

**F.No.27/1357(EX)/2013/Tpt/BSF/MHA-Prov-I
Bharat Sarkar/Government of India
Griha Mantralaya/Ministry of Home Affairs
PM Division/Prov.I Desk**

**26, Man Singh Road, Jaisalmer House
New Delhi, Dated 3rd October, 2013**

To,

DsG: AR (through LOAR), BSF, CISF, CRPF, ITBP, SSB, NSG & BPR&D.

Subject: QRs and Trial Directive for Excavator cum Backhoe Loader.

The QRs and Trial Directives in respect of Excavator cum Backhoe Loader as per Annexure have been accepted by the Competent Authority in MHA.

2. Henceforth, all the CAPFs should procure the above item required by them strictly as per the laid down Technical Specifications/QRs.

Yours faithfully,

Encl: as above



(Smt. S.B.Nanda)

Under Secretary to the Govt. of India

Tel: 23381278

Copy forwarded for necessary action :-

SO (IT), MHA : It is requested to host the QRs and Trial Directives (soft copy attached) on the MHA website (under the page of Organizational Set up- Police Modernization Division- Qualitative Requirement)



(R.K. Soni)

Section Officer (Prov-I)

Copy to: DDG (Procurement), MHA.

Copy for information to: PPS to JS (PM)

(33) (1)

TECHNICAL SPECIFICATION OF EXCAVATOR CUM BACKHOE LOADER

(A) PHYSICAL SPECIFICATION

1. Performance Specification:-

The excavator cum backhoe loader shall be employed for excavation, digging, demolition grading and finishing job. The equipment shall be rugged and of sturdy construction, capable of working continuously and successfully under adverse working conditions.

2. Prime Mover :-

The prime mover shall have the following specifications:-

(a) **Engine:** Water cooled, **turbo charged diesel engine** of ISUZU/ BEML / TATA/ Kirloskar, Cummins OR of any reputed make conforming to ARAI / BIS / BS / DIN/ SAE standards.

(b) **Power Output:** 90 HP or more at rated RPM.

(c) **Starting System** 12/24 V electric system with suitable battery and alternator.

3. Main frame Chassis:-

The main frame shall be very strong and robust enough to withstand extreme working stresses .

4. Transmission Unit:-

With 4 or more forward and minimum 1 reserve gear with 4 WD. The transmission shall be internationally accepted with torque converter. There shall be a provision for changing from 2 wheel drive to 4 wheel drives.

5. Axle with Steering Arrangement :-

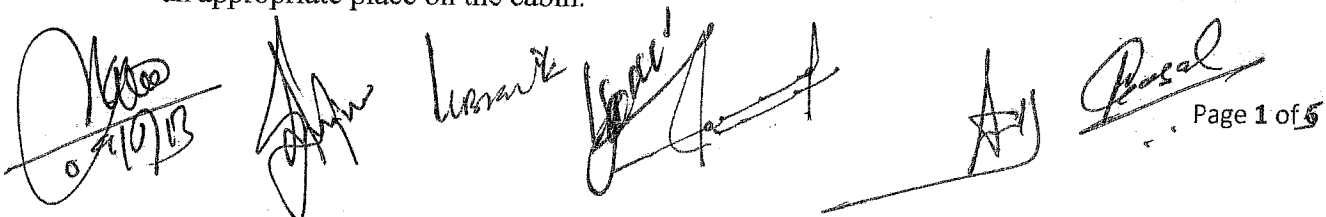
The front Axle shall be centrally pivoted, oscillating type and shall be designed for continuous loading cycles and shall ensure excellent manoeuvrability.

6 Brake System:-

The service brake should be hydraulically/pneumatically activated, dual line each LH and RH self-adjusting. The brake system should conform to CMVR norms. The parking brake should maintain the parking performance on its application and it should be easily applied by the driver. The break system should be designed in such a way so as to protect itself from dirt, water, mud etc

7. Electrical System.

It should be 12/ 24 volt and to be powered by alternator and batteries. The complete system of the equipment shall cater for safeguards against short circuits and over voltage. Separate searchlight to illuminate the surrounding area of the vehicle should be provided at an appropriate place on the cabin.

