Reasoned document prepared after receipt of stakeholders' comment on draft specification No. WD-70-BD-10 (Rev. 04) for 'Schedule of Technical Requirement for Upgraded High Tensile Centre Buffer Coupler for Freight Stock'.

1. **Date of uploading of draft specification on web site: 16.10.2024.**
2. **Last date of submission of comments draft specification**: **01.11.2024.**

A draft of revised specification No.WD-70-BD-10 (Rev 04) for 'Schedule of Technical Requirement for Upgraded High Tensile Centre Buffer Coupler for Freight Stock' was uploaded on RDSO website from 11.07.24 to 11.08.24 for comments by all stakeholders. Comments received from different stakeholders are analysed in this reasoned document with RDSO's remarks against each item. Revised draft specification No. WD-70-BD-10 (Rev 04) along with this reasoned document shall be uploaded on RDSO's website for 15 days as per above mentioned details, for the comments of all stakeholders.

<table>
<tr><td>Draft Spec Para no.</td><td>2.1</td></tr>
<tr><td>Draft Spec Para</td><td>Table-I
<table>
<tr><th>SN</th><th>Name of Part</th><th>Cast/ Forged</th><th>Number/ Coupler</th></tr>
<tr><td>5</td><td>Knuckle Pin with Anti-theft cotter pin</td><td>Forged (Forging Grade Steel 42Cr4Mo2 to IS 5517-1993)</td><td>1</td></tr>
<tr><td>6</td><td>Rotary bottom operated articulated lock lift assembly</td><td>Cast Grade B / Forged (IS1875-93)</td><td>1</td></tr>
<tr><td>8</td><td>Yoke Pin</td><td>Forged/Rolled (Forging Grade Steel class 5 to IS: 1875-93)</td><td>1</td></tr>
<tr><td>9</td><td>Yoke pin support with wear plate</td><td>Cast Grade B / Forged (IS 1875-93, Class 2))</td><td>1</td></tr>
</table>
"All the latest provisions contained in RDSO's ISO procedures laid down in document No.QO-D-8.1-11 (Latest) (Titled 'Vendor – Changes in approved status') and subsequent version/amendments thereof, shall be binding and applicable on the successful vendor/vendors in the contracts floated by Railways to maintain quality of products supplied to Railways.</td></tr>
<tr><td>Firm's Comments</td><td>M/s Frontier Alloys, Kanpur:-
The lock, Knuckle thrower and rotary bottom operated articulated lock lift assembly should be incorporate Investment casting process also.

Yoke pin shall be rolled dully heat treated.</td></tr>
<tr><td>RDSO's Remarks</td><td>Provision regarding investment casting is already available. Rolling as manufacturing method for yoke pin and knuckle pin has been added in revised draft specification.</td></tr>
<tr><td>Final Para</td><td>
<table>
<tr><th>SN</th><th>Name of Part</th><th>Cast/ Forged</th><th>Number/ Coupler</th></tr>
<tr><td>5</td><td>Knuckle Pin with Anti-theft cotter pin</td><td>Forged/Rolled (Forging Grade Steel 42 Cr4Mo2 to IS 5517-1993)</td><td>1</td></tr>
<tr><td>6</td><td>Rotary bottom operated articulated lock lift assembly</td><td>Cast Grade B / Forged (IS 1875-93)</td><td>1</td></tr>
<tr><td>7</td><td>Coupler Yoke</td><td>Cast Grade E</td><td>1</td></tr>
<tr><td>8</td><td>Yoke Pin</td><td>Forged/Rolled (Forging Grade Steel class 5 to IS: 1875-93)</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>Draft Spec Para no.</td><td>3.0</td></tr>
<tr><td>Draft Spec Para</td><td>GENERAL REQUIREMENTS
Lock shall be to Drg. No. SK-62724 (Item 8), latest alteration. The lock must be manufactured by lost wax /investment casting or forging process.</td></tr>
</table>

<table>
<tr><td>Firm's Comments</td><td colspan="2">M/s Frontier Alloys, Kanpur:-
Lock shall be machined and the thickness of lock should be 78 mm instead of 76.2 mm as presently internationally AAR is using 78 mm lock in their assembly.</td></tr>
<tr><td>RDSO's Remarks</td><td colspan="2">No changes in specification are envisaged at this stage. As per VC meeting held on 15.10.24, suggestion from stakeholders is awaited. After receipt, it will be examined and incorporated in the final draft.</td></tr>
<tr><td>Final Para</td><td colspan="2">Same as Draft specification.</td></tr>
<tr><td>Draft Spec Para no.</td><td colspan="2">4.2.1</td></tr>
<tr><td>Draft Spec Para</td><td colspan="2">4.2.1.1 The material Grade- 42Cr4Mo2 to IS: 5517-1993 shall have following minimum requirements:

