

Ganz Prototype Refurbishment Specification

No.	Scope of work	Specification	Improvement
1	Braking system	System overhaul	Reliability
		Fine tune existing braking function to mitigate excessive wheel flat problem	Reliability & maintenance cost
2	Traction control system	System overhaul	Reliability
		Modify speed control circuit to achieve better traction and speed control at low speed	Reliability & maintenance cost
		Modify the wheel slip control system to achieve better adhesion	Reliability
3	Auxiliary power supply system	Modify and replace the control system of the Motor Alternator (MA) set	Reliability & passenger comfort
		Overhaul to restore machines out of specification	Reliability & passenger comfort
4	Doors	System overhaul	Reliability
		Install obstacle detection feature	Safety
		Modify door control circuit to achieve on demand opening, timer close alarms, etc	Reliability
		Eco-glo strips on step edges and step well lights	Accessibility
5	Compressed air supply system	System overhaul	Reliability
		Repair coolers	Reliability
		Inspect & test air reservoirs	Reliability
		Clean, restore and test resistor grids	Reliability
6	Pantograph	Servicing the auxiliary compressor	Reliability
7	Couplers, drawgears & intercar passages	General overhaul, change spring packs, pins and bushes to code	Reliability
		Redesign end door latch to be more rugged and self adjusting	Safety
		Replace intercar door seals and bellows	Safety
8	Electrical Systems	Overhaul (main resistor grids and fan motors, wire tags, jumpers, traction motor cut out switches)	Reliability
		Replace life expired components (contactors, relays, high speed circuit breakers)	Reliability
		Replace saloon power points with RCD protected type	Reliability
		Additional electrical protection for saloon heaters	Reliability
9	Bogies	Modify torsion bar mounting brackets	Reliability
10	Driver Interface	Replace driver seats to KR locomotives type	Driver comfort
		Modify cab layout (tidy up control panel by removing obsolete switches, fit emergency brake override switch, fit Passenger Information System)	Driver comfort
		Modify cab side windows	Driver comfort
11	Passenger Communication	Install new auto Public Address (PA) system	Passenger information / amenities
		Install Passenger Information Display System (PIDS)	Passenger information / amenities
12	Saloon Windows	Overhaul (frames, seals and springs)	Life extension
		Install latest spec protective window film	Maintenance cost
13	Safety	Install CCTV system	Safety
		Replace cab windscreen to comply with latest railway standard	Safety
		Install smoke alarms	Safety
		Fit anti climb fins	Safety
		Replace tail lights by LED type	Safety & maintenance cost
		Fit emergency brake override	Safety
		Fit window glass hammers	Safety
14	Structural Integrity	Inspect, repair and apply corrosion treatment including watertightness to car body	Life extension
		Carry out Non Destructive Testing (NDT) to bogie and major underframe rotating machinery mountings for crack inspection	Life extension
15	Exterior	Repaint and branding	Vehicle general condition and presentation
16	Interior Fitout	New seats (extra legroom)	passenger comfort
		Better flip-up seats in the wheelchair areas giving improved space utilization	Accessibility
		New floor covering (Matangi type) and underfloor plywood	Life extension
		Replace interior panels and insulation to a fire retardant type	Safety
		Ceiling painting and change emergency light inverters	Safety & maintenance cost
		Clean and repair luggage racks	Passenger amenities
		Improve wheelchairs and bicycle storage (similar to Matangi)	Passenger amenities / accessibility