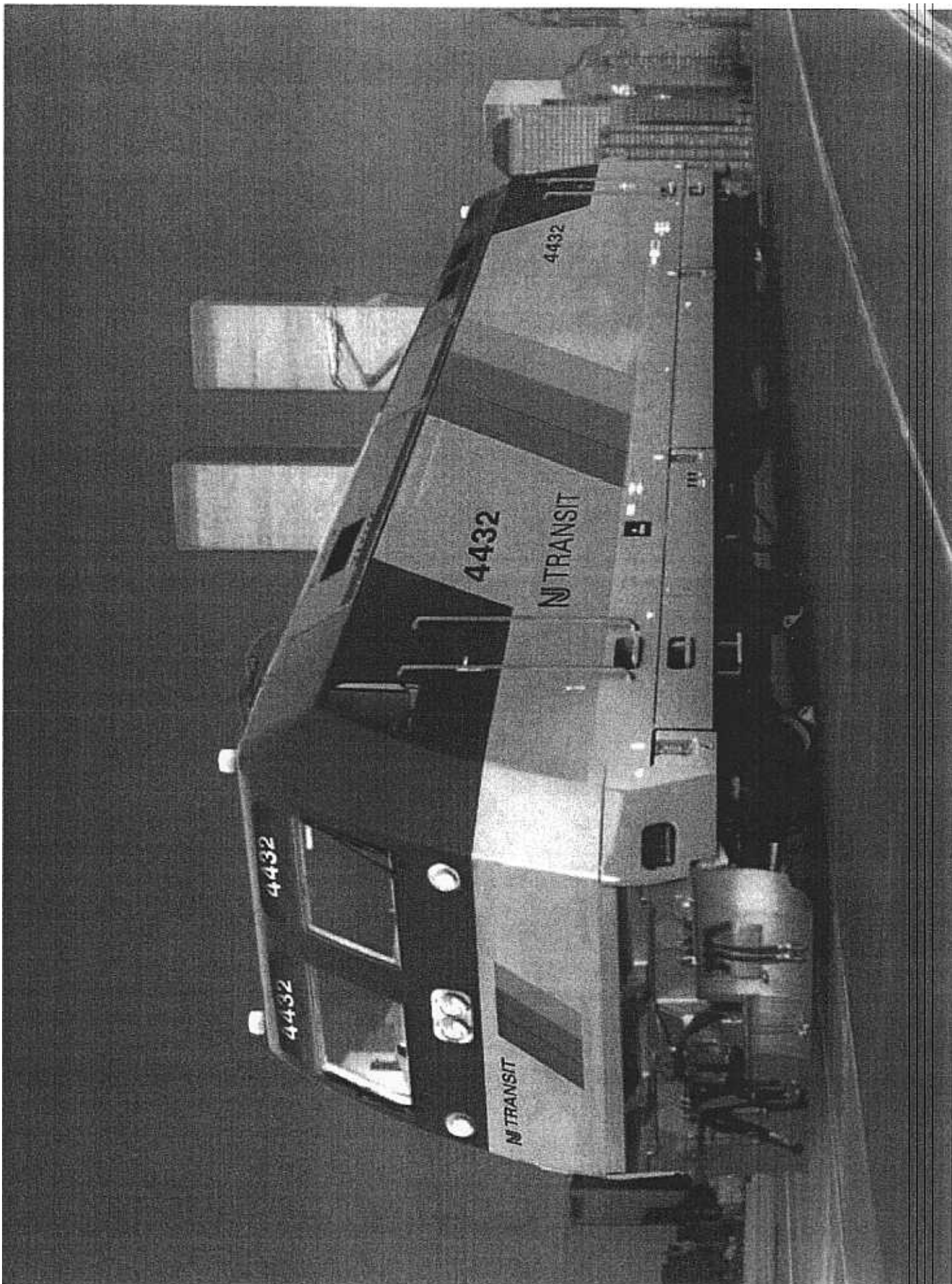


APPENDIX 4

***Design Data
ALP-46 NJTC Electric Locomotive***



**4. TRACTION AND BRAKING EFFORT
CHARACTERISTIC**

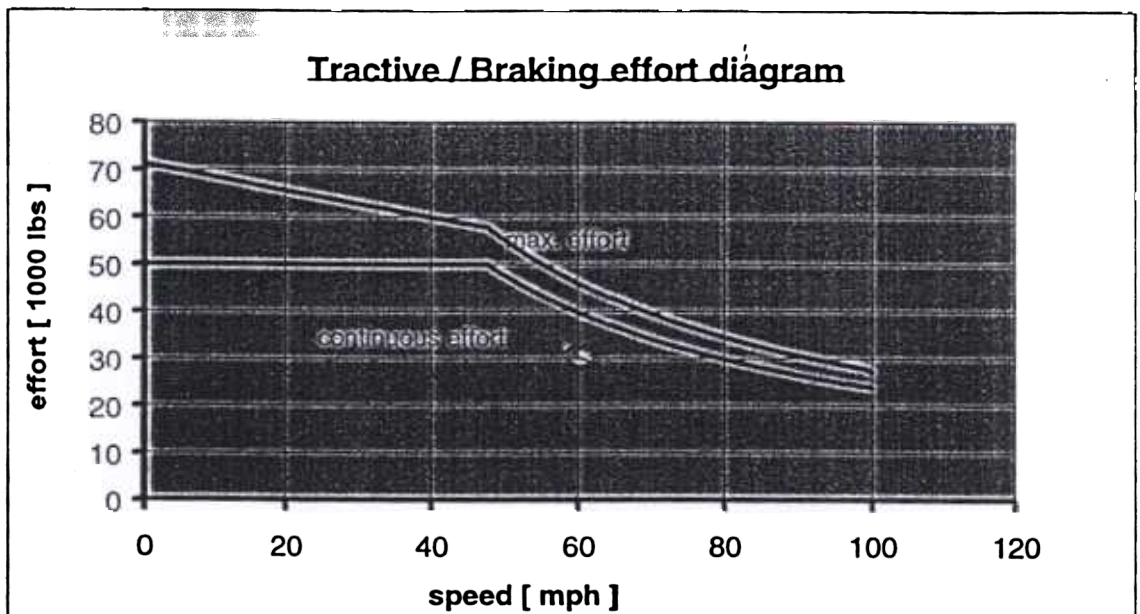
4. TRACTION AND BRAKING EFFORT CHARACTERISTIC2

4. TRACTION AND BRAKING EFFORT CHARACTERISTIC

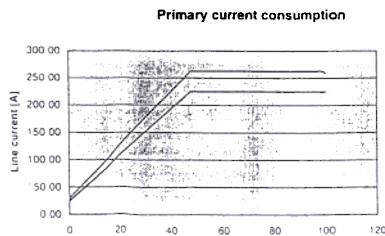
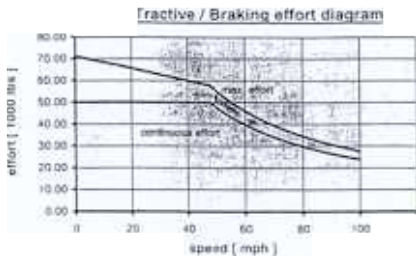
The diagram below shows the maximum and nominal traction and braking effort curve at wheel rim.

The 'maximum' curve corresponds to the values specified for traction, and is consistent with the dimensioning of the motors, taking into account also the inverter properties.

The braking effort may be limited electronically (particularly at low speed) to lower values which shall be agreed upon.



Power Motor kW)	Power Loco (HP)	speed (mph)	Effort (kN)	Effort (kibs)	accel[m/s ²]	acc.[mph/s]	Pwheel[kW]	Losses gear [kW]	Pmotor total in [kW]	Losses line conv [kW]	Losses conv tot [kW]	Ptransfo out [kW]	Losses transfo [kW]	Plot at calenary [kW]	I_Line [A]
1370	7456	0	316.20	71.15	3.42	7.66	0.00	0.00	416.00	64.99	174.99	710.99	32.02	743.01	29.72
1370	7456	47.7	257.04	57.84	2.78	6.22	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	50	245.22	55.18	2.65	5.94	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	55	222.93	50.16	2.41	5.40	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	60	204.35	45.98	2.21	4.95	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	65	188.63	42.45	2.04	4.57	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	70	175.16	39.42	1.90	4.24	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	75	163.48	36.79	1.77	3.96	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	80	153.26	34.49	1.66	3.71	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	85	144.25	32.46	1.56	3.49	