Reasoned Document regarding Technical specification of Scharfenberg Couplers and Draw Gear for EMU, DEMU and MEMU rolling stocks for Indian Railway" Broad Gauge (1676 mm) in Indian Railways.

Clause No	Description	M/s Vasco	M/s Escort	M/s Sanrok	M/s FASL	RDSO Comment
1.0	**SCOPE**					
i)	This specification covers the design, manufacture and supply of Scharfenberg Couplers and Draw Gear for 4-car AC or 3-car DC EMU, DEMU and MEMU Stock	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
ii)	The coupling and draw gear arrangement at the outer ends of each 4-car/3-car units shall be suitable for fitting of Scharfenberg Automatic Coupler that meet the requirements given in Appendix 'A'. These end couplers shall be suitable for coupling with AC/DC Locomotives provided with screw coupling and side buffers either by using special transition Gear (Adopter) or by removing the automatic head and replacing by pot and draw screw.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
iii)	All intermediate couplers in the 4-car /3-car units shall be of the semi-permanent type.	Accepted with No Comments.	Noted	Noted and agreed.	Specify the grade of casting as example AAR M-201, Grade-E.	Clause is self explanatory. No change is required.
iv)	The contractor shall develop a design based on sound engineering practice and submit general arrangement and working drawings and all technical data to concerned railway organization or Coach builders and to RDSO/Lucknow for approval before commencing manufacture.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	

v)	This specification is intended to include everything requisite to the manufacture of the coupler, notwithstanding that everything required may not be mention herein.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
vi)	All the provisions contained in RDSO's ISO procedures laid down in document no. QO-D-8.1-11 dated 14.10.2024 Ver-3.0 (Title: "Vendor-changes in approved status") and subsequent version /amendments thereof, shall be binding and applicable on the successful vendor/ vendors in the contacts floated by Railways to maintain quality of products supplied to Railways.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
2.0	**GENERAL DESIGN FEATURES**				Noted	
i)	The fixing of coupler to underframe shall be by bolts/welding the fixing arrangement and underframe cutaways shall be identical for all couplers (end and intermediate).	Accepted with No Comments.	Complied	Noted and agreed.	Noted	
ii)	The draft gear housing shall be capable of taking either rubber springs or ring springs, and identical spring's packs shall be used for both end and intermediate couplers.	Accepted with No Comments.	Complied	Noted and agreed.	Specify the draft gear housing material with grade AAR M-201, Grade-E.	Clause is self explanatory. No change is required.
iii)	The draft/buffing springs shall be of natural or synthetic rubber available in India.	Accepted with No Comments.	Complied	Noted and agreed.	Noted shall follow IS: 3400.	Clause is modified. Modified clause is as below: The draft/buffing springs shall be of natural or synthetic

						rubber or blend thereof available in India.
iv)	The attachment of the draw hook to the draft gear shall be designed so that it can be conveniently replaced by automatic Scharfenberg heads, without alteration to any other part of the coupler or draft gear.	Accepted with No Comments.	Noted	Noted and agreed.	Noted important part shall be manufactured through AAR M-201, Grade-E.	
v)	The location of the pivot pin centre line of couplers shall not exceed 707 mm from headstock face, and should preferably be the same for both end and intermediate couplers.	Accepted with No Comments.	Complied	Noted and agreed.	Noted	
vi)	The distance between the headstocks of adjacent coaches shall be 800 mm when semi-permanent couplers are fitted, and not less than 964 mm for the end couplers when fitted with automatic heads.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
vii)	The semi-permanent couplers shall be provided with arrangement for coupling of brake pipes. If required provision should also be made for coupling of electrical cables for which 76 electrical contacts should be catered for.	Accepted with No Comments.	Complied	Noted and agreed.	Noted	
viii)	The Air Brake connections shall fulfil the requirements given in Appendix 'B'.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
ix)	For casted components, the material used for coupler shall be High strength steel					New clause added

	casting to AAR M- 201 Grade 'E' standard. However equivalent or superior grade are permitted in case of alternate manufacturing processes.					
x)	CHEMICAL COMPOSITION-(in case of AAR M-201 Grade 'E') a) The percentage by weight of different elements in Grade 'E' steel of specification M-201 shall not exceed the following limits: Carbon, (Max. %) = 0.32 Manganese,(max. %) = 1.85 Phosphorus, (max. %) = 0.04 Sulphur, (max. %) = 0.04 Silicon, (max. %) = 1.50 Hardness = 241-311 Note: Other alloying element may be added in order to improve the strength requirement.					New clause added
	b) HEAT TREATMENT: Heat treatment process shall be done as per AAR M-201, Grade 'E' steel specification (latest version). AAR M-201 Grade E or as per mandated ASTM/CEN practice for alternate materials so that properties at par or better to AAR M 201 grade E can be achieved.					New clause added
3.	**MAIN REQUIREMENTS**					
i)	The couplers shall have a rated draft	Accepted with No	Noted	Noted and agreed.	Noted	