<table>
<tr><td>Tensile Strength</td><td>Yield Strength</td><td>Elongation</td><td>Reduction in Area</td></tr>
<tr><td>Kgf/mm2</td><td>Kgf/mm2</td><td>%</td><td>%</td></tr>
<tr><td>91.8 – 107.1</td><td>66.3</td><td>11</td><td>46.2</td></tr>
</table></td></tr>
<tr><td>Firm's Comments</td><td>M/s Jupiter Wagons Pvt. Ltd:-
Disproportionate between EL% and RA%</td><td>M/s Frontier Alloys, Kanpur:-
As per AAR M118 the tensile strength shall be 98 Kg/mm2 min., Yield strength 63 Kg/mm2 min, Elongation 15% min. and RA value shall be 38% min.</td></tr>
<tr><td>RDSO's Remarks</td><td colspan="2">No changes in specification are envisaged at this stage. As per VC meeting held on 15.10.24, suggestion from stakeholders is awaited. After receipt, it will be examined and incorporated in the final draft.</td></tr>
<tr><td>Final Para</td><td colspan="2">Same as Draft specification.</td></tr>
<tr><td>Draft Spec Para no.</td><td colspan="2">4.2.1.2</td></tr>
<tr><td>Draft Spec Para</td><td colspan="2">Hardness value shall be within the range of 229 to 428 BHN. Two or more hardness determinations shall be made at locations approximately midway between the center and end of the knuckle pin on opposite sides from each other on the cylindrical surface. Hardness shall also be taken on the center at both ends of the pin. Hardness shall be taken after decarburization by surface grinding up to a minimum depth of 0.20 mm.</td></tr>
<tr><td>Firm's Comments</td><td colspan="2">M/s Frontier Alloys, Kanpur:-
As per AAR M118 Hardness value shall be 277 to 337 BHN at the mid length of the center.</td></tr>
<tr><td>RDSO's Remarks</td><td colspan="2">Location of hardness measurement has been objectively defined. However, this para is also interlinked with para no. 4.2.1. Therefore in case of changes in para 4.2.1, requisite changes shall be done in this para too, and incorporated in the final draft specification.</td></tr>
<tr><td>Final Para</td><td colspan="2">Hardness value shall be within the range of 229 to 428 BHN. Two or more hardness determinations shall be made at locations approximately midway between the center and end of the knuckle pin on diametrically opposite sides from each other on the cylindrical surface. Hardness shall also be taken on the center at both ends of the pin. Hardness shall be taken after decarburization by surface grinding up to a minimum depth of 0.20 mm.</td></tr>
<tr><td>Draft Spec Para no.</td><td colspan="2">5.2</td></tr>
<tr><td>Draft Spec Para</td><td colspan="2">Process of Steel Making
All steel melting and refinement must be performed with the use of an Electric Arc Furnace. Any other process of steel melting may also be employed provided it's capability of consistently attaining the required chemistry of castings is established to the satisfaction compliance of RDSO specification.</td></tr>
<tr><td>Firm's Comments</td><td colspan="2">M/s Frontier Alloys, Kanpur:-
RDSO may kindly clarify any other process of Steel melting process.</td></tr>
<tr><td>RDSO's Remarks</td><td colspan="2">Process of Steel Making has been standardized since adaption of this specification. Therefore, No changes in specification are envisaged.</td></tr>
<tr><td>Final Para</td><td colspan="2">Same as Draft specification.</td></tr>
<tr><td>Draft Spec Para no.</td><td colspan="2">3.3</td></tr>
<tr><td>Draft Spec Para</td><td colspan="2">Gauges
The CBC and all the coupler components shall be gauged with RDSO approved gauges manufactured as per RDSO Drawings of gauges given in Annexure-I.</td></tr>
</table>

