Title
Evaluation Of Potential Hybrid Electric Vehicle Applications: Vol. II

Author
Gris, Arturo

Publication Date
1991

Program on Advanced Technology for the Highway
INSTITUTE OF TRANSPORTATION STUDIES
UNIVERSITY OF CALIFORNIA AT BERKELEY

Evaluation of Potential Hybrid Electric Vehicle Applications Volume II: Appendices

Arturo E. Gris

PATH Research Report
UCB-ITS-PRR-91-5

This work was performed as part of the Program on Advanced Technology for the Highway (PATH) at the Institute of Transportation Studies, University of California, Berkeley, under the sponsorship of Chevron Research Company.

ISSN 1055-1425

EVALUATION OF POTENTIAL HYBRID ELECTRIC VEHICLE APPLICATIONS
VOLUME II: APPENDICES

Arturo E. Gris

University of California
Berkeley, CA 94720

CONTENTS

Appendix A. 1	Simulation of the Scenarios With The Same Vehicle
Appendix A.2	Simulation of the Scenarios With Selected Vehicles
Appendix A. 3	Comparison of Simulation Results With Track Test Results
Appendix B	Top Speed and Acceleration Power Requirements
Appendix C	Designs Without Air Conditioning
Appendix D	Sensitivity of the Designs to Changes in Batter Specs
Appendix E	Designs With Air Conditioning
Appendix F	Alternate Sizing Method for Hybrid Vehicles
Appendix G	Practical Limitations of Engine-Generator Sets

APPENDIX Al. SIMULATION OF THE SCENARIOS WITH THE SAME VEHICLE

TITLE: (I) DRIVING SCENARIO, 5 PERSON CAR

Cd:	0.3	r(Kg/m3):	1.225
Area(m2):	1.9	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	15.0%
Mass(Kg):	1400	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	10 mi
%dist.grdl:	50.0%
Vconstant:	30 mi/h

CYCLE INFORMATION

Ranqe:	3 mi
%dist.grdl:	50.0%
%dist.grd2:	0.0%
t(ac):	4 s
t(cr):	0 s
t(co):	2 s
t(br):	3 s
Vcruise:	10 mi/h

CYCLE RESULTS

V after (co):	9.54 mi/h
dist/cycl (ac) :	3.94 m
dist/cycl(cr):	0.00 m
dist/cycl(co+br):	11.17 m
Total cyle dist:	20.11 m
#cycles needed:	240.00

FORCES ANALYSIS

Fcn	199.97	N
Fcn up,/grl :	1021.63	N
Fcn dw/grl:	-521.75	N
Fac:	1708.48	N
Fac up/grl:	2530.20	N
Fac dw/grl:	886.76	N
'ac up/gr2:	3743.71	N
Fac dw/gr2 :	-325.75	N
Fcr:	144.17	N
Fcr up/grl :	965.90	N
Fcr dw/grl :	-977.55	N
Fcr up/gr2 :	2179.41	N
Fcr dw/ gr2:	-1891.06	N
Fco:	0.00	N
Fco up / grl:	221.72	N
"cc dw/grl:	-821.72	N
Fco up/gr2:	2035.23	N
Fco dw/ g r 2 :	-2035.23	N
Fbr:	-1346.08	N
Fbr up/grl:	-1024.35	N
Fbr dw/grl:	-2667.80	N
Fbr up/gr2:	139.15	N
Fbr dw/gr2:	-3381.31	N

POWER ANALYSIS

Pcn:	2.68 KW	
Pcn up/gr1:	13.70 Kw	
Pcn dw/gr1:	-8.34 KW	
Pac:	7.64 Kw	-max-
Pac up/gr1:	11.31 Kw	-max-
Pac dw/grl:	3.96 KW	-max-
Pac up/gr2:	16.73 KW	-max-
Pac dw/gr2:	-1.46 KW	-max-
Pcr:	0.64 KW	
Pcr up/gr1:	4.32 KW	
Pcr dw/gr1:	-3.03 KW	
Pcr up/gr2:	9.74 Kw	
Pcr dw/gr2:	-3.45 KW	
Pco :	0 . 0 0 KW	
Pco up/gr1:	3.67 KW	
Pco dw/gr1:	-3.67 KW	
Pco up/gr2:	9 . 10 KW	
Pcs dw/gr2 :	-9.10 KW	
Pbr:	-7.31 KW	-max-
Pbr up/gr1:	-4.37 KW	-max-
Pbr dw/gr1:	-11.37 KW	-max-
Pbr up/gr2:	0 . 8 1 KW	-max-
Pbr dw/gr2:	-16.55 KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn :	0.447	0.447	0.447	KWh
Ecn up/gr1:	1.142	1.112	1.142	KWh
Ecn dw/gr1 :	-0.695	-0.174	0.000	KWh
Eac:	0.509	0.509	0.509	KWh
Eac up/gr1:	0.377	0.377	0.377	KWh
Eac dw/gr1:	0.132	0.132	0.132	KWh
Eac up/gr2:	0 000	0.000	0.000	KWh
Eac dw/gr2:	0: 000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco :	0.000	0.000	0.000	KWh
Eco up/gr1:	0.122	0.122	0.122	KWh
Eco dw/gr1:	-0.122	-0.031	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	-0.394	-0.093	0.000	KWh
Ebr up/gr1:	-0.109	-0.027	0.000	KWh
Ebr dw/gr1:	-0.284	-0.071	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	1.125	2.328	2.729	KWh
	0.087	0.179	0.210	KWh/mi

TITLE: **(II) DRIVING SCENARIO, 5 PERSON CAR**

Cd:	**0.3**	r(Kg/m3):	1.225
Area(m2):	**1.9**	Grade1(%):	6.0%
Ur:	**0.01**	Grade2(%):	15.0%
Mass(Kg):	**1400**	**Reg.Brake (n):**	0.25

CONSTANT SPEED INFORMATION

Range:	40 **mi**
%dist.grd1:	**15.0%**
Vconstant:	**55** mi/h

CYCLE INFORMATION

Range:	60 mi
%dist.grd1:	15.0%
%dist.grd2:	**5.0%**
t(ac):	19 **s**
t(cr):	**19** s
t(co):	4 **s**
t(br):	9 **s**
Vcruise :	**20** mi/h

CYCLE RESULTS

V **after** (co):	13.94 mi/h
dist/cycl (ac) :	84.92 m
dist/cycl(cr):	159.34 m
dist/cycl(co+br) :	43.23 m
Total cycle dist:	294.98 m
<cycles-needed:	327.27

FORCES ANALYSIS

Fcn:	348.17 N
Fcn up/gr1 :	**1159.89** N
Fcn dw/gr1:	-473.56 N
"ac :	323.75 N
Fac up/gr1:	1645.47 N
Fac dw/gr1:	2.03 N
Fac up/gr2:	2858.98 N
"ac dw/gr2:	-1211.43 N
Fcr:	165.10 N
Fcr up/gr1:	986.82 N
Fcr dw/gr1:	-556.53 N
Fcr up/gr2:	2200.33 N
Fcr dw/gr2:	-1870.13 N
Fco:	0.00 N
Fco up/gr1:	321.72 N
Fco dw/gr1:	-821.72 **N**
Fco up/gr2:	2035.23 N
Fco dw/gr2 :	-2035.23 N
Fbr:	-2208.53 N
Pbr up/gr1:	-1336.36 N
Fbr dw/gr1 :	-3030.30 N
Fbr up/gr2:	-173.35 N
Fbr dw/gr2:	-4243.31 N

POWER ANALYSIS

Pcn:	8.56	KW	
Pcn up/gr1:	28.76	KW	
Pcn dw/gr1:	-11.64	Kw	
Pac:	7.36	KW	-max-
Pac up/gr1:	14.71	KW	-max-
Pac dw/gr1:	0.02	KW	-max-
Pac up/gr2:	25.56	KW	-max-
Pac dw/gr2:	-10.83	KW	-max-
Pcr:	1.48	KW	
Pcr up/gr1:	8.82	KW	
Pcr dw/gr1:	-5.87	KW	
Pcr up/gr2 :	14.67	KW	
Pcr dw/gr2:	-16.72	KW	
Pco:	0.00	KW	
Pco up/gr1:	7.35	KW	
Pco dw/gr1:	-7.35	KW	
Pco up/gr2 :	13.19	KW	
Pco dw/gr2 :	-13 .19	KW	
Pbr:	-18.70	KW	-max-
Pbr up/gr1:	-11.74	KW	-max-
Pbr dw/gr1 :	-25.66	KW	-max-
Pbr up/gr2:	-1.41	KW	-max-
Pbr dw/gr2:	-35.93	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	3.291	5. 291	5.291	KWh
Ecn up/gr1 :	1.563	1.569	1.569	KWh
Ecn dw/gr1 :	-0.635	-0.159	0.000	KWh
Eac:	5.087	5.027	5.087	KWh
Eac up/gr1:	0,953	0.953	0.953	KWh
Eac dw/gr1:	0.001	0.001	0.001	KWh
Eac up/gr2:	0.552	0.552	0.552	KWh
Eac dw/gr2:	-0.234	-0.058	0.000	KWh
Ecr :	2.039	2.039	2.039	KWh
Ecr up/gr1:	1.1113	1.143	1.143	KWh
Ecr dw/gr1:	-0.760	-0.190	0.000	KWh
Ecr up/gr2:	0.849	0.849	0.843	KWh
Ecr dw/gr2:	-0.722	-3.180	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.200	0.200	0.200	KWh
Eco dw/gr1:	-0.200	-0.050	0.000	KWh
Eco up/gr2 :	0.165	0.165	0.165	KWh
Eco dw/gr2:	-0.165	-0.041	0.000	KWh
Ebr:	-3.400	-0.850	0.000	KWh
Ebr up/gr1:	-0.200	-0.050	0.000	KWh
Ebr dw/gr1:	-0.437	-0.109	0.000	KWh
Ebr up/gr2:	-0.008	-0.002	0.000	KWh
Ebr dw/gr2:	-0.204	-0.051	0.000	KWh
TOTAL ENERGY	10.883	16.108	17.850	KWh
	0.109	0.161	0.178	KWh/mi

TITLE: (III) DRIVING SCENARIO, 5 PERSON CAR

Cd:	0.3	r(Kg/m3):	1.225
Area(m2):	1.9	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	15.0%
Mass(Kg):	1400	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	0 mi
%dist.grd1:	0.0%
Vconstant:	0 mijh

CYCLE INFORMATION

		CYCLE RESULTS	
Range:	100 mi		
%dist.grd1:	20.0%	V after (co):	27.44 mi/h
%dist.grd2:	0.0%		
t(ac):	13 s	dist/cycl(ac):	120.68 m
t(cr):	20 s	dist/cycl(cr):	268.17 m
t(co):	8 s	dist/cycl(co+br):	113.97 m
t(br):	9 s	Total cycle dist:	502.31 m
Vcruise:	30 mi/h	#cycles needed:	320.00

FORCES ANALYSIS

Fcn:	137.20 N
Fcn up/gr1:	958.92 N
Fcn dw/gr1:	-684.52 N
Fac:	1242.84 N
Fac up/gr1:	2064.56 N
Fac dw/gr1:	421.12 N
Fac up/gr2:	3278.07 N
Fac dw/gr2:	-792.39 N
Fcr:	199.97 N
Fcr up/gr1:	1021.69 N
Fcr dw/gr1:	-621.76 N
Fcr up/gr2:	2235.20 N
Fcr dw/gr2:	-1835.26 N
Fco:	0.00 N
Fco up/gr1:	821.72 N
Fco dw/gr1:	-821.72 N
Fco up/gr2:	2035.23 N
Fco dw/gr2:	-2035.23 N
Fbr:	-1718.27 N
Fbr up/gr1:	-896.55 N
Fbr dw/gr1:	-2539.99 N
Fbr up/gr2:	316.96 N
Fbr dw/gr2:	-3753.50 N

POWER ANALYSIS

Pcn:	0.00	KW	
Pcn up/grl:	0.00	KW	
Pcn dw/grl:	0.00	KW	
Pac:	16.66	KW	-max-
Pac up/grl:	27.68	KW	-max-
Pac dw/grl:	5.65	KW	-max-
Pac up/gr2:	43.95	KW	-max-
Pac dw/gr2:	-10.62	KW	-max-
Pcr :	2.68	KW	
Pcr up/grl:	1 3.70	KW	
Pcr dw/grl:	-8.34	KW	
Pcr up/gr2:	29.97	KW	
Pcr dw/gr2:	-24.61	KW	
Pco:	0.00	KW	
Pco up/grl:	11.02	KW	
Pco dw/grl:	-11.02	KW	
"co up/gr2 :	27.29	KW	
Pco dw/gr2 :	-27. 29	KW	
Phr:	-21. 08	KW	-max-
Pbr up/grl :	-31.00	KW	-max-
Pbr dw/qr1 :	-31.15	KW	-max-
Pbr up/gr2:	3.89	KW	-max-
Pbr dw/gr2 :	-46.04	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	Nc Reg. Brk	
Ecn:	0.000	0.000	O.CGO	KWh
Ecn up/grl:	0.000	0. oco	0.000	KWh
Ecn dw/grl :	0.000	0.000	0.000	KWh
Eac:	10.665	10.665	10.665	KWh
Eacup/grl :	2.215	2.215	2.215	KWh
Eac dw/grl :	0.452	0.452	0.432	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr :	3.313	3.813	3.313	KWh
Ecr up/grl:	2.435	2.435	2.435	KWh
Ecr dw/grl:	-1.432	-0.371	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/grl:	0. 783	0. 733	0. 733	KWh
Eco dw/grl:	-0.733	-0.0196	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	-6.744	-1.686	0.000	KWh
Ebr upjgrl:	-0.440	-0.110	0.000	KWh
Ebr dw/grl:	-1.246	-0.312	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	9.668	17.690	20.364	KWh
	0.097	0.177	0.204	KWh/mi

TITLE: (III) DRIVING SCENARIO, 5 PERSON CAR

Cd:	0.3	r(Kg/m3):	1.225
Area(m2):	1.9	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	15.0%
Mass(Kg):	1400	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	50 mi
%dist.grd1:	20.0%
Vconstant:	55 mi/h

CYCLE INFORMATION

		CYCLE RESULTS	
Range:	100 mi		
%dist.grd1:	20.0%	V after (co):	27.44 mi/h
%dist.grd2:	0.0%		
t(ac):	13 s	dist/cycl(ac):	120.68 m
t(cr):	20 s	dist/cycl(cr):	268.17 m
t(co):	3 s	dist/cycl(co+br):	113.97 m
t(br):	9 s	Total cyle dist:	502.81 m
Vcruise:	30 mi/h	#cycles needed:	320.00

FORCES ANALYSIS

Fcn:	318.17 N
Fcn up/gr1:	1169.39 N
Fcn dw/gr1:	-473.56 N
Fac:	1242.84 N
Fac up/gr1:	2064.56 N
Fac dw/gr1:	421.12 N
Fac up/gr2:	3273.07 N
Fac dw/gr2:	-792.39 N
Fcr:	199.97 N
Fcr up/gr1:	1021.69 N
Fcr dw/gr1:	-621.76 N
Fcr up/gr2:	2235.20 N
Fcr dw/gr2:	-1335.26 N
Fco:	0.00 N
Fco up/gr1:	821.72 N
Fco dw/gr1:	-821.72 N
Fco upjgr2:	2035.23 N
Fco dw/gr2:	-2035.23 N
Fbr:	-1718.27 N
Fbr up/gr1:	-896.55 N
Fbr dw/gr1:	-2539.99 N
Fbr up/gr2:	316.96 N
Fbr dw/gr2:	-3753.50 N

POWER ANALYSIS

Pcn:	8.56	KW	
Pcn up/gr1:	28.76	KW	
Pcn dw/gr1:	-11.64	Kw	
Pac:	16.66	Kw	-max-
Pac up/gr1:	27.68	KW	-max-
Pac dw/gr1:	5.65	KW	-max-
Pac up/gr2:	43.95	KW	-max-
Pac dw/gr2:	-10.62	KW	-max-
Pcr:	2.68	KW	
Psr up/gr1:	13.70	Kw	
Pcr dw/gr1:	-3.34	Kw	
Pcr up/gr2:	29.97	KW	
Pcr dw/gr2:	-24.61	KW	
Pco:	0.00	KW	
'"co up/gr1:	11.02	KW	
Pco dw/gr1:	-11.02	KW	
Pco up/gr2:	27.29	KW	
Pco dw/gr2 :	-27.29	KW	
Pbr:	-21.08	KW	-max-
Pbr up/gr1 :	-11.00	KW	-max-
Fbr dw/gr1 :	-31.1	KW	-max-
Pbr up/gr2:	3.39	KW	-max-
Pbr dw/gr2 :	-46.04	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	6.224	6.224	6.224	KWh
Ecn up/gr1:	2.614	2.614	2.614	KWh
Ecn dw/gr1:	-1.05a	-0.265	0.000	KWh
Eac:	10.665	10.565	10.665	KWh
Eac up/gr1:	2.215	2.215	2.215	KWh
Eac dw/gr1 :	0.452	0.452	0.452	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	3.813	3.813	3.813	KWh
Ecr up/gr1:	2.435	2.435	2.435	KWh
Ecr dw/gr1:	-1.422	-0.371	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.783	0.733	0.783	KWh
Eco dw/gr1:	-0.783	-0.196	0.000	KWh
Eco up/gr2:	3.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	-5.744	-1.686	0.000	KWh
Ebr up/gr1:	-0.440	-0.110	0.000	KWh
Ebr dw/gr1:	-1.246	-0.312	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	17.448	26.264	29.203	KWh
	0.116	0.175	0.195	KWh/mi

TITLE: (IV) DRIVING SCENARIO, 5 PERSON CAR

Cd:	0.3	r(Kg/m3):	**1.225**
Area(m2):	1.9	Grade1(%):	**6.0%**
Ur:	0.01	Grade2(%):	**15.0%**
Mass(Kg):	**1400**	Reg.Brake (n):	**0.25**

CONSTANT SPEED INFORMATION

Range:	**30** mi
%dist.grd1:	15.0%
Vconstant:	55 mi/h

CYCLE INFORMATION

Range:	**30** mi
%dist.grd1:	15.0%
%dist.grd2:	**5.0%**
t(ac):	28 **s**
t(cr):	**50 s**
t(co):	**10 s**
t(br):	9 **s**
Vcruise:	4 **5** mi/h

CYCLE RESULTS

V after (co):	40.55 mi/h
dist/cycl(ac):	281.58 m
dist/cycl(cr):	1005.63 m
dist/cycl(co+br):	191.07 m
Total cyle dist:	1478.27 m
#cycles needed:	32.65

FORCES ANALYSIS

Fcn:	348.17 N
Fcn up/gr1:	1169.89 N
Fcn dw/gr1:	-473.56 N
Fac:	**1234.05** N
Fac up/ gr1 :	**2135.77** N
Fac dw/gr1:	**462.33 N**
Fac up/gr2:	**3313.28** N
Fac dw/gr2 :	-751.18 N
Fcr :	**273.43** N
Fcr up/gr1:	1100.15 **N**
Fcr dw/gr1:	-543.30 N
Fcr up/gr2 :	2313.66 N
Fcr dw/gr2 :	-1756.81 N
Fco:	**0.00 N**
Fco up/gr1 :	**221.72** N
Fco dw/gr1 :	**-821.72** N
Fco up/gr2:	**2035.23 N**
Fco dw/gr2:	**-2035.23** N
Fbr:	**-2567.37 N**
Fbr up/gr1:	-1745.65 **N**
Fbr dw/gr1:	**-3389.09 N**
Fbr up/gr2:	-532.14 **N**
Fbr dw/gr2:	**-4602.60** N

POWER ANALYSIS

Pcn:	8.56	KW	
Pcn up/grl:	28.76	KW	
Pcn dw/grl:	-11.64	KW	
Pac:	25.83	KW	-max-
Pac up/grl:	42.35	KW	-max-
Pac dw/grl:	9.30	KW	-max-
Pac up/gr2:	66.76	KW	-max-
Pac dw/gr2:	-15.11	KW	-max-
Pcr:	5.60	KW	
Pcr up/grl:	22.13	KW	
Pcr dw/grl:	-10.93	KW	
Pcr up/gr2:	46.53	KW	
Pcr dwjgr2:	-35.33	KW	
Pco:	0.00	KW	
Pco up/grl:	16.53	KW	
Pco dw/grl:	-16.53	KW	
Pco up/gr2:	40.93	KW	
Pco dw/gr2:	-40.93	Kw	
Pbr:	-46.53	KW	-max-
Pbr up/grl:	-3'1.64	KW	-max-
Pbr dw/grl:	-61.42	KW	-max-
Pbr up/gr2:	-9.64	KW	-max-
Pbr dw/gr2:	-33. 42	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	3.968	3.968	3. 963	KWh
Ecn up/grl:	1.176	1.176	1.175	KWh
Ecn dw/grl:	-0.476	-0.119	0.000	KWh
Eac:	2.624	2.624	2.624	KWh
Eac up/grl:	0.403	0.403	0.403	KWh
Eac dw/grl :	0.089	0.089	0.089	KWh
Eac upjgr2:	0.212	0.212	0 .212	KWh
Eac dw/gr2:	-0.043	-0.012	0.000	KWh
Ecr:	2.032	2.032	2.032	KWh
Ecr up/grl:	0.753	0.753	0.753	KWh
Ecr dw/grl:	-0.372	-0.093	0.000	KWh
Ecr up/gr2:	0.528	0.528	0.523	KWh
Ecr dwjgr2:	-0.401	-0.100	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/grl:	0.112	0.112	0.112	KWh
Eco dw/grl:	-0.112	-0.023	0.000	KWh
Eco up/gr2:	0.093	0.093	0.093	KWh
Eco dw/gr2:	-0.093	-0.023	0.000	KWh
Ebr:	-1.519	-0.380	0.000	KWh
Ebr up/grl:	-0.097	-0.024	0.000	KWh
Ebr dw/grl:	-0.188	-0.047	0.000	KWh
Ebr up/gr2:	-0.010	-0.002	0.000	KWh
Ebr dw/gr2:	-0.085	-0.021	0.000	KWh
TOTAL ENERGY	8.588	11.139	11.989	KWh
	0.143	0.186	0.200	KWh/mi

TITLE: (V) DRIVING SCENARIO, 5 PERSON CAR

Cd:	**0.3**	r(Kg/m3):	1.225
Area(m2):	1.9	Grade1(%):	**6.0%**
Ur:	0.01	Grade2(%):	**15.0%**
Mass(Kg):	**1400**	Reg.Brake (n):	**0.25**

CONSTANT SPEED INFORMATION

Range:	**120** mi
%dist.grd1:	**15.0%**
Vconstant:	60 mi/h

CYCLE INFORMATION

Range:	**30** mi
%dist.grd1:	**15.0%**
%dist.grd2:	**5. 0%**
t(acj:	**28 s**
t(cr):	**50 s**
t(coj:	**10 s**
t(br) :	**3 s**
Vcruise:	45 mi/h

CYCLE RESULTS

V after [illegible] (coj :	40.55 mi/h
dist/cycl(ac):	**28 1.53** m
dist/cycl(cr):	1005.63 m
dist/cycl((co+br)co :	191.07 a
Total cyle dist:	1478.27 m
#cycles **needed:**	32.65

FORCES ANALYSIS

Fcn:	**338.27**	**N**
Fcn up/gr1:	1209.99	N
Fcn dw/gr1:	-433.45	N
Fac:	1284.05	N
Fac upjgrl:	**2105.77**	**N**
Fac dw/gr1:	**462.33**	**N**
Fac up/gr2:	3319.23	**N**
Fac dw/gr2:	**-751**.18	N
Fcr:	**273.43**	N
Fcr up/gr1:	**1100.15**	N
Fcr dw/gr1:	-543.30	N
Fcr up/gr2:	**2313.66**	N
Fcr dw/gr2 :	-1756.81	N
Fco:	0.00	N
Fco up/gr1:	**821. 72**	**N**
Fco dw/gr1:	**-821.72**	**N**
Fco up/gr2:	**2035.23**	**N**
Fcc dw/gr2:	**-2035.23**	**N**
Fbr:	**-2567.37**	**N**
Fbr up/gr1:	**-1745.65**	N
Fbr dw/gr1:	**-3389.09**	**N**
Fbr up/gr2:	**-532.14**	**N**
Fbr dw/gr2:	**-4602.60**	**N**

POWER ANALYSIS

Pcn:	10.41	KW	
Pcn up/gr1:	32.45	KW	
Pcn dw/gr1:	-11.62	KW	
Pac:	25.33	KW	-max-
Pac up/gr1:	42.35	KW	-max-
Pac dw/gr1:	9.30	KW	-max-
Pac up/gr2:	66.76	KW	-max-
Pac dw/gr2:	-15.11	KW	-max-
Pcr:	5.60	KW	
Pcr up/gr1:	22.13	KW	
Pcr dw/gr1:	-10.93	KW	
Pcr up/gr2:	46.53	KW	
Pcr dw/gr2:	-35.33	KW	
Pco:	0.00	KW	
Pco upjgrl:	16.53	KW	
Pco dw/gr1:	-16.53	KW	
Pco up/gr2:	40.93	KW	
Pco dw/gr2:	-40.93	Kw	
Pbr:	-46.53	KW	-max-
Pbr up/gr1:	-31.64	KW	-max-
Pbr dw/gr1:	**-51.42**	KW	-max-
Pbr up/gr2:	-9.64	KW	-max-
Pbr dwjgr2:	-33.42	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=i	Reg.Brk n=n	No Reg.Brk	
Ecn:	17.**700**	**17.700**	17.700	KWh
Ecn up/gr1:	4.367	4.867	1.367	KWh
Ecn dw/gr1:	-1.744	-0.436	0.000	KWh
Eac:	2.624	2.624	2.624	KWh
Eac upjgrl:	0.403	0.403	0.403	KWh
Eac dw/gr1:	0.089	0.089	0.089	KWh
Eac up/gr2:	0.212	0.212	0.212	KWh
Eac dw/gr2:	-0.043	-0.012	0.000	KWh
Ecr:	2.032	2.032	2.032	KWh
Ecr up/gr1:	0.753	0.753	0.753	KWh
Ecr dw/gr1:	-0.372	-0.093	0.000	KWh
Ecr up/gr2:	0.528	0.523	0.523	KWh
Ecr dw/gr2:	-0.401	-0.100	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.112	0.112	0.112	KWh
Eco dw/gr1:	-0.112	-0.028	0.000	KWh
Eco up/gr2:	0.093	0.093	0.093	KWh
Eco dw/gr2:	-0.093	-0.023	0.000	KWh
Ebr:	-1.519	-0.330	0.000	KWh
Ebr up/gr1:	-0.097	-0.024	0.000	KWh
Ebr dw/gr1:	-0.188	-0.047	0.000	KWh
Ebr up/gr2:	-0.010	-0.002	0.000	KWh
Ebr dw/gr2:	-0.085	-0.021	0.000	KWh
TOTAL ENERGY	24.744	28.245	29.412	KWh
	0.165	0.188	0.196	KWh/mi

TITLE: (V) DRIVING SCENARIO, 5 PERSON CAR

Cd:	0.3	r(Kg/m3):	1.225
Area(m2):	1.9	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	15.0%
Mass(Kg):	1400	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	160 mi
%dist.grd1:	15.0%
Vconstant:	60 mi/h

CYCLE INFORMATION

Range:	40 mi
%dist.grd1:	15.0%
%dist.grd2:	5.0%
t(ac):	28 s
t(cr):	50 s
t(co):	10 s
t(brj :	9 s
Vcruise:	45 mi/h

CYCLE RESULTS

V after (co):	40.55 mi/h
dist/cycl(ac):	281.58 m
dist/cycl(cr):	1005.63 m
dist/cycl(co+br):	191.07 m
Total cyle dist:	1478.27 m
#cycles needed:	43.54

FORCES ANALYSIS

Fcn:	388.21 N
Fcn up/gr1:	1209.99 N
Fcn dw/gr1:	-433.45 N
Fac:	1284.05 N
Fac up/gr1:	2105.77 N
Fac dw/gr1:	462.33 N
Fac up/gr2:	3319.28 N
Fac dw/gr2:	-751.13 N
Fcr:	273.43 N
Fcr up/gr1:	1100.15 N
Fcr dw/gr1:	-543.30 N
Fcr up/gr2:	2313.66 N
Fcr dw/gr2:	-1756.81 N
Fco:	0.00 N
Fco up/gr1:	821.72 N
Fco dw/gr1:	-821.72 N
Fco up/gr2:	2035.23 N
Fco dw/gr2:	-2035.23 N
Fbr:	-2567.37 N
Fbr up/gr1:	-1745.65 N
Fbr dw/gr1:	-3339.09 N
Fbr up/gr2:	-532.14 N
Fbr dw/gr2:	-4602.60 N

POWER ANALYSIS

Pcn:	10.41	KW	
Pcn up/gr1:	32.45	KW	
Pcn dw/gr1:	-11.62	KW	
Pac:	25.83	KW	-max-
Pac up/gr1:	42.35	KW	-max-
Pac dw/gr1:	9.30	KW	-max-
Pac up/gr2:	66.76	KW	-max-
Pac dw/gr2:	-15.11	KW	-max-
Pcr:	5.60	KW	
Pcr up/gr1:	22.13	Kw	
Pcr dw/gr1:	-10.93	KW	
Pcr up/gr2:	46.53	KW	
Pcr dw/gr2:	-35.33	KW	
Pco:	0.00	KW	
Pco up/gr1:	16.53	KW	
Pco dw/gr1:	-16.53	KW	
Pco up/gr2:	40.93	KW	
Pco dw/gr2:	-40.93	KW	
Pbr:	-46.53	KW	-max-
Pbr up/gr1:	-31.64	KW	-max-
Pbr dw/gr1:	-61.42	KW	-max-
Pbr up/gr2:	-9.64	KW	-max-
Pbr dw/gr2:	-83.42	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	23.601	23.601	23.601	KWh
Ecn up/gr1:	6.490.	6.490	6.490	KWh
Ecn dw/gr1:	-2.325	-0.581	0.000	KWh
Eac:	3.498	3.498	3.498	KWh
Eac up/gr1:	0.538	0.538	0.538	KWh
Eac dw/gr1:	0.118	0.118	0.118	KWh
Eac up/gr2:	0.283	0.233	0.283	KWh
Eac dwjgr2:	-0.064	-0.016	0.000	KWh
Ecr:	2.709	2.709	2. 709	KWh
Ecr up/gr1:	1.003	1.003	1.003	KWh
Ecr dw/gr1:	-0.496	-0.124	0.000	KWh
Ecr up/gr2:	0.703	0.703	0.703	KWh
Ecr dw/gr2:	-0.534	-0.134	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.150	0.150	0.150	KWh
Eco dw/gr1:	-0.150	-0.037	0.000	KWh
Eco up/gr2:	0.124	0.124	0.124	KWh
Eco dw/gr2:	-0.124	-0.031	0.000	KWh
Ebr:	-2.026	-0.506	0.000	KWh
Ebr up/gr1:	-0.129	-0.032	0.000	KWh
Ebr dw/gr1:	-0.251	-0.063	0.000	KWh
Ebr up/gr2:	-0.013	-0.003	0.000	KWh
Ebr dw/gr2:	-0.113	-0.028	0.000	KWh
TOTAL ENERGY	32.992	37.660	39.216	KWh
	0.165	0.188	0.196	KWh/mi

TITLE: (VI) DRIVING SCENARIO, 5 PERSON CAR

Cd:	0.3	r(Kg/m3):	1.225
Area(m2):	1.9	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	0.0%
Mass(Kg):	1400	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	480 mi
%dist.grdl:	15.0%
Vconstant:	60 mi/h

CYCLE INFORMATION

Range:	0 mi
%dist.grdl:	0.0%
%dist.grd2:	0.0%
t(ac):	0 s
t(cr):	0 s
t(co):	0 s
t(br):	0 s
Vcruise:	0 mi/h

CYCLE RESULTS

V after (co):	0.00 mi/h
dist/cycl(ac):	0.00 m
dist/cycl(*cr):*	0.00 n-l
dist/cycl(co+br):	0.00 m
Total cyle dist:	0.00 m
#cycles needed:	0.00

FORCES ANALYSIS

Fcn:	388.27 N
Fcn up/grl:	1209.99 N
Fcn dw/grl:	-433.45 N
Fac:	0.00 N
Fac up/grl:	0.00 N
Fac dw/grl:	0.00 N
Fac up/gr2:	0.00 N
Fac dw/gr2:	0.00 N
Fcr:	0.00 N
Fcr up/grl:	0.00 N
Fcr dw/grl:	0.00 N
Fcr up/gr2:	0.00 N
Fcr dw/gr2:	0.00 N
Fco:	0.00 N
Fco up/grl:	0.00 N
Fco dw/grl:	0.00 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	0.00 N
Fbr up/grl:	0.00 N
Fbr dw/grl:	0.00 N
Fbr up/gr2:	0.00 N
Fbr dw/gr2:	0.00 N

POWER ANALYSIS

Pcn:	10.41	Kw	
Pcn up/gr1:	32.45	KW	
Pcn dw/gr1:	-11.62	KW	
Pac:	0.00	Kw	-max-
Pac up/gr1:	0.00	KW	-max-
Pac dw/gr1:	0.00	Kw	-max-
Pac up/gr2:	0.00	Kw	-max-
Pac dw/gr2:	0.00	KW	-max-
Pcr:	0.00	Kw	
Pcr up/gr1:	0.00	KW	
Pcr dw/gr1:	0.00	Kw	
Pcr up/gr2:	0.00	KW	
Pcr dw/gr2:	0.00	KW	
Pco:	0.00	KW	
Pco up/gr1:	0.00	KW	
Pco dw/gr1:	0.00	Kw	
Pco up/gr2:	0.00	Kw	
Pco dw/gr2:	0.00	KW	
Pbr:	0.00	KW	-max-
Pbr up/gr1:	0.00	KW	-max-
Pbr dw/gr1:	0.00	Kw	-max-
Pbr up/gr2:	0.00	Kw	-max-
Pbr dw/gr2:	0.00	Kw	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	70.802	70.802	70.802	KWh
Ecn up/gr1:	19.469	19.469	19.469	KWh
Ecn dw/gr1:	-6.974	-1.744	0.000	KWh
Eac:	0.000	0.000	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000,	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	83.296	88.527	90.271	KWh
	0.174	0.184	0.188	KWh/mi

APPENDIX A2. SIMULATION OF THE SCENARIOS WITH SELECTED VEHICLES

TITLE: (I) RESIDENTIAL POSTAL, MAIL DELIVERY CAR

Cd:	**0.45**	r(Kg/m3):	**1.225**
Area(m2):	**2.5**	Grade1(%):	**5.0%**
Ur:	**0.01**	Grade2(%):	**0.0%**
Mass(Kg):	**1400**	Reg.Brake **(n):**	**0.25**

CONSTANT SPEED INFORMATION

Range:	**10 mi**
%dist.on **grd**	**50.0%**
Vconstant:	**30** mi/h

CYCLE **INFORMATION**

		CYCLE RESULTS	
Range:	**3** mi		
%dist.grd1:	**50.0%**	V after (co):	9.52 mi/h
%dist.grd2:	**0.04**		
t(ac):	**4 s**	dist/cycl(ac):	8.94 m
t(cr):	**0 s**	dist/cycl(cr):	0.00 m
t(co):	2 **s**	dist/cycl(co+br):	11.17 m
t(br):	**3 s**	Total cyle dist:	20.11 m
Vcruise:	10 mi/h	#cycles needed:	240.00

FORCES ANALYSIS

Fcn:	251.08	N
Fcn up/gr1:	**1082.30**	**N**
Fcn dw/gr1:	-560.64	N
Fac:	1715.27	N
Fac up/gr1:	**2536.99**	N
Fac dw/gr1:	893.55	N
Fac up/gr2:	1715**.27**	N
Fac dw/gr2:	**1715.27**	N
Fcr:	150.96	N
Fcr up/gr1:	**572.59**	N
Fcr dw/ grl :	-670.76	N
Fcr up/gr2:	**150.96**	N
Fcr dw/gr2:	150.96	N
Fco:	**0.00**	N
Fco up/gr1:	**821.72**	**N**
Fco dw/gr1:	**-821.72**	**N**
Fco up/gr2:	**0.00**	**N**
Fco dw/gr2:	**0.00**	**N**
Fbr:	**-1835.43**	**N**
Fbr up/gr1:	**-1013.71**	**N**
Fbr dw/gr1:	**-2657.15**	**N**
Fbr up/gr2:	-1835.43	N
Fbr dw/gr2:	**-1835.43**	N

POWER ANALYSIS

Pcn:	3.50	KW	
Pcn up/gr1:	14.52	KW	
Pcn dw/gr1:	-7.52	KW	
Pac:	7.67	KW	-max-
Pac up/gr1:	11.34	KW	-max-
Pac dw/gr1:	3.99	KW	-max-
Pac up/gr2:	7.67	KW	-max-
Pac dw/gr2:	7.67	KW	-max-
Pcr:	0.67	KW	
Pcr up/gr1:	4.35	KW	
Pcr dw/gr1:	-3.00	KW	
Pcr up/gr2:	0.67	KW	
Pcr dw/gr2:	0.67	KW	
Pco:	0.00	KW	
Pco up/gr1:	3.67	KW	
Pco dw/gr1:	-3.67	KW	
Pco up/gr2:	0.00	KW	
Pco dw/gr2:	0.00	KW	
Pbr:	-7.31	KW	-max-
Pbr up/gr1:	-11.30..31	KW KW	--Tax- -max-
Pbr dw/gr1:			
Pbr up/gr2:	-7.81	KW	-max-
Pbr dw/gr2 :	-7.31	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg . Brk n=n	NC Req. Brk	
Ecn:	0.583	0.533	3 .583	KWh
Ecn up /gr1 :	1.210..	1.210	1.210..	KWh
Ecn dw/ / gr1:	- 0 .626	-0.157	0.000	KWh
Eac:	0.511	0.511	0 . .511	KWh
Eac up/gr1:	0.378	0.373	0.378	KWh
Eac dw/gr1:	0.133	0 .133	0.133	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.122	0.122	0 . .122	KWh
Eco dw/gr1:	-0.122	-. 3 .031	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	-0.390	-0.098	0.000	KWh
Ebr up/gr1:	-0.108	-0.027	0.000	KWh
Ebr dw/gr1:	-0.283	-0.071	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	1.408	2.556	2.938	KWh
	0.108	0.197	0.226	KWh/mi

TITLE: (II) SMALL DELIVERY RANGE, MINI VAN

Cd:	0.37	r(Kg/m3):	1.225
Area(m2):	2.9	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	15.0%
Mass(Kg):	2720	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	40 mi
%dist.grd1:	15.0%
Vconstant:	55 mi/h

CYCLE INFORMATION

		CYCLE RESULTS	
Range:	60 mi	V after (co):	13.95 mi/h
%dist.grd1:	15.0%		
%dist.grd2:	5.0%		
t(acj:	19 s	dist/cycl(ac):	84.92 m
t(cr):	19 s	dist/cycl(cr):	169.84 m
t(co):	4 s	dist/cycl(co+br):	40.23 m
t(br):	5 s	Total cyle dist:	294.98 m
Vcruise:	20 mi/h	#cycles needed:	327.27