	capacity of not less than 34 tonnes and buff capacity not less than 800 mkg. The stroke of Buffing Gear shall be restricted to 75 mm and the Sill Pressure shall not exceed 50,000 kg. under buffing impacts of 800 mkg intensity.	Comments.				
ii)	The couplers shall allow coupled coaches to negotiate curves of radius 152.4 metres and shall be capable of passage in either direction over standard 1 in 81/2 turnouts, and shall function satisfactorily with a 75 mm difference in headstock heights of adjacent coaches.	Accepted with No Comments.	Complied	Noted and agreed.	Noted	
iii)	The coupler shall be tight lock and shall not develop slack in service.	Accepted with No Comments.			Noted	
4.	**TESTS**					
4.1	The coupler assembly excluding the rubber draft gear shall withstand tensile loads of 70 tonnes and compressive loads of 100 tonnes without any permanent deformation and tensile or compressive loads of 150 tonnes without fracture.	Accepted with No Comments.	Complied	Noted and agreed.	Noted gauging coupler assembly shall be go to proof test for prototype with strain gauging.	
4.2	OEM/Supplier should have a well-established quality control system and organizational set up to ensure adequate quality at all stages of manufacture.					New clause added
4.3	The vendor should have all testing facilities for items being manufactured to in-house to facilitate testing of items during acceptance tests.					New clause added

5.	**WARRANTY** The vendor shall, at his cost, replace the couplers and associated components failing prematurely or proving unsatisfactory in service for reasons attributed to defective/ faulty design, defective material or poor workmanship within a period of 36 months from the date of fitment or 48 months from the date of supply whichever is earlier. This warranty shall survive, notwithstanding the fact that the coupler may have been inspected, accepted and payment thereof may by the purchaser.	Accepted with No Comments.	Noted & will be complied except Rubber Parts. We recommend the warranty for Rubber parts should be considered 24 months from the date of fitment & 36 months from the date of supply, whichever is earlier.	Noted. The current design and material deposed is sufficient for achieving the strength characteristics of the coupler. Increasing the warranty would entail the improvement in the material which should be standardised.	Noted	Clause is self explanatory. No change is required.
6.	**CONTRACTORS' RESPONSIBILITY** The Contractor shall assist the coach builders in the fitting, testing and commissioning of these couplers and shall be responsible for their satisfactory working, and for any failure due to defective design or materials for a period of two years from date of their placement in service. He shall replace free of cost all parts damaged or found defective during the period of guarantee. The Contractor shall be responsible for the execution of the contract strictly in accordance with the terms of this specification and the Standard Conditions of Contract as may be applicable.	Accepted with No Comments. Kindly review if "period of two years" of this clause No. is not conflicting with "period of 36 months" of clause no. 5 of this draft specification.	Noted	Noted and agreed.	Noted Contractor should have Class A foundry with melting to heat treatment infrastructure.	Clause is modified. Modified clause is as below: **CONTRACTORS' RESPONSIBILITY** The Contractor shall assist the coach builders in the fitting, testing and commissioning of these couplers and shall be responsible for their satisfactory working, and for any failure due to defective design or

						materials for a period of 36 months from the date of fitment or 48 months from the date of supply whichever is earlier. He shall replace free of cost all parts damaged or found defective during the period of guarantee.
7.	**INSTRUCTIONAL MANUALS** The Contactor hall supply repair manuals, instructional booklets and spare parts list for these couplers.	Accepted with No Comments.	Noted & will be supplied as & when required.	Noted and agreed.	Noted	
8.	**CONTRACT DRAWINGS** The list of contract drawings for Scharfenberg couplers and their assemblies is given in Appendix 'C'.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
9.	**MAINTENANCE OF COUPLERS** OEM/Supplier shall provide detailed instructions for day-to-day and workshop maintenance and shall include the following					New clause added
9.1	Detailed work content of various inspection/maintenance practices including procedure for assembly and fitment of couplers. The work content of each schedule shall also be intimated.					New clause added

