



**INDIAN RAILWAYS**  
**SPECIFICATION**  
**FOR**  
**SCHARFENBERG COUPLERS & DRAW GEAR**  
**FOR**  
**ELECTRIC MULTIPLE UNIT ROLLING STOCK**  
**FOR**  
**CALCUTTA & BOMBAY SUBURBAN SERVICE**  
**BROAD GAUGE**  
**1676 mm**

**SPECIFICATION No. 61- B - 36/Rev. 68-1**

**(RECONSTRUCTED NOVEMBER 2004)**

**ISSUED BY**  
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**INDIAN RAILWAYS**  
**SPECIFICATION FOR SCHARFENBERG COUPLERS AND DRAW GEAR**  
**FOR**  
**AC / DC EMU STOCK FOR CALCUTTA & BOMBAY SUBURBAN**  
**SERVICES**  
**BROAD GAUGE**

**1. 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 Stock.
- 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 & side buffers either by using special Transition Gear (Adopter) or by removing the automatic head and replacing by pot and draw screw.
- iii) All intermediate couplers in the 4-car / 3-car units shall be of the semi-permanent type.
- 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.
- v) This specification is intended to include everything requisite to the manufacture of the coupler, notwithstanding that everything required may not be mentioned herein.

**2. GENERAL DESIGN FEATURES:**

- 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).
- ii) The draft gear housing shall be capable of taking either rubber springs or ring springs, and identical spring packs shall be used for both end and intermediate couplers.
- iii) The draft / buffing springs shall be of natural or synthetic rubber, 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.
- 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.
- 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.
- 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.
- viii) The Air Brake connections shall fulfil the requirements given in Appendix 'B'.

3. **MAIN REQUIREMENTS:**

- i) The couplers shall have a rated draft 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.
- 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 8½ turnouts, and shall function satisfactorily with a 75 mm difference in headstock heights of adjacent coaches.
- iii) The couplers shall be tight lock, and shall not develop slack in service.

4. **TESTS:**

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.

5. **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.

6. **INSTRUCTIONAL MANUALS:**

The Contractor shall supply repair manuals, instructional booklets and spare parts list for these couplers.

7. **CONTRACT DRAWINGS:**

The list of contract drawings for Scharfenberg couplers and their assemblies is given in Appendix 'C'.

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**APPENDIX 'A' TO SPECIFICATION  
No. 61 - B - 36/Rev. 68-1**

**ADDITIONAL REQUIREMENTS FOR FITMENT OF AUTOMATIC  
SCHARFENBERG COUPLER HEADS**

1. The automatic head when fitted shall be generally to Scharfenberg Drg. 40.672(0).
2. Automatic coupling heads shall provide for automatic coupling of brake pipes and have provision for subsequent fitting of automatic electrical contacts.
3. The automatic heads shall be capable of uncoupling through hand operated lever. This lever shall give a visual indication of the 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 driver's 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.
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.
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.

**APPENDIX 'B' TO SPECIFICATION  
No. 61- B - 36/Rev. 68-1**

**NOTES ON BRAKE REQUIREMENTS FOR AUTOMATIC COUPLERS  
(WITH AIR CONNECTIONS)**

- a) Brake pipe connection to be 1" B.S.P. - working pressure 4.922 kg/cm<sup>2</sup>.
- b) Main reservoir connection to be 3/4" B.S.P. - working pressure 7.031 kg/cm<sup>2</sup>.
- c) Brake pipe to be closed only at uncoupled ends.
- d) Main reservoir pipe to be closed only at uncoupled ends.
- e) In the event of an unwanted uncoupling between coach the brake pipe connection on both halves of the train must be vented to the atmosphere. The main reservoir should preferably (but not essentially) seal on both halves of the train under these circumstances.
- 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 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.



# **APPENDIX 'C' TO SPECIFICATION No. 61- B - 36/Rev. 68-1**

## **LIST OF DRAWINGS FOR SCHARFENBERG COUPLERS AND THEIR ASSEMBLIES**

1.	<u>Semi-permanent Intermediate Coupler End 'A'</u>	40.586 (0) ✓
a)	Rubber Draft Gear	40.586.06 (2) ✓
b)	Bearing Bracket	40.586.07 (3)
2.	<u>Semi-permanent Intermediate Coupler End 'B'</u>	40.587 (0) ✓
a)	Rubber Draft Gear	40.586.06 (2) ✓
b)	Bearing Bracket	40.586.07 (3)
3.	<u>Fully Automatic Coupler</u>	40.672 (0)
a)	<u>Automatic Coupler Head</u>	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 pipe assembly	40.663.03 (2)
iv)	Stem with Spring Sleeve	40.371.02 (3)
b)	<u>Draw &amp; Buff Gear</u>	40.588 (0)s
i)	Rubber Draft Gear	40.586.06 (2) ✓
ii)	Bearing Bracket with support	40.588.07 (2) ✓
iii)	Centering carrier	40.1000.10 (2)

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