

RAIL COACH FACTORY, KAPURTHALA		
Specification No.	Description	Covering Page
Mech/M&P/3500/GM/12 Rev.- NIL	Hydraulic Puller for Dismounting of Spherical Roller Bearing of MEMU/DMC	

Designation	Name	Signature	Date	Level
JE/M&P	S.K Juneja			Prepared
Dy.CPE-I	Anil Kumar			Agreed & Reviewed
CPE	Vineet Singhal			Approved

Issue/ Rev	Changes	Date

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1.0 IMPORTANT INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL BID

- 1.1 Bidders are required to give clause wise comments on the technical specifications, confirming compliance/non-compliance with details of deviations if any along with their effect on the performance. Back references to be avoided, offers are likely to be ignored in case of non-compliance of these instructions for furnishing the information.
- 1.2 Unless otherwise stated, latest alterations/ revisions of specifications/ standards/ drawings shall be applicable. In respect of safety standards and environmental standards relevant to the machine, the machine manufacturers shall ensure compliance with international (CE/ISO/DIN/JIS)/National standards (IS) (wherever applicable).
- 1.3 Tenderers should offer and quote for all the specified concomitant accessories, as these are considered essential for commissioning and utilization of the machine. Even if bidder does not recommend the purchase any of these accessories, the price must be quoted for comparison purposes and their recommendation/suggestion indicated in the offer.
- 1.4 Tenderers should also quote for optional accessories, spares and consumable spares as asked in the specifications.
- 1.5 In case, any item is required in sets, please specify nos./pieces per set. This is essential for proper technical evaluation of the offer. Offers received without this may be considered as incomplete and liable to be rejected.
- 1.6 The bidder should quote only for the specified make of sub-assemblies and equipment wherever specified. Makes of sub-systems other than the specified ones will normally not be acceptable. In case, some other make is quoted, specific reasons for the same including its features/advantages over specified makes must be brought out in the offer.
- 1.7 In case there is a contradiction in any information provided (some parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.
- 1.8 The Purchaser may accept internationally accepted alternative specifications which ensure equal or higher quality than the specifications mentioned in the Technical Specification. However, the decision of the Purchaser in this regard shall be final.
- 1.9 Purchaser reserves the right to verify the details submitted by the bidder by actual site visits.
- 1.10 Bidder is advised to visit the site to comprehensively understand the requirement of Railways.
- 1.11 Other terms & condition of the contract will be as per Indian Railway Standard conditions of contract.

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2.0 PURPOSE

A Hydraulic Puller for Dismounting of Spherical Roller Bearing of MEMU/DMC is required in Roller Bearing shop of Rail Coach Factory, Kapurthala for dismounting of Spherical Roller Bearing no. 22328 fitted on Journal of dia 140 mm MEMU/DMC by hydraulic force i.e oil introduced under pressure between inner ring of the bearing and the journal(Axle) to reduce the dismounting force required so that the bearing and the journal (Axle) to reduce the dismounting force required so that the bearing can be easily and automatically removed from the journal by hydraulic means.

3.0 DESCRIPTION AND SCOPE OF SUPPLY

3.1 The scope of supply covers design, manufacture, supply, installation and commissioning of Hydraulic Puller for Dismounting of Spherical Roller Bearing of MEMU/DMC as per below specifications and major parameters given in the Schedule-I.

3.2 The supply shall also include all equipments and accessories which the manufacturer considers essential to make the equipment fully functional when installed and put into operation.

3.3 Other concomitant accessories/ equipment which the manufacturer considers essential to make the machine fully operational when installed and commissioned with requirement of utilities, etc if any, should be clearly indicated by tenderer in the offer.

3.4 The total value of the offer will be calculated on.

- i. The cost of the basic machine.
- ii. Cost of the concomitant accessories according to tenderer specification.
- iii. Cost of any other accessory treated as concomitant accessory.
- iv. Application duties and taxes, insurance, freight and installation and Commissioning charges.