	The manufacturer must possess at least 3 full sets of gauges out of which one set of gauges must be reserved for the exclusive use of Inspecting authorities. Accuracy of 02 sets of gauges in use shall be checked against third set of calibrated gauge preserved with manufacturers. However, periodical calibration of all 03 sets shall be ensured by manufacturer. Re-calibration of gauges shall be done at prescribed periodicity or after every 2000 pieces supplied whichever is earlier. Calibration shall be got done from Govt./RDSO approved agencies. Manufacturers can also use their in house calibration facility with prior approval of DG/Wagon/RDSO.		
Firm's Comments	**M/s Jupiter Wagons Pvt. Ltd:-** It is to be noted that there is hardly any Gauge manufacturer who is RDSO/Govt. approved.	**M/s Atul Engineering, Agra:-** We shall carry out calibration in-house. We can use in-house CMM facilities where ever required.	**M/s Frontier Alloys, Kanpur:-** The investment casted lock Arm Side and Knuckle Side can be machined for maintaining of parallelism
RDSO's Remarks	**Provision of four set gauges has been made to objectively bifurcate intended purpose of these gauges as per specification. As regard to use of inhouse calibration facilities, CMM, machine of casted locks etc. were discussed during VC meeting held on 15.10.2024 and inputs were requested from all stakeholders. Based on inputs, requisite changes shall be further incorporated in the final draft specification.**		
Final Para	02 sets of gauges are prescribed for production/ internal inspection so as during calibration/ replacement, availability of all gauges is ensured for production/internal inspection. Master gauges shall be used for calibration of rest 03 sets of gauges at prescribed periodicity or after every 2000 pieces supplied whichever is earlier for which the manufacturer shall have a well-equipped facility. Periodicity of calibration shall be specified by OEM of these gauges and a record to this effect shall be maintained by the manufacturer. Master gauges shall be got calibrated only from OEM/ authorized agency at frequency prescribed for calibration of such master gauges. Manufacturers can also use their in house calibration facility for master gauges only with prior approval of DG/Wagon/RDSO.		
Draft Spec Para no.	**3.5**		
Draft Spec Para	**Marking** The coupler components found having illegible marking at the time of fitment in Railway Workshops, Maintenance depot or on Wagon Builders premises shall be treated as rejected and shall be replaced by the manufacturers free of cost. The cost of transportation shall be borne by the manufacturer. Marking particulars of all coupler components shall be maintained by Wagon Builder/Workshops/Depot as per Annexure – A.		
Firm's Comments	**M/s Frontier Alloys, Kanpur:-** For investment casting the marking of lock it is on back side of lock surface, the location of marking may be changed to reduce wear in lock (Drawing No. SK 76611).		
RDSO's Remarks	Marking in nonbearing area has already been incorporated in latest revision (Alt 31) of drawing. Therefore, No changes in specification are envisaged.		
Final Para	**Same as Draft specification.**		
Draft Spec Para no.	5.3.2		
Draft Spec Para	**Methoding** i) Casting solidification software must be available with the firm to evaluate castings for potential defects and to qualify the casting for production. ii) Standardized running, gating and risering system design and no. of cores including use of chills and chaplets shall be developed with the help of casting solidification software and only such system be employed for regular production of castings. Complete methoding system shall be part of approved QAP of the firm		
Firm's Comments	**M/s Frontier Alloys-Kanpur** The firm should have Casting solidification software in house and The firm should submit the copy of invoice at the time of registration		
RDSO's Remarks	This aspect has already been incorporated in draft specification. No change required.		
Final Para	**Same as Draft specification.**		
Draft Spec Para no.	**5.3.4**		
Draft Spec	**Core making**		

