Dated: 29.01.2021

Sub : Requirement of around 25 sets of Hydraulic Rescue Devices per year for next 5 years i.e. 2021, 2022, 2023, 2024 & 2025 manufactured by indigenous firms.

"Central Organisation for Modernisation of Workshops (COFMOW), on behalf of Ministry of Railways is required to procure around 25 sets of Hydraulic Rescue Devices per year for next 5 years from indigenous manufacturers to be used primarily for rescue and relief operations in the event of an accident involving human lives.

The Scope and Capability of Hydraulic Rescue Device is enclosed as Annexure-A. The brief details of the existing Hydraulic Rescue Devices in use by Indian Railway and technical specifications are enclosed as Annexures B & C respectively."

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Enclosures:

Annexure-A, B & C

ANNEXURE - A

SCOPE & CAPABILITY :

1. The Hydraulic Rescue Device offered shall be capable of performing quick and safe rescue operation to facilitate extrication of passangers entrapped inside the Railway coaches, locomotive cabs and road vehicles, involved in accident by cutting through, spreading or pushing apart the structural parts of coaches, locomotive cabs and road vehicles involved in the accident.

2 The equipment shall be capable to perform various operations such as spreading and pulling of metal sheet of coach body, pushing apart for opening of closed doors and windows (560 mm opening), cutting of various sections such as window bars, window frame channel, body panel sheet, roof sections, berth supports, pillars between windows and various body sections efficiently and quickly with ease.

3. The equipment shall be capable of performaing various operations detailed above on various structural parts of Railway coaches, locomotive cabs and road vehicles. These are fabricated out of mild steel/ corten steel/ Stainless steel/ Ferritic steel sheet of quality X2CrNi 12 (409M) having a tensile strength of up to 650 N/mm^2 and Austenitic steel sheet having a tensile strength of 750 N/mm^2 of quality X5CrNi18 10 (304) as per DIN 1.4003. The drawing no. ICF/SK-9-0-300 showing the various structural parts of standard coach body is placed as Annexure - I. For other dimensional details of the BG/MG coaches, the following drawings may be referred for guidance.

CSC-1668 (BG) Day coach (Annexure - II)
CSC-1650 (MG) Day coach (Annexure - III)
LG90012 LHB (BG) coach (Annexure - IV)
1.101130.01.000.001 LHB (BG) coach (Annexure - V)

4. The rescue operations generally involves following activities :
   a) Cutting of rods of two windows.
   b) Cutting of pillars between two windows.
   c) Cutting of bottom channel of windows from both sides downwards approx. to a depth of 600 mm and spreading the same to create a minimum opening of 1300 x 1000 mm.
   d) Entry to the coach when the approach through the window is not accessible.
   e) Making access to the coach through the lavatory and its adjacent door.
   f) Making access through ceiling of the coach.
   g) Opening of door & window from inside when both metallic shutters and glass shutter are closed.

The total time for the operations at a, b & c above shall not exceed 60 minutes.

5. The Hydraulic Rescue Device shall be capable of performing rescue operations (as detailed above) without causing any additional injury to entrapped passengers as a result of cutting, spreading, pulling off and other operations.

6. The equipment shall be capable to perform under severe conditions at an altitude of 2000 meters with temperature ranging from -10° C to 55° C and relative humidity up to 100 %. The equipment shall be suitably tropicalised for use under Indian operating conditions so that under high humidity and high temperature conditions, the material used for manufacture of the equipment should not get corroded / rusted or develop fungus. The equipment should be of robust design, portable, light weight and able to withstand manual handling while moving from place to place even in rough terrain. The equipment should not suffer any damage even after being dropped from a height of not exceeding 2 meters. The equipment should be easy to dismantle and key parts easily accessible for repair and adjustment.

ANNEXURE – B

Brief Details of existing HYDRAULIC RESCUE DEVICE is given below :

S. No.	DESCRIPTION	SPECIFICATION
1.	**Hydraulic Pump with Power unit**	
	Function	Two/Three stage
	Working Pressure	700 bar ± 3 %
	No. of tools to be operated simultaneously	2
	Operational weight (Nominal)	23 Kg ± 10%
	Power	2 kW
	Oil tank capacity	3500 cc (± 500 cc)
2.	**Hydraulic Hand/Foot Pump**	
	Function	Two stage
	Working Pressure	700 bar ± 3 %
	Weight (Nominal)	13.5 ± 10 %
3.	**Spreader**	
	Spreading force (Minimum)	**250 kN**
	Pulling force (Minimum)	**40 kN**
	Spreader opening at tips (Minimum)	**680 mm**
	Weight (Nominal)	**19 Kg** ± 10%
4.	**Cutter**	
	Opening of blade at tips (Minimum)	200 mm
	Cutting force (Minimum)	950 kN
	Weight (Nominal)	18.5 ± 10%
6.	**Combination Tool**	
	Spreading force (Minimum)	200 kN
	Spreading distance (Minimum)	360 mm
	Pulling force (Minimum)	48 kN
	Cutting force (Minimum)	380 kN
	Weight (Nominal)	14 ± 10%
7.	**Ram Jack with Accessories (Telescopic 2 stage only)**	
	Pushing force (Minimum) Piston 1 Piston 2	 189 kN 80 kN
	Stroke (Minimum) Total Piston 1	 700 mm 350 mm
	Retracted length (Maximum)	550 mm
	Weight (Nominal)	17.5 Kg ± 10%
8.	**Ram Jack with Accessories (Single Piston only)**	
	Pushing force (Minimum)	**135 kN**
	Stroke (Minimum)	**250 kN**
	Retracted length (Maximum)	**550 mm**
	Fully extended length w/out extension piece (Minimum)	**750 mm**
	Fully extended length with extension piece (Minimum)	**1000 mm**
	Weight (Nominal)	**12 Kg** ± 10%

9.	**Laminated Glass Cutter with Center Punch**	Light weight and handy. Spring loaded Center to tap and break the glasses. Glass cutter shall be able to cut ordinary coach glass and laminated toughened glass of AC coaches (size: 540 mm x 560 mm) and one AC coach window glass (size: 1220 mm x 540 mm).
10.	**Light Weight Folding Type Ladder**	Light Weight Collapsible type aluminum ladder, sturdy enough to withstand the load of minimum 150 Kg.
11.	**Light Weight Rescue Platform**	Light Weight aluminum construction platform having space for at least 4 person to stand on the platform, sturdy enough to withstand load of 600 Kg. Size of platform shall be minimum 1000 mm x 800 mm x 300 mm and height shall be adjustable from 800 mm to 1400 mm. Provision for adjustable ladder on both side of platform.
12.	**Sharp Edge Protection Cover**	Made of wear resistant, water repellent, fire-retardant and washable polyester / material capable of instant attachment to a vehicle. Minimum requirement : 1 set of sharp edge protection cover consisting of 4 covers with velcro or other suitable binding attachment of size 26 cm x 30 cm approx. 4 blanket covers with 4 magnets of size 24"x24" approx. and 2 blanket covers with 6 magnets of size 60"x24" approx.

ANNEXURE-C

ISO 9001 : 2008	Specification No:	MP.0.08.00.105	Revision No:01	Date Issued:10/04/2015
Specification Title: Hydraulic Rescue Device (HRD)				

(For official use only)
(केवल सरकारी प्रयोग हेतु)

भारत सरकार
रेल मंत्रालय

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

TECHNICAL SPECIFICATION
OF
HYDRAULIC RESCUE DEVICE (HRD)

Specification no. MP-0.08.00.105 (Rev.-01)
April-2015

Issued by

अनुसंधान अभिकल्प एवं मानक संगठन,
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0.0 INTRODUCTION:

This document pertains to Hydraulic Rescue Devices intended to be used primarily for quick and safe rescue operation to facilitate the extrication of passengers entrapped inside the railway coaches, locomotive cabs and road vehicles, involved in accidents by cutting through, spreading or pushing apart the structural parts.

1.0 OBJECTIVES AND SCOPE OF THE SPECIFICATION:

1.1 The specification covers the requirements for design, manufacture, performance and testing, supply & delivery including commissioning into service of Hydraulic Rescue Devices as per requirement of tendering authority and to be used primarily for quick and safe rescue operation to facilitate extrication of passengers entrapped inside the railway coaches, locomotive cabs and road vehicles, involved in accident by cutting through, spreading or pushing apart the structural parts of coaches, locomotive cabs and road vehicles involved in accident.