3.5 Technical experts of the manufacturer during commissioning of machine will fully and adequately train the operators/ maintenance staff nominated by the consignee including repairs of electronic gadgets, sub-assemblies and Printed Circuit Boards up to component level.

4.0 ELIGIBILITY CRITERIA

4.1 The tenderer shall have established quality control system and organization to ensure adequate control at all stages of the manufacturing process.

4.2 The tenderer shall provide a performance statement giving a list of major supplies of same/similar equipments in last 5 years to Indian Railways giving details of the order no. and date and the quantity supplied and whether the supply was made within the delivery schedule. Such period shall be reckoned from the date of opening of tender. Tenderer should also provide the prove out test certificate of his supply/supplies. All above documents shall be uploaded along with the offer.

4.3 Only OEM of equipment or their authorized dealers can only participate in the tender.

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5.0 GENERAL FEATURES

- 5.1 The equipment shall consist of mobile workstation mounted with compact hydraulic power pack having built in controls and safety devices. It shall have two oil injection pumping units. One pumping unit shall generate primary hydraulic pressure of 250 bars (max.) for drum locking and other pumping unit shall generate secondary pressure of 750 bars (min.) for oil injection to inner race of bearing and journal.
- 5.2 The Motorized Hydraulic Power pack with oil injection system of the equipment shall make the bearing withdrawal safe and effortless. The oil injection system shall inject pressurizes oil between inner ring of the bearing and journal surface forming a thin oil film eliminating metal to metal contact. Therefore, the bearing withdrawal shall be smooth without causing any damage to the bearing and without scoring the journal.
- 5.3 **Tank:** It shall have the following details:
- i) Material: Mild Steel
 - ii) Capacity: 20 liter
 - iii) Usable oil capacity should be more than 12 liter.
 - iv) A level gauge to show the oil level with high and low level markings.
 - v) An air breather mounted on top surface.
 - vi) Draining provision with end cap/plug.
 - vii) Four nos. of caster wheel with a long handle to move tank in any direction.
 - viii) A plate showing the process and instrument drawing duly with tag numbers of the devices fixed on the tank at appropriate place so that it can be referred while operating the system.
 - ix) Junction box for power pack supply to the motor and other instruments.
- 5.4 **Hydraulic Withdrawal Fixture:** It shall be provided with double acting hydraulic cylinder for fast, safe and effortless axial displacement of bearing. It shall be hydraulically actuated for automatic removal of bearing. Manual fixture shall also be provided for field operations and for use in case of power failure.
- 5.5 **Extension Adapter for Axle:**
- i) An adapter of suitable design shall be provided to fit with axle so that it shall have a rigid support to the bearing and the withdrawal tool during oil injection into the mating parts and then to the bearing after dismounting so that it may not drop down on the floor and cause damage.
 - ii) Extension adapter shall be of suitable alloy steel, heat treated and ground finished. It shall have spring loaded center for rigid fitment and self alignment with the axis of the axle. Three nos. holes for counter shrunk head screws shall also be provided on the adapter to suit the tapped holes of the axle for clamping purpose.
- 5.6 **Hydraulic Nut with self retracting annular piston:** This shall ensure uniform force required for dismounting the bearing by injecting sufficient oil to spread out between the inner ring and the journal along with the hole width of the bearings.

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5.7 **Bearing holding drum:** It shall be made of suitable alloy steel duly heat treated. The drum shall be in two- halves with integrated hinges and locking arrangements to cover the complete bearing over the outer ring and hydraulic nut etc.