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8. Hydraulic System:

The components of the hydraulic system should be a tank, pump. Control valves hydraulic lines and filters as per the design of the manufacturer. The filter elements in the return line of the system filling strainer shall be provided to filter of the hydraulic system and for its protection.

9. Steering system

The equipment should have hydraulically operated steering system.

10. Instrument Panel :-

The instrument panel should be fixed at an appropriate position for the ease of operation. The following shall invariably be fitted in the instrument panel:-

- (a) Digital Hour meter, water / coolant temperature gauge, engine oil pressure gauge, fuel gauge, engine starting ignition key, horn switch and switches for various lights.
- (b) All the gauge in the panel should be quickly readable and understandable.
- (c) All instruments must be properly illuminated for night time operation.
- (d) All audible signals shall be distinguishable from the operating point of the hydraulic excavator.
- (e) The equipment shall be provided with warning system for low engine oil pressure and high temperature gauge.

11. Operator's cabin :-

It should be so designed to serve the intended purpose of operator's safety and comfort and it should conform to the ISO standards. The operator's seat should be so designed to ensure easy operation of all leaver positions. The seat should be vertically and horizontally adjustable, revolving, reclining type with armrest movable with or without control levers. The cabin shall be well ventilated with two rear view mirrors, interior light, wiper, fire extinguisher, first Aid box and a fan. The equipment shall be provided with adequate lights to perform the tasks during darkness/fog/ rainy season and should be conforming to traffic rules.

12. Excavator :- excavator should consist following main components:-

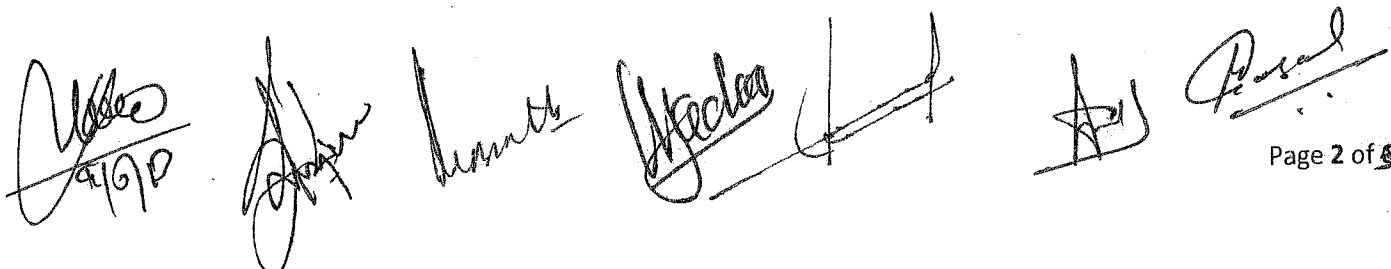
- a. King Post
- b. Boom
- c. Dipper
- d. Bucket

13. Loader :-

The loader shall consist of a bucket pivoted on end of a pair of hydraulically operated arms. The loader arms shall be of self-levelling type. The bucket capacity of the loader shall be minimum 1.00 Cum.

14. Stabilizers. :-

Two stabilizers shall be fitted at the rear end of the machine. The stabilizers shall be hydraulically operated. Each stabilizer having its own control shall be operated independently at different heights.



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15. Access System For Excavator-cum Loader:-

- (a) Access system for Excavator-cum Loader may include platform, grab rail entrance opening
- (b) The design of these devices and means of attachments should provide adequate strength for the purpose intended.

16. General Requirements:-

- (a) Rotating and Fixed shafts/ Axles: - The shafts and axles shall have ample rigidity and adequate quality.
- (b) Hardware Items: - All the hardware items shall be galvanized/ surface treated as per manufacturer's design.
- (c) Instruction Plate/ decals: - The machine shall have instruction place/ Decals permanently affixed at suitable location, indicating precautions and any special important procedures to be observed in operation the machine.

17. Miscellaneous

a) Bearings

Shall be of a standard reputed make with BIS certification / international standards.

b) Battery

Shall be maintained free, of standard reputed make like Exide Furukawa, Amron and SF with BIS certification/ international standards. According to ambient temperature the capacity of the battery should be as under.