1.2 The equipments shall be capable to perform various operations such as spreading and pulling of metal sheet of coach body, pushing apart for opening of closed doors, & windows (560 mm opening), cutting of various sections such as window bars, window frame channels, body panel sheet roof sections, berth supports. Pillars between windows and various body sectionsefficiently and quickly with ease.

1.3 The equipments shall be capable of performing various operations detailed at 1.2 above on various structural parts of railway coaches, locomotive cabs and road vehicles. These are fabricated out of mild steel/corten steel/stainless steel/Ferritic steelsheetof quality X2 CrNi12 (409M)having a tensile strength of up to650 N/mm^2 and Austenitic steelup to750N/mm^2(Ref- RDSO spec. no. C-K201)of qualityX5CrNi18 10 (304) as per DIN 1.4003.The drawing no. ICF/SK-9-0-300 showing the various structural partsof standard coach body is placed at Annexure-I. For other dimensional details of the BG/MGCoaches, the following drawings may be referred for guidance.

a) Drg No. CSC-1668 (BG) day coach (Annexure-II).
b) Drg No. CSC-1650 (MG) day coach. (Annexure-III).
c) Drg No. LG90012 LHB(BG) Coach (Annexure-IV).
d) 1.101130.01.000.001 LHB(BG) Coach (Annexure-V).

1.4 The **SCHEDULE-I** rescue devices shall be capable of working satisfactorily and efficiently under the service condition indicated below:

1.4.1 Altitude = 1200 meters above mean sea level
1.4.2 Temperature = 0^oC to 55^oC
1.4.3 Relative Humidity = upto 100%
1.4.4 TheHydraulicRescueDevices shall be capable of operating efficiently in spite of dirt, dust, mist, torrential/heavy rainfall with thunderstorms. The HydraulicRescue Devices shall also be capable of working on railway coach body or road vehicle, partially or wholly submerged in water except the pump and power unit.
1.4.5 The Hydraulicrescue devices offered for Kashmir or hill stations higher than 1200 m shall be capable of performing efficiently under the service condition indicated below:
1.4.5.1 Altitude = 3000 meters above mean sea level
1.4.5.2 Temperature = -15^oC to 55^oC
1.4.5.3 Relative Humidity = upto 100%
1.5 The Hydraulic Rescue Devices shall be capable of performing rescue operations without causing any additional injury to entrapped passengers as a result ofcutting, spreading etc.

2 DESCRIPTION OF EQUIPMENTS:

2.1 The equipments should conform to parameters as per schedule-I and shall have basic design features & specific characteristics as per clause 3 & 4 respectively.

2.2 The equipments should be of a well proven design and should have been in use by Railway systems of different countries for rescue operations. Each set should have following equipment.

2.3 One set of equipments shall normally consist of the following, unless otherwise specified by the purchaser:-

(i) Hydraulic pump with power unit = 1 no.

(ii) Manual Hydraulic hand/Foot pump suitable for operation in standing as well as sitting position = 1 no.

(iii) Spreader with spreading cum peeling tips/jaws = 1no.
or
Spreader with separate spreading and peeling tips with jaws = 1 no.

(iv) Cutter with blades = 1 no.

(v) Combination tool suitable for spreading, cutting and pulling with blades = 1 no.

(vi) Ram Jack with accessories (Telescopic 2stage/single piston) = 1 no.

(vii) Laminated Glass cutter with Center punch = 1 no.

(viii) Light weight folding type ladder = 1 no.

(ix) Light weight rescue platform (complete) = 1 no.

(x) Sharp edge protection covers = 1 set

2.4 CONCOMITANT ACCESSORIES

2.4.1 Hydraulic hoses, 4x20 meters length each in case of two hose system or 2x20 meters length in case of single hose system mounted ondoublehose reel drum for connecting minimum number of two rescue devices complete with non-interchangeable hydrauliccoupling with dust caps for quick connection/disconnection . = Two sets

2.4.2 Extra hoses of 4x10 meter length each in case of two hose system or 2x10 meter length in case of Single hose system for extending the operating hose length up to 30 meters, with non-interchangeable hydraulic couplings with dust caps. =Two sets

2.4.3 Accessories for spreader.

a) Chain set with chain hook for adjusting the length of the chain = 1 no.

b) Spreader cum peeling tips (spare) = 1 pair
or
Spare spreader tips and peeling tips = 1 pair each

2.4.4 Cutter blades (spare) = 1 pair

2.4.5 Quick change coupling with dust cap. = 2 set (4 nos.)

2.4.6 Short connection tool side hoses (Only in case of two hose system) = 1 set (2 nos.)
Or
Quick connect male/female coupler (only in case of single hose system)

2.4.7 Storage case for accessories of spreader, cutter andcombination tool = 1 no.each

2.4.8 First fill of hydraulic oil, lubricating oil and fuel oil (quantity and brand to be furnished)

2.5 **ACCESSORIES (OPTIONAL)**

2.5.1 C Shaped continuous length cutter = 1 no.

3. BASIC DESIGN FEATURES

3.1 The equipments shall be of robust design and construction & shall be easily portable. It shall be able to withstand manual handling while moving it from one place to another on rough terrain. It should have a very high degree of reliability so that its satisfactory performance during the course of operation at accident site is ensured.

3.2 The equipments shall be of lightweight construction and ergonomically designed for ease of handling & operation by single man. There shall be provision for firming up the equipment in position for temporary relief of the operator.

3.3 The working pressure at maximum capacity shall be 700 bars $\pm$ 3%. The weight of individual equipment, as specified in Schedule–I may exceed by maximum of 10%.However, there is no limit on the lower side. The weight of the power unit shall include the hydraulic fluid, fuel and engine oil, if applicable. The weight of the tool will be determined with hydraulic fluid and attached hose coupling.

3.4 The equipments shall be hydraulically operated by portable power pack unit consisting of light weight four stroke petrol engine and hydraulic pump. The pump shall be capable to operate two tools simultaneously at a time. The engine shall be designed to withstand frequent starts, stops as demanded and capable to perform efficiently in environmental condition as specified in Clause 1.4. The equipment should not transmit any jerk/vibration to the operator.

3.5 The equipments must conform to European Specification EN 13204 (latest) and/or American specification NFPA 1936 (latest). A test certificate issued by an accredited (as per ISO 65 by an accreditation body operating in accordance with ISO 17011) internationally accepted Test laboratory or an accredited testing agency operating in accordance with an ISO 17025 stating that the rescue devices meets the performance standards as specified in EN 13204 and/or NFPA 1936 shall be enclosed with the offer. The product should carry the label, symbol or other identifying mark of certificate issuing authority.

4. SPECIFIC CHARACTERISTICS OF EQUIPMENT: (The details as per schedule-II shall also be provided with the offer).

4.1 HYDRAULIC PUMP WITH POWER UNIT

4.1.1 Petrol engine driven hydraulic pump shall be capable of developing adequate hydraulic pressure and pulsation free flow to operate minimum two hydraulic rescue devices at a time at high pressure for performing rescue operations as stipulated at clause 1.2 and clause 1.3. The working hydraulic pressure should be indicated in the offer.

4.1.2 The petrol engine shall be four stroke, compact design easy to carry & store, light weight construction and preferably available in India. The installed output of the engine shall be compatible with the requirement of the hydraulic pump. Details of the petrol engine provided shall be indicated in the offer.

4.1.3 The hydraulic pump should be of positive displacement type capable of developing and maintaining adequate operating pressure and shall provide a pulsation free flow of oil. Details of pump, its type, make, capacity etc. should be clearly explained in the offer. The pump shall be two stage /three stage as mentioned in para 4.1.7 for low and high-pressure outputs. The oil sump capacity should be indicated in the offer.

4.1.4 The pump should have a suitable oil filter at the suction end. Filter element should be reusable after periodic cleaning. The type, make and other details of the filters as well as the recommended cleaning process and periodicity should be explained in the offer.

4.1.5 Simultaneous operation of two tools connected to the pump at one time should be possible from the same power pack (Hydraulic pump and power unit) without coupling and uncoupling pressure and return lines of equipment. Details of the arrangement provided should be explained in the offer.

4.1.6 The pump along with power pack should be mounted on light portable metal frame having rubber feet. The frame should be provided with suitable soft grip carrying handles to carry it easily over undulating / rough terrain.