5.8 **Trolley:**

- i. A robust tubular structure shall be used to make the trolley.
- ii. The extractor/Power-pack along with all its accessories and spares shall be located and fixed on this trolley.
- iii. It shall have horizontal structural members which can be used for suspending heavy parts like Holding drum halves and cranking jack suspended on spring balancers.
- iv. It shall also have Structural cross supports to clamp the oil injection pumps.
- v. Oil storage tanks shall be located in the structural frame which shall carry sufficient oil for a number of bearing extractions. It shall be provided with an integral tool box to keep tools, spares and accessories.
- vi. A wear resistant mat shall be placed on the trolley base so that parts and components can be kept on this mat.
- vii. The trolley shall be able to be wheeled into position where the bearing is to be extracted. The cart shall have two swivel castors in front and two fix wheels at the rear of the basic oil tank frame for easy mobility. There shall also be a provision to lock it in position by using a foot pedal brake.

5.9 **Manual withdrawal option:** In case of power failure or in case of field operations, the unit shall be provided with two sets of manually operated oil injectors with foot stand & other accessories and one Cranking Jack Assembly, to be used for Manual withdrawal procedure. These oil injectors shall also be provided with matching male connector of the quick release coupling so that the same hydraulic hoses can be used which are supplied with the powerpack.

5.10 Hydraulic circuit shall be provided with two nos. pressure gauges indicating the pressure in the hydraulic circuit. It shall be located in such way that it remains protected from accidental damage.

5.11 Hydraulic hoses shall have a working pressure capacity of 1000kg/cm² and shall be provided alongwith end fittings.

5.12 The equipment shall be provided with steel wire braided or thermoplastic hydraulic hoses with end fitting for connecting the oil injection accessories. The hydraulic lines should be of high quality, solid drawn, cold bent, seamless steel having their surface treated for rust prevention and capable of withstanding the working pressure.

5.13 It shall be capable of working in normal Indian Railways workshop environment with maximum ambient temperature up to 50°C and maximum relative humidity up to 98%.

5.14 The hydraulic fluid used shall be non corrosive stable and safe for the operator. It shall be available indigenously.

6.0 CONCOMITANT ACCESSORIES

6.1 Following accessories shall be supplied with the machine:

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S.No.	Description	Qty.
1.	Hydraulic Power Pack complete with Control Valves, Regulating Valves, safety valves, and High Pressure Hoses and Pressure Gauges	01 set
2.	Double acting Withdrawal Fixture	01 No.
3.	Extension Adopter for Axle with socket head screws	02 Nos.
4.	Hydraulic Nut with annular piston	01 No.
5.	Bearing Holding drum in two halves	01 No.
6.	'O' Rings for various locations	100 Nos.
7	Service tools consisting of spanners, Allen keys & Nylon Hammer (Spanner set consists of 9 pieces and Allen key consists of 7 Pieces)	01 set

- 6.2 Along with the above list the tenderer shall supply a list of concomitant accessories, which will be supplied along with the machine. The cost of each listed concomitant accessory should be quoted separately. Wherever for any reason the cost of any concomitant accessory is included in the basic price of the machine the same should be specifically mentioned.
- 6.3 Any other accessory, which in the opinion of the tenderer can contribute to higher performance, should be indicated and quoted separately.
- 6.4 A maintenance tool kit containing hand tools is required to cover all the fasteners of all sub-assemblies of the equipment.

7.0 SPARES & CONSUMABLES

7.1 Following list of spares shall be supplied for one year normal maintenance :

S.No.	Description	Qty.
1	Pressure Relief valve	01 no.
2.	Non Return Valve	02 nos.
3.	Hose for Hydraulic Nut	02 nos.
4.	Hose for withdrawal fixture	01 no.
5.	Seal set for withdrawal fixture	01 set.

- 7.2 Along with the above list the tenderer shall furnish details of spares covered under warranty.
- 7.3 List of important spare parts and accessories with their part number and costing.
- 7.4 The tenderer should be furnishing the price list of spare parts required for two years normal maintenance of the equipment. Sources of supply of spares used other than that of manufacturer should be furnished by the tenderer.
- 7.5 List of recommended spares for normal maintenance after expiry of warranty period to till useful life of the equipment and these spares should be readily available in the market with your authorised stockists.
- 7.6 List of recommended consumables for two years shall be quoted separately.
- 7.7 Useful life estimated/expected for each equipment and its sub assembly should be indicated by the tenderers.