FORCES ANALYSIS

Fcn:	663.70 N
Fcn up/gr1:	2260.18 N
Fcn dw/gr1:	-932.79 N
Fac:	1598.75 N
Fac up/gr1:	3195.24 N
Fac dw/gr1:	2.26 N
Fac up/gr2:	5552.91 N
Fac dw/gr2:	-2355.42 N
Fcr:	319.07 N
Fcr up/gr1:	1915.56 N
Fcr dw/gr1:	-1277.42 N
Fcr up/gr2:	4273.24 N
Fcr dw/gr2:	-3635.09 N
Fco:	0.00 N
Fco up/gr1:	1596.49 N
Fco dw/gr1:	-1596.49 N
Fco up/gr2:	3954.16 N
Fco dw/gr2:	-3954.16 N
Fbr:	-4293.79 N
Fbr up/gr1:	-2697.30 N
Fbr dw/gr1:	-5890.28 N
Fbr up/gr2:	-339.63 N
Fbr dw/gr2:	-8247.95 N

POWER ANALYSIS

Pcn:	16.31	XW	
Pcn up/gr1:	55.56	KW	
Pcn dw/gr1:	-22.93	KW	
Pac:	14.29	KW	-max-
Pac up/gr1:	28.56	KW	-max-
Pac dw/gr1:	0.02	Kw	-max-
Pac up/gr2:	49.64	KW	-max-
Pac dw/gr2:	-21.05	KW	-max-
Pcr:	2.85	KW	
Pcr up/gr1:	17.12	KW	
Pcr dw/gr1:	-11.42	KW	
Pcr up/gr2:	38.20	KW	
Pcr dw/gr2:	-32.49	KW	
Pco:	0.00	KW	
Pco up/gr1:	14.27	KW	
Pco dw/gr1:	-14.27	KW	
Pco up/gr2:	35. 35	KW	
Pco dw/gr2:	-35.35	KW	
Pbr:	-36.37	KW	-max-
Pbr up/gr1:	-22.85	KW	-max-
Pbr dw/gr1:	-49.89	KW	-max-
Pbr up/gr2:	-2.88	KW	-max-
Pbr dw/gr2:	-69.86	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	10.086	10.086	10.086	KWh
Ecn up/gr1:	3.031	3.031	3.031	KWh
Ecn dw/gr1:	-1.251	-0.313	0.000	KWh
Eac:	9.874	9.874	9.874	KWh
Eac up/gr1:	1.850	1.850	1.850	KWh
Eac dw/gr1:	0.001	0.001	0.001	KWh
Eac up/gr2:	1.072	1.072	1.072	KWh
Eac dw/gr2:	-0.455	-0.114	0.000	KWh
Ecr:	3.941	3.941	3.941	KWh
Ecr up/gr1:	2.218	2.218	2.218	KWh
Ecr dw/gr1:	-1.479	-0.370	0.000	KWh
Ecr up/gr2:	1.649	1.649	1.649	KWh
Ecr dw/gr2:	-1.403	-0.351	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.389	0.389	0.389	KWh
Eco dw/gr1:	-0.389	-0.097	0.000	KWh
Eco up/gr2:	0.321	0.321	0.321	KWh
Eco dw/gr2:	-0.321	-0.080	0.000	KWh
Ebr:	-6.612	-1.653	0.000	KWh
Ebr up/gr1:	-0.389	-0.097	0.000	KWh
Ebr dw/gr1:	-0.850	-0.213	0.000	KWh
Ebr up/gr2:	-0.016	-0.004	0.000	KWh
Ebr dw/gr2:	-0.397	-0.099	0.000	KWh
TOTAL ENERGY	20.869	31.041	34.432	KWh
	0.209	0.310	0.344	KWh/mi

TITLE: (III) PARCEL POST DELIVERY, VAN

Cd:	0.47	r(Kg/m3):	1.225
Area(m2):	3.4	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	0.0%
Mass(Kg):	3400	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	0 mi
%dist.grd1:	0.0%
Vconstant:	0 mi/h

CYCLE INFORMATION

Range:	100 mi
%dist.grd1:	20.0%
%dist.grd2:	0.0%
t(ac):	13 s
t(cr):	20 s
t(co):	3 s
t(br):	9 s
Vcruise :	30 mi/h

CYCLE RESULTS

V after (co):	27.32 mi/h
dist/cycl(ac):	120.68 m
dist/cycl(cr j :	253.17 4
dist/cycl(co+br):	113.97 m
Total cyle dist:	502.81 m
#cycles needed:	320.00

FORCES ANALYSIS

Fcn :	333.20 N
Fcn up/gr1:	2328.81 N
Fcn dw/gr1:	-1662.41 N
Fac:	3041.85 N
Fac up/gr1:	5037.46 N
Fac dw/gr1:	1046.24 N
Fac up/gr2:	3041.35 N
Fac dw/gr2:	3041.85 N
Fcr:	509.17 N
Fcr up/gr1:	2504.78 N
Fcr dw/gr1:	-1486.44 N
Fcr up/gr2:	509.17 N
Fcr dw/gr2 :	509.17 N
Fco:	0.00 N
Fco up/gr1:	1995.61 N
Fco dw/gr1:	-1995.51 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	-4133.65 N
Fbr up/gr1:	-2138.04 N
Fbr dw/gr1:	-6129.26 N
Fbr up/gr2:	-4133.65 N
Fbr dw/gr2:	-4133.55 N

POWER ANALYSIS

Pcn:	0.00	KW	
Pcn up/gr1:	0.00	Kw	
Pcn dw/gr1:	0.00	Kw	
Pac:	40.79	KW	-max-
Pac up/gr1:	67.54	KW	-max-
Pac dw/gr1:	14.03	KW	-max-
Pac up/gr2:	40.79	KW	-max-
Pac dw/gr2:	40.79	KW	-max-
Pcr:	6.83	Kw	
Pcr up/gr1:	33.58	KW	
Pcr dw/gr1 :	-19.93	KW	
Pcr up/gr2:	6.83	KW	
Pcr dw/gr2:	6.83	Kw	
Pco:	0.00	KW	
Pco up/gr1:	26.76	KW	
Pco dw/gr1 :	-26.76	KW	
Pco upjgr2:	0.00	KW	
Pco dw/gr2:	0.00	KW	
Pbr:	-50.47	KW	-max-
Pbr up/gr1:	-26.11	KW	-max-
Pbr dw/gr1:	-74.84	KW	-max-
Pbr up/gr2:	-50.47	KW	-max-
Pbr dw/gr2:	-50.4,	KW	-max-

ENERGY ANALYSIS

	Reg. Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	0.000	0.000	0.000	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1 :	0.000	0.000	0.000	KWh
Eac:	26.103	25.103	26.103	KWh
Eac up/gr1 :	5.404	5.404	5.404	KWh
Eac dw/gr1 :	1 .122	1.122	1.122	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2 :	0.000	0.000	0.~000	KWh
Ecr :	9.710	9.710	9.710	KWh
Ecr up/gr1:	5.971	5.971	5.971	KWh
Ecr dw/gr1:	-3.543	-0.886	0.000	KWh
Ecr up/gr2 :	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	1.903	1.903	1.903	KWh
Eco dw/gr1:	-1.903	-0.476	0.000	KWh
Eco up/gr2:	0.000	0 . “00	0.000	KWh
Eco dwjgr2:	0.000	0.000	0.000	KWh
Ebr:	-16.151	-4.038	0.000	KWh
Ebr up/gr1:	-1.044	-0.261	0.000	KWh
Ebr dw/gr1:	-2.994	-0.748	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	24.577	43.803	50.212	KWh
	0.246	0.438	0.502	KWh/mi

TITLE: (III) PARCEL POST DELIVERY, VAN

Cd:	0.47	r(Kg/m3):	1.225
Xrea(m2):	3.4	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	0.0%
Mass(Kg):	3400	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	50 mi
%dist.grd1:	20.0%
Vccnstant:	55 mi/h

CYCLE INFORMATION

Range:	100 mi
%dist.grd1:	20.0%
%dist.grd2:	0.0%
t(ac):	18 s
t(cr):	20 s
t(co):	8 s
t(br):	9 s
Vcruise:	30 mi/h

CYCLE RESULTS

V after (co):	27.32 mi/h
dist/cycl(ac):	120.68 m
dist/cycl(cr):	268.17 m
dist/cycl(co+br):	113.97 m
Total cyle dist:	502.81 m
#cycles needed:	320.00

FORCES ANALYSIS

Fcn:	924.65	N
Fcn up/gr1:	2920.26	N
Fcn dw/gr1:	-1070.96	N
Fac:	3041.85	N
Fac up/gr1:	5037.46	N
Fac dw/ gr1:	1046.24	N
Fac up/gr2:	3041.85	N
Fac dw/gr2:	3041.85	N
Fcr:	509.17	N
Fcr up/gr1:	2504.73	N
Fcr dw/gr1:	-1436.44	N
Fcr up/gr2:	509.17	N
Fcr dw/gr2:	509.17	N
Fco:	0.00	N
Fcc up/gr1:	1995.61	N
Fco dw/gr1:	-1995.61	N
Fco up/gr2:	0.00	N
Fco dw/gr2:	0.00	N
Fbr:	-4133.65	N
Fbr up/gr1:	-2138.04	N
Fbr dw/gr1:	-6129.26	N
Fbr up/gr2:	-4133.65	N
Fbr dw/gr2:	-4133.65	N

POWER ANALYSIS

Pcn:	22.73	KW	
Pcn up/gr1:	71.79	KW	
Pcn dw/gr1:	-26.33	KW	
Pac:	40.79	KW	-max-
Pac up/gr1:	67.54	KW	-max-
Pac dw/gr1:	14.03	KW	-max-
Pac up/gr2:	40.79	KW	-max-
Pac dw/gr2:	40.79	KW	-max-
Pcr:	6.83	KW	
Pcr up/gr1:	33.58	KW	
Pcr dw/gr1:	-19.93	KW	
Pcr up/gr2:	6.83	KW	
Pcr dw/gr2 :	6.83	KW	
Pco:	0.00	KW	
Pco up/gr1:	26.76	KW	
Pco dw/gr1:	-26.76	KW	
Pco up/gr2:	'0.00	KW	
Pco dw/gr2:	0.00	KW	
Pbr:	-50.47	KW	-max-
Pbr up/gr1:	-26.11	KW	-max-
Pbr dw/gr1:	-74.84	KW	-max-
Pbr up/gr2:	-50.47	KW	-max-
Pbr dw/gr2:	-50.47	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg. Brk n=n	No Reg.Brk	
Ecn:	16.531	16.531	15.531	KWh
Ecn up/gr1:	6.526	6.526	6.526	KWh
Ecn dw/gr1:	-2.393	-0.593	0.000	KWh
Eac:	26.103	25.133	26.103	KWh
Eac up/gr1:	5.404	5.404	5.404	KWh
Eac dw/gr1:	1.122	1 122	1.122	KWh
Eac up/gr2:	0.000	0: 000	0 . 000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	9.710	9.710	a.710	KWh
Ecr up/gr1:	5.971	5.971	5.971	KWh
Ecr dw/gr1:	-3.543	-0.886	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2 :	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	1.903	1.903	1.903	KWh
Eco dw/gr1:	-1.903	-0.475	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	-16.151	-4.033	0.000	KWh
Ebr up/gr1:	-1.044	-0.261	0.000	KWh
Ebr dw/gr1 :	-2.994	-0.748	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	45.240	66.261	73.269	KWh
	0.302	0.442	0.488	KWh/mi

TITLE: (IV) DRIVING SCENARIO 5 PERSON CAR

Cd:	0.3	r(Kg/m3):	1.225
Area(m2):	1.9	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	15.0%
Mass(Kg) :	1400	Reg.Brake (n):	0. 25

CONSTANT SPEED INFORMATION

Range:	30 mi
%dist.grd1:	15.0%
Vconstant :	55 mi/h

CYCLE INFORMATION

Range:	30 mi
%dist.grd1:	15.0%
%dist.grd2:	5.0%
t(ac):	28 s
t(cr):	50 s
t(co):	10 s
t(br):	9 s
Vcruise:	45 mi/h

CYCLE RESULTS

V after (co):	40.65 mi/h
dist/cycl(ac):	281.58 m
dist/cycl(cr):	1005.63 m
dist/cycl(co+br):	191.07 m
Total cyle dist:	1478.27 m
#cycles needed:	32.65

FORCES ANALYSIS

Fcn:	348.17 N
Fcn up/gr1:	1169.89 N
Fcn dw/gr1:	-473.56 N
Fac:	1284.05 N
Fac up/gr1:	2105.77 N
Fac dw/gr1:	462.33 N
Fac up/gr2:	3319.28 N
Fac dw/gr2:	-751.18 N
Fcr:	278.43 N
Fcr up/gr1:	1100.15 N
Fcr dw/gr1:	-543.30 N
Fcr up/gr2:	2313.66 N
Fcr dw/gr2:	-1756.81 N
Fco:	0.00 N
Fco up/gr1:	821.72 N
Fco dw/gr1:	-821.72 N
Fco up/gr2:	2035.23 N
Fco dw/gr2:	-2035.23 N
Fbr:	-2567.37 N
Fbr up/gr1:	-1745.65 N
Fbr dw/gr1:	-3389.09 N
Fbr up/gr2:	-532.14 N
Fbr dw/gr2:	-4602.60 N

POWER ANAL-ISIS

Pcn:	8.56	KW	
Pcn up/gr1:	28.76	KW	
Pcn dw/gr1:	-11.64	KW	
Pac:	25.83	KW	-max-
Pac up/gr1:	42.35	KW	-max-
Pac dw/gr1:	9.30	KW	-max-
Pac up/gr2:	66.76	KW	-max-
Pac dw/gr2:	-15.11	KW	-max-
Fcr :	5.60	KW	
Pcr up/gr1:	22.13	KW	
Pcr dw/gr1:	-10.93	KW	
Pcr up/gr2:	46.53	KW	
Pcr dw/gr2:	-35.33	KW	
Pco:	3.00	KW	
Pco up/gr1:	15.53	KW	
Pco dw/gr1:	15.53	KW	
Pco up/gr2:	40.93	KW	
Pco dw/gr2:	-10.33	KW	
Pbr:	-46.53	KW	-max-
Pbr up/gr1:	-31.64	KW	-max-
Pbr dw/gr1:	-61.42	KW	-max-
Pbr up/gr2:	-9.64	KW	-max-
Pbr dw/gr2:	-33.42	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	3.968	3.968	3.968	KWh
Ecn up/gr1:	1.176	1.176	1.176	KWh
Ecn dw/gr1:	-0.476	-0.119	0.000	KWh
Eac:	2.624	2.624	2.624	KWh
Eac up/gr1:	0.403	0.403	0.403	KWh
Eac dw/gr1:	0.089	0.089	0.089	KWh
Eac up/gr2:	0.212	0.212	0.212	KWh
Eac dw/gr2:	-0.048	-0.012	0.000	KWh
Ecr:	2.032	2.032	2.032	KWh
Ecr up/gr1:	0.753	0.753	0.753	KWh
Ecr dw/gr1:	-0.372	-0.093	0.000	KWh
Ecr up/gr2:	0.528	0.528	0.528	KWh
Ecr dw/gr2:	-0.401	-3.100	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.112	0.112	0.112	KWh
Eco dw/gr1:	-0.112	-0.023	0.000	KWh
Eco up/gr2:	0.093	0.093	0.093	KWh
Eco dw/gr2:	-0.093	-0.023	0.000	KWh
Ebr:	-1.519	-0.380	0.000	KWh
Ebr up/gr1:	-0.097	-0.024	0.000	KWh
Ebr dw/gr1:	-0.188	-0.047	0.000	KWh
Ebr up/gr2:	-0.010	-0.002	0.000	KWh
Ebr dw/gr2:	-0.085	-0.021	0.000	KWh
TOTAL ENERGY	8.588	11.139	11.989	KWh
	0.143	0.186	0.200	KWh/mi

TITLE: **(V) DRIVING** SCENARIO, **5 PERSON** CAR

Cd:	**0.3**	r(Kg/m3):	**1.225**
Area(m2):	**1.9**	Grade1(%):	6.0%
Ur:	**0.01**	Grade2(%):	**15.0%**
Mass(Kg):	1400	Reg.Brake **(n):**	**0.25**

CONSTANT SPEED **INFORMATION**

Range:	**120 mi**
%dist.grd1:	15.0%
Vconstant:	6 **3** mi/h

CYCLE INFORMATION

Range:	30 mi
%dist.grd1:	15.0%
%dist.grd2:	5.0%
t(ac):	28 s
t(cr):	50 s
t(co):	10 s
t(br):	9 s
Vcruise:	45 mi/h

CYCLE RESULTS

V after (co):	40.55 mi/h
dist/cycl(ac):	281.58 m
dist/cycl(cr):	1005.63 m
dist/cycl(co+br):	191.07 m
Total cyle dist:	1478.27 m
#cycles needed:	32.55

FORCES ANALYSIS

Fcn:	388.27 N
Fcn up/gr1:	1209.99 N
Fcn dw/gr1:	-433.45 N
Fac:	1284.05 N
Fac up/gr1:	2105.77 N
Fac dw/gr1:	462.33 N
Fac up/gr2:	3819.28 N
Fac dw/gr2:	-751.18 N
Fcr:	278.43 N
Fcr up/gr1:	1100.15 N
Fcr dw/gr1:	-543.30 N
Fcr up/gr2:	2313.66 N
Fcr dw/gr2:	-1756.81 N
Fco:	0.00 N
Fco up/gr1:	821.72 N
Fco dw/gr1:	-821.72 N
Fco up/gr2:	2035.23 N
Fco dw/gr2:	-2035.23 N
Fbr:	-2567.37 N
Fbr up/gr1:	-1745.65 N
Fbr dw/gr1:	-3389.09 N
Fbr up/gr2:	-532.14 N
Fbr dw/gr2:	-4602.60 N

POWER ANALYSIS

Pcn:	10.41	KW	
Pcn up/gr1:	32.45	KW	
Pcn dw/gr1:	-11.62	KW	
Pac:	25.83	KW	-max-
Pac up/gr1:	42.35	KW	-max-
Pac dw/gr1:	9.30	KW	-max-
Pac upjgr2:	66.76	KW	-max-
Pac dw/gr2:	-15.11	KW	-max-
Pcr:	5.60	KW	
Pcr up/gr1:	22.13	KW	
Pcr dw/gr1:	-10.93	KW	
Pcr up/gr2:	16.53	KW	
Pcr dw/gr2:	-7E [illegible]	KW	
Pco:	0.00	KW	
Pco up/gr1:	16.53	KW	
Pco dw/gr1:	-16.53	KW	
Pco up/gr2:	40.93	KW	
Pco dw/gr2:	-40.93	KW	
Pbr:	-46.53	KW	-max-
Pbr up/gr1:	-31.64	KW	-max-
Pbr dw/gr1:	-61.42	KW	-max-
Pbr up/gr2:	-9.64	KW	--ax-
Pbr dw/gr2:	-33.42	KW	-ma-x-

ENERGY ANALYSIS

	Reg. Brk n=1	Reg. Brk n=n	No Reg. Brk	
Ecn:	17.700	17.700	17.700	KWh
Ecn up/gr1:	4.867	4.867	4.867	KWh
Ecn dw/gr1:	-1.744	-0.436	0.000	KWh
Eac:	2.624	2.624	2.624	KWh
Eac up/gr1:	0.403	0.403	0.403	KWh
Eac dw/gr1:	0.089	0.089	0.089	KWh
Eac up/gr2:	0.212	0.212	0.212	KWh
Eac dw/gr2:	-0.048	-0.012	0.000	KWh
Ecr:	2.032	2.032	2.032	KWh
Ecr up/gr1:	0.753	6.753	0.753	KWh
Ecr dw/gr1:	-3.372	-0.093	0.000	KWh
Ecr up/gr2:	0.528	0.528	0.523	KWh
Ecr dw/gr2:	-0.401	-0.100	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.112	0.112	0.112	KWh
Eco dw/gr1:	-0.112	-3.023	0.000	KWh
Eco up/gr2:	0.093	0.093	0.093	KWh
Eco dw/gr2:	-0.093	-0.023	0.000	KWh
Ebr:	-1.519	-0.380	0.000	KWh
Ebr up/gr1:	-0.097	-9.024	0.000	KWh
Ebr dw/gr1:	-0.188	-0,047	0.000	KWh
Ebr up/gr2:	-0.010	-0.002	0.000	KWh
Ebr dw/gr2:	-0.085	-0.021	0.000	KWh
TOTAL ENERGY	24.743	28.245	29.412	KWh
	0.165	0.188	0.196	KWh/mi

TITLE: (V) DRIVING **SCENARIO, 5 PERSON** CAR

Cd:	**0.3**	r(Kg/m3):	**1.225**
Area(m2):	**1.9**	Grade1(%):	**5.0%**
Ur:	**0.01**	Grade2(%):	**15.0%**
Mass(Kg):	**1400**	Reg.Brake **(n):**	**0.25**

CONSTANT SPEED INFORMATION

Range:	160 mi
%dist.grd1:	15.0%
Vconstant:	60 mi/h

CYCLE INFORMATION

		CYCLE **RESULTS**	
Range:	40 mi		
%dist.grd1:	15.0%	V after (co):	40.55 mi/h
%dist.grd2:	5.0%		
t(ac):	28 s	dist/cycl(ac):	231.58 m
t(cr):	50 s	dist/cycl(cr):	1005.63 m
t(co):	10 s	dist/cycl(co+br):	191.07 m
t(br):	9 s	Total cyle dist:	1478.27 m
Vcruise:	45 mi/h	#cycles needed:	43.54

FORCES ANALYSIS

Fcn:	388.27 N
Fcn up/gr1:	1209.99 N
Fcn dw/gr1:	-433.45 N
Fac:	1284.05 N
Fac up/gr1:	2105.77 N
Fac dw/gr1:	462.33 N
Fac up/gr2:	3319.28 N
Fac dw/gr2:	-751.13 N
Fcr:	278.43 N
Fcr up/gr1:	1100.15 N
Fcr dw/gr1:	-543.30 N
Fcr up/gr2:	2313.66 N
Fcr dw/gr2:	-1756.81 N
Fco:	0.00 N
Fco up/gr1:	321.72 N
Fco dw/gr1:	-821.72 N
Fco up/gr2:	2035.23 N
Fco dw/gr2:	-2035.23 N
Fbr:	-2567.37 N
Fbr up/gr1:	-1745.65 N
Fbr dw/gr1:	-3389.09 N
Fbr up/gr2:	-532.14 N
Fbr dw/gr2:	-4602.60 N

POWER ANALYSIS

Pcn:	10.41	KW	
Pcn up/gr1:	32.45	KW	
Pcn dw/gr1:	-11.62	KW	
Pac:	25.83	KW	-max-
Pac up/gr1:	42.35	KW	-max-
Pac dw/gr1:	9.30	KW	-max-
Pac up/gr2:	66.76	KW	-max-
Pac dw/gr2:	-15.11	KW	-max-
Pcr:	5.60	KW	
Pcr up/gr1:	22.13	KW	
Pcr dw/gr1:	-10.93	KW	
Pcr up/gr2:	46.53	KW	
Pcr dw/gr2:	-35.33	KW	
Pco:	0.00	KW	
Pco up/gr1:	16.53	KW	
Pco dw/gr1:	-16.53	KW	
Pco up/gr2:	40.93	KW	
Pco dw/gr2:	-40.93	KW	
Pbr:	-46.53	KW	-max-
Pbr up/gr1:	-31.64	KW	-max-
Pbr dw/gr1:	-61.42	KW	-max-
Pbr up/gr2:	-9.64	KW	-max-
Pbr dw/gr2:	-83.42	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	23.601	23.601	23.601	KWh
Ecn up/gr1:	6.490	6.490	6.490	KWh
Ecn dw/gr1:	-2.325	-0.681	0.000	KWh
Eac:	3.498	3.498	3.498	KWh
Eac up/gr1:	0.538	0.538	0.538	KWh
Eac dw/gr1:	0.118	0.118	0.118	KWh
Eac up/gr2:	0.283	0.283	0.283	KWh
Eac dw/gr2:	-0.064	-0.016	0.000	KWh
Ecr:	2.709	2.709	2.709	KWh
Ecr up/gr1:	1.003	1.003	1.003	KWh
Ecr dw/gr1:	-0.496	-0.124	0.000	KWh
Ecr up/gr2:	0.703	0.703	0.703	KWh
Ecr dw/gr2:	-0.534	-0.134	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.150	0.150	0.150	KWh
Eco dw/gr1:	-0.150	-0.037	0.000	KWh
Eco up/gr2:	0.124	0.124	0.124	KWh
Eco dw/gr2:	-0.124	-0.031	0.000	KWh
Ebr:	-2.026	-0.506	0.000	KWh
Ebr up/gr1:	-0.129	-0.032	0.000	KWh
Ebr dw/gr1:	-0.251	-0.063	0.000	KWh
Ebr up/gr2:	-0.013	-0.003	0.000	KWh
Ebr dw/gr2:	-0.113	-0.028	0.000	KWh
TOTAL ENERGY	32.992	37.660	39.216	KWh
	0.165	0.188	0.196	KWh/mi

TITLE- **(VI) DRIVING SCENARIO, 5 PERSON CAR**

Cd:	**0.3**	r(Kg/m3):	**1.225**
Area(m2):	**1.9**	Grade1(%):	**6.0%**
Ur:	**0.01**	Grade2(%):	**0.0%**
Mass(Kg):	**1400**	Reg.Brake **(n):**	**0.25**

CONSTANT SPEED INFORMATION

Range:	480 mi
%dist.grd1:	15.0%
Vconstant:	**60** mi/h

CYCLE INFORMATION

		CYCLE RESULTS	
Range:	0 mi		
%dist.grd1:	0.0%	V after (co):	0.00 mi/h
%dist.grd2:	0.0%		
t(ac):	0 s	dist/cycl(ac):	0.30 m
t(cr):	0 s	dist/cycl(cr):	0.00 m
t(co):	0 s	dist/cycl(co+br):	0.00 m
t(br):	0 s	Total cyle dist:	3.00 m
Vcruise:	0 mi/h	#cycles needed:	0.00

FORCES ANALYSIS

Fcn:	388.27 N
Fcn up/grl:	1209.99 N
Fcn dw/grl:	-433.45 N
Fac:	0.00 N
Fac up/grl:	0.00 N
Fac dw/grl:	0.00 N
Fac up/gr2:	0.00 N
Fac dw/gr2:	0.00 N
Fcr:	0.00 N
Fcr up/grl:	0.00 N
Fcr dw/grl:	0.00 N
Fcr up/gr2:	0.00 N
Fcr dw/gr2:	0.00 N
Fco:	0.00 N
Fco up/grl:	0.00 N
Fco dw/grl:	0.00 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	0.00 N
Fbr up/grl:	0.00 N
Fbr dw/grl:	0.00 N
Fbr up/gr2:	0.00 N
Fbr dw/gr2:	0.00 N

POWER ANALYSIS

Pcn:	10.41 KW	
Pcn up/gr1:	32.45 KW	
Pcn dw/gr1:	-11.62 KW	
Pac:	0.00 KW	-max-
Pac up/gr1:	0.00 KW	-max-
Pac dw/gr1:	0.00 KW	-max-
Pac up/gr2:	0.00 KW	-max-
Pac dw/gr2 :	0.00 KW	-max-
Pcr :	0.00 KW	
Pcr up/gr1:	0.00 KW	
Pcr dw/gr1 :	0.00 KW	
Pcr up/gr2:	0.00 KW	
Pcr dw/gr2:	0.00 KW	
Pco:	3.00 KW	
Pco up/gr1:	0.00 KW	
Pco dw/gr1:	0.00 KW	
Pco up/gr2:	0.00 KW	
Pco dw/gr2:	3.00 KW	
Pbr:	0.00 KW	-max-
Pbr up/gr1:	3.00 KW	-max-
Pbr dw/gr1:	0.00 KW	-max-
Pbr up/gr2:	0.00 KW	-max-
Pbr dw/gr2:	0.00 KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg. Brk	
Ecn:	70.802	70.802	70.802	KWh
Ecn up/gr1:	19.469	19.469	19.469	KWh
Ecn dw/gr1:	-6.974	-1.744	0.300	KWh
Eac:	0.000	0.000	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000;	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1 :	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	83.296	88.527	90.271	KWh
	0.174	0.184	0.188	KWh/mi

TITLE: (II) LOCAL BUS, BUS

Cd:	0.5	r(Kg/m3):	1.225
Area(m2):	8.92	Grade1(%):	6.0%
Ur:	0.01	Grade2(%):	15.0%
Mass(Kg):	13605	Reg.Brake (n):	0.25

CONSTANT STEED INFORMATION

Range:	0 mi
%dist.grd1:	0.0%
Vconstant:	0 mi/h

CYCLE INFORMATION

		CYCLE RESULTS	
Range:	120 mi		
%dist.grd1:	15.0%	V after (co):	18.98 mi/h
%dist.grd2:	5.0%		
t(ac):	19 s	dist/cycl(ac):	81.92 m
t(cr):	19 s	dist/cycl(cr):	169.81 m
t(co):	4 s	dist/cycl(co-br):	40.23 m
t(br):	5 s	Total cyle dist:	294.98 m
Vcruise:	20 mi/h	#cycles needed:	654.55

FORCES ANALYSIS

Fsn:	1333.29 N
Fcn up/gr1:	9318.57 N
Fcn dw/gr1:	-6652.39 N
Fac:	7952.23 N
Fac up/gr1:	15937.56 N
Fac dw/gr1:	-33.10 N
Fac up/gr2:	27730.37 N
Fac dw/gr2:	-11825.80 N
Fcr:	1551.57 N
Fcr up/gr1:	9536.95 N
Fcr dw/gr1:	-6433.51 N
Fcr up/gr2:	21329.65 N
Fcr dw/gr2:	-18226.52 N
Fco:	0.00 N
Fco up/gr1:	7985.38 N
Fco dw/gr1:	-7985.38 N
Fco up/gr2:	19778.03 N
Fco dw/gr2:	-19778.08 N
Fbr:	-21551.51 N
Fbr up/gr1:	-13566.23 N
Fbr dw/gr1:	-29536.80 N
Fbr up/gr2:	-1773.52 N
Fbr dw/gr2:	-4i329.69 N

POWER ANALYSIS

Pcn:	0.00	KW	
Pcn up/gr1:	0.00	KW	
Pcn dw/gr1:	0.00	KW	
Pac:	71.08	KW	-max-
Pac up/gr1:	142.46	KW	-max-
Pac dw/gr1:	-0.30	KW	-max-
Pac up/gr2:	247.88	KW	-max-
Pac dwjgr2:	-105.71	KW	-max-
Pcr:	13.87	KW	
Pcr upjgrl:	85.25	KW	
Pcr dw/gr1:	-57.51	KW	
Pcr up/gr2:	190.66	KW	
Pcr dw/gr2 :	-162.92	KW	
PCG :	0.00	KW	
Pco up/gr1:	71. 38	KW	
Pco dw/gr1:	-71.38	KW	
Pco up/gr2:	136.79	KW	
Pco dw/gr2:	-176.79	KW	
Pbr:	-132.82	KW	-max-
Pbr up/gr1:	-115.08	KW	-max-
Pbr dw/gr1:	-250 .55	KW	-max-
Pbr up/gr2:	-15. 04	KW	-max-
Pbr dw/gr2:	-350 . [illegible]	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg. Brk	
Ecn:	0.000	0. 000	is. 000	KWh
Ecn up/gr1:	0.000	0.000	0. 000	KWh
Ecn dw/gr1..	0.000	0.000	0.000	KWh
Eac:	98. 226	98o.226	98.226220	KWh
Eac up/gr1 :	13.456	13.456	13.456	KWh
Eac dw/gr1:	-0.038	-3.010	0.000	KWh
Eac up/gr2 :	10.704	10.704	10.704	KWh
Eac dw/gr2 :	-4.565000	-1 -.141	0.000	KWh
Ecr :	38.330	38.330	38.330	KWh
Ecr up/gr1:	22.087	22. 087	22.927	KWh
Ecr dw/gr1:	-14.901	-3.725	0.000	KWh
Ecr up/gr2:	16.466	16.366	16.466	KWh
Ecr dw/gr2:	-14.071	-3.518	0.000	KWh
Eco:	0.000	0,000	0.000	KWh
Ecc up/gr1:	3. 893	3.393	3.393	KWh
Eco dw/ g r 1 :	-3.893	-0.973	0.000	KWh
Eco up/gr2:	3.214	3.214	3.214	KWh
Eco dw/gr2:	-3.214	-0.804	0.000	KWh
Ebr:	-66.479	-16.620	0.000	KWh
Ebr up/gr1:	-3.923	-0.981	0.000	KWh
Ebr dw/gr1:	-8.542	-2.135	0.000	KWh
Ebr up/gr2:	-0.171	-0.043	0.000	KWh
Ebr dw/gr2:	-3 .984	-0.996	0.000	KWh
TOTAL ENERGY	87.596	180.432	211.377	KWh
	0.730	1.504	1.761	KWh/mi

TITLE: **(VI) CITY TO CITY BUS, BUS**

Cd:	**0.5**	r(Kg/m3):	**1.225**
Area(m2):	**3.92**	Grade1(%):	**6.0%**
Ur:	**0.01**	Grade2(%):	**0.0%**
Mass(Kg):	**13605**	Reg.Brake **(n):**	**0.25**

CONSTANT STEED INFORMATION

Range:	**480** mi
%dist.grd1:	15.0%
Vconstant:	**60** mi/h

CYCLE INFORMATION

Range:	0 mi
%dist.grd1:	*0.0%*
%dist.grd2:	0. *0%*
t(ac):	**0 s**
t(cr):	**0 s**
t(co):	**0 s**
t(br):	0 *s*
Vcruise:	*0* mi/h

CYCLE RESULTS

V after (co):	0 . *00* mi/h
dist/cycl(ac):	*3.00* m
dist/cycl(cr):	*0.00* m
dist/cycl(co+br):	*0. 00 m*
Total cyle dist:	0.00 m
#cycles needed:	*3.00*

FORCES *ANALYSIS*

Fcn :	*3297.73* N
Fcn up/grl:	11283.16 N
Fcn dw/grl:	-4687.60 N
Fac:	0.00 N
Fac up/grl:	0.00 N
Fac dw/grl:	0.00 N
Fac up/gr2:	0.00 N
Fac dw/gr2:	0.00 N
Fcr:	**0.00** N
Fcr up/grl:	**0.00 N**
Fcr dw/ **grl** :	**0.00 N**
Fcr up/gr2:	0.00 N
Fcr dw/gr2 :	0.00 N
Fco :	**0.00 N**
Fco up/grl:	**0.00** N
Fco dw/grl:	0.00 N
Fco up/gr2:	0.00 *N*
Fco dw/gr2:	0.00 N
Fbr:	**0.00** N
Fbr up/grl:	0.00 N
Fbr dw/grl:	0.00 N
Fbr up/gr2:	0.00 N
Fbr dwjgr2:	0.00 N

POWER ANALYSIS

Pcn:	88.44	KW	
Pcn up/gr1:	302.58	KW	
Pcn dw/gr1:	-125.71	KW	
Pac:	0.00	KW	-max-
Pac up/gr1:	0.00	KW	-max-
Pac dw/gr1:	0.00	KW	-max-
Pac up/gr2:	0.00	KW	-max-
Pac dw/gr2:	0.00	KW	-max-
Pcr :	0.00	KW	
Pcr up/gr1:	0.00	KW	
Pcr dw/gr1:	0.00	KW	
Pcr up/gr2:	0.00	KW	
Pcr dw/gr2:	0.00	Kw	
Pco:	0.00	KW	
Pco up/gr1:	0.00	KW	
Pco dw/gr1:	0.00	KW	
Pco up/gr2:	0.00	KW	
Pco dw/gr2:	0.00	KW	
Pbr:	0.00	KW	-max-
Pbr up/gr1:	0.00	KW	-max-
Pbr dw/gr1:	0.00	KW	-max-
Pbr up/gr2:	0.00	KW	-max-
Pbr dw/gr2:	0.00	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg. Brk	
Ecn :	601.362	601.362	601.362	KWh
Ecn up/gr1:	131.546	181.546	181.546	KWh
Ecn dw/gr1:	-75.423	-18.556	0.000	KWh
Eac:	0.000	0.000	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1 :	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	707.484	764.052	782.908	KWh
	1.474	1.592	1.631	KWh/mi

APPENDIX A3. COMPARISON OF SIMULATION RESULTS WITH TRACK TEST RESULTS

ETV-1 TRACK VS. SIMULATION

	TRACK TEST (1) RESULTS (Wh/mile)	DYNAMOMETER TEST (1) RESULTS (Wh/mile)	SIMULATION RESULTS(2) (Wh/mile)	SIMULATION ERROR W/RESPECT TO TRACK
35 mph	169	166	157	-7.1%
45 mph	190	181	194	+2.1%
55 mph	223	212	240	+7.1%
SAE J227a "D" Cycle	304	294	296	-2.6%

G-VAN TRACK VS. SIMULATION RESULTS

	TRACK TEST (3) RESULTS (Wh/mile)	SIMULATION RESULTS (2) (Wh/mile)	SIMULATION ERROR W/RESPECT T'O TRACK
35 mph	359.2	375.7	i4.64
40 mph	403.4	422.3	+4.8%
45 mph	454.3	475.7	+4.7%
50 mph	519.7	535.7	+3.1%
SAE J227a "C" Cycle	52:. 0	585.7	+11.8%

(1) Reference: "The DOE ETV-1 Electric Test Vehicle. Phase III Final Report. Performance Testing and System Evaluation" Donald W. Kurtz. Prepared for the U.S. Department of Energy by Jet Propulsion Laboratory.

