

BHARAT HEAVY ELECTRICAL LIMITED, JHANSI

Spec. No.	ME-7223
Item No.	ME-3/2/2773
Location	New Bogie Shop
Qty.	01 No.

SCOPE: Design, Manufacturing, Supply, Erection & Commissioning of Bogie Load Test Machine

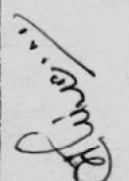
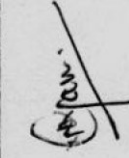
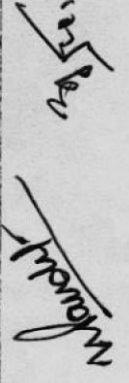
Note:

1. Vendor must submit complete information against clause No. 24 (Qualifying criteria) and the offers meeting this clause would only be processed.

2. The "offeror" column and the "deviations" column (if applicable) of this format shall be filled in by the vendor and submitted along with the offer. Technical details also need to be submitted along with the offer.

3. The offer and all the documents enclosed with the offer shall be in English only.

SPECIFICATION CUM COMPLIANCE CERTIFICATE OF BOGIE LOAD TEST MACHINE			
Sr. No.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	BIDDER OFFER
1	EQUIPMENT DESCRIPTION: Bogie Load Test Equipment	Vendor to confirm	
2	PURPOSE: The purpose of Bogie Load Test Equipment shall be to apply designated force on each dummy placed at air spring mounting on Bogie assembly at the same time. The force on dummy is determined and preset by the Type of Bogie. Operators measure the distance of Complete Bogie designated by Railcar type, and adjust the shims of Complete Bogie as necessary.	Vendor to confirm	
3	PRODUCTIVITY: 2 Bories per shift (8 Hrs.)	Vendor to confirm	
4	TEST SURFACE / WORK PIECE: Complete Bogie (Vande Bharat Train Set Bogie)	Vendor to confirm	
5	MAJOR PARAMETERS	Vendor to confirm	
5.1	Measurable Height of Complete Bogie: Minimum 800 mm or less / maximum 1200 mm or more	Vendor to confirm	
5.2	Size and Weight of Complete Bogie: Bogie assembly drawing / Bogie suspension drawing shall be provided to vendor only after submission of NDA as per clause No. - 24.11	Vendor to confirm and submit NDA	
5.3	Loading Force: 50 Tonnes	Vendor to confirm	
5.4	Track Gauge : Broad Gauge	Vendor to confirm	
5.5	Overall Height from floor level	Vendor to Specify	
5.6	External Dimension of Gate Frame	Vendor to Specify	
5.7	Total Length of "Rail for Measurement"	Vendor to Specify	
5.8	Cylinder Speed on Push Side (LP)	Vendor to Specify	
5.9	Cylinder Speed on Push Side (HP)	Vendor to Specify	
5.10	Cylinder Speed on Pull Side	Vendor to Specify	
6	MAJOR COMPONENTS		
6.1	Dummy for Air Spring as per BHEL requirement		
6.1.1	Quantity : 4 nos	Vendor to confirm	
6.1.2	Design as per air spring assembly on the Bogie : Bogie assembly drawing / Bogie suspension drawing shall be provided to vendor only after submission of NDA as per clause No. - 24.11	Vendor to confirm and submit NDA	
6.2	Hydraulic Loading Head		
6.2.1	Quantity	Vendor To specify	
6.2.2	Cylinder Type: Double Acting Type	Vendor to confirm	