8.0 OPTIONAL ACCESSORIES

Prepared by
JE/M&P

Agreed by
Dy.CPE-I

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Any other accessory, which is in the opinion of the tenderer can contribute to higher production rates, should be indicated and quoted separately mentioning prices of each accessory.

9.0 INSPECTION OF EQUIPMENT & TESTING AT MANUFACTURERS WORKS

- 9.1 Manufacturers must have suitable facilities at their works for carrying out various performance tests on the equipment. The tenderer should clearly confirm that all the facilities exists and shall be made available to the inspecting authority.
- 9.2 A load and functional test must be carried out at the manufacturer's works. Reliability of the equipment shall be demonstrated to the satisfaction of the appointed inspector or inspecting agency.
- 9.3 A sample inspection chart for inspecting the equipment should be supplied along with the bid.

10.0 INSTALLATION COMMISSIONING AND PROVING TESTS

- 10.1 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/transit damages. It is necessary that this joint inspection be done immediately on receipt of the machine by consignee to avoid commissioning delays due to shortages/transit damages.
- 10.2 Installation of the machine would be done under the supervision / direction of firm engineers. The contractor shall arrange commissioning of machine after installation is done. Adequate number of teams of technical experts will be made available so that the commissioning delays are eliminated. Such personnel will be required to be present as soon as the machine has been received.
- 10.3 The contractor or his agent shall commission the machine within 15 days from the date of receipt of machine.
- 10.4 The machine performance shall be demonstrated to the full satisfaction of consignee at the consignee's works.
- 10.5 If an assembly/sub-assembly requires to be taken back to the manufacturer's premises for repairs/replacement either before commissioning or during warranty, the manufacturer or his agent would be required to submit a Bank Guarantee.
- 10.6 In case the entire machine has to be taken back, a Bank Guarantee would have to be submitted. The Bank Guarantee should be of adequate value so as to cover the cost of the assembly/sub-assembly/paid up cost of the machine.

11.0 TECHNICAL LITERATURE

- 11.1 One copy of the printed illustrative catalogue showing technical features of the machine and its elements must be enclosed with each copy of the bid.
- 11.2 The successful tenderer will have to furnish, for each machine 4 copies of spare parts catalogue giving the part list number of each component with exploded views and assembly drawings of major assemblies, maintenance manual, trouble shooting guide, operational manual of the machine and all electrical circuit diagrams to the consignee directly within 3 months of the placement of order. The bidders should provide a list of literature, they will supply along with the machine. The technical literature shall be

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provided for complete machine including imported and indigenously purchased components/sub-assemblies.

12.0 SPECIAL FEATURES

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

13.0 MAKE

13.1 The supplier shall clearly mention whether the system quoted is Indian make or imported. If Indian make, the tender should be accompanied by duly sanctioned factory license & relevant documents & also produce records of installation & satisfactory aftersales service performance of their equipment from at least one govt. Institution of similar or large size for duration at least 3 Years duration.

13.2 If imported item, the OEM firm should be registered for operations in India for a minimum period of last 3 years. In case this is not so, the dealer should be authorised regional supplier & service provide for the late 3 years. He should also produce installation & satisfactory after sales service record of duration at least last 3 years from at least one govt. Institution for a system of similar or larger size. Further the tender should be accompanied by authorisation certificate from OEM.

13.3 The supplier shall furnish the complete details of Model No. Make & Manufacturer's details/ address, Country and authorization details of Dealership.

14.0 DEVIATIONS:

The tenderer should clearly certify that the machine offered fully meets the specification various design features incorporated in the machine to fulfil different technical 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 machine, can be considered for acceptance.

15.0 SERVICING FACILITIES

15.1 Service facility in Punjab, Address and contract details including phone and fax no. to be provided. The facility should have the necessary equipments recommended by the manufacture to carry out preventive maintenance test as per guideline provided in the service / maintenance manual. Firm should provide list of equipment available for providing calibrations and routine maintenance support as per manufacturer.