4.1.7 The following features, gauges/ indicators and safety devices shall be provided in power pack unit for two stage /three stagehydraulic pump:

i) Engine:

a) Single switch operation.
b) Easy access for filling of fuel.
c) Fuel level indicator/ gauge.
d) Protection cap for spark plug.

ii) Hydraulic pump:

a) Easy access for filling of hydraulic oil.
b) Pressure relief valve.
c) Hydraulic oil level indicator/ gauge.

Drain plug shall be provided at the lowest position of the fuel/hydraulic oil tank. It shall be possible to drain the oil/ fuel from the tank without disconnecting any pipe or other fittings.

4.2 **MANUAL HYDRAULIC PUMP :**

4.2.1 A light weight hydraulic hand/Foot pump mounted on suitable base plate shall be offered by the suppliers as a standby unit for operating the hydraulic rescue devices.

4.2.2 It shall be capable of developing adequate pressure for operating hydraulic rescue devices up to their full capacity. It shall be possible to operate the pump even when placed in an inclined/vertical position.

4.2.3 The pump shall have two stage operations. The operating pressure and flow rate shall be indicated in the offer. The handle of hand/foot pump shall be adjustable in two positions (i)Pumping in horizontal position (sitting down) and (ii) Pumping in vertical position (standing up).

4.2.4 In case of two hose system, the tool shall include minimum 0.3 meter long hydraulic hose complete with a single quick connect coupling mounted at the end of the twin hose equipped with dust cap and protection cover/spring over length of 125 mm minimum from coupling end. In case of single hose system the tool shall have a quick connect female/male coupler fitted at the end for connecting to the single hose directly.

4.3 HOSE ASSEMBLY

4.3.1 An independent double hose reel drum with two sets of return and pressure hoses of 20 meters length each or an independent double hose reel drum with two single hosesconsisting of high pressure inner hose inside a low pressure outer hose of 20 meter length with hose fittings at each end of the hose and quick coupling shall be provided for ease of handling. It shall be possible to coil and uncoil hoses independently even under working pressure. The hoses shall be of high quality suitable to withstand the high pressure involved in working of the equipment for pressure and return lines. Non-interchangeable hydraulic coupling designed for quick connection/disconnecting shall be provided with dust caps. The coupling details should be explained in the offer. The hoses shall be capable for coupling together to increase the length. The hose coupling should be freely rotatable by 360° to ensure that the hose is not twisted during usage or storage. It should be provided with a locking device to prevent accidental uncoupling during operations and with anti-kink protection at each end e.g. spring guards.

4.3.2 Coupling/Tool shall have a safety valve, which will be actuated, to prevent the equipment from being damaged, if there is any sudden change in system pressure; say due to bursting of hoses.The hoses shall be tested for bursting pressure (four times of maximum operating pressure) and impulse test according toEN 13204 and NFPA 1936.Hose assemblies shall withstand a proof pressure of at least 2 times the allowable pressure. The tenderer shall provide the test certificate along with catalogue of the manufacturer with the offer. The total weight of the hoses and reel drum shall be indicated in the offer.Hose reel should be tested for endurance test as specified in EN13204 and/or NFPA1936.

4.3.2 The hydraulic oil shall be of non-corrosive type and shall have flash point not less than 90^0 C and shall not have toxic or allergic effect when coming in direct contact with persons. Equivalent grade suitable for the equipment should be freely available in India from leading oil companies. The equipments shall be supplied with the first fill of hydraulic oil during commissioning as well as “one time” after prove out. Successful bidder shall be required to indicate at least three Indian sources for supply of the equivalent suitable hydraulic oil.

4.4 SPREADER

4.4.1 The spreader should be double acting hydraulically operated device, light weight construction made of anti-corrosive high strength metal capable of being lifted, held and operated manually with ease. The details and design features of the hydraulic spreader and its controls, and material used for construction of its major components such as spreader arms, cylinder and other components should be explained in the offer.

4.4.2 It should be capable of spreading, pulling, squeezing various structural parts of railway coaches as detailed in clause 1.2 and 1.3 above.

4.4.3 In case of two hose system, the toolshall include minimum 0.3 meter long hydraulic hose complete with a single quick connect coupling mounted at the end of the twin hose equipped with dust cap and protection cover/spring over length of 125 mm minimum from coupling end. In case of single hose system the tool shall have a quick connect female/male coupler fitted at the end for connecting to the single hose directly.

4.4.4 Spreader arms should be light weight, robust construction and properly ribbed for strength. Quick locking system for spreader/peeling tips and chain attachment shall be available.

4.4.5 The operating controls should be conveniently positioned. All the control positions for (a) Spreading (opening), (b) Stopping and (c) Closing, should be clearly marked to avoid any ambiguity. It should be possible for right handed as well as left handed operator to operate equipment conveniently.

4.4.6 The spreader tips shall be wear resistance with excellent grip and made of alloy steel suitably heat treated to spread/open the steel doors, windows, side panel, roofs of passenger coaches without the tips getting bent or broken. The material specification of the tips and their hardness should be indicated in the offer. It should be possible to quickly interchange tips/ accessories without the use of hand tools and without loosening connecting parts.

4.4.7 The tips of the spreader should be suitably serrated to prevent any slip during operation. These should be of easily replaceable type and should have provision for mounting chains for pulling operation.

4.4.8 Spreader should have safety features like dead man control device and built in automatic safety relief device. There should be a gap between two arms of spreader when the tips are fully closed so that operator fingers are not squeezed between them at any time.

4.5 CUTTER

4.5.1 The cutter shall be double acting hydraulically operated and shall be supplied along with minimum 0.3 m long hose complete with a single quick connect coupling mounted at the end of the twin hose equipped with dust caps and protection cover/springoverlength of 125 mm minimum from coupling end. In case of single hose system the tool shall have a quick connect female/malecoupler fitted at the end for connecting to the single hose directly.It should be strong, reliable and of light weight construction capable of being lifted, held and operated manually with ease. Details of the cutter and material used for construction of its major components such as cylinder, piston and other components should be explained in the offer.

4.5.2 The cutter blade should be curve shaped/ parrot type and shall be capable to meet the requirements mentioned in clause 1.2 & 1.3. The cutting blades should be of shock resistant non corroding alloy steel, hardened and ground and shall be exchangeable and re-grindable. The material specification of the cutting blades and hardness shall be indicated in the offer. The blades should be robust with long service life.

4.5.3 It should be capable of cutting or shearing structural parts of railway coaches as detailed in clause 1.2 & 1.3 above.

4.6 COMBINATION TOOL

4.6.1 The combination tool should be double acting hydraulically operated device of light weight and well balancedconstruction made of anti-corrosive high strength material capable of being lifted, and operated manually with ease. The details and design features of the combination tool and its controls and material used for construction of its major components such as arms, cylinders and other components should be explained in the offer.

4.6.2 The multipurpose combination tool should be capable of spreading, squeezing, cutting and pulling & shall be capable to meet the requirements mentioned in clause 1.2 and 1.3.

4.6.3 In case of two hose system the tool should be supplied with connection hoses of 0.3 meter long complete with a single quick connect coupling mounted at the end of the twin hose, equipped with dust caps and protection cover over length of 125mm minimum from coupling end or protection spring over length of 125mm minimum from coupling end. In case of single hose system the tool shall have a quick connect female/male coupler fitted at the end for connecting to the single hose directly.

4.6.4 The operating control should be conveniently positioned and it should be possible for right handed as well as for left handed operator to operate equipment conveniently.

4.6.5 The blades should be of shock resistant non corroding alloy steel hardened and ground and shall be exchangeable and re-grindable. The material specification of blades and hardness should be indicated in the offer. The blade should be robust with long service life.

4.7 RAM JACK WITH ACCESSORIES

4.7.1 The ram cylinder shall be telescopic and of light weight construction suitable for manual application with ease. The tool should be supplied with connection hoses of minimum 0.3meter long complete with a single quick connect coupling mounted at the end of the twin hose equipped with dust caps and protection cover/spring over a length of 125mm minimum from coupling end. In case of single hose system the tool shall have a quick connect female coupler fitted at the end for connecting to the single hose directly.

4.7.2 The dead length of cylinder should be less than width of window and should get accommodated in the windows of the coaches as per drawing given in clause 1.3. The ram cylinder shall be capable of making a hole in the body of the coach by using a penetration tip so that the tips of the spreader offered can be inserted to enable its operation. The peeling attachment and penetration tip should also form a part of supply. The ram cylinder shall remain in position under load even if the operating push button is released. The details and design features of the hydraulic ram cylinder and its attachments should be explained in the offer.

