



# Needs and experiences from the Railway sector for Freight

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External

V001



FUEL CELLS  
AND HYDROGEN  
JOINT UNDERTAKING



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# Generic Requirements for Freight Operation

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## Objective evidences acc.

- TSI LOC & PAS
- TSI Noise
- TSI ENE
- EN45545 Fire Safety
- EN 50126/128/129 Safety
- IRIS (ISO/TS 22163) Quality

## Operational requirements

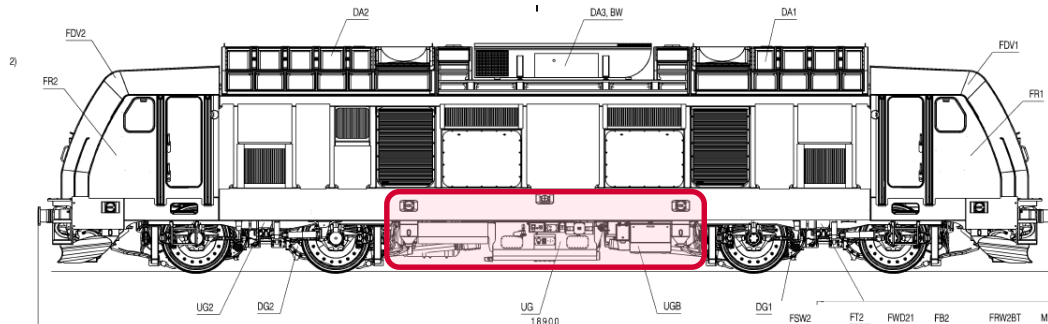
- Maintenance periods  
(Inspection after >50.000km, Maintenance activities >300.000km)
- Handling of fuel at track / depot like diesel

## Technical requirements

- Voltage output 1800V – 3000V

# Requirements for Freight Operation

## main-line locomotive medium power catenary free



### Operational boundaries

- Distance between fuel stop > 1000km
- Operation time >15h per day
- Ready to operate <30Min

### Replacement of diesel-gensets

Total power: >2.4MW

Waste heat/cooling power: 4x 450kW

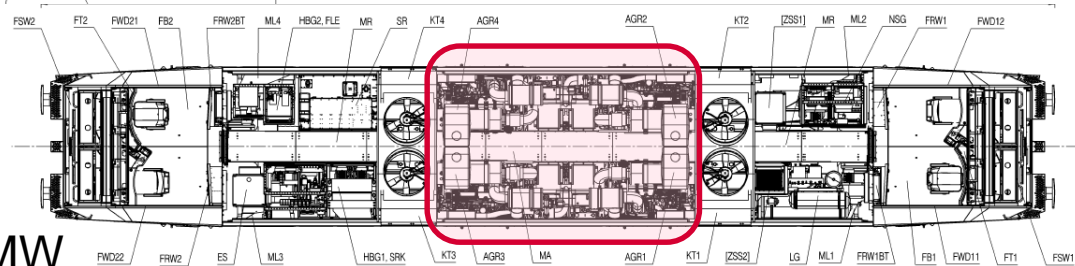
Machine Room:

4 cuboids each

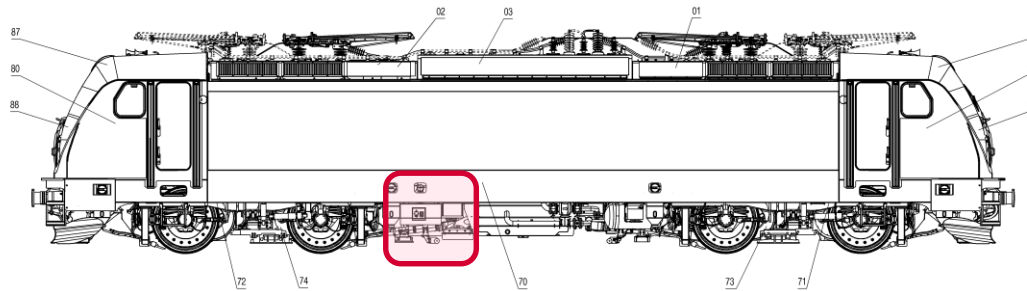
a) Volume	3500mm x 1050mm x 1800mm
b) Mass	3500kg

Tank in underframe

a) Volume	2700l	4000l
b) Mass (empty)	900kg	1300kg



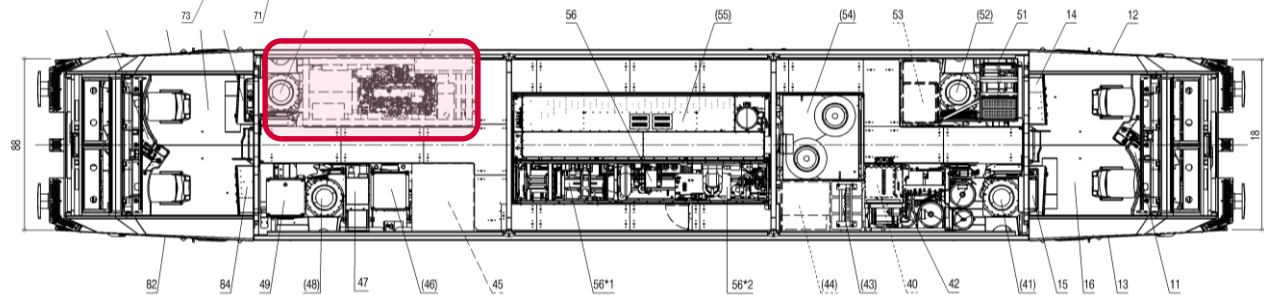
# Requirements for Freight Operation main-line locomotive under catenary line with last mile (LM)



## Operational boundaries

- LM only catenary free (harbor, depot)
- Operation time 0-4h per day
- Ready to operate <5Min

## Replacement of LM diesel-genset & Battery



Totalpower: >275kW

Maschine Room:

1 cuboids	a) Volume	2800mm x 1050mm x 1800mm
	b) Mass	4800kg

Tank in underframe

a) Volume	400l
b) Mass (empty)	200kg

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# Q&A

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