Para	All cores shall be produced by No-bake process for which continuous mixer with compaction table/ batch mixer shall be available. **Only single piece core should be used for manufacture of coupler body and yoke. Any deviation will require prior approval from DG/Wagon/RDSO.**
Firm's Comments	**M/s Frontier Alloys, Kanpur:-** All core shall be produce by No Bake/Cold Box Process by cold box core shooter machine. Only single piece core must be use for manufacturing of coupler body for better dimensional control i.e. Knuckle pin centre to shank pin hole also single piece core eliminate the jointing of other lock chamber cores.
RDSO's Remarks	Single core in coupler body is essential requirement in WD-70-BD-10(rev3). Use of Cold Box Process by cold box core shooter machine is desirable for good foundry practice. Other stakeholders should also comment on incorporation of cold box core shooter machine so as it can be incorporated in the final draft specification.
Final Para	**Same as Draft specification.**
Draft Spec Para no.	5.3.3
Draft Spec Para	For High pressure moulding line mould hardness shall be minimum 85 and the same should be uniform at all the surfaces (Within 85 to 90 at the entire surface including vertical), and for No – Bake System scratch hardness of mould shall be minimum 60 and same should be uniform at all the surfaces so as to get good dimensional accuracy in castings.
Firm's Comments	**M/s Jupiter Wagons Pvt. Ltd:-** In case of No bake Moulding, Scratch Hardness of 50 minimum may be considered.
RDSO's Remarks	Requisite changes, inline with relevant standards have already been incorporated in draft specification. No change required.
Final Para	**Same as Draft specification.**
Draft Spec Para no.	**5.3.5**
Draft Spec Para	**Melting** A sufficient carbon boil must be accomplished with a 20 point carbon reduction. Double slag process for proper removal of sulphur and phosphorus shall be followed. Argon purging may be carried out to ensure freedom from harmful gases. Ladle pre-heating at 600 to 700°C shall be carried out. Temperature checking in Furnace and in Ladle by Immersion Pyrometer shall be done before pouring in Mould.
Firm's Comments	**M/s Frontier Alloys, Kanpur:-** In any other steel melting process there is no need 20 point carbon reduction and double slag process.
RDSO's Remarks	Specified melting requirements are essential for manufacturing of Upgraded CBC Coupler to meet the specified performance parameters. To achieve this, Arc Furness is essential, which is a mandatory requirement of this specification. Therefore, no changes in specification are envisaged.
Final Para	**Same as Draft specification.**
Draft Spec Para no.	**5.3.8**
Draft Spec Para	**Heat-treatment** All castings shall be heat treated after fettling. Grade-E steel castings shall be furnished, normalized, quenched and tempered. Grade-B steel castings shall be furnished, normalized and tempered. State-of-the-art heat treatment furnaces shall be employed and must be capable of maintaining an even heat distribution within +/-10°C throughout. Verification must be established by performing a minimum of eight zone survey on monthly basis.
Firm's Comments	**M/s Frontier Alloys, Kanpur:-** The grade B castings shall be normalized/normalized and tempered according to AAR M-201 Grade B+
RDSO's Remarks	RDSO Specification No. WD-70-BD-10 has standardized the heat treatment process and manufacturing since adoption of this specification. Therefore, no changes in specification are envisaged.
Final Para	**Same as Draft specification.**
Draft Spec Para no.	**7.2.3**
Draft Spec Para	**Hardness** Hardness values will remain same irrespective of sample prepared from test coupon or from

	casting.	
Firm's Comments	**M/s RIL:-** The empirical study has established a linear relationship between tensile properties and hardness of the steel. Therefore if 80% of tensile properties are acceptable from the casting then hardness upto 80% may also be accepted. The NML test done for evaluation of coupler has also accepted hardness value in several cases upto 80% of the specified value.	
RDSO's Remarks	RDSO Specification No. WD-70-BD-10 has specified that 80% value is taken only for tension test and impact test. In case of Hardness test, heat treated steel components must meet the hardness range as specified in Table-6(i). Therefore, no changes in specification are envisaged.	
Final Para	**Same as Draft specification.**	
Draft Spec Para no.	**7.2.5**	
Draft Spec Para	**Destructive Testing** One casting per 200 shall be subjected to destruction to examine the presence of casting defects. Defects such as blow holes, slag inclusions, shrinkage, etc. are not acceptable. Porosity to a level of 2% of the cross section may be considered acceptable.	
Firm's Comments	**M/s Jupiter Wagons Pvt. Ltd:-** One/300 castings are good enough, since we are validating our methoding through requisite software. Moreover 10% of offered lots are Radiographed for acceptance. Increasing the destructive test is not justified.	
RDSO's Remarks	One casting per 200 shall be subjected to destruction is considered essential to determine quality of castings. Therefore, no changes in specification are envisaged.	
Final Para	**Same as Draft specification.**	
Draft Spec Para no.	**7.2.4**	
Draft Spec Para	**Nil Ductility Test** Fracture Toughness**/**Nil Ductility Test shall be conducted on specimens from castings /Investment Casting/Forging in accordance with either ASTM E604 or E208 except that Nil – Ductility Transition Temperature (NDTT) shall be -57° C or lower for grade E. The test specimen shall withstand the test without showing any sign of distress.	
Firm's Comments	**M/s Siena Engg- Pithampur Dhar:-** Due to uneven thickness, shape and size of CBC castings it is very critical to make specimen from casting, to conduct this test accordance with either ASTM E604 or E208 required OK size of test samples which are only possible in Test coupon. Therefore, Fracture Toughness/Nil Ductility Test shall be conducted on specimens from castings/Investment Casting/Forging or from integrated Test coupon of castings /Investment Casting/Forging.	
RDSO's Remarks	Test samples for **Nil Ductility Test** shall have to be prepared from casing to represents actual values. **Only in case of Lock, where preparation of test sample for this test is difficult owing to size constraints, preparation of sample has been permitted from test coupon for casting or forged test sample. Para is revised accordingly.**	
Final Para	**Nil Ductility Test** Fracture Toughness/Nil Ductility Test shall be conducted on test sample prepared from finished product in accordance with either ASTM E604 or E208 except that Nil –Ductility Transition Temperature (NDTT) shall be -57° C or lower for grade E. The test specimen shall withstand the test without showing any sign of distress. Only in case of Lock, test sample can be prepared from test coupon for casting or forged test sample for forged components.	
Draft Spec Para no.	**7.3.1**	
Draft Spec Para	**Non-Destructive Testing** Radiographic examination shall be conducted on Knuckle, Coupler Body & Yoke to the extent of 10% of the casting produced and level of acceptance shall be as per ASTM E 446 Level-II. The location for Radiographic test shall be as per Annexure-II (Sheet-1, 2, & 3). Radiographic testing facility to be available with the manufacturer i.e. testing to be in-house. The procedure of radiography is given in Annexure-II.	
Firm's Comments	**M/s Jupiter Wagons Pvt. Ltd:-** Since prior to Production, methoding and casting solidity is verified and	**M/s Atul Engineering, Agra:-** Radiographic examination is more important when prototyping or developing a product.

