Required vehicle information for power system studies and simulations

The following information must be prepared and submitted to respective National Rail Administration in accordance with requirements for acceptance of vehicle to national rail network in Norway and/or Sweden. The information is needed for traction power system simulations in Simpow ® Tracfeed ® simulations in order to develop traction power system for future, investigate power systems problems and do energy demand and loss calculations.

No comment means information not found/received.

Vehicle: _____

Data required for all vehicles:

Item number	Description	Comment
1	Motor type (asynchronous motor or direct-current motor)	
2	Dynamic mass [metric tons] of vehicle including load	
3	Mass [metric tons] of vehicle including load	
4	Adhesion mass [metric tons] of vehicle	
5	Maximum speed [km/h] for vehicle	
6	Length [m] of vehicle	
7	Curve resistance CR0 [kNm/tons] and CR1 [m] as function of curve radius [m] as in formula (curve resistance)=CR0/((curve radius)-CR1)·MASS	
8	Minimum allowed curve radius [m] for the vehicle	
9	Running resistance RRA [kN], RRB [kN/(km/h)] and RRC [kN/(km/h)^2] on straight track as function of speed [km/h] in formula (running resistance)=RRA+RRB·v+RRC·v^2	
10	Adhesion coefficients ADH1 [km/h] and ADH2 [km/h] in adhesion formula (adhesion)=ADHCOEFF+ADH1/(speed+ADH2). ADHCOEFF is track dependent and in this simulations presumed to be 0.161.	
11	Nominal voltage [kV] at current collector	
12	Active power consumption [MW] for auxiliary power, train heating and air condition which is taken directly from the main transformer (no load losses not included)	
13	Power factor [] at zero speed for auxiliary power, train heating and air condition which is taken directly from the main transformer	
14	Losses [MW] for the tractive equipment from current collector to wheel at no load, for instance the no load losses of the main transformer	
15	Maximum and continuous curve for tractive and electric braking effort [kN] as function of speed	

	[km/h] at nominal voltage	
16	Desired acceleration and retardation [m/s^2] as function of speed [km/h]	
17	Efficiency [%] for maximum tractive effort from current collector to wheel at maximum tractive effort as function of speed [km/h]. Auxiliary power not included	
18	Maximum power consumption and regeneration [MW] (measured at current collector) as function of contact line voltage [kV]. Power consumption for passenger coaches if vehicle is locomotive to be added.	
19	Maximum tractive effort [kN] as function of contact line voltage [kV]	
20	Main circuit schematics	
21	Filter configuration and component values/data including main transformer	
22	Admittance frequency response including control system	
23	Software version(s)	

Additional data required for phase angle controlled (thyristor) vehicles:

Item number	**Description**	**Comment**
24	Number of converter bridges in series with one motor	
25	Maximum allowed voltage between the motor's terminals under the worst conditions in [%]	
26	First limitation for the motors; current or flux	
27	Power factor [] of the motor when the control is with fully advanced angle	

Additional data required for inverter vehicles:

Item number	**Description**	**Comment**
28	Power angle alternative power factor (measured at current collector) for power consumption and regeneration as function of contact line voltage [kV]	
29	Active power consumption [MW] for auxiliary power, train heating and air condition which is taken from the converter bridge	
30	Power factor [] at zero speed for auxiliary power, train heating and air condition which is taken from the converter bridge	

General comments:

Date and signature: _____