15.2 Supplier will undertake for service repairs & replacement of any needed part as & when needed.

15.3 Maintenance contract to be quoted after the expiry of maintenance period quoted above with details of scheduled visits, part covered under contract & cost of parts not covered as well.

15.4 The tenderer shall clearly spell out in the offer about the facility available with him or his agent/dealer for providing adequate after sales service in Punjab during warranty period.

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- 15.5 The contractor shall give a comprehensive spare part list with OEM details and price for all the sub systems.
- 15.6 The tenderer/contractor shall provide list of spares, consumables required for maintenance for 5 years after completion of warranty period as per annexure A.
- 15.7 Tenderer shall provide expected life for the components of the system and provide the maintenance schedule required for 10years for as per annexure -
- 15.8 Total up time of the system should be at least 90%. Up time shall be counted in following manner:-
- A) Total breakdown of less than 8 hours shall be ignored for the purpose of this calculation.
- B) Penalty may be imposed if the down time is more than 10% without any valid reasons. The levy of token penalty as deemed fit based on the merit of the case may also be considered.
- 15.9 Tenderer shall provide the service charges /per day/per man for deputing service engineer on the machine on requirement separately for Indian and Foreign engineer.
- 16.0 **WARRANTY**
- 16.1 As per IRS conditions or as quoted by the tenderer whichever is later.
- 16.2 Warranty period for part or machine shall be extended after completion of warranty period by the duration under which the part or machine remains under breakdown during warranty.
- 17.0 **SCHEDULE OF ANNUAL MAINTENANCE CONTRACT (AMC) FOR PERIOD OF 5 YEARS AFTER COMPLETION OF WARRANTY PERIOD**
- 17.1 Tenderer shall provide proposal for 5 year Annual Preventive Maintenance schedule to be executed after completion of warranty period in the format as per annexure-B.
- 17.2 The firm shall maintain the machine in good working condition during the contract period and shall correct the fault or failures, repair or replace the worn or defective parts/equipment during the normal working hours of shop where the equipment has been installed. Unserviceable parts/equipment need to be replaced at no extra cost with brand new parts/equivalent or superior specification.
- 17.3 The firm shall respond by deputing service personal to oral / telephonic/ or other modes of intimation for repair and maintenance of the said machines within 2 hours.
- 17.4 The firm shall ensure that the machine is in proper working condition, to the full capacity, after repair and maintenance.
- 17.5 To have a timely supply of spares during AMC, the contractor shall furnish a total list of spares which should contain list of spares that shall be arranged by the firm, both chargeable, duly mentioning the charge against each item, and spares which shall be non-chargeable, and list of spares to be held by RCF.
- 17.6 The contractor shall clearly list-out the list of consumables required for day-to-day operation of the machine. It shall be the scope of RCF to arrange the consumables once the completion certificate is issued for the retrofitted machine.
- 17.7 The tenderer/contractor shall provide suitable standby when repairs exceeds 2 hours. When any equipment is taken for repair to the tenderer/contractor's premises suitable standby equipment should be provided.
- 17.8 Besides attending the breakdown calls, the firm shall attend to the corrective and preventive maintenance of the machines once in a month.

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- 17.9 The AMC is valid for five years from the date of completion of the warranty period . No freight is admissible.
- 17.10 During the AMC period, whatever equipment is defective shall be handed over to RCF. During completion of the AMC period the machines should be handed over in full working condition to its full capacity.
- 17.11 The firm should maintain a register duly indicating the nature of defects and repair attended and got signed by RCF authority. Preventive maintenance schedule should be made. The schedule should be made in such a way that more than one machine should not be attended on the same day. A copy of the schedule should be given to RCF at the beginning of the AMC and the schedule should be strictly followed and on carrying out the preventive maintenance the same should be entered in the register and got signed by RCF authority.
- 17.12 AMC charges shall be paid quarterly as one quarter of the total AMC charges applicable for that year on submission of bills duly certified by the engineers in charge with regard to the satisfactory execution of AMC during the period for which the bill is claimed. Duties & taxes as applicable at the time of payment shall be deducted at source.