Ambient Temp	Battery Capacity 12 Volt	Battery Capacity 24 Volt
Above +10	135 AH	Two batteries of 12 V 80 - 90 Amp-hr in series
Below +10 and Down to - 20	180 AH	Two batteries of 12 V, 120 Amp-hr in series.

c) Rubber Items

Shall be of Dunlop/Fenner or any reputed make

d) Painting

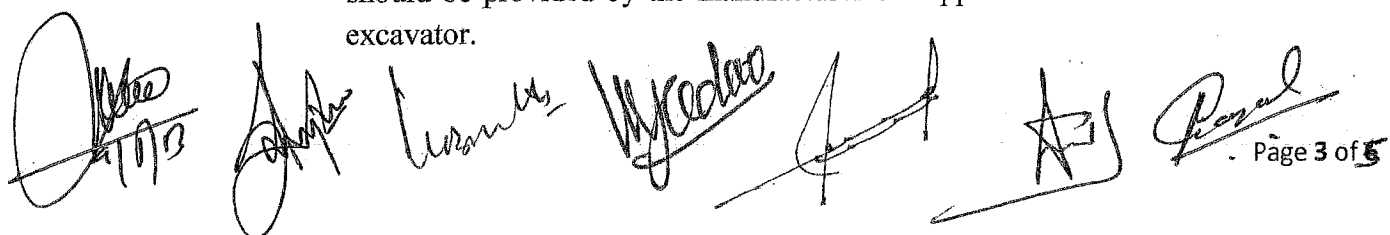
The equipment shall be painted in any colour as suggested by the CAPFs

e) Publication :-

The manufacturer shall supply all the technical literature like operation and maintenance manual for engine and equipment. Workshop manual for engine and equipment, illustrated part catalogue, lubricant chart of complete equipment in English and Hindi both in hard and soft copy

f) Warranty

A Warranty period of minium 2 years or more for unlimited hours of operation should be provided by the manufacturer or supplied of the backhoe loader/earth excavator.



(18)

(B) TECHNICAL SPECIFICATIONS OF EXCAVATOR-CUM BACK HOE LOADER

(I) Excavator Parameters:-

- | | |
|---|---------------------|
| (a) Digging Depth | 4.30 Mtr or more |
| (b) Reach-ground level to rear wheel centre | 6.7 meter or more |
| (c) Maximum working height (stabilizers not raised) | 5.20 meters |
| (d) Bucket rotation | 180 Degree or more |
| (e) Bucket digging/ breakout force | 5500 Kg or more |
| (f) Bucket Capacity | 0.24 Cum or more |
| (g) Load over height (Maximum) | 3.5 meters |
| (h) Side reach to centre of machine | 6.00 meters or more |

(II) Loader Parameters

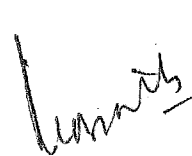
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|----------------------------------|--------------------------|
| (a) Dump height - | 2.65 Mts or more |
| (b) Load Over height | 3 meters or less |
| (c) Dump Angle | 43 degree or more |
| (d) Loader Bucket capacity | 1.00 Cum or more |
| (e) Pin height | Not Less than 3.40 meter |
| (f) Reach at ground | 1.35 meter or more |
| (g) Reach at full height | 1 Meter or more |
| (h) Below ground level dig depth | 0.05 meter or more |
| (i) Bucket Breakout force | 5700 Kg or more |

(III) Static Dimensions

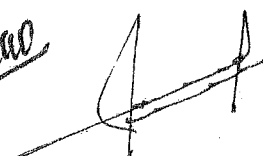
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|---------------------------|----------------|
| (a) Ground Clearance | 350 mm or more |
| (b) Slew ground clearance | 500 mm or more |


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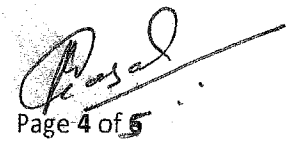