(2) Includes the transmission efficiency of 70% (controller, motor and gear train) and regen efficiency of 0.25

(3) Reference: "Test and Evaluation Report for the General Motors G-Van" Prepared for Electric Power Research Institute by Tennessee Valley Authority. June 1988

TITLE: ETV-1 SIMULATION

Cd:	**0.32**	r(Kg/m3):	1.225
Area(m2):	1.84	Grade1(%):	0.0%
Ur:	**0.009**	**Grade%(%):**	0.0%
Mass(Kg) :	**1795**	**Reg.Brake (n):**	0.25

CONSTANT SPEED INFORMATION

Range:	100 mi
%dist.on grd	**0.0%**
Vconstant:	35 mi/h

CYCLE INFORMATION

		CYCLE **RESULTS**	
Range:	0 mi	V **after (cc):**	41.21 mi/h
%dist.grd1:	0.0%		
%dist.grd2:	0.0%		
t(ac):	28 s	dist/cycl (ac) :	281.58 m
t(cr) :	53 s	dist/cycl(cr) :	1005.63 m
t(co) :	10 s	dist/cycl(co+br) :	191.07 m
t(br):	9 s	Total cyle dist:	1478.27 m
Vcruise :	45 mi/h	#cycles needed:	0.00

FORCES ANALYSIS

Fcn :	246.57	N
Fcn up/gr1:	246.57	N
Fcn dw/gr1:	246.57	N
Fac:	1593.56	N
Fac up/gr1:	1593.56	N
Fac dw/gr1:	1593.56	N
Fac up/gr2:	1593.56	N
Fac dw/gr2 :	1593.56	N
Fcr:	304.20	N
Fcr up/gr1:	304.20	N
Fcr dw/gr1:	304.20	N
Fcr up/gr2:	304.20	N
Fcr dw/gr2:	304.20	N
Fco:	0.00	N
Fco up/gr1:	0.00	**N**
Fco dw/gr1:	0.00	N
Fco up/gr2:	0.00	N
Fco dw/gr2:	0.00	N
Fbr:	-3392.67	N
Fbr up/gr1:	-3392.67	N
Fbr dw/gr1:	-3392.67	N
Fbr up/gr2:	-3392.67	N
Fbr dw/gr2:	-3392.67	N

POWER ANALYSIS

Pcn:	3.86	KW	
Pcn up/gr1:	3.26	KW	
Pcn dw/gr1:	3.86	KW	
Pac:	32.05	KW	-max-
Pac up/gr1:	32.05	KW	-max-
Pac dw/gr1:	32.05	KW	-max-
Pac up/gr2:	32.05	KW	-max-
Pac dw/gr2:	32.05	KW	-max-
Pcr:	6.12	KW	
Pcr up/gr1:	6.12	KW	
Pcr dw/gr1:	6.12	KW	
Pcr up/gr2:	6.12	KW	
Pcr dw/gr2:	6.12	KW	
Pcs :	0.00	KW	
Pco up/gr1:	0.00	KW	
Pco dw/gr1:	0.00	KW	
Pco up/gr2:	0.00	KW	
Pco dw/gr2 :	0.00	KW	
Pbr:	-62.43	KW	-max-
Pbr up/gr1:	-62. 49	KW	-max-
Pbr dw/gr1:	-62.49	KW	-max-
Pbr up/gr2:	-62.19	KW	-max-
Pbr dw/gr2:	-62.49	KW	-max-

ENERGY ANALYSIS

	Reg. Brk n=1	Reg.Brk n=n	No Reg. Brk	
Ecn:	11.020	11.020	11.020	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1 :	o.oco	0.000	0.000	KWh
Eac:	0.000	0. oco	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	o.oco	3,300	3.000	KWh
Eac up/gr2:	0.000	0.900	0.000	KWh
Eac dw/gr2:	0.000	0.000	9.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dwjgrl:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	11.020	11.020	11.020	KWh
	0.110	0.110	0.110	KWh/mi

TITLE: ETV-1 SIMULATION

Cd:	0.32	r(Kg/m3):	1.225
Area(m2):	1.84	Grade1(%):	0.0%
Ur:	0.009	Grade%(%):	0.0%
Mass(Kg):	1795	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	100 mi
%dist.on grd	0.0%
Vconstant:	45 mi/h

CYCLE INFORMATION

Range:	0 mi	CYCLE RESULTS	
%dist.grd1:	0.0%	V after (co):	41.21 mi/h
%dist.grd2:	0.0%		
t(ac):	28 s	dist/cycl(ac):	281.53 m
t(cr):	50 s	dist/cycl(cr):	1005.63 m
t(co):	10 s	dist/cycl(co+br):	191.07 m
t(br):	9 s	Total cyle dist:	1178.27 m
Vcruise:	45 mi/h	#cycles needed:	0.00

FORCES ANALYS IS

Fcn:	304.20	N
Fcn upjgrl:	304.20	N
Fcn dw/gr1:	304.21)	N
Fac:	1593.56	N
Fac up/gr1:	1593.56	N
Fac dw/gr1:	1593.56	N
Fac up/gr2:	1593.56	N
Fac dw/gr2:	1593.56	N
Fcr:	304.20	N
Fcr up/gr1:	304.20	N
Fcr dw/gr1:	304.20	N
Fcr up/gr2:	304.20	N
Fcr dw/gr2:	304.20	N
Fco:	0.00	N
Fco up/gr1:	0.00	N
Fco dw/gr1:	0.00	N
Fco up/gr2:	0.00	N
Fco dw/gr2:	0.00	N
Fbr:	-3392.67	N
Fbr up/gr1:	-3392.67	N
Fbr dw/gr1:	-3392.67	N
Fbr up/gr2:	-3392.57	N
Fbr dw/gr2:	-3392.67	N

POWER ANALYSIS

Pcn:	6.12	KW	
Pcn up/gr1:	6.12	KW	
Pcn dw/gr1:	6.12	Kw	
Pac:	32.05	KW	-max-
Pac up/gr1:	32.05	KW	-max-
Pac dw/grl:	32.05	KW	-max-
Pac up/gr2:	32.05	KW	-max-
Pac dw/gr2:	32.05	KW	-max-
Pcr:	6.12	Kw	
Pcr up/grl:	6.12	KW	
Pcr dw/gr1:	6.12	Kw	
Pcr up/gr2:	6.12	KW	
Pcr dw/gr2 :	6.12	KW	
Pco:	0.00	KW	
Pco up/gr1:	0.00	Kw	
Pco dw/gr1:	0.00	KW	
Pco up/gr2:	0.00	KW	
Pro dw/gr2:	0.00	KW	
Pbr:	-62.49	KW	-max-
Pbr upjgrl:	-62.19	KW	-max-
Pbr dw/gr1:	-62.49	KW	-max-
Pbr up/gr2:	-62.49	KW	-max-
Pbr dw/gr2:	-62.49	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg. Brk n=n	No Reg.Brk	
Ecn :	13.536	13.596	13.596	KWh
Ecn up/gr1:	0.000	9.000	3.000	KWh
Ecn dw/gr1:	0.000	0.000	0.000	KWh
Eac:	o.ooc	0. 000	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2 :	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	13.596	13.596	13.596	KWh
	0.136	0.136	0.136	KWh/mi

TITLE: ETV-1 SIMULATION

Cd:	0.32	r(Kg/m3):	1.225
Area(m2):	1.84	Grade1(%):	0.0%
Ur:	0.009	Grade2(%):	0.0%
Mass(Kg):	1795	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	100 mi
%dist.on grd	0.0%
Vconstant:	55 mi/h

CYCLE INFORMATION

		CYCLE RESULTS	
Range:	0 mi	V after (co):	41.21 mi/h
%dist.grdl:	0.0%		
%dist.grd2:	0.0%		
t(ac):	28 s	dist/cycl(ac) :	281.58 m
t(cr) :	50 s	dist/cycl(cr) :	1005.63 m
t(co):	io s	dist/cycl(co+br) :	191.07 m
t(br):	9 s	Total cyle dist:	1178.27 m
Vcruise :	45 mi/h	#cycles needed:	0.00

FORCES ANALYSIS

Fcn:	376.24 N
Fcn up/gr1:	376.24 N
Fcn dw/gr1:	376.24 N
Fac:	1593.56 N
Fac upjgrl:	1593.56 N
Fac dw/gr1:	1593.56 N
Fac up/gr2:	1593.56 N
Fac dw/gr2:	1593.56 N
Fcr:	304.20 N
Fcr up/gr1:	304.20 N
Fcr dw/gr1:	304.20 N
Fcr up/gr2:	304.20 N
Fcr dw/gr2:	304.20 N
Fco:	0.00 N
Fco up/gr1:	0.00 N
Fco dw/gr1:	0.00 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	-3392.67 N
Fbr up/gr1:	-3392.67 N
Fbr dw/gr1:	-3392.67 N
Fbr up/gr2:	-3392.67 N
Fbr dw/gr2:	-3392.67 N

POWER ANALYSIS

Pcn:	9.25	Kw	
Pcn up/grl:	9.25	KW	
Pcn dw/gr1:	9.25	KW	
Pac:	32.05	KW	-max-
Pac up/gr1:	32.05	KW	-max-
Pac dw/grl:	32.05	KW	-max-
Pac up/gr2:	32.05	KW	-max-
Pac dw/gr2:	32.05	KW	-max-
Pcr:	6.12	KW	
Pcr up/gr1:	6.12	Kw	
Pcr dw/qrl:	6.12	KW	
Pcr up/gr2:	6 .12	KW	
Pcr dw/gr2:	6.12	KW	
Pco:	0.00	KW	
Pco up/gr1:	0.00	Kw	
Pco dw/gr1:	0.00	KW	
Pco up/gr2:	0.00	Kw	
Pco dw/gr2:	0.00	KW	
Pbr:	-62.49	KW	-max-
Pbr up/gr1:	-62.39	KW	-max-
Pbr dwjgrl:	-62.49	KW	-max-
Pbr up/gr2:	-62.43	KW	-max-
Pbr dw/gr2:	-62.49	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn :	16.816	16.816	16.816	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1:	0.000	0.000	0.000	KWh
Eac:	0.000	3.000	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	16.816	16.816	16.816	KWh
	0.168	0.168	0.168	KWh/mi

TITLE: ETV-1 SIMULATION

Cd:	0.32	r(Kg/m3):	1.225
Area(m2):	1.84	Grade1(%):	0.0%
Ur:	0.009	Grade2(%):	0.0%
Mass(Kg):	1795	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	0 mi
%dist.on grd	0.0%
Vconstant:	0 mi/h

CYCLE INFORMATION

		CYCLE RESULTS	
Range:	100 mi	V after (co):	41.21 mi/h
%dist.grd1:	0.0%		
%dist.grd2:	0.0%		
t(ac):	28 s	dist/cycl(ac):	281.58 m
t(cr):	50 s	dist/cycl(cr):	1005.53 m
t(co):	10 s	dist/cycl(co+br):	191.07 m
t(br) :	9 s	Total cyle dist:	1473.27 m
Vcruise:	45 mi/h	#cycles needed:	108.84

FORCES ANALYSIS

Fcn:	158.32	N
Fcn up/gr1:	158.32	N
Fcn dw/gr1:	158.32	N
Fac:	1593.56	N
Fac up/gr1:	1593.56	N
Fac dw/gr1:	1593.56	N
Fac up/gr2:	1593.56	N
Fac dw/gr2:	1593.56	N
Fcr:	304.20	N
Fcr up/gr1:	304.20	N
Fcr dw/gr1:	304.20	N
Fcr up/gr2:	304.20	N
Fcr dw/gr2:	304.20	N
Fco:	0.00	N
Fco up/gr1:	0.00	N
Fco dw/gr1:	0.00	N
Fco up/gr2:	0.00	N
Fco dw/gr2:	0.00	N
Fbr:	-3392.67	N
Fbr up/gr1:	-3392.67	N
Fbr dw/gr1:	-3392.67	N
Fbr up/gr2:	-3392.67	N
Fbr dw/gr2:	-3392.67	N

POWER ANALYSIS

Pcn:	0.00	Kw	
Pcn up/gr1:	0.00	Kw	
Pcn dw/grl:	0.00	KW	
Pac:	32.05	KW	-max-
Pac up/gr1:	32.05	KW	-max-
Pac dw/gr1:	32.05	KW	-max-
Pac up/gr2:	32.05	KW	-max-
Pac dw/gr2:	32.05	KW	-max-
Pcr:	6.12	KW	
Pcr up/gr1:	6.12	KW	
Pcr dw/gr1:	6.12	KW	
Pcr up/gr2:	6.12	KW	
Pcr dw/gr2:	6.12	KW	
Pco:	0.00	KW	
Pco up/gr1:	0.00	KW	
PCS dw/gr1 :	0.00	KW	
Pco up/gr2:	0.00	KW	
Pco dw/gr2 :	0.00	KW	
Pbr:	-62.49	KW	-max-
Pbr up/gr1:	-62.49	KW	-max-
Pbr dw/gr1 :	-62.49	KW	-max-
Pbr up/gr2:	-62.49	KW	-max-
Pbr dw/gr2 :	-62 .49	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	0.000	0.000	0.000	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1:	0.000	0.000	0.000	KWh
Eac:	13.566	0.000	13.566	KWh
Eac up/gr1:	0.000		0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	3.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	9.249	9.249	9.249	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	-8.501	-2.125	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	14.314	20.690	22.815	KWh
	0.143	0.207	0.228	KWh/mi

TITLE: G-VAN SIMULATION

Cd:	0.463	r(Kg/m3):	1.225
Area (m2):	3.485	Grade1(%):	0.0%
Ur:	0.01	Grade2(%):	0.0%
Mass(Kg):	3530	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	100 mi
%dist.on grd	0.0%
Vconstant:	35 mi/h

CYCLE INFORMATION

Range:	0 mi	CYCLE RESULTS	
%dist.grdl:	0.0%	V after (co):	40.27 mi/h
%dist.grd2:	0.0%		
t(ac):	28 s	dist/cycl(ac):	281.58 m
t(cr):	50 s	dist/cycl(cr):	1005.53 m
t(co):	10 s	dist/cycl(co+br):	191.07 m
t(br):	9 s	Total cvle dist:	i478.27 m
Vcruise:	45 mi/h	{cycles-needed:	0.00

FORCES ANALYSIS

Fcn:	587.78 N
Fcn up/gr1:	587.78 N
Fcn dw/gr1:	587.78 N
Fac:	3281.33 N
Fac up/gr1:	3281.33 N
Fac dw/gr1:	3281.33 N
Fac up/gr2:	3281.33 N
Fac dw/gr2:	3281.33 N
Fcr:	745.72 N
Fcr upjgrl:	745.72 N
Fcr dw/gr1:	745.72 N
Fcr up/gr2:	745.72 N
Fcr dw/gr2:	745.72 N
Fco:	0.00 N
Fco up/gr1:	0.00 N
Fco dw/gr1:	0.00 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	-6393.84 N
Fbr upjgrl:	-6393.84 N
Fbr dw/gr1:	-6393.84 N
Fbr up/gr2:	-6393.84 N
Fbr dw/gr2:	-6393.84 N

POWER ANALYSIS

Pcn:	9.19	Kw	
Pcn up/gr1:	9.19	Kw	
Pcn dw/gr1:	9.19	Kw	
Pac:	66.00	KW	-max-
Pac up/gr1:	66.00	KW	-max-
Pac dw/gr1:	66.00	KW	-max-
Pac up/gr2:	66.00	KW	-max-
Pac dw/gr2:	66.00	KW	-max-
Pcr:	15.00	KW	
Pcr up/gr1:	15.00	Kw	
Pcr dw/gr1:	15.00	Kw	
Pcr up/gr2:	15.00	KW	
Pcr dw/gr2:	15.00	KW	
Pco :	0.00	Kw	
Pco up/gr1:	0.00	KW	
Pco dw/gr1:	0.00	KW	
Pco up/gr2:	0.00	KW	
Pco dw/gr2:	0.00	xw	
Pbr:	-115.09	KW	-max-
Pbr up/gr1:	-115.09	KW	-max-
Pbr dw/gr1:	-115.09	KW	-max-
Pbr up/gr2:	-115.09	KW	-max-
Pbr dw/gr2:	-115.09	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	26.271	26.271	26.271	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1:	0.000	0.000	0.000	KWh
Eac:	0.000	0.000	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	26.271	26.271	26.271	KWh
	0.263	0.263	0.263	KWh/mi

TITLE: G-VAN SIMULATION

Cd:	0.463	r(Kg/m3):	1.225
Area(m2):	3.485	Grade1(%):	0.0%
Ur:	0.01	Grade2(%):	0.0%
Mass (Kg):	3530	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	100 mi
%dist.on grd	0.0%
Vconstant:	40 mi/h

CYCLE INFORMATION

Range:	0 mi	CYCLE RESULTS	
%dist.grdl:	0.0%	V after (co):	40.27 mi/h
%dist.grd2:	0.0%		
t(ac):	28 s	dist/cycl(ac):	281.58 m
t(cr):	50 s	dist/cycl(cr):	1005.63 m
t(co):	10 s	dist/cycl(co+br):	191.07 m
t(br):	9 s	Total cyle dist:	1478.27 m
Vcruise:	45 mijh	#cycles needed:	0.00

FORCES ANALYSIS

Fcn:	661.82 N
Fcn up/grl:	661.32 N
Fcn dw/grl:	661.82 N
Fac:	3281.33 N
Fac up/grl:	3231.33 N
Fac dw/grl:	3231.33 N
Fac up/gr2:	3231.33 N
Fac dwjgr2:	3231.33 N
Fcr:	745. 72 N
Fcr up/grl:	745.72 N
Fcr dw/grl:	'745.72 N
Fcr up/gr2:	745.72 N
Fcr dw/gr2:	745.72 N
Fco:	0.00 N
Fco up/grl:	0.00 N
Fco dw/grl:	0.00 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	-6393.84 N
Fbr up/grl:	-6393.84 N
Fbr dw/grl:	-6393.34 N
Fbr up/gr2:	-6393.34 N
Fbr dw/gr2:	-6393.34 N

POWER ANALYSIS

Pcn:	11.83	KW	
Pcn up/gr1:	11.83	KW	
Pcn dw/gr1:	11.83	KW	
Pac:	66.00	Kw	-max-
Pac up/gr1:	66.00	Kw	-max-
Pac dw/gr1:	66.00	KW	-max-
Pac up/gr2:	66.00	KW	-max-
Pac dw/gr2:	66.00	Kw	-max-
Pcr:	15.00	Kw	
Pcr up/gr1:	15.00	KW	
Pcr dw/gr1:	15.00	KW	
Pcr up/gr2:	15.00	KW	
Pcr dw/gr2:	15.00	Kw	
Pco :	0 . 0 0	Kw	
Pco up/gr1:	0.00	Kw	
Pco dw/gr1:	0.00	Kw	
Pco up/gr2:	0.00	KW	
Pco dw/gr2:	0.00	KW	
Pbr:	-115.09	KW	-max-
Pbr up/gr1:	-115.09	KW	-max-
Pbr dw/gr1:	-115.09	KW	-max-
Pbr up/gr2:	-115.09	KW	-max-
Pbr dw/gr2:	-115.09	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	29.580	29.580	29.580	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1:	0.000	0.000	0.000	KWh
Eac:	0.000	0.000	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	29.580	29.580	29.580	KWh
	0.296	0.296	0.296	KWh/mi

TITLE: G-VAN SIMULATION

Cd:	0.463	r(Kg/m3):	1.225
Area(m2):	3.485	Grade1(%):	0.0%
Ur:	0.01	Grade2(%):	0.0%
Mass (Kg) :	3530	Reg.Brake (n):	0.25

CONSTANT STEED INFORMATION

Range:	**100 mi**
%dist.on grd	0.0%
Vconstant:	45 mi/h

CYCLE **INFORMATION**

Range:	0 mi	**CYCLE** RESULTS	
%dist.grdl:	0.0%	V after (co):	40.27 mi/h
%dist.grd2:	0.0%		
t(ac):	28 s	dist/cycl(ac) :	231.58 m
t(cr):	50 s	dist/cycl(cr):	1005.63 m
t(co):	10 s	dist/cycl(co+br):	191.07 m
t(br):	9 s	Total cyle dist:	1178.27 m
Vcruise:	45 mi/h	#cycles needed:	0.00

FORCES ANALYSIS

Fcn:	745.72	N
Fcn up/gr1:	745.72	**N**
Fcn dw/gr1:	745.72	N
Fac:	3281.33	N
Fac up/gr1:	3281.33	N
Fac dw/gr1:	3281.33	**N**
Fac up/gr2:	3281.33	**N**
Fac dw/gr2:	3281.33	N
Fcr:	745.72	N
Fcr up/gr1:	745.72	N
Fcr dw/gr1:	745.72	N
Fcr up/gr2:	745.72	N
Fcr dw/gr2 :	745.72	N
Fco:	0.00	N
Fco up/gr1:	0.00	**N**
Fco dw/gr1:	0.00	**N**
Fco up/gr2:	0.00	N
Fco dw/gr2:	0.00	N
Fbr:	-6393.84	**N**
Fbr up/gr1:	-6393.84	**N**
Fbr dw/gr1:	-6393.84	N
Fbr up/gr2:	-6393.84	N
Fbr dw/gr2:	-6393.84	N

POWER ANALYSIS

Pcn:	15.00	KW	
Pcn up/gr1:	15.00	KW	
Pcn dw/gr1:	15.00	KW	
Pac:	66.00	KW	-max-
Pac up/gr1:	66.00	KW	-max-
Pac dw/grl:	66.00	KW	-max-
Pac up/gr2:	66.00	Kw	-max-
Pac dw/gr2:	66.00	KW	-max-
Pcr:	15.00	Kw	
Pcr up/gr1:	15.00	Kw	
Pcr dw/gr1:	15.00	KW	
Pcr up/gr2:	15.00	KW	
Pcr dw/gr2:	15.00	Kw	
Pco :	0.00	KW	
Pco up/gr1:	0.00	KW	
Pco dw/gr1:	0.00	Kw	
Pco up/gr2:	0.00	Kw	
Pco dw/gr2:	0.00	KW	
Pbr:	-115.09	KW	-max-
Pbr up/gr1:	-115.09	KW	-max-
Pbr dw/gr1:	-115.09	KW	-max-
Pbr up/gr2:	-115.09	KW	-max-
Pbr dw/gr2:	-115.09	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn:	33.330	33.330	33.330	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1:	0.000	0.000	0.000	KWh
Eac:	0.000	0.000	0.000	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	33.330	33.330	33.330	KWh
	0.333	0.333	0.333	KWh/mi

TITLE: G-VAN SIMULATION

Cd:	0.463	r(Kg/m3):	1.225
Area(m2):	3.485	Grade1(%):	0.0%
Ur:	0.01	Grade2(%):	0.0%
Mass(Kg) :	3530	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	100 mi
%dist.on grd	0.0%
Vconstant:	50 mi/h

CYCLE INFORMATION

Range:	0 mi
%dist.grdl:	0.0%
%dist.grd2:	0.0%
t(ac):	28 s
t(cr):	50 s
t(co):	10 s
t(br) :	9 s
Vcruise:	45 mi/h

CYCLE RESULTS

V after (co):	40.27 mi/h
dist/cycl(ac):	281.58 m
dist/cycl(cr) :	1005.63 m
dist/cycl(co+br):	191.07 m
Total cyle dist:	1478.27 m
#cycles needed:	0.00

FORCES ANALYSIS

Fcn:	839.50 N
Fcn up/gr1:	839.50 N
Fcn dw/gr1:	839.50 N
Fac:	3281.33 N
Fac up/gr1:	3281.33 N
Fac dw/gr1:	3281.33 N
Fac up/gr2:	3281.33 N
Fac dw/gr2 :	3281.33 N
Fcr:	745.72 N
Fcr up/gr1:	745.72 N
Fcr dw/gr1:	-745.72 N
Fcr up/gr2:	745.72 N
Fcr dw/gr2 :	745.72 N
Fco:	0.00 N
Fco up/gr1:	0.00 N
Fco dw/gr1:	0.00 N
Fro up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	-6393.84 N
Fbr up/gr1:	-6393.84 N
Fbr dw/gr1:	-6393.84 N
Fbr up/gr2:	-6393.84 N
Fbr dw/gr2:	-6393.84 N

POWER ANALYSIS

Pcn:	18.76	KW	
Pcn up/gr1:	18.76	KW	
Pcn dw/gr1:	18.76	KW	
Pac:	66.00	KW	-max-
Pac up/gr1:	66.00	Kw	-max-
Pac dw/gr1:	66.00	Kw	-max-
Pac up/gr2:	66.00	KW	-max-
Pac dw/gr2:	66.00	Kw	-max-
Pcr:	15.00	Kw	
Pcr up/gr1:	15.00	Kw	
Pcr dw/grl:	15.00	Kw	
Pcr up/gr2 :	15.00	Kw	
Pcr dw/gr2:	15.00	Kw	
Pco:	0.00	Kw	
Pco up/gr1:	0.00	Kw	
Pco dw/gr1:	0.00	Kw	
Pco up/gr2:	0.00	KW	
Pco dw/gr2 :	0.00	KW	
Pbr:	-115.09	KW	-max-
Pbr up/gr1:	-115.09	Kw	-max-
Pbr dw/gr1 :	-115.09	KW	-max-
Pbr up/gr2 :	-115.09	KW	-max-
Pbr dw/gr2:	-115.09	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=l	Reg.Brk n=n	No Reg.Brk	
Ecn :	37.521	37.521	37.521	KWh
Ecn up/gr1 :	0.000	0.000	0.000	KWh
Ecn d-i /grl:	0.000	0.000	0.000	KWh
Eac:	0.000	0.000	0.000	KWh
Eac up/gr1 :	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	Kwh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	37.521	37.521	37.521	KWh
	0.375	0.375	0.375	KWh/mi

TITLE: G-VAN SIMULATION

Cd:	0.463	r(Kg/m3):	1.225
Area(m2):	3.485	Grade1(%):	0.0%
Ur:	0.01	Grade2(%):	0.0%
Mass(Kg):	3530	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	0 mi
%dist.cn grd	0.0%
Vconstant:	0 mi/h

CYCLE INFORMATION

Range:	100 mi	CYCLE RESULTS	
%dist.grd1:	0.04	V after (co):	27.34 mi/h
%dist.grd2:	0.0%		
t(ac):	18 s	dist/cycl(ac):	120.68 m
t(cr):	20 s	dist/cycl(cr):	262.17 m
t(co):	8 s	dist/cycl(co+br):	113.97 m
t(br):	9 s	Total cyle dist:	502.31 m
Vcruise :	30 mi/h	#cycles needed:	320.00

FORCES ANALYS IS

Fcn :	345.94 N
Fcn up/gr1:	345.94 N
Fcn dw/gr1:	345.94 N
Fac:	3153.14 N
Fac up/gr1:	3153.14 N
Fac dw/gr1 :	3153.14 N
Fac up/gr2 :	3153.14 N
Fac dw/gr2 :	3153.14 N
'cr.'	523.62 N
Fcr up/gr1:	523.62 N
Fcr dw/gr1 :	523.62 N
Fcr up/gr2 :	523.62 N
Fcr dw/gr2:	523.62 N
Fco :	0.00 N
Fco up/gr1:	0.00 N
Fco dw/gr1:	0.00 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	-4300.04 N
Fbr up/gr1:	-4300.04 N
Fbr dw/gr1 :	-4300.04 N
Fbr up/gr2:	-4300.04 N
Fbr dw/gr2:	-4300.04 N

POWER ANALYSIS

Pcn:	0.00	Kw	
Pcn up/gr1:	0.00	Kw	
Pcn dw/gr1:	0.00	Kw	
Pac:	42.28	KW	-max-
Pac up/gr1:	42.28	KW	-max-
Pac dw/gr1:	42.28	KW	-max-
Pac up/gr2:	42.28	KW	-max-
Pac dw/gr2:	42.28	KW	-max-
Pcr:	7.02	KW	
Pcr up/gr1:	7.02	KW	
Pcr dw/gr1:	7.02	KW	
Pcr up/gr2:	7.02	KW	
Pcr dw/gr2:	7.02	KW	
Pco:	0.00	KW	
Pco up/gr1:	0.00	Kw	
Pco dw/gr1:	0.00	Kw	
Pco up/gr2:	0.00	KW	
Pco dw/gr2:	0.00	KW	
Pbr:	-52.55	KW	-max-
Pbr up/gr1:	-52.55	KW	-max-
Pbr dw/gr1:	-52.55	KW	-max-
Pbr up/gr2:	-52.55	KW	-max-
Pbr dw/gr2:	-52.55	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn :	0.000	0.000	0.000	KWh
Ecn upjgrl:	0.000	0.000	0.000	KWh
Ecn dw/gr1 :	0.000	0.000	0.000	KWh
Eac :	33.823	33.823	33.823	KWh
Eac up/gr1:	0.000	0.000	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
E c r :	12.482	12.482	12.482	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	-21.021	-5.255	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	25.283	41.049	46.304	KWh
	0.253	0.410	0.463	KWh/mi

APPENDIX B. TOP SPEED AND ACCELERATION POWER REQUIREMENTS

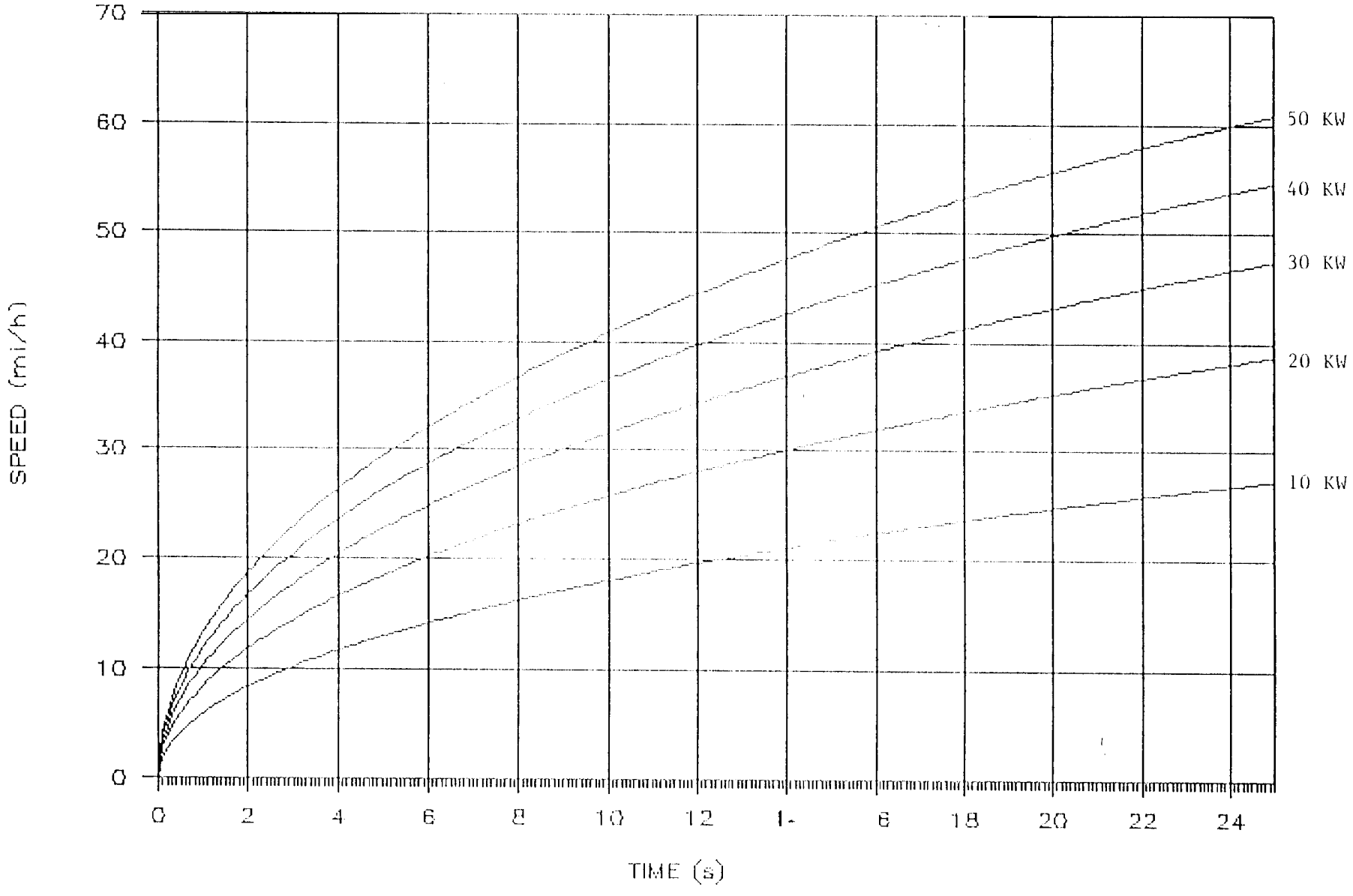
TOP SPEED POWER REQUIREMENTS

TITLE: MAIL DELIVERY CAR

MASS (Kg) : **1400**
AREA(m2): 2.5
Ur: 0.01
Cd: **0.45**

TOP SPEED (mi/h)	POWER (KW)
50.0	10.756
55.0	13.608
60.0	16.968
65.0	20.881
70.0	25.394
75.0	30.553
80.0	36.404
85.0	42.993

MAIL DELIVERY VEHICLE

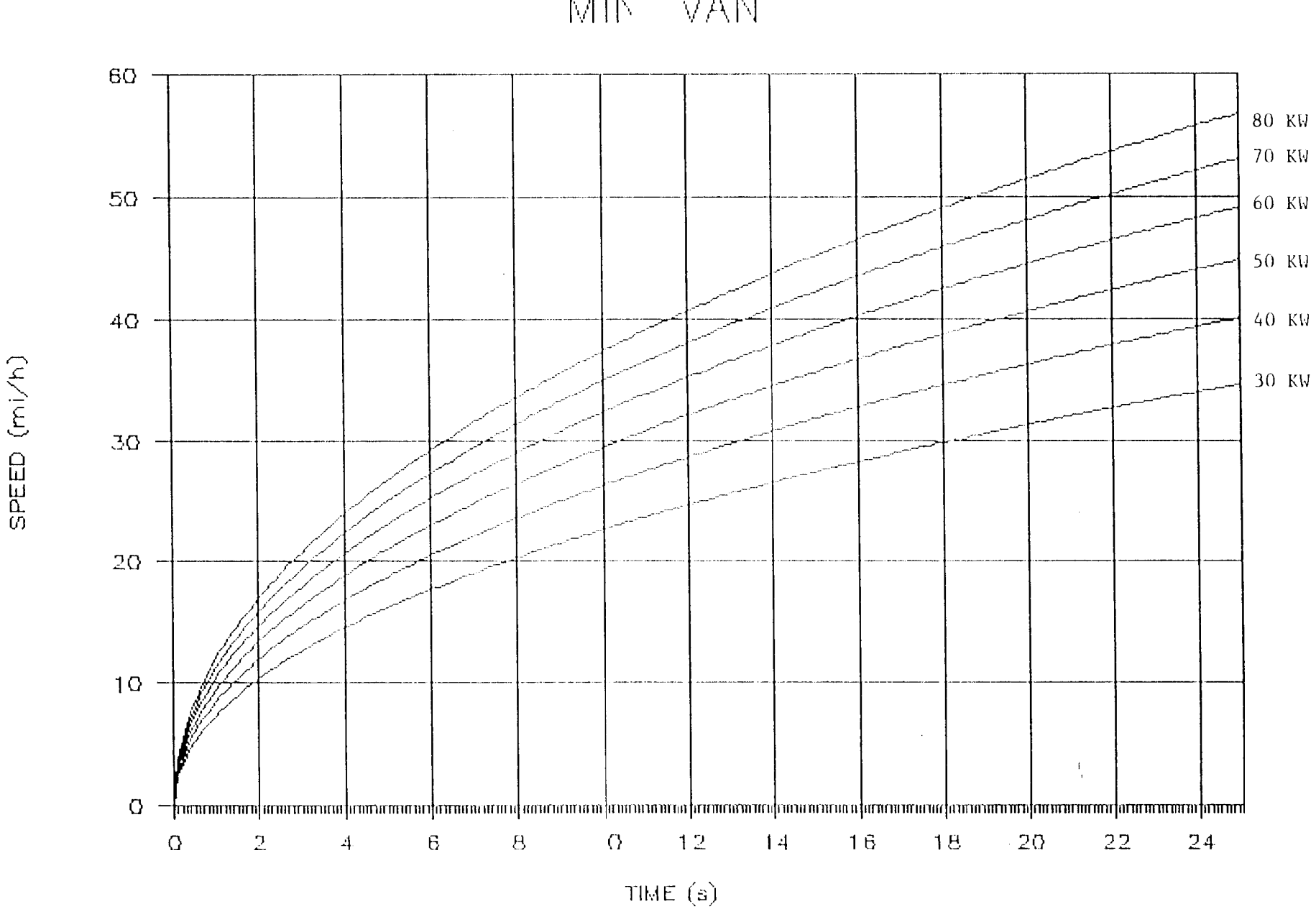


TOP SPEED POWER REQUIREMENTS

TITLE: MINI VAN

MASS (Kg) :	**2720**
AREA(m2):	**2.9**
Ur:	**0.01**
Cd:	**0.37**

TOP SPEED (mi/h)	POWER (KW)
50.0	13.291
33. 0	15.315
60.0	19.822
65.0	23.858
70.0	28.466
75.0	33.630
80.0	39.574
85.0	46.[illegible]52


MIN VAN
60
50
40
30
20
10
0
SPEED (mi/h)
0
2
4
6
8
0
12
14
16
18
20
22
24
TIME (s)
80 KW
70 KW
60 KW
50 KW
40 KW
30 KW

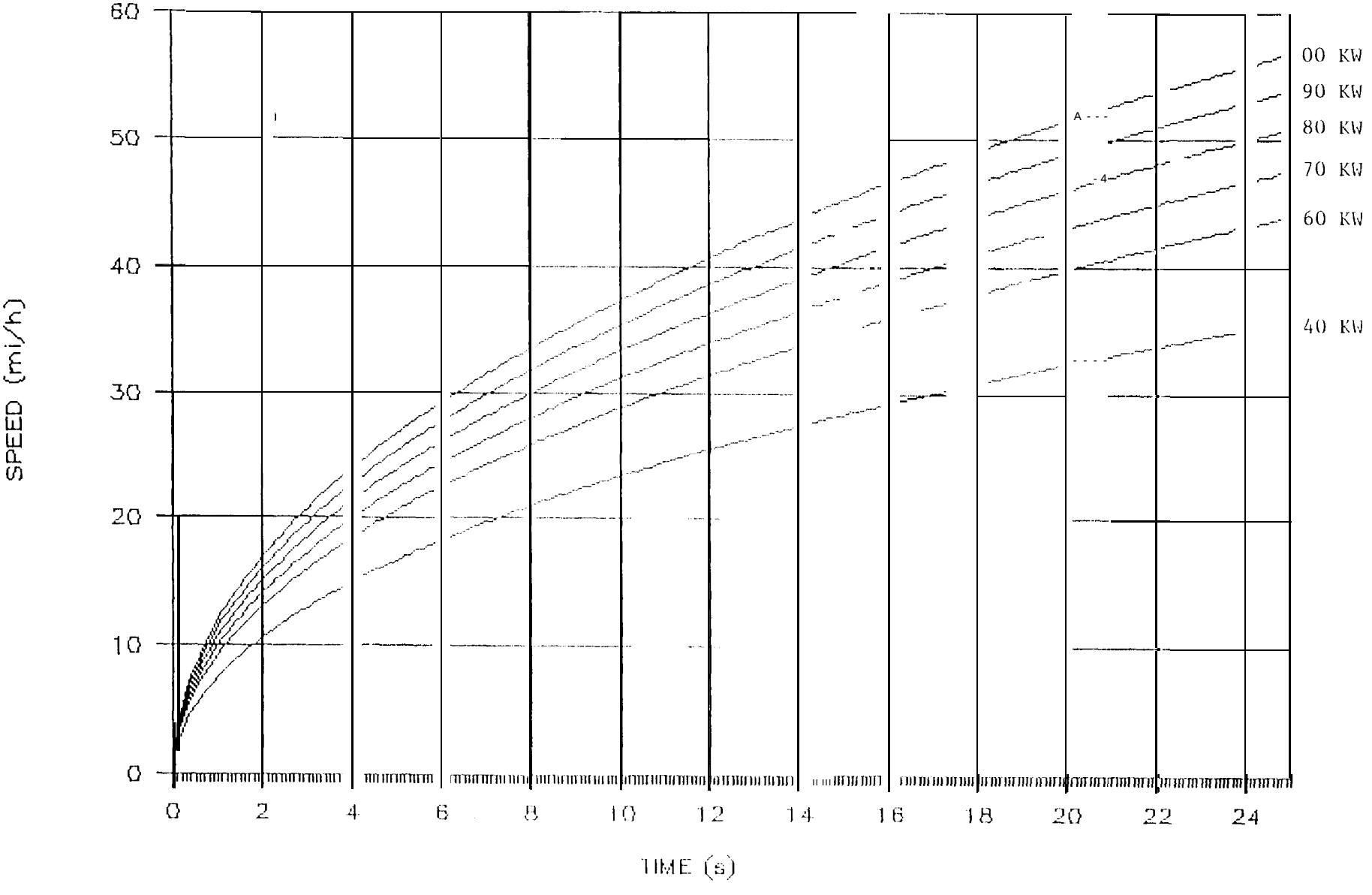
TOP SPEED POWER REQUIREMENTS

TITLE: LARGE VAN

MASS(Kg): 3400
AREA(m2): 3.4
Ur: 0.01
Cd: 0.47

TOP SPEED (mi/h)	POWER (KW)
50.0	18.369
55.0	22.730
60.0	27.811
65.0	33.678
70.0	40.398
75.0	48.035
80.0	56.656
85.0	66.324