<table>
<tr><td></td><td>subsequently validated through standard software, hence 5% of produced casting are good enough for Radiographic Examination.</td><td>Once bulk production has been achieved and validated with all tests as per the Spec. Radiographic examination of @10% of the lot is very costly and time-consuming. Given the ambitious wagon production plans, Radiographic examination itself may become a bottle neck operation. Further, since methoding is standard and if a firm has supplied more than 10,000 couplers. The Radiographic examination requirement should be at a max. of 5%.</td></tr>
<tr><td>RDSO's Remarks</td><td colspan="2">10% Radiographic examinations of the casting produced (Knuckle, Coupler Body & Yoke) are being carried out accordance to para 7.3.1 of RDSO Specification No. WD-70-BD-10 which is considered essential to establish quality of casting. No changes in specification are envisaged.</td></tr>
<tr><td>Final Para</td><td colspan="2">Same as Draft specification.</td></tr>
<tr><td>Draft Spec Para no.</td><td colspan="2">7.4</td></tr>
<tr><td>Draft Spec Para</td><td colspan="2">Metallographic Test
With a view to ensure the homogeneity of the steel and the quality of heat treatment, it is essential to examine the microstructure of the knuckles at the time of acceptance inspection. The samples should be taken from the lugs attached to actual castings produced and not from the separately cast test bars/test coupons. Microstructure achieved shall be uniform fine tempered martensite.</td></tr>
<tr><td>Firm's Comments</td><td colspan="2">M/s Frontier Alloys, Kanpur:-
Microstructure achieved should be uniform fine tempered martensite with 70 to 80% tempered martensite.</td></tr>
<tr><td>RDSO's Remarks</td><td colspan="2">Requirement of RDSO Specification No. WD-70-BD-10(rev3) is uniform fine tempered martensite . Therefore, no changes in specification are envisaged.</td></tr>
<tr><td>Final Para</td><td colspan="2">Same as Draft specification.</td></tr>
<tr><td>Draft Spec Para no.</td><td colspan="2">7.6</td></tr>
<tr><td>Draft Spec Para</td><td colspan="2">Type and Number of Tests
<table>
<tr><th>S.N</th><th>Parameters</th><th>Test to be done on</th><th>Sampling plan</th><th>Reference</th></tr>
<tr><td>1</td><td>Visual & Operational Check</td><td>CBC Components</td><td>10% of the offered lot Or Min. 10</td><td>Para:8.2 & 8.4</td></tr>
<tr><td>2</td><td>Dimensional</td><td>CBC Components</td><td>10% of the offered lot Or Min. 10</td><td>Para:3.3</td></tr>
<tr><td>4</td><td>(i) Proof Static tension test
(ii) Proof static test of yoke</td><td>CBC Components</td><td>As per Table-8 One per Lot</td><td>Para:7.5</td></tr>
<tr><td>7</td><td>Hardness</td><td>CBC Components</td><td>Castings ~~5%~~ 10% of the lot or min 10 numbers (in case of knuckle 100% checking)</td><td>Table 6(i)</td></tr>
<tr><td>9</td><td>As Quench hardness</td><td>E-Grade Casting</td><td>10% of the Castings or Min. 10</td><td>Table 6(ii)</td></tr>
<tr><td>10</td><td>Impact</td><td>Test Coupon/CBC components</td><td>~~Three per heat~~ One per lot</td><td>Para:7.2.2</td></tr>
<tr><td>11</td><td>Nil ductility</td><td>CBC Components</td><td>1 per lot ~~heat~~</td><td>Para:7.2.4</td></tr>
<tr><td>12</td><td>Weight variation</td><td>CBC Components</td><td>100% of offered lot.</td><td>Para:8.6</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Firm's Comments</td><td>M/s Jupiter Wagons Pvt. Ltd: –
Comments on Proof Static tension test
Sample Plan shall be as per Table or Lot Size, increase lot size in general, 5000 may be considered. It is difficulty for Wagon manufacturer to follow said stipulation.

