



Horizon Power Systems
 888 3rd Street S.W.
 Calgary, Alberta T2P5C5
 (505) 327-0422
 BN# 834604605

SERVICE INVOICE

Invoice #	
531591	
Order #	Page
00454831 52	1
Invoice Date	
09/22/2020	

19125
INVOICE TO
 SURGE ENERGY INC
 2100, 635-8TH AVE SW
 INV on ADP/signature stamp required
 INQ: accountspayable@surgeenergy.ca
 *****SIGNATURE REQUIRED*****
 CALGARY, AB T2P 3M3

19125
SHIP TO
 SURGE ENERGY INC
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 CALGARY, AB T2P 3M3

Foreman	ERICKSON, DEVON	Customer PO	
Location	Surge Battery	Customer WO	
Add'l Ref 1	C600R/SN: 5383	Add'l Ref 2	CALL OUT
Approver		Equipment #	
Technician		Order/Work Date	
NADEAU, RODNEY		5/16/2020	
		Salesman	
		Todd Taylor	

Item #	Description	Lot/Serial	U/M	Taxable	Quantity	Unit Price	Ext Price
LB6H	Capstone Labor Regular		HR	Y	81.00	135.00	10935.00
CAP511714105	JUCB C6X, MULTIPACK REPLACES 511714-1		EA	Y	3.00	1,917.98	5753.94
CAP512300105	PCBA, ECM CONTROL BOARD SA		EA	Y	2.00	3,223.00	6446.00
CAP510338301	PDM,250-850VIN,25VOUT,15A, REPLACED B		EA	Y	1.00	1,620.65	1620.65
CAP511710106	BCM CONTROL BOARD SG/GC INTERCEDS		EA	Y	2.00	1,252.29	2504.58
CAP510252101	POWER BOARD, C6X BATTERY CONTROL M		EA	Y	1.00	1,799.34	1799.34
CAP520486101	PCBA, C200 INVERTER CTRL BOARD REPLA		EA	Y	1.00	2,049.80	2049.80
CAP520627101	PCBA,FCB-CE COMMON ELECT FUEL CONT		EA	Y	1.00	2,049.80	2049.80
CAP503010101	PERSONALITY MODULE C30/C6X FRAME/EN		EA	Y	1.00	230.69	230.69
CAP525203101	CABA, CAP COMM CABLE A, 1000 FAMILY		EA	Y	1.00	988.65	988.65
CAP525203200	CABA, CAP COMM CABLE B, 1000 REPLACE		EA	Y	1.00	1,443.43	1443.43
CAP525203300	CABA CAP COM CABLE C 1000 REPLACED B		EA	Y	1.00	1,891.62	1891.62
CAP512300105	PCBA, ECM CONTROL BOARD SA		EA	Y	2.00	3,223.00	6446.00
CAP511714105	JUCB C6X, MULTIPACK REPLACES 511714-1		EA	Y	2.00	1,917.98	3835.96
CAP522250100	POWER DISTRIBUTION BOARD		EA	Y	1.00	1,463.20	1463.20
KILOMETER	KILOMETERS DRIVEN		EA	Y	1344.00	1.20	1612.80

