

D741802331

Rail Coach Factory, Kapurthala

MD46111

Date: 15.11.18

Sub: Issue of specification MDTS-24317, Rev-01 for Schedule of technical requirements for Electro Pneumatic Pressurised Flushing system for BG coaches.

Please find enclosed the specification MDTS-24317, Rev-01 for schedule of technical requirements for Electro Pneumatic Pressurised Flushing system for BG coaches.

All concerned are requested to take necessary action.



(D.K. Singh)

Dy CME/D-2

Encls: MDTS-24317, Rev-01 (06pages)

Dy CPLE-II

✓ SSE/Lib/Design

SSE/Record (With Original Specification)

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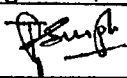

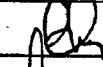

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RAIL COACH FACTORY KAPURTHALA	SPECIAL TERMS AND CONDITIONS FOR ELECTRO- PNEUMATIC PRESSURISED FLUSHING SYSTEM FOR BG COACHES.	MDTS-24317 REV- 01 PAGE 1 OF 6 DATE 31.10.18
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Name	Designation	Signature	Date	Level
T.P.SINGH	SSE/D/Fur-2		31.10.18	Prepared
RAVI RANJAN KUMAR	ADE/D/FUR-2		31.10.18	Agreed
D.K.SINGH	Dy. CME/D-2		31.10.18	Reviewed
MANISH BHIMTE	CDE		31.10.18	Approved

Issue/Rev	Details of Changes	Date
00	Nil	09.05.18
01	<ol style="list-style-type: none"> Clause 1.3 modified by incorporating "The electrical switch should be IP-65 compliant or above. It should also be permanent illuminating type and its outer body should be sturdy having metal body. Clause 1.4 added as "All electrical, electronic & pneumatic system should be shock and vibration tested and comply to EN61373 category-2. These components should also comply with EN50155 for environmental protection." Clause 2.2 modified to incorporate "Regular orders shall be placed on tenderers who have supplied at least 100 nos of such system to Railways (national or international)." Clause 4.1,4.2 & 4.3 modified to incorporate "Alternatively, complete system can be mounted on under frame also (above the bio tanks). However, there should not be any infringement of the parts of this system with any other underslung moving/non-moving items." Clause 4.3 modified to incorporate : <u>the system must be mounted on under frame above the bio-tank.</u> Clause 4.4 modified to incorporate "After flushing, the system should be ready for next flushing after max 60 second". Clause 4.6 modified to incorporate " AC-DC / DC- DC converter fitted should be able to withstand +/- 30% voltage fluctuations, 2 KVA surge, +/- 10% ripple and complying with IEC 60571 or any equivalent international standards." 	31.10.2018


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RAIL COACH FACTORY KAPURTHALA	SPECIAL TERMS AND CONDITIONS FOR ELECTRO- PNEUMATIC PRESSURISED FLUSHING SYSTEM FOR BG COACHES.	MDTS-24317 REV- 01 PAGE 2 OF 6 DATE 31.10.18
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1. PREAMBLE:-

- 1.1 This technical specification covers the general conditions, technical requirements, inspection, testing procedure, repair maintenance services to be provided during the warranty period for Electro-Pneumatic pressurized flushing system.
- 1.2 Pressurized flushing system will transfer the fecal matter from the Indian style bowl/ western style bowl with minimum uses of pressurized water.
- 1.3 Passenger interface will be a Electrical switch which should be operated by a light press. The electrical switch should be IP-65 compliant or above. It should also be permanent illuminating type and its outer body should be sturdy having metal body.
- 1.4 All electrical, electronic & pneumatic system should be shock and vibration tested and comply to EN61373 category-2. These components should also comply with EN50155 for environmental protection.

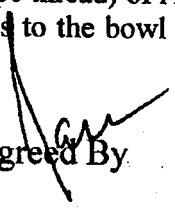
2. ELIGIBLTY CRITERIA

- 2.1 Tenderer or their principal should be in the field of design, development and supplying of pneumatic/electric control valves. Proof in the regard (including of items using these control valves) shall be submitted along with the tender.
- 2.2 Tenderer or their principal should have supplied pressurized flushing system (pneumatic, electric or electro-pneumatic) to railways or similar pressurized flushing system of CDTS or vacuum evacuation system to railways. Proof in this regard shall be submitted along with the tender. Regular orders shall be placed on tenderers who have supplied at least 100 nos of such system to Railways (national or international).
- 2.3 Tenderer or their principal should have well established manufacturing and testing facilities. Tenderer or their principal should have established quality control system and organization to ensure quality of the product and should be an ISO 9000 certified company in field of flushing system/pneumatic or electric control valves or should have an internationally certified quality control system.

