

RAIL COACH FACTORY, KAPURTHALA


MD46261

Date: 06.01.2016

Sub: Specification no. MDTS-100 Rev-02 for Technical Specification for Fuel Tank for ALSTOM LHB Design generator car coaches.

Please find enclosed a copy of MDTS-100 Rev-02 for Technical Specification for Fuel Tank for ALSTOM LHB Design generator car coaches. This should be implemented with immediate effect.

Encl. MDTS-100 Rev-02

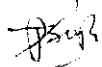

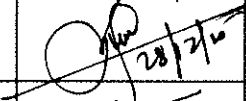
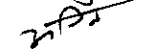

Dy CME/D-1

Dy CPLE-III

Copy to: -

CQM, CPLE, CWE/Fur, CMM/RCF, CMT, CMM/TKJ
✓ SSE/Record
SSE/Lib/Design
SSE/Design/RCF/TKJ

SPECIFICATION	TECHNICAL SPECIFICATION FOR FUEL TANK FOR ALSTOM LHB COACHES	MDTS 100 REV-02 Page 1 of 5 DATED 26.12.2015
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NAME	DESIGNATION	SIGNATURE	DATE	LEVEL
T.P.Singh	SSE/D/FUR-2			Prepared
Joginder Singh	SME/D-1			Agreed
Suraj Prakash	Dy CME/D-1		28.12.15	Reviewed
A.K.Kathpal	CDE		28.12.15	Approved

Issue/Rev	Details of Changes	Date
01	<ol style="list-style-type: none"> 1. In clause 2.1 sheet thickness of fuel tank has been changed from 2 mm to 4mm. and weight has been changed from 350 Kg to 550 Kg. 2. In clause 2.1 line-one additional mounted brackets on each side is to be provided at the centre line of the fuel tank to support more weight added. 3. In clause 5.0 line-additional mounting bracket holes shall be confirmed from RCF added. 	01 01 04
02	Clause 3.0 modified for provision of additional equalising pipe, EPDM in place of rubber seal and testing pressure.	26.12.15


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SPECIFICATION	TECHNICAL SPECIFICATION FOR FUEL TANK FOR ALSTOM LHB COACHES	MDTS 100 REV-02 Page 2 of 5 DATED 26.12.2015
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1.0 SCOPE

This specification covers the general & technical requirements of under slung fuel tank & mountings for ALSTOM LHB Design generator car coaches.

Scope of supply shall cover all the items mentioned in Drg. No. 602.291.000.001 Alt-'a' along with fuel tank. While constructional detail of fuel tank shall meet the requirement of Drg. No. 602.291.200.000(1 sheet) & 602.291.100.000 (4 sheet), the drawings are only for reference purposes. Alternative design can be developed by supplier keeping the mounting interface & space envelope the same. The capacity of fuel tank shall be 1540 litres.

2.0 FUNCTIONAL REQUIREMENTS:

2.1 FUEL TANK MATERIAL:

Body of fuel tank shall be made out of stainless steel to DIN 17440 1.4301(X5CrNi 1810) equivalent to AISI 304 or IS:6911(1992) Gr,304S2 of 4mm sheet thickness. All pipes, inlet/outlet fittings, Mountings etc. shall also be to stainless steel of the same grade. Approximate weight of fuel tank with accessories should not exceed beyond 550 kg.

2.2 FABRICATION PROCESS REQUIREMENT:

TIG welding process is to be followed. Pre & post weld/surface preparation for stainless steel as per standard practice to be followed.

3.0 TECHNICAL REQUIREMENTS:

The fuel tank shall be mounted below the coach through the six mounting brackets (one additional mounting bracket on each side of fuel tank is to be provided at the centre line to support more weight). The tanks, along with mounting brackets should be of robust construction capable of withstanding following service loads.