4.7.3 The ram jackshould be provided with its complete accessories including extension piece to enable operation of widening and supporting operations and also preferably making holes. The piston rods should have chrome plated/ chemically nickeled finish. The ram should have high grip claws on the piston rod and base of cylinder. The claws should be 360^0 rotatable. The feet of the rams should be profiled to form a gripping surface.

4.7.4 The ram jack shall be used for pushing of structural parts of coaches such as for widening an opening from 560 mm to minimum 1100 mm. The equipment will have maximum two stage telescopic ram without extension pieces to achieve the desired opening of 1100 mm.
(For telescopic 2 stage Ram jack only).

The ram jack shall be used for widening an opening from 560mm to minimum 750 mm without extension piece and minimum 1000 mm with extension piece (for single piston ram jack only)

4.7.5 The Ram jack should comply to safety requirements and performance requirements such as tool operating temperature test, spreading force sudden power loss test, pulling force sudden power loss test, Ram tool spreading force test, Ram tool pulling force test, dynamic endurance test, hydraulic and mechanical overload test, Ram bend test, off centre load test as specified in EN132014 and/or

NFPA1936 and should have safety features such as deadman control device and built in automatic safety relief device.

4.8 **LAMINATED GLASS CUTTER WITH CENTER PUNCH:**

4.8.1 The equipment shall be very handy and light weight and able to cut ordinary coach glass and laminated toughened glass of AC coaches. The time required to cut one ordinary coach window glass (size: 540mm x 560mm) and one AC coach window glass (size: 1220 mm x 540 mm) shall be indicated. The center punch should be spring loaded so that it is easy to tap and break the glasses.

4.9 **LIGHT WEIGHT FOLDING TYPE LADDER:**

4.9.1 Lightweight ladder of all aluminum construction and robust in design shall be manufactured for carrying out rescue works at elevated position. The offered ladder shall be of collapsible type and sturdy enough to withstand the load of minimum 150 kg. It will be possible to place the ladder firmly even on rough and uneven surface or on a slippery surface. If required, ladder shoes shall be provided to avoid slippage. The weight of the ladder shall be indicated in the offer.

4.10 LIGHT WEIGHT RESCUE PLATFORM:

4.10.1 Light weight rescue platform of solid aluminum construction and robust in design shall be offered for rescue work in elevated position. The platform shall be safe stable and provided with non-slip surface and steps. There will be provision for adjustable ladder on both sides of platform which shall also be of solid aluminum construction and robust in design.The legs of the platform should be telescopic with feature of auto lock system and each leg be adjusted individually at uneven surfaces.The platform shall be foldable type for easy transition. The design of ladder feet shall be such that it will be possible to work on uneven ground. Suitable railing shall be provided for carrying out safe rescue operation. It shall be possible for at least 4 persons to stand on the platform to perform the work with necessary tools. It should be possible to withstand the load of 600 kg. Total weight of the offered equipment shall be indicated in the offer. The platform height should be adjustable from 800 mm to 1400 mm. The dimensions of the platform should be approx. 1000X1800X300 mm and it should comply to DIN 14830 standards.

4.11 SHARP EDGE PROTECTION COVERS:

4.11.1 1 Set of sharp edge protection cover consisting of 4 covers with valcro or other suitable binding attachment of size 12” x 12” approx. 4 blanket-covers with 4 magnets of size 24” x 24” approx. and 2 blanked covers with 6 magnets of size 60” x 24” approx. These covers should be made of wear resistant, water repellent, fire-retardant polyesters / material capable of instant attachment to a vehicle. The magnets should be removable and covers should be washable.

4.12 CONTINUOUS LENGHTH C-CUTTER (OPTIONAL)

4.12.1 The C-Cutter should be double acting hydraulically operated device of light weight and balanced construction made of anti-corrosive high strength material capable of being lifted and operated manually with ease. The details and design features of the C-Cutter and its control and material used for construction of its major components such as arms, cylinders and other components should be explained in the offer.

4.12.2 The C-Cutter should be capable of continuous cutting sheets and structural parts of railway coaches as detailed in clause no. 1.2 & 1.3.

4.12.3 In case of two hose system the tool should be supplied with connection hoses of minimum 0.3 meters long complete with a single quick connect coupling mounted at the end of the twin hose, equipped with dust caps and protection cover/spring over length of 125 mm minimum from coupling end. In case of single hose system the tool shall have a quick connect female/male coupler fitted at the end for connecting to the single hose directly.

4.12.4 The operating control should be conveniently positioned and it should be possible for right handed as well as left handed operator to operate equipment conveniently.

4.12.5 The blade should be of shock resistant non corroding alloy steel hardened and ground. The material specification of the blade and hardness should be indicated in the offer. The blade should be robust with long service life.

4.12.6 The C-Cutter should comply to safety requirements and performance requirements such as tool operating temperature test , cutting test in each material category, cutter integrity test and over load test as specified in EN 13204 and/or NFPA 1936 and should have safety features such as deadman control device and built in automatic safety relief valve.

5. SAFETY FEATURES

5.1 Hydraulic Rescue Devices shall comply with all safety devices specified in EN 13204.All rescue tool hydraulic fittings and quick connect couplers shall have a safety factor of at least 2:1.

5.2 It is assumed that only trained and competent persons wearing gloves will use and operate the Hydraulic Rescue Devices.

5.3 The manual control actuator shall be located on the tool and designed to enable to operate the tool with a variable speed and as a hold-to-run control device.

5.4 Heat generating components and rotating parts of the power pack shall be provided with fixed guards or devices to prevent unintended contact. All electric component of power pack shall have a minimum degree of protection IP44. All pressure containing parts of power pack shall withstand a pressure of 1.5 times the allowable pressure for 60 s.

5.5 The power unit should comply to the safety requirements and performance requirements such as Impact resistance test, Noise test, Incline operation test, power unit pressure test, power unit pressure relief and automatic limiting device test, power unit dump value test, endurance test, directional value endurance test as specified in EN 13204 and/or NFPA1936

5.6 Safety valve shall be provided to protect the tool if return hose is wrongly connected in case of two hose system. Safety valve to be provided to prevent over loading. All quick connect couplers to be provided with a locking feature to prevent accidental uncoupling during operation.

5.7 Handles and controls shall be located on the rescue devices to allow them to be safely carried and operated by personnel wearing gloves. All handles and controls shall be designed to prevent the user's hand from being caught or crushed by moving parts of the tool during tool operation.

5.8 Hold function shall be available to allow tool to be disconnected under load. Tools shall remain in position even if control handle is accidentally turned while hoses are disconnected.

5.9 All pressure and return lines to be clearly marked and color coded.

5.10 Additional safety features available shall be highlighted by the tenderer.

6. MARKING

6.1 The equipment shall be provided with a suitable identification plate permanently attached to the tool with text printed in English inscribing the following:-

i) Manufacturers' name
ii) Product identification number or lot number or Serial Number
iii) Month and year of Manufacture
iv) Model name, number or design
v) Rated system pressure, where applicable
vi) Manufacturer's specified hydraulic fluid for power unit.
vii) Fluid capacity of Hydraulic reservoir for power unit.
viii) Operating voltage and current type, where applicable.
ix) Operating amperage at no load, where applicable.
x) Operating amperage at Max. load, where applicable.

7. AFTER SALES SERVICE

7.1 The tenderer shall clearly spell out in the offer the facilities available with him or his agent for providing adequate after sales service anywhere in India during warranty and post warranty periods. Tenderer shall also indicate the service organizations located at various places in India and the availability of trained staff, maintenance spares etc. at different centers in the country. The tenderer will also spell out how and from where spare parts can be obtained.

8. TECHNICAL LITERATURE

8.1 Normally printed illustrative catalogue showing features of the equipment and its elements must be enclosed with unless otherwise specified by the purchaser.

8.2 The manufacturer shall specify in the catalogue the length, width and height of all the tools. The date for opening distance of cutters and rating of cutters as per EN13204 and NFPA1936 shall be provided in the catalogue. The data for opening and closing travel distance for other rescue tools and weight of the tool in ready to use configuration shall be provided in the catalogue.