Order Notes



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5-16-20 Got a call for phone support C600 went down, Bay D would not run in pack, set to grid connect and started, load will have to be controlled manually, bay B had all 3 E stop errors and UCB error, tried writing ECM software and pm no luck, either JUCB failure or power supply.
 5-18-20 Drive to site fill out JSA and get work permit, go to unit and isolate Bay B, open up GCM and SCM bays, found JUCB board heavily damaged, shut down C600 to replace JUCB, was replaced powered unit up logged into unit and issued start cmd to bay, Jucb burned up immediatly and also damaged Jucb in bay C, unit logged all ESD faults and PDM 1 had only one light on power. Started by ringing all pins as per trouble guide for ESD faults all checked out okay, picture was sent to Capstone for help, they suggested woodward valve short could be issue. Set up burned Jucb as a pass thru, replaced Jucb on bay C and was able to start bay C and D in multipac to allow customer to start plant. Replaced Jucb in bayB replaced woodward with one from C1000, drove to hotel for night.
 5-19-20 Drive to site check with operator get permit, go back to unit inspect cable and cable bundles for damage, rack out BCM's to inspect control boards, no visible signs of damage, pin out all capcom cables for continuity and short to ground, all tested okay, started testing intra bus cable, drive to hotel for night
 5-20-20 Drive to site continue testing inta bus connections all okay, remove cables from from inductors in LCM and check main Contactor for short, tested okay, replace all wiring and harness except removed intra bus to BCM's and shut off batteries, installed new JUCB set up as per Capstone and turned power on to bay, bay powered up alright was able to get to grid connect standby, at this point tried test tools open loop, shorted JUCB, started diode test on IGBT's as per Capstone Engineer. did GCM went to Hotel for night.
 5-21-20 Drive to site check with operator and drive to unit, checked all IGBTs in LCM they tested okay, removed DC bus to BCM's, power plug to BCM,s and Intra harness to BCM, removed dc bus from VFD and test VFD as per Capstone instructions, it tested okay, replace Jucb, turn on went to test tools open loop everything was fine, plugged in power to main contactor and tested again, everything still okay, added dc power to VFD and tested again all okay, was able to test all fuel components no issues, problem in BCM's.Was able to start the unit in grid connect and support plant load. When I went to test ethernet connection it failed, found blown Moxa device, removed devie from bay A on C1000 and reprogrammed for C600 was able to connect. Went to C1000 to start bayD and E, found bay D had bunch of GCM faults, opened door found air filter was wet and water on filter tray, suspect water got ino GCM, started bay E and drove to town.
 5-22-20 Drive home and order parts for BCM repairs.
 7-27-20 Drive to site, fill out JSA and get work permit, shut down 5883B and rack out BCM's, replace both control boards and power board in BCM#2, replace BCM,s, install jumper for SA could not get it to recognize SA, tried replacing SCM CB and JUCB still no luck, put unit in GC and placed online for night.
 7-29-20 Drive to site get prmit, get 5383B to SA, connected batteries and DC bus and controls to BCM's and tested in test tools with batteries, all ok. Tried to start unit got to prepare to light and failed on overload GCM IGBT C. removed all cables and DC bus to BCM's found bad terminal block on DC+ in GCM, put unit back to grid connect would not see GC or any cb's, replaced JUCB and SCM CB and would see GC but not other CB's,
 replaced PDB no luck, replaced cap comm cable from PDB to GCM could see GCM CB and talk to it, reprogramed GCM, replaced frame PM, replaced cap comm cable from GCM to LCM, replaced LCM CB, could see and talk to , reprogrammed LCM, had issues seeing FCM CB, replaced cap comm cable from LCM to FCB, reprogrammed FCM CB, got unit to standby ready. drive to town for night
 7-30-20 Drive to site use test tools test unit in GC was okay button all panels and wire tie cables and place bay back on line in GC.

PLEASE REMIT IN CAD

Materials	Labor	Mileage	Freight	GST 5%	PST 6%	Tax Amount	Order Total
40136.46	10935.00	.00	.00	2,553.58	3,064.29	5617.87	56689.33

Please Remit Payment to:
 Horizon Power Systems CANADA, ULC.
 Bankers Hall West Tower # 1000
 888 3rd Street S.W.
 Calgary, Alberta T2P5C5

*Thank You
 For Your Business!*

Question About This Invoice?
 Contact: Accounts Receivable 855-256-7697

PARTS SOLD HEREIN ARE WARRANTED ONLY TO THE EXTENT OF THE WARRANTY FURNISHED BY THE MANUFACTURER OF SUCH PARTS. ITEMS RETURNED MUST BE IN NEW CONDITION, ORIGINAL BOX, AND ACCOMPANIED BY THE PURCHASE INVOICE. THERE WILL BE NO RETURNS OR REFUNDS ALLOWED ON THE FOLLOWING: 1) PARTS RETURNED AFTER 30 DAYS, 2) ANY ELECTRICAL EQUIPMENT OR PARTS, 3) BROKEN OR PARTIAL KITS AND GASKET SETS, 4) TOOLS THAT HAVE BEEN USED, 5) SPECIAL ORDER ITEMS, OR 6) PARTS NOT IN THEIR ORIGINAL PACKAGE. 1.5% CHARGE ON INVOICES 30 DAYS PAST DUE (18% ANNUALLY.)



HORIZON POWERSYSTEMS

Work Order Number:

454831

52

Date Opened: May 16, 2020

Employee: Rodney Nadeau

Customer Information

Work Type:	Customer	AFE & P.O. #'s:	
Customer Name:	Misc.	Customer Foreman:	Devon Erickson
Location:	Surge Battery	Nearest City:	
Turbine Model:	C600R	Type of Service:	Call-out
System S/N:	5383	Misc. Cust. Name:	Surge Energy
Capstone IR:		Capstone RMA/SVS:	

Employee Charges

HPS Technician	Date	Vehicle #	Mileage	Time In	Time Out	Hours	
1	Rodney Nadeau	5/16/2020	C-205 RN	0	18:00	19:15	1:15
2	Rodney Nadeau	5/18/2020	C-205 RN	559	5:10	19:50	14:40
3	Rodney Nadeau	5/19/2020	C-205 RN	44	7:00	18:30	11:30
4	Rodney Nadeau	5/20/2020	C-205 RN	44	7:00	18:00	11:00
5	Rodney Nadeau	5/21/2020	C-205 RN	44	6:55	17:00	10:05
6	Rodney Nadeau	5/22/2020	C-205 RN	559	7:00	13:30	6:30
7	Rodney Nadeau	7/27/2020	C-205 RN	47	6:10	18:10	12:00
8	Rodney Nadeau	7/29/2020	C-205 RN	47	6:50	19:00	12:10
9	Rodney Nadeau	7/30/2020	C-205 RN	0	6:40	8:30	1:50
10							0:00
11							0:00
12							0:00
13							0:00
14							0:00
15							0:00
16							0:00
17							0:00
18							0:00
19							0:00
20							0:00
21							0:00
22							0:00
23							0:00
24							0:00
25							0:00
Total Mileage:			1344	Total Hours:		81:00:00	



HORIZON POWERSYSTEMS

Work Order Number:

454831

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Date Opened: May 16, 2020

Employee: Rodney Nadeau

Parts & Materials

Branch Plant	Quantity	Part Number	Description	
1	4	Accommodation	hotel for night	
2	C205	3	510714-105	JUCB multipac C6X
3	C205	2	512300-105	SCM CB C200
4	C205	1	510338-301	PDM for C200
5	CUSTOMER	1	522455-001	Swift 36
6	CUSTOMER	2	510714-105	
7	CUSTOMER	1	512300-105	
8	C205	2	511710-106	Board hybrid control C65/C200 BCM
9	C205	1	510252-101	Board,Power, C65,C200 BCM
10	C205	1	520486-103	Board, inverter control, C200
11	C205	1	520627-101	Board, Control, Fuel C200
12	C205	1	503010-101	Personality Module C30/C65/C200
13	C205	1	525203-101	CABA,Cap Comm, PDB to GCM C1000
14	C205	1	525203-201	CABA,Cap Comm, GCM to LCM C1000
15	C205	1	525203-301	CABA,Cap Comm LCM to FCB C1000
16	Possible			
17	C205	2	512300-105	SCM CB C200
18	C205	2	510714-105	JUCB multipac C6X
19	C205	1	522250-100	Board Power Distribution, C1000
20				



HORIZON POWERSYSTEMS

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Date Opened: May 16, 2020

Employee: Rodney Nadeau

Service Report - Begin

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