

Reasoned Document for Spec.RDSO/CG/S/24005 for Fasteners for bogies of passenger Coaches

| STR Para No. | Description of para | Comments received from M/s Pioneer Nuts & Bolts Pvt. Ltd., Ludhiana | Southern Railway | ICF, Chennai | LPS Bossard | RDSO Remark |
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| 2.0, 2.1 | WEATHER CONDITION | - | - | - | 1. Steel and alloy steel fasteners are used in the application ranging form -50°C to +150°C 2. Stainless steel fasteners are used in the application ranging form -20°C to +150°C 3. Surface treatment / Plating / Coating will be applied to meet environmental conditions | This seems informative values. Hence no change in this clause is envisaged. |
| 2.2 | Coach-body displacement encountered under dynamic conditions | - | - | - | 1. property class selection to achieve desired clamp load in the assembly 2. Additional elements shall be used to counter vibration | Property class of fasteners has been defined in reference list. |
| 4.0 | Specification for Fasteners | ---- | In Draft Specification in page no 5, under the heading 4.0 Specification of Fasteners the following details only mentioned, | ---- | - | This specification is generic specification for fasteners being used in bogies of IR Passenger Coaches including ICF, LHB & |

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| | | | 1.Types of Fasteners 2.Size and range 3.Properties range 4.Hardness range 5.Material /Quality standard 6.Coating requirement Remarks: The details of fasteners to be used in LHB Coaches, ICF Coaches and Vande Bharat train set not properly mentioned regarding Grading of Fasteners, Material Quality and Coating requirements. Since the ICF and LHB coach periodicity of overhauling is varying with service period time and km running in between overhauling periods. | | | VB. In view of Southern Railway comments, reference list of fasteners used in bogies of passenger coaches is included in specification as Annexure-II. Reference list of fasteners is for reference only & may change later on. |
| Page-5 | IS:5556 Type A & B / DIN 6798 A, Serrated Washer, 200HV to 400HV | Serrated Washer Should be 430HV to 530 HV as per IS 5556 350 HV to 425 HV as per DIN 6798 | --- | ---- | 430HV to 530 HV as per IS 5556 & 350 HV to 425 HV as per DIN 6798 | Firm's comment may be considered as acceptable and changes has been done min. 400 HV as per IS 5556 |
| Page-5 | ISO 2341 / ISO 1234, Clevis Pins with Head / Split Pins, | Clevis Pins with Head Should be 125 HV to 245 HV as per ISO 2341, Split Pin is as per ISO 1234 | | | 125 HV to 245 HV as per ISO 2341 & Split Pin is as per ISO 1234 | Firm's comments in line with this clause of specification. Hence, no change is envisaged. |

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| | 200HV to 400HV | | | | | |
| 6.2 | The thread profile shall be checked/measured by traveling microscope or profile projector in addition to conventional thread gauge. | - | - | - | Thread profile by profile projector and contour tracer Thread fits by Thread ring gauges(External) & Thread plug gauge (internal) | The comments of firm are in line with this clause. Hence, no change is envisaged. |
| 7.5 (NEW) | After coating, ISO metric screw threads shall be gauged in accordance with ISO-1502 with a go gauge of tolerance portion 'h'. | | | | Threads fits by mating nut of 6H class for zinc & aluminium flake coatings | The comments of firm are in line with this clause. Hence, no change is envisaged. |
| 7.6 (NEW) | H2DE test shall be conducted for the fasteners of property class 10.9 and above | - | - | - | For electrolytic plating process only | Comments of firm are in line with this clause. Hence, no change is envisaged. |

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| | for hardness exceeding 36 HRC. | | | | | |
| 8.1 | The manufacturers shall have adequate space and covered area with cemented floor to accommodate the following: | | | | Separate and dedicated space for raw material , semi finished , test lab and finishing goods | Comments of firm are in line with this clause. Hence, no change is envisaged. |
| 8.2 | Following machines/equipment shall be available (In-House or at Sister Concern Facility) with the manufacturers for manufacturing of fasteners for use in bogies of Passenger Coaches. | | | | Raw material processing at sister concern facility | Comments of firm are in line with this clause. Hence, no change is envisaged. |