FULL SIZE VAN

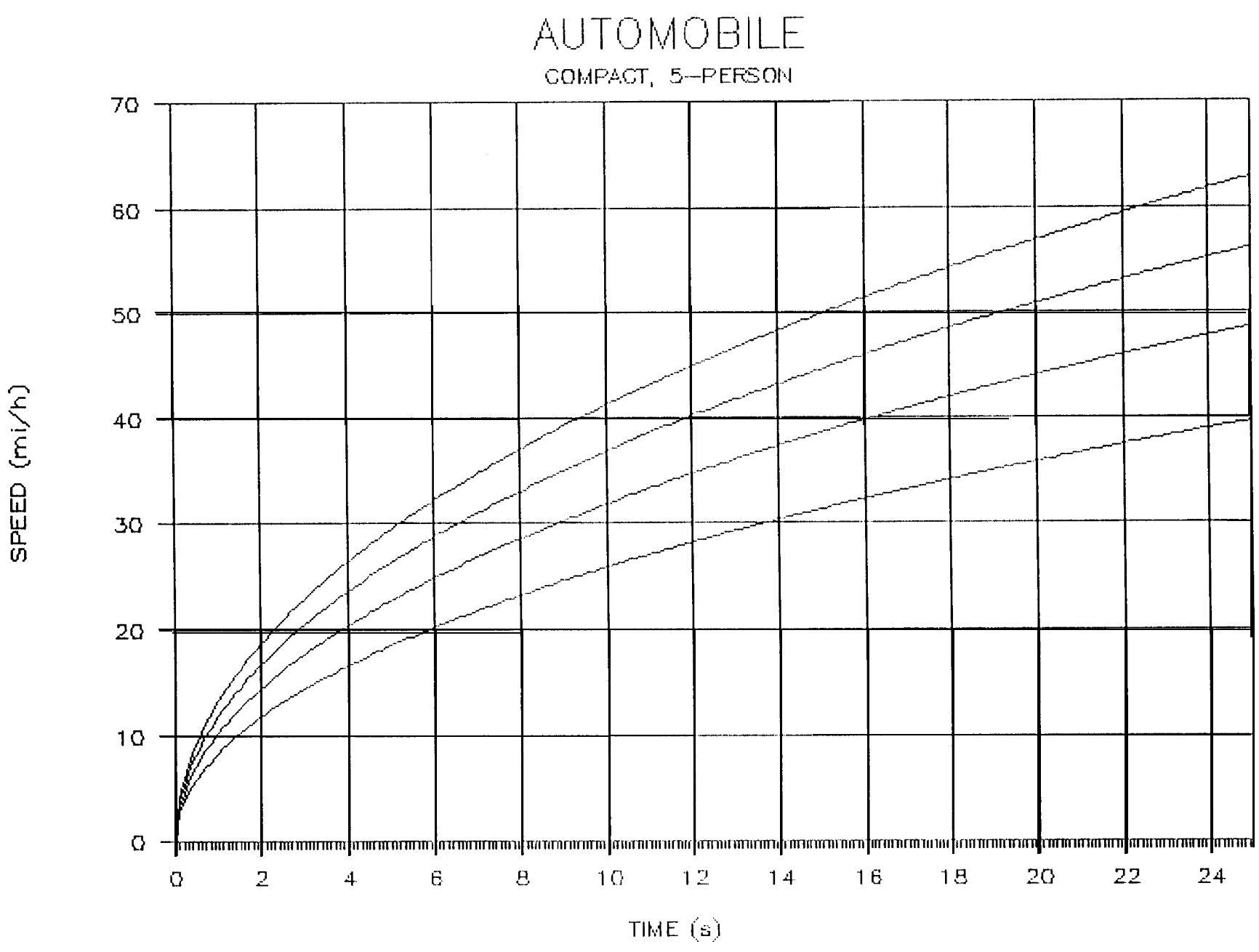


TOP SPEED POWER REQUIREMENTS

TITLE: CAR (5 PERSON)

MASS (Kg) :	**1400**
AREA(m2):	**1.9**
Ur:	**0.01**
Cd:	**0.3**

TOP SPEED (mi/h)	POWER (KW)
50.0	**6.962**
55.0	8.559
60.0	**10.312**
65.0	12.546
70.0	**l-L.984**
75.0	17.749
80.0	20.865
85.0	**24.355**


AUTOMOBILE
COMPACT, 5-PERSON
SPEED (mi/h)
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (s)

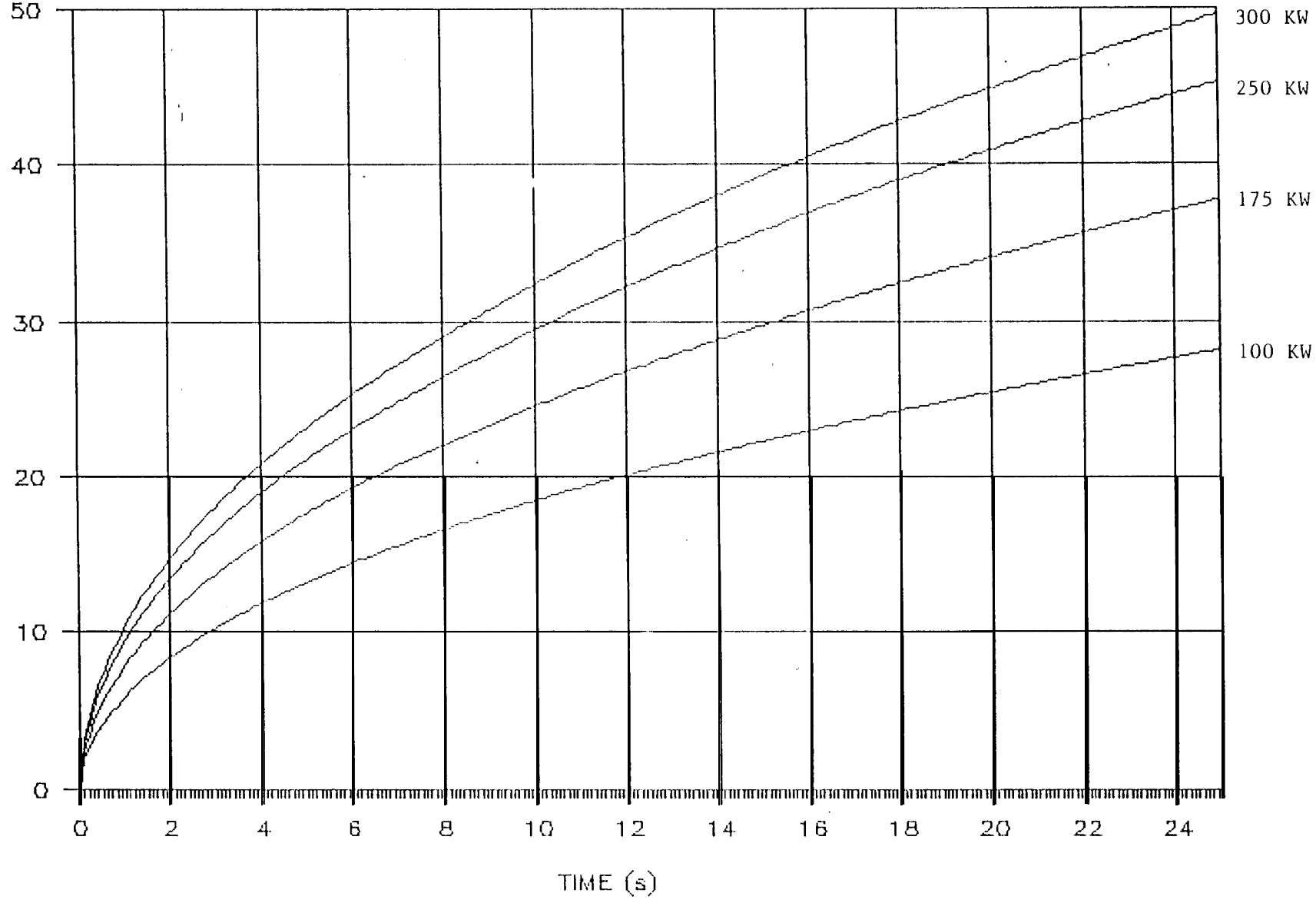
TOP SPEED POWER REQUIREMENTS

TITLE: BUS

MASS (Kg) :	13605
AREA(m2):	8.92
Ur:	0.01
Cd:	0.5

TOP SPEED (mi/h)	POWER (KW)
50.0	60.282
55.0	73.353
60.0	88.436
65.0	105.713
70.0	125.369
75.0	147.586
80.0	172.546
85.0	200.434

BUS


50
40
30
20
10
0
SPEED (mi/h)
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (s)
300 KW
250 KW
175 KW
100 KW

APPENDIX C. DESIGNS WITHOUT AIR CONDITIONING

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH.

13 mi

Energy?	**2.56**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy=	**3.66**	KWh
Power?	**15.0**	**Kw**
Driving time?	**2.93**	**h**
Veh.Weight?	**1400**	**Kg**
Veh.Weight/4 =	**350**	**Kg (Target Weight)**

EV:
Designed for 30% DOD of the battery.

Na-S (CSPL)	**1 15**	**Kg**	11.1	KWh	**15.0 Kw**
	136		**7.2**	KWh	**15.0 Kw**
NiMi-Fe-3 n (Delco-Remy)	**125**	Kg Kg	**6.5**	KWh	**15.0** KW
Pb-Ac (EV-5T)	**242**	**Kg**	**7.7**	KWh	15 . 0 KW
Pb-Ac (GC-6V-2 00)	**208**	**Kg**	4.6	KWh	**16.6** KW

HV:
Designed for 33% DCD of the battery.

Na-S (CSPL)	**0**	**Kg**	**0.0**	KWh	**0.0** KW
rx	**0**	**Kg**	**0.0**	KWh	**0.0 Kw**
	0	**Kg**	**0.0**	KWh	0 . 0 KW
Ni-Fe (NIF225)	**0**	**Kg**	3 . 0	KWh	0 . 0 **Kw**
rx	0	**Kg**	**3. 0**	KWh	**0.0** KW
	0	Kg	0.0	KWh	0.0 KW
Ni-Zn (Delco-Remy)	0	Kg	**0.0**	KWh	**0.0 Kw**
rx	0	Kg	**0.0**	KWh	**0.0** KW
	0	Kg	**0.0**	KWh	0 . 0 **Kw**
Pb-Ac (EV-5T)	0	Kg	**0.0**	KWh	**0.0 Kw**
rx	0	Kg	**0.0**	KWh	**0.0** KW
	0	Kg	**0.0**	KWh	**0.0 Kw**
Pb-Ac (GC-6V-200)	0	Kg	**0.0**	KWh	**0.0 Kw**
rx	0	Kg	**0.0**	KWh	**0.0 Kw**
	0	Kg	**0.0**	KWh	**0.0 Kw**

DESIGNS: SMALL DELIVERY, MINI VAN

100 mi

Energy?	≥1.°4	(@ n=0.25)
Transm.Eff?	○.70	
Total Energy=	44.34	KWh
Power?	50.○	KW
Driving time?	7.27	h
Veh.Weight?	2720	Kg
Veh.Weight/4 =	680	Kg (Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	577 Kg	55.4 KWh	75.1 KW
Ni-Fe (NIF225)	1046 Kg	55.4 KWh	115.○ KW
Ni-Zn (Delco-Remy)	1066 Kg	55.4 KWh	127.9 KW
Pb-Ac (EV-5T)	1732 Kg	55.4 KWh	107.4 KW
Pb-Ac (GC-6V-200)	2519 Kg	55.4 KWh	201.ε KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	365 Kg	35.1 KWh	47.5 KW
rx	54 Kg	18.2 KWh	2.5 KW
	419 Kg	53.3 KWh	50.0 KW
Ni-Fe (NIF225)	418 Kg	22.2 KWh	46.0 KW
rx	90 Kg	29.1 KWh	4.0 KW
	508 Kg	51.2 KWh	50.0 KW
Ni-Zn (Delco-Remy)	383 Kg	19.9 KWh	46.0 KW
rx	90 Kg	29.1 KWh	4.0 KW
	473 Kg	49.0 KWh	50.0 KW
Pb-Ac (EV-5T)	750 Kg	24.0 KWh	46.5 KW
rx	74 Kg	25.4 KWh	3.5 KW
	824 Kg	49.4 KWh	5○.0 KW
Pb-Ac (GC-6V-200)	563 Kg	12.4 KWh	45.0 KW
rx	102 Kg	36.4 KWh	5.0 KW
	665 Kg	48.7 KWh	5○.○ KW

DESIGNS: LONG DELIVERY "A", VAN

100 mi

Energy?	**43.80**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy=	**62.57**	KWh
Power?	**60.0**	KW
Driving tiae?	**7.09**	**h**
Veh.Weight?	**3400**	**Kg**
Veh.Weight/4 =	**350**	**Kg (Target Weight)**

EV:
Designed fcr 30% DCD of the battery.

Na-S (CSPL)	815	**Kg**	**73.2**	KWh	105.9 KW
Ni-Fe (NIF225)	1476	**Kg**	78.2	KWh	**162.3** KW
Ni-Zn (Delco-Remy)	1504	**Kg**	**73.2**	KWh	**130.5** KW
Pb-Ac (EV-5T)	2444	**Kg**	**73.2**	KWh	151.5 KW
Pb-Ac (GC-6V-200)	3555	**Kg**	**73.2**	KWh	**284.4** KW

HV:
Designed for 80% DOD **of the** battery.

Na-S (CSPL)	427	Kg	**41.0**	**Kiih**	55.5 KW
ax	**96**	**Kg**	**3 1.9**	KWh	4.5 KW
	523	Kg	72.9	KWh	60.0 KW
Ni-Fe (NIF225)	491	Kg	26.0	KWh	54.0 KW
rx	113	Kg	42.5	KWh	6.0 KW
	604	Kg	68.6	KWh	60.0 KW
Ni-Zn (Delco-Remy	446	Kg	23.2	KWh	53.5 KW
rx	122	Kg	46.1	KWh	6.5 KW
	568	Kg	69.3	KWh	60.0 KW
Pb-Ac (EV-5T)	**371**	**Kg**	**27.9**	KWh	**54.0** KW
rx	**113**	**Kg**	**42.5**	KWh	**6.0** KW
	984	**Kg**	**70.4**	KWh	**60.0** KW
Pb-Ac (GC-6V-200)	**656**	**Kg**	**14.4**	KWh	**52.5** KW
rx	**139**	**Kg**	**53.2**	KWh	**7.5** KW
	795	**Kg**	**67.6**	KWh	**60.0** KW

DESIGNS: LONG DELIVERY "B" , VAN

150 mi

Energy?	**66.26**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy=	**94.66**	KWh
Power?	**60.0**	KW
Driving **time?**	**8.00**	**h**
Veh.Weight?	**3400**	**Kg**
Veh. Weight/4 =	**850**	**Kg (Target Weight)**

EV:
Designed for 804 DOD of the battery.

Na-S	(CSPL)	**1233**	Kg	**113.3**	KWh	**160.2** KW
Ni-Fe	(NIF225)	**2232**	Kg	**113.3**	KWh	**245.6** KW
Ni-Zn	(Delco-Remy)	**2275**	Kg	**113.3**	KWh	**273.0** KW
Pb- AC	(**w-5-r**)	**3698**	**Kg**	**113.3**	KWh	229.2 KW
Pb-AC	(GC-6V-200)	**5378**	**Kg**	**113.3**	KWh	a30.3 KW

HV:
Designed for 80% **DOD of the** battery.

Na-S	(CSPL)	400	Kg	68.4	KWh	**52.0** KW
rx		147	**Kg**	64.0	KWh	**8.0** KW
		547	Kg	**132.4**	KWh	**60.0** KW
Ni-Fe	(NIF225)	**459**	Kg	24.3	KWh	**50.5** KW
rx		156	**Kg**	76.0	KWh	**9.5** KW
		615	Kg	100.3	KWh	**60.0** KW
Ni-Zn	(Delco-Remy)	417	**Kg**	**21.7**	KWh	**50.0** KW
rx		**159**	**Kg**	**80.0**	KWh	**10.0** KW
		576	**Kg**	**101.7**	KWh	**60. 0** KW
Pb-Ac	(EV-5T)	**815**	**Kg**	**26.1**	KWh	**50.5** KW
rx		**156**	**Kg**	**76.0**	KWh	**9.5** KW
		971	Kg	**102.1**	KWh	**60.0** KW
Pb-Ac	**(GC-6V-200)**	**619**	**Kg**	**13.6**	KWh	**49.5** KW
rx		**162**	**Kg**	**84.0**	KWh	**10.5** KW
		781	**Kg**	**97.6**	KWh	**60.0** KW

DESIGNS: CITY SCENARIO, AUTOMOBILE

60 mi

Energy?	11.14	(@ n=0.25)	
Transm.Eff?	0.70		
Total Energy=	15.91	KWh	
Power?	40.0	Kw	
Driving time?	1.65	h	
Veh.Weight?	1400	Kg	
Veh.Weight/4 =	350	Kg	(Target Weight)

EV :
Designed for 30% DOD of the battery.

Na-S (CSPL)	308 Kg	29.5 KWh	40.0 KW
Ni-Fe (NIF225)	375 KG	19.9 KWh	41.3 KW
Ni-Zn (Delco-Remy)	333 Kg	19.9 KWh	45.9 KW
Pb -Ac (EV-5T)	645 Kg	20.6 KWh	40.0 KW
Pb-Ac (GC-6V-200)	904 Kg	19.9 KWh	72.3 KW

HV:
Designed for 80% DCD of the battery.

Na-S (CSPL)	0 Kg	0.C KWh	3.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Fe (NIF225)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Zn (Delco-Remy	323 Kg	16.8 KWh	38.3 KW
rx	45 Kg	2.5 KWh	1.5 KW
	368 Kg	19.3 KWh	40.3 KW
Pb-Ac (EV-5T)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (GC-6V-200)	438 Kg	9.6 KWh	35.0 KW
rx	102 Kg	8.3 KWh	5.0 Kw
	540 Kg	17.9 KWh	40.0 KW

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE

150 mi

Energy?	**28.25**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy=	**40.36**	KWh
Power?	**40.0**	KW
Driving time?	3.11	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	**350**	Kg **{Target** Weight)

EV :
Designed for 80% DOD **of** the battery.

Na-3 (CSPL)	**525** Kg	50.4 KWh	**58.3** KW
Ni-Fe (NIF225)	**952 Kg**	50.4 KWh	**104.7** KW
Ni-Zn (Delco-Remy)	**970** Kg	50.4 KWh	115.4 KW
Pb-Ac (EV-5T)	**1576 Kg**	50.4 KWh	97.7 KW
Pb-Ac (GC-6V-200)	22 93 Kg	50.3 KWh	18 3 . 4 KW

HV:
Designed fcr 33% DOD **of** the battery.

Na-S (CSPL)	254 Kg	24.4 KWh	**3 3.** 0 KW
rx	**130** Kg	**21.8** KWh	7 . 0 KW
	334 Kg	45.1 KWh	40.0 KW
Ni-Fe (NIF225)	**277 Kg**	14.7 KWh	**30.5** KW
rx	**156** Kg	**29.5** KWh	9 . 5 KW
	433 **Kg**	44.2 KWh	4 0 . 0 KW
Ni-Zn (Delco-Remy)	250 Kg	13.5 KWh	**31.2 KW**
rx	**156 Kg**	29.5 KWh	9.5 Kw
	416 Kg	43.1 KWh	**40.7** KW
Pb-Ac (EV-5T)	**500 Kg**	**15.0** KWh	31.0 KW
rx	153 Kg	**28.0** KWh	9.0 KW
	653 Kg	**44.0** KWh	**40.0** KW
Pb-Ac (GC-6V-200)	**363** Kg	**8.0** KWh	29.0 KW
rx	165 Kg	**34.2** KWh	11.0 KW
	528 Kg	**42.2** KWh	**40.0** KW

DESIGNS: LARGE METROPOLIS "B", AUTOMOBILE

200 mi

Energy?	37.66	(@ n=0.25)	
Transm.Eff?	0.70		
Total Energy=	53.80	KWh	
Power?	40.0	KW	
Driving time?	4.14	h	
Veh.Weight?	1400	Kg	
Veh.Weight/4 =	350	Kg	(Target Weight:

EV :
Designed for 80% DOD of the battery.

Na-S (CSPL)	701 Kg	67.3 KWh	91.1 KW
Ni-Fe (NIF225)	1269 Kg	67.2 KWh	139.6 KW
Ni-Zn (Delco-Remy)	1293 Kg	67.3 KWh	155.2 KW
Pb-Ac (EV-5T)	2132 Kg	67.2 KWh	130.3 KW
Pb-Ac (GC-6-J-200)	3057 Kg	67.2 KWh	244.5 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	242 Kg	23.3 KWh	31.5 KW
rx	150 Kg	35.2 KWh	8.5 KW
	392 Kg	58.5 KWh	40.0 KW
Ni-Fe (NIF225)	268 Kg	14.2 KWh	29.5 KW
rx	162 Kg	43.5 KWh	10.5 KW
	430 Kg	57.7 KWh	40.0 KW
Ni-Zn (Delco-Remy)	248 Kg	12.1 KWh	29.8 KW
rx	162 Kg	43. 5 KWh	10.5 KW
	410 Kg	56.4 KWh	40.3 KW
Pb-AC (EV-5T)	484 Kg	15.5 KWh	30.0 KW
rx	159 Kg	4i.4 KWh	10.0 KW
	643 Kg	56.9 KWh	40.0 KW
Pb-Ac (GC-6V-200)	356 Kg	7.8 KWh	28.5 KW
rx	168 Kg	47.6 KWh	11.5 KW
	524 Kg	55.4 KWh	40.0 KW

DESIGNS: INTERCITY SCENARIO, AUTOMOBILE

480 mi

Energy?	88.53	(@ n=O.25)
Transm.Eff?	0.70	
Total Energy=	126.47	KWh
Power?	40.0	Kw
Driving time?	8.00	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	350	Kg (Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1647 Kg	158.1 KWh	214.1 KW
Ni-Fe (NIF225)	2983 Kg	158.1 KWh	328.1 KW
Ni-Zn (Delco-Remy;	3040 Kg	158.1 KWh	364.8 KW
i'b-AC (EV-5T)	4940 Kg	158.1 KWh	306.3 KW
Pb-AC (GC-6V-200)	7186 Kg	158.1 KWh	574.9 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	200 Kg	i9.2 KWh	26.0 KW
rx	183 Kg	112.3 KWh	14.0 KW
	383 Kg	131.2 KWh	43.0 KW
Ni-Fe (NIF225)	247 Kg	13.1 KWh	27.2 KW
rx	136 Kg	116.0 KWh	14.5 KW
	433 Kg	129.1 KWh	11.7 KW
Ni-Zn (Delco-Remy)	208 Kg	10.8 KWh	25.0 KW
rx	189 Kg	120.0 KWh	15.0 Kw
	397 Kg	130.8 KWh	40.0 KW
Pb-Ac (EV-ST)	411 Kg	13.2 KWh	25.5 KW
rx	186 Kg	116.0 KWh	14.5 KW
	597 Kg	129.2 KWh	40.0 Kw
Pb-Ac (GC-6V-200)	306 Kg	6.7 KWh	24.5 KW
rx	192 Kg	124.0 KWh	15.5 KW
	498 Kg	130.7 KWh	40.0 Kw

DESIGNS LOCAL BUS

120 mi

Energy?	**180.43**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy=	**257.76**	KWh
Power?	**175.0**	KW
Driving time?	**13.08**	**h**
Veh.Weight?	**13605**	**Kg**
Veh.Weight/4 =	**3401**	**Kg (Target** Weight)

EV:
Designed for 80% DOD of the battery.

Na-S	(CSPL)	**3356**	**Kg**	**322.2**	KWh	**436.3** KW
Ni-Fe	(NIF225)	**6079**	**Kg**	**322.2**	KWh	**668.7** KW
Ni-Zn	**(Delco-Remyj**	**6196**	**Kg**	**322** .2	KWh	**743.5** KW
Pb-AC	**(EV-5T)**	**10069**	**Kg**	**322.2**	KWh	**624.3** KW
Pb-Ac	**(GC-6V-200)**	**14645**	**Kg**	**322.2**	KWh	1171.6 KW

HV:
Designed for 80% COD of the battery.

Na-S	(CSPL)	**1250**	**Kg**	**120.0**	KWh	162.5 KW
rx		**174**	**Kg**	163 . **5**	KWh	12.5 KW
		1124	**Kg**	**283.5**	KWh	**175.0** KW
Ni-Fe	(NIF225)	1455	**Kg**	77.1	KWh	160 . **0** KW
rx		**139**	**Kg**	196.2	KWh	**15.0** KW
		1644	**Kg**	**273.3**	KWh	**175.0** KW
Ni-Zn	**(Delco-Remy)**	**1329**	**Kg**	**69.1**	KWh	**159.5** KW
rx		**192**	**Kg**	**202.7**	KWh	**15.5** KW
		1521	**Kg**	**271.9**	KWh	**175.0** KW
Pb-Ac	**(EV-5T)**	**2581**	**Kg**	**82.6**	KWh	**160.0** KW
rx		**189**	**Kg**	**196.2**	KWh	**15.0** KW
		2770	**Kg**	**273.8**	KWh	**175.0** KW
Pb-Ac	**(GC-6V-200)**	**2011**	**Kg**	**44.2**	KWh	**160.9** KW
rx		**201**	**Kg**	**222.4**	KWh	**17.0** KW
		2212	**Kg**	**266.6**	KWh	**177.9** KW

DESIGNS: INTERCITY BUS

480 mi

Energy? 764.05 (@ n=0.25)
Transm.Eff? 0.70
Total Energy= 1091.50 KWh

Power? 300.0 Kw

Driving time? 8.00 h
Veh.Weight? 13605 Kg
Veh.Weight/4 = 3401 Kg (Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	14212 Kg	1364.4 KWh	1847.6 KW
Ni-Fe (NIF225)	25743 Kg	1364.4 KWh	2831.7 KW
Ni-Zn (Delco-Remy)	26238 Kg	1364.4 KWh	3i48.6 KW
Pb-Ac (XV-5T)	42637 Kg	1364.4 KWh	2643.5 Kw
Pb-Ac (GC-6-V-200)	62017 Kg	1364.4 KWh	4961.4 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1346 Kg	129.2 KWh	175.0 KW
rx	842 Kg	1000.0 KWh	125.0 Kw
	2188 Kg	1129.2 KWh	300.0 KW
Ni-Fe (NIF225)	1545 Kg	81.9 KWh	170.0 Kw
rx	872 Kg	1040.0 KWh	130.0 KW
	2417 Kg	li21.9 KWh	300.0 KW
Ni-Zn (Delco-Remy)	1417 Kg	73.7 KWh	170.0 Kw
rx	872 Kg	1040.0 KWh	130.0 KW
	2289 Kg	1113.7 KWh	300.0 Kw
Pb-Ac (EV-5T)	2742 Kg	87.7 KWh	170.0 KW
rx	872 Kg	1040.0 KWh	130.0 KW
	3614 Kg	1127.7 KWh	300.0 Kw
Pb-Ac (GC-6V-200)	2063 Kg	45.4 KWh	165.0 KW
rx	902 Kg	1080.0 KWh	135.0 KW
	2965 Kg	1125.4 KWh	300.0 Kw

APPENDIX D. SENSITIVITY OF THE DESIGNS OF CHANGES IN BATTERY SPECS

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH.
SENSITIVITY ANALYSIS

13 mi

Energy?	2.56	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	3.65 KWh	
Power?	15.0 KW	
Driving time?	2.93 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	304	(of the Spec.E and Spec.P)

EV:
Designed for 30% DOD of the battery.

Na-S (CSPL)	39 Kg	11.1 KWh	15.0 KW
Ni-Fe (NIF225)	105 Kg	7.2 KWh	15.0 KW
Ni-Zn (Delco-Remy)	96 Kg	6.5 KWh	15.0 KW
PS-AC (EV-5T)	136 Kg	7.7 KWh	15.0 KW
Pb-AC (GC-6V-200)	160 Kg	4.6 KWh	16.6 KW

HV:
Designed for 30% DOD of the batter-y.

Na-S (CSPL)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Fe (NIF225)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	3.0 KWh	0.0 KW
	0 Kg	0.0 KWh	3.0 KW
Ni-Zn (Delco-Remy)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (EV-5T)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (GC-6V-200)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH.
SENSITIVITY ANALYSIS

13 mi

Energy?	2.56	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	3.65 KWh	
Power?	15.0 KW	
Driving time?	2.93 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight;
Sensit.Factor?	20%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	96 Kg	11.1 KWh	15.0 KW
Ni-Fe (NIF225)	114 Kg	7.2 KWh	15.0 KW
Ni-Zn (Delco-Remyj	104 Kg	5.5 KWh	15.0 KW
Pb-Ac (EV-5T)	202 Kg	7.7 KWh	15.0 KW
Pb-Ac (GC-6V-200)	173 Kg	4.6 KWh	16.5 KW

HV:
Designed for 80% COD cf the battery.

Na-S (CSPL)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Fe (NIF225)	0 Kg	3.0 KWh	3.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	3.0 KWh	0.0 KW
Ni-Zn (Delco-Remy)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (EV-5T)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (GC-6V-200)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH.
SENSITIVITY ANALYSIS

13 mi

Energy?	2.56	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	3.65 KWh	
Power?	15.0 KW	
Driving time?	2.93 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	0%	(or the Spec.3 and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	115 Kg	11.1 KWh	15.0 KW
Ni-Fe (NIF225)	136 Kg	7.2 KWh	15.0 KW
Ni-Zn (Delco-Remy)	125 Kg	5.5 KWh	15.0 KW
Pb-Ac (EV-5T)	242 Kg	7.7 KWh	15.0 KW
Pb-Ac (GC-6V-200)	207 Kg	4.6 KWh	16.6 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	0 Kg	3.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Fe (NIF225)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Zn (Delco-Remy)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (EV-5T)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (GC-6V-200)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH.
SENSITIVITY ANALYSIS

13 mi

Energy?	2.56	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	3.65 KWh	
Power?	15.0 Kw	
Driving time?	2.93 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	-20%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	144 Kg	11.1 KWh	15.0 KW
Ni-Fe (NIF225)	170 Kg	-5.2 KWh	15.0 KW
Ni -Zn (Delco-Remy)	156 Kg	6.5 KWh	15.0 KW
Pb-Ac (W-ST)	302 Kg	7.7 KWh	15.0 KW
Pb-Ac (GC-6V-200)	259 Kg	4.6 KWh	16.6 KW

HV:
Designed for 80% COD of the battery.

Na-S (CSPL)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Fe (NIF225)	0 Kg	3.0 KWh	0.3 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Zn (Delco-Remy)	0 Kg	0.0 KWh	0.0 Kii
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.9 KW
Pb-Ac (EV-5T)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (GC-6V-200)	0 Kg	0.0 KWh	0.0 Kw
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 Kw

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH.
SENSITIVITY ANALYSIS

13 mi

Energy?	2.56	(@ n=0.25)
Transm.Eff?	0.70	
-Total Energy =	3.65 KWh	
Power?	15.0 Kw	
Driving time?	2.93 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weightj
Sensit.Factor?	-30%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	155 Kg	11.1 KWh	15.0 KW
Ni-Fe (NIF225)	195 Kg	7.2 KWh	15.0 KW
Ni -Zn (Delco-Remy)	179 Kg	6.5 KWh	15.0 KW
Pb-Ac (EV-5T)	336 Kg	7.7 KWh	15.0 KW
Pb-AC (GC-6V-200)	296 Kg	4.5 KWh	16.6 KW

HV:
Designed for 80% DCD of the battery.

Na-S (CSPL)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Fe (NIF225)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	3.0 KWh	0.0 KW
Ni-Zn (Delco-Remyj	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (EV-5T)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (GC-W-200)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW

DESIGNS: SMALL DELIVERY, MINI VAN
SENSITIVITY ANALYSIS

100 mi

Energy? 31.04 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 44.34 KWh

Power? 50.0 Kw

Driving time? 7.27 h
Veh.Weight? 2720 Kg
Veh.Weight/4 = 680 Kg (Target battery and rx weight)

Sensit.Factor? 30% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	444 Kg	5 5.4 KWh	75.1 KW
Ni-Fe (NIF225)	804 Kg	55.4 KWh	115. 0 KW
Ni-Zn (Delco-Remyj	820 Kg	55.4 KWh	127.9 Kw
Pb-AC (EV-5T)	1332 Kg	55.4 KWh	107.4 KW
Pb-Ac (GC-6V-200)	i938 Kg	55.4 KWh	201. 6 Kw

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	281 Kg	35.1 KWh	47.5 KW
rx	54 Kg	18.2 KWh	2.5 KW
	335 Kg	53.3 KWh	50.0 Kw
Ni-Fe (NIF225)	322 Kg	22 . 2 KWh	46.0 KW
rx	90 Kg	29.1 KWh	4. 0 KW
	412 Kg	51.2 KWh	50.0 KW
Ni-Zn (Delco-Remy)	295 Kg	19.9 KWh	46.0 Kw
rx	90 Kg	29.1 KWh	4.0 Kw
	385 Kg	49.0 KWh	50.0 Kw
Pb-Ac (EV-5T)	577 Kg	24.0 KWh	46.5 Kw
rx	74 Kg	25.4 KWh	3.5 Kw
	651 Kg	49.4 KWh	50.0 Kw
Pb-Ac (GC-6V-200)	433 Kg	12.4 KWh	45.0 Kw
rx	102 Kg	36.4 KWh	5.0 Kw
	535 Kg	48.7 KWh	50.0 Kw

DESIGNS: SMALL DELIVERY, MINI VAN
SENSITIVITY ANALYSIS

100 mi

Energy?	**31.04**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**44.34**	KWh
Power?	**50.0**	**Kw**
Driving time?	**7.27**	**h**
Veh.Weight?'	**2720**	**Kg**
Veh.Weight/4 =	**680**	**Kg (Target battery and rx weight)**
Sensit.Factor?	20%	**(of** the Spec.E **and** Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**481 Kg**	**55.4** KWh	75.1 KW
Ni-Fe (NIF225)	**872 Kg**	**55.4** KWh	115.0 KW
Ni-Zn (Delco-Remy)	**888 Kg**	**55.4** KWh	**127.9** KW
Pb-Ac (EV-5T)	**1443 Kg**	**55.4** KWh	107.4 KW
Pb-Ac (GC-6V-200)	**2100 Kg**	**55.4** KWh	**201.6 KW**

HV:
Designed for 80% **DOD of the** battery.

Na-S (CSPL)	**304 Kg**	**35.1** KWh	**47.5** KW
rx	**54 Kg**	**18.2** KWh	2.5 KW
	358 Kg	53.3 KWh	**50.0** KW
Ni-Fe (NIF225)	**348 Kg**	**22.2** KWh	46.0 KW
rx	**90 Kg**	29.1 KWh	4.0 KW
	438 Kg	**51.2** KWh	50.0 KW
Ni-Zn (Delco-Remy)	**319 Kg**	**13.9** KWh	**46.0** KW
rx	**90 Kg**	**29.1** KWh	**4 . 0** KW
	409 Kg	**49.0** KWh	**50.0** KW
Pb-Ac (EV-5T)	**625 Kg**	**24.0** KWh	**46.5** KW
rx	**74 Kg**	**25.4** KWh	**3.5 Kw**
	699 Kg	**49.4** KWh	**50.0 Kw**
Pb-Ac (GC-6V-200)	**469 Kg**	**12.4** KWh	**45.0 Kw**
rx	**102 Kg**	**36.4** KWh	**5.0 Kw**
	571 Kg	**48.7** KWh	**50.0 Kw**

DESIGNS: SMALL DELIVERY, MINI VAN
SENSITIVITY ANALYSIS

100 mi

Energy? **31.04** (@ n=0.25)
Transm.Eff? **0.70**
Total Energy = 44.34 KWh

Power? **50.0 Kw**

Driving time? **7.27 h**
Veh.Weight? . **2720 Kg**
Veh.Weight/4 = **680** Kg **(Target battery and rx weight)**

Sensit.Factor? **0%** (of the Spec.E **and** Spec.P)

EV:
Designed for 30% COD of the battery.

Na-S (CSPL)	577 **Kg**	**55.4** KWh	**75.1** KW
Ni-Fe (NiF225)	**1046 Kg**	55.4 KWh	115.0 KW
Ni-Zn (Delco-Remy)	**1066 Kg**	**55.4** KWh	1227.9 KW
Pb-AC (EV-5T)	**1732** Kg	**55.4** KWh	**107.4** KW
Pb-AC (GC-6V-200)	**2519 Kg**	**55.4** KWh	**201.6** KW

HV:
Designed for 33% COD of the battery.