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	90	136.23	30.66	1.47	3.30	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	95	129.06	29.04	1.40	3.12	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1370	7456	98.8	124.10	27.93	1.34	3.00	5481.02	109.62	6006.64	132.08	242.08	6368.72	192.24	6560.96	262.44
1351	7352	100	120.91	27.21	1.31	2.93	5405.00	108.10	5929.10	131.15	241.15	6290.25	188.27	6478.52	259.14
1184	6444	0	222.15	50.00	2.40	5.38	0.00	0.00	300.00	63.60	163.60	583.60	31.36	614.96	24.60
1184	6444	47.7	222.15	49.99	2.40	5.38	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	48	220.76	49.68	2.39	5.34	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	50	211.93	47.69	2.29	5.13	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	55	192.66	43.35	2.09	4.66	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	60	176.61	39.74	1.91	4.28	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	65	163.02	36.68	1.76	3.95	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	70	151.38	34.06	1.64	3.66	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	75	141.29	31.79	1.53	3.42	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	80	132.45	29.81	1.43	3.21	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	85	124.66	28.05	1.35	3.02	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	90	117.74	26.49	1.27	2.85	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	95	111.54	25.10	1.21	2.70	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	98.8	107.25	24.13	1.16	2.60	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92
1184	6444	100	105.96	23.84	1.15	2.57	4736.88	94.74	5131.62	121.58	221.58	5473.19	149.82	5623.02	224.92



Plosses motor = 4 x 75 = 300 kW at rated current
Plosses motor = 4 x 104 = 416 kW at max. current

Power auxiliares: 120 kW constant consumption
No HEP load