8.3 The successful tenderer will have to furnish , for each equipment 4 copies of spare parts catalogue giving the part list number of each component with exploded views and assembly drawings , maintenance manual, troubleshooting guide, safety instructions, operating manual of the equipment to the consignee directly within 3 months of placement of A.T. The bidder should provide a list of literature they will supply alongwith the equipment. One copy of these manuals shall be sent directly to RDSO Lucknow. The technical literature shall be provided for complete equipment including imported and indigenously purchased components/subassemblies.

9. SPARES

9.1 The lists of recommended perishable and non-perishable spares required for normal maintenance to cover complete range of mechanical, and hydraulic equipments (including controls) shall be furnished and quoted separately. The quantities shall relate in case of non-perishable spares, to two years normal maintenance, and in case of perishable spares to the duration of its shelf life or two years, whichever is less. Shelf life should be indicated with the quotation for spares. A complete catalogue giving the part list number of each component and assembly drawings shall also be provided with each equipment in duplicate.

10. SPECIAL FEATURES

10.1 Special features incorporated into the equipment, if any, shall be indicated separately by the tenderer, clearly indicating the advantages of these features.

11. DEVIATIONS

11.1 The tenderer should certify that the equipment offered fully meets the specifications. Various design features incorporated in equipment to fulfill different technical and performance requirements should be fully explained in the offer. However, Minor deviations from this specification, which do not affect or in any way interfere with the stipulated performance standards, or would result in improved safety / reliability or would reduce recurring maintenance / operating cost of the equipment, can be considered for acceptance. The tenderer in such eventuality shall clearly indicate the details of the deviations and their implications.

12. INSPECTION OF EQUIPMENT AND TESTING AT MANUFACTURER'S WORKS

12.1 The required capacity/ capability of each equipment shall be checked at manufacturer's premises by the inspecting authority nominated by the purchaser as per the test procedures / norms laid down in European Standard EN 13204 Euronorm / American specification NFPA 1936. For this purpose, necessary testing schemes for each equipment, based on the respective classifications under above standard as mentioned in Annexure A shall be submitted by the tenderer with the offer.

13 Dimensional Check :

Physical dimension check of each equipment shall be made as per the specification.

13.1 Manufacturers must have suitable facilities at their works for carrying out various performance tests on the equipment. The tenderer should clearly confirm that all facilities exist and shall be made available to the inspecting authority.

13.2 A sample inspection chart for inspecting the equipment should be supplied along with the bid. The inspection charts should indicate all the tests that are carried out during the equipment manufacture and also the tests to be offered to inspecting agency. The standard to which this inspection chart conforms should be clearly indicated. Against each test, acceptable limit/range of values should be indicated.

13.3 The tenderer will submit quality assurance plan being followed at the manufacturer's works for ensuring quality of the product offered. In case the firm is ISO certified, a copy of valid certificate may also be enclosed with the offer.

14 TRAINING

14.1 In order to ensure highest utilization and keeping the equipment in proper state, adequate number (at least three staff from each consignee) of Indian Railway personnel will have to be trained in operation and maintenance of these equipments. The contractor shall organize a centralized training for the representatives of Indian Railways at a Carriage depot shop/ Carriage POH shop for maximum 10 consignees in a batch for a period of three working days for each batch. It shall include hands on training pertaining to operation and maintenance of rescue equipments to the consignees. Scheme of training should be submitted with the offer.

14.2 The purchaser and contractor shall mutually decide the place of training after award of contract. The training shall include practical demonstration of all the equipment and their proper utilization, on a condemned coach arranged by the consignee. This shall include:

a. Cutting of rods of two windows.
b. Cutting of pillars between two windows.
c. Cutting of bottom channel of windows form both sides downwards approx. to a depth of 600 mm and spreading the same to create a minimum opening of 1300 x 1100 mm.
d. Entry to the coach when the approach through the window is not accessible.
e. Making access to the coach through the lavatory and its adjacent door.
f. Making access through ceiling of the coach.
g. Opening of door & window from inside when both metallic shutter and glass shutters are closed.

Total time for the operations a, b & c shall not exceed 18 minutes.

14.3 The purchaser shall issue a certificate after successful demonstration of the above timings by the contractor.

15. COMMISSIONING AND PROVING TEST

15.1 The contractor or his agent would be required to carry out a joint check at the consignee's end along with the consignee before unpacking is done to avoid subsequent complaints regarding short shipment or transit damages. It is necessary that this joint inspection be done immediately on receipt of equipment by consignees to avoid commissioning delays due to shortages / transit damages.

15.2 The contractor or his agent shall commission the equipment within 30 days from the date of intimation by the consignee regarding receipt of equipment.

15.3 The equipment performance shall be demonstrated by the contractor or his agent after receipt at the consignee's works. Thereafter the equipment performance shall be watched by the consignee for a period of one month before the proving test certificate is issued by the consignee.

15.4 The final commissioning and proving certificate of the equipment shall be issued by the purchaser only after clauses 15.3 & 16.3 are met with.

15.5 The time schedule as per Schedule – II enclosed with technical specification must be filled in by the bidder.

16 TOOL BOX

Normally tools required for day to day maintenance/ operation shall be supplied in a box with each set.

17 PACKING:

17.1 All the equipments shall suitably be packed to avoid damage during transit.

-----xxxx----

SCHEDULE - I

SPECIFICATION No. MP-0.08.00.105 (Rev.-01)
(See clause no. 2.1 of Technical Specification)

S.No	Description	Specification
1.	**Hydraulic Pump With Power Unit**	
•	Function	Two/Three stage
•	Working Pressure	700 bar ± 3%
•	No. of tools to be operated simultaneously	2
•	Operational Weight	23kg (Nominal)
•	Power Minimum	2 kW
•	Oil Tank capacity (approx.)	3500 cc (± 500 cc)
•	NFPA 1936/EN 13204 classification	MTO
2	**Hydraulic hand/Foot Pump**	
•	Function	Two stage
•	Working pressure	700 bar ± 3%
•	Nominal Weight	13.5 kg (Nominal)
3	**Spreader**	
•	Spreading force (Min)	250kN (min)
•	Pulling force (Min)	40 kN (Min.)
•	Spreader opening at tips (Min)	680mm(Min)
•	Weight	19 kg (Nominal)
•	EN 13204 classification	Type AS/BS
4	**Cutter**	
•	Opening of blades at tips	200 mm (Min)
•	Cutting force (Min)	950 kN (min)
•	Weight	18.5 kg(Nominal)
•	EN 13204 classification	Type 'CC' cutting capacity 'H'
•	Cutting classification as per NFPA1936 (Min)	As per consignee requirement
5	**C-Cutter (Continues length cutter) (Optional)**	
•	Cutting (Force) (Min)	300 kN
•	Cutter opening (Min)	120 mm
•	Weight (Max)	19.0 kg
•	EN 13204 classification	Type 'AC' Cutting capacity 'C'
•	Cutting classification as per NFPA 1936 (Min)	As per consignee requirement
6	**Combination Tool**	
•	Spreading force (Min)	200 kN (Min)
•	Spreading distance (Min)	360 mm (Min.)
•	Pulling force with chain set	48 kN (min)
•	Cutting force	380 kN (min)
•	Weight	14 kg (nominal)

•	EN 13204 cutting class	Type 'CK' cutting capacity 'H'
•	Cutting classification as per NFPA 1936 (Min)	A6/B7/C6/D7/E7
7	**Ram Jack with Accessories (Telescopic 2 stage only)**	
•	Pushing force (Min) Piston 1 Piston 2	 189 kN 80 kN
•	Stroke (Min) Total Piston 1	 700 mm (min) 350 mm (min)
•	Retracted length (Max)	550 mm (Max.)
•	**Nominal Weight (Nominal)**	17.5kg(Nominal)
8	**Ram Jack with Accessories (Single piston only)**	
•	Pushing force(Min)	135 kN (Min)
•	Stroke(Min)	250 mm (Min)
•	Retracted length(Max)	550 mm(Max)
•	Fully extended length w/out extension piece (Min)	750 mm (Min)
•	Fully extended length with extension piece (Min)	1000 mm (min)
•	Weight	12kg (Nominal)

Annexure-I

DETAILS OF DESIGN PARAMETERS TO BE SUBMITTED BY THE TENDERERS

The tenderers shall also furnish the following information regarding the equipments offered.