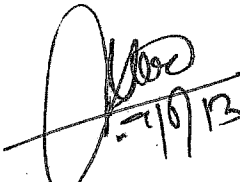




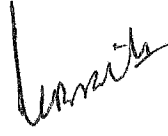




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- (c) Overall height (maximum) 3.90 meter
- (d) Turning radius (Outside Wheels) Not more than 6.50 meter
- (e) Engine HP Not less than 90 HP at 2200 (+ -) 100 RPM
- (f) Torque 320 nm or more
- (g) Tyres As per manufacturer's design (16PR)
- (h) Steering system Power, Hydraulically operated through valves
- (i) Hydraulic Pump flow. Not less than 105 L/min at 2200 rpm
- (j) Fuel Diesel.
- (k) Forward Speed Minimum 30 KMPH or more
- (l) Fuel Tank Capacity Minimum 120 Liters or more
- (m) Temperature Range 20 degree to + 55 degree



h. RPS Malik
DIG BSF SRO (PO)


Sh. Sanjeev
Singh, DC
CRPF (M-1)



Inspt R.S.
Bisht,
CISF (M-2)


Inspt
Hargovind
Singh, ETBP
(M-3)


Sh. Arvind Kr.
AC, SSB (M-4)


Maj Tanjit D. M. M.
Singh, Team Gosai, Dy SP
Cdr, NSG (T), BPRD
(M-5) (M-6)

Approved / Not Approved


(Subhash Joshi, IPS)
DG, BSF.

TRIAL DIRECTIVE FOR EXCAVATOR CUM BACKHOE LOADER

Date of Trial
Time of Trial
Place of Trial
GR of Trial Area.....

Temperature.....
Altitude.....
Weather Condition.....
(Clear/cloudy/Partially cloudy/Hot and Humid/rainy/Foggy and Humid/Soft Snow or Hard Ice)

(I) TECHNICAL PARAMETERS

Sr NI	Specification	Parameter	Procedure Suggested for Trial	Result expected/desired
1	Performance	The excavator cum backhoe loader shall be employed for excavation, digging, demolition grading and finishing job.	The equipment will be employed for the work of digging, excavation, loading, grading demolition etc.	The equipment should be able to perform all the specified jobs.
2	Engine Make	Water cooled, turbo charged diesel engine of ISUZU/ BEML / TATA/ Kirloskar, Cummins OR of any reputed make conforming to ARAI / BIS / BS / DIN/ SAE standards.	Based on the certificates provided by the manufacturer	It should meet the desired Parameters as per the QRs.
3	Engine power	Not Less than 90 HP	Based on the certificates provided by the manufacturer	It should meet the desired Parameters as per the QRs..
4	Fuel	Diesel	The fuel at any port will be checked and certificate to be provided by the manufacturer.	It should be diesel. The equipment should be compatible to Indian fuel.

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5	Transmission	4 FWD and 1 reverse gear with 4WD	The equipment will be driven in all the gears including change over to 4WD	The equipment should attain the specified speed at respective gears as specified by manufacture.
6	Steering System	Power Steering	The equipment will be driven and turned right /left. Also certified to this effect may be provided by the manufacture.	The Operator should be able to turn the equipment with ease.
7	Brake System	Hydraulically/ Pneumatic activated.	The brakes shall be applied on the equipment. Parking brak should be applied on a slope not more than 10 degree.	It should be able to stop the equipment properly and effectively with both service and parking brake.
8	Turning Radius	Not more than 6.50 meter	The turning radius shall be calculated from the outer wheels of the equipment which shall me driven in a circle.	The radius of the circle made by the outer wheels should not be more than 6.50 meter
9	Ground Clearance	The under carriage ground clearance of the equipment should not be LESS than 350mm	Ground clearance shall be measured from the lowest part of the equipment.	It should not be less than 350 mm
10	Slew ground Clearance	500 mm or more	Will be measured from the slew centre	It should not be less than 500 mm
11	Torque	320 nm or more.	As per the certificates provided by the manufacturer	It should be within the desired Parameters as per the QRs..
12	Hydraulic Pump flow	Not less than 105 L/min at 2200 rpm	As per certificates provided by the firm	It should be within desired parameters as per the QRs.