Force Direction	Force in kgf
Vertical force	2500
Force in running direction (along width of the tank)	7200
Force transverse to the running direction (along Length of the tank)	1500

The calculated strength should have adequate factor of safety:

Against Fracture (for steel)	1.5
Against yield stress ($\sigma_{0.2}$)	
For non welded parts	1.0
For welded areas	1.1

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SPECIFICATION	TECHNICAL SPECIFICATION FOR FUEL TANK FOR ALSTOM LHB COACHES	MDTS 100 REV-02 Page 3 of 5 DATED 26.12.2015
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In addition, following conditions shall apply:

- The fuel tank shall be able to withstand flying ballast.
- The fuel tank shall be provided with two level indicators of commercial proven quality and there should not be any fuel leakage in case of breakage of the indicator glass.
- The tanks shall be provided with a discharge facility and shall be easily cleanable when necessary.
- Fuel tank filling cap shall be of spring loaded with additional provision of pad lock.
- All gasket and sealing used shall be oil resistant.
- All the holes are to be jig drilled only.
- The coaches running on Indian Railways are designed for a service life of 30 years. The fuel tanks are to be developed and assembled accordingly.
- **Additional equalising pipe, specification for EPDM in place of rubber seal and testing pressure will be maintained as per drawing no. MI006589.**

4.0. SAFETY FEATURES OF FUEL TANK

Fuel tank shall be manufactured with high standard engineering practices with following inherent safety features:

- The filler pipe shall be fitted with a narrow sieve. The sieve will prevent the open flames run in the fuel tank. The sieve must always be mounted in the filler pipe to give the tank fire safety.
- Ventilation pipe shall be provided and following shall be ensured:
- Until opening the tank top, no pressure exchange through top should be allowed.
- During fill up, the ventilation pipe should prevent gas pressure in the tank.
- The ventilation pipe construction should prevent fuel penetration out of pipe.
- Air relief valve shall be provided for safety of fuel tank. During filling up and emptying of fuel tank, it shall prevent build up of high or low pressures in the tank. If the train slants or the tank turns to the top, the air relief valves should prevent the penetration of fuel through the ventilation tube.
- Fuel tank shall have one bracket for earthing plug.

5.0. INTERFACES WITH CARBODY

Mounting brackets and holes for mounting the tanks shall be as per Drg.No. 602.291.100.000 (additional mounting bracket holes shall be confirmed from RCF). The overall dimensions of tanks shall be adapted to fit within available space as represented in Drg. No. 1.11012.0.89.310.001 alt-'A'.

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SPECIFICATION	TECHNICAL SPECIFICATION FOR FUEL TANK FOR ALSTOM LHB COACHES	MDTS 100 REV-02 Page 4 of 5 DATED 26.12.2015
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6.0 WARRANTY:

The supplier shall give warranty for the complete or part of fuel tanks, for failing or proving unsatisfactory in service due to defective design, material of workmanship within 36 months from the date of regular supply and shall replace the same at his own cost and risk. The supplier shall fix metallic identification marks on each fuel tank clearly marking the name/address of supplier and date of supply.

7.0 DOCUMENTS TO BE SUBMITTED BY SUPPLIER FOR PROTOTYPE APPROVAL:

The following documentation for the assembly of fuel tanks and suspension arrangement are to be prepared by the supplier for submission along with prototype assembly:

- A set of drawings consisting of drawings and parts lists.
- clearly organised instructions for mounting and adjusting the fuel tanks, changing the fuel tanks and wearing parts.
- Maintenance and repair instructions.
- Technical description of fuel tanks.
- A copy of test certificate of the supplier.

8.0 TESTING PROTOTYPE & REGULAR PRODUCTION ASSEMBLIES:

8.1 Type Test:

The supplier shall supply one prototype of fuel tank and suspension along with the documents indicated above for approval before commencing bulk supply. This prototype and drawings shall be examined from all viewpoints and supplier shall incorporate changes suggested by RCF in the prototype as well as bulk supply.

Testing of the fuel tanks prototypes shall be done in the same conditions as fixed in the coaches. The following test shall be applied to prototype samples.

- Dimensional checking.
- Fuel tightness: The fuel tank shall be tested for leakage at the pressure of 35 kPa. All joints should be free from leakage.
- The fulfillment of the strength requirements according to para 3.0 of this specification by calculations and tests respectively.
- The complete weight of the entire tank types and suspensions.
- Test report of stainless steel sheet/coils from the manufacturer of stainless steel.

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SPECIFICATION	TECHNICAL SPECIFICATION FOR FUEL TANK FOR ALSTOM LHB COACHES	MDTS 100 REV-02 Page 5 of 5 DATED 26.12.2015
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The bulk manufacture shall be undertaken only after the approval of prototype.

The clause is applicable for the first supply of a supplier. However, RCF shall have the right to repeat prototype approval process in subsequent order also. In this regard RCF decision shall be final.