Sr. No.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	BIDDER OFFER	DEVIATION / REMARK
6.2.3	Maximum Output to Push: Min. 50 Tonnes (Total)	Vendor to confirm and specify		
6.2.4	Maximum Output to Pull: Min. 20 Tonnes (Total)	Vendor to confirm and specify		
6.2.5	Press Stroke: Min. 400 mm	Vendor to confirm and specify		
6.2.6	The control panel operator shall be able to adjust force applied by loading unit with cylinder operation while the operator is confirming applied force display on the control panel. The loading will be maintained automatically when applied force reaches to a desired value within $\pm 10\text{kgf}$ in accuracy.	Vendor to confirm		
6.2.7	In addition to the control panel, it shall be required to install a remote control (pendant) on the opposite side of the control panel.	Vendor to confirm		
6.2.8	Interlock between the control panel and the pendant shall be specified by vendor.	Vendor to specify		
6.2.9	Automatic operation on the control panel:	Vendor to confirm		
6.2.10	Load of hydraulic cylinder shall be controlled not only manually but automatically. During automatic operation loading units shall be applied until the load cell of loading unit reaches into force values set in advance in control system. The applied force shall be within $\pm 10\text{kgf}$ in accuracy.	Vendor to confirm		
6.2.11	In case of the manual operation mode, cylinder shall push/pull the head of the loading unit while the control panel/pendant operator continues to push the button of "push"/"pull". Also, the cylinder movement shall stop while the operator stops pushing the button.	Vendor to confirm		
6.2.12	In case of the automatic operation mode, the cylinder movement shall stop whenever the control panel and pendant operator pushes the stop / Emergency button. Also, the cylinder shall restart when the operator pushes the restart button.	Vendor to confirm		
6.2.13	Regardless of the cylinder displacement, the operator shall be able to switch the operation mode of manual and automatic operation on the control panel.	Vendor to confirm		
6.2.14	The force value of the loading unit shall be maintained without oil leak while the loading unit apply the constant force value to the air spring dummy no matter whether the operation mode is manual, or automatic.	Vendor to confirm		
6.2.15	To adjust force on the air spring dummy manually, the PC screen and the control panel shall be placed at the position where it is easy to confirm the loading unit status.	Vendor to confirm		
6.3	Hydraulic Power Pack			
6.3.1	Quantity:	Vendor to specify		
6.3.2	Type of Hydraulic Pump : Two-Step Discharge Type (HP/LP)	Vendor to confirm		
6.3.3	Oil Heater & Chiller : To maintain oil temperature 30 (+/-10)Deg. Cent.	Vendor to confirm and specify		
6.3.4	Make : Vickers or Rexroth only	Vendor to confirm and specify		
6.4	Hydraulic Load cell of Loading Unit			
6.4.1	Quantity :	Vendor to specify		
6.4.2	Total Rated Capacity : 50 Tonnes or more	Vendor to confirm and specify		

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K. Srinivasan

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Sr. No.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	BIDDER OFFER	DEVIATION / REMARK
6.4.3	Accuracy of Output: Within ± 10 kgf	Vendor to confirm and specify		
6.4.4	Minimum Display Unit of Output: 10 kgf	Vendor to confirm and specify		
6.4.5	Rated Output	Vendor to specify		
6.4.6	External Diameter	Vendor to specify		
6.5 Gate Frame				
6.5.1	Quantity: 1 No.	Vendor to confirm		
6.5.2	Construction of Gate frame shall be sturdy and rigid considering application.	Vendor to confirm		
6.5.3	Working clearance between Gate Frame Pillar and the most protruded part of bogie : Min. 1000 mm	Vendor to confirm		
6.6 Proving Ring for calibration				
6.6.1	Proving Ring as per IS:4169 : 1 No.	Vendor to confirm		
6.6.2	Type : Compression Type	Vendor to confirm		
6.6.3	Rated Capacity : 50 Tonnes or more	Vendor to confirm and specify		
6.7 Control System and Panel				
6.7.1	Display Unit: 17" Industrial grade, Value of Load Cell in Loading Unit shall be displayed, and recorded/printed.	Vendor to confirm		
6.7.2	Storage for record keeping	Vendor to specify		
6.7.3	Report generation in specified format and printing	Vendor to confirm		
6.7.4	A4 Laser Jet Printer	Vendor to confirm		
6.7.5	Graph generation b/w load applied and deflection	Vendor to confirm		
6.7.6	Report Format (For reference)			
6.7.6.1	<Input>	Vendor to confirm		
6.7.6.1.1	Test date (automatic input)	Vendor to confirm		
6.7.6.1.2	Customer code	Vendor to confirm		
6.7.6.1.3	Bogie Type	Vendor to confirm		
6.7.6.1.4	Order number	Vendor to confirm		
6.7.6.1.5	Serial number	Vendor to confirm		
6.7.6.1.6	Coach number	Vendor to confirm		
6.7.6.1.7	Train set number	Vendor to confirm		
6.7.6.2	<Output>	Vendor to confirm		
6.7.6.2.1	Value of load cell of loading unit	Vendor to confirm		
6.7.6.2.2	Deflection of bogie frame (In mm)	Vendor to confirm		
6.7.6.2.3	Graphical Real-time display of measurement (Load Vs deflection)	Vendor to confirm		
6.7.6.3	<Function selection button>	Vendor to confirm		