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| | <p>i) The manufacturer shall have at least one Annealing Furnace.</p> <p>ii) Cleaning Line / Chamber</p> <p>iii) Wire drawing machine</p> | | | | | |
| | <p>v) Continuous Heat Treatment Furnace (Hardening, Oil Quenching & Tempering).</p> <p>vi) Head Trimming Machines.</p> <p>vii) Threads Rolling Machines & Thread Tapping Machines.</p> <p>ix) Shot Blasting</p> | | | | <p>Bolts & Screws manufacture in house Nut & Washers to be procured from approved sources</p> | <p>Comments of firm are in line with this clause. Hence, no change is envisaged.</p> |

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| | Chamber / Room using stainless Steel shots of sizes 0.250mm/0.275mm. x) CNC Machines for Machining | | | | | |
| | xxi) Sealed quenching facility | | | | no , continuous mesh belt atmosphere controlled furnace available | Comments of firm is acceptable. Sealed quenching facility or continuous mesh belt atmosphere controlled furnace shall be available. |
| 8.2 (viii) | Coating chamber / Room / Tank along with other facility for coating of fasteners as per this specification. | Being fasteners and Dip Spin zinc flake coating process to be followed. Being Zinc flake is licence coating process, it need to be approved for carried out under MOU. (We are enclosing certificate for the same allowed by ROSO vide BS - 111 Rev. 7.) | | | Bolts & Screws manufacture in house Nut & Washers to be procured from approved sources | Firm's comments are acceptable and facility for zinc flake coating may be in-house or outsource. If outsource, MOU/ Contract with outsourced agencies to be submitted. |

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| | | It is suggested to incorporate outsource Zinc flake coating facility. | | | | |
| 8.3 | Testing facilities required for manufacturing and supply of fasteners for use in Bogies of Passenger Coaches are as below: | - | - | - | - | - |
| | i) Microscope/Profile projector for threads laps. | | | | thread laps verification by Microscope | Comments of firm are in line with this clause. Hence, no change is envisaged. |
| | ii) Spectroscope (For chemical composition testing) | | | | Chemical testing by Sterrescope | Comments not acceptable. |
| | iii) Hardness Tester | | | | Rockwell B & C scale tester | Comments of firm are in line with this clause. Hence, no change is envisaged. |
| 8.3 (iii) | Hardness Tester | As per Clause no. 8.3 (xxvii) Hardness Testing Machine is already mentioned hence Hardness tester should be deleted. | | Page - 7 Clause 8.3 - Sl. No. XXIII and XXVIII may be deleted as they exist | | Firm's comment may be considered as acceptable and S No. 8.3 (iii) – Hardness Tester has been removed as Testing facility requirement for |

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| | | | | in III & IV already. | | Hardness Testing already mentioned S.No. 8.3 (xxvii). | is at |
| 8.3 (xii) & (xxvi) | Junker vibration testing machine and Fatigue test for product assembly | Being Junker machine already required as per the requirement of this STR, product assembly as mentioned will not be possible being many types of assemblies will be used for different assemblies hence fatigue test should be deleted from STR. | | | 1. Junker test at sister concern 2. Fatigue test at third party lab | Test as per para no. 8.3 (xii) to be done for Interlock washer only. Fatigue test to be done as per DIN969/ISO 3800/DIN65151/DIN 25201-4. Fatigue Test of Fasteners (para no. 8.3 (xxiii)) to be done as per DIN969/ISO 3800/DIN65151/DIN 25201-4 during prototype test only. Facility for the same may be with Sister concern unit or third party lab. | |
| 8.3 (xxv) | Stress Rupture Testing | Stress Rupture test is being carried out on constant temperature for a given period of time, at up to | - | - | - | Firms comments are acceptable as the operating temperature on IR is mentioned in this spec as -20 to +70 C. Hence the same | |