Na-S (CSPL)	**365 Kg**	**35.1** KWh	47.5 KW
rx	**54 Kg**	**13.2** KWh	2.5 KW
	419 Kg	53.3 KWh	50.0 KW

Ni-Fe (NIF225)	413 Kg	**22.2** KWh	46.0 KW
rx	90 Kg	**29.1** KWh	**4.0** KW
	403 Kg	51.2 KWh	50.0 KW

Ni-Zn (Delco-Remy)	**333 Kg**	**19.9** KWh	**46.0 Kw**
rx	**90 Kg**	29.1 KWh	4.0 KW
	473 Kg	**49.0** KWh	**50.0** KW

Pb-Ac (EV-5T)	**750 Kg**	**24.0** KWh	**46.5** KW
rx	**74 Kg**	**25.4** KWh	**3.5** KW
	324 Kg	**49.4** KWh	**50.0 Kw**

Pb-Ac (GC-6V-200)	**563 Kg**	**12.4** KWh	**45.0 Kw**
rx	**102 Kg**	**36.4** KWh	**5.0 Kw**
	665 Kg	**43.7** KWh	**50.0 Kw**

DESIGNS: SMALL DELIVERY, MINI VAN
SENSITIVITY ANALYSIS

100 mi

Energy?	31.04	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	44.34	KWh
Power?	50.0	KW
Driving time?	7.27	h
Veh.Weight?	2720	Kg
Veh.Weight/4 =	680	Kg (Target Battery and rx weight)
Sensit.Factor?	-20%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	722 Kg	55.4 KWh	75.1 KW
Ni-Fe (NIF225)	1307 Kg	55.4 KWh	115.0 KW
Ni-Zn (Delco-Remy)	1332 Kg	55.4 KWh	127.9 KW
Pb-Ac (EV-5T)	2165 Kg	55.4 KWh	107.4 KW
Pb-Ac (GC-6V-200)	3149 Kg	55.4 KWh	201.6 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	457 Kg	35.1 KWh	47.5 KW
rx	54 Kg	13.2 KWh	2.5 KW
	511 Kg	53.3 KWh	50.0 KW
Ni-Fe (NIF225)	523 Kg	22.2 KWh	46.0 KW
rx	90 Kg	23.1 KWh	4.0 KW
	613 Kg	51.2 KWh	50.0 KW
Ni-Zn (Delco-Remy)	479 Kg	19.9 KWh	46.0 KW
rx	90 Kg	29.1 KWh	4.0 KW
	569 Kg	49.0 KWh	50.0 KW
Pb-Ac (EV-5T)	938 Kg	24.0 KWh	46.5 KW
rx	74 Kg	25.4 KWh	3.5 KW
	1012 Kg	49.4 KWh	50.0 KW
Pb-Ac (GC-6V-200)	703 Kg	12.4 KWh	45.0 KW
rx	102 Kg	36.4 KWh	5.0 KW
	805 Kg	48.7 KWh	50.0 KW

DESIGNS: SMALL DELIVERY, MINI VAN
SENSITIVITY ANALYSIS

100 mi

Energy?	31.04	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	44.34	KWh
Power?	50.0	Kw
Driving time?	7.27	h
Veh.Weight?	2720	Kg
Veh.Weight/4 =	680	Kg (Target battery and rx weight)
Sensit.Factor?	-30%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	825 Kg	55.4 KWh	75.1 KW
Ni-Fe (NIF225)	1494 Kg	55.4 KWh	115.0 KW
Ni-Zn (Delco-Remy)	1523 Kg	55.4 KWh	127.3 KW
Pb-AC (EV-5T)	2474 Kg	55.4 KWh	107.4 KW
Pb-AC (GC-6V-200)	3599 Kg	55.4 KWh	201.6 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	522 Kg	35.1 KWh	47.5 KW
rx	54 Kg	13.2 KWh	2.5 KW
	576 Kg	53.3 KWh	50.0 KW
Ni-Fe (NIF225)	597 Kg	22.2 KWh	46.0 KW
rx	90 Kg	23.1 KWh	4.0 KW
	637 Kg	51.2 KWh	53.0 KW
Ni-Zn (Delco-Remy)	548 Kg	19.9 KWh	46.0 KW
rx	90 Kg	29.1 KWh	4.0 KW
	638 Kg	43.0 KWh	50.0 Kw
Pb-AC (EV-5T)	1071 Kg	21.0 KWh	46.5 KW
rx	74 Kg	25.4 KWh	3.5 Kw
	1145 Kg	43.4 KWh	50.0 Kw
Pb-Ac (GC-6V-200)	804 Kg	12.4 KWh	45.0 Kw
rx	102 Kg	36.4 KWh	5.0 Kw
	906 Kg	48.7 KWh	50.0 Kw

DESIGNS: LONG DELIVERY "A", VAN
SENSITIVITY ANALYSIS

100 mi

Energy?	**43.80**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**62.57**	KWh
Power?	**60.0**	KW
Driving time?	**7.09**	**h**
Veh.Weight?	**3400**	**Kg**
Veh.Weight/4 =	**850**	**Kg (Target battery and rx weight)**
Sensit.Factor?	**30%**	**(of the** Spec.E **and** Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)		**627**	**Kg**	**78.2**	KWh	**105.9** KW
Ni-Fe (NIF225)		1135	**Kg**	**73.2**	KWh	**162.3** KW
Ni-Zn **(Del co-Remy)**		**1157**	**Kg**	**73.2**	KWh	**130.5** KW
Pb-AC (EV-5T)		1880	**Kg**	**73.2**	KWh	151.5 KW
Pb-Ac (GC-6V-200)		**2735**	**Kg**	**78.2**	KWh	284.4 KW

HV:
Cesigned for 80% DOD of the battery.

Na-S (CSPL)	**323**	**Kg**	**41.0**	KWh	55.5 KW
rx	**96**	**Kg**	**31.9**	KWh	**4.5** KW
	424	**Kg**	**72.9**	KWh	**60.0** KW
Ni-Fe (NIF225)	**378**	**Kg**	**26.0**	KWh	54.0 KW
rx	**113**	**Kg**	**42.5**	KWh	5.0 KW
	491	**Kg**	**68.6**	KWh	60.0 KW
Ni-Zn (Delco-Remy)	**343**	**Kg**	**23.2**	KWh	**53.5** KW
rx	**122**	**Kg**	**46.1**	KWh	**6.5** KW
	465	**Kg**	**69.3**	KWh	**60.0** KW
Pb-Ac (EV-5T)	**670**	**Kg**	**27.9**	KWh	**54.0** KW
rx	**113**	**Kg**	**42.5**	KWh	**6.0** KW
	783	**Kg**	**70.4**	KWh	**60.0** KW
Pb-Ac (GC-6V-200)	**505**	**Kg**	**14.4**	KWh	**52.5** KW
rx	**139**	**Kg**	**53.2**	KWh	**7.5** KW
	644	**Kg**	**67.6**	KWh	**60.0** KW

DESIGNS: LONG DELIVERY "A", VAN
SENSITIVITY ANALYSIS

100 mi

Energy?	**43.80**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**62.57**	KWh
Power?	**60.0**	KW
Driving time?	**7.09**	**h**
Veh.Weight?	**3400**	**Kg**
Veh.Weight/4 =	**850**	**Kg (Target battery and rx weight)**
Sensit.Factor?	**20%**	**(of the** Spec.E **and** Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**679 Kg**	**73.2** KWh	105.9 KW
Ni-Fe **(NIF225)**	**1230 Kg**	**78.2** KWh	**162.3** KW
Ni-Zn (Delco-Remy)	**1253 Kg**	**73.2** KWh	**130.5** KW
Pb-Ac (EV-5T)	**2037 Kg**	78.2 KWh	**151.5** KW
Pb-Ac (GC-6V-200)	**2963 Kg**	**78.2** KWh	284.4 KW

HV:
Designed for **80% DOD of** the battery.

Na-S (CSPL)	**356 Kg**	**41.0** KWh	**55.5** KW
rx	**96 Kg**	31.9 KWh	4.5 KW
	452 Kg	**72.9** KWh	50.0 KW

Ni-Fe (NIF225)	**409 Kg**	25.0 KWh	54.0 KW
rx	**113 Kg**	**42.5** KWh	**6.0** KW
	522 Kg	**63.6** KWh	**60.0** KW

Ni-Zn (Delco-Remy)	**372 Kg**	**23.2** KWh	**53.5** KW
rx	**122 Kg**	**46.1** KWh	**6.5** KW
	494 Kg	**69.3** KWh	**60.0** KW

Pb-Ac (EV-5T)	**726 Kg**	**27.9** KWh	**54.0** KW
rx	**113 Kg**	**42.5** KWh	**6.0** KW
	839 Kg	**70.4** KWh	**60.0** KW

Pb-AC (GC-6V-200)	**547 Kg**	**14.4** KWh	**52.5** KW
rx	**139 Kg**	**53.2** KWh	**7.5** KW
	686 Kg	**67.6** KWh	**60.0** KW

DESIGNS: LONG DELIVERY "A", VAN
SENSITIVITY ANALYSIS

100 mi

Energy?	**43.80**	(@ n=0.25)
Transm .Eff?	**0.70**	
Total Energy =	**62.57**	KWh
Power?	**60.0**	**KW**
Driving time?	**7.09**	**h**
Veh.Weight?	**3400**	**Kg**
Veh.Weight/4 =	**850**	**Kg (Target battery and rx weight;**
Sensit.Factor?	**0%**	**(of the** Spec.E **and** Spec.P)

EV:
Designed for 80% DGD of the battery.

Na-S (CSPL)	**815**	**Kg**	**78.2**	KWh	**105.3** KW
Ni-Fe (NIF225)	**1476**	**Kg**	**78.2**	KWh	**152.3** KW
Ni-Zn **(Delco-Remy)**	**1504**	**Kg**	**78.2**	KWh	**130.5** KW
Pb-AC (EV-5T)	**2444**	**Kg**	**78.2**	KWh	**151.5** KW
Pb-Ac (GC-6V-200)	**3555**	**Kg**	**73.2**	KWh	**284.4 KW**

HV:
Designed for 80% **DCD of the battery.**

Na-S (CSPL)	**427**	**Kg**	**41.0**	KWh	**55.5 Kw**
rx	**96**	**Kg**	**31.9**	KWh	4.5 KW
	523	**Kg**	**72.9**	KWh	**60.0** KW
Ni-Fe (NIF225)	**491**	Kg	**26. 0**	KWh	**54.0 Kw**
rx	**113**	**Kg**	**42.5**	KWh	**6.0** KW
	604	**Kg**	68 . 6	KWh	6 0 . 0 KW
Ni-Zn (Delco-Remy)	**446**	**Kg**	**23.2**	KWh	**53.5** KW
rx	**122**	**Kg**	**46.1**	KWh	**6. 5 KW**
	568	**Kg**	**69.3**	KWh	**60. 0 KW**
Pb-Ac (EV-5T)	**871**	**Kg**	**27.9**	KWh	**54.0** KW
rx	**113**	**Kg**	**42.5**	KWh	**6.0** KW
	984	**Kg**	**70.4**	KWh	**60.0 KW**
Pb-Ac (GC-6V-200)	**656**	**Kg**	**14.4**	KWh	**52.5 KW**
rx	**139**	**Kg**	**53.2**	KWh	**7.5 Kw**
	795	**Kg**	**67.6**	KWh	**60.0 KW**

DESIGNS: LONG DELIVERY "A", VAN
SENSITIVITY ANALYSIS

100 mi

Energy?	**43.80**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**62.57**	KWh
Power?	**60.0**	KW
Driving **time?**	**7.09**	**h**
Veh.Weight?	**3400**	Kg
Veh.Weight/4 =	**850**	**Kg (Target battery and rx weight)**
Sensit.Factor?	**-20%**	**(of the** Spec.E **and** Spec.P)

EV :
Designed for 80% DOD of the battery.

Na-S (CSPL)	**1018**	**Kg**	**73.2**	KWh	**105.9**	KW
N1-Fe **(NIF225)**	**1845**	**Kg**	**73.2**	KWh	**162.3**	KW
Ni-Zn (Delco-Remy)	**1880**	**Kg**	**78.2**	KWh	**130.5**	KW
Pb-Ac (EV-5T)	**3055**	**Kg**	**73.2**	KWh	**151.5**	KW
Pb-Ac (GC-W-200)	**4444**	**Kg**	**78.2**	KWh	**284.4**	KW

HV:
Designed **for 80% DOD of the battery.**

Na-S (CSPL)	**534**	**Kg**	**41.0**	KWh	**55 . 5**	KW
rx	**96**	**Kg**	**31.9**	KWh	**4.5**	KW
	630	**Kg**	**72 .9**	KWh	**6 0 . 0**	KW
Ni-Fe (NIF225)	614	**Kg**	**26.0**	KWh	**54.0**	KW
rx	**ii3**	**Kg**	**42.5**	KWh	**6.0**	KW
	727	**Kg**	**63.6**	KWh	**60. 0**	KW
Ni-Zn (Delco-Remy)	**557**	**Kg**	**23.2**	KWh	**53.5**	KW
rx	**122**	**Kg**	**46.1**	KWh	**6.5**	KW
	679	**Kg**	**69.3**	KWh	**60.0**	KW
Pb-Ac (EV-5T)	**1089**	**Kg**	**27.9**	KWh	**54.0**	KW
rx	**113**	**Kg**	**42.5**	KWh	**6.0**	KW
	1202	**Kg**	**70.4**	KWh	**60.0**	KW
Pb-Ac (GC-6V-200)	**820**	**Kg**	**14.4**	KWh	**52.5**	KW
rx	**139**	**Kg**	**53.2**	KWh	**7.5**	KW
	959	**Kg**	**67.6**	KWh	**60.0**	KW

DESIGNS: LONG DELIVERY "A", VAN
SENSITIVITY ANALYSIS

100 mi

Energy?	43.80	(@ n=0.25)	
Transm.Eff?	0.70		
Total Energy =	62.57	KWh	
Power?	60.0	KW	
Driving time?	7.09	h	
Veh.Weight?	3400	Kg	
Veh.Weight/4 =	850	Kg	(Target battery and rx weight)
Sensit.Factor?	-30%	(of the Spec.E and Spec.P)	

EV:
Designed for 83% DOD of the battery.

Na-S (CSPL)	1164 Kg	78.2 KWh	105.9 Kw
Ni-Fe (NIF225)	2108 Kg	78.2 KWh	162.3 KW
Ni-Zn (Delco-Remy)	2149 Kg	72.2 KWh	180.5 KW
Pb-Ac (EV-5T)	3492 Kg	78.2 KWh	151.5 KW
Pb-Ac (X-577-200)	5079 Kg	78.2 KWh	284.4 KW

HV:
Designed for 80% DCD of the battery.

Na-S (CSPL)	610 Kg	41.0 KWh	55.5 KW
rx	96 Kg	31.9 KWh	4.5 Kw
	----------e-v----------		
	706 Kg	72.9 KWh	60.0 KW
Ni-Fe (NIF225)	701 Kg	25.0 KWh	54.0 KW
rx	113 Kg	42.5 KWh	6.0 KW
	814 Kg	68.6 KWh	60.0 KW
Ni-Zn (Delco-Remy)	637 Kg	23.2 KWh	53.5 Kw
rx	122 Kg	46.1 KWh	6.5 KW
	759 Kg	69.3 KWh	60.0 Kw
Pb-Ac (EV-5T)	1244 Kg	27.9 KWh	54.0 Kw
rx	113 Kg	42.5 KWh	6.0 KW
	1357 Kg	70.4 KWh	60.0 KW
Pb-Ac (GC-6V-200)	938 Kg	14.4 KWh	52.5 KW
rx	139 Kg	53.2 KWh	7.5 Kw
	1077 Kg	67.6 KWh	60.0 KW

DESIGNS: LONG DELIVERY "B", VAN
SENSITIVITY ANALYSIS

150 mi

Energy?	**66.26**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**94.66**	KWh
Power?	**60.0**	KW
Driving **time?**	**8.00**	**h**
Veh.Weight?	**3400**	**Kg**
Veh.Weight/4 =	**850**	**Kg (Target battery and rx weight)**
Sensit.Factor?	**30%**	**(of the** Spec.E **and** Spec.P)

EV:
Designed for **80%** DOD **of the battery.**

Na-S (CSPL)	**948**	**Kg**	**118.3**	KWh	160.2	KW
Ni-Fe (NIF225)	**1717**	**Kg**	**118.3**	KWh	245.6	KW
Ni-Zn (Delco-Remy)	**1759**	**Kg**	**li8.3**	KWh	**213.0**	**Kw**
Pb-Ac (EV-5T)	**2844**	**Kg**	**118.3**	KWh	**229.2**	KW
Pb-Ac (GC-6V-200)	4137	**Kg**	**118.3**	KWh	**430.3**	KW

HV:
Designed for **80% DOD of the** battery.

Na-S (CSPL)	**308**	**Kg**	**38.4**	KWh	**52.c**	KW
rx	147	**Kg**	**64.0**	KWh	**8.0**	KW
	455	**Kg**	**102.4**	KWh	**60. 0**	KW
Ni-Fe (NIF225)	**353**	**Kg**	24.3	KWh	50.5	KW
rx	156	**Kg**	**76.0**	KWh	9.5	KW
	509	**Kg**	**100.3**	KWh	60.0	KW
Ni-Zn (Delco-Remy)	**32i**	**Kg**	**21.7**	KWh	**50.0**	KW
rx	**159**	**Kg**	**80.0**	KWh	10.0	KW
	480	**Kg**	**101.7**	KWh	**60.0**	KW
Pb-Ac (EV-ST)	**627**	**Kg**	**26.1**	KWh	**50.5**	KW
rx	**156**	**Kg**	**76.0**	KWh	**9.5**	KW
	783	**Kg**	**102.1**	KWh	**60.0**	**KW**
Pb-Ac (GC-6V-200)	**476**	**Kg**	**13.6**	KWh	**49.5**	**Kw**
rx	**162**	**Kg**	**84.0**	KWh	**10.5**	**Kw**
	638	**Kg**	**97.6**	KWh	**60.0**	**KW**

DESIGNS: LONG DELIVERY "B", VAN
SENSITIVITY ANALYSIS

150 mi

Energy?	**66.26**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**94.66**	KWh
Power?	**60.0**	KW
Driving time?	**8.00**	**h**
Veh.Weight?	**3400**	**Kg**
Veh.Weight/4 =	**850**	**Kg (Tarqet battery and rx weiqhtj**
Sensit.Factor?	2'3%	**(of the** Spec.E **and** Spec.P)

EV:
Designed for 80% COD of **the** battery.

Na-3 (CSPL)	1027	**Kq**	118.3	KWh	160.2 KW
Ni-Fe (NIF225)	**1863**	Kg	**118.3**	KWh	245.6 KW
Ni-Zn (Delco-Remy)	**1896**	**Kq**	**118.3**	KWh	273.0 KW
Pb-Ac (EV-5T)	**3081**	Kg	**118.3**	KWh	**229.2** KW
Pb-Ac (GC-6V-200)	**4482**	**Kq**	**118.3**	KWh	**130.3** KW

HV:
Designed for 80% **DOD of the battery.**

Na-S (CSPL)	**333**	**Kq**	**38.4**	KWh	**52.0** KW
rx	147	Kg	**64.0**	KWh	**8.0** KW
	480	**Kg**	**102.4**	KWh	**60.0** KW
Ni-Fe (NIF225)	**333**	Kg	**24.3**	KWh	**50.5** KW
rx	156	Kg	**76.0**	KWh	**9.5** KW
	539	**Kg**	**100.3**	KWh	60.0 KW
Ni-Zn (Delco-Remy)	**317**	**Kg**	**21.7**	KWh	**50.0** KW
rx	**159**	**Kq**	**80.0**	KWh	**10.0** KW
	506	Kg	**101.7**	KWh	**60.0** KW
Pb-AC (EV-5T)	**679**	**Kq**	**26.1**	KWh	**50.5** KW
rx	**156**	Kg	**76.0**	KWh	**9.5** KW
	835	**Kq**	**102.1**	KWh	**60.0** KW
Pb-Ac (GC-6V-200)	**516**	**Kq**	**13.6**	KWh	**49.5** KW
rx	**162**	**Kq**	**84.0**	KWh	**10.5** KW
	678	**Kq**	**97.6**	KWh	**60.0** KW

DESIGNS: LONG DELIVERY "B", VAN
SENSITIVITY ANALYSIS

150 mi

Energy? 66.26 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 94.66 KWh

Power? 60.0 **KW**

Driving time? 8.00 **h**
Veh.Weight? 3400 Kg
Veh.Weight/4 = 850 **Kg (Target battery and rx weight)**

Sensit.Factor? 0% **(cf the** Spec.E **and** Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**1233 Kg**	**113.3** KWh	**160. 2** KW
Ni-Fe (NIF225)	**2232 Kg**	**113.3** KWh	**245.6 KW**
Ni-Zn (Delco-Remy)	**2275 Kg**	**113.3** KWh	**273.0** KW
Pb-Ac (EV-5T)	**3698 Kg**	**118.3** KWh	**229.2** KW
Pb-AC (SC-W-200)	**5378 Kg**	**118.3** KWh	**430.3** KW

HV:
Designed for 83% DOD of the battery.

Na-S (CSPL)	400 **Kg**	**38.4** KWh	**52.0** KW
rx	147 **Kg**	**64.0** KWh	**8.0** KW
	547 Kg	**102.4** KWh	**60.0** KW
Ni-Fe (NIF225)	**459** Kg	24.3 KWh	**50 . 5** KW
rx	156 Kg	**75.0** KWh	**9.5** KW
	615 Kg	**100.3** KWh	**60.0** KW
Ni-Zn (Delco-Remy)	**417 Kg**	**21.7** KWh	**50.0** KW
rx	159 **Kg**	**80.0** KWh	**10.0** KW
	576 Kg	**101.7** KWh	**60.0** KW
Pb-AC (EV-5T)	**815 Kg**	**26.1** KWh	**50.5** KW
rx	**156 Kg**	**76.0** KWh	**9.5 Kw**
	971 Kg	**102.1** KWh	**60.0 KW**
Pb-Ac (GC-6V-200)	**619 Kg**	**13.6** KWh	**49.5 Kw**
rx	**162 Kg**	**84.0** KWh	**10.5** KW
	781 Kg	**97.6** KWh	**60.0 KW**

DESIGNS: LONG DELIVERY "B", VAN
SENSITIVITY ANALYSIS

150 mi

Energy?	**66.26**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**94.66**	KWh
Power?	**60.0**	KW
Driving **time?**	**8.00**	**h**
Veh.Weight?	**3400**	**Kg**
Veh.Weight/4 =	**850**	**Kg (Target battery and rx weightj**
Sensit.Factor?	**-20%**	**jcf the** Spec.E **and** Spec.P)

EV:
Designed for 80% **COD of** the **battery.**

Na-S (CSPL)	**1541 Kg**	**118.3** KWh	**160.2** KW
Ni-Fe (NIF225)	**2791 Kg**	**118.3** KWh	**245.6** KW
Ni-Zn (Delco-Remy)	**2844 Kg**	**li8.3** KWh	**273.0** KW
Pb-Ac (EV-5T)	**4622 Kg**	**li8.3** KWh	**229.2** KW
Pb-Ac (GC-6V-200)	**6723 Kg**	**118.3** KWh	**430.3** KW

HV:
Designed for **33% CCC of the battery.**

Na-S (CSPL)	**500 Kg**	**38.4** KWh	**52.0** KW
rx	147 **Kg**	**64.0** KWh	8.0 KW
	647 **Kg**	**102. 4** KWh	**60.0** KW
Ni-Fe (NIF225)	574 Kg	24.3 KWh	50.5 KW
rx	156 **Kg**	**76.0** KWh	**9.5** KW
	730 Kg	**100.3** KWh	60.0 KW
Ni-Zn (Delco-Remy)	**521 Kg**	**21.7** KWh	**50.0** KW
rx	**159** Kg	**80.0** KWh	**10.0** KW
	680 Kg	**101.7** KWh	**60.0** KW
Pb-Ac (W-ST)	**1018 Kg**	**26.1** KWh	**50.5** KW
rx	**156 Kg**	**76.0** KWh	**9.5** KW
	1174 Kg	**102.1** KWh	**60.0** KW
Pb-Ac (GC-6V-200)	**773 Kg**	**13.6** KWh	**49.5** KW
rx	**162 Kg**	**84.0** KWh	**10.5** KW
	935 Kg	**97.6** KWh	**60.0** KW

DESIGNS: LONG DELIVERY "B", VAN
SENSITIVITY ANALYSIS

150 mi

Energy?	66.26	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	94.66 KWh	
Power?	60.0 KW	
Driving time?	8.00 h	
Veh.Weight?	3400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	-30%	(of the Spec.E and Spec.P)

EV:
Designed for 30% DOD of the battery.

Na-S (CSPL)	1761 Kg	113.3 KWh	160. 2 KW
Ni-Fe (NIF225)	3189 Kg	113.3 KWh	245.6 KW
Ni-5n (Delco-Remy)	3251 Kg	113.3 KWh	273.0 KW
Pb-Ac (EV-5T)	52 32 Kg	113.3 KWh	229 .2 KW
Pb-Ac (GC-6V-200)	7633 Kg	113.3 KWh	430.3 KW

HV:
Designed for 30% DOD of the battery.

Na-S (CSPL)	5 71 Kg	33.4 KWh	52.0 Kw
rx	147 Kg	64. 0 KWh	3.0 KW
	718 Kg	102.4 KWh	60 . 0 KW
Ni-Fe (NIF225)	656 Kg	24.3 KWh	50.5 KW
rx	156 Kg	76.0 KWh	9.5 KW
	312 Kg	100.3 KWh	60 . 0 KW
Ni-Zn (Delco-Remy)	595 Kg	21.7 KWh	50.0 Kw
rx	159 Kg	30.0 KWh	10.0 KW
	754 Kg	101.7 KWh	60.0 KW
Pb-Ac (EV-5T)	1164 Kg	26.1 KWh	50.5 Kw
rx	156 Kg	76.0 KWh	9 .5 Kw
	1320 Kg	102.1 KWh	60.0 KW
Pb-Ac (GC-6V-200)	384 Kg	13.6 KWh	49.5 Kw
rx	162 Kg	84.0 KWh	10.5 Kw
	1046 Kg	97.6 KWh	60.0 KW

DESIGNS: CITY SCENARIO, AUTOMOBILE
SENSITIVITY ANALYSIS

60 mi

Energy?	11.14	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	15.91	KWh
Power?	40.0	KW
Driving time?	1.65	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	350	Kg (Target battery and rx weight)
Sensit.Factor?	30%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-Sna (CSPL)	237 Kg	29.5 KWh	40.0 KW
Ni-Fe (NIF225)	289 Kg	19.9 KWh	41.3 KW
Ni-Zn (Delco-Remy)	294 Kg	19.9 KWh	45.9 KW
Pb-Ac (EV-5T)	496 Kg	20.6 KWh	40.0 KW
Pb-AC (GC-6V-200)	696 Kg	19.9 KWh	72.3 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Fe (NIF225)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Zn (Delco-Remy)	249 Kg	16.8 KWh	38.8 KW
rx	45 Kg	2.5 KWh	1.5 KW
	294 Kg	19.3 KWh	40.3 KW
Pb-Ac (EV-ST)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Pb-Ac (GC-6V-200)	337 Kg	9.6 KWh	35.0 KW
rx	102 Kg	8.3 KWh	5.0 KW
	439 Kg	17.9 KWh	40.0 KW

DESIGNS: CITY SCENARIO, AUTOMOBILE
SENSITIVITY ANALYSIS

60 mi

Energy? 11.14 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 15.91 KWh

Power? 40.0 Kw

Driving time? 1.65 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 20% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	256 Kg	29.5 KWh	40.0 K-d
Ni-Fe (NIF225)	313 Kg	19.9 KWh	41.3 KW
Ni-Zn (Delco-Remy)	319 Kg	19.9 KWh	45.9 Kw
Pb-Ac (EV-5T)	538 Kg	28.6 KWh	40.0 Kw
Pb-AC (GC-6V-200)	754 Kg	19.9 KWh	72.3 Kw

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	0 Kg	0.0 KWh	0.0 Kw
rx	0 Kg	0.0 KWh	0.0 Kw
	0 Kg	0.0 KWh	0.0 Kw
Ni-Fe (NIF225)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 Kw
	0 Kg	0.0 KWh	0.0 KW
Ni-Zn (Delco-Remy)	259 Kg	16.8 KWh	38.8 Kw
rx	45 Kg	2.5 KWh	1.5 KW
	314 Kg	19.3 KWh	40.3 Kw
Pb-Ac (EV-5T)	0 Kg	0.0 KWh	0.0 Kw
rx	0 Kg	0.0 KWh	0.0 Kw
	0 Kg	0.0 KWh	0.0 Kw
Pb-Ac (GC-6V-200)	365 Kg	9.6 KWh	35.0 KW
rx	102 Kg	8.3 KWh	5.0 KW
	467 Kg	17.9 KWh	40.0 KW

DESIGNS: CITY SCENARIO, AUTOMOBILE
SENSITIVITY ANALYSIS

60 mi

Energy?	11.14	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	15.91 KWh	
Power?	40.0 Kw	
Driving time?	1.65 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	0%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	308 Kg	29.5 KWh	40.0 KW
Ni-Fe (NIF225)	375 Kg	19.9 KWh	41.3 Kw
Ni-Zn (Delco-Remy)	383 Kg	19.9 KWh	45.9 Kw
Pb-AC (EV-5T)	645 Kg	29.6 KWh	40.0 KW
Pb-Ac (GC-6V-200)	904 Kg	19.9 KWh	72.3 KW

HV:
Designed for 80% COD of the battery.

Na-S (CSPL)	0 Kg	0.0 KWh	0.0 Kw
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW

Ni-Fe (NIF225)	0 Kg	0.0 KWh	0.0 KW
mil	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 Kw

Ni-Zn (Delco-Remy)	323 Kg	16.8 KWh	33.8 KW
rx	45 Kg	2.5 KWh	1.5 KW
	368 Kg	19.3 KWh	40.3 Kw

Pb-AC (EV-5T)	0 Kg	0.0 KWh	0.0 Kw
rx	0 Kg	0.0 KWh	0.0 Kw
	0 Kg	0.0 KWh	0.0 Kw

Pb-AC (GC-6V-200)	438 Kg	9.6 KWh	35.0 KW
rx	102 Kg	8.3 KWh	5.0 KW
	540 Kg	17.9 KWh	40.0 KW

DESIGNS: CITY SCENARIO, AUTOMOBILE SENSITIVITY ANALYSIS

60 mi

Energy?	**11.14**	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	**15.91** KWh	
Power?	40.0 KW	
Driving time?	1.65 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	-20%	(of the Spec.E and Spec.P)

EV:
Designed for 30% COD of the battery.

Na-S (CSPL)	335 Kg	29.5 KWh	a0.0 KW
Ni-Fe (NIF225)	469 Kg	**13.9** KWh	41.3 KW
Ni-Zn (Delco-Remy)	478 Kg	19.9 KWh	35.9 KW
Ib-Ac (EV-5T)	306 Kg	20.6 KWh	**40.0** KW
Ib-Ac (GC-6V-200)	1130 **Kg**	**13.9** KWh	72.3 KW

HV:
Designed for 30% COD of the battery.

Na-S (CSPL)	C Kg	0.0 KWh	**0.0** KW
rx	**0 Kg**	0.0 KWh	**0.0** KW
	0 Kg	0. **0** KWh	**0.0** KW
Ni-Fe (NIF225)	0 Kg	0.0 KWh	0.0 KW
rx	0 Kg	0.0 KWh	0.0 KW
	0 Kg	0.0 KWh	0.0 KW
Ni-Zn (Delco-Remy)	404 Kg	16.3 KWh	38.8 KW
rx	45 Kg	2.5 KWh	1.5 KW
	449 Kg	19.3 KWh	40.3 KW
Pb-Ac (EV-5T)	0 Kg	**0.0** KWh	**0.0** KW
rx	0 Kg	**0.0** KWh	**0.0 Kw**
	0 Kg	**0.0** KWh	**0.0** KW
Pb-Ac (GC-6V-200)	547 **Kg**	**9.6** KWh	35.0 KW
rx	102 Kg	8.3 KWh	5.0 Kw
	649 **Kg**	**17.9** KWh	40.0 KW

DESIGNS: CITY SCENARIO, AUTOMOBILE SENSITIVITY ANALYSIS

60 mi

Energy?	**11.14**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**15.91** KWh	
Power?	**40.0 Kw**	
Driving time?	**1.65 h**	
Veh.Weight?	**1400 Kg**	
Veh.Weight/4 =	**350 Kg**	**(Target battery and rx weight)**
Sensit.Factor?	**-30%**	(of the Spec.E **and** Spec. **P)**

EV:
Designed for 30% DOD of the battery.

Na-S (CSPL)	440 **Kg**	**20.5** KWh	**40.0** KW
Ni-Fe (NIF225)	**536 Kg**	**19.9** KWh	41.3 KW
Ni-Zn (Delco-Remy)	547 **Kg**	**19.9** KWh	**45.9** KW
Pb-Ac (EV-5T)	**922 Kg**	20.6 KWh	40.0 KW
Pb-Ac (GC-W-200)	**1292 Kg**	19.9 KWh	72.3 KW

HV:
Designed fcr 30% DCD of the battery.

Na-S (CSPL)	**3** Kg	3.0 KWh	0.0 KW
rx	**0 Kg**	0.0 KWh	0.0 KW
	0 **Kg**	**0.0** KWh	0.0 KW
Ni-Fe (NIF225)	**0 Kg**	**3.9** KWh	**0.0** KW
rx	0 **Kg**	0.0 KWh	**0.0** KW
	0 **Kg**	0.3 KWh	0.0 KW
Ni-Zn (Delco-Remy)	462 **Kg**	**16.3** KWh	**38.8** KW
rx	**45 Kg**	**2.5** KWh	**1.5** KW
	507 Kg	**19.3** KWh	**40.3** KW
Pb-Ac (EV-5T)	0 Kg	**0.0** KWh	**0.0** KW
rx	0 Kg	**0.0** KWh	**0.0** KW
	0 Kg	**0.0** KWh	**0.0** KW
Pb-Ac (GC-6V-200)	**625 Kg**	**9.6** KWh	**35.0 Kw**
rx	**102 Kg**	a.3 KWh	**5.0 Kw**
	727 Kg	**17.9** KWh	**40.0 Kw**

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE SENSITIVITY ANALYSIS

150 mi

Energy?	28.25	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	40.36	KWh
Power?	40.0	KW
Driving time?	3.11	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	350	Kg (Target battery and rx weight)
Sensit.Factor?	30%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-3 (CSPL)	404 Kg	50.4 KWh	68.3 KW
Ni-Fe (NIF225)	732 Kg	50.4 KWh	104.7 KW
Ni -Zn (Delco-Remy)	746 Kg	50.4 KWh	116.4 KW
Pb-AC (EV-5T)	1213 Kg	50.4 KWh	97.7 KW
Pb-Ac (GC-6V-200)	1764 Kg	50.4 KWh	183.4 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	i95 Kg	2 4.4 KWh	33.0 KW
rx	130 Kg	21.8 KWh	7.0 KW
	325 Kg	46.1 KWh	40.0 KW
Ni-Fe (NIF225)	213 Kg	14.7 KWh	30.5 KW
rx	156 Kg	29.5 KWh	9.5 KW
	369 Kg	44.2 KWh	40.0 KW
Ni-Zn (Delco-Remy)	200 Kg	13.5 KWh	31.2 KW
rx	156 Kg	29.5 KWh	9 .5 KW
	356 Kg	43.1 KWh	40.7 KW
Pb-Ac (EV-ST)	385 Kg	16.0 KWh	31. 0 KW
rx	153 Kg	28.0 KWh	9.0 KW
	538 Kg	44.0 KWh	40.0 KW
Pb-Ac (GC-6V-200)	279 Kg	8.0 KWh	29.0 KW
rx	165 Kg	34.2 KWh	11.0 KW
	444 Kg	42.2 KWh	40.0 KW

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE SENSITIVITY ANALYSIS

1.50 mi

Energy?	**28.25**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**40.36**	KWh
Power?	**40.0**	KW
Driving time?	**3.11**	**h**
Veh.Weight?	**1400**	**Kg**
Veh.Weight/4 =	**350**	**Kg (Target battery and rx weight)**
Sensit.Factor?	**20%**	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**438 Kg**	50.4 KWh	68.3 KW
Ni-Fe (NIF225)	**793 Kg**	50.4 KWh	104.7 KW
Ni-Zn (Delco-Remy)	**808 Kg**	50.4 KWh	116.4 KW
Pb-Ac (EV-5T)	**1314 Kg**	50.4 KWh	97.7 KW
Pb-Ac (GC-6V-200)	**1911 Kg**	50.4 KWh	183.4 KW

HV:
Designed far 80% DOD of the battery.

Na-S (CSPL)	**212 Kg**	**24.1** KWh	**33.0** KW
rx	**130 Kg**	21.8 KWh	7.0 KW
	342 Kg	**46.1** KWh	**40.0** KW
Ni-Fe (NIF225)	231 Kg	14.7 KWh	30.5 KW
rx	156 Kg	29.5 KWh	9.5 KW
	337 Kg	44.2 KWh	**40.0** KW
Ni-Zn (Delco-Remy)	217 **Kg**	**13.5** KWh	**31.2** KW
rx	**156 Kg**	**29.5** KWh	**9.5** KW
	373 Kg	**43.1** KWh	**40.7** KW
Pb-Ac (EV-5T)	**417 Kg**	**16.0** KWh	**31.0** KW
rx	**153 Kg**	**28.0** KWh	**9.0** KW
	570 Kg	**44.0** KWh	**40.0** KW
Pb-Ac (GC-6V-200)	**302 Kg**	**8.0** KWh	**29.0** KW
rx	**165 Kg**	**34.2** KWh	**11.0** KW
	467 Kg	**42.2** KWh	**40.0** KW

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE
SENSITIVITY ANALYSIS

150 mi

Energy?	**28.25**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**40.36** KWh	
Power?	**40.0 Kw**	
Driving time?	**3.11 h**	
Veh.Weight?	**1400 Kg**	
Veh.Weight/4 =	350 Kg	**(Target battery and rx veight)**
Sensit.Factor?	0%	(of the Spec.E **and** Spec.P)

EV:
Designed for 30% DOD of the battery.

Na-S (CSPL)	**525 Kg**	50.4 KWh	**63.3** KW
Ni-Fe (NIF225)	**952 Kg**	**50.4** KWh	**104.7** KW
Ni-Zn (Delco-Remy)	970 **Kg**	**50.4** KWh	**116.4 KW**
Pb-Ac (EV-5T)	**1576 Kg**	**50.4** KWh	**97.7** KW
Pb-Ac (GC-6V-200)	**2293 Kg**	**50.4** KWh	**133.4** KW

HV:
Designed for 80% **DCD of the** battery.

Na-S (CSPL)	**254 Kg**	**24.4** KWh	**33.0 Kw**
rx	**130** Kg	**21. 3** KWh	**7.0 Kw**
	334 Kg	**46.1** KWh	40.0 KW
Ni-Fe (NIF225)	277 Kg	**14.7** KWh	**30.5** KW
rx	**156 Kg**	**23.5** KWh	**9. 5 Kw**
	-133 Kg	44.**2** KWh	4**0** . 0 KW
Ni-Zn (Delco-Remy)	**250 Kg**	**13.5** KWh	**31.2 Kw**
rx	**156 Kg**	**29.5** KWh	**9 . 5** KW
	416 Kg	**43** .1 KWh	**40.7 Kw**
Pb-AC (EV-5T)	**500 Kg**	**16.0** KWh	**31.0 Kw**
rx	**153 Kg**	**28.0** KWh	**9.0 Kw**
	653 Kg	**44.0** KWh	**40.0 Kw**
Pb-Ac (GC-6V-200)	**363 Kg**	**8.0** KWh	**29.0 Kw**
rx	**165 Kg**	**34.2** KWh	**11.0 KW**
	528 Kg	**42.2** KWh	**40.0 Kw**

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE SENSITIVITY ANALYSIS

150 mi

Energy?	28.25	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	40.36 KWh	
Power?	40.0 KW	
Driving time?	3.11 **h**	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery **and** rx weight)
Sensit.Factor?	-20%	(of the 3pec.E and Spec.P)

EV:
Designed *for* 80% DOD of the battery.

Na-S (CSPL)	657 Kg	50.4 KWh	**68.3** KW
Ni-Fe (NIF225)	1190 Kg	50.4 KWh	104.7 KW
Ni- *Zn* (Delco-Remy;	1213 Kg	50.4 KWh	116.4 KW
Pb-Ac (EV-5T)	1971 Kg	50.4 KWh	**97.7** KW
Pb-Ac (GC-6V-200)	2866 **Kg**	50.4 KWh	183.4 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	317 Kg	24.4 KWh	33.0 KW
rx	130 Kg	21.8 KWh	**7.0** KW
	447 Kg	46.1 KWh	43.0 KW
Ni-Fe (NIF225)	347 Kg	14.7 KWh	30.5 KW
rx	156 Kg	29.5 KWh	9.5 KW
	503 Kg	44.2 KWh	40.0 KW
Ni-Zn (Delco-Remy)	325 Kg	13.5 KWh	31.2 KW
rx	156 Kg	29.5 KWh	9.5 KW
	481 Kg	43.1 KWh	40.7 KW
Pb-Ac (EV-ST)	625 **Kg**	**16.0** KWh	31.0 KW
rx	153 Kg	28.0 KWh	**9.0** KW
	778 **Kg**	44.0 KWh	40.0 KW
Pb-Ac (GC-6V-200)	453 **Kg**	8.0 KWh	**29.0** KW
rx	165 **Kg**	34.2 KWh	**11.0** KW
	618 **Kg**	42.2 KWh	40.0 KW

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE SENSITIVITY ANALYSIS

150 mi

Energy?	**28.25**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**40.36**	KWh
Power?	**40.0**	xw
Driving time?	**3.11**	**h**
Veh.Weight?	**1400**	**Kg**
Veh.Weight/4 =	**350**	**Kg (Target battery and rx weight)**
Sensit.Factor?	-30%	**(of** the Spec.E **and** Spec.P)

EV:
Designed for 80% DCD of the battery.

Na-S (CSPL)	**751 Kg**	**50.4** KWh	**68.3 XW**
Ni-Fe (NIF225)	**1360 Kg**	**50.4** KWh	**104.7** KW
Ni-Zn **(Delco-Remy)**	**1386 Kg**	**50.4** KWh	116.4 KW
Pb-Ac (EV-5T)	**2252 Kg**	**50.4** KWh	**97.7** KW
Pb-Ac (GC-5V-200)	**3276 Kg**	**50.4** KWh	**183.1** KW

HV:
Designed for 80% DOD **cf** the battery.

Na-S (CSPL)	363 Kg	24.4 KWh	33.0 KW
rx	130 Kg	21.8 KWh	7.0 KW
	493 Kg	46.1 KWh	40.0 KW
Ni-Fe (NIF225)	*396 Kg*	**14.7** KWh	**30.5** KW
rx	**156 Kg**	**29.5** KWh	**9.5** KW
	552 Kg	**44.2** KWh	**40.0** KW
Ni-Zn (Delco-Remy)	**371 Kg**	**13.5** KWh	**31.2 xw**
rx	**156 Kg**	**29.5** KWh	**9.5** KW
	527 Kg	**43.1** KWh	**40.7 xw**
Pb-Ac (EV-5T)	**714 Kg**	**15.0** KWh	**31.0 XW**
rx	**153 Kg**	**28.0** KWh	**9.0 xw**
	867 Kg	**44.0** KWh	**40.0 xw**
Pb-Ac (GC-6V-200)	**518 Kg**	**8.0** KWh	**29.0 xw**
rx	**165 Kg**	**34.2** KWh	**11.0** KW
	683 Kg	**42.2** KWh	**40.0 xw**

DESIGNS: LARGE METROPOLIS "B", AUTOMOBILE
SENSITIVITY ANALYSIS

200 mi

Energy? 37.66 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 53.80 KWh

Power? 40.0 KW

Driving time? 4.14 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 30% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	539 Kg	67.3 KWh	91.1 KW
Ni-Fe (NIF225)	976 Kg	67.2 KWh	139.6 KW
Ni-Zn (Delco-Remy)	995 Kg	67.3 KWh	155.2 KW
Pb-AC (EV-5T)	1617 Kg	67.2 KWh	130.3 KW
Pb-AC (GC-6V-200)	2351 Kg	67.2 KWh	244.5 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	186 Kg	23.3 KWh	31.5 KW
rx	150 Kg	35.2 KWh	8.5 KW
	336 Kg	58.5 KWh	40.0 KW
Ni-Fe (NIF225)	206 Kg	14.2 KWh	29.5 KW
rx	162 Kg	43.5 KWh	10.5 KW
	368 Kg	57.7 KWh	40.0 KW
Ni-Zn (Delco-Remy)	191 Kg	12.9 KWh	29.8 KW
rx	162 Kg	43.5 KWh	10.5 KW
	353 Kg	56.4 KWh	40.3 KW
Pb-Ac (EV-5T)	373 Kg	15.5 KWh	30.0 KW
rx	159 Kg	41.4 KWh	10.0 KW
	532 Kg	56.9 KWh	40.0 KW
Pb-Ac (GC-6V-200)	274 Kg	7.8 KWh	28.5 KW
rx	168 Kg	47.6 KWh	11.5 KW
	442 Kg	55.4 KWh	40.0 KW

DESIGNS: LARGE METROPOLIS "B", AUTOMOBILE SENSITIVITY ANALYSIS

200 mi

Energy?	**37.66**	(@ n=0.25)
Transm.Eff?	**0.70**	
Total Energy =	**53.80**	KWh
Power?	**40.0**	KW
Driving time?	**4.14**	**h**
Veh.Weight?	**1400**	**Kg**
Veh.Weight/4 =	350	**Kg (Target battery and rx weight)**
Sensit.Factor?	**20%**	(of the Spec.E and Spec.P)

EV :
Designed for 80% DOD of the **battery.**

Na-S (CSPL)	**584 Kg**	**67.3** KWh	**91.1** KW
Ni-Fe (NIF225)	1057 Kg	**67.3** KWh	**139.6** KW
Ni-Zn (Delco-Remy)	**1078 Kg**	**67.2** KWh	**i55.2** KW
Pb-Ac (EV-5T)	**1751 Kg**	**67.3** KWh	**130.3** KW
Pb-Ac (GC-6V-200)	**2547** Kg	**67.2** KWh	**244.5** KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**202** Kg	**23.3** KWh	31.5 KW
rx	150 Kg	**35.2** KWh	**8.5** KW
	352 Kg	**58.5** KWh	**40.0** KW
Ni-Fe (NIF225)	**223** Kg	14.**2** KWh	29.5 KW
rx	**162** Kg	43 . 5 KWh	**10.5** KW
	385 Kg	**57.7** KWh	**40.0** KW
Ni-Zn (Delco-Remy)	**207** Kg	12.9 KWh	**29.a** KW
rx	**162 Kg**	**43.5** KWh	10.5 KW
	369 Kg	**56.4** KWh	**40.3** KW
Pb-Ac (EV-5T)	**404 Kg**	**15.5** KWh	**30.0** KW
rx	159 Kg	41.4 KWh	**10.0** KW
	563 Kg	**56.9** KWh	**40.0** KW
Pb-Ac (GC-6V-200)	**297 Kg**	**7.8** KWh	**28.5** KW
rx	**168 Kg**	**47.6** KWh	**11.5** KW
	465 Kg	**55.4** KWh	**40.0** KW

DESIGNS: LARGE **METROPOLIS "B", AUTOMOBILE**
SENSITIVITY ANALYSIS

200 mi

Energy? **37.66** (@ n=0.25)
Transm.Eff? **0.70**
Total-Energy = 53.80 KWh

Power? 40.0 Kw

Driving time? 4.14 h
Veh.Weight? **1400 Kg**
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec . E and Spec . P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	701 Kg	67.3 KWh	91.1 KW
Ni-Fe (NIF225)	1269 Kg	67.2 KWh	**139.5** KW
Ni-**Zn** (Delco-Remy)	1293 Kg	67.3 KWh	155.2 KW
Pb-AC (EV-5T;	2102 Kg	67.2 KWh	130.3 KW
Pb-AC (GC-6V-200)	3057 Kg	67.2 KWh	244.5 KW

HV:
Designed for 83% **DOD of** the battery.

Na-S (CSPL)	242 Kg	23.3 KWh	31.5 KW
rx	150 Kg	35.2 KWh	3.5 KW
	392 Kg	53.5 KWh	40.0 KW

Ni-Fe (NIF225)	268 Kg	14.2 KWh	29.5 KW
rx	162 Kg	43.5 KWh	10.5 KW
	430 Kg	57.7 KWh	40.0 KW

Ni-Zn (Delcs-Remy)	243 Kg	**12.9** KWh	**29.3** KW
rx	162 Kg	43.5 KWh	13.5 KW
	410 Kg	56.4 KWh	40.3 KW

Pb-AC (EV-5T)	484 Kg	**15.5** KWh	30.0 KW
rx	159 Kg	41.4 KWh	10.0 Kw
	643 Kg	56.9 KWh	40.0 Kw

Pb-Ac (GC-6V-200)	356 **Kg**	7.8 KWh	28.5 KW
rx	168 **Kg**	47.6 KWh	**11.5 KW**
	524 **Kg**	55.4 KWh	40.0 Kw

DESIGNS: LARGE METROPOLIS "B", AUTOMOBILE
SENSITIVITY ANALYSIS

200 mi

Energy?	37.66	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	53.80 KWh	
Power?	40.0 KW	
Driving time?	4.14 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	-20%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	876 Kg	67.3 KWh	91.1 KW
Ni-Fe (NIF225)	1586 Kg	67.3 KWh	139.6 KW
Ni-Zn (Delco-Remy)	1617 Kg	67.2 KWh	155.2 KW
Pb-Ac (EV-5T)	2627 Kg	67.2 KWh	130.3 KW
Pb-Ac (GC-6V-200)	3321 Kg	67.3 KWh	244.5 KW

HV:
Designed for 80% DOD of the batter:/.

Na-S (CSPL)	303 Kg	23.3 KWh	31.5 KW
rx	150 Kg	35.2 KWh	3.5 KW
	453 Kg	58.5 KWh	40.0 KW
Ni-Fe (NIF225)	335 Kg	14.2 KWh	29.5 KW
rx	162 Kg	43.5 KWh	10.5 KW
	497 Kg	57.7 KWh	40.0 KW
Ni-Zn (Delco-Remy)	310 Kg	12.9 KWh	29.2 KW
rx	162 Kg	43.5 KWh	10.5 KW
	472 Kg	56.4 KWh	40.3 KW
Pb-Ac (EV-5T)	605 Kg	15.5 KWh	30.0 KW
rx	159 Kg	41.4 KWh	10.0 KW
	764 Kg	56.9 KWh	40.0 KW
Pb-Ac (GC-6V-200)	445 Kg	7.8 KWh	28.5 KW
rx	168 Kg	47.6 KWh	11.5 KW
	613 Kg	55.4 KWh	40.0 KW

DESIGNS: LARGE METROPOLIS "B", AUTOMOBILE
SENSITIVITY ANALYSIS

200 mi

Energy? 37.66 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 53.80 KWh

Power? 40.0 KW

Driving time? 4.14 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? -30% (of the Spec.E and Spec. P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1001 Kg	67.3 KWh	91.1 KW
Ni-Fe (NIF225)	1313 Kg	67.2 KWh	139.6 KW
Ni-Zn (Delco-Remy)	1848 Kg	67.2 KWh	155.2 KW
Pb-Ac (ZV-5T)	3002 Kg	67.3 KWh	130.3 KW
Pb-Ac (GC-6V-200)	1367 Kg	67.2 KWh	244.5 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	346 Kg	23.3 KWh	31.5 KW
rx	150 Kg	35.2 KWh	8.5 KW
	496 Kg	58.5 KWh	40.0 KW
Ni-Fe (NiF225)	333 Kg	14.2 KWh	29.5 KW
rx	162 Kg	43.5 KWh	10.5 KW
	545 Kg	57.7 KWh	40.0 KW
Ni-Zn (Delco-Remy)	355 Kg	12.9 KWh	29.3 KW
rx	162 Kg	-13.5 KWh	10.5 KW
	517 Kg	56.4 KWh	40.3 KW
Pb-Ac (EV-5T)	692 Kg	15.5 KWh	30.0 KW
rx	159 Kg	41.4 KWh	10.0 KW
	851 Kg	56.9 KWh	40.0 KW
Pb-Ac (GC-6V-200)	509 Kg	7.8 KWh	28.5 KW
rx	168 Kg	47.6 KWh	11.5 KW
	677 Kg	55.4 KWh	40.0 KW

DESIGNS: INTERCITY SCENARIO, AUTOMOBILE SENSITIVITY ANALYSIS

480 mi

Energy? 88.53 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 126.47 KWh

Power? 40.0 Kw

Driving time? 8.00 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 30% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1267 Kg	158.1 KWh	214.1 KW
Ni-Fe (NIF225)	2294 Kg	158.1 KWh	328.1 KW
Ni-Zn (Delco-Remy)	2339 Kg	158.1 KWh	364.8 KW
Pb-Ac (EV-5T)	3800 Kg	158.1 KWh	306.3 KW
Pb-Ac (GC-6V-200)	5528 Kg	158.1 KWh	574.9 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	154 Kg	19.2 KWh	26.0 KW
rx	133 Kg	112.0 KWh	14.0 Kw
	337 Kg	131.2 KWh	40.0 KW
Ni-Fe (NIF225)	190 Kg	13.1 KWh	27.2 KW
rx	186 Kg	116.0 KWh	13.5 KW
	376 Kg	129.1 KWh	41.7 KW
Ni-Zn (Delco-Remy)	160 Kg	10.8 KWh	25.0 KW
rx	189 Kg	120.0 KWh	15.0 Kw
	349 Kg	130.8 KWh	40.0 KW
Pb-Ac (EV-5T)	316 Kg	13.2 KWh	25.5 KW
rx	186 Kg	116.0 KWh	14.5 KW
	502 Kg	129.2 KWh	40.0 Kw
Pb-Ac (GC-6V-200)	236 Kg	6.7 KWh	24.5 KW
rx	192 Kg	124.0 KWh	15.5 Kw
	428 Kg	130.7 KWh	40.0 Kw

DESIGNS: INTERCITY SCENARIO, AUTOMOBILE
SENSITIVITY ANALYSIS

480 mi

Energy?	88.53	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	126.47 KWh	
Power?	40.0 Kw	
Driving time?	8.00 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	20%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1372 Kg	158.1 KWh	214.1 KW
Ni-Fe (NIF225)	2436 Kg	158.1 KWh	328.1 KW
Ni-Zn (Delco-Remy)	2533 Kg	158.1 KWh	364.8 KW
Pb-Ac (XV-5T)	4117 Kg	158.1 KWh	306.3 KW
PS-AC (GC-6V-200)	5988 Kg	158.1 KWh	574.9 KW

HV:
Designed for 80% *C O D o f* the *b a t t e r y .*

Na-S (CSPL)	167 Kg	19.2 KWh	26.0 KW
rx	133 Kg	112.0 KWh	14.0 KW
	350 Kg	131.2 KWh	40.0 KW
Ni-Fe (NIF225)	206 Kg	13.1 KWh	27.2 KW
rx	186 Kg	116, 0 KWh	14.5 KW
	392 Kg	129.i KWh	41.7 KW
Ni-Zn (Delco-Remy)	174 Kg	19.8 KWh	25.0 KW
rx	189 Kg	120.0 KWh	15.0 KW
	363 Kg	130.8 KWh	40.0 Kw
Pb-AC (EV-ST)	343 Kg	13.2 KWh	25.5 KW
rx	186 Kg	116.0 KWh	14.5 KW
	529 Kg	129.2 KWh	40.0 KW
Pb-AC (GC-6V-200)	255 Kg	6.7 KWh	24.5 KW
rx	192 Kg	124.0 KWh	15.5 Kw
	447 Kg	130.7 KWh	40.0 Kw

DESIGNS: INTERCITY SCENARIO, AUTOMOBILE SENSITIVITY ANALYSIS

480 mi

Energy? 88.53 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 126.47 KWh

Power? 40.0 Kw

Driving time? 8.00 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = **350 Kg (Target battery and rx weight)**

Sensit.Factor? **0% (of the Spec.E and Spec.P)**

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**1647 Kg**	**158.1** KWh	**214.1** KW
Ni-Fe (NIF225)	**2983 Kg**	**158.1** KWh	**328.1** KW
Ni-Zn (Delco-Remy)	**3040 Kg**	**158.1** KWh	**364.8** KW
Pb-Ac (EV-5T)	**4940 Kg**	**158.1** KWh	**306.3** KW
Pb-AC (GC-6V-200)	**7186 Kg**	**158.1** KWh	**574.9 Kw**

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**200 Kg**	**19.2** KWh	**25.0** KW
rx	**183 Kg**	**112.0** KWh	14.0 KW
	383 Kg	**131.2** KWh	**40.0** KW
Ni-Fe (NIF225)	247 **Kg**	**13.1** KWh	27.2 KW
rx	**136 Kg**	**115.0** KWh	**14.5** KW
	433 Kg	**129.i** KWh	**41.7** KW
Ni-Zn (Delco-Remy)	**208 Kg**	**10.8** KWh	25.0 KW
rx	**189 Kg**	**120.0** KWh	**15.0 KW**
	397 Kg	**130.8** KWh	40.0 KW
Pb-AC (EV-5T)	**411 Kg**	**13.2** KWh	**25.5 KW**
rx	**186 Kg**	**116.0** KWh	**14.5 KW**
	597 Kg	**129.2** KWh	**40.0 Kw**
Pb-Ac (GC-6V-200)	**306 Kg**	**6.7** KWh	**24.5 KW**
rx	**192 Kg**	**124.0** KWh	**15.5 KW**
	498 Kg	**130.7** KWh	**40.0 Kw**

DESIGNS: INTERCITY SCENARIO, AUTOMOBILE
SENSITIVITY ANALYSIS

480 mi

Energy?	88.53	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	126.47	KWh
Power?	40.0	Kw
Driving time?	8.00	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	350	Kg (Target battery and rx weight)
Sensit.Factor?	-20%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	2058 Kg	i58.i KWh	214.i KW
Ni-Fe (NIF225)	3729 Kg	158.1 KWh	328.1 KW
Ni- Zn (Delco-Remy)	3800 Kg	158.1 KWh	364.8 KW
Db-Ac (EV-5T)	6175 Kg	158.1 KWh	306.3 KW
Pb-Ac (GC-6V-200)	8982 Kg	i58.1 KWh	574.9 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	250 Kg	19.2 KWh	26.0 KW
rx	183 Kg	112.0 KWh	14.0 KW
	433 Kg	131.2 KWh	40.0 KW
Ni-Fe (NIF225)	309 Kg	13.1 KWh	27.2 KW
rx	136 Kg	116.0 KWh	14.5 KW
	495 Kg	129.1 KWh	41.7 KW
Ni-Zn (Delco-Remy)	260 Kg	10.8 KWh	25.0 KW
rx	189 Kg	120.0 KWh	15.0 KW
	449 Kg	130.8 KWh	40.0 KW
Pb-Ac (EV-ST)	514 Kg	13.2 KWh	25.5 KW
rx	186 Kg	116.0 KWh	14.5 KW
	700 Kg	129.2 KWh	40.0 KW
Pb-Ac (GC-6V-200)	383 Kg	6.7 KWh	24.5 KW
rx	192 Kg	124.0 KWh	15.5 KW
	575 Kg	130.7 KWh	40.0 Kw

DESIGNS: INTERCITY SCENARIO, AUTOMOBILE
SENSITIVITY ANALYSIS

480 mi

Energy? **88.53** (@ n=0.25)
Transm.Eff? **0.70**
Total Energy = **126.47** KWh

Power? **40.0** KW

Driving time? **8.00** **h**
Veh.Weight? **1400** **Kg**
Veh.Weight/4 = **350** Xg (Target battery and **rx** weight)

Sensit.Factor? -30% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**2353** Kg	**158.1** KWh	214.1 KW
Ni-Fe (NIF225)	**4261** **Kg**	158.1 KWh	**328.1** KW
Ni-Zn (Delco-Remy)	4343 **Kg**	158.1 KWh	**364.8** KW
Pb-Ac (EV-5T)	**7058** Kg	**158.1** KWh	**306.3** KW
Pb-Ac (GC-6V-200)	i0266 Kg	**158.1** KWh	**574.9** KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	286 Kg	19.2 KWh	26.0 KW
rx	183 Kg	112.0 KWh	14.0 KW
	469 Kg	**131.2** KWh	40.0 KW
Ni-Fe (NIF225)	**353** Kg	13.1 KWh	27.2 KW
rx	**136** Kg	116.0 KWh	14.5 KW
	539 Kg	129.1 KWh	41.7 KW
Ni-Zn (Delco-Remy)	**298** **Kg**	**10.8** KWh	**25.0** KW
rx	**189** **Kg**	**120.0** KWh	15.0 KW
	487 Kg	130.8 KWh	40.0 KW
Pb-Ac (EV-5T)	**588** **Kg**	**13.2** KWh	**25.5** KW
rx	**186** Kg	116.0 KWh	14.5 Kw
	774 **Kg**	**129.2** KWh	**40.0** KW
Pb-Ac (GC-6V-200)	**438** **Kg**	**6.7** KWh	**24.5** KW
rx	**192** **Kg**	**124.0** KWh	**15.5** **Kw**
	630 **Kg**	**130.7** KWh	**40.0** **Kw**

DESIGNS: LOCAL BUS
SENSITIVITY ANALYSIS

120 mi

Energy? 180.43 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 257.76 KWh

Power? 175.0 KW

Driving time? 13.08 h
Veh.Weight? 13605 Kg
Veh.Weight/4 = 3401 Kg (Target battery and rx weight)

Sensit.Factor? 30% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	2582 Kg	322.2 KWh	436.3 KW
Ni-Fe (NIF225)	4676 Kg	322.2 KWh	668.7 KW
Ni-Zn (Delco-Remy)	4766 Kg	322.2 KWh	743.5 KW
Pb-AC (EV-5T)	7745 Kg	322.2 KWh	624.3 KW
PS-AC (GC-6V-200)	11266 Kg	322.2 KWh	1171.6 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	962 Kg	120.0 KWh	162.5 KW
rx	174 Kg	153.5 KWh	12.5 KW
	1136 Kg	233.5 KWh	175.0 KW
Ni-Fe (NIF225)	1119 Kg	77.1 KWh	160.0 KW
rx	189 Kg	196.2 KWh	15.0 KW
	1308 Kg	273.3 KWh	175.0 KW
Ni-Zn (Delco-Remy)	1022 Kg	69.1 KWh	159.5 KW
rx	192 Kg	202.7 KWh	15.5 KW
	1214 Kg	271.9 KWh	175.0 KW
Pb-AC (EV-5T)	1985 Kg	82.6 KWh	160.0 KW
rx	189 Kg	196.2 KWh	15.0 KW
	2174 Kg	278.8 KWh	175.0 KW
Pb-AC (GC-6V-200)	1547 Kg	44.2 KWh	160.9 KW
rx	201 Kg	222.4 KWh	17.0 KW
	1748 Kg	266.6 KWh	177.9 KW

DESIGNS: LOCAL BUS
SENSITIVITY ANALYSIS

120 mi

Energy?	180.43	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy =	257.76	KWh
Power?	175.0	KW
Driving time?	13.08	h
Veh.Weight?	13605	Kg
Veh.Weight/4 =	3401	Kg (Target battery and rx weight)

Sensit.Factor? 20% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	2797 Kg	322.2 KWh	436.3 KW
Ni-Fe (NIF225)	5066 Kg	322.2 KWh	668.7 KW
Ni-Zn **(Delco-Remy)**	5163 Kg	322.2 KWh	743.5 KW
Pb-Ac (EV-5T)	8391 Kg	322.2 KWh	624.3 KW
Pb-AC (GC-6V-200)	12204 Kg	322.2 KWh	1171.6 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1042 Kg	120.0 KWh	162.5 KW
rx	174 **Kg**	163.5 KWh	12.5 KW
	1216 Kg	283.5 KWh	175.0 KW
Ni-Fe (NIF225)	1212 Kg	77.1 KWh	150.0 KW
rx	139 Kg	196.2 KWh	15.0 KW
	1401 Kg	273.3 KWh	175.0 KW
Ni-Zn (Delco-Remy)	1108 Kg	69.1 KWh	159.5 KW
rx	192 Kg	202.7 KWh	15.5 KW
	1300 Kg	271.9 KWh	175.0 Kw
Pb-Ac (EV-5T)	2151 Kg	82.6 KWh	160.0 KW
rx	189 Kg	196.2 KWh	15.0 KW
	2340 Kg	278.8 KWh	175.0 KW
Pb-AC (GC-6V-200)	1676 Kg	44.2 KWh	160.9 KW
rx	201 Kg	222.4 KWh	17.0 Kw
	1877 Kg	266.6 KWh	177.9 Kw

DESIGNS: LOCAL BUS
SENSITIVITY ANALYSIS

120 mi

Energy? **180.43** (@ n=0.25)
Transm.Eff? **0.70**
Total **Energy** = **257.76** KWh

Power? **175.0** KW

Driving time? **13.08** **h**
Veh .Weight? **13605** **Kg**
Veh.Weight/4 = 3401 **Kg** **(Target battery and rx weight)**

Sensit.Factor? **0%** (of the Spec.E **and** Spec.P)

EV:
Designed for 80% COD of the battery.

Na-S (CSPL)	**3356** **Kg**	**322.2** KWh	**436.3** KW
Ni-Fe (NIF225)	**6079** **Kg**	**322.2** KWh	668.7 KW
Ni-Zn (Delco-Remy)	**6196** **Kg**	**322.2** KWh	743.5 KW
Pb-AC (EV-5T)	**10069** **Kg**	**322.2** KWh	624.3 KW
Pb-Ac (GC-6V-200)	14645 **Kg**	**322.2** KWh	**1171.6** KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**1250** **Kg**	**120.0** KWh	**162.5** KW
rx	**174** **Kg**	**153.5** KWh	**12.5** KW
	1424 **Kg**	**283.5** KWh	**175.0** KW

Ni-Fe (NIF225)	1455 **Kg**	**77.1** KWh	**160.0** KW
rx	**133** **Kg**	**196.2** KWh	**15.0** KW
	1644 **Kg**	**273.3** KWh	175.0 KW

Ni-Zn (Delco-Remy)	**1329** **Kg**	**69.1** KWh	**159.5** KW
rx	**192** **Kg**	**202.7** KWh	**15.5** KW
	1521 **Kg**	**271.9** KWh	**175.0** KW

Pb-Ac (EV-5T)	**2581** **Kg**	**82.6** KWh	**160.0** KW
rx	**139** **Kg**	**196.2** KWh	**15.0** KW
	2770 **Kg**	**278.8** KWh	**175.0** KW

Pb-Ac (GC-6V-200)	**2011** **Kg**	**44.2** KWh	**160.9** KW
rx	**201** **Kg**	**222.4** KWh	**17.0** KW
	2212 **Kg**	**266.6** KWh	**177.9** KW

DESIGNS: LOCAL BUS
SENSITIVITY ANALYSIS

120 mi

Energy? **180.43** (@ n=0.25)
Transm.Eff? **0.70**
Totai Energy = **257.76** KWh

Power? **175.0** KW

Driving time? **13.08** **h**
Veh.Weight? **13605** **Kg**
Veh.Weight/4 = **3401** **Kg** **(Target battery and rx weight)**

Sensit.Factor? -20% **(of the** Spec.E **and** Spec.P)

EV:
Designed for **808 DOD of the battery.**

Na-S (CSPL)	**4195**	**Kg**	**322.2**	KWh	**436.3**	KW
Ni-Fe (NIF225)	**7599**	**Kg**	**322.2**	KWh	**668.7**	KW
Ni-Zn (Delco-Remy)	**7745**	**Kg**	**322.2**	KWh	**743.5**	KW
Pb-AC (EV-5T)	**12586**	**Kg**	**322 . 2**	KWh	**624.3**	KW
Pb-Ac (GC-6V-200)	**12307**	**Kg**	**322. 2**	KWh	**1171.6**	KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**1563**	**Kg**	**120.0**	KWh	**162.5**	KW
rx	**174**	**Kg**	**163 . 5**	KWh	**i2.5**	KW
	1737	Kg	**2 83.5**	KWh	**175.0**	KW
Ni-Fe (NIF225)	1818	**Kg**	77.1	KWh	160.0	KW
rx	**139**	**Kg**	**196 . 2**	KWh	**15.0**	KW
	2007	**Kg**	**273.3**	KWh	**175.0**	KW
Ni-Zn (Delco-Remy)	**1561**	**Kg**	**69.1**	KWh	**159.5**	KW
rx	**192**	**Kg**	**202.7**	KWh	**15.5**	**Kw**
	1853	**Kg**	**271.9**	KWh	**175.0**	KW
Pb-Ac (EV-5T)	**3226**	**Kg**	**82.5**	KWh	**160.0**	KW
rx	**189**	**Kg**	**i96.2**	KWh	**15.0**	KW
	3415	**Kg**	**278.8**	KWh	**175.0**	KW
Pb-Ac (GC-6V-200)	**2514**	**Kg**	**44.2**	KWh	**160.9**	**KW**
rx	**201**	**Kg**	**222.4**	KWh	**17.0**	**Kw**
	2715	**Kg**	**266.6**	KWh	**177.9**	**Kw**

DESIGNS: LOCAL BUS
SENSITIVITY ANALYSIS

120 mi

Energy? **180.43** (@ n=0.25)
Transm.Eff? **0.70**
Totai Energy = **257.** 76 KWh

Power? **175.0 Kw**

Driving time? 13.08 **h**
Veh.Weight? **13605 Kg**
Veh.Weight/4 = 3401 **Kg** (Target **battery and rx weight)**

Sensit.Factor? -30% (of **the** Spec.E and Spec.P)

EV:
Designed for **80%** DOD of **the** battery.

Na-S (CSPL)	**4795 Kg**	**322.2** KWh	**436. 3** KW
Ni-Fe (NIF225)	**8685 Kg**	**322.2** KWh	**668.7** KW
Ni-Zn (Delco-Remy)	**8852 Kg**	**322.2** KWh	**743.5** KW
Pb-Ac (EV-5T)	**14384 Kg**	**322.2** KWh	**624.3** KW
Pb-Ac (GC-6V-200)	**20922 Kg**	**322.2** KWh	**117'1.6** KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**1786 Kg**	**120.0** KWh	**162.5** KW
rx	**171 Kg**	**153. 5** KWh	**12.5** KW
	1960 Kg	**283.5** KWh	175.0 KW

Ni-Fe (NIF225)	**2078 Kg**	77.1 KWh	**160.0** KW
rx	**189 Kg**	196.2 KWh	**15. 0** KW
	2267 Kg	**2 73.3** KWh	**175.0** Kii

Ni-Zn (Delco-Remy)	**1899 Kg**	**69.1** KWh	**159.5** KW
rx	**192 Kg**	**202.7** KWh	**15.5 Kw**
	2091 Kg	**271.9** KWh	**175.0** KW

Pb-Ac (EV-5T)	**3687 Kg**	**82.6** KWh	**160.0 KW**
rx	**189 Kg**	**196.2** KWh	**15.0** KW
	3876 Kg	**278.8** KWh	**175.0** KW

Pb-Ac (GC-6V-200)	**2873 Kg**	**44.2** KWh	**160.9 KW**
rx	**201 Kg**	**222.4** KWh	**17.0 Kw**
	3074 Kg	**266.6** KWh	**177.9 Kw**

DESIGNS: INTERCITY BUS
SENSITIVITY ANALYSIS

480 mi

Energy? **764.05** (@ n=0.25)
Transm.Eff? **0.70**
Total Energy = 1091.50 KWh

Power? **300.0** KW

Driving time? **8.00 h**
Veh.Weight? **13605 Kg**
Veh.Weight/4 = **3401 Kg** **(Target battery and rx weight)**

Sensit.Factor? **30%** **(of the** Spec.E **and** Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	10932 Kg	**1364.4** KWh	**1847.6** KW
Ni-Fe (NIF225)	**19802 Kg**	**1364.4** KWh	**2831.7** KW
Ni-Zn (Delco-Remy)	**20183 Kg**	**1364.4** KWh	**3148.6** KW
Pb-AC (EV-5T)	**32797 Kg**	**1364.4** KWh	**2643.5** KW
Pb-Ac (GC-6V-200)	**47705** Kg	**1364.4** KWh	4961.4 KW

HV:
Designed for **80% DOD** of the battery.

Na-S (CSPL)	1036 Kg	**129.2** KWh	**175.0** KW
rx	**842 Kg**	1000.0 KWh	125.0 KW
	1378 Kg	**1129.2** KWh	**300.0** KW

Ni-Fe (NIF225)	**1139 Kg**	**81.9** KWh	**170.0** KW
rx	**872 Kg**	**1040.0** KWh	**130.0** KW
	2061 Kg	**1121.9** KWh	**300.0** KW

Xi-Zn (Delco-Remy)	1090 **Kg**	**73.7** KWh	**170.0** KW
rx	**872** Kg	1040.0 KWh	130.0 KW
	1962 Kg	1113.7 KWh	**300.0** KW

Pb-Ac (XV-5T)	**2109 Kg**	**87.7** KWh	**170.0** KW
rx	**872 Kg**	**1040.0** KWh	**130.0** KW
	2981 Kg	**1127.7** KWh	**300.0** KW

Pb-Ac (GC-6V-200)	**1587 Kg**	**45.4** KWh	**165.0** KW
rx	**902 Kg**	**1080.0** KWh	**135.0** KW
	2489 Kg	**1125.4** KWh	**300.0** KW

DESIGNS: INTERCITY BUS
SENSITIVITY ANALYSIS

480 mi

Energy? 764.05 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 1091.50 KWh

Power? 300.0 KW

Drivins time? 8.00 h
Veh.Weight? 13605 Kg
Veh.Weight/4 = 3401 Kg (Target battery and rx weight)

Sensit.Factor? 20% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	11844 Kg	1364.4 KWh	1347.6 KW
Ni-Fe (NIF225 j	21452 Kg	1364.4 KWh	2831.7 KW
Ni-Zn (Delco-Remy)	21365 Kg	1364.4 KWh	3148.6 KW
Pb-Ac (EV-5T)	35531 Kg	1364.4 KWh	2643.5 KW
Pb-Ac (GC-6V-200)	51681 Xg	1364.4 KWh	4961.4 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1122 Kg	129. 2 KWh	175.0 KW
rx	842 Kg	1000.0 KWh	125.0 KW
	1964 Kg	1129.2 KWh	300, 0 KW
Ni-Fe (NIF225)	1238 Kg	81. 9 KWh	170.0 KW
rx	372 -Kg	1040. 0 KWh	130.0 KW
	2150 Kg	1121.9 KWh	300.0 KW
Ni-Zn (Delco-Remy)	1181 Kg	73.7 KWh	170.0 KW
rx	872 Kg	1340.0 KWh	130.0 KW
	2053 Kg	1113.7 KWh	300.0 KW
Pb-Ac (XV-X')	2285 Kg	87.7 KWh	170.0 KW
rx	372 Kg	1040.0 KWh	130.0 KW
	3157 Kg	1127.7 KWh	300.0 Kw
Pb-Ac (GC-6V-200)	1719 Kg	45.4 KWh	165.0 KW
rx	902 Kg	1080.0 KWh	135.0 KW
	2621 Kg	1125.4 KWh	300.0 Kw

DESIGNS: INTERCITY BUS
SENSITIVITY ANALYSIS

480 mi

Energy? 764.05 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 1091.50 KWh

Power? 300.0 Kw

Driving time? 8.00 h
Veh.Weight? 13605 Kg
Veh.Weight/4 = 3401 Kg **(Target battery and rx weight)**

Sensit.Factor? 0% (of the Spec.E and Spec.P)

EV:
Designed fsr 80% DOD of the battery.

Na-S (CSPL)	14212 Kg	1364.4 KWh	**1847.6** KW
Ni-Fe (NIF225)	**25743** Kg	**1364.4** KWh	**2331.7** KW
Ni-Zn **(Delco-Remy)**	**26238** Kg	**1364.4** KWh	**3148.6** KW
PS-AC (EV-5T)	**12637** Kg	1364.4 KWh	**2643.5** KW
PS-AC (GC-6V-200)	62017 Kg	1364.4 KWh	**4961.4** KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1346 Kg	129.2 KWh	**175.0** KW
rx	842 Kg	1000.0 KWh	1225.0 KW
	2138 Kg	**1129.2** KWh	**300.0** KW
Ni-Fe (NIF225)	1545 Kg	81.9 KWh	170.1 KW
rx	**272** Kg	1040.0 KWh	**130.0** KW
	2417 Kg	**1121.3** KWh	**300.0** KW
Ni-Zn (Delco-Remy;	1417 **Kg**	**73.7** KWh	**170.0** KW
rx	**272 Kg**	**1040.0** KWh	**130.0** KW
	2289 Kg	**1113.7** KWh	**300.0** KW
Pb-AC (EV-5T)	**2742 Kg**	877.7 KWh	**170.0** KW
rx	**872 Kg**	**1040.0** KWh	**130.0 Kw**
	3614 Kg	**1127.7** KWh	**300.0 Kw**
Pb-AC (GC-6V-200)	**2063 Kg**	**45.4** KWh	**165.0 KW**
rx	**902 Kg**	**1080.0** KWh	**135.0 Kw**
	2965 Kg	**1125.4** KWh	**300.0 Kw**

DESIGNS: INTERCITY BUS
SENSITIVITY ANALYSIS

480 mi

Energy? **764.05** (@ n=0.25)
Transm.Eff? **0.70**
Total Energy = 1091.50 KWh

Power? **300.0 Kw**

Driving **time?** **8.00 h**
Veh.Weight? **13605 Kg**
Veh.Weight/4 = **3401 Kg** (Target **battery and rx weight)**

Sensit.Factor? **-20%** (of the Spec.E **and** Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	17765	Kg	**1354.1**	KWh	**1347.5**	KW
Ni-"e (NIF225)	32179	**Kg**	1364.4	KWh	**2831.7**	KW
N i-Zn **(Delco-Remy)**	**32797**	**Kg**	**1364.4**	KWh	3148.6	KW
Pb-Ac (EV-5T)	**53296**	**Kg**	1364.4	KWh	**2643.5**	KW
Pb-Ac (GC-6V-200)	77521	**Kg**	**1354.4**	KWh	**4961.4**	KW

HV:
Designed for **80%** DOD **of** the **battery.**

Na-S (CSPL)	**1583**	**Kg**	**129.2**	KWh	**175.0**	KW
rx	**342**	**Kg**	**1000.0**	KWh	**125.0**	KW
	2525	**Kg**	**1129.2**	KWh	**300.0**	KW
Ni-Fe (NIF225)	1932	Kg	**31.3**	KWh	**170.0**	KW
rx	**372**	Kg	1040.0	KWh	**130.0**	KW
	2804	**Kg**	1121.9	KWh	**300.0**	KW
Ni-Zn **(Delco-Remy)**	1771	**Kg**	**73.7**	KWh	**170.0**	**Kw**
rx	**872**	**Kg**	**1040.0**	KWh	**130.0**	KW
	2543	**Kg**	1113.7	KWh	**300.0**	KW
Pb-Ac (EV-5T)	**3427**	**Kg**	**8 7.7**	KWh	**170.0**	KW
rx	**872**	**Kg**	**1040.0**	KWh	**130.0**	**Kw**
	4299	**Kg**	**1127.7**	KWh	**300.0**	KW
Pb-Ac (GC-6V-200)	**2578**	**Kg**	**45.4**	KWh	**165.0**	**KW**
rx	**902**	**Kg**	**1080.0**	KWh	**135.0**	**Kw**
	3480	**Kg**	**1125.4**	KWh	**300.0**	**Kw**

DESIGNS: INTERCITY BUS
SENSITIVITY ANALYSIS

480 mi

Energy? 764.05 (@ n=0.25)
Transm.Eff? 0.70
Total Energy = 1091.50 KWh

Power? 300.0 Kw

Driving time? 8.00 h
Veh.Weight? 13605 Kg
Veh.Weight/4 = 3401 Kg (Target battery and rx weight)

Sensit.Factor? -30% (of the Spec.E and Spec.P)

EV:
Designed for 80% **DOD of the battery.**

Na-S (CSPL)	20303 **Kg**	1364.4 KWh	1347.6 KW
Ni-Fe (NIF225)	36776 **Kg**	i364.4 KWh	2331.7 KW
Ni-Zn (Delco-Remy)	37483 **Kg**	**i364.4** KWh	3148.6 KW
Pb-AC (EV-ST)	60910 Kg	1364.4 KWh	2643.5 KW
Pb-Ac (GC-6V-200)	38596 Kg	1364.4 KWh	4961.4 KW

HV:
Designed **for 83% EOD of the battery.**

Na-S (CSPL)	1923 Kg	129.2 KWh	175.0 Kw
rx	842 **Kg**	1000.0 KWh	125.0 KW
	2765 Kg	1129.2 KWh	300.0 KW
Ni-Fe (NIF225)	2208 Kg	31.9 KWh	170.0 Kw
rx	372 **Kg**	**1040.0** KWh	**130.0 Kw**
	3080 **Kg**	**1121.9** KWh	300.0 Kw
Ni-Zn (Delco-Remy)	2024 **Kg**	73.7 KWh	170.0 Kw
rx	872 **Kg**	1040.0 KWh	130.0 Kw
	2396 Kg	1113.7 KWh	300.0 Kw
Pb-Ac (EV-5T)	**3917 Kg**	37.7 KWh	170.0 KW
rx	872 **Kg**	1040.0 KWh	130.0 Kw
	4789 Kg	1127.7 KWh	300.0 KW
Pb-Ac (GC-6V-200)	2946 Kg	45.4 KWh	165.0 KW
rx	902 Kg	1080.0 KWh	135.0 Kw
	3848 Kg	1125.4 KWh	300.0 Kw

APPENDIX E. DESIGNS WITH AIR CONDITIONING

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH. W/ AIR CONDITIONER (13mi)

Energy?	**2.56**	(@ n=0.25)
Transm.Eff?	**0.70**	
A.C. Power?	**2.5**	KW
Total **Energy =**	**lo.98**	KWh
Power?	**15.0**	**Kw**
Driving **time?**	**2.93**	h
Veh.Weight?	**1400**	**Kg**
Veh.Weight/4 =	**350**	Kg (Target battery and **rx weight;**
Sensit.Factor?	0%	(of the Spec.E and Spec.P)

EV:
Designed fsr 80% DOD of the battery.

Na-S (CSPL)	**143** Kg	13.7 KWh	18.**3** KW
Ni-Fe (NIF225)	259 **Kg**	13.7 KWh	28.5 KW
Ni-Zn (Delco-Remy)	**254** Kg	**13.7** KWh	31.7 KW
FS-AC (EV-5T)	429 **Kg**	13.7 KWh	26.6 KW
Pb-Ac (GC-6V-200)	**624 Kg**	**13.7** KWh	**43.9** KW

HV:
Designed for **80% DCD** of **the** battery.

Na-S (CSPL)/c	**138 Kg**	**10.3** KWh	14.0 KW
rx	40 **xg**	**2.9** KWh	1.0 KW
	148 **Kg**	**13.3** KWh	**13.0** KW
Ni-Fe (NIF225)	121 Kg	6.4 KWh	13.3 KW
rx	50 Kg	5.9 KWh	2.0 KW
	171 Kg	12.3 KWh	15.3 KW
Ni-Zn (Delco-Remy)	**134 Kg**	**5.4** KWh	**12.5** KW
rx	**54 Kg**	**1.3** KWh	**2.5** KW
	158 **Kg**	**12.7** KWh	**15.0** KW
Pb-AC (EV-5T)	**210 Kg**	**6.7** KWh	**13.9** KW
rx	**50 Kg**	**5.9** KWh	**2.0** KW
	260 Kg	**12.6** KWh	**15.0** KW
Pb-AC (GC-6V-200)	**150 Kg**	**3.3** KWh	**12.0 Kw**
rx	**57 Kg**	**8.8** KWh	**3.0 Kw**
	207 Kg	**12.1** KWh	**15.0 Kw**

DESIGNS: SMALL DELIVERY, MINI VAN
W/ AIR CONDITIONER (100mi)

Energy? 31.04 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 3.5 Kw
Total Energy = 69.79 KWh

Power? 50.0 Kw

Driving time? 7.27 h
Veh.Weight? 2720 Kg
Veh.Weight/4 = 680 Kg (Target battery and rx weight)

Sensit.Factor? 04 (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	909 Kg	87.2 KWh	118.1 KW
Ni-Fe (NIF225)	1646 Kg	87.2 KWh	131. 1 KW
Ni-Zn (Delco-Remy)	1678 Kg	87.2 KWh	201.3 Kw
Pb-Ac (EV-5T)	2726 Kg	8 7.2 KWh	169.0 KW
Pb-Ac (GC-6V-200)	3965 Kg	87.2 KWh	317.2 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	341 Kg	32 .7 KWh	44.3 KW
rx	113 Kg	43.6 KWh	'6.0 KW
	454 Kg	76.3 KWh	50.3 KW
Ni-Fe (NIF225)	386 Kg	23.5 KWh	4 2 . 5 KW
rx	139 Kg	54.5 KWh	7.5 KW
	525 Kg	75.0 KWh	5 3 . 0 KW
Ni-Zn (Delco-Remy)	367 Kg	19.1 KWh	44.0 KW
rx	139 Kg	54.5 KWh	7.5 KW
	506 Kg	73.6 KWh	51.5 Kw
Pb-Ac (EV-5T)	685 Kg	21.9 KWh	42.5 KW
rx	139 Kg	54.5 KWh	7 . 5 KW
	824 Kg	76.5 KWh	5 0 . 0 Kw
Pb-Ac (GC-6V-200)	519 Kg	11.4 KWh	41.5 Kw
rx	150 Kg	61.8 KWh	8.5 KW
	669 Kg	73.2 KWh	50.0 Kw

DESIGNS: LONG DELIVERY "A", VAN
W/ AIR CONDITIONER (100mi)

Energy?	43.80	(@ n=0.25)
Transm.Eff?	0.70	
A.C. Power?	3.75 KW	
Total Energy =	89.16 KWh	
Power?	60.0 KW	
Driving time?	7.09 h	
Veh.Weight?	3400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight)
Sensit.Factor?	0%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1161 Kg	111.4 KWh	150.9 KW
Ni-Fe (NIF225)	2103 Kg	111. 4 KWh	231.3 KW
Ni-Zn (Delco-Remy)	2143 Kg	111.4 KWh	257.2 KW
Pb-Ac (EV-5T)	3483 Kg	111.3 KWh	215.9 KW
Pb-AC (GC-6V-200)	5066 Kg	111.4 KWh	405.3 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	396 Kg	33.0 KWh	51.3 KW
rx	150 Kg	60.3 KWh	8 .5 KW
	546 Kg	98.3 KWh	60. 0 KW
Ni-Fe (NIF225)	455 Kg	24.1 KWh	50.0 KW
rx	159 Kg	70.3 KWh	10.0 KW
	614 Kg	95.0 KWh	60.0 KW
Ni-Zn (Delco-Remy)	413 Kg	21.5 KWh	49.5 KW
rx	162 Kg	74.4 KWh	10.5 KW
	575 Kg	95.9 KWh	60.0 KW
Pb-Ac (EV-5T)	806 Kg	25.8 KWh	50.0 KW
rx	159 Kg	70.9 KWh	10.0 KW
	965 Kg	96.7 KWh	60.0 KW
Pb-Ac (GC-6V-200)	635 Kg	14.0 KWh	50.8 KW
rx	165 Kg	78.0 KWh	11.0 KW
	800 Kg	92.0 KWh	61.8 KW

DESIGNS: LONG DELIVERY "B", VAN
W/ AIR CONDITIONER (150mi)

Energy?	66.26	(@ n=0.25)
Transm.Eff?	0.70	
A.C. Power?	3.75 Kw	
Total Energy =	124.66 KWh	
Power?	60.0 KW	
Driving time?	8.00 h	
Veh.Weight?	3400 Kg	
Veh.Weight/4 =	850 Kg	(Target battery and rx weight)
Sensit.Factor?	0%	(of the Spec. E and Spec. P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1623 Kg	155.3 KWh	2ii.3 KW
Ni-Fe (NIF225)	2940 Kg	155.8 KWh	323.4 KW
Ni-Zn (Delco-Remy)	2997 Kg	155.3 KWh	359.6 KW
Pb-AC (EV-5T)	4869 Kg	155.8 KWh	301.9 KW
Pb-Ac (GC-6V-200)	7083 Kg	155.3 KWh	566.6 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	373 Kg	35.8 KWh	48.5 KW
rx	171 Kg	96.0 KWh	12.0 KW
	544 Kg	131.8 KWh	60.5 KW
Ni-Fe (NIF225)	423 Kg	22.4 KWh	46.5 KW
rx	130 Kg	108.0 KWh	13.5 KW
	603 Kg	130.4 KWh	60.0 KW
Ni-Zn (Delco-Remy)	400 Kg	20.3 KWh	48.0 KW
rx	130 Kg	108.0 KWh	13.5 KW
	580 Kg	128.8 KWh	61.5 KW
Pb-Ac (XV-5T)	750 Kg	24.0 KWh	46.5 KW
rx	180 Kg	108.0 KWh	13.5 KW
	930 Kg	132.0 KWh	60.0 KW
Pb-Ac (GC-6V-200)	569 Kg	12.5 KWh	45.5 Kw
rx	186 Kg	116.0 KWh	14.5 KW
	755 Kg	128.5 KWh	60.0 KW

DESIGNS: CITY SCENARIO, AUTOMOBILE
W/ AIR CONDITIONER (60mi)

Energy? 11.14 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 3 K W
Total Energy = 20.86 KWh

Power? 40.0 xw

Driving time? 1.65 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	308 Kg	29.5 KWh	40.0 KW
Ni-Fe (NIF225)	492 Kg	25.1 KWh	54.1 KW
Ni-Zn (Delco-Remy)	502 xg	26.1 KWh	60.2 KW
Pb-Ac (EV-5T)	815 xg	26.1 KWh	50.5 xw
Pb-AC (GC-6V-200)	li85 Xg	26.1 KWh	94.8 KW

HV :
Designed for 80% DOD of the battery.

Na-S (CSPL)	0 xg	0.0 KWh	0.0 KW
rx	0 xg	0.0 KWh	0.0 xw
	0 xg	0.0 KWh	0.0 KW
Ni-Fe (NIF225)	323 Kg	17.1 KWh	35.5 KW
rx	96 Kg	7.4 KWh	4.5 KW
	419 Kg	24.5 KWh	40.0 KW
Ni-Zn (Delco-Remy)	288 Kg	15.0 KWh	34.5 KW
rx	108 Kg	9.1 KWh	5.5 KW
	396 Kg	24.0 KWh	40.0 KW
Pb-Ac (EV-5T)	589 Xg	18.9 KWh	36.5 XW
rx	74 Kg	5.8 KWh	3.5 xw
	663 Kg	24.6 KWh	40.0 xw
Pb-Ac (GC-6V-200)	394 Kg	8.7 KWh	31.5 KW
rx	150 Kg	14.0 KWh	8.5 XW
	544 Kg	22.7 KWh	40.0 xw

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE
W/ AIR CONDITIONER (150mi)

Energy?	28.25	(@ n=0.25)
Transm.Eff?	0.70	
A.C. Power?	3	KW
Total Energy =	49.69	KWh
Power?	40.0	KW
Driving time?	3.11	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	350	Kg (Target battery and rx weightj
Sensit.Factor?	0%	(of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	647 Kg	62.1 KWh	84.1 KW
Ni- Fe (NIF225)	1172 Kg	62.1 KWh	128.9 KW
Ni-Zn (Delco-Remy)	1194 Kg	62.1 KWh	143.3 KW
Pb-Ac (EV-5T)	1941 Kg	62.1 KWh	120.3 KW
Pb-Ac (GC-N-200)	2823 Kg	62.1 KWh	225.9 KW

HV:
Designed for 80% DOD cf the battery.

Na-S (CSPL)	227 Kg	21.8 KWh	29.5 KW
rx	162 Kg	32.7 KWh	10.5 KW
	389 Kg	54.4 KWh	43.0 KW
Ni-Fe (NIF225)	255 Kg	13.5 KWh	28.1 KW
rx	174 Kg	38.9 KWh	i2.5 KW
	429 Kg	52.4 KWh	40.6 KW
Ni-Zn (Delco-Remy)	225 Kg	11.7 KWh	27.0 KW
rx	177 Kg	40.4 KWh	13.0 KW
	402 Kg	52.1 KWh	40.0 KW
Pb-Ac (EV-5T)	444 Kg	14.2 KWh	27.5 KW
rx	174 Kg	38.9 KWh	12.5 KW
	618 Kg	53.1 KWh	40.0 KW
Pb-Ac (GC-6V-200)	319 Kg	7.0 KWh	25.5 KW
rx	186 Kg	45.1 KWh	14.5 KW
	505 Kg	52.1 KWh	40.0 KW

DESIGNS: LARGE METROPOLIS "B", AUTOMOBILE
W/ AIR CONDITIONER (200mi)

Energy? 37.66 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 3 KW
Total Energy = 66.22 KWh

Power? 40.0 Kw

Driving time? 4.14 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	862 Kg	82.8 KWh	ii2.1 Kw
Ni-Fe (NIF225)	1562 Kg	82.8 KWh	171.8 KW
Ni-Zn (Delco-Remy)	1592 Kg	82.8 KWh	191.0 KW
Pb-Ac (XV-5T)	2587 Kg	82.8 KWh	160.4 KW
Pb-Ac (GC-6V-200)	3763 Kg	82.8 KWh	30i.0 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	215 Kg	20.7 KWh	28.0 KW
rx	171 Kg	49.7 KWh	12.0 KW
	386 Kg	70.4 KWh	40.0 Kw
Ni-Fe (NIF225)	244 Kg	12.9 KWh	26.8 KW
rx	180 Kg	55.9 KWh	13.5 KW
	424 Kg	68.8 KWh	40.3 KW
Ni-Zn (Delco-Remy)	217 Kg	11.3 KWh	26.0 KW
rx	183 Kg	58.0 KWh	14.0 KW
	400 Kg	69.2 KWh	40.0 Kw
Pb-Ac (XV-5T)	427 Kg	13.7 KWh	26.5 KW
rx	180 Kg	55.9 KWh	13.5 KW
	607 Kg	69.6 KWh	40.0 Kw
Pb-Ac (GC-6V-200)	313 Kg	6.9 KWh	25.0 KW
rx	189 Kg	62.1 KWh	15.0 KW
	502 Kg	69.0 KWh	40.0 Kw

DESIGNS: INTERCITY, AUTOMOBILE
W/ AIR CONDITIONER **(480mi)**

Energy?	**88.53**	(@ n=0.25)
Transm.Eff?	**0.70**	
A.C. Power?	3	KW
Total Energy =	**150.47**	KWh
Power?	**40.0**	KW
Driving time?	**8.00**	**h**
Veh.Weight?	**1400**	**Kg**
Veh.Weight/4 =	**350**	**Kg (Target battery and rx weight**
Sensit.Factor?	**0%**	**(of the** Spec.E **and** Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**1959 Kg**	**188.1** KWh	**254.7 KW**
Ni-Fe (NIF225)	**3549 Kg**	**188.1** KWh	**390.4** KW
Ni-Zn (Delco-Remy)	**3617 Kg**	**188.1** KWh	**434.1** KW
Pb-Ac (SV-5T)	**5878 Kg**	**188.1** KWh	**364.4** KW
Pb-Ac (GC-6-V-200)	**8550 Kg**	**188.1** KWh	**684.0** KW

HV :
Designed for 80% DOD of the battery.

Na-S (CSPL)	**173 Kg**	**16.6** KWh	**22.5** KW
rx	**204 Kg**	140.0 KWh	**1 7.5** KW
	377 Kg	**156.5** KWh	**40.0** KW
Ni-Fe **(NIF225)**	**200 Kg**	**10.6** KWh	22.0 KW
rx	**207 Kg**	**144.0** KWh	18.0 KW
	407 Kg	**154.6** KWh	**40.0** KW
Ni-Zn **(Delco-Remy)**	**183 Kg**	**9.5** KWh	**22.0** KW
rx	**207 Kg**	**144.0** KWh	**18.0** KW
	390 Kg	**153.5** KWh	**40.0** KW
Pb-Ac (EV-5T)	**355 Kg**	**11.4** KWh	**22.0** KW
rx	**207 Kg**	**144.0** KWh	**18.0** KW
	562 Kg	**155.4** KWh	**40.0** KW
Pb-Ac (GC-6V-200)	**269 Kg**	**5.9** KWh	**21.5** KW
rx	**210 Kg**	**148.0** KWh	**18.5** KW
	479 Kg	**153.9** KWh	**40.0** KW

DESIGNS: LOCAL BUS
W/ AIR CONDITIONER (120mi)

Energy? 180.43 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 28 KW
Total Energy = 624.00 KWh

Power? 175.0 Kw

Driving time? 13.08 h
Veh.Weight? 13605 Kg
Veh.Weight/4 = 3401 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	8125 Kg	780.0 KWh	1056.2 KW
Ni-Fe (NIF225)	14717 Kg	780.0 KWh	1618.9 KW
Ni-Zn (Delco-Remy)	15000 Kg	780.0 KWh	1800.0 KW
Pb-Ac (EV-5T)	24375 Kg	780.0 KWh	1511.2 KW
Pb-AC (GC-6V-200)	35454 Kg	780.0 KWh	2836.4 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1023 Kg	98.2 KWh	133.0 KW
rx	351 Kg	549.4 KWh	42. 0 KW
	1374 Kg	647.6 KWh	175.0 KW
Ni-Fe (NIF225)	1191 Kg	63.1 KWh	131.0 KW
rx	363 Kg	575.5 KWh	44.0 Kw
	1554 Kg	638.6 KWh	175.0 KW
Ni-Zn (Delcc-Remy)	1083 Kg	56.3 KWh	130.0 KW
rx	369 Kg	588.6 KWh	45.0 Kw
	1452 Kg	644.9 KWh	175.0 KW
Pb-Ac (EV-5T)	2113 Kg	67.6 KWh	131.0 KW
rx	363 Kg	575.5 KWh	44.0 KW
	2476 Kg	643.1 KWh	175.0 KW
Pb-Ac (GC-6V-200)	1613 Kg	35.5 KWh	129.0 KW
rx	375 Kg	601.7 KWh	46.0 KW
	1988 Kg	637.2 KWh	175.0 KW

DESIGNS: INTERCITY BUS
W/ AIR CONDITIONER **(480mi)**

Energy? **764.05** (@ n=0.25)
Transm.Eff? **0.70**
A.C. Power? **20** **Kw**
Total Energy = **1251.50** KWh

Power? **300.0** KW

Driving time? **8.00** **h**
Veh.Weight? **13605** **Kg**
Veh.Weight/4 = **3401** **Kg** **(Target battery and rx weight)**

Sensit.Factor? **0%** **(of the** Spec.E **and** Spec.P)

EV:
Designed for **80%** DOD **of the battery.**

Na-S (CSPL)	**16296**	**Kg**	**1564.4**	KWh	**2118.4**	KW
Ni-Fe (NIF225)	**29517**	**Kg**	**1564.4**	KWh	**3246.8**	**KW**
Ni-Zn (Delco-Remy)	**30084**	**Kg**	**1564.4**	KWh	**3610.1**	**KW**
Pb-AC (W-ST)	**48887**	**Kg**	**1564.4**	KWh	**3031.0**	**Kw**
Pb-Ac (GC-6V-200)	**71108**	**Kg**	**1564.4**	KWh	**5688.6**	**Kw**

HV:
Designed for **83%** DOD **of the battery.**

Na-S (CSPL)	**1192**	**Kg**	**111.5**	KWh	**155.0**	**KW**
rx	**964**	**Kg**	**1160.0**	KWh	**145.0**	**Kw**
	2156	**Kg**	**1273.5**	KWh	**300.0**	KW
Ni-Fe (NIF225)	**1364**	**Kg**	**72.3**	KWh	**150.0**	KW
rx	**995**	**Kg**	**1200.0**	KWh	**150.0**	**Kw**
	2359	**Kg**	**1272.3**	KWh	**300.0**	**Kw**
Ni-Zn (Delco-Remy)	**1250**	**Kg**	**65.0**	KWh	**150.0**	**Kw**
rx	**995**	**Kg**	**1200.0**	KWh	**150.0**	**Kw**
	2245	**Kg**	**1265.0**	KWh	**300.0**	**Kw**
Pb-Ac (EV-5T)	**2419**	**Kg**	**77.4**	KWh	**150.0**	**Kw**
rx	**995**	**Kg**	**1200.0**	KWh	**150.0**	**KW**
	3414	**Kg**	**1277.4**	KWh	**300.0**	**Kw**
Pb-Ac (GC-6V-200)	**1813**	**Kg**	**39.9**	KWh	**145.0**	**KW**
rx	**1025**	**Kg**	**1240.0**	KWh	**155.0**	**KW**
	2838	**Kg**	**1279.9**	KWh	**300.0**	**Kw**

APPENDIX F. ALTERNATE SIZING METHOD FOR HYBRID VEHICLES

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH.

Method 2
13 mi

Energy?	2.56	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy=	3.66	KWh
Power?	15.0	KW
Driving time?	2.93	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	350	Kg (Target Weight)

EV:
Designed for 30% DOD cf the battery.

Na-S (CSPL)	115 Kg	11.1 KWh	15.0 KW
Ni-Fe (NIF225)	136 Kg	7.2 KWh	15.0 KW
Ni-Zn (Delco-Remy)	125 Kg	6.5 KWh	15.0 KW
Pb-Ac (EV-5T)	242 Kg	7.7 KWh	15.0 KW
Pb-AC (GC-6V-200)	208 Kg	4.6 KWh	16.6 KW

HV:
Cesigned for 80% DCD of the battery.

Na-S (CSPL)	104 Kg	10.0 KWh	13.5 KW
rx	45 Kg	4.4 KWh	1.5 KW
	149 Kg	14.4 KWh	15.0 KW
Ni-Fe (NIF225)	123 Kg	6.5 KWh	13.5 KW
rx	45 Kg	4.4 KWh	1.5 KW
	168 Kg	10.9 KWh	15.0 KW
Ni-Zn (Delco-Remy)	113 Kg	5.9 KWh	13.5 KW
rx	45 Kg	4.4 KWh	1.5 KW
	158 Kg	10.2 KWh	15.0 KW
Pb-AC (EV-5T)	218 Kg	7.0 KWh	13.5 KW
rx	45 Kg	4.4 KWh	1.5 KW
	263 Kg	11.4 KWh	15.0 KW
Pb-Ac (GC-W-200)	169 Kg	3.7 KWh	13.5 KW
rx	45 Kg	4.4 KWh	1.5 KW
	214 Kg	8.1 KWh	15.0 KW

DESIGNS: SMALL DELIVERY, MINI VAN

Method 2
100 mi

Energy?	31.04	(@ n=0.25)	
Transm.Eff?	0.70		
Total Energy=	44.34	KWh	
Power?	50.0	KW	
Driving time?	7.27	h	
Veh.Weight?	2720	Kg	
Veh.Weight/4 =	680	Kg	(Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	577 Kg	55.4 KWh	75.1 KW
Ni-Fe (NIF225)	1046 Kg	55.4 KWh	115.0 KW
Ni-Zn (Delco-Remy)	1066 Kg	55.4 KWh	127.9 KW
Pb-Ac (XV-5T)	1732 Kg	55.4 KWh	107.4 KW
Pb-AC (GC-6V-2 00)	2519 Kg	55.4 KWh	201.6 KW

HV :
Designed for 80% DOD of the battery.

Na-S (CSPL)	338 Kg	32.5 KWh	44.0 KW
rx	113 Kg	43.5 KWh	6.0 KW
	451 Kg	76.1 KWh	50.0 KW
Ni-Fe (NIF225)	400 Kg	21.2 KWh	44.0 KW
rx	113 Kg	43.6 KWh	6.0 KW
	513 Kg	64.8 KWh	50.0 KW
Ni-Zn (Delco-Remy)	367 Kg	19.1 KWh	44.0 KW
rx	113 Kg	43.6 KWh	6.0 KW
	480 Kg	62.7 KWh	50.0 KW
Pb-Ac (EV-5T)	710 Kg	22.7 KWh	44.0 KW
rx	113 Kg	43.5 KWh	6.0 KW
	823 Kg	66.3 KWh	50.0 KW
Pb-Ac (GC-6V-200)	550 Kg	12.1 KWh	44.0 Kw
rx	113 Kg	43.6 KWh	6.0 KW
	663 Kg	55.7 KWh	50.0 KW

DESIGNS: LONG DELIVERY "A", VAN

Method 2
100 mi

Energy?	43.80	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy=	62.57	KWh
Power?	60.0	KW
Driving time?	7.09	h
Veh.Weight?	3400	Kg
Veh.Weight/4 =	850	Kg (Target Weight:

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	815 Kg	78.2 KWh	105.9 KW
Ni-Fe (NIF225)	1476 Kg	78.2 KWh	162.3 KW
Ni-Zn (Delco-Remy)	1504 Kg	78.2 KWh	180.5 KW
Pb-Ac (EV-5T)	2444 Kg	78.2 KWh	151.5 KW
Pb-Ac (GC-6V-200)	3555 Kg	78.2 KWh	284.4 KW

HV:
Designed for 83% DOD of the battery.

Na-S (CSPL)	392 Kg	37.7 KWh	51.0 KW
rx	153 Kg	53.3 KWh	9.0 KW
	545 Kg	131.5 KWh	60.3 KW
Ni-Fe (NIF225)	464 Kg	24.6 KWh	51.0 KW
rx	153 Kg	63.8 KWh	9.0 KW
	617 Kg	88.4 KWh	60.0 KW
Ni-Zn (Delco-Remy)	425 Kg	32.1 KWh	51.0 KW
rx	153 Kg	53.3 KWh	9.0 KW
	578 Kg	85.9 KWh	60.0 KW
Pb-Ac (EV-5T)	823 Kg	25.3 KWh	51.0 KW
rx	153 Kg	53.3 KWh	9.0 KW
	976 Kg	90.1 KWh	60.0 KW
Pb-Ac (GC-6V-200)	638 Kg	14.0 KWh	51.0 KW
rx	153 Kg	63.8 KWh	9.0 KW
	791 Kg	77.8 KWh	60.0 KW

DESIGNS: LONG DELIVERY "B", VAN

Method 2
150 mi

Energy?	66.26	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy=	94.66	KWh
Power?	60.0	KW
Driving time?	8.00	h
Veh.Weight?	3400	Kg
Veh.Weight/4 =	850	Kg (Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1233 Kg	118.3 KWh	160.2 KW
Ni-Fe (NIF225)	2232 Kg	118.3 KWh	245.6 KW
Ni- Zn (Delco-Remy)	2275 Kg	118.3 KWh	273.0 KW
Pb-AC (EV-5T)	3698 Kg	118.3 KWh	229.2 KW
Pb-AC (GC-6V-200)	5378 Kg	118.3 KWh	430.3 KW

HV:
Designed for 80% COD of the battery.

Na-S (CSPL)	369 Kg	35.4 KWh	43.0 KW
rx	[illegible] Kg	96.0 KWh	12.0 KW
	540 Kg	131.4 KWh	60.0 KW
Ni-Fe (NIF225)	436 Kg	23.1 KWh	48.0 KW
rx	171 Kg	96.0 KWh	12.0 KW
	607 Kg	119.1 KWh	60.0 KW
Ni-Zn (Delco-Remy)	400 Kg	20.8 KWh	[illegible] KW
rx	171 Kg	96.0 KWh	12.0 KW
	571 Kg	116.3 KWh	60.0 KW
Pb-AC (EV-5T)	774 Kg	24.8 KWh	48.0 KW
rx	171 Kg	96.0 KWh	12.0 KW
	945 Kg	120.8 KWh	60.0 KW
Pb-Ac (GC-6V-200)	600 Kg	13.2 KWh	48.0 KW
rx	171 Kg	96.0 KWh	12.0 KW
	771 Kg	109.2 KWh	60.0 KW

DESIGNS: CITY SCENARIO, AUTOMOBILE

Method 2
60 mi

Energy?	11.14	(@ n=0.25)
Transm.Eff?	0.70	
Total Energy=	15.91	KWh
Power?	40.0	KW
Driving time?	1.65	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	350	Xg (Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	308 Kg	29.5 KWh	40.0 KW
Ni-Fe (NIF225)	375 Kg	19.9 KWh	41.3 KW
Ni-Zn (Delco-Remy)	383 Kg	19.9 KWh	45.9 KW
Pb-Ac (EV-5T)	645 Kg	20.6 KWh	40.0 KW
Pb-Ac (GC-6V-200)	904 Kg	19.9 KWh	72.3 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	231 Kg	22.2 KWh	30.0 KW
rx	159 Kg	16.5 KWh	13.0 KW
	390 Kg	38.7 KWh	40.0 KW
Ni-Fe (NIF225)	273 Kg	14.5 KWh	30.0 KW
rx	159 Kg	16.5 KWh	10.0 KW
	432 Kg	31.0 KWh	40.0 KW
Ni-Zn (Delco-Remy)	250 Kg	13.3 KWh	30.0 KW
rx	159 Kg	16.5 KWh	10.0 KW
	409 Kg	29.5 KWh	40.0 KW
Pb-AC (EV-5T)	484 Kg	15.5 KWh	30.0 KW
rx	159 Kg	16.5 KWh	10.0 KW
	643 Kg	32.0 KWh	40.0 KW
Pb-Ac (GC-6V-200)	375 Kg	8.3 KWh	30.0 KW
rx	159 Kg	16.5 KWh	10.0 KW
	534 Kg	24.8 KWh	40.0 KW

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE

Method 2
150 mi

Energy?	28.25	(@ n=0.25)	
Transm.Eff?	0.70		
Total Energy=	40.36	KWh	
Power?	40.0	KW	
Driving time?	3.11	h	
Veh.Weight?	1400	Kg	
Veh.Weight/4 =	350	Kg	(Target Weight;

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	525 Kg	50.4 KWh	68.3 KW
Ni-Fe (NIF225)	952 Kg	50.4 KWh	104.7 KW
Ni-Zn (Delco-Remy)	970 Kg	50.4 KWh	116.4 KW
Pb-Ac (EV-5T)	1576 Kg	50.4 KWh	97.7 KW
Pb-AC (GC-6V-200)	2293 Kg	50.4 KWh	133.4 KW

HV:
Designed for 80% DCD of the battery.

Na-S (CSPL)	208 Kg	19.9 KWh	27.0 KW
rx	177 Kg	40.4 KWh	13.0 KW
	385 Kg	613.4 KWh	a0.0 KW
Ni-Fe (NIF225)	245 Kg	13.0 KWh	27.0 KW
rx	177 Kg	40.4 KWh	13.0 KW
	422 Kg	53.4 KWh	40.0 KW
Ni-Zn (Delco-Remy)	225 Kg	11.7 KWh	27.0 KW
rx	177 Kg	40.4 KWh	13.0 KW
	402 Kg	52.1 KWh	40.0 KW
Pb-AC (EV-5T)	435 Kg	13.9 KWh	27,0 KW
rx	177 Kg	10.4 KWh	13.0 KW
	612 Kg	54.4 KWh	40.0 KW
Pb-Ac (GC-6V-200)	338 Kg	7.4 KWh	27.0 KW
rx	177 Kg	40.4 KWh	13.0 KW
	515 Kg	47.9 KWh	40. 0 KW

DESIGNS: LARGE METROPOLIS "B", AUTOMOBILE

Method 2
200 mi

Energy?	37.66	(@ n=0.25)
Transm . Eff?	0.70	
Total Energy=	53.80	KWh
Power?	40.0	KW
Driving time?	4.14	h
Veh.Weight?	1400	Kg
Veh.Weight/4 =	350	Kg (Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	701 Kg	57.3 KWh	[illegible] KW
Ni-Fe (NIF225)	1259 Kg	67.2 KWh	139.5 KW
Ni-Zn (Delco-Remy)	1293 Kg	67.3 KWh	155.2 KW
Pb-AC (EV-5T)	2102 Kg	6,. 2 KWh	130.3 KW
Pb-AC (GC-6V-200)	3057 Kg	67.2 KWh	244.5 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	208 Xg	13.9 KWh	27.73 KW
rx	177 Kg	53.3 KWh	13,0 KW
	385 Kg	73.3 KWh	40.0 KW
Ni-Fe (NIF225)	245 Kg	13.3 KWh	27.0 KW
rx	177 Kg	53.8 KWh	13.3 KW
	-122 Kg	60.3 KWh	40.0 KW
Ni-Zn (Delcc-Remy)	225 Kg	11.7 KWh	27.0 KW
rx	177 Kg	53.8 KWh	13.0 KW
	402 Kg	65.5 KWh	40.0 KW
Pb-AC (EV-5T)	435 Kg	13.9 KWh	27.0 KW
rx	177 Kg	53.8 KWh	13.0 KW
	612 Kg	67.8 KWh	40.0 KW
Pb-Ac (GC-6V-200)	338 Kg	7.4 KWh	27.0 KW
rx	177 Kg	53.8 KWh	13.0 KW
	515 Kg	61.2 KWh	40.0 KW

DESIGNS: INTERCITY SCENARIO, AUTOMOBILE

Method 2
480 mi

Energy? 88.53 (@ n=O 25)
Transm.Eff? 0.70
Total Energy= 126.47 KWh

Power? 40.0 KW

Driving time? a.00 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Targer Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1647 Kg	15 3 .1 KWh	214.1 KW
Ni-Be (NIF225)	2983 Kg	158.1 KWh	3 2 3 . 1 KW
Ni-Zn (Delco-Remy)	3040 Kg	153.; KWh	364. 3 KW
Pb-AC (EV-5T)	4940 Kg	153.1 KWh	3 06 . 3 KW
Pb-AC (GC-6V-200)	7136 Kg	158.1 KWh	574.9 KW

HV:
Designed for 80% CCD of the battery.

Na-S (CSPL)	135 Kg	17 .7 KWh	24.0 KW
rx	195 Kg	123.0 KWh	16.0 KW
	380 Kg	145.7 KWh	40.0 KW
Ni-Fe (NIF225)	213 Kg	11.6 KWh	24.0 KW
rx	195 Kg	128.0 KWh	16.0 KW
	413 Kg	139.6 KWh	40.0 KW
Ni-Zn (Delco-Remy)	200 Kg	10. 4 KWh	24.0 KW
rx	195 Kg	123.0 KWh	16.0 KW
	395 Kg	138.4 KWh	13.0 KW
Pb-Ac (EV-5T)	387 Kg	12.4 KWh	24.0 KW
rx	195 Kg	128.0 KWh	16.0 KW
	582 Kg	140.4 KWh	40.0 KW
Pb-Ac (GC-6V-200	300 Kg	6.6 KWh	24.0 KW
rx	195 Kg	123.0 KWh	16.0 KW
	495 Kg	134.6 KWh	40.0 KW

DESIGNS: LOCAL BUS

Method 2
120 mi

Energy? 180.43 (@ n=0.25)
Transm.Eff? 0.70
Total Energy= 257.76 KWh

Power? 175.0 KW

Driving time? 13.08 h
Veh.Weight? 1 3 6 0 5 Kg
Veh.Weight/4 = 3401 Kg (Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	3356 Kg	322.2 KWh	436.3 KW
Ni-Fe (NIF225)	6079 Kg	322.2 KWh	668.7 KW
Ni-Zn (Delco-Remy)	6196 Kg	322.2 KWh	743.5 KW
Pb-AC (EV-5T)	10069 Kg	322.2 KWh	624.3 KW
PS-AC (GC-6V-200)	14645 Kg	322.2 KWh	1171.6 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1192 Kg	114.5 KWh	155.0 KW
rx	219 Kg	251.6 KWh	20.0 KW
	1411 Kg	376.1 KWh	175.3 KW
Ni-Fe (NIF225)	1409 Kg	74.7 KWh	155.0 KW
rx	219 Kg	261.5 KWh	20.0 KW
	1628 Kg	336.3 KWh	175.0 KW
Ni-Zn (Delco-Remy)	1292 Kg	67.2 KWh	155.0 KW
rx	219 Kg	261.5 KWh	20.0 KW
	1511 Kg	322.8 KWh	175.0 KW
Pb-AC (EV-5T)	2500 Kg	20.0 KWh	155.0 KW
rx	219 Kg	261.6 KWh	20.0 KW
	2719 Kg	341.6 KWh	175.0 KW
Pb-Ac (GC-6V-200)	1938 Kg	42.6 KWh	155.0 KW
rx	219 Kg	261.6 KWh	20.0 KW
	2157 Kg	304.2 KWh	175.0 KW

DESIGNS: INTERCITY BUS

Method 2
480 mi

Energy?	764.05	(@ n=O 25)
Transm.Eff?	0.70	
Total Energy=	1091.50	KWh
Power?	300.0	KW
Driving time?	8.00	h
Veh.Weight?	13605	Kg
Veh.Weight/4 =	3401	Kg (Target Weight)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	14212 Kg	1364.4 KWh	1847.6 KW
Ni-Fe (NIF225)	25733 Kg	1364.4 KWh	2831.7 KW
Ni-Zn (Delco-Remy)	26238 Kg	1364.4 KWh	3148.6 KW
Pb-AC (XV-5T)	42637 Kg	1364.4 KWh	2643.3 KW
Pb-AC (GC-6V-200)	62017 Kg	1364.4 Kwh	4961.4 KW

HV:
Designed for 80% CCD of the battery.

Na-S (CSPL)	1269 Kg	121.3 KWh	165.0 KW
rx	902 Kg	1080.0 KWh	135.0 KW
	2171 Kg	1201.3 KWh	300.0 KW
Ni-Fe (NIF225)	1500 Kg	79.5 KWh	165.0 KW
rx	902 Kg	1080.0 KWh	135.0 KW
	2402 Kg	1159.5 KWh	300.0 KW
Ni-Zn (Delco-Remy)	1375 Kg	71.5 KWh	165.0 KW
rx	902 Kg	1080.0 KWh	135.0 KW
	2277 Kg	1151.5 KWh	300.0 KW
Pb-AC (EV-ST)	2661 Kg	85.2 KWh	165.0 KW
rx	902 Kg	1080.0 KWh	135.0 KW
	3563 Kg	1165.2 KWh	300.0 KW
Pb-Ac (GC-6V-200)	2063 Kg	45.4 KWh	165.0 KW
rx	902 Kg	1080.0 KWh	135.0 KW
	2965 Kg	1125.4 KWh	300.0 KW

DESIGNS: RESIDENTIAL POSTAL, MAIL DELIVERY VEH.
W/ AIR CONDITIONER (13mi)

METHOD 2

Energy?	2.56	(@ n=0.25)
Transm.Eff?	0.70	
A.C. Power?	2.5 KW	
Total Energy =	10.98 KWh	
Power?	15.0 Kw	
Driving time?	2.93 h	
Veh.Weight?	1400 Kg	
Veh.Weight/4 =	350 Kg	(Target battery and rx weight;
Sensit.Factor?	0%	(of the Spec.E and Spec.P)

EV :
Designed for 80% DOD of the battery.

Na-S (CSPL)	143 Kg	13.7 KWh	18.6 KW
Ni-Fe (NIF225)	259 Kg	13.7 KWh	28.5 KW
Ni-Zn (Delco-Remy)	264 Kg	13.7 KWh	31.7 KW
Pb-Ac (XV-5T)	429 Kg	13.7 KWh	26.6 KW
Pb-Ac (GC-6V-200)	624 Kg	13.7 KWh	49.9 KW

HV:
Designed for 80% DOD of the batter:,.

Na-S (CSPL)	85 Kg	8.1 KWh	11.0 KW
rx	90 Kg	11.7 KWh	4.0 KW
	175 Kg	13.3 KWh	15.0 KW
Ni-Fe (NIF225)	100 Kg	5.3 KWh	11.0 KW
rx	90 Kg	11.7 KWh	4.0 KW
	130 Kg	17.C KWh	15.0 KW
Ni-Zn (Delco-Remy)	92 Kg	1.3 KWh	11.0 KW
rx	90 Kg	11.7 KWh	4.0 KW
	132 Kg	16.5 KWh	15.0 KW
Pb-Ac (EV-5T)	177 Kg	5.7 KWh	11.0 KW
rx	90 Kg	11.7 KWh	4.0 KW
	267 Kg	17.4 KWh	15.0 Kw
Pb-Ac (GC-6V-200)	138 Kg	3.0 KWh	11.0 KW
rx	90 Kg	11.7 KWh	4.0 Kw
	228 Kg	14.7 KWh	15.0 KW

DESIGNS: SMALL DELIVERY, MINI VAN
W/ AIR CONDITIONER (100mi)

METHOD 2
Energy? 31.04 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 3.5 KW
Total Energy = 69.79 KWh

Power? 50.0 KW

Driving time? 7.27 h
Veh.Weight? 2.720 Kg
Veh.Weight/4 = 680 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	909 Kg	87.2 KWh	118.1 KW
Ni-Fe (NIF225)	1646 Kg	87.2 KWh	131.1 KW
Ni-Zn (Delco-Remy)	1678 Kg	87.2 KWh	201.3 KW
Pb-Ac (EV-5T)	2726 Kg	87.2 KWh	169.0 KW
Pb-AC (GC-6V-200)	3965 Kg	87.2 KWh	317.2 KW

HV:
Designed for 30% DOD of the battery.

Na-S (CSPL)	312 Kg	29.9 KWh	40.5 KW
rx	156 Kg	63.1 KWh	9.5 KW
	468 Kg	99.0 KWh	50.0 KW
Ni-Fe (NIF225)	368 Kg	19.5 KWh	40.5 KW
rx	156 Kg	69.1 KWh	9.5 KW
	524 Kg	88.6 KWh	50.0 KW
Ni-Zn (Delco-Remy)	338 Kg	17.5 KWh	40.5 KW
rx	156 Kg	69.1 KWh	9.5 KW
	434 Kg	85.6 KWh	50.0 KW
Pb-Ac (EV-ST)	653 Kg	20.9 KWh	40.5 KW
rx	156 Kg	69.1 KWh	9.5 KW
	809 Kg	90.0 KWh	50.0 KW
Pb-Ac (GC-6V-200)	506 Kg	11.1 KWh	40.5 KW
rx	156 Kg	69.1 KWh	9.5 KW
	662 Kg	80.2 KWh	50.0 KW

DESIGNS: LONG DELIVERY "A", VAN
W/ AIR CONDITIONER (100mi)

METHOD 2

Energy?	43.80	(@ n=0.25)
Transm.Eff?	0.70	
A.C. Power?	3.75 Kw	
Total Energy =	89.16 KWh	
Power?	60.0 KW	
Driving time?	7.09 h	
Veh.Weight?	3400 Kg	
Veh.Weight/4 =	850 Kg	(Target battery and rx weight)
Sensit.Factor?	0%	(of the Spec. E and Spec. P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	1161 Kg	111.4 KWh	150.9 KW
Ni-Fe (NIF225)	2103 Kg	111.4 KWh	231.3 KW
Ni-Zn (Delco-Remy)	2143 Kg	111.4 KWh	237.2 KW
Pb-Ac (EV-5T)	3483 Kg	111.3 KWh	215.9 KW
Pb-Ac (GC-6V-200)	5066 Kg	111.4 KWh	405.3 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	365 Kg	35.1 KWh	47.5 KW
rx	174 Kg	88.6 KWh	12.5 KW
	539 Kg	123.7 KWh	60.0 KW
Ni-Fe (NIF225)	432 Kg	22.3 KWh	47.5 KW
rx	174 Kg	88.6 KWh	12.5 KW
	606 Kg	111.5 KWh	60.0 KW
Ni-Zn (Delco-Remy)	396 Kg	20.6 KWh	47.5 KW
rx	174 Kg	83.6 KWh	12.5 KW
	570 Kg	109.2 KWh	60.0 KW
Pb-Ac (EV-5T)	766 Kg	21.5 KWh	47.5 KW
rx	174 Kg	33.6 KWh	12.5 KW
	940 Kg	113.1 KWh	60.0 KW
Pb-Ac (GC-6V-200)	594 Kg	13.1 KWh	47.5 KW
rx	174 Kg	88.6 KWh	12.5 KW
	768 Kg	101.7 KWh	60.0 KW

DESIGNS: LONG DELIVERY "B", VAN W/ AIR CONDITIONER (150mi)

METHOD 2
Energy? 66.26 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 3.75 KW
Total Energy = 124.66 KWh.

Power? 60.0 KW

Driving time? 8.00 h
Veh.Weight? 3400 Kg
Veh.Weight/4 = 850 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec . E and Scec . P)

EV:
Desiqned for 80% DOD of the battery.

Na-S (CSPL)	**1623 Kg**	155.8 KWh	**211.0** KW
Ni-Fe (NIF225)	**2940** Kg	**155.8** KWh	**323.4** KW
Ni **-5n (Delco-Remyj**	**2997 Kg**	**155.8** KWh	359.6 KW
Pb-Ac (EV-5T)	4869 **Kg**	155.**3** KWh	**301.9** KW
Pb-Ac (GC-6V-200)	**7083 Kg**	155.**3** KWh	**566.6** KW

HV :
Designed **for 80% DOD of the battery.**

Na-S (CSPL)	**342** Kg	**32.9** KWh	44.5 KW
rx	**192 Kg**	124.**0** KWh	**15 . 5** KW
	534 Kg	**156.9** KWh	60 . **0** KW

Ni-Fe (NIF225)	405 Kg	21.4 KWh	44.5 KW
rx	192 Kg	124.0 KWh	15.**5** KW
	597 Kg	145..4 KWh	**50 . 0** KW

Ni-Zn (Delco-Remy)	**371 Kg**	**13.3** KWh	44.5 KW
rx	**192 Kg**	124.0 KWh	**15.5** KW
	563 Kg	143.**3** KWh	**60.0** KW

Pb-Ac (EV-5T)	**713 Kq**	2**5**.0 KWh	**44.5** KW
rx	**192 Kg**	124.0 KWh	**15.5** KW
	910 Kg	**147. 0** KWh	**60.0** KW

Pb-Ac (GC-6V-200)	**556 Kg**	**12.2** KWh	**44.5** KW
rx	**192 Kg**	**124.0** KWh	**15.5** KW
	748 Kg	**136.2** KWh	**60.0** KW

DESIGNS: CITY SCENARIO, AUTOMOBILE
W,' AIR CONDITIONER (60mi)

METHOD 2
Energy? 11.14 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 3 KW
Total Energy = 20.86 KWh

Power? 40.0 KW

Driving time? 1.65 h
Veh.Weight? 1400 Kg .
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec.E and Spec.P)

EV:
Designed fcr 80% DOD of the battery.

Na-S (CSPL)	308 Kg	21.5 KWh	40.0 KW
Ni-Fe (NIF225)	492 Kg	25.1 KWh	54.1 KW
Ni -Zn (Delco-Remy)	502 Kg	26.1 KWh	60.2 KW
Pb-Ac (EV-5T)	815 Kg	25.1 KWh	50.5 KW
Pb-AC (GC-6V-200)	1185 Kg	25.1 KWh	94.8 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	208 Kg	13.9 KWh	27.3 KW
rx	177 Kg	21.5 KWh	13.0 KW
	335 Kg	41.4 KWh	a0.0 KW
Ni-Fe (NIF225)	245 Kg	13.0 KWh	27.0 KW
rx	177 Kg	21.5 KWh	13.0 KW
	422 Kg	34.5 KWh	40.0 KW
Ni-Zn (Delco-Remy)	225 Kg	11.7 KWh	27.0 KW
rx	177 Kg	21.5 KWh	13.0 KW
	402 Kg	33.2 KWh	40.0 KW
Pb-Ac (EV-5T)	435 Kg	13.9 KWh	27.0 KW
rx	177 Kg	21.5 KWh	13.0 KW
	612 Kg	35.4 KWh	40.0 KW
Pb-Ac (GC-6V-200)	338 Kg	7.4 KWh	27.0 KW
rx	177 Kg	21.5 KWh	13.0 KW
	515 Kg	28.9 KWh	40.0 KW

DESIGNS: LARGE METROPOLIS "A", AUTOMOBILE
W/ AIR CONDITIONER (150mi)

METHOD 2
Energy? **28.25** (@ n=0.25)
Transm.Eff? **0.70**
A.C. Power? 3 KW
Total Energy = **49.69** KWh

Power? **40.0** KW

Driving time? **3.11** **h**
Veh.Weight? **1400** **Kg**
Veh.Weight/4 = **350** **Kg** **(Target battery and rx weight)**

Sensit.Factor? **0%** **(of the** Spec.E **and** Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	**647** **Kg**	**62.1** KWh	**34.1** KW
Ni-Fe **(NIF225)**	**1172** **Kg**	**62.1** KWh	**123.9** KW
Ni-Zn (Delco-Remy)	**1194** **Kg**	**62.1** KWh	**143.3** KW
Pb-Ac (EV-5T)	**1941** **Kg**	**62.1** KWh	120.3 KW
Pb-Ac (GC-SV-200)	**2223** **Kg**	**62.1** KWh	**225.9** KW

HV:
Designed for 80% DOD of the battery.

Na-SNa (CSPL)	**135** **Kg**	**17.7** KWh	**24.0** KW
rx	**195** **Kg**	**49.8** KWh	**16.0** KW
	380 **Kg**	**67.5** KWh	40.0 KW

Ni-Fe (NIF225)	**218** **Kg**	11.6 KWh	24.0 KW
rx	**195** **Kg**	49.8 KWh	**16.0** KW
	413 **Kg**	**61.3** KWh	40.0 KW

Ni-Zn **(Delco-Remy)**	**200** **Kg**	**10.4** KWh	24.0 KW
rx	**195** **Kg**	**49.8** KWh	**16.0** KW
	395 **Kg**	**60.2** KWh	a0.0 KW

Pb-Ac (EV-5T)	**387** **Kg**	**12.4** KWh	**24. 0** KW
rx	**195** **Kg**	**49.8** KWh	**16. 0** KW
	582 **Kg**	**62.1** KWh	**40.0** KW

Pb-Ac (GC-6V-200)	**300** **Kg**	**6.6** KWh	**24.0** KW
rx	**195** **Kg**	**49.8** KWh	**16.0** KW
	495 **Kg**	**56.4** KWh	**40.0** KW

DESIGNS: LARGE METROPOLIS "B", AUTOMOBILE
W/ AIR CONDITIONER (200mi)

METHOD 2
Energy? 37.66 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 3 Kw
Total Energy = 66.22 KWh

Power? 40.0 Kw

Driving time? 4.14 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 0 % (of the Spec.E and Spec.P)

EV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	862 Kg	82.8 KWh	112.13 KW
Ni-Fe (NIF225)	1562 Kg	82.8 KWh	171. 3 KW
Ni-Zn (Delco-Remy)	1592 Kg	82.3 KWh	191.0 KW
Pb-Ac (EV-5T)	2587 Kg	82. 8 KWh	160.4 KW
Pb-Ac (GC-6V-200)	3763 Kg	82.8 KWh	301.0 KW

HV:
Designed for 80% DOD of the battery.

Na-S (CSPL)	185 Kg	17.7 KWh	24.0 KW
rx	195 Kg	66.2 KWh	15.0 KW
	380 Kg	84.0 KWh	40.0 KW
Ni-Fe (NIF225)	213 Kg	11.6 KWh	24.0 KW
rx	195 Kg	56.2 KWh	16.0 KW
	413 Kg	77. 8 KWh	43. 0 KW
Ni-Zn (Delco-Remy)	200 Kg	10.4 KWh	24.0 KW
rx	195 Kg	66. 2 KWh	16.0 KW
	395 Kg	75.6 KWh	40.0 KW
Pb-Ac (EV-5T)	387 Kg	12.4 KWh	21. 0 KW
rx	195 Kg	66.2 KWh	16. 0 KW
	582 Kg	78.6 KWh	40.0 Kw
Pb-Ac (GC-6V-200)	300 Kg	6.6 KWh	24.0 KW
rx	195 Kg	66.2 KWh	16.0 KW
	495 Kg	72.8 KWh	40.0 Kw

DESIGNS: INTERCITY, AUTOMOBILE
W/ AIR CONDITIONER (480mi)

METHOD 2
Energy? 88.53 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 3 KW
Total Energy = 150.47 KWh

Power? 40.0 Kw

Driving time? 8.00 h
Veh.Weight? 1400 Kg
Veh.Weight/4 = 350 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec.E and Spec.P)

EV:
Designed for **80% DOD of the battery.**

Na-S (CSPL)	**1959 Kg**	**i88.1** KWh	254.7 KW
Ni-Fe (NIF225)	**3549 Kg**	**188.1** KWh	390.4 KW
xi-z,? (Delco-Remy)	**3617 Kg**	188.1 KWh	434.0 KW
Pb-AC (EV-5T)	**5878 Kg**	**188.1** KWh	364.4 KW
Pb-Ac... (GC-6V-200)	**8549 Kg**	188.1 KWh	684.0 KW

HV:
Designed for 30% DOD of the battery.

Na-S (CSPL)	**162 Kg**	**15.5** KWh	21.0 KW
rx	**213 Kg**	**152.0** KWh	19.0 KW
	375 Kg	167.5 KWh	**43.0** KW

Ni-Fe (NIF225)	**191 Kg**	10.1 KWh	2i.5 KW
rx	**213 Kg**	**152.0** KWh	**13.5** KW
	404 **Kg**	**162.1** KWh	**40.0** KW

Ni-Zn (Delco-Remy)	**175 Kg**	**9.1** KWh	**21.0** KW
rx	**213 Kg**	**152.0** KWh	**19.0** KW
	388 Kg	**151.1** KWh	**40.0** KW

Pb-Ac (EV-5T)	**339 Kg**	**10.8** KWh	21.0 KW
rx	**213 Kg**	**152.0** KWh	**19.0** KW
	552 Kg	**162.8** KWh	**40.0** KW

Pb-Ac (GC-6V-200)	**263 Kg**	**5.8** KWh	**21.0** KW
rx	**213 Kg**	**152.0** KWh	**19.0 KW**
	476 Kg	**157.8** KWh	**40.0 Kw**

DESIGNS: LOCAL BUS
W/ AIR CONDITIONER **(120mi)**

METHOD 2
Energy? **180.43** (@ n=0.25)
Transm.Eff? **0.70**
A.C. Power? **28** KW
Total Energy = **624.00** KWh

Power? **175.0** KW

Driving time? **13.08** **h**
Veh.Weight? **13605** **Kg**
Veh.Weight/4 = **3401** **Kg** **(Target battery and rx weight**

Sensit.Factor? **0%** **(of the Spec.E and Spec.P)**

EV:
Designed for 80% DOD of the battery.

N,a-S	(CSPL)	**8125**	**Kg**	**780.3**	KWh	**1056.2**	KW
Ni-Fe	(NIF225)	14717	**Kg**	**780.0**	KWh	**1618 . 9**	KW
Ni-Zn	(Delco-Remy)	**15000**	**Kg**	**780.0**	KWh	1800.0	KW
Pb-Ac	(EV-5T)	**24375**	**Kg**	**780.0**	KWh	**1511.2**	KW
"S-AC	(GC-6V-200)	**35454**	**Kg**	**780.0**	KWh	**2836.4**	KW

HV:
Designed for **30% COD of the** battery.

Na-S	(CSPL)	**977**	**Kg**	**93.8**	KWh	**127.0**	KW
rx.		**387**	**Kg**	**627. 8**	KWh	**48. 0**	KW
		1364	**Kg**	**721.6**	KWh	**175.0**	KW
Ni-Ae	(NIF225)	1155	Kg	**61.2**	KWh	**127.0**	KW
x-:		**387**	**Kg**	**627.8**	KWh	**48.0**	KW
		1542	**Kg**	**639.0**	KWh	17 5 . 0	KW
Ni-Zn	(Delco-Remy)	**1058**	**Kg**	**55.0**	KWh	**127.0**	KW
rx		**387**	**Kg**	**627.8**	KWh	**48.0**	KW
		1445	**Kg**	**682.9**	KWh	**175.0**	KW
Pb-Ac	(EV-5T)	**2048**	**Kg**	**65.5**	KWh	**127.0**	KW
rx		**387**	**Kg**	**627. 8**	KWh	**48.0**	KW
		2435	**Kg**	**693.4**	KWh	**175.0**	KW
Pb-Ac	(GC-6V-200)	**1588**	**Kg**	**34.9**	KWh	**127.0**	KW
rx		**387**	**Kg**	**627.8**	KWh	**48.0**	KW
		1975	**Kg**	**662.8**	KWh	**175.0**	KW

DESIGNS: INTERCITY BUS
W/ AIR CONDITIONER (480mi)

METHOD 2
Energy? 764.05 (@ n=0.25)
Transm.Eff? 0.70
A.C. Power? 20 Kw
Total Energy = 1251.50 KWh

Power? 300.0 Kw

Driving time? 8.00 h
Veh.Weight? 13605 Kg
Veh.Weight/4 = 3401 Kg (Target battery and rx weight)

Sensit.Factor? 0% (of the Spec.E and Spec.P)

EV :
Designed for 80% DOD of the battery.

Na-S (CSPL)	16296 Kg	1564.4 KWh	2118.4 KW
Ni-Fe (NIF225)	29517 Kg	1564.4 KWh	3246.8 KW
Ni-Zn (Delco-Remyj	30084 Kg	1564.4 KWh	3610.1 KW
Pb-Ac (EV-5T)	48887 Kg	1564.4 KWh	3031.0 KW
Pb-Ac (GC-6-V-200)	71108 Kg	1564.4 KWh	5688.6 KW

HV :
Designed for 80% DOD of the battery.

Na-S (CSPL)	1077 Kg	103.4 KWh	140.0 KW
rx	1055 Kg	1280.0 KWh	160.0 KW
	2132 Kg	1383.4 KWh	300.0 Kw
Ni-Fe (NIF225)	1273 Kg	6 7.5 KWh	140.0 Kw
rx	1055 Kg	1230.0 KWh	160. 0 KW
	2328 Kg	1347.5 KWh	300.0 Kw
Ni-In (Delco-Remy)	1167 Kq	60.7 KWh	140.0 KW
rx	1055 Kg	1280.0 KWh	160.0 KW
	2222 Kq	1340.7 KWh	300. 0 KW
Pb-Ac (EV-5T)	2258 Kg	72.3 KWh	140.0 KW
rx	1055 Kg	1280.0 KWh	160.0 KW
	3313 Kg	1352.3 KWh	300.0 Kw
Pb-Ac (GC-6V-200)	1750 Kg	38.5 KWh	140.0 KW
rx	1055 Kg	1280.0 KWh	160.0 KW
	2805 Kg	1318.5 KWh	300.0 KW

APPENDIX G. PRACTICAL LIMITATIONS OF ENGINE-GENERATOR SETS

TITLE: ETV-1

Cd:	0.32	r(Kg/m3):	1.225
Area(m2):	1.84	Grade1(%):	0.0%
Ur:	0.009	Grade2(%):	0.0%
Mass(Kg):	1791	Reg.Brake (n):	0.25

CONSTANT SPEED INFORMATION

Range:	0 mi
%dist.on grd	0.0%
Vconstant:	0 mi/h

CYCLE INFORMATION

Range:	100 mi
%dist.grd1:	0.0%
%dist.grd2:	0.0%
t(ac):	28 s
t(cr):	50 s
t(co):	10 s
t(br):	9 s
Vcruise	45 mi/h

CYCLE RESULTS

V after (co):	41.20 mi/h
dist/cycl(ac):	281.58 m
dist/cycl(cr):	1005.63 m
dist/cycl(co+br):	191.07 m
Total cyle dist:	1478.27 m
#cycles needed:	108.84

FORCES ANALYSIS

Fcn:	157.97 N
Fcn up/gr1:	157.97 N
Fcn dw/gr1:	157.97 N
Fac:	1590.33 N
Fac up/gr1:	1590.33 N
Fac dw/gr1:	1590.33 N
Fac up/gr2:	1590.33 N
Fac dw/gr2 :	1590.33 N
Fcr:	303.35 N
Fcr up/gr1:	303.85 N
Fcr dw/gr1:	303.35 N
Fcr up/gr2:	303.85 N
Fcr dw/gr2 :	303.85 N
Fco:	0.00 N
Fco up/gr1:	0.00 N
Fco dw/gr1:	0.00 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	-3384.50 N
Fbr up/gr1:	-3384.50 N
Fbr dw/gr1:	-3384.50 N
Fbr up/gr2:	-3384.50 N
Fbr dw/gr2:	-3384.50 N

POWER ANALYSIS

Pcn:	0.00	Kw	
Pcn up/gr1:	0.00	KW	
Pcn dw/gr1:	0.00	KW	
Pac:	31.99	Kw	-max-
Pac up/gr1:	31.99	KW	-max-
Pac dw/gr1:	31.99	KW	-max-
Pac up/gr2:	31.99	Kw	-max-
Pac dw/gr2:	31.99	KW	-max-
Pcr:	6.11	KW	
Pcr up/gr1:	6.11	KW	
Pcr dw/gr1:	6.11	KW	
Pcr up/gr2:	6.11	KW	
Pcr dw/gr2:	6.11	KW	
Pco:	0.00	KW	
Pco up/gr1:	0.00	KW	
Pco dw/gr1:	0.00	KW	
Pco upjgr2:	0.00	KW	
Pco dw/gr2:	0.00	KW	
Pbr:	-62.33	KW	-max-
Pbr up/gr1:	-62.33	KW	-max-
Pbr dw/gr1:	-62.33	KW	-max-
Pbr up/gr2:	-62.33	KW	-max-
Pbr dw/gr2:	-62.33	KW	-max-

ENERGY ANALYSIS

	Reg.Brk n=1	Reg.Brk n=n	NO Reg.Brk	
Ecn:	0.000	0.000	0.000	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1:	0.300	0.000	0.000	KWh
Eac:	13.539	13.539	13.539	KWh
Eac up/gr1:	0.000	0.000	0.300	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	9.238	9.238	9.238	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	-8.480	-2.120	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	14.297	20.657	22.777	KWh
	0.143	0.207	0.228	KWh/mi

TITLE: ETV-1

Cd:	0.32	r(Kg/m3):	1.225
Area(m2):	1.84	Grade1(%):	0.0%
Ur:	0.009	Grade2(%):	0.0%
Mass(Kg) :	1791	Reg.Brake (n):	0.25

CONSTANT SPEED IN**FORMATION**

Range:	**100 mi**
%dist.on grd	**0.0%**
Vconstant:	60 mi/h

CYCLE INFORMATION

Range:	**0 mi**
%dist.grd1:	0.0%
%dist.grd2:	0.0%
t(ac):	28 s
t(cr):	50 s
t(co):	10 s
t(br) :	9 s
Vcruise :	45 mi/h

CYCLE RESULTS

V after (co):	41.20 mi/h
dist/cycl(ac):	281.58 m
dist/cycl(cr):	1005.63 m
dist/cycl(co+br):	191.07 m
Total cyle dist:	1478.27 m
#cycles **needed** :	0.00

FORCES ANALYSIS

Fcn:	417.31 N
Fcn up/gr1:	417.31 N
Fcn dw/gr1:	417.31 N
Fac:	1590.33 N
Fac up/gr1:	1590.33 N
Fac dw/gr1:	1590.33 N
Fac up/gr2:	1590.33 N
Fac dw/gr2 :	1590.33 N
Fcr:	303. 85 N
Fcr up/gr1:	303.85 N
Fcr dw/gr1 :	303. 85 N
Fcr up/gr2:	303. 85 N
Fcr dw/gr2 :	303.85 N
Fco:	0.00 N
Fco up/gr1:	0.00 N
Fco dw/gr1:	0.00 N
Fco up/gr2:	0.00 N
Fco dw/gr2:	0.00 N
Fbr:	-3384.50 N
Fbr upjgrl:	-3384.50 N
Fbr dw/gr1:	-3384.50 N
Fbr up/gr2:	-3384.50 N
Fbr dw/gr2:	-3384.50 N

POWER ANALYSIS

Pcn:	11.19 KW	
Pcn up/gr1:	11.19 KW	
Pcn dw/gr1:	11.19 KW	
Pac:	31.99 KW	-max-
Pac up/gr1:	31.99 KW	-max-
Pac dw/gr1:	31.99 KW	-max-
Pac up/gr2:	31.99 KW	-max-
Pac dw/gr2:	31.99 KW	-max-
Pcr:	6.11 KW	
Pcr up/gr1:	6.11 KW	
Pcr dw/gr1:	6.11 KW	
Pcr up/gr2:	6.11 KW	
Pcr dw/gr2:	6.11 KW	
Pco:	0.00 KW	
Pco up/gr1:	0.00 KW	
Pco dw/gr1:	0.00 KW	
Pco up/gr2:	0.00 KW	
Pco dw/gr2:	0.00 Kw	
Pbr:	-62.33 KW	-max-
Pbr up/gr1:	-62.33 KW	-max-
Pbr dw/gr1:	-62.33 KW	-max-
Pbr up/gr2:	-62.33 KW	-max-
Pbr dw/gr2:	-62.33 KW	-max-

ENERGY ANALYSIS

	Reg. Brk n=1	Reg.Brk n=n	No Reg.Brk	
Ecn :	18.652	18.552	18.652	KWh
Ecn up/gr1:	0.000	0.000	0.000	KWh
Ecn dw/gr1 :	0.000	0.000	0.000	KWh
Eac:	0.000	0.000	0.000	KWh
Eac up/gr1:	0.000	o.oco	0.000	KWh
Eac dw/gr1:	0.000	0.000	0.000	KWh
Eac up/gr2:	0.000	0.000	0.000	KWh
Eac dw/gr2:	0.000	0.000	0.000	KWh
Ecr:	0.000	0.000	0.000	KWh
Ecr up/gr1:	0.000	0.000	0.000	KWh
Ecr dw/gr1:	0.000	0.000	0.000	KWh
Ecr up/gr2:	0.000	0.000	0.000	KWh
Ecr dw/gr2:	0.000	0.000	0.000	KWh
Eco:	0.000	0.000	0.000	KWh
Eco up/gr1:	0.000	0.000	0.000	KWh
Eco dw/gr1:	0.000	0.000	0.000	KWh
Eco up/gr2:	0.000	0.000	0.000	KWh
Eco dw/gr2:	0.000	0.000	0.000	KWh
Ebr:	0.000	0.000	0.000	KWh
Ebr up/gr1:	0.000	0.000	0.000	KWh
Ebr dw/gr1:	0.000	0.000	0.000	KWh
Ebr up/gr2:	0.000	0.000	0.000	KWh
Ebr dw/gr2:	0.000	0.000	0.000	KWh
TOTAL ENERGY	18.652	18.652	18.652	KWh
	0.187	0.187	0.187	KWh/mi

GASOLINE CONSUMPTION

Vehicle : Hybrid Automobile based on the ETV-1
Battery E.? 15.44 KWh (Going into 80%DOD)
RX gas/KWh? 0.15 gal/KWh

Cycle ? SAE "D"
E/mi ? 0.207 KWh (for propulsion)
0.295 KWh (including transm.eff=0.7)
0.406 KWh (plus Air Conditioning,3KW)
Vavg ? 27.11 mph

AIR CONDITIONING: OFF

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	RX size (KW) 6.0 RX running (hours)	12.0	13.5	Gasoline used (Gal)	(mi/gal)
30	1.11	3.85	0.00	0.00	0.00	0.00	0.000	ERR
60	2.21	17.70	2.26	0.38	0.19	0.12	0.339	177.0
90	3.32	26.55	11.11	1.35	0.93	0.60	1.666	54.0
120	4.43	35.40	19.96	3.33	1.66	1.08	2.994	40.1
150	5.53	44.25	23.31	4.30	2.40	1.56	4.322	34.7
130	6.64	53.10	37.66	5.23	3.14	2.04	5.649	31.9
210	7.75	61.95	46.51	NA	3.88	2.51	6.977	30.1
240	3.35	70.80	55.36	NA	4.61	2.99	3.304	28.9
270	9.96	79.65	64.21	NA	5.35	3.47	9.631	28.0
300	11.07	33.50	73.06	NA	5.09	3.35	10.959	27.4
330	12.17	97.35	31.91	NA	6.33	4.43	12.236	26.9
360	13.23	106.20	90.76	NA	7.56	4.91	13.614	26.4
390	14 .39	115.05	99.61	NA	8.30	5.33	ii.942	26.1
420	15.49	123.90	103.46	NA	9.04	5.36	16.269	25.8
450	16.60	132.75	117.31	NA	9.73	6.34	**i7.597**	25.6
430	17.71	141.63	126.16	NA	10.51	5.32	18.924	25.4

AIR CONDITIONING: ON

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	RX size (KW) 6.0 RX running (hours)	12.0	12.5	Gasoline used (Galj	(mi/gal)
30	1.11	12.17	0.00	0.00	0.00	0.00	0.000	ERR
60	2.21	24.34	3.90	1.43	0.74	0.43	1.335	44.9
90	3.32	36.51	21.07	NA	1.76	1.14	3.160	23.5
120	4.43	43.63	33.24	NA	2.77	1.30	4.936	23.1
150	5.53	60.85	45.41	NA	3.73	2.45	6.311	22.0
130	6.64	73.02	57.53	NA	4.80	3.11	3.637	20.3
210	7.75	35.19	69.75	NA	5.31	3.77	10.462	20.1
240	3.85	97.36	81.92	NA	6.33	4.43	12.233	13.5
270	9.96	109.53	94.09	NA	7.34	5.09	14.113	19.1
300	11.07	121.70	106.26	NA	3.85	5.74	15.939	12.3
330	12.17	133.37	113.43	NA	9.87	6.40	17.764	13.6
360	13.23	146.04	130.60	NA	10.33	7.06	19.590	13.4
390	14.39	158.21	142.77	NA	11.90	7.72	21.415	13.2
420	15.49	170.33	154.94	NA	12.91	3.37	23.241	13.1
450	16.60	182.55	167.11	NA	13.93	9.03	25.066	18.0
430	17.71	194.72	179.23	NA	14.94	9.69	26.392	17.3

GASOLINE CONSUMPTION

Vehicle : Hybrid Automobile based on the ETV-1
Battery E.? 15.44 KWh **(Going into** 80%DOD)
RX gas/KWh? 0.15 gal/KWh

Cycle ? 60 mph
E/mi ? 0.187 KWh (for propulsion)
0.266 KWh (including transm.eff=0.7)
0.316 KWh (plus Air Conditioning,3KW)
Vavg ? 60 mph

AIR CONDITIONING: OFF

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	**RX** Energy (KWh)	RX size (KW) 5.0 RX running	12.0 (hours)	18.5	Gasoline used (Gal)	(mi/gal)
30	0.50	7.99	0.00	0.00	0.00	0.00	0.000	ERR
60	**1.00**	15.99	0.55	0.09	0.05	0.03	0.082	733.0
90	**1.50**	23.98	8.54	1. 42	0.71	0.46	1.281	70.3
120	2.00	31.97	16.53	NA	1.38	0.89	2.480	48.4
150	2.50	39.96	24.52	NA	2.04	1.33	3.679	40.8
180	3.00	47.96	32.52	NA	2.71	1.76	4.878	36.9
210	3.50	55.95	40.51	NA	3.38	2.19	6.077	34.6
240	4.00	63.94	48.50	NA	NA	2.62	7.275	33.0
270	4.50	71.94	56.50	NA	NA	3.05	8.474	31.9
300	5.00	79.93	64.49	NA	NA	3.49	9.673	31.0
330	5.50	87.92	72.48	NA	NA	3.92	10.8'72	30.4
360	6.00	95.91	80.47	NA	NA	1.35	12.071	29.8
390	6.50	103.91	88.47	NA	**NA**	4.78	13.270	29.4
420	7.00	111.90	96.46	NA	**NA**	5.21	14.469	29.0
450	7.50	119.89	104.45	NA	NA	5.65	1 5.668	28.7
480	8.00	127.89	112.45	NA	NA	6.08	16.867	28.5

AIR CONDITIONING: CN

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	RX size (KW) 6.0 RX running	12.0 (hours)	18.5	Gasoiine used (Gal)	(mi/gal)
30	0.50	9.49	0.00	0.00	0.00	0.00	0.000	ERR
60	1.00	18.99	3.55	0.59	0.30	0.19	0.532	112.8
90	1.50	28.48	13.04	NA	1.09	0.70	1.956	46.0
120	2.00	37.97	22.53	NA	1.88	1.22	3.380	35.5
150	2.50	47.46	32.02	NA	NA	1.73	4.804	31.2
180	3.00	56.96	41.52	NA	NA	2.24	6.228	28.9
210	3.50	66.45	51.01	NA	NA	2.76	7.652	27.4
240	4.00	75.94	60.50	NA	NA	3.27	9.075	26.4
270	4.50	85.44	70.00	NA	**NA**	3.78	10.499	25.7
300	5.00	94.93	79.49	**NA**	**NA**	4.30	11.923	25.2
330	5.50	104.42	88.98	NA	NA	4.81	13.347	24.7
360	6.00	113.91	98.47	NA	NA	5.32	14.771	24.4
390	6.50	123.41	107.97	**NA**	**NA**	5.84	16.195	24.1
420	7.00	132.90	117.46	**NA**	**NA**	6.35	17.619	23.8
450	7.50	142.39	126.95	NA	NA	6.86	19.043	23.6
480	8.00	151.89	**136.45**	**NA**	**NA**	7.38	20.467	23.5

MOBILE SOURCE EMISSIONS

Vehicle : Hybrid Automobile based on the ETV-1
Battery E.? 15.44 KWh

Cycle ? SAE "D"
E/mi ? 0 . 2 0 7 KWh (for propulsion)
0.295 KWh (including transm.eff=0.7)
0.406 KWh (plus Air Conditioning,3KW)
Vavg ? 27.11 mph

Emiss.? 15.2 (g/hp.hr)HC 4.97 (g/hp.hr)NOx
250 (g/hp.hr)CO
Comment: Small Engine

AIR CONDITIONING: OFF

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	18.5 (KW) RX (hours)	EMISSIONS (grams/mile) HC	CO	NOx
30	1.11	8.85	0.00	0.00	0.000	0.000	0.000
60	2.21	17.70	2.26	0.12	0.767	12.623	0.251
90	3.32	26.55	11.11	0.60	2.515	41.369	0.822
120	4.43	35.40	19.96	1.08	3.389	55.742	1.108
150	5.53	44.25	28.81	1.56	3.913	64.366	1.280
180	6.64	53.10	37.66	2.04	4.263	70.115	1.394
210	7.75	61.95	46.51	2.51	4.513	74.221	1.476
Limit @ infinite driving distance =					6.011	98.861	1.965
RX running all the time, (more energy than needed) . . . . . =					13.904	228.688	4.546

AIR CONDITIONING: ON

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	18.5 (KW) RX (hours)	EMISSIONS (grams/mile) HC	CO	NOx
30	1.11	12.17	0.00	0.00	0.000	0.000	0.000
60	2.21	24.34	8.90	0.48	3.022	49.707	0.988
90	3.32	36.51	21.07	1.14	4.770	78.453	1.560
120	4.43	48.68	33.24	1.80	5.644	92.826	1.845
150	5.53	60.85	45.41	2.45	6.168	101.450	2.017
180	6.64	73.02	57.58	3.11	6.518	107.199	2.131
210	7.75	85.19	69.75	3.77	6.767	111.306	2.213
Limit @ infinite driving distance =					8.265	135.945	2.703
RX running all the time, (more energy than needed) . . . . . =					13.904	228.688	4.546

MOBILE SOURCE EMISSIONS

Vehicle : Hybrid Automobile based on the ETV-1
Battery E.? 15.44 KWh

Cycle ? SAE "D"
E/mi ? 0.207 KWh (for propulsion)
0.295 KWh (including transm.eff=0.7)
0.406 KWh (plus Air Conditioning,3KW)
Vavg ? 27.11 mph

Emiss.? 1.9 (g/hp.hr)HC 3.9 (g/hp.hr)NOx
40 (g/hp.hr)CO
Comment: Improved Engine

AIR CONDITIONING: OFF

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	la.5 (KW) RX (hours)	EMISSIONS (grams/mile) HC	CO	NOx
30	1.11	8.85	0.00	0.00	0.000	0.000	0.000
60	2.21	17.70	2.26	0.12	0.096	2.020	0.197
90	3.32	26.55	11.11	0.60	0.314	6.619	0.645
120	4.43	35.40	19.96	1.08	0.424	a.919	0.870
150	5.53	44.25	28.81	1.56	0.489	10.298	1.004
180	6.64	53.10	37.66	2.04	0.533	11.218	1.094
210	7.75	61.95	46.51	2.51	0.564	ii.875	1 .158
Limit @ infinite driving distance =					0.751	15.818	1.542
RX running all the time, (more energy than needed) . . . . . =					1.738	36.590	3.568

AIR CONDITIONING: ON

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	la.5 (KW) RX (hours)	EMISSIONS (grams/mile) HC	CO	NOx
30	1.11	12.17	0.00	0.00	0.000	0.000	0.000
60	2.21	24.34	a.90	0.48	0.378	7.953	0.775
90	3.32	36.51	21.07	1.14	0.596	12.553	1.224
120	4.43	48.68	33.24	1.80	0.705	14.852	1.448
150	5.53	60.85	45.41	2.45	0.771	16.232	1.583
180	6.64	73.02	57.58	3.11	0.815	17.152	1.672
210	7.75	85.19	69.75	3.77	0.846	17.809	1.736
Limit @ infinite driving distance =					1.033	21.751	2.121
RX running all the time, (more energy than needed) . . . . . =					1.738	36.590	3.568

MOBILE SOURCE EMISSIONS

Vehicle : Hybrid Automobile based on the ETV-1
Battery E.? 15.44 KWh

Cycle ? SAE "D"
E/mi ? 0.207 KWh (for propulsion)
0.295 Kwh (including transm.eff=0.7)
0.406 KWh (plus Air Conditioning,3KW)
Vavg ? 27.11 mph

Emiss.? 0.2 (g/hp.hr)HC 0.4 (g/hp.hr)NOx
4 (g/hp.hr)CO
Comment: 3-Way Catalyst

AIR CONDITIONING: OFF

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	18.5 (KW)RX (hours)	EMISSIONS (grams/mile) HC	CO	NOx
30	1.11	8.85	0.00	0.00	0.000	0.000	0.000
60	2.21	17.70	2.26	0.12	0.010	0.202	0.020
90	3.32	26.55	11.11	0.60	0.033	0.662	0.066
120	4.43	35.40	19.96	1.08	0.045	0.892	0.089
150	5.53	44.25	28.81	1.56	0.051	1.030	0.103
180	6.64	53.10	37.66	2.04	0.056	1.122	0.112
210	7.75	61.95	46.51	2.51	0.059	1.188	0.119
Limit @ infinite driving distance =					0.079	1.582	0.158
RX running all the time, (more energy than needed) . . . . . =					0.183	3.659	0.366

AIR CONDITIONING: ON

Driving Dist. (miles)	Time (hours)	Total Energy (KWh)	RX Energy (KWh)	18.5 (KW)RX (hours)	EMISSIONS (grams/mile) HC	CO	NOx
30	1.11	12.17	0.00	0.00	0.000	0.000	0.000
60	2.21	24.34	8.90	0.48	0.040	0.795	0.080
90	3.32	36.51	21.07	1.14	0.063	1.255	0.126
120	4.43	48.68	33.24	1.80	0.074	1.485	0.149
150	5.53	60.85	45.41	2.45	0.081	1.623	0.162
180	6.64	73.02	57.58	3.11	0.086	1.715	0.172
210	7.75	85.19	69.75	3.77	0.089	1.781	0.178
Limit @ infinite driving distance =					0.109	2.175	0.218
RX running all the time, (more energy than needed) . . . . . =					0.183	3.659	0.366