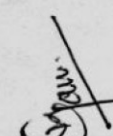
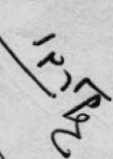
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6.7.6.3.1	Zero adjustment of load cell of loading unit	Vendor to confirm		
6.7.6.3.2	Record	Vendor to confirm		
6.7.6.3.3	Print	Vendor to confirm		
6.7.6.3.4	Real-time display of measurement (Load Vs deflection)	Vendor to confirm		
6.7.6.3.5	Manual measurement (indication of measurement value at clicked moment)	Vendor to confirm		
7	ELECTRICAL SPECIFICATION	Vendor to Confirm		
7.1	415V +/- 10%, 50 HZ +/- 3%, 3 phase AC (3 wire system without neutral) Power Supply Source will be provided by BHEL at a single point near the machine as per layout recommended by VENDOR. All step down transformers, rectifiers & regulators shall also be supplied by the VENDOR. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine /control cabinets, shall be the responsibility of VENDOR. Requirement of grounding /earthing with required material details is to be informed by VENDOR well in advance so that same could be incorporated during construction of foundation.	Vendor to Confirm		
7.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized.	Vendor to Confirm		
7.3	All electrical & electronic control cabinets & panels should be dust and vermin proof fitted with suitable panel air conditioner/s.	Vendor to Confirm		
7.4	All electrical components in the cabinets should be mounted on DIN Rail, sticker name and wire number.	Vendor to Confirm		
7.5	Motors shall conform to IEC or Indian standards.	Vendor to Confirm		
7.6	Vendor should ensure the proper earthing for the Machine and its peripherals.	Vendor to Confirm		
7.7	All electrical equipment shall be suitably protected by HRC fuses/ MCBs/ Overload relays & single phase preventives.	Vendor to Confirm		
8	SAFETY	Vendor to Confirm		
8.1	Ladder (For routine inspection of the equipments)	Vendor to Confirm		
8.2	Safety fence required for routine inspection on the top of the gate frame.	Vendor to Confirm		
8.3	Oil and water pipe lines should not run with electrical cable in the same tray/trenches.	Vendor to Confirm		
8.4	All the pipes, cables etc. on the machine should be well supported and protected.	Vendor to Confirm		
8.5	Emergency Switches at suitable locations as per international norms are to be provided.	Vendor to Confirm		
8.6	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.	Vendor to Confirm		
8.7	Safety lights at suitable locations.	Vendor to Confirm		
8.8	Bogie Stopper shall be required to prevent Complete Bogie jumping out in the rail direction in case that the load position slightly shifts.	Vendor to Confirm		
9	TESTING AND INSPECTION	Vendor to confirm		
9.1	Operation Test and Inspection			
9.1.1	Operation Speed (Press Down speed)	Vendor to confirm		
9.1.2	Operation Speed (Fast approach and return speed):	Vendor to confirm		
9.2	Function Test and Inspection			
9.2.1	Start / Stop Operation : to confirm smoothness and reliability	Vendor to confirm		
9.2.2	Up / Down Operation : to confirm smoothness and reliability	Vendor to confirm		