Hardness - Mechanical properties such as Hardness are totally dependable on the chemical composition followed by heat treatment. Both process are carried out (melting and Heat Treatment) in batches, therefore 5% of the casting are good enough for validation.

It is not feasible to conduct the said tests as it is time consuming. Directly it will hamper regular inspection of Wagon manufacturing unit.

Weight variation – Since CBC components are manufactured on the basis of RDSO drawings and validated by requisite software, 10% of the weight is checked good enough in bulk production. 100% weight variation is not possible.</td><td>M/s Atul Engineering –Agra
Hardness:
The Coupler body, yoke and striker casting are bulky & heavy items moving of these items for Brinell hardness testing is manually intensive and may cause loss in production. We suggest to maintain @5%.

Weight Variation:
The Coupler body, yoke, knuckle and striker casting are bulky & heavy items moving of these items for weighing is manually intensive and may cause loss in production. We suggest to maintain @ 10%.

As Quench Hardness:
The Coupler body, and yoke casting are bulky & heavy items moving of these items for Brinell hardness testing is manually intensive and may cause loss in production. We suggest to maintain @5%.</td><td>M/s Siena Engineering:-
As per Clause 7.2.5 Destructive test shall be carried out on the actual casting during prototype inspection as well as during acceptance inspection. So this clause can be removed from table of para 7.6.</td></tr>
<tr><td>RDSO's Remarks</td><td colspan="3">Weighment para has been revised and read as following:-
"Manufacturer will conduct weighment of 100% components of which minimum 10% shall be checked by Inspecting Official".
Regarding hardness para has been revised and read as following:-
"Manufacturer will conduct 100% hardness on Knuckle and minimum 10% shall be checked by Inspecting Official".
Above clarification has been incorporated in the revised draft.</td></tr>
<tr><td>Final Para</td><td colspan="3">Weighment: - Manufacturer will conduct weighment of 100% components of which minimum 10% shall be checked by Inspecting Official.
Hardness: - 10% of the lot or min 10 numbers (in case of knuckle 100% checking internally).</td></tr>
<tr><td>Draft Spec Para no.</td><td colspan="3">8.3</td></tr>
<tr><td>Draft Spec Para</td><td colspan="3">Purchase inspection
<table>
<tr><th>S.N</th><th>Parameters</th><th>Test to be done on</th><th>Sampling plan</th><th>Reference</th></tr>
<tr><td>5</td><td>Hardness</td><td>CBC Components</td><td>10% of the lot or min 10 numbers (in case of knuckle 100% checking)</td><td>Table 6(i)</td></tr>
<tr><td>9</td><td>Weight variation</td><td>CBC Components</td><td>100% of offered lot.</td><td>Para:8.6</td></tr>
</table></td></tr>
<tr><td>Firm's Comments</td><td colspan="2">M/s Atul Engineering, Agra:-
Hardness
It will be not possible for inspecting official to carryout @10% of the lot or min 10 numbers (in case of knuckle 100% checking). The Coupler body, yoke and striker casting are bulky & heavy items moving of these items for Brinell hardness testing is manually intensive and</td><td>M/s RIL:-
100% hardness checking in case of knuckle during purchase inspection may kindly be reviewed as it is a huge time consuming process and will severely affect the inspection and supplies.</td></tr>
</table>