1. HYDRAULIC PUMP WITH POWER UNIT

1.1 Pump Make and type.
1.2 Pump output (cc/Min or liters/Min at low & high pressure)
1.3 Max. operating pressure.
1.4 Temperature range
1.5 Brand of hydraulic oil
1.6 Oil sump capacity (liters)
1.7 Weight of hoses with reels (kg.)
1.8 Make & type of petrol engine.
1.9 Max. power and rpm.
1.10 Details of filters used
1.11 Type of cooling: air or water.
1.12 Fuel Tank capacity. (liters)
1.13 Overall dimensions: LxBxH
1.14 Weight with frame, pump and power unit.

2. MANUAL HYDRAULIC HAND/FOOT PUMP

2.1 Make and type.
2.2 Max. operating pressure.
2.3 Pump output (cc/Min or liters/Min at low & high pressure)
2.4 Reservoir capacity.
2.5 Type of filters (if any).
2.6 Size of equipment.
2.7 Weight (a) with hoses (b) without hoses

3. **SPREADER**

3.1 Type and make
3.2 Spreading force at end of tips with closed arms.
3.3 Spreading force with open arms
3.4 Spreading distance
3.5 Pulling force
3.6 Pulling distance
3.7 Squeeze force
3.8 Type of control
3.9 Material of :
a) spreader arms
b) cylinder
c) Other components
3.10 Working pressure.

4. CUTTER

4.1 Cutting force at the blade tips at Max. opening.
4.2 Cutting force at the centre of the blades.
4.3 Opening of blades
4.4 Capacity of round bar cutting
4.5 Capacity of flat bar cutting
4.6 Working pressure.
4.7 Weight.
4.8 Cutting classification as per NFPA1936 (Min)
4.9 EN 13204 classification

5.0 C- CUTTER (CONTINUES LENGTH CUTTER)

5.1 Cutting Force (Min)
5.2 Cutter opening (Min)
5.3 Nominal Weight (Max)
5.4 EN 13204 classification
5.5 Cutting classification as per NFPA 1936 (Min)

6.0 COMBINATION TOOL

6.1 Spreading force at tip end with arm closed
6.2 Spreading force at tip end with arm open
6.3 Spreading range
6.4 Pulling force with chain set.
6.5 Pulling range with chain set.
6.6 Cutting force
6.7 Opening of cutting blades
6.8 Capacity of round bar cutting
6.9 Capacity of flat bar cutting
6.10 Working pressure
6.11 Weight.

7 RAM JACK WITH ACCESSORIES (Telescopic 2 stage/Single piston)

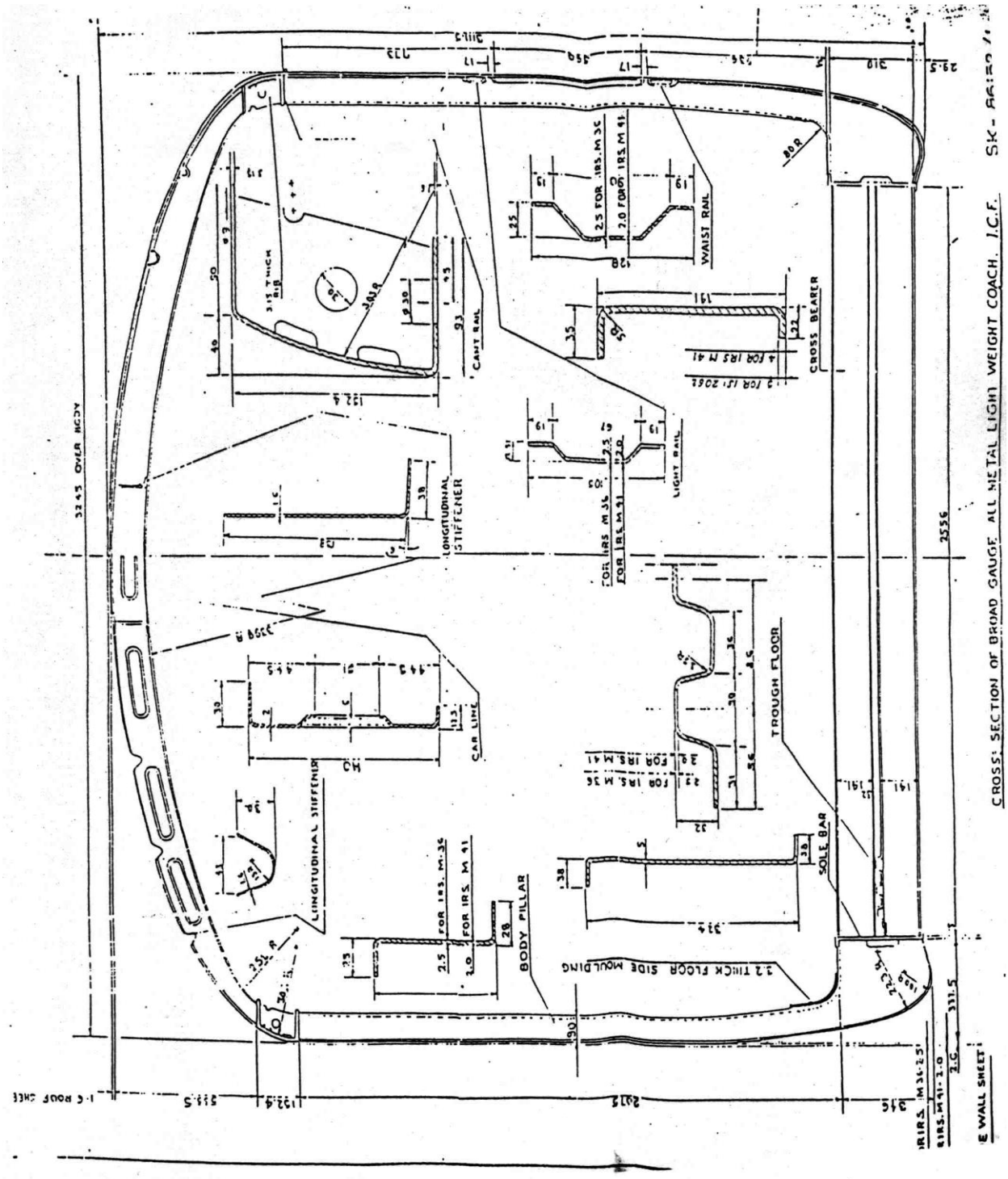
7.1 Spreading force.
7.2 Closed length.
7.3 Fully extended length without extension piece.
7.4 Fully extended length with extension piece (details of extension piece & numbers used).
7.5 Details of Accessories.

8. **HYDRAULIC HOSES AND COUPLING**

8.1 Working pressure
8.2 Test pressure
8.3 Bursting pressure
8.4 Material
8.5 Type of coupling

-----xxxxx-----

Annexure –II


CROSS SECTION OF BROAD GAUGE ALL METAL LIGHT WEIGHT COACH. I.C.F.
SK- AB:82
3243 OVER BODY
LONGITUDINAL STIFFENER
CANT RAIL
WAIST RAIL
CROSS BEARER
LIGHT RAIL
TROUGH FLOOR
SOLE BAR
BODY PILLAR
CAR LINE
LONGITUDINAL STIFFENER
1.2 THICK FLOOR SIDE MOULDING
FOR IRS M 36
FOR IRS M 41
2556
2212
E WALL SHEET

