. PURKEYS SPECIFICALLY DISCLAIMS AND SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES arising out of or from the use of Purkeys products by the Customer.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, INCLUDING COMMON LAW WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, AND ANY OTHER EXPRESS OR IMPLIED WARRANTIES. ALL OTHER SUCH WARRANTIES ARE SPECIFICALLY DISCLAIMED.

This Limited Commercial Warranty supersedes all previous Warranty Policies issued by Purkeys and any of its suppliers.

WATT Keeps You Trucking