	time consuming. We suggest to maintain @ 5%. **Weight:** It will be not possible for inspecting official to carryout @100% of the offered lot. The Coupler body, yoke and striker casting are bulky & heavy items moving of these items for weighing is manually intensive and time consuming. We suggest maintaining @10%.			
RDSO's Remarks	**Weighment para has been revised and read as following:-** "Manufacturer will conduct weighment of 100% components of which minimum 10% shall be checked by Inspecting Official". **Regarding hardness para has been revised and read as following:-** "Manufacturer will conduct 100 % hardness on Knuckle and minimum 10% shall be checked by Inspecting Official". Above clarification has been incorporated in the revised draft.			
Final Para	Weighment: - Manufacturer will conduct weighment of 100% components of which minimum 10% shall be checked by Inspecting Official. Hardness: - 10% of the lot or min 10 numbers (in case of knuckle 100% checking internally).			
Draft Spec Para no.	**9.0**			
Draft Spec Para	**GUARANTEE** The coupler supplied shall be accompanied by a guarantee for a period of 72 months from the date of supply or 60 months from the date of fitment, whichever is earlier.			
Firm's Comments	**M/s Jai Multi** The Coupler supplied shall be accompanied by a guarantee for a period of 72 months from date of supply or 60 months from the date of fitment, whichever is earlier. Any wear and tear occurred over a period of time due to uses is not be covered under warranty/guarantee.	**M/s Atul Engineering –Agra** The guarantee should be only for failure of components which is beyond "Fair wear & tear" according to IRS conditions of contract clause no. 3200. Fair or expected wear & tear should be defined. Gauge application for checking the wear of the knuckle (and other CBC components) should be standardized and not left to the individual consignees. Coupler components have to be maintained as per G-80 manual. Wear & tear which can be repaired as per G-80 manual should not be cause for rejection of warranty. Minor surface defects should not be a cause for rejection under warranty.	**M/s Siena** **Clause No 9.0** Warranty: The product warranty is given for the manufacturing defects and not for wearing due to use of products. As the CBC Assemblies comprises various other components such as Knuckle Pin, Yoke Pin etc thus the warranty responsibility of these items should not be imposed on the CBC Assembly manufacturer. We have come across cases when purchaser raised warranty claim for complete Assembly whereas the warranty period of the purchased components had already expired. Therefore, In case of premature failure of any cast component/sub-assembly, the firm will be liable to make the replacement of the failed cast component to the depot where	**M/s Frontier Alloys-Kanpur** The guarantee of coupler and components should be only for breakage of the components not to wear of the components and the guarantee should be fair wear and tear according to indian railway standard condition

			failure has been reported within reasonable time."	
RDSO's Remarks	RDSO specification No. WD-70-BD-10(rev3) is indigenous version of specification No. WD-66-BD-06. Therefore, Warranty clause is taken same as WD-66-BD-06. In view of this, no changes in specification are envisaged.			
Final Para	**Same as Draft specification.**			
Draft Spec Para no.	**11.0**			
Draft Spec Para	**MINIMUM FOUNDRY INFRASTRUCTURE REQUIREMENTS**			
Firm's Comments	**M/s Frontier Alloys, Kanpur:-** **The foundry must have class A foundry certification**			
RDSO's Remarks	RDSO specification No. WD-70-BD-10(Rev3) has well defined infrastructural requirement for manufacturing of Upgraded High Tensile CBC Coupler which is considered adequate. No change in specification required.			
Final Para	**Same as Draft specification.**			
Draft Spec Para no.	**12.0**			
Draft Spec Para	Process for The Qualification, Approval and Vendor Progression of a Casting Foundry for the Manufacture of Railroad Couplers.			
Firm's Comments	**M/s Frontier Alloys, Kanpur:-** A fatigue testing machine for knuckle fatigue must be available with manufacturer according to AAR M-216 and fatigue test frequency should be 1 in a year			
RDSO's Remarks	No changes envisaged at this stage. Other stakeholders may also offer their views on specified fatigue testing as per AAR recommendation. Based on inputs it will be further examined and requisite changes if any, shall be incorporated in the final draft specification..			
Final Para	**Same as Draft specification.**			