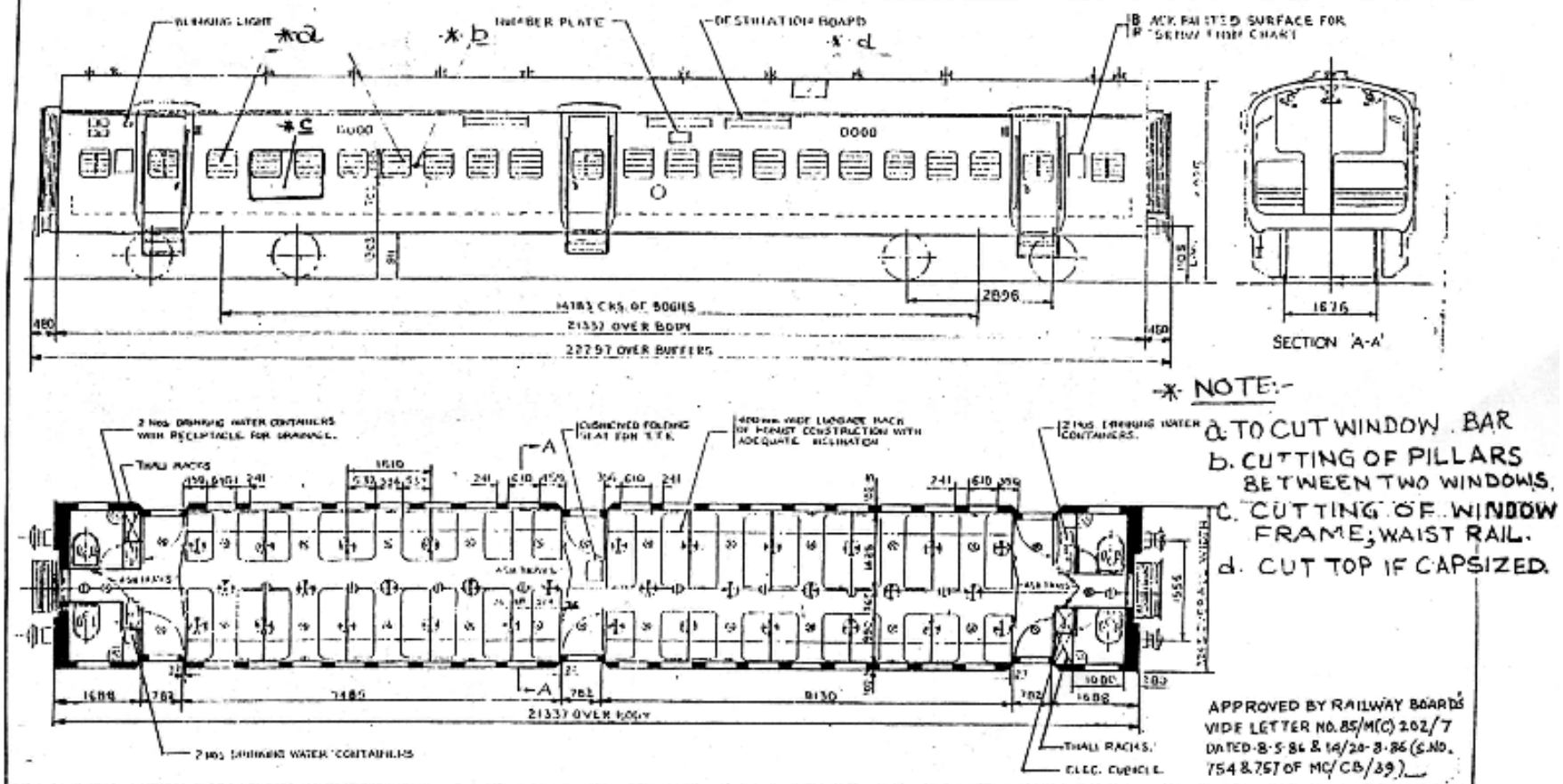
Annexure-III

R.D.S.O.
CARRIAGE DIRECTORATE

SHEET No. 54

1. No. OF PASSENGERS TO SEAT---------- 95
2. No. OF DOORS ASIDE---------- 3
3. No. OF LAVATORIES---------- 4
4. No. OF PASSENGERS PER DOOR---------- 32
5. No. OF PASSENGERS PER LAVATORY---- 24

1- COACH PROFILE & MAX. MOVING DIMENSIONS TO SKETCH NO- 66064.
2- EXTERIOR MARKING TO DRG. NO. CS [illegible] 970.

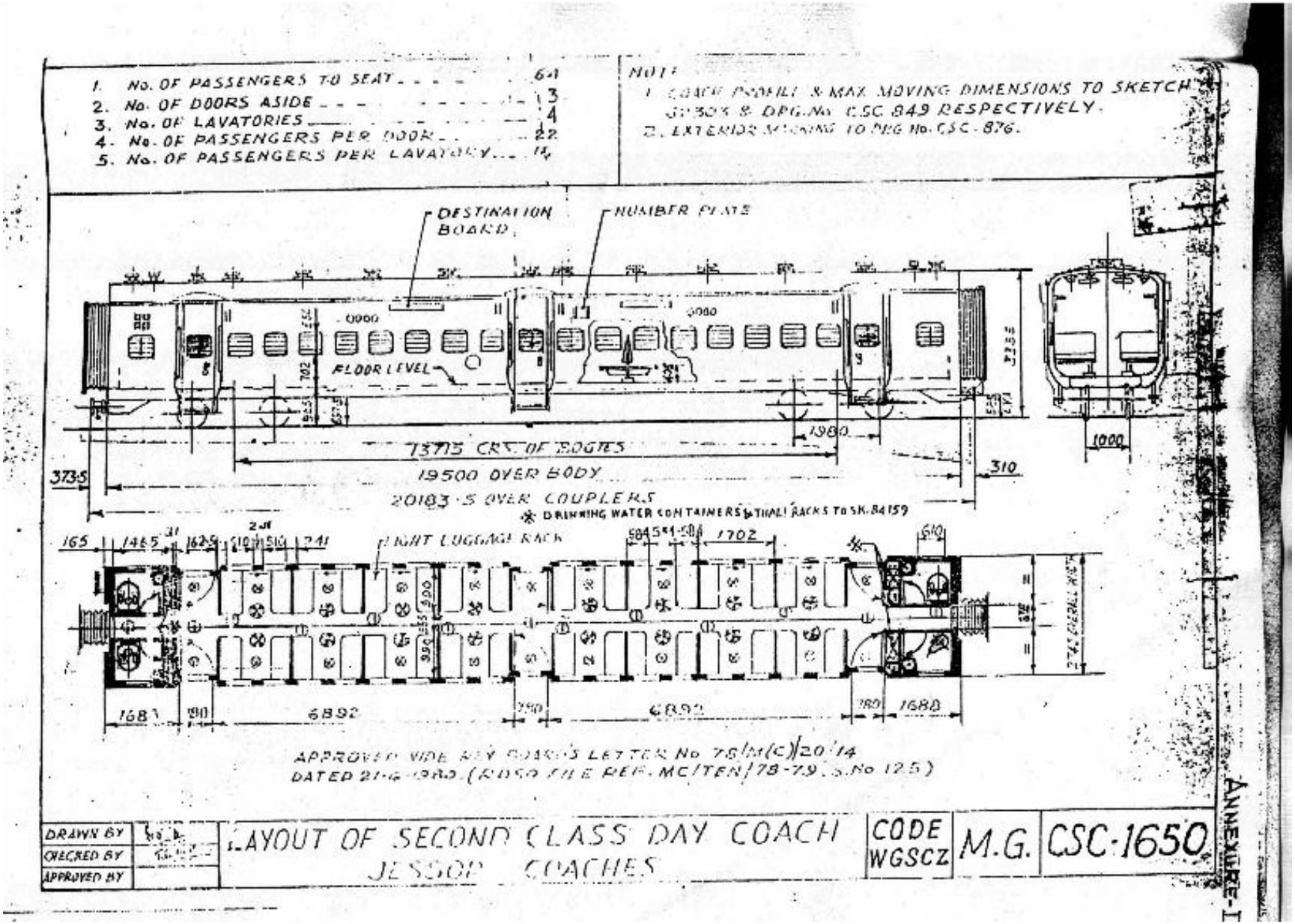


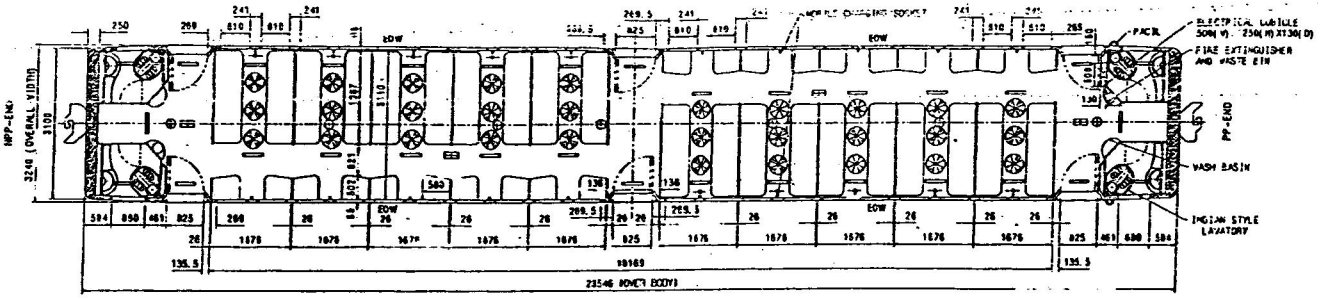
* NOTE:-
a. TO CUT WINDOW BAR
b. CUTTING OF PILLARS BETWEEN TWO WINDOWS.
c. CUTTING OF WINDOW FRAME; WAIST RAIL.
d. CUT TOP IF CAPSIZED.