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| | | <p>1200°C (2192°F), and its applicable on Inconel steel as per ASTM A453 Grade 660</p> <p>These fasteners are being used in Refineries, Nuclear Power, Power Plants where application of fasteners is under high temperature hence stress rupture testing facilities should be deleted from STR.</p> | | | | para is being deleted. |
| 11.1 | <p>The manufacturer shall have valid ISO: 9001:2015 certification, ISO 45001:2018 certification, Zed certification, IATF 16949 certification, ISO 14001:2015 certification and IRIS certification.</p> | <p>Being Government of India has introduced Zero defect Zero effect certification (Zed Certification) where Zed Gold certification integrates various factors, including productivity, quality, pollution mitigation, energy efficiency, financial status, human resources, and technological in</p> | - | - | <p>All the QMS certificates are available except ZED Not Applicable</p> | <p>All certifications specified for quality of product being acceptable globally. Hence, no changes is envisaged.</p> |

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| | | depth hence certifications like IATF 16949, ISO14001:2015, IRIS should be deleted from STR. | | | | |
| 11.2 11.10 | The manufacturer shall have in-house NAMBL Accredited Lab for Testing. | There is a typographical error It should be written as NABL Accredited Lab instead of NAMBL Accredited Lab. | - | Page - 9 Clause 11.10 - Typographical error of "NAMBL" shall be corrected as "NABL". | - | Correction has been done in STR. |
| 11.11 | Manufacturer shall submit past Performance letter /certificate of same for similar grade items. (minimum from 2 customers) | - | - | Clause 11.11 - "for" shall be corrected as "or" | - | Correction has been done in STR. |
| 14 | Upgradation quantity- Minimum Supplies of Bolts/Screws or Nuts/Prevailing Torque Nuts or Washers shall be 250000 nos. | - | Upgradation quantity mentioned for minimum supplies is as 250000 Nos. Remarks: This quantity may be reviewed to ease for small purchaser like depots and shops. | - | - | Upgradation quantity pertain to Manufacturer not for purchaser. However, upgradation quantity increased to 2500000 nos. |

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| New clause | - | - | <p>Warranty/Guarantee Clause also to be specified in the Specification, and periodicity of usage of Fasteners to be specified after fitment. Since in LHB Bogies During SS II and SS III time i.e once in every 3 years fasteners are to be Must change but in ICF Bogies during POH i.e once in 18 Months must change issued. So in RDSO Specification according to Coach wise i.e ICF, LHB and Vande Bharat usage of fasteners to be properly specified.</p> <p>Remarks: The List of Fasteners used in LHB coaches, Vande Bharat coaches and ICF Coaches separately provided as a set of Fasteners with grade and size, so it enables to procurement of the fasteners as a coach sets. Must change of Fasteners (Periodicity) after Fitment warranty & guarantee clause also to be elaborated in Spec.</p> | <p>New Clause 15.0 - Warranty details shall be added.</p> | - | <p>New Clause has been added as follows: 15.0 Warranty All fasteners shall not exhibit any defect/deformation for a period of 36 months in service or 48 months from supply for Bolt/Screws/Studs/Pins. Warranty for other fasteners including nut, washers shall be governed by IRS condition of contract.</p> |
| Page 10- | 2.0 Reference Codes: | - | - | Page - 10 New clause 2.3 - EN 13858 shall be added | - | EN 13858 has been added as clause 2.3 |