8.2 Acceptance Test :

This test shall be done on all the supplies after approval of prototype sample of fuel tanks.

- Dimensional checking.
- Fuel tightness –the fuel tank should be tested for leakage at the pressure of 35 kPa. The pressure shall be retained for min.15 minutes. All joints should be free from leakage.
- The complete weight of the entire tank with suspensions.
- Test for checking weld quality.

9.0 UPGRADATION OF DESIGN:

Supplier may offer alternate design of fuel tanks for all the above or any of the above clauses with a view to upgrade the design. Clause-wise justification shall be given by the supplier in such a case. Fuel tanks having a lower weight shall be preferred. Specification details may be deviated from those specified above, if sufficient technical justification is available. However, RCF 's decision on all such matters shall be final.

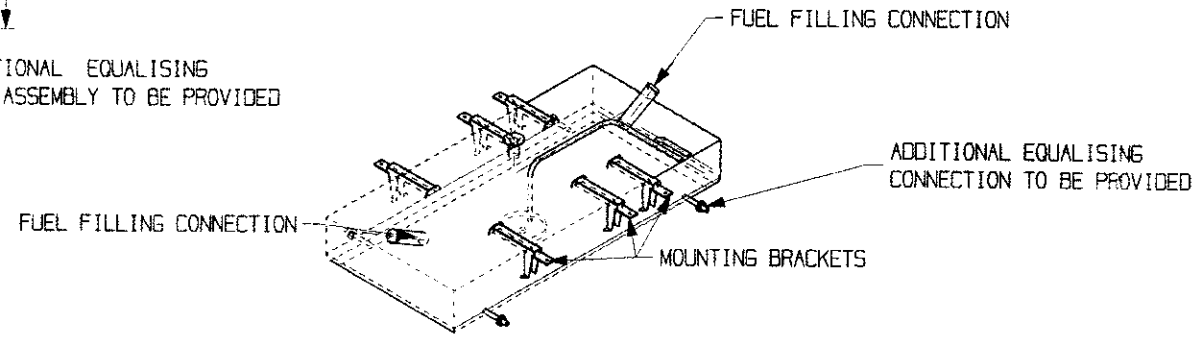
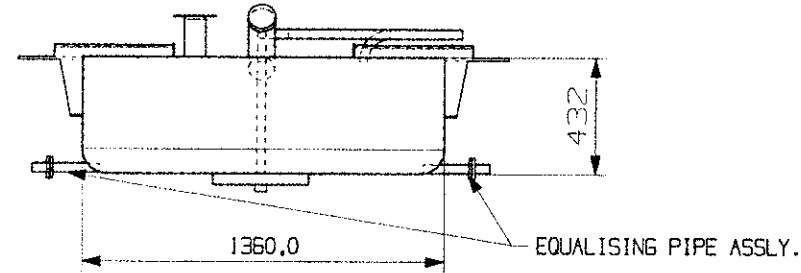
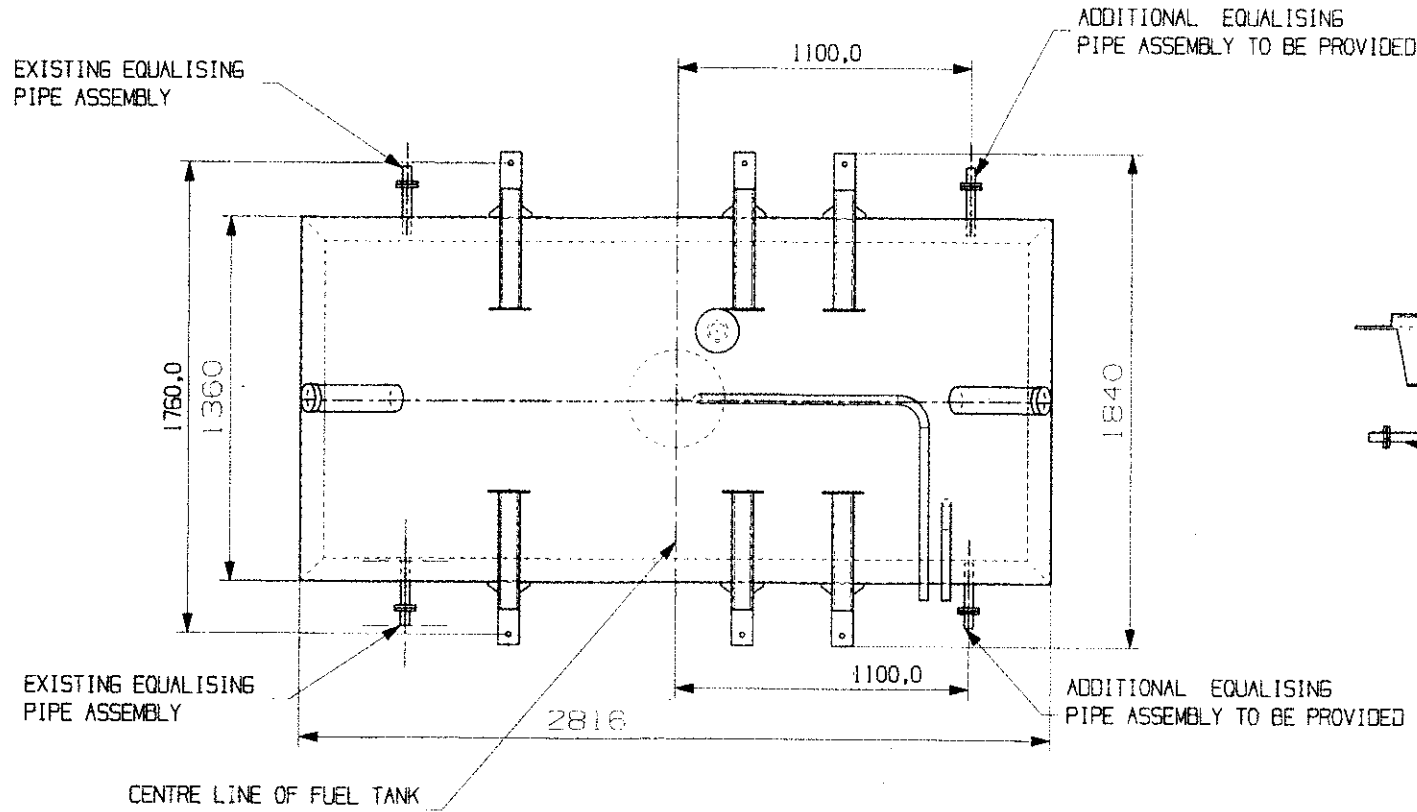
10.0 LIST OF APPLICABLE DRAWINGS:

- 10.1 Drg. No. 602.291.000.001 Alt-'a'
- 10.2 Drg. No. 602.291.200.000 (One sheet)
- 10.3 Drg. No. 602.291.100.000 (Four sheet)
- 10.4 Drg. No. 1.11012.0.89.310.001 alt-'a'
- 10.5 Drawing no. MI006589


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ALT. NO	ALT. DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL



VIEW FOR REFERENCE ONLY

NOTE - :

1. ADDITIONAL EQUALISING PIPE ASSEMBLY HAVING 25 BORE WILL BE PROVIDED BY FOLLOWING TIG WELDING PROCESS AS SHOWN IN DRAWING.
2. SPECIFICATION FOR EPDM (MDTS 030) SHALL BE USED INPLACE OF RUBBER SEALS AS MENTIONED IN PREVIOUS DRAWINGS OF FUEL TANKS.
3. THE FUEL TANK SHALL BE TESTED FOR LEAKAGE AT THE PRESSURE OF 35 KPa.

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ENTERED
IN
INTO
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DATA BASE

06 NOV 2015

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WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	GROUP	DEVICES ON UNDERFRAME		SUPERSEDES: NIL	
WEIGHT	FILE	C:\GRIP\users2\dl\MI006589.prt (3D)				
NIL	KG	FUEL TANK 1500 LITRES			SCALE	SSE/REC
S.AREA	M ²	FOR LHB COACHES			1:5	CHD
LENGTH / -DIA-	M	RAIL COACH FACTORY, KAPURTHALA			DRN	AVTR
WIDTH / THICK	M	रेलकोच फेक्टरी कपुरथला			REF.DRG.No.	NIL
HEIGHT	M	IRS			PL NO.	NIL
NIL	M	ABEVSME			DRG.NO MI006589	
					CDE	ALT. NIL SIZE A2 SHEET 1/1

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DATE OF FIRST ISSUE 06/11/2015

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