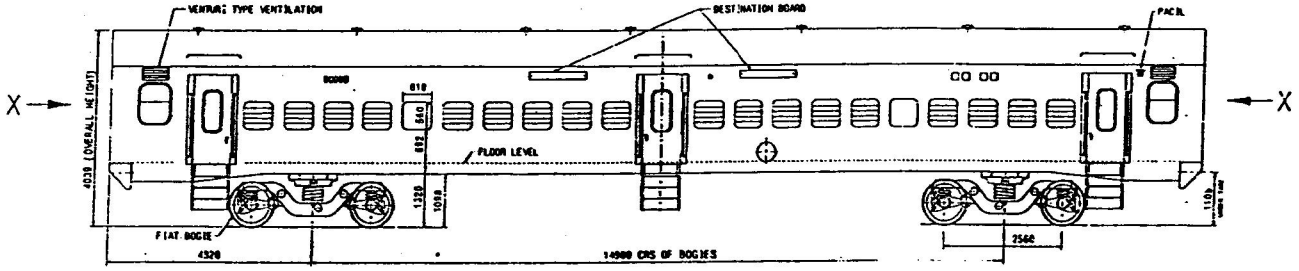
APPROVED BY RAILWAY BOARD'S VIDE LETTER NO. 85/M(C) 202/7 DATED 8-5-86 & 14/20-8-86 (S.NO. 754 & 757 OF MC/CB/89)

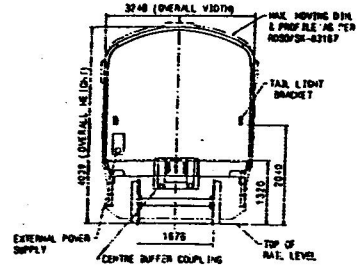
DRAWN BY				
CHECKED BY	LAYOUT OF SECOND CLASS DAY COACH	CODE WGSCZ	B. G.	CSC-1668
APPROVED BY				

Annexure -IV


1. No. OF PASSENGERS TO SEAT - - - - - 64
2. No. OF DOORS ASIDE - - - - - - - - - 3
3. No. OF LAVATORIES - - - - - - - - - - 4
4. No. OF PASSENGERS PER DOOR - - - - 22
5. No. OF PASSENGERS PER LAVATORY - - 16
NOTE
1. COACH PROFILE & MAX. MOVING DIMENSIONS TO SKETCH SK.3015 & DRG. No. CSC 849 RESPECTIVELY.
2. EXTERIOR PAINTING TO DRG No. CSC-876.
DESTINATION BOARD
NUMBER PLATE
FLOOR LEVEL
1980
1000
310
7375 CRS OF BOGIES
19500 OVER BODY
20183·5 OVER COUPLERS
3735
* DRINKING WATER CONTAINERS & TIFFIN RACKS TO SK-84159
LUGGAGE RACK
165
1465
1625
510
241
1702
610
1681
6892
6892
1680
APPROVED VIDE RLY BOARD'S LETTER No 75/M(C)/20/14
DATED 21-6-1980. (RDSO FILE REF. MC/TEN/78-7.9. S.No 125)
DRAWN BY
CHECKED BY
APPROVED BY
LAYOUT OF SECOND CLASS DAY COACH
JESSOP COACHES
CODE WGSCZ
M.G.
CSC-1650
ANNEXURE-I







VIEW FROM 'X'

- RAILWAY CREST
- RAILWAY
- COACH NUMBER
- VENTILATOR
- FAN FIXED TYPE (400MM SWEEP)
- FLOURESCENT LIGHT
- DISASTER EMERGENCY LIGHT (LHB TYPE)
- ALARM PULL
- PACIL
- EOW — EMERGENCY OPERABLE WINDOW
- MOBILE CHARGING SOCKET

NOTE:-

1. NO. OF PASSENGERS TO SIT ——— 100
2. NO. OF DOOR ASIDE ——— 02
3. NO. OF LAVATORIES ——— 04
4. NO. OF EMERGENCY OPERABLE WINDOWS — 04

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

DATE OF FIRST ISSUE 25/01/2012

LAYOUT OF
EOG COACH (EOG) 100 SEATERS
(LHB SHELL ON FIAT BOGIES)

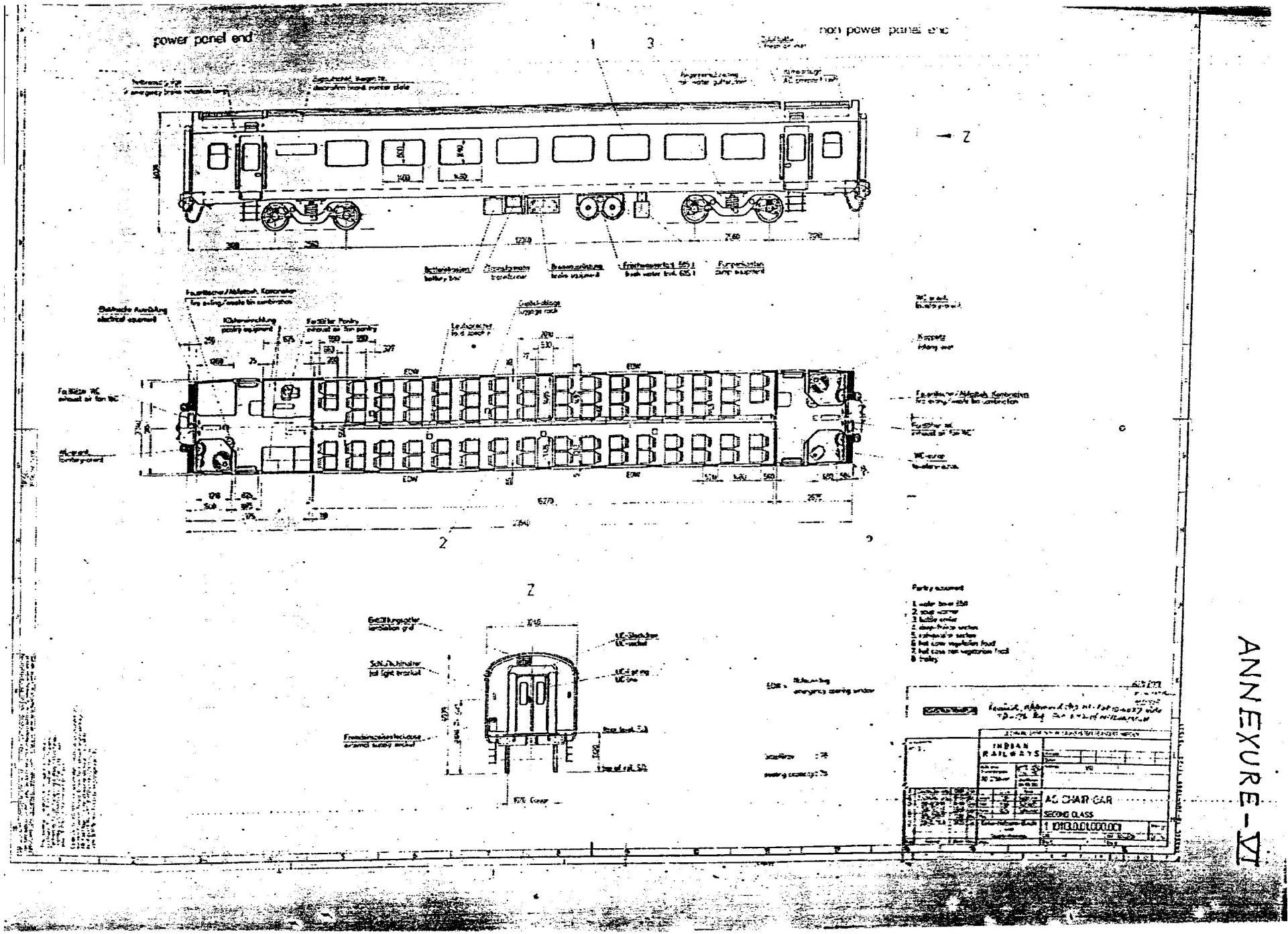
RDSO

PL NO. NIL

DRG NO. LG90012

ANNEXURE-V

20 FEB 2012


power panel end
non power panel end
1
3
Z
2
Z
INDIAN RAILWAYS
AC CHAIR CAR
SECOND CLASS

ANNEXURE-VI