18.0 PAYMENT TERMS

80 % on receipt of machine and balance 20% after successful commissioning of machine and submission of Bank guarantee equivalent to 10% of P.O value valid up to the warranty period of the machine.

19.0 DOCUMENTS TO BE UPLOADED FOR TECHNICAL EVALUATION

Following documents must be submitted by the bidder along with the offer:

1. Clause wise comments on technical specification
2. Documentary evidence of previous supplies to other Railways
3. Authorisation certificate of OEM.
4. Details list of spares covered under warranty.
5. Annexure A and Annexure-B.
6. Details of deviations from specification if any as per Annexure-C

Tenderer not submitting the above information may note that his offer is liable to be ignored.

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SCHEDULE-I

MAJOR PARAMETERS

S.No.	Description	Requirement
a.	Roller Bearing No. to be extracted	22328
b.	Journal Dia	140 mm
c.	Primary Hydraulic Pressure for drum locking	250 bars (max.)
d.	Secondary Pressure for Oil Injection to Inner race of bearing	750 bars (min.)
e.	Tank	Material: MS, Capacity-20 liter minimum (with usable oil capacity of more than 12 liter)
f.	Electric Motor Power	3 HP of reputed make with ISI mark , 3 phase, 440 ±15%V, 50 ±10% Hz
g.	Relief Valve	Operating pressure : 0-250 kg /cm ² of Polyhydron/Yuken/Prism make.
h.	Flow Control Valve	Operating Pressure: 0-250 kg /cm ² , Max. Flow 4.5 LPM of Polyhydron/Yuken/Prism make.
i.	Pressure Reducing valve	Operating Pressure: 0-250 kg /cm ² , Minimum 2.5 LPM to Max. Flow 4.5 LPM of Polyhydron/Yuken/Prism make.
j.	Pump	Fixed displacement pump with output pressure 250 bar and flow rate at 2.0 LPM minimum to 4.5 LPM maximum.
k.	Filter	Filtration size: 10 Micron (nominal) Operating Pressure: 0-250 kg /cm ² , Max. Flow 4.5 LPM
l.	Suction strainer	Filtration size: 125 Micron or less Max. Flow 4.5 LPM
m.	Pressure gauge	Bourden Tube Type, Range 0-300 kg /cm ² Resolution : 1 kg /cm ² or better.
n.	Isolating valves	Pressure rating: 0-300 kg /cm ² Max. Flow 4.5 LPM Material: SS-304/316
o.	Check valve	Pressure rating: 250 kg /cm ² Max. Flow 4.5 LPM
p.	Tubes	Material : SS-304/316, Seamless type
q.	Castor Wheels	2 nos. swivel type and 2 nos. Fixed type for minimum capacity of 50 Kg per wheel.
Environmental Working Conditions		
r.	Ambient Temperature Range	0 to 50° C
s.	Relative humidity	98%

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ANNEXURE-A

Tenderer shall provide list of spares, consumables required for maintenance for 5 years after completion of warranty period as below:

S.N.	ITEM	PART NO.	SERVICE LIFE	PRICE

ANNEXURE –B

Tenderer shall provide proposal for 5 year Annual Preventive Maintenance schedule to be executed after completion of warranty period in the format as below:

S.N.	YEAR	AMC CHARGES
1.	IST YEAR	
2.	IIND YEAR	
3.	IIIRD YEAR	
4.	IVTH YEAR	
5.	VTH YEAR	

ANNEXURE –C

DEVIATION STATEMENT (IF ANY)

S.N.	Specification Clause No.	Deviation (If Any)
1.		
2.		
3.		
4.		
5.		

Prepared by
JE/M&P

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Dy.CPE-I