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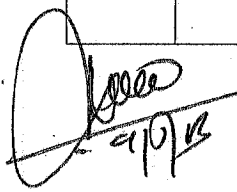
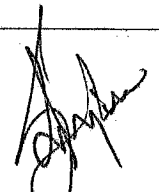
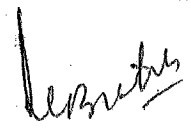

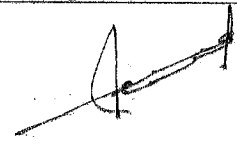

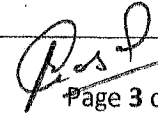
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13	Operator's Cabin material	The material used for seat and upholstery items should be of best quality	The material should be checked physically and BOO will satisfy themselves about the quality of the same.	It should be of best quality
14	Electrical System	12 volt/ 24 volt	As per the certificates provided by the manufacturer.	It should be within the desired parameters as per the QRs.
15	Instrument Panel	All devices, meters fitted on instrument panel should be in excellent working condition, readable and understandable.	The devices will be checked physically	All devices, meters fitted on instrument panel should be in excellent working condition, readable and understandable.
16	Lights	All the lights fitted on the equipment should be functional	All the lights will be switched on	All the lights will be in excellent functional condition.
17	Stabilizers	The stabilizers should be hydraulically operated	The stabilizers should be operated on site.	The stabilizers should be able to lift smoothly.

(II) EXCAVATOR PARAMETERS:-

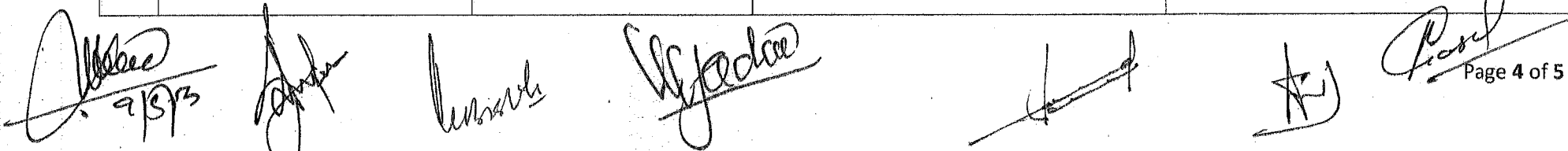
SrlNo	Specification	Parameter	Procedure Suggested for Trial	Result expected/desired
1	Digging depth	The digging depth should Not be Less than 4.30 meters	The digging depth will be measured physically	It should be as per desired parameters in the QRs..
2	Reach-ground level to rear wheel centre	Ground level reach to rear centre wheel should Not be Less than 6.70 meters	Will be measured physically	It should be as per desired parameters in the QRs.
3	Maximum working height (stabilizers not raised)	Should Not be more than 5.20 meter	Will be measured physically	It should be as per desired parameters in the QRs.
4	Bucket rotation	Should not be less than 180 degree	The bucket rotation will be measured physically by rotating the bucket of the equipment	It should not be less than 180 degree.

5	Bucket Capacity	0.24 meters	Will be calculated as per SAE standards	It should be as per desired parameters as mentioned the QRs..
6	Load over height (Maximum)	3.50 meters or more	Will be checked physically.	It should be as per desired parameters as mentioned the QRs..
7	Bucket digging/ breakout force	5500 Kg or more	As per the certificates provided by the manufacturer	It should be as per desired parameters as mentioned the QRs..

(III) LOADER PARAMETERS

Srl No	Specification	Parameter	Procedure Suggested for Trial	Result expected/desired
1	Dump height -	2.65 Mts or more	The Dump height of the loader shall be measured physically	It should be as per desired parameters as mentioned the QRs..
2	Load Over height	3 Meters or More	The Dump height of the loader shall be measured physically	It should be as per desired parameters as mentioned the QRs..
3	Dump Angle	43 degree or more	Will be measured with the help of protractor	It should Not be less than 43 degree
4	Loader Bucket capacity	1.00 Cum or more	The Loader bucket capacity will be calculated as per SAE standards.	It should not be Less than 1.00 Cum
5	Pin height	Not less than 3.40 meter	Will be measured Physically on site	It should be as per desired parameters as mentioned the QRs..
6	Reach at ground	1.35 meter or more	Reach at ground will be measured physically	It should be as per desired parameters as mentioned the QRs..
7	Reach at full height	1 Meter or more	Will be measured physically	It should be within the desired parameters as per the QRs
8	Bucket Breakout force	- 5700 Kg or more	As per the certificate provided by the manufacturer	The certificate should specify the Bucket breakout force to be more than 5700
9	Below ground level dig depth	- 0.05 meters or more	Will be checked physically on site	It should be as per desired parameters as mentioned the QRs..



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