Under Jurisdiction of Dhanbad/Jharkhand Court Only

Bharat Coking Coal Limited

(A Miniratna Company)

A Subsidiary of **Coal India Limited**

Registered Office: Koyla Bhawan, Koyla Nagar, Dhanbad -826005

CIN:U10101JJH1972GOI00091

Website: www.bcclweb.in

Material Management Department

Level-III, Commercial Block

Koyla Bhawan, Dhanbad-826005

(Fax No- 0326-2230183)

Phone No.0326-2230181

Email Id: gmmm.bccl@coalindia.in

Purchase Order

Ref: BCCL/Pur/422011/60T Dumper/OTE-RA/22-23/10 Date: 16.11.2022

To

M/s BEML Limited

BEML SOUDHA
23/1, 4th Main SR Nagar ,
Bengaluru-560027 ,Mobile No.9440600172 ,
Phone No. 080 – 22963532.

E-mail : mtt@beml.co.in
mfm@beml.co.in
GSTIN:29AAACB8433D1ZU
Vendor Category : Manufacturer (PSU)
PAN-AAACB8433D

Sub: Supply, Installation and Commissioning of 13 nos. of 60 Ton Rear Dumper along withSpares and Consumables for 12 months of warranty period from the date of commissioning of the Equipment and thereafter Spares & Consumables for 48 months guaranty period

Ref: BEML Online offer Ref: MT/TC-1572/BCCL (BH60M-1) dtd 29.06.2022 (Bid Id: 834915 dtd 30.06.22) and subsequent last counter offer letter no. BEML/MTT/TC-1572/BH60M/1037 dtd 11.10.22against open domestic e-tender with reverse auction vide tender no. BCCL/Pur/422011/60T Dumper/OTE-RA/22-23/24 dtd 01.06.22 (Tender Id: 2022_BCCL_245460_1), Cover -I opened on 02.07.2022 & Cover-II opened on 04.08.22.

Dear Sirs,

With reference to the above, we, for and on behalf of BCCL, hereby place PURCHASE ORDER on BEML for the following items as per rate, terms and conditions indicated below as above BEML referred offer has been accepted to the extent as indicated here under:

1. SCOPE OF SUPPLY-

Sl	Item Description	Qty (No)	Price Element	Unit Price (Rs/No)	Extended Value (Rs)
1	BEML Make 60T Rear Dumper , Model : BH 60M Dumper Powered by Cummins Make QSK-19C Diesel engine developing 480 KW net Power including first fill of oils , grease and lubricates	13	Basic	2,47,39,272.98	32,16,10,548.74
			P&F Charges	Inclusive	Inclusive
			Freight	Inclusive	Inclusive
			Transit Insurance	Inclusive	Inclusive
			GST @ 28 %	69,26,996.43	9,00,50,953.65
			Total	3,16,66,269.41	41,16,61,502.39
2	Erection & Commissioning, Special Tools charges	13	Basic	0.00	0.00
3	Spare Parts and Consumables for warranty period/1st year of the equipment	13	Basic	17,86,768.00	2,32,27,984.00
			GST @ 18/28 %	3,21,618.24	41,81,037.12
			Total	21,08,386.24	2,74,09,021.12
4	Spare Parts and Consumables for 2nd Year of Operation	13	Basic	19,39,200.00	2,52,09,600.00
			GST @ 18/28 %	3,49,056.00	45,37,728.00
			Total	22,88,256.00	2,97,47,328.00

5	Spare Parts and Consumables for 3rd Year of Operation	13	Basic	22,10,501.00	2,87,36,513.00
			GST @ 18/28 %	4,28,855.48	55,75,121.24
			Total	26,39,356.48	3,43,11,634.24
6	Spare Parts and Consumables for 4th Year of Operation	13	Basic	22,70,160.00	2,95,12,080.00
			GST @ 18/28 %	4,42,234.20	57,49,044.60
			Total	27,12,394.20	3,52,61,124.60
7	Spare Parts and Consumables for 5th Year of Operation	13	Basic	21,91,597.00	2,84,90,761.00
			GST @ 18/28 %	4,23,552.66	55,06,184.58
			Total	26,15,149.66	3,39,96,945.58
8	Total Basic price of equipment with freight insurance and 5 years spares parts & consumables.	13	Basic	3,51,37,498.98	45,67,87,486.74
9	Total GST amount	13	GST @ 18/28 %	88,92,313.01	11,56,00,069.19
10	Total price of equipment with freight, insurance and 5 years spares parts & consumables.	13	Landed Price	**4,40,29,811.99**	**57,23,87,555.93**

Note: Year wise Spare Parts and Consumables List per equipment for above spares amount is as per Annexure –B

Supply Point:
Equipment: Supply and billing will be from BEML Limited, Mysore Complex, Belwadi Post,Mysore 570018
Spares: Supply and billing will be from BEML Limited, Dhanbad, Jharkhand: 828109

2. Total Purchase Value :- (Equipment & Spare Parts and Consumables for 12 months of warranty period from the date of commissioning of the Equipment and thereafter Spares & Consumables for a period of 48 months): **Rs 57,23,87,555.93** (Fifty Seven Crore Twenty Three Lakh Eighty Seven Thousand Five Hundred Fifty Five Rupees and Ninety Three Paisa Only.)
The above prices are FIRM and on FOR Destination basis inclusive of packing & forwarding, Freight & insurance. Safe arrival of the complete equipment upto destination stores shall be BEML's responsibility.
Note: During 60 months contractual period, guaranteed spares covered under price list, shall be paid at the price list rate prevailing in BCCL or order price, whichever is lower.

3. GST:

a) GST shall be paid at actual against documentary evidence as applicable at the time of dispatch within the stipulated delivery period. The current rate of GST is 28% on equipment. Input Tax credit benefit shall be availed by the consignee, for which you should submit GST complaint Invoice. You have to comply with the terms and conditions of GST Act / rules such as issuance of Tax invoices, ensure payment of GST and enabling mechanism to facilitate Input Tax credit by BCCL. You should upload the Tax Invoices / Debit Note / Credit Note in GST Portal, make payment of GST and file returns in time, as prescribed under GST Act and Rule to facilitate BCCL to avail Input Tax Credit (ITC) as per eligibility under GST.

In case BCCL is unable to avail ITC or any liability arises to BCCL due to failure on the part of you to comply the above provisions, the entire amount including Interest (if any) borne by BCCL shall be recovered from you. The present rate GST applicable on individual items of spares is as per Annex- B enclosed.

b) Invoice issued by you should contain following elements as per Section 31 of CGST Act, 2017 along with Rule 46 and 47 of CGST Rule, 2017:

- Firm Name, address and GSTIN;
- A consecutive serial number (not exceeding sixteen characters) containing only alphabets and/or numerals, unique for a financial year; (should not be hand-written)
- Date of its issue;
- Name, address and GSTIN/ Unique ID Number, if registered, of the recipient;
- Name and address of the recipient and the address of delivery, along with the name of State and its code, if such recipient is unregistered and where the taxable value of supply is fifty thousand rupees or more;
- HSN code of goods or Accounting Code of services;
- Description of goods or services;
- Quantity in case of goods and unit or Unique Quantity Code thereof;
- Total value of goods or services;
- Taxable value of goods or services taking into account discount or abatement, if any;
- Rate of tax (CGST, SGST or IGST);
- Amount of tax charged in respect of taxable goods or services (CGST, SGST or IGST);
- Place of supply along with the name of State, in case of a supply in the course of inter-State trade or commerce;
- Place of delivery where the same is different from the place of supply;
- Whether the tax is payable on reverse charge;
- the word "Revised Invoice" or "Supplementary Invoice", as the case may be, indicated prominently, where applicable along with the date and invoice number of the original invoice; and
- Signature or digital signature of the BEML or its authorized representative
- GST Registration Number of BCCL in case of supply for Jharkhand is 20AAACB7934MFZB and in case of supply for WB is 19AAACB7934M2Z7. Your bills should bear this number to enable BCCL to claim INPUT TAX CREDIT.

c) BEML has to ensure proper uploading in your return so that BCCL may be able to avail Input Tax Credit.

d) BEML has to ensure that if BCCL does not be able to avail Input Credit due to your fault then the loss amount shall be recovered from your bill.

e) The benefit of any extra input tax credit earned by BEML, if any, in future shall be passed on to BCCL.

f) E-Way bill, if required, shall be arranged by BEML

g) HSN codes and GST rates of the items covered in the above supply order placed will be as under:

Sl	**Item**	**HSN code**	**GST rate**
1	Dumper	87041010	28 %
2	Spares & Consumables	HSN Code & GST mentioned in Annexure-B	

h) Your GST details are as under:

SN	Particulars	Firm's Details
1	Name	M/s BEML Ltd
2	Constitution of Business	Government of India Undertaking under Ministry of Defence
3	Trade Type (Manufacturer/Dealer/Service Provider)	Manufacturer
4	PAN	AAACB8433D
5	Contact number	9440600172
6	GST No.	29AAACB8433D1ZU

4. **Packing & Forwarding Charges**: Inclusive

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5. Freight/Transportation Charges Inclusive Of Service Tax: Inclusive

6. Transit Insurance Inclusive Of Service Tax: Inclusive

7. TERMS OF PAYMENT:

(a) For Payment of equipment and consumable spares and consumables for first 12 months of warranty period from the date of commissioning of the equipment in Indian Rupees:

i. 80% value of the equipment and consumable spares and consumables for first 12 months of warranty period from the date of commissioning of the equipment and 100% taxes and duties and other charges excluding erection & commissioning charges shall be made within 21 days after receipt and acceptance of materials at site at the consignee's end and acceptance of Performance Bank Guarantee valid till 3 months after the completion of 60 months period from the date of commissioning of all the equipment covered in the contract.

ii. Balance 20% payment including erection & commissioning charges shall be made after successful completion of erection, testing, commissioning and final acceptance of the equipment (along with the accessories) upon presentation of successful commissioning certificate, signed by the concerned officials of the Project and counter-signed by the Area General Manager and HOD of Excavation Deptt. Of BCCL, where the equipment has been deployed and confirmation of receipt of spares and consumables for first 12 months of warranty period from the date of commissioning of the equipment by the paying authority.

iii. Freight and transit insurance charges shall be paid at actual subject to ceiling of the quoted rates/prices.