3. SCOPE OF SUPPLY :

- 3.1 Pressurized flushing system should be supplied with all accessories including clamping and bolt/nuts as per requirement. System interface with car body shall be clearly specified and submitted along with the offer. List of all items supplied to be labeled with every package.
- 3.2 Supply, installation and commissioning will be in the scope of Tenderer.
- 3.3 Plumbing Connection from Auxiliary roof water tank (3/4" female pipe thread) of AC coaches /roof water tank (1" female pipe thread) of Non-AC coaches to the bowl of


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RAIL COACH FACTORY KAPURTHALA	SPECIAL TERMS AND CONDITIONS FOR ELECTRO- PNEUMATIC PRESSURISED FLUSHING SYSTEM FOR BG COACHES.	MDTS-24317 REV- 01 PAGE 3 OF 6 DATE 31.10.18
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- 3.4 One no. Isolating cock (3/4" BSP) in water line from Auxiliary roof water tank/ roof water tank and 1 no. Isolating cock (1/4" BSP with both end female thread) in pneumatic line shall be provided to isolate the system for attending the faults occurred, if any, in Pressurized unit or in pneumatic/water line.
- 3.5 Apart from above, all other items/activities required for installation and functioning of the system is under the scope of tenderer.
- 3.6 Firm shall provide electrical switch to be operated by the passenger for using the pressurized flushing system.

4. TECHNICAL REQUIREMENTS:

- 4.1 Pressurized flushing system shall be installed within the existing space envelope to Dr. No. 1 10113.0.21.530.001 alt-ER earmarked at doorway on FRP Toilet Module in AC Coaches, behind attachment Wall to Dr. Nos. LW64143 alt-i & LW64144 alt-h with 110mm Max. space. Alternatively, complete system can be mounted on under frame also (above the bio tanks). However, there should not be any infringement of the parts of this system with any other under-slung moving/non-moving items.
- 4.2 Drawing no. LE63202 alt-d for Indian style pan bowl interface and 1.10113.0.30.400.002 alt-FR2 alt-ER & 1.10113.0.30.400.004 alt-FR2 for mounting and bracketing interface for LHB type AC and Non AC Coaches. Alternatively, complete system can be mounted on underframe also (above the bio tanks). However, there should not be any infringement of the parts of this system with any other underslung moving/non-moving items.
- 4.3 In Antyodaya Non AC Coach, mounting and bracketing interface drawing is MI006710 for one Lavatory Module with outside Electrical cubicle the system must be mounted on under frame above the biotank. For other Lavatory Modules, drawings for mounting and bracketing are same as used in Clause 4.1 & 4.2. or alternatively, complete system can be mounted on underframe also (above the bio tanks). However, there should not be any infringement of the parts of this system with any other underslung moving/non-moving items.
- 4.4 Electro-Pneumatic Pressurized flushing system should effectively clean the bowl and transfer the fecal matter to Bio-Digester Tank with a min. quantity of water. Max. Discharge of water during a flush shall be 1.5 liters. After flushing, the system should be ready for next flushing after max 60 second. Pressurized water alone should discharge through the spray tube around bowl. No mix of air & water should be released in the bowl at the time of flushing.

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RAIL COACH FACTORY KAPURTHALA	SPECIAL TERMS AND CONDITIONS FOR ELECTRO-PNEUMATIC PRESSURISED FLUSHING SYSTEM FOR BG COACHES.	MDTS-24317 REV-01 PAGE 4 OF 6 DATE 31.10.18
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4.5 All mechanical, pneumatic and electric/electronic components of pressurized flushing system shall operate under the conditions mentioned in para-5 without any problems.

4.6 The required energy for the pressurized flushing system shall be provided from the pneumatic/electric circuits of the coach. A limited quantity of 3.5 litres/minute/lavatory can be made available at 5 kg/cm² to 6kg/cm² for the system. Tenderer should specify the consumption of air in liters/minute or liter/flushing operation, at the time of prototype offer. Also, 110 V AC/DC supply is available in the coach. AC-DC / DC- DC converter fitted should be able to withstand +/- 30% voltage fluctuations, 2 KVA surge, +/- 10% ripple and complying with IEC 60571 or any equivalent international standards. The Tenderer should clearly mention the electrical power requirement in its offer. Total peak electrical power requirement per toilet shall not exceed 600 Watts.

4.7 The pressurizer unit should be compact and robust. The pressurized flushing system shall be designed for a usage of min. 150 times within 24 hours.

5. OPERATING CONDITIONS

5.1 Ambient Conditions: -4°C to 55°C with 100% humidity and dust, high humidity air with salt content. System and its components should not get damaged in these conditions. Temperature variations can be quite high in the same journey or short period of time. Most coaches are based in coastal cities, with continued exposure to Salt laden air.

5.2 Car-body dynamics and forces on flushing system:

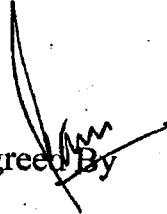
- 5.2.1.1. ± 100mm vertically
- 5.2.1.2. ±55mm laterally
- 5.2.1.3. ±10mm longitudinally
- 5.2.1.4. ±4° bogie rotation about centre pivot.
- 5.2.1.5. Maximum Speed of train-130KMPH

5.3 Water supply:

(a) In AC coaches, one auxiliary water tank 30 liter capacity is available over each toilet roof at the end, at a height of about 2030 mm from toilet floor. Water is pumped into these from under-frame mounted main water tanks. Water-flow from this tank to flushing line is by gravity.

(b) In non-AC coaches, one tank of 390/455 lit. or other suitable capacity as per coach design is available over each toilet at a height of 2030 mm from toilet floor. Water flow from these tanks to flushing line is by gravity.


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RAIL COACH FACTORY KAPURTHALA	SPECIAL TERMS AND CONDITIONS FOR ELECTRO-PNEUMATIC PRESSURISED FLUSHING SYSTEM FOR BG COACHES.	MDTS-24317 REV-01 PAGE 5 OF 6 DATE 31.10.18
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6. MARKING :

Manufacture's name with serial/batch number, month & year of manufacture shall be marked on major components at a visible location for identification.

7. TESTING AND APPROVAL OF PROTOTYPE:

- 7.1 The tenderer must submit the detail drawings, which meets all technical requirements for pressurized flushing system.
- 7.2 Pressurized flushing system should be tested up to a minimum of 50000 cycles of continuous trouble free operation. Manufacturer should provide a work test certificate in this regard.
- 7.3 One prototype shall be submitted for approval by CDE/RCF. Prototype shall be fitted in one coach for fitment and functional approval. Supplier has to incorporate any changes noticed during the prototype inspection without any additional cost. Bulk manufacturing will be commenced only after clearance of prototype. Test certificates to be submitted by the supplier for raw materials and testing of all critical components/assemblies at the time of supply. Regular supplies are to be made as per approved prototype only. If supplier upgrades any components/sub-system on this equipment, he shall get it approved from CDE/RCF before its implementation.

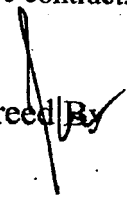
8. SPARE PARTS :

- 8.1 The tenderer shall indicate in an itemized list, the life expectancy of components subjected to wear under Indian conditions.
- 8.2 The tenderer shall rectify the equipment by replacing or repairing components at his cost without affecting the service of the coach attached to the train within the warranty period. The warranty period would get extended on a pro-rata basis if warranty replacement/repair is not provided within 5 days of notice. If tenderer fails to provide warranty in 5 days of notice, Railways reserves the right to cancel balance contract.

9. WARRANTY :

Tenderer shall ensure warranty for 36 months from the date of commissioning. During warranty, the tenderer shall rectify the equipment by replacing or repairing components at his cost without affecting the service of the coach attached to the train. The warranty period would get extended on a pro-rata basis if warranty replacement/repairs is not provided within 5 days of notice. If tenderer fails to provide warranty in 5 days of notice, Railway reserves the right to cancel balance contract.

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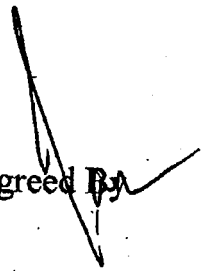
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RAIL COACH FACTORY KAPURTHALA	SPECIAL TERMS AND CONDITIONS FOR ELECTRO- PNEUMATIC PRESSURISED FLUSHING SYSTEM FOR BG COACHES.	MDTS-24317 REV- 01 PAGE 6 OF 6 DATE 31.10.18
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10. DRAWINGS TO BE ENCLOSED FOR REFERENCE :

1. Drg. No. 1 10113.0.21.530.001 alt-ER.
2. Drg. Nos. LW64143 alt-i & LW64144 alt-h
3. LE63202 alt-d for Indian style pan bowl interface.
4. 1.10113.0.30.400.002 alt-FR2 alt-ER & 1.10113.0.30.400.004 alt-FR2 for mounting and bracketing interface for LHB type AC and Non AC Coaches.
5. MI006710


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