Signature

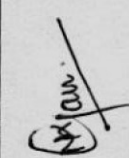
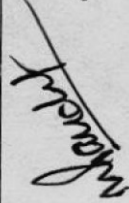
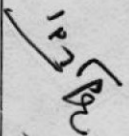
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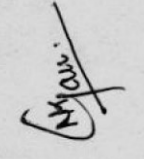
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9.2.3	Hydraulic Pump Operation :To confirm reliability, no leakage and any abnormalities	Vendor to confirm		
9.2.4	Hydraulic Cylinder Press Force (Output Force) confirmation :For Max. Load	Vendor to confirm		
9.2.5	Electrical Control operation confirmation : to confirm reliability	Vendor to confirm		
9.2.6	Operation confirmation (all function) : to confirm all specified operation function	Vendor to confirm		
9.2.7	Load Cell shall be calibrated. The calibration sheet of the load cell shall be submitted by vendor. This sheet shows rated output, calibration constant etc. to measure the output force.	Vendor to confirm		
10	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :			
10.1	Maximum noise level shall be 85 dB at normal load condition, 1 M away from the machine.	Vendor to confirm		
10.2	There shall not be any emissions from the machine.	Vendor to confirm		
10.3	Tropicalisation: All electrical / electronic equipment shall be tropicalized.	Vendor to confirm		
10.4	No hazardous chemicals shall be required to be used in the machine.	Vendor to confirm		
10.5	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm		
10.6	Paint of the machine should be oil resistant and should not peel off.	Vendor to confirm		
11	MACHINE LIGHTS:			
11.1	Machine Lights for sufficient illumination of complete working area should be provided for clear visibility.	Vendor to confirm		
11.2	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Vendor to confirm		
12	LEVELING AND ANCHORING SYSTEM:			
12.1	Complete anchoring system including foundation bolts, anchoring materials etc. shall be vendors scope.	Vendor to confirm		
13	TOOLS FOR ERECTION, OPERATION & MAINTENANCE :			
13.1	Tools required for erection & commissioning of the machine has to be arranged by the vendor. One set of tool kit for maintenance and operation of the press to be supplied.	Vendor to confirm		
14	SPARES:			
14.1	Itemised list of mechanical, hydraulic, electrical and electronic spares used on the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be submitted by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item, make & model of spare shall be offered.	Vendor to confirm and submit		
14.2	a) Mechanical & Hydraulic Spares: All types of Pumps, Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, Hydraulic Hoses etc.	Vendor to confirm and submit		
14.3	b) Electrical /Electronic Spares: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch.	Vendor to confirm and submit		
14.4	All types of spares for total machine and accessories should be available for at least ten years after supply of the machine. If machine or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure them in advance, if required	Vendor to confirm		
14.5	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to confirm and submit		
15	DOCUMENTATION:			

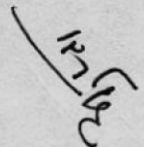





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15.1	Five sets (Hard copies) of following documents in English language should be supplied along with the machine.	Vendor to confirm		
15.1.1	Operation and maintenance manual with hydraulic sequence chart.	Vendor to confirm		
15.1.2	Catalogues, O&M Manuals of bought out items, including drawings (Electrical & electronic circuit, PLC Logic, machine assembly drawings, hydraulic circuit).	Vendor to confirm		
15.4	One additional set of all the above documentation in soft copy.	Vendor to confirm		
16	FOUNDATION:			
16.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval. Complete foundation design including details like static / dynamic loads etc. and final layout drawings shall be submitted by the supplier with in a month after getting PO for BHEL's approval. The Layout should consist of all requirements pertaining to complete machine and all accessories. BHEL shall construct complete foundation for the machine.	Vendor to confirm		
17	ERECTION AND COMMISSIONING :			
17.1	Erection and commissioning is the responsibility of the supplier. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings.	Vendor to confirm		
17.2	Tools, Tackles, instruments and other necessary equipment required for erection and commissioning of the machine should be brought by the supplier.	Vendor to confirm		
17.3	Commissioning spares, required for commissioning of the equipment within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to confirm		
17.4	All Cover Plates required for the equipment and its peripherals including pits, if any, shall be supplied and installed by the vendor.	Vendor to confirm		
17.5	Portion, if any, of the machine, accessories and other supplied items where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	Vendor to confirm		
17.6	Duration for E&C after call of commissioning from BHEL - 4 Months Max.	Vendor to confirm and specify		
17.7	E&C schedule for machine in Bar chart	Vendor to submit		
17.8	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 18.0 (Machine Acceptance Criteria) shall form the part of commissioning activity.	Vendor to confirm		
17.9	Any thing else required for successful commissioning of machine shall be vendors scope without any extra cost to BHEL.			
18	MACHINE ACCEPTANCE:			
18.1	Tests/activities should be carried out at supplier's works on the machine before dispatch.	Vendor to confirm		
18.2	Vendor to demonstrate all the functions of the machine in line with clause 9.	Vendor to confirm		
18.3	Vendor to demonstrate machine accuracies as per DIN/ISO/IS standard test chart as applicable at vendors works during inspection of the machine by BHEL engineers.	Vendor to confirm		
18.4	Vendor to furnish the test chart	Vendor to submit		