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| Other comments | - | - | <p>1. Manufacturing Code (Brand), Grade and Month & Year of Manufactured of the Fastener to be embossed on the Head of the Fasteners/ Nuts. In draft spec. it is not clearly mentioned, since in LHB Bogies the Fasteners/ Nuts are Must Change items during SS II/ SS/III schedule attentions. And Fasteners are being procured from RDSO approved source only, the details of manufacturers details with Grade, Month and Year must be embossed on head of Fasteners/ Nuts for identification during next SS-I schedule attention.</p> <p>2. Masking of threads of Fasteners to be provided to avoid damage during packing and transit also not mentioned in Draft specification.</p> <p>3. Packaging and storage of fasteners to be clearly specified in the specification unless suppliers can supply the fasteners in Gunny Bags, it will damage the threaded</p> | - | - | <p>New Clauses to be added as follows:</p> <p>16.0 Marking All fasteners shall have identification marking on heads or appropriate places and contain at least following parameters:</p> <ul style="list-style-type: none"> i. Manufacture r's Code ii. Property Class iii. MM YY <p>17.0 Packing</p> <p>All fasteners shall be packed properly to avoid any damage to threads during transit & storage preferably by masking of threads.</p> |
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| | | | <p>portion during transit period.</p> <p>Note: RCF having the packing condition for various materials vide document no. MPM001OE-VER-6.0, may be included in the specification.</p> | | | |
| | - | - | <p>Torque values for the Fasteners during fitment also to be specified for different sizes of Fasteners on the specifications.</p> <p>Remarks: Torque value with respect to Different size and grade of the fasteners for coach application wise (LHB,VB,ICF) to be specified.</p> | - | - | <p>Torque of fasteners is being specified in Maintenance Manual issued by CAMTECH.</p> |
| Page - 2 Index | Annexure-1 | - | - | Sl. No. of Annexure -1 page numbers shall be corrected as 11-19. | - | Correction has been done. |
| Page-3 | <p>SCHEDULE OF TECHNICAL REQUIREMENTS FOR PLAIN NUT, ALL METAL PREVAILING TORQUE</p> | - | - | In the title 'washers' may also be added. | - | Washers has been added. |

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| | TYPE HEXAGON NUTS, BOLTS, PINS AND SCREWS ETC. FOR BOGIES OF PASSENGER COACHES | | | | | |
| Page-3 1.0 Scope 1.1 Sr. no.9 | TECHNICAL SUPPLY CONDIT-IONS FOR THREADED STEEL FASTENERS | - | - | Typographical error of" CONDITIONS" shall be corrected | - | Correction has been done. |
| Page -5 | General Requirements | - | - | Page - 5 Clause 3.4 - Since, Fasteners are the safety items. It is suggested that Manufacturer with well- established facilities and capacity should only be considered. So, minimum annual Capacity of the firm can be specified. | - | Min. Annual production Capacity: 25000000 nos. 3.3, 3.4 have been added in STR. |

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| | | | | <p>Clause 3.3 - The manufacturer shall have design capabilities with CAE Analysis software and R&D facilities. The firm should have experienced employee in the field of CAE and CAD with a minimum experience of 5 years - This clause can be considered for inclusion.</p> | | |
| Page-6, 7.0 | Coating Requirements | - | - | <p>'Coating requirements' may be changed as 'Surface Protection'.</p> | - | <p>Changes has been done in STR</p> |
| Page -6 | New clause 7.4, 7.5, 7.6 | - | - | <p>Page – 6, New Clause 7.4 - Surface protection of the fasteners should be as specified in the drawings/POs.</p> | - | <p>ICF comments may be considered as acceptable. New clause has added in STR</p> <p>7.4, 7.5 & 7.6 has been added.</p> |

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| | | | | <p>New Clause 7.5 - After coating, ISO metric screw threads shall be gauged in accordance with ISO-1502 with a go gauge of tolerance portion 'h'.</p> <p>New Clause 7.6 - H2DE test shall be conducted for the fasteners of property class 10.9 and above for hardness exceeding 36 HRC.</p> | | |
| Page-8 | - | - | - | <p>Page – 8, Clause 9.2 - Marking and Manufacturer's identification shall be done in accordance with clause - 10 of ISO 898-1 for bolts, screws and studs and clause - 10 of</p> | - | New clause added as 9.1 |

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| | | | | ISO - 898 -2 for nuts . | | |
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Comments received from M/s RS Technologies, Kolkata – The final draft is acceptable to us.

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