(b) Payment of spares and consumables for 48 months after the warranty period of 12 months from the date of commissioning of the equipment in Indian Rupees:

100% value of the supplementary items as per scope of supply and 100% taxes and duties and other charges shall be made within 21 days after receipt and acceptance of materials at consignee's end.

BCCL is making payment of BEML Ltd's bills through Electronic Fund Transfer (EFT). BEML Ltd is therefore, advised to indicate their Bank Account number and other Bank Details in their Invoice.

Name of the Bank.
Name of the Branch with complete address.
Party's Account Style.
Party's nature of Account.
Party's Account Number.
Your E-Payment mandate is enclosed as Annexure- O

8. DELIVERY:

(a) Period for supply of complete equipment shall be as under:

08 No's Dumpers to be supplied within 6 months from the date of receipt of purchase order and balance 5 nos Dumpers to be supplied in 7th month from the date of receipt of purchase order. However early supply will be appreciated. Hence, total delivery period shall be 7 months from date of supply order.

(b) The delivery of spare parts and consumables for individual machine should be made as follows:

The supplier shall submit *Five (5)* separate schedules for every year showing spare parts and consumables proposed to be supplied by them in each 12 (twelve) months period from the date of commissioning of equipment project-wise in order to comply with the provisions herein contained.

(c) Erection & Commissioning Period: The Equipment shall be commissioned at site within 30 days of receipt of last consignment of each Equipment.

9. LIQUIDATED DAMAGES CLAUSE:

(i) In the event of failure to deliver or dispatch the equipment / stores within the stipulated date / period in accordance with the terms and conditions and the specifications mentioned in the supply order and in the event of breach of any of the terms and conditions mentioned in the supply order, the Purchaser shall have the right:

(a) To recover from the successful bidder as agreed liquidated damages, a sum not less than 0.5% (Half Percent) of the price of any equipment / stores which the successful tenderer has not been able to supply as aforesaid for each week or part of a week during which the delivery of such stores may be in arrears limited to 10% (Ten Percent) of the total contract value, or

(b) To purchase elsewhere after due notice to the successful tenderer on the account and at the risk of the defaulting supplier, the equipment / stores not supplied or others of similar description without cancelling the supply order in respect of the consignment not yet due for supply, or
(c) To cancel the supply order or a portion thereof, and if so desired to purchase the equipment / stores at the risk and cost of the defaulting supplier and also,
(d) To extend the period of delivery with or without penalty as may be considered fit and proper. The penalty, if imposed, shall not be more than the agreed liquidated damages referred to in clause (a) above.
(e) To forfeit the security deposit fully or in part.
(f) Whenever under this contract any sum of money is recoverable from and payable by the supplier, the Purchaser shall be entitled to recover such sum by appropriating in part or in whole by deducting any sum or which at any time thereafter may become due to the successful tenderer in this or any other contract. Should this sum be not sufficient to recover the full amount recoverable, the successful tenderer shall pay the Purchaser on demand the remaining balance. The supplier shall not be entitled to any gain on any such purchase.

(ii) Compensation for not achieving guaranteed Availability:-

In the event that Equipment fails to achieve the Availability herein provided, measured over each twelve (12) month period, the Supplier shall be liable for and pay to the Purchaser, as liquidated damages, a sum equal to as indicated hereunder for each equipment against the PBG submitted by the bidder as per clause-2 of SCC

a. 1% of the delivered landed price of the equipment including the price of spares & consumables for 60 months period for reduction in every percentage or part thereof from the Guaranteed Availability for the first 5%.

b. 10% of the delivered landed price of the equipment including the price of spares & consumables 60 months period for reduction beyond 5% from the guaranteed availability.

(iii) LIQUIDATED DAMAGES CHARGES ON ERECTION & COMMISSIONING:

The supplier shall be responsible for the delivery, erection, commissioning and testing of each equipment as detailed in the Schedule of Requirements and the Technical Specifications.
If the supplier fails to commission the equipment within the specified period as incorporated in the NIT, Liquidated damages will be recovered @ 0.5% of the landed price of the equipment along with accessories per week or part thereof for the delayed period subject to a maximum of 10% of the landed price of equipment along with accessories including erection and commissioning charges.

10.CONSIGNEE:

The equipment allocated to the Areas as follows which is subject to change as per the requirement:

Sl	Name of the Area	Qty. (Nos.)	CONSIGNEE
1	Barora Area	02	Depot Officer, Regional Store, Barora Area, BCCL, P.O. Nawagarh, Dhanbad, Pin code-828306.
3	Govindpur	04	Depot Officer, Regional Store, Sinidih, Govindpur, Area-3, BCCL, Post- Tundu, Dhanbad, Pincode-828128.
5	Bastacolla	02	Depot Officer, Regional Stores, Bastacolla Area, Dhanbad Pin 828106
6	CV	05	Depot Officer, Regional Stores, CV Area, Lakdhi PO Chirkunda, Pin-828202
	Total	13	

11. PAYING AUTHORITY: The HOD (Finance) MM, Purchase Finance ,Koyla Bhawan:Koyla Nagar,Dhanbad

13. SECURITY DEPOSIT: Exempted being a PSU under the Ministry of Defence; Govt of India.

14. COMPOSITE GUARANTEE/WARRANTY: As indicated in Technical Specification (ANNEXURE-A)

15. PERFORMANCE GUARANTEE:

In accordance with the provisions of clause C 6.2.6 of the technical specifications the expected working hours per annum are 4000 (four thousand) hours. The expected working hours per annum as indicated are only approximate hours and may vary +/- 500 hours.

In accordance with the provisions of clauses C 7.2.2 and C 7.3.2 of the technical specifications the supplier shall guarantee that the availability of each equipment shall be not less than 85% (eighty-five percent) annually for a period of 36 months from the date of accepted date of commissioning and 80% (eighty percent) annually for following 24 months.

[Note - Expected annual working hours may be decided by the subsidiary company as per actual requirement]

BEML Ltd shall be required to furnish a Performance Guarantee equivalent to 10% value of the total landed value of the contract including all taxes, duties and other costs and charges subsidiary wise. The PBG will be required to be submitted to Paying Authority of BCCL. The performance guarantee shall be submitted in the form of a Bank Guarantee issued by a scheduled bank in the format Attached as ANNEXURE-G.

The PBG(s) shall remain valid till 3 months after the completion of 60 months period from the date of commissioning of respective equipment covered in the contract and the same shall either be released or extended depending upon the merit of the case. This Performance Guarantee shall be for the performance of the Contract /Supply Order.

The release of the Performance Bank Guarantee(s) after above indicated period shall be subject to satisfactory performance of the equipment during 60 months period from the date of commissioning of the equipment and fulfilment of contractual obligations failing which, action for further extension or encashment of PBG, as deemed suitable shall be taken. Release of PBG for each equipment may be done separately on satisfactory performance of the respective equipment as above.

The Bank Guarantee issued by the Bank on behalf of BEML Ltd in favor of" BHARAT COKING COAL LIMITED" shall be in paper form as well as issued under "Structural Financial Messaging System". The detail of beneficiary for issue of BG under SFMS platform is furnished below.

Name of beneficiary & its details	Name	Bharat Coking Coal Limited
	Area	HQ,BCCL
	Bank Account No	35160317947
	Deptt	MM Department
Beneficiary Bank Branch &Address	State Bank of India	
	Main Branch Dhanbad	
IFSC Code	SBIN0000066	

Or

Name of beneficiary & its details	Name	Bharat Coking Coal Limited
	Area	HQ,BCCL
	Bank Account No	35160317947
	Deptt	MM Department
Beneficiary Bank Branch &Address	ICICI Bank	
	ICICI Bank Dhanbad	
IFSC Code	ICIC0000196	

The PBG issued by Issuing bank on behalf of BEML Ltd in favour of"Bharat Coking Coal Limited" shall be in paper form (Stamp Paper) as well as issued under "Structured Financial Messaging System".

Original copy of the PBG issued by the Issuing Bank shall be sent by the issuing bank to BCCL.

The Performance Bank Guarantee (s) may be submitted equipment wise to BCCL. Total value of Performance Bank Guarantee is Rs. 5,72,38,755.59 Or Rs. 44,02,981.20 per Equipment.

16. INTEGRITY PACT: The Integrity Pact document has been signed by you and the same is deemed to have been signed by BCCL authorities.

17. PRICE FALL CLAUSE –

The Bidder undertakes in CPS that it has not offered to supply/ supplied/ is not supplying same or similar product/ systems or sub systems at a price lower than that offered in the present bid in respect of any Organization/ Ministry/ Department of the Govt. of India or Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization during the currency of the contract and if it is found at any stage that same or similar product/ systems or sub systems was supplied by the bidder to any Organization/ Ministry / Department of the Govt. of India or Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization at a lower price during the currency of the contract, then that very price will be applicable to the present case and the difference in the cost would be refunded by the bidder to buyer, if the contract has already been concluded.

(i) The currency of contract will mean the period till completion of supply.

(ii) The bidder will be asked to submit a copy of the last (latest) purchase order for the similar/ordered item(s) received by them from any Organization / Ministry / Department of the Govt. of India Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization, along with the offer.

Bidder may opt to mask the price portion and submit an undertaking that price copy will be submitted on being L-1 on opening of price bid/ reverse auction.

(iii) It shall be responsibility of the supplier to inform the purchaser of offer to supply /supply of the similar/ordered item(s) at a lower rate to any Organization / Ministry / Department of the Govt. of India or Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization during the currency of the contract.

(iv)The supplier shall submit a certificate along with the bill(s) that it has not offered to supply/ supplied the similar/ordered item(s) at a lower rate to any Organization/ Ministry/ Department of the Govt. of India or Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization.

18. INSPECTION AND TESTS:

Inspection and Tests shall be as per Clause 8 of the GCC and details of specific inspections and/or tests to be carried out at the Supplier's works and/or at the Site(s) are given in Section VI, Technical Specifications. However, Pre Dispatch Inspection will be done by GM(Excavation)/HOD , BCCL or its Authorized representative.

19. FORCE MAJEURE CLAUSE:

I. Force Majeure means an event beyond the control of the supplier and not involving the supplier's fault or negligence and which is not foreseeable. Such events may include, but are not restricted to, acts of the purchaser either in its sovereign or contractual capacity, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, freight embargoes and act of God.

II. If there is delay in performance or other failures by the supplier to perform its obligation under the contract due to an event of a Force Majeure and the contract is governed by Force Majeure Clause, the supplier shall not be held responsible for such delays / failures.

III. In such a situation, the supplier shall promptly notify the purchaser in writing of such conditions and the cause thereof, duly certified by the local Chamber of Commerce or Statutory authorities, the beginning and end of the causes of the delay, within twenty-one days of occurrence and cessation of such Force Majeure Conditions. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

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20. SUBMISSION OF BILLS:

(a)Submission of Documents for Payment in Indian Rupees for equipment

For payment for equipment in Indian Rupees, the supplier will submit the following documents along with bills to the paying authority:

a. Four copies of the Supplier's invoice, Pre-Receipted and Stamped showing Contract Number, Goods description, quantity, unit price, total amount and GST No. of Ultimate Consignee.
b. Receipted Challan/ Consignment Note of all the consignments.
c. Manufacturer's Test & Inspection Certificate.
d. Manufacturer's Warranty /Guarantee Certificate.
e. Lowest Price Certificate as per SCC clause -8.2
f. Copy of Performance Bank Guarantee as per Clause –2, SCC, Sec-IV.
g. Documentary evidence for freight and transit insurance charges up to the destination.
h. Copy of Certificate of Insurance.
i. Any other document(s) required as per contract.

(b) Submission of Documents for Payment in Indian Rupees for spares and consumables as per scope of supply:

For payment for Spares and consumables in Indian Rupees, the supplier will submit the following documents along with bills to the paying authority:

a. Four copies of the Supplier's invoice, Pre-Receipted and Stamped showing Contract Number, Goods description, quantity, unit price, total amount and GST No. of Ultimate Consignee.
b. Receipted Challan/ Consignment Note of all the consignments.
c. Lowest Price Certificate as per SCC clause -8.2.
d. Any other document(s) required as per contract.

21. Risk Purchase

a) In the event of failure of the supplier to deliver or dispatch the stores within the stipulated date/period of the supply order or in the event of breach of any of the terms and conditions mentioned in the supply order/ contract, BCCL shall have the right to purchase the stores from elsewhere after due notice to the defaulting supplier at the risk and cost of the defaulting supplier.

The cost as per risk purchase exercise may be recovered from the Earnest Money Deposit/ Security Deposit/ Performance Security of the supplier and/or bills submitted by the supplier against the same contract or any other contract pending in the BCCL and/or in any other Subsidiary Companies / CIL.

b) Risk purchase action may be initiated as a last resort, under any of the following conditions:

I. When the supplier fails to deliver the materials even after extending the delivery period.
II. (When the supplier fails to respond to purchaser's request for supply of the materials and fails to provide any genuine and bonafide reason for the delay in supply.
III. When the supplier breaches any of the terms and conditions of the supply order/ contract and as a result fails to execute the order satisfactorily.

22. GENERAL TERMS AND CONDITIONS: Unless otherwise specified in the purchase order, the Purchase order shall be subject to the General Terms and Conditions of Supply of Stores given as ANNEXURE –D. In case there is a conflict in any particular term of the NIT with the General Terms, the terms of the NIT will prevail.

23. JURISDICTION: Any dispute arising out of this enquiry shall come under the sole jurisdiction of the Dhanbad/Jharkhand High Court, (INDIA).

All Other Terms & Conditions shall be as per NIT & as per BEML techno-commercial accepted offer.

Two copies of the order is being sent to BEML. BEML is advised to acknowledge the receipt and acceptance of the order by returning one copy duly signed and stamped to this office positively within 15 days, failing which this order shall be deemed to have been accepted by BEML for execution.

Enclosures:

SL	ANNEXURE	DESCRIPTION
1	ANNEXURE - A	Technical Specifications Comprising Section - Schedule Of Requirement; Parts I,II, Schedule Of Requirements Of Service , Technical Specifications Preface - Scope Of Supply , Specific Project Requirements, General Requirement, Equipment Specification
2	ANNEXURE - B	List Of Warranty Spares & Spare Parts And Consumables For 5 (1+4) years
3	ANNEXURE - C	Quality Assurance Plan
4	ANNEXURE - D	GCC & SCC
5	ANNEXURE - E	Technical Parameters Sheet (TPS)
6	ANNEXURE - F	Tool List
7	ANNEXURE - G	Performa Of Performance Bank Guarantee
8	ANNEXURE - H	Leaflet of Offered Machine
9	ANNEXURE - I	Engine Performance Curves
10	ANNEXURE - J	Technical Description & Other offered details
11	ANNEXURE - K	List of Major Bought Out Items
12	ANNEXURE - L	Major Depot/Warehouse & Service facility
13	ANNEXURE - M	Erection & Commissioning Program
14	ANNEXURE - N	Maintenance Schedule
15	ANNEXURE - O	Authorization For E Payment
16	ANNEXURE-P	Pre Integrity Pact

INDENT & BUDGET CERTIFICATION REFERENCE:

Area Indent ref no. and Date			Budget Reference
Sl	Area/ Colliery	Indent no	SAP PR no. 1300029418 dtd 26.04.2022
1	Barora/APMC	GM(Ar-I/AM(X)/ 22-23/08 dtd 15.04.22	
2	Govindpur/NAKC OCP	NAKC/Store/22-23/11 dtd 14.04.22	
3	Bastacolla/ Kuya OCP	BCCL/CAP/IX/RS/2022-23/0 dtd 16.04.22	
4	CV / DBOCP	CV/Excv/22-23/08 dtd 15.04.22	
IR No. 422011 dtd 24.05.22			

Yours faithfully,
For & on behalf of Bharat Coking Coal Limited

16/11/22
(Alok Kumar)
Manager(MM

16/11/22
(A.K.Sinha)
Chief Manager (MM)

***Note**: - This is issued with the approval of competent Authority as communicated by Company Secretary vide note sheet no. 9164 dated 15.11.2022. This order is placed against the consolidated indent Ref no. Indent/HEMM Capital/60T Dumper /22-23/206 dated 27.04.2022 of GM (Excavation)/HOD, Excavation Department, BCCL HQ.*

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Copy to:

1. GM(Excv) HOD, Koyla Bhawan: Koyla Nagar, Dhanbad
2. The HOD (Finance) MM, Koyla Bhawan: Koyla Nagar, Dhanbad
3. The GM(Areas), Barora/Govindpur/Bastacolla/CV Area , BCCL
4. GM/HOD(MM), ECL/CCL/WCL/SECL/NCL/MCL
5. M/s BEML Limited, GT Road , Kandra ,PO-Bhitia GOVINDPUR, DHANBAD, JHARKHAND - 828109
6. The Depot Officer ,Regional Store , Barora/Govindpur/Bastacolla/CV Area , BCCL
7. Company Secretary , Koyla Bhawan, BCCL
8. Tech-cell, MM Division, Koyla Bhawan: Koyla Nagar, Dhanbad
9. **The Independent External Monitor for Integrity Pact** :-

   i. Sri Madusudan Prasad , IAS (Retd.) Address: M-l l, Green Park Main , New Delhi-110016

   ii. Shri Gautam Sen , IDAS (Retd.) Address: Flat no.I-081, Vendanta , Gurugram , Sector-108, Haryana-122001

Annexure-A

Section-I-Schedule of requirements

Part I

S. No	Brief Description of Goods & Services	Quantity	Expected Delivery Schedule at Site
1	60 US Ton (55 metric ton approx) Rear Dumper	13 no's	08 No's Dumpers to be supplied within 6 months from the date of receipt of purchase order and balance 5 nos Dumpers to be supplied in 7th month from the date of receipt of purchase order. However early supply will be appreciated. Hence, total delivery period shall be 7 months from date of supply order.
2	Ancillary Equipment and other requirements for each of Item 1 as specified in Technical Specifications included in Section VI Attachments	In accordance with item 1	Delivery to be made along with the machine.

The equipment allocated to the mine projects are as follows which is subject to change as per the requirement of purchaser:

Sl No.	Area/Project	Company	Total Requirement	
			Under NCD	Under PCD
1.	Barora Area	BCCL	02 No's	-
2.	Govindpur Area	do	04 No's	-
3.	Bastacolla Area	do	02 No's	-
4.	CV Area	do	05 No's	-
	TOTAL		**13 No's**	**NIL**

Part II

S.No	Brief Description of Services	Period/Quantum
1	Training of Purchaser's Personnel at the manufacturer's works or elsewhere outside India.	Please refer to Schedule of Requirements of Services later in this Section and to the Technical Specifications (Section VI).
2	Training of Purchaser's Personnel on Site.	Please refer to Schedule of Requirements of Services later in this Section and to the Technical Specifications (Section VI).
3	Assembly and erection of equipment at Site in accordance with the Technical Specification and Conditions of Contract.	To be specified by the Bidder to comply with the Technical Specifications (Section VI) and the terms and Conditions of Contract.

Note: 1. Price for the equipment along with accessories should be quoted with Normal Custom Duty (NCD) for 13 no's. and Project Concessional Duty (PCD) for zero nos. applicable for the imported contents.

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Schedule of Requirements of Services

The Supplier's scope of the Contract will include the following -

I. Type test on each equipment included in the technical specification and offered in the bid.

II. Providing Services of Supplier's qualified engineer(s)/personnel for:
   A. unloading, transportation to site, storage at site and/or
   B. Transportation from storage to erection site, installation, testing and commissioning.

III. Training of Purchaser's Personnel: Training of Purchasers personnel to be confirmed by the bidder in respect of training to be provided at manufacturer's works or at our site in the following format :

Type of Personnel	***At Manufacturer's Works***					***At Site***				
	No	***Period***		***Total***		***No***	***Period***		***Total***	
Mech Engineer			*weeks*		*weeks*			*Week*		*Week*
Elec Engineer			*weeks*		*weeks*			*Week*		*Week*
Mech Supervisor			*weeks*		*weeks*			*Week*		*Week*
Elec Supervisor			*weeks*		*weeks*			*Week*		*Week*
Mech Fitter								*Week*		*Week*
Electrician								*Week*		*Week*
Operator								*Week*		*Week*
Total			***weeks***		*weeks*					***weeks***

Definitions:

Mech/Elect Engineer- Graduate Engineer having basic knowledge of the equipment

Elect/Mech Supervisor - Diploma Holder Engineer having basic knowledge of the equipment

Mech Fitters/Electricians/Operators - Un-skilled, semi-skilled and skilled.

Section-II - Technical Specifications
Preface - Instructions to Bidders

Introduction

These Technical Specifications identify the technical requirements of the Goods and Services which are the subject of this tender.
The Technical Specifications are presented in four parts as follows:

A. Scope of Supply
B. Specific Project Requirements
C. General Requirements
    1) Geography and Climatic Conditions
    2) Goods (Equipment and Machinery)
    3) Services
    4) Standards
    5) Supplier's Responsibility
    6) Spare Parts Provisions
    7) Availability Provisions
    8) Deemed Breakdown
    9) Composite Warranty / Guarantee
    10) Quality Assurance
D. Equipment Specifications

Technical Response

Bidders shall provide a Clause by Clause commentary demonstrating compliance with the Purchaser's Technical Specifications, together with full supporting technical literature and data sheets.

Wherever graphical representation of data (e.g., load, power, performance curve) is required, the grid axis and data shall be properly and clearly labeled for ready comprehension.
Additionally, Bidders shall provide the information specifically requested in the Attachment to the Technical Specifications.

Failure to demonstrate compliance in all respects with the requirements of the Technical Specifications may render the bid non-responsive.

Failure to provide any information requested in any part of this specification may deem the bid non-responsive.

Site Visits

The Bidder prior to making any Bid calculation and as part of the preparation of its Bid, shall be deemed to have visited and inspected the Site(s), made all enquiries and collected all information documentary or otherwise, including climatic conditions, as considered necessary by the Bidder for the proper and accurate preparation of its bid.

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A Bidder may visit the Site(s) by prior appointment with the purchaser. The number of Bidder's representatives permitted to make visits to the Site(s) shall be limited to a maximum of two.

Bidders wishing to make appointments for Site Visits should do so in writing or by facsimile directly with BCCL and concerned officer as detailed in the following schedule. Copies of all such communications should be sent to:

General Manager (MM)
Bharat Coking Coal Limited
KoylaBhawan, Koyla Nagar
Commercial Building (Level-III)
Dhanbad-826005 (Jharkhand), India,
Fax- 91 (0) 326 2230183

Company	Project
Bharat Coking Coal Limited **KoylaBhawan, Koyla Nagar** **Commercial Building (Level-III)** **Dhanbad-826005,** **Fax- 91 (0) 326 2230177** **Tel- 91 (0) 326 2230177** **Attention: General Manager (Excv)**	**All Projects**

Part A

Scope of Supply

A.1 Equipment Package

The Supplier is required to provide a complete package of equipment for the supply of 60 T Rear Dumper to opencast (surface) coal mining projects as per the Technical Specifications provided in Part D.

The supplier is required to supply the equipment along with accessories, consumables, training, installation, commissioning and testing at the coal mining project.

The package also includes Consumable Spares and Consumables for 12 months of warranty period from the date of commissioning of the equipment and thereafter Spares & Consumables for a period of 48 months.

The Scope and Phasing of supply for the 60 T Rear Dumper is given in **'Schedule of Requirement'.**

A.2 Supplementary Items

The equipment shall be provided with a comprehensive tool kit which shall include any special tools required for erection and commissioning of equipment. First fill of all oils, greases and lubricants needed for test, erection and commissioning of equipment.

A.3 Information and Drawings

At least one month before the scheduled installation date, the Supplier shall provide not less than:

(a) Suitably illustrated copies of Operating, Repair and Maintenance Manuals for each type/model of equipment and accessories, written in English language, substantially bound in book form;

Three (3) copies to each project site; and

One (1) copy each along with soft copy to the concerned Project In-charge, Area Manager / Staff officer (Excv), General Manager (Excv.)/HOD, Subsidiary Hqrs. and General Manager (MM)/HOD, subsidiary Hqrs.

(b) Suitably illustrated copies of detailed Spares Parts Manuals for each type/model of equipment and accessories, written in English language, substantially bound in book form;

Three (3) copies to each project site; and

One (1) copy each along with soft copy to the Project In-charge, Area Manager / Staff officer (Excv), General Manager (Excv.)/HOD, Subsidiary Hqrs. and General Manager (MM)/HOD, subsidiary Hqrs.

In addition to the Equipment drawings, where appropriate the Supplier shall supply detailed drawings (in the same number of copies) illustrating erection/assembly site(s), foundation and accommodation requirements for such items as drive motors, switch installations etc.

A.4 Erection/Assembly, Commissioning and Performance Testing:

The Supplier shall provide the Services of Specialist Technicians (refer Part – C.3) and required manpower (skilled/semi-skilled/unskilled) to undertake the installation/erection/assembly, commissioning and any performance testing of the plant, Equipment and accessories supplied. The purchaser will assist in providing necessary facilities like erection tools and tackles (supplied along with the equipment), cranes with operator and electricity during erection and commissioning.

The technicians shall remain at site following commissioning until all necessary personnel are fully conversant with the maintenance and operation of the equipment.

The Equipment shall be commissioned at site within 30 days of receipt of last consignment of each Equipment.

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A.5 Training:

I. The supplier in consultation with the project in-charge / HOD [Excavation] of the respective site shall make available experienced personnel to conduct training of engineers, supervisors, technicians and operation personnel for specified period as mentioned in table given in 'Schedule of Requirement of Services' from the date of issue of acceptance certificate of the equipment. The training shall cover the following:

a) Training on simulator module by the bidder at their works/suitable location in India/suitable end user's location is preferable.

b) Equipment system, safety and risk assessment.

c) Equipment operation and maintenance.

d) Trouble shooting, localization of fault and their remedies covering:

1. Electrical and electronics
2. Mechanical
3. Hydraulic system
4. Lubrication system
5. Pneumatic system etc.

Comprehensive training manuals with clear illustration shall be provided to each participant in English language. The training courses shall be conducted in both English and Hindi language.

Details of purchaser's estimates of the minimum training programme required for total number of equipment is described in Sec-V.

Note: - The training shall be completed in batches within warranty period from the date of commissioning of first equipment in the respective project.

IV. Provision of additional training within the contract period after completion of warranty period.

i. The bidder shall give confirmation in their bid to impart training to the BCCL personnel, in addition to the contractual training provision, after completion of warranty period but at any time within the contract period.

ii. The additional training will be as per requirement of the user and shall cover the training scope same as per the mandatory training (within warranty period) of the contract.

iii. The training will be on chargeable basis and additional payment to the supplier will be made at the same rates which have been indicated for mandatory training.

Part B

Specific Site Requirements

B.1 Project Specific Requirements

The equipment shall be suitable for use at the specific site projects under the conditions detailed below.

B.1.1 Opencast Projects

All the Opencast Project are owned by the Bharat Coking Coal Limited, a wholly owned subsidiary of Coal India Limited (the "Purchaser"). The mine is located partly in the Dhanbad District of Jharkhand approximately 30 Km from Dhanbad railway station.

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Part C
General Requirements

C.1 Geography and Climatic Conditions

Elevation: -

The natural surface varies from 100 to 1000 m above mean sea level.

Climate: -

The climate is sub-tropical to tropical, dusty, with a hot and humid atmosphere. Monsoon rains occur in the period from June to October.

Ambient Conditions: -

Relative Humidity - Maximum 98%

Temperature - Minimum 0° C

Maximum 50° C

Rainfall: - The mean annual rainfall is 1,000mm, 90 to 95 % of which may fall in rainy season from June to October.

Wind: - April to September - South to South Westerly

October to March - North Westerly

Speed: -- 8 km per hr. average

- 100 km per hr. maximum

C.2 Goods (Equipment and Machinery)

Detailed specifications of the Equipment to be supplied are given in **Part D** of this section.

In general, all items shall be:

Designed and constructed to handle without overload and for the working hours stated, the maximum volumes/rates specified;

Designed to facilitate ready access, cleaning, inspection, maintenance and repair of component parts;

Designed to facilitate rapid changeover of consumable items.

The component parts of all items shall, wherever possible, be selected from the standard ranges of reputable manufacturers.

The Equipment and accessories shall be physically robust and where necessary capable of dismantling for transportation and ready re-assembly using simple tools. All Equipment items provided shall be designed to be compatible within the proposed overall Scope of Supply.

Electrical Equipment shall provide all protection devices, controls and interfaces for the Equipment to operate safely and efficiently.

All workmanship and materials shall be of first-class quality in every respect.

All parts and surfaces, which are exposed to corrosive environment, shall be suitably protected to prevent any effects of corrosion or erosion.

C.3 Services

The supplier shall be responsible for the erection and commissioning of the equipment at site. The supplier shall depute qualified and competent Engineer(s) and specialist technicians to supervise the entire assembly, erection and commissioning of equipment free of cost.

C.4 Standards

The design, supply, erection, testing and commissioning of all Equipment under this Contract shall in all respects comply with the requirement of this specification and with the appropriate current Indian standards and codes, or relevant Standards issued by the Bureau of Indian Standard or International Standards Organization or any other equivalent international standards, which corresponds to specific ISO/Indian standards indicated in the technical specification.

Such equivalent international standards are to be supported by documentary evidence certifying that offered standards are identical to the corresponding ISO/Indian standards.

The equipment shall comply with requirements of the statutory government authorities, including Director General of Mines Safety (DGMS) having jurisdiction over the equipment and its use.

The system of units for all measurements shall be the **System of InternationalUnites (S.I.)**

C.5 Suppliers Responsibility

The Purchaser requires that the Supplier shall accept responsibility for the provision of complete operable and compatible Equipment and systems within the Scope of Supply. This document identifies only the major items required for the installation and the Supplier shall ensure that the total supply includes all necessary Equipment for it to function effectively, safely and efficiently. Any additional items the Supplier considers necessary to ensure compliance with such a requirement shall be identified and included.

If the Supplier observes that this Specification document contains any anomalies, ambiguities, flaws, errors or omissions, the Supplier shall immediately bring these to the attention of the Purchaser but not later than 15 days prior to the due date of opening.

The Supplier shall be responsible for the testing and commissioning of the Equipment and ensure that it meets the requirements as specified. The commissioning and setting to work of the whole Equipment Supply package shall be carried out under the supervision of the Supplier in conjunction with the Purchaser's nominated personnel

C.6 Spare Parts Provisions

C.6.1.a. Availability of Spare Parts

All items and Equipment proposed shall be of current design and manufacture. The Supplier shall warrant that sufficient spares and servicing facilities will be available to maintain the Equipment in use throughout its life.

C.6.1.b Bought-out assemblies and sub-assemblies

The supplier is required to furnish the details of all Major bought-out items as indicated in the technical specification against "Information to be provided by the bidder".

C.6.2 Provision of Spare Parts

C.6.2.1 Within the Contract Price, the Purchaser shall agree to purchase all Operational, maintenance and standby/contingency spare parts, consumable items, wear materials, maintenance tools and special tools (hereinafter collectively referred to as "Spare Parts", unless the context requires otherwise) in accordance with the Supplier's recommendations for 60 months from the date of issue of the Commissioning Certificate. Similarly, within the Contract Price, the Purchaser shall also agree to purchase consumable items (hereinafter referred to as "Consumables") in accordance with the Supplier's recommendations for 60 months from the date of issue of the Commissioning Certificate. The schedule of supply of spares and consumables shall as indicate in Schedule of Requirement, Section-V. In addition, the Supplier shall provide Spare Parts and Consumables for Commissioning.

Consumables shall include items such as oils, lubricants and fluids also. *Tyres and trailing cable are not included in consumables.*

The supplier shall submit *Five (5)* separate schedules for every year showing spare parts and consumables proposed to be supplied by them in each 12 (twelve) months period from the date of commissioning of equipment project-wise in order to comply with the provisions herein contained.

C.6.2.2 In the event that the spare parts and consumables, as recommended by the Supplier, in any way fall short of actual requirements during the period for which they are said to be adequate, the supplier shall provide such additional spare parts and consumables as are necessary at the final destination. Such additional spare parts and consumables shall be provided by the Supplier to the Purchaser free of all cost and shall be transported to Site by air freight internationally and by air, rail or fast road transport within India.

C.6.2.3 In the event that the spare parts, Insurance items and consumables, as recommended by the Supplier, are in excess of actual requirements. The Purchaser may at its option.

a) Retain such excess spare parts and consumables as, in its discretion it may elect to do so

b) Require the Supplier to repossess or repatriate or otherwise dispose of such excess spare parts and consumables in exchange for payment to the Purchaser of the Contract Price of the spare parts and Consumables concerned.

The Purchaser shall notify the Supplier, in writing of its requirements under this Clause within thirty (30) days of completion of the period referred to in Clause C.6.2.1 hereof.

C.6.2.4. In the event that operation of the Plant is inhibited or frustrated as a direct result of lack of spare parts and consumables, pursuant to Clause C.6.2.2 hereof, then the period referred to in Clause C.6.2.1 hereof shall be extended by a period of not less than the period during which operation as aforesaid was inhibited or frustrated.

C.6.2.5. The supplier shall not be liable for the supply of additional spare parts and consumables, nor to extend the period referred to in Clause C.6.2.1 hereof, if and to the extent that, additional Spare Parts and Consumables are required by reason of unforeseen accidents, negligence or misuse on the part of the Purchaser.

C.6.2.6 The assessment of the Supplier of the spare parts requirements shall be based upon the expected working hours per year as defined in the individual Equipment Specifications included in the Technical Specifications.

C.6.3. **Emergency Spare Parts**

C.6.3.1. Emergency spare parts required by the Purchaser to repair breakdowns shall be dispatched to the site by the Supplier by the fastest, practicable means as directed from time to time by the Purchaser.

C.6.3.2. For the purpose of Clause C.6.2.6, "Emergency Spare Parts" shall mean those spare parts or components required by the Purchaser to repair any item of Plant supplied pursuant to the Contract in the event of a breakdown not attributable to a failure covered by guarantee or a failure of the Supplier to provide adequate Spare Parts or Consumables.

C.6.3.3 Payment in respect of the supply and delivery of such Emergency Spare Parts shall be made promptly, retrospectively, by the Purchaser, in a manner consistent with the terms of payment described in the contract.

C.6.3.4 **Lifetime Spare Parts**

The Supplier undertakes and guarantees to produce and maintain stocks, to be available for purchase by the Purchaser under separate agreement, of all Spare Parts and Consumables as may be required for maintenance and repair of the Plant throughout its working life. In the event that the Supplier wishes to terminate production of such Spare Parts, the Supplier shall:

(a) give not less than six months' notice in writing of its intention to terminate production in order to permit the Purchaser reasonable time in which to procure needed requirements; and

(b) immediately following termination, provide to the Purchaser at no cost, manufacturing drawings, material specifications and all necessary permissions to facilitate manufacture of the Spare Parts elsewhere.

(c) any change in part number or superseded part number should be informed to the HOD of Excavation department / MM department of of BCCL hqrs. and the project site wherever the equipment is operating.

In any event, the Supplier shall not seek to terminate manufacture of spare parts for period of not less than (15) years from taking over or the life time of the equipment whichever is later.

C.6.4 Oils, Lubricants and Fluids

The Supplier shall provide to the Purchaser a detailed schedule of all necessary oils, lubricants, fluids for the operation and maintenance of Equipment. The schedule shall indicate estimated annual consumption and specify the appropriate international standard number or the name and reference number of an equivalent available in India considered to be acceptable by the Supplier.

C.6.5 General

C.6.5.1 Nothing in this Clause C.6 shall relieve the Supplier of any Guarantee, Availability, Performance or other obligations or liabilities under this Contract.

C 7 Guaranteed Availability

The Guaranteed availability shall be as per 'Clause – Performance Guarantee' of the individual equipment specification.

C.7.1 Introduction

C.7.1.1 The Supplier shall guarantee that the Equipment supplied pursuant to this Contract shall be available for use by the Purchaser and shall meet the performance criteria specifications at the level and in accordance with the terms and conditions of the Availability Guarantee herein contained.

C7.1.2 Where Equipment supplied under the Contract fails to meet the criteria of the Availability Guarantee, the Supplier shall, at its own cost, provide suitably qualified and experienced personnel at Site to demonstrate to the Purchaser's satisfaction that the required level of availability can be achieved and maintained.

C.7.1.3 The Supplier shall provide the Services of such personnel at Site within seven (7) days of notification by the Purchaser that the availability criteria have not been met in any one (1) month.

C.7.2 Guarantee

C.7.2.1 The Supplier shall guarantee that the Equipment supplied pursuant to the Contract shall be available to the Purchaser at the level hereinafter defined to perform to criteria of not less than that defined in the Technical Specifications incorporated in the Contract.

C.7.2.2 The Supplier shall guarantee that the Equipment shall be available to perform its duty to minimum criteria and to the minimum availability percentage level as defined in the individual Equipment specifications included in the Technical Specifications.

The method of assessment applied shall be as follows:

Method of Assessment:

The following calculation shall determine the availability of the Equipment:

$$\%\,\text{Availability} = \frac{\text{Scheduled Available Time - Downtime}}{\text{Scheduled Available Time}} \times 100$$

Scheduled Available Time shall equate to 24 hours daily.

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Downtime: -

Downtime shall mean all hours of work lost due to mechanical, electrical or other failure, including:

a) routine servicing and maintenance in accordance with the manufacturer's published recommendations, including:
changing oils, oil filters and air filters; lubrication; changing identified consumable or wear parts.

b) planned preventative maintenance programs;

It shall not however include:

I. damage due to abusive use or incorrect operation methods by the purchaser;
II. accidents;
III.strikes or stoppage of work by the Purchaser's personnel;
IV.natural disaster;
V. lack of Spare Parts not attributable to a failure of the Supplier, it's Agents or Representatives.

Downtime shall also specifically include all hours lost due to failures determined to be guarantee failures.

The Supplier shall provide a schedule of maintenance required to carry out (a) and (b) above for the first *Five (5)* years of operation and shall state the number of hours required to carry out each maintenance task. The time stated shall, with the agreement of the Purchaser, form the basis of the assessment of the availability.

This schedule of tasks and time will be reviewed periodically by the Purchaser and the Supplier, jointly, to monitor the practicality of the schedule.

The Purchaser will assist the Supplier, without relieving the Supplier of any other obligations under the Contract, to achieve the guaranteed availability by:

1. Providing normal and proper maintenance, including preventative maintenance in accordance with the Supplier's standard/published recommendations, and making all necessary repairs using only spare parts provided by the Supplier in accordance with the requirements specified in part C6.
2. Providing co-operation to all Suppliers' authorized representatives, complying with all reasonable procedural suggestions to improve efficiency of machine operation or reduce downtime.
3. Where appropriate, providing and maintaining such conditions as:
   - Proper Electrical Supply
   - Terrain Area
   - Bench Preparation
   - Reasonable Floor Conditions
4. Providing all Suppliers' authorized representatives access at all reasonable times to the machine service and repair facilities.

Maintaining a logbook for each shift wherein the working hours, breakdown hours, maintenance hours, idle hours, etc. shall be recorded. This record will be available for examination and signature by the Supplier's representative.

C.7.3 Effect and Duration of Guarantee

C.7.3.1 This Guarantee shall become effective on the day on which the Equipment is commissioned at the Site. Commissioning shall be evidenced by the issue of the Purchaser's Acceptance Certificate.

C.7.3.2 This guarantee shall remain effective for 60 Months from the date of commissioning irrespective of the hours operated by the Equipment during the period of the guarantee.

C.7.3.3 Compensation for not achieving Guaranteed Availability

In the event that Equipment fails to achieve the Availability herein provided, measured over each twelve (12) month period, the Supplier shall be liable for and pay to the Purchaser, as liquidated damages, a sum equal to as indicated hereunder for each equipment against the PBG submitted by the bidder as per clause-2 of SCC

a. 1% of the delivered landed price of the equipment including the price of spares & consumables for 60 months period for reduction in every percentage or part thereof from the Guaranteed Availability for the first 5%.
b. 10% of the delivered landed price of the equipment including the price of spares & consumables 60 months period for reduction beyond 5% from the guaranteed availability.

C.8 Deemed Breakdown

When the supplier is unable to supply the replacement of a failed part during the contract period, and if the machine is commissioned by using the spares from the stock of the project, the period after 21 days till the supplier replaces the part shall be treated as 'deemed breakdown' (the credit for keeping machine available shall not be given to the supplier.)

The supplier shall not in any way be allowed to take out spare parts from other equipment, which are under breakdown and covered within the scope of this contract. However, BCCL, in the interest of work, reserves the right to advise the supplier to commission the breakdown equipment covered under this contract by taking out spare parts from other breakdown equipment. Nevertheless, during this period also, the equipment shall be treated as 'deemed breakdown' till the supplier replaces the spare parts.

C.9 Composite-warranty/guarantee

The supplier shall warrant that the equipment supplied under this contract is:

a) In accordance with the contract specifications.
b) The equipment shall have no defects arising out of design, material or workmanship & the complete equipment shall be warranted for 12 months from the date of commissioning. Any defect arising observed on this account will have to be attended immediately.
c) The supplier must ensure that there is no major breakdown due to manufacturing / design defects during the warranty period. In case such breakdown occurs, the purchaser reserves the right to extend the warranty period suitably.

The warranty shall cover for total equipment so that comprehensive responsibility lies only with the equipment supplier although components may be supplied by different suppliers to the bidder.

C.10 Quality Assurance

C.10.1 The Supplier should furnish in detail its quality assurance plan for various stages of manufacture. The Quality Assurance plan shall comply with an internationally recognized quality assurance standard such as ISO 9000 or its equivalent.

C.10.2 The Supplier shall provide facilities to Purchaser or their authorized representatives for progress inspection during manufacture at his works and furnish all test data available in this regard for quality control, both for bought-out items and his own manufactured items.

C.10.3 The Purchaser or his agent, when so required by him, shall also be provided with samples of "bought-out" materials for the purposes of undertaking independent tests, which independent tests shall be at the expense of the Purchaser.

PART D: - EQUIPMENT SPECIFICATIONS

EQUIPMENT SPECIFICATION OF 60 TON REAR DUMPER

[Payload Range 60T – 65T]

1. Scope of specification

This specification is intended to cover the technical requirements for the design, manufacture, testing, delivery, on-site erection and commissioning of a diesel powered, self-propelled, Wheeled, Rock Body, Rear Dumper having payload range of 60 Ton to 65Ton.

Note: If the offered capacity is in fraction, then the fraction equal to or more than 0.5 will be taken as 1 (one) and less than 0.5 will be considered as zero. (1 Ton = 0.907185 Tonne)

2. References:

The following International Standards as per latest amendment are referred to in, and form part of, the Specification. The superseded or equivalent standards, if any, to any of the following ISO standards if offered are to be supported by documentary evidence in form of copies of the equivalent standards certifying that offered standards are identical to the corresponding ISO standards of NIT.

ISO Ref.	Description
ISO 2867	Earth-moving machinery - Access system.
ISO 3450	Earth-moving machinery - Wheeled machines - Performance requirements and test procedures for braking systems.
ISO 3457	Earth-moving machinery - Guards and shields - Definitions and specifications.
ISO 3471	Earth-moving machinery - Roll-Over Protective Structures - Laboratory tests and performance requirements.
ISO 5010	Earth-moving machinery - Rubber Tyres Machines - Steering requirements.
ISO 6014	Earth-moving machinery - Determination of ground speed.
ISO 6405-1	Earth-moving machinery - Symbols for operator controls and other displays - Part 1 Common symbols.
ISO 6405-2	Earth-moving machinery - Symbols for operator controls and other displays - Part 2 Specific symbols for machines, equipment and accessories.
ISO 6483	Earth-moving machinery - Dumper bodies - Volumetric rating.
ISO 6682	Earth-moving machinery - Zones of comfort and reach for control.
ISO 6750-1	Earth-moving machinery - Operation and maintenance – Contents & Formats
ISO 6750-2	Earth-moving machinery - Operation and maintenance – Operator's Manual-Part 2: List of references
ISO 7132	Earth-moving machinery - Dumpers - Terminology and commercial specifications
ISO 7457	Earth-moving machinery - Measurement of turning dimensions of wheeled machines.

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ISO 9249	Earth-moving machinery – Engine test code – Net power.
ISO 10268	Earth-moving machinery – Retarders for dumpers – performance tests
ISO 10968	Earth-moving machinery – Operator's control.
ISO 7000 / IEC 60417	Graphical symbols for use on equipment.
Other ISO standards mentioned in the specification of individual system of the equipment	

3. **Design Criteria**

The dumper shall be capable of continuous operation for protracted periods on a system of 3 shifts each of 8 hours duration per day throughout the year.

The dumper shall be suitable for loading by 5-6 CuM Backhoe Hydraulic Shovel, 5.5 -6.5 CuM Face Hydraulic Shovel &5 CuM ER Shovel with rock. having average density of 1,800 kg/m^3after blasting.

4. Technical requirements:

4.1 Engine:

The dumper shall be powered by a direct injection 4-stroke Diesel Engine of not less than **475 kW net power** measured between 1700 and 2200 r/min according to ISO 9249.

The engine shall be provided with 24V electrical starting, dry type 2 stage air cleaner with dust evacuator, dust level indicator and 2 stage fuel filter with water separator.

The engine shall have a water jacket cooling system, thermo-statically controlled, using an engine driven water pump, with the cooling water re-circulated through a heavy-duty radiator. The system shall be capable of providing sufficient cooling to allow the dumper to continuously operate at full rated output at the maximum ambient temperature. The radiator cap shall be fastened with body with the help of suitable capacity chain/locking arrangement. The moving parts of the engine shall be lubricated by an engine driven oil pump with full flow oil filtration and cooling.

The engine shall be provided with a heavy-duty pan guard / suitable protection as per manufacturer design.

The engine is to be fuel efficient having fully integrated electronically controlled monitoring system & real-time self-diagnostic features with built in protections. The Engine electronic control module should be fully integrated with all systems of power train for all operating conditions and be capable to monitor operator's and sensors inputs for optimum engine performance & reduced emissions level. All engine vital parameter data shall be integrated with On Board Display (OBD) system of operator's cabin.

The engine shall be environment friendly with Tier-II or above or Equivalent standard certified. However, higher environmental standard, if any, shall be applicable as per notification of Govt. of India at the time of tendering. Certificate for Tier-II or above from engine manufacturer is to be enclosed.

A suitable electronic tool (laptop) loaded with compatible software and all related accessories shall be provided project wise **(1 no. laptop for a fleet up to 10 nos. or part there off for each project)** along with special tools for retrieval and analysis of the recorded critical parameters of self-diagnostic features, real time monitoring and equipment health-monitoring systems

fitted with the equipment. The supplier shall also be required to provide readable reports downloaded from each Equipment.
Compatible Software loaded in electronic tool (Laptop) should be warranted for entire contract period.

4.2 Drive system:

The drive system shall be mechanical with power shift transmission.

4.2.1 Transmission

The dumper shall be provided with an off-highway electronically controlled automatic power shift hydraulic transmission/heavy duty double reduction planetary gear system with lock-up clutch and downshift/reverse inhibitors, engine over speed protection, body up shift limiter. A suitable arrangement of individual modulation for maximum smoothness in all gearshift is to be provided. The electronic control shall have built in diagnostics features with suitable memory capacity. Suitable protection of the transmission pan from external damage should be provided. The pan guard/ suitable protection should be designed to minimize accumulation of dirt and debris.

4.2.2 Propel and final drive

A dynamically balanced propel shaft with universal joints at both ends should be utilized for power transmission. Adequate means should be provided to prevent damage to other components in the event of failure of the universal joints.
The final drive shall comprise of a heavy-duty differential with high quality spiral bevel gear and pinions and a heavy-duty planetary gear system and drive axle.

4.3 Suspension:

Suitable (hydra-air) independent front and rear gas over oil suspension shall be provided to absorb road shocks and prolong chassis & tire life.

4.4 Steering:

Full hydraulic orbitrol power steering and emergency steering, which complies with latest ISO 5010, shall be provided. Emergency steering shall be automatically activated in the event of failure of the normal steering power source. Suitable steering locking arrangement is to be provided to prevent untoward movement of steering wheel and tyre during working below the cabin and engine is running.

4.5 Hoses:

Fire resistant/ fire retarder/ heat resistant hydraulic hoses to decrease the chance of fire. All the sleeves and conduits in which cable/wire are laid shall be of fire resistant /fire retarder type.

4.6 Brakes:

Suitable reliable Service, Secondary (Emergency) and Parking Brakes which comply with latest ISO 3450, shall be provided.

4.6.1 Service Brakes:

The front service brakes shall be air and/or hydraulic actuated caliper/disc type and should operate automatically in the event of low air/oil pressure.
The rear service brakes shall be air and/or hydraulic actuated oil cooled multiple disc type and should operate automatically in the event of low air/oil pressure.
They shall be fully enclosed to prevent entry of dust & water and designed for low maintenance.

4.6.2 Secondary Brakes (Emergency Brakes):

Provision of Automatic Emergency Brake along with manual Emergency Braking system, which shall be operative in the event of failure of Service Brake, shall be provided.

4.6.3 Parking Brakes:

The parking brake system shall have suitable interlocking arrangement with Drive System to prevent movement of the dumper when parking brake is engaged.

The parking brakes should be operational even at zero system pressure.

4.7 Retarder:

Both Automatic and manual retarding control system to control speed while descending grades shall be provided.

4.8 Tyres:

Tubeless, rock duty, cut resistant, E 4 Tyre of size 24.00-35 of suitable TKPH rating to match the operational condition.

4.9 Frame:

The frame should be rugged durable construction of high strength steel and free from any stress concentration. The design must take care of all forces encountered during the operation of the dumper.

4.10 Dump Body:

The body should be an exhaust heated (excluding the extended canopy portion), heavy-duty (Rock as mentioned in clause 3) type with high hardness abrasion resistant side, front and bottom plates. The width of the body should be such that it protrudes over the tyres to prevent damage due to spillage of material from the body.

The volume of the body should be such that it can accommodate 6 pass loads from 5 CuM shovel & 5 pass loads from 6 CuM Shovel **(minimum 28 CuM struck capacity)** without spillage and body design should be such that the stability of the machine is maintained in all operating conditions especially during turning.

[Note - In case of coal body, the no. of pass and minimum dump body volume shall be indicated based on density of coal]

A body position indicator shall be provided in operator's cabin. Should comply as per requirement of Clause-6 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020

4.11 Fuel Tank:

The fuel tank shall be of sufficient capacity to allow 16 hours operation without refueling and be provided with a level indicator and a lockable-hinged filler cap. The cap shall be fastened with tank with the help of suitable capacity chain/locking arrangement.

Construction of the tank should be such that it provides for easy accumulation and drainage of water with minimum loss of fuel.

4.12 Lubrication System:

A centralized PLC/microprocessor/micro controller based hydraulic/Air/Electric operated, automatic lubrication system shall be provided to service all lubrication points on the machine, including those points where use of high viscosity lubricants is required.

The lubrication system shall be fully monitored to ensure adequate lubricant flow is maintained to all points of major parts. The monitoring system shall, wherever necessary, be interlocked with the relevant control circuits to prevent damage due to lack of lubrication at any point. Alarms and indications for failure of lubrication system shall be provided and may be repeated in the OBD (Onboard Display) of operator's cab.

Lubricant containers of adequate size shall be located in a separate room / enclosure inside the machinery house / convenient location and be large enough to cater lubrication needs for continuous operation between refills. The containers shall be fitted with suitable arrangement for cleaning and refilling

All lubrication lines and injectors shall be protected from damage. Location of all injectors shall be such that these can be conveniently inspected and repaired. The lubrication lines to the remote points should be properly guided. Flexible lines shall only be used where there is relative movement between parts and for final connection to movable components. Preferably steel piping shall be used for long runs and shall terminate in steel junction blocks or rigidly mounted bulk head connectors to prevent disturbance to steel piping when flexible hoses are replaced.

Fire/heat resistant/ retardant hoses shall be provided in lubrication system. Lubricants recommended shall be of reputed make with Indian equivalent, if available.

Note: Maintenance of lubrication system shall be done by the supplier during the contract period

4.13 Automatic Fire Detection and Suppression System (AFDSS):

A suitable automatic fire detection and suppression system of reputed manufacturer (indigenous or imported), shall be provided on the equipment complying **Clause-5**of DGMS (Tech) Circular No. 06 of 2020 dated 27.02.2020.

- Automatic fire detection and suppression system suitable for fire class A, B & C shall be provided in the fire prone zone of the dumper.
- Bidder requires submitting a schematic drawing indicating Plan of the system with relative position of items to be protected from fire.
- Fire detection and suppression of fire may be either total gas flooding or dry chemical powder base spray through nozzle strategically through an actuation cartridge, located to the targets, or combination of the two.
- Fire suppression agent used in neighborhood of electrical appliances shall be clean and shall not damage electrical / electronic component.
- Fire suppression system shall be non-hazardous & safe for human and environment friendly. It should have quick cleanup and environmental sustainability.
- The sensor shall send the signal to the control unit integrated with a LED and/or alarm indicator to show the status of the detector.
- The system shall operate to supply adequate quantity of fire suppressing agent for effective firefighting and to avoid re-ignition and suitably designed to extinguish the fire as per class of fire (A, B & C) of that location. The System shall operate only in active fire area.
- The system shall be actuated automatically by detection of fire and control unit to be installed within the Operator's cabin for automatic system operation.
- The system shall also have provision of actuating manually.
- The system shall provide facility for self-checking /testing/inspection without operating.
- The system should be capable for efficient operation in the extreme mining conditions with dust, dirt, water & vibrations.

The high-pressure storage vessels and hoses, if used with fire- fighting and fire suppression systems, shall conform to the requirements stipulated in the relevant Indian standards.

Bidder shall submit a Certificate as an undertaking that, a valid Test Certificate (valid as on the date of commissioning of the equipment at site) shall be submitted at the time of supply of equipment along with other documents, for AFDSS including materials and chemicals used in fire suppression system from any Government or Government approved Laboratory in compliance with relevant Indian Standards as per DGMS (Approval) Circular No. 02 dated 08th July 2013.

Note: Periodical refilling and maintenance shall be done by the supplier during the contract period

4.14 Fire Extinguisher:

A fire extinguisher shall be provided on the dumper, suitably mounted in heavy-duty bracket for ease of removal. The extinguisher shall be dry powder (cartridge type) with a minimum capacity of **5 kg** and shall comply with Indian Standard IS: 15683 with latest amendment.

Bidder shall submit a Certificate as an undertaking that, a valid Test Certificate (valid as on the date of commissioning of the equipment at site) shall be submitted at the time of supply of equipment along with other documents, for fire extinguisher including Materials and Chemicals to be used in fire extinguisher from any Government or Government approved Laboratory in compliance with relevant Indian Standards as per DGMS Circular No. **DGMS(Approval)CircularNo.02 dtd. 08thJuly2013**.

Periodical refilling of fire extinguishers shall be done by the supplier during the contract period

4.15 Operator's Station:

A suitable Operator's Station shall be provided on the equipment as per Gazette notification issued by Chief Inspector of Mines vide F. No. Z-20045/01/2018/S&T (HQ) Dhanbad, the 1st October, 2018.

4.15.1 Operator's Cabin:

A fully insulated, high-visibility, rigidly mounted, sound-suppressed, vibration-suppressed, air conditioned, operator's cab with tinted safety glass should be so positioned to facilitate a clear and unrestricted view of the travel & work areas of the machine necessary for its intended use. The performance criteria shall be in accordance with ISO 5006. The sound level inside the cab shall be below 85dBA while the equipment is operating, and with the door closed. All operating controls, all monitoring, working signals and emergency switch to stop the engine should be conveniently located in consoles within easy reach of the operator and shall comply with ISO: 6405-1, ISO: 6405-2, ISO: 6682 & ISO: 10968. The operator's cab shall be provided with an emergency exit in addition to primary access path to the cabin.

Alternative opening (Emergency Exit): An alternative opening shall be provided on a side other than that of the primary opening. A window panel or another door is acceptable if they are easy to open or remove without the use of keys or tools. Latches may be used if they can be opened from the inside without the use of keys or tools. The breaking of a suitable size of glass pane is considered to represent a suitable alternative opening, provided that the necessary pane hammer, immediately accessible to the operator, is provided and stored in the cab. When the window panel is used as an emergency exit, it shall bear an appropriate marking.

Doors, Windows and flaps shall be securely held in their intended operating positions. Doors shall be retained at their intended operating positions by a positive engagement device. The front glass shall be fitted with motorized wind screen wipers and washers. The tank of the front glass washers shall be easily accessible.
Pipes and hoses that contain fluids at pressures exceeding 5MPa or temperatures above 60ºC located inside the cab shall be suitably guarded.
Steps and handrails of robust design, which comply with ISO 2867, shall be provided for access to the operator's cab.

Periodical maintenance of Air Condition system including gas refilling to be done by the supplier during the contract period

4.15.2 Operator's Protective Structures:
Dumper shall be equipped with a roll-over protective structure (ROPS). The ROPS shall comply with ISO 3471. Also, FOPS shall be provided as per ISO -ISO3449
4.15.3 Operator's Seats:
The Operator's Station shall be fitted with an ergonomically designed adjustable seat that supports the operator in a position that allows the operator to control the machine under the intended operating conditions. The seat and its suspension shall be so designed to reduce vibration transmitted to the operator to the lowest level that can be reasonably achieved.
An additional seat for a trainer installed in the Operator's Station, shall be padded and shall provide adequate space for the trainer. The trainer shall also have available a conveniently placed handhold.
Seat Belt for operator with reminder shall be provided as per DGMS circular no. DGMS (Tech) Circular No. 06 of 2020 Dhanbad dated 27.02.2020.
4.15.4 Operator's Controls and Indicators:
The controls shall be of suitable design and construction and arranged so that they are able to be operated with ease from the operator's seat and within the operator's force limits. Controls shall be laid out and designed to allow easy and safe operation based on the principle that a given direction of movement of any control produces a consistent and expected effect. The surfaces of frequently used pedals shall be fitted with skid resistant type materials.
Controls that can cause a hazard due to inadvertent activation shall be so arranged, deactivated or guarded as to minimize the risk — particularly while the operator is getting into or out of the operator's station. The deactivation device shall either be self-acting or shall act by compulsory actuation of the relevant device.
4.15.5 Starting and Stopping System:
Dumper shall be equipped with a starting and stopping device (e.g., key). The starting system shall have a provision for protection against unauthorized use.
The starting and Stopping system shall be designed such that movement of the machine, shall not be possible, while starting or stopping the engine, without activating the controls. (e.g., Transmission Neutral-Engine Start safety arrangement).
4.16 Gauges and Indicators/Electronic Display:
The following shall be provided:

a. Water temperature gauge
b. Air cleaner vacuum gauge
c. Engine oil pressure gauge
d. Converter oil temperature gauge/indicator (where applicable)

e. Fuel capacity gauge
f. Engine tachometer
g. Engine hour meter
h. Speedometer
i. Air pressure gauge (if applicable)
j. Voltmeter (where applicable)
k. Hydraulic Oil Temperature Gauge

4.17 Warning Alarms/Lights/Indicators:

Warning systems shall be provided for the following:

a. Reversing –DGMS complied Audio Visual Alarm (Type confirming to Specifications as per DGMS (Approval)/ AVA/01 dated 25-05-2010 of DGMS)
b. Parking Brake actuation
c. High torque converter oil temperature (where applicable)
d. Low engine oil pressure
e. High coolant temperature
f. Low air pressure (where applicable)
g. Emergency steering
i. Indicator light for retarding, over speed & service brakes
j. Dumping buzzer
g. Warning alarms in case of failure of automatic lubrication system.
h. Tyre pressure monitoring system in cabin to be incorporated.

4.18 Engine Electrical System:

The dumper shall be provided with the following:

a. 24V DC electrical system with suitably rated alternator of reputed make
b. Electrical starter motor of reputable make
c. High capacity maintenance free batteries of reputed make
d. Battery isolation switch/ Relay

All electrical circuits shall be protected by adequately rated fuses/MCBs, which shall be easily accessible for maintenance. In case of fuses, at least two spare fuses of each size/ratings shall be provided in each fuse box, which shall be easily accessible for maintenance.

4.19 Lighting:

Adequate lighting shall be provided for safe night shift operation.

All lighting system shall be LED which include the following:

a. 4 nos. LED Headlight
b. Stop and tail LED lights
c. Hazard and Turn signal lights (left and right) on both front and rear LED type
d. Fog lamps 2 nos.
e. Backup lights 2 nos.
f. Cabin Dome & Ladder lights
g. Service light in rear axle & under hood (Wherever applicable)
h. Manual/ Auto backup light

4.20 Guards and shields:

Adequate guards and shields, which comply with ISO 3457, shall be provided on the dumper.

5. Safety Features:

All safety features & devices as per Govt. Of India Gazette notification no. Z 20045/01/2018/S&T (HQ) dated 01.10.2018, DGMS Circular No. DGMS (Tech) Circular No. 06 of 2020 Dhanbad dated 27.02.2020 and subsequent amendments, if any, including following shall be provided in the equipment. Bidder shall submit a Certificate as an undertaking in this regard that all safety features and devices are incorporated in the equipment.

a. Mechanical steering locking device to prevent untoward movement of steering wheel and tyre while persons are working underneath the cabin when engine is ON.

b. Blind spot mirror or any other device apart from rear view mirror to enable operator to have clear visibility of blind spot shall be provided.

c. **Proximity Warning Device** - Should comply as per requirement of Clause 14 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020

d. Mechanical Device to avoid head to Tail Collision of Dumpers: - Should comply as per requirement of **Clause 4** of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020. The manufacturers should submit a self-certificate explicitly stating that any one of the features fitted in the Dumper shall provide additional protection to the operator and it shall not affect the normal operation of the Dumper on the gradients and its steerability, loading or dumping operations.

e. Fire resistant/ fire retarder/ heat resistant hydraulic hoses in place of ordinary hoses to decrease the chance of fire. All the sleeves and conduits in which cable/wire are laid shall be of fire resistant /fire retarder type.

f. Seat belt &Seat belt reminder- Should comply as per requirement of Clause 10 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020

g. Methodology/ facility to be provided in the dumper to restrict/ control the speed as determined by management.

h. Propeller shaft guard (Wherever applicable).

i. Mirrors, right and left.

j. Hot zones shall be separated from cold zone by providing suitable arrangement.

k. Exhaust pipes and turbocharger shall be adequately guarded.

l. Load Indicator- Should comply as per requirement of Clause 8 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020

m. Dump Body raised position indicator with warning- Should comply as per requirement of Clause-6 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020

n. Safety provision for holding the dump body in hoist condition.

o. Manual wheel stopper while parking dumper in gradient.

p. Auto dipping system - Should comply as per requirement of Clause -3 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020

q. Rear Vision Camera - Should comply as per requirement of Clause -1 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020

r. Retro reflective reflectors on all sides for visibility of truck during night

s. Cabin Guard Extension – Canopy shall cover the operator's cabin fully.

t. Warning System for Operator Fatigue - Should comply as per requirement of Clause-2 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020

6. Ancillary Equipment and other requirements:

The following shall be provided on the dumper:

a. Front and rear tow hooks.
b. Pressurized radiator cap with chain attachment.
c. Headlight high beam indicator
d. Cab protection spill guard
e. Water separators in air lines (Where applicable)
f. Rock ejector bar/chains between each set of dual rear wheels
g. Suitable on-board payload monitoring system with a feature to store & retrieve data of at least one month
h. Self-diagnostic and real time monitoring electronic tool
i. Tyre inflation kit.

7. Productivity & Health monitoring system:

The equipment shall be provided with suitable licensed, on-line, real time, monitoring interface facility, compatible for GPS-based transfer of equipment performance data (commonly known as PMS and HMS) to third party equipment management system.

The system shall have OBD Self-diagnostic & error alarm features and should capture the parameters of HMS module and other parameters not covered by HMS of the equipment to monitor the following items:

i. Working hour, idle hour, based on the duration of a shift for which the equipment is switched on for operation
ii. Maximum speed, average speed, distance travelled, waiting time, loading time, unloading time, load carried by dumper for each trip and cumulative.
iii. Engine oil pressure
iv. Coolant temperature
v. Coolant level
vi. Engine RPM
vii. Fuel level and fuel consumption rate
viii. Hyd. oil temperature
ix. Engine electrical system - Battery voltage and Alternator out put
x. All vital parameters of drive system including transmission Fault codes along with details
xi. Tyre inflation pressure & temperature

This system shall have suitable memory capacity to store above measured data in batch form for at least one month period and shall have suitable port to download these data to a laptop / data storage system.

Alert audio messages to be given to Dumper Operators and control room person for the following events:

a) In the case of operator exceeds pre-defined maximum speed for different dumpers.
b) In the event of dumpers travelling in opposite direction falls in line.
c) To maintain safe distance between dumpers travelling in the same direction.
d) Fire warning to operator in case of catching fire.
e) Dump Body hoist indication to be given in the event of dumper travelling in dump body
hoist position.

The supplier shall provide the following:

A. There has to be one integrated single online port for capturing all the vital data.
B. The real time interface telemetry port will be provided in the equipment
C. All the data shall be available in the individual form through single port and its communication protocol must be as per global standards.
D. There shall be no additional requirement of any data converter for data capturing like Analog to Digital and vice-versa etc.
E. There shall be integrated on board data management system as explained at point no.3 as above.
F. Permission to third party for interfacing, data collection through online port.
G. Signing of Non-disclosure agreement to protect intellectual property right on either side.
H. To provide full technical support to third party vendor for interpretation and defining parameters for individual alarm to monitor equipment vital data.
I. The HEMM equipment supplier should provide access to data as required by end user without any financial implication to third party.

This interface facility shall be made available till the working life of equipment. However, the supplier shall provide this interface facility during the contract period as a part of contract cost.

To ensure the satisfactory operation of above system, a tripartite agreement shall be signed by the user, supplier and the service provider of OITDS / System Integrator.

8. Special Guarantees

The following guarantee will apply for the different components from the accepted date of commissioning.

a. Body, Chassis – 10,000 hours.
b. Complete Engine system- 8000 hours
c. Transmission Assembly (where applicable) - 8000 hours
d. Differential / Final drive (where applicable) - 8000 hours
e. Disc Brake - 8000 hours
f. OTR tyre - 4500 hours or 12 months first life before re-treading

In case of failure of any of the above component within the special guarantee period, the supplier shall replace the same with a new one. However, in case of failure of any peripheral item of Engine and transmission e.g., fuel pump/ turbocharger/ water pump / transmission pump etc. within the special guarantee period shall not be treated as failure of engine and transmission but the failed item is to be replaced with new assy. and should work up to completion of the special warranty period. No repair of such components or use of spares supplied against Clause: C6.2 shall be allowed within the special guarantee period.

However, spares supplied against Clause: C6.2 can be used for repair/replacement of above assemblies after attaining above mentioