

FreedomCAR 42 V Energy Storage System End-of-Life Performance Goals (August 2002)

42 Volt Targets Rev. August 2002	Start-Stop		M-HEV		P-HEV	
Discharge Pulse Power (kW)	6	2 s	13	2 sec	18	10 sec
Regenerative Pulse Power (kW)	N/A		8	2 sec	18	2 s
Engine-Off Accessory Load (kW)	3	5 min	3	5 min	3	5 min
Available Energy (Wh @3 kW)	250		300		700	
Recharge Rate (kW)	2.4 kW		2.6 kW		4.5 kW	
Energy Efficiency on Load Profile (%)	90		90		90	
Cycle Life, Miles/Profiles (Engine Starts)	150k (450k)		150k (450k)		150k (450k)	
Cycle Life and Efficiency Load Profile	Zero Pwr Asst (ZPA)		Partial Pwr Asst (PPA)		Full Pwr Asst (FPA)	
Cold Cranking Power @ -30°C (kW)	8	21 V Min.	8	21 V Min.	8	21 V Min.
Calendar Life (Yrs)	15		15		15	
Maximum System Weight (kg)	10		25		35	
Maximum System Volume (Liters)	9		20		28	
Selling Price (\$/system @ 100k/yr)	150		260		360	
Maximum Open Circuit Voltage (Vdc) after 1 Sec.	48		48		48	
Minimum Operating Voltage (Vdc)	27		27		27	
Self Discharge (Wh/day)	<20		<20		<20	
Heat Rejection Coefficient (W/°C)	N/A		N/A		>30	
Maximum Cell-to-Cell Temperature Difference (°C)	N/A		N/A		<4	
Operating Temperature Range (°C)	-30 to +52		-30 to +52		-30 to +52	
Survival Temperature Range (°C)	-46 to +66		-46 to +66		-46 to +66	