9.2	OEM/Supplier shall specifically advise criteria for replacement of components of couplers during maintenance.					New clause added
9.3	OEM/Supplier shall supply min. 10 (Ten) copies of Maintenance Manuals for every supply of 500 (five hundred) couplers to PURCHASER and subsequently whenever revised. A soft copy of the Maintenance manual shall also be submitted					New clause added
10.	**MARKING** Each item under scope of supply shall be embossed/ punched clearly with unique numbers along with manufacturer logo and year of manufacture for traceability.					New clause added
	APPENDIX 'A' TO SPECIFICATION NO. 61-B-/REV. 68-1.					Heading of APPENDIX 'A' is corrected due to typographical error as under: APPENDIX 'A' TO SPECIFICATION NO. 61-B-36 (REV-02)
1.	The automatic head when fitted shall be generally to Scharfenberg Drg. 40.672(0)	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
2.	Automatic coupling heads shall provide for automatic coupling of brake pipes and have provision for subsequent fitting of automatic electrical contacts.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
3.	The automatic heads shall be capable of uncoupling through hand operated lever. This lever shall give a visual indication of the	Accepted with No Comments.	Noted	Noted and agreed.	Noted	

	coupler position and may be set in the open, neutral or closed position. The lever shall be easily accessible for operation and shall allow for fitting of pneumatic release from drivers cab at a later date.					
4.	Automatic coupling shall take place satisfactorily when coaches are brought together at speeds between 1 km/h and 15 km/h.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	Clause is modified. Modified clause is as below: Automatic coupling shall take place satisfactorily when coaches are brought together at speeds between 1 km/h and 5 km/h.
5.	The gathering range shall be 75 mm. Vertically on either side and 284 mm horizontally on either side of centre line of the coupler.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
6.	It should be possible to couple Scharfenberg automatic heads with standard IRS draw hooks through a transition gear adaptor Schaku automatic /IRS draw hook which should be obtainable on demand.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
	APPENDIX 'B' TO SPECIFICATION NO. 61-B-/REV. 68-1.				Noted	Heading of APPENDIX 'B' is corrected due to typographical error as under: APPENDIX 'B' TO SPECIFICATION NO. 61-B-36 (REV-02).

a.	Brake pipe connection to be 1” B.S.P.- working pressure 4.922 kg/cm2.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
b.	Main reservoir connection to be ¼” B.S.P. – working pressure 7.031 kg/cm2.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	Clause is corrected due to typographical error. Corrected clause is as below: Main reservoir connection to be 3/4” B.S.P. – working pressure 7.031 kg/cm2.
c.	Brake pipe to be closed only at uncoupled ends.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
d.	Main reservoir pipe to be closed only at uncoupled ends.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
e.	In the event of an unwanted uncoupling between coaches the brake pipe connection on both halves of the train must be vented to the atmosphere. The main reservoir should preferable (but not essentially) seal on both halves of the train under these circumstances.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
f.	Provision must be made on the couplers adjacent to the Driving Cabs of the control trailers and the motor coach for a connection (1/2” or 3/8” B.S.P.) to the brake pipe pressure switch. This connection must be taken from the brake pipe contained within the coupler. Thus the pressure switch at both ends of the train will be subjected to the atmospheric pressure but at all intermediate points down the train will be subjected to	Accepted with No Comments.	Noted	Noted and agreed.	Noted	

	brake pipe pressure.					
g.	As there will be relative movement between the coupler and the main frame flexible hose connections will be required for the brake pipe, the main reservoir pipe and (where fitted) the pressure switch pipe.	Accepted with No Comments.	Noted	Noted and agreed.	Noted	
	APPENDIX 'C' TO SPECIFICATION NO. 61-B-/REV. 68-1.					Heading of APPENDIX 'C' is corrected due to typographical error as under: APPENDIX 'C' TO SPECIFICATION NO. 61-B-36 (REV-02).
1.	Semi-permanent Intermediate Coupler End 'A' 40.586(0) a) Rubber Draft Gear 40.586.06 (2) b) Bearing Bracket 40.586.07(3)		Noted		Noted	
2.	Semi-permanent Intermediate Coupler End 'B' 40.586(0) Rubber Draft Gear 40.586.06 (2) Bearing Bracket 40.586.07(3)		Noted		Noted	
3.	Fully Automatic Coupler 40.572(0)		Noted		Noted	
a)	Automatic Coupler Head 40.663(1) i) Coupler Head 40.640.01(1) ii) Air Pipe Coupling for main air reservoir pipe 40.370.04 (1) iii) Air pipe coupling with valve for brake		Noted		Noted	

	pipe assembly 40.663.03(2) iv)Stem with spring Sleeve 40.371.02(3)					
b)	Draw & Buff Gear 40.588 (0)s i) Rubber Draft Gear 40.586.06(2) ii) Bearing Bracket with support 40.588.07(2) iii) Centering carrier 10.1000.10 (2)		Noted			