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18.5	Tests to be carried out at BHEL works while commissioning the machine.			
18.6	Vendor to demonstrate machine accuracies as per test chart.	Vendor to confirm		
18.7	Vendor to demonstrate all the functions of the press for its proper functioning.	Vendor to confirm		
18.8	Job prove out for min 3 nos. Assembled Bogies load test operation	Vendor to confirm		
19	PACKING:			
19.1	Proper packing of the items is to be ensured to avoid any damage in transit.	Vendor to confirm		
20	GUARANTEE :			
20.1	24 Months from the date of acceptance of the machine.	Vendor to confirm		
21	TRAINING:			
21.1	BHEL Persons shall be trained at BHEL Works in the field of Operation and Mechanical, Electrical & Electronics maintenance of machine & other supplied equipment.	Vendor to confirm		
22	AMBIENT CONDITIONS & THERMAL STABILITY:			
22.1	Ambient Conditions : Temperature = 5 to 50 degree Celsius , Relative Humidity : 95 %	Vendor to Note and confirm		
22.2	Thermal Stability of the complete Plant keeping in view specified Ambient Conditions and accuracy requirements of BHEL components and trouble free operation of the Plant should be ensured by VENDOR.	Vendor to Note and confirm		
23	GENERAL :			
23.1	Machine Model:	Vendor to specify		
23.2	Total connected load (KVA):	Vendor to specify		
23.3	Floor area required (Length, Width, Height) for complete equipment & accessories	Vendor to specify		
23.4	Painting of machine/electrical panels: RAL 6011 Apple green (polyurethane paint)	Vendor to confirm		
23.5	Total weight of the equipment.	Vendor to specify		
23.6	Weight of heaviest part of machine	Vendor to specify		
23.7	Detailed catalogues , sketch/ photographs of the machine should be submitted with the offer.	Vendor to specify		
23.8	Delivery period: 6 months Max.	Vendor to confirm and specify		
23.9	First fill of hydraulic oil / consumable shall be in vendors scope. Machine should be compatible to use with hydraulic oils being supplied by IOCL/ HPCL/BPCL / Balmer Lawrie/ any other equivalent make in india oil grade.			
24	QUALIFYING CRITERIA			
24.1	Only OEM or OEM authorized dealer / partners, who have supplied at least one number min. 50 ton capacity Bogie Load Test machine in the past 7 years from the date of tender opening should quote. If the bidder is OEM-authorized dealer or partner or distributor then bidder to submit valid authorization certificate from OEM & Letter from OEM for technical support for this tender . The following information is also to be submitted by all the bidders for qualification of their offer.	Vendor to Confirm		
24.2	Purchase order copy (Unpriced) for supply of one number Bogie Load Test Machine of min. 50 Tons capacity during last 7 years from the date of this enquiry. If the bidder is OEM-authorized dealer or partner or distributor Purchase Order in the name of principal is also accepted .	Vendor to submit		





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24.3	One no. Performance certificate from the customer of the same machine for min. one-year satisfactory operation from date of commissioning during last 7 years from the date of this enquiry.	Vendor to submit		
24.4	Name of the customer/company where similar machine is supplied.	Vendor to submit		
24.5	Complete postal address of the customer.	Vendor to submit		
24.6	Date of supply	Vendor to submit		
24.7	Date of commissioning.	Vendor to submit		
24.8	Name and designation of the contact person of the customer.	Vendor to submit		
24.9	Phone number & email address of the customer's contact person.	Vendor to submit		
24.10	BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.	Vendor to Confirm		
24.11	Vendor shall be required to submit signed NDA (Non Disclosure Agreement) with BHEL All relevant drawing will be shared with vendor only after submission of NDA. Offer without NDA shall not be considered.	Vendor to Confirm and submit		
<i>Lalit Kumar Verma</i> Lalit Kumar Verma (Mgr./ WEX) <i>Nitin Kumar Gaur</i> Nitin Kumar Gaur (DGM/ WEX) <i>Manish Khandelwal</i> Manish Khandelwal (Mgr./ LMM) <i>Ankur Gupta</i> Ankur Gupta (Mgr./ LME) <i>Rajeev Ranjan</i> Rajeev Ranjan (Dy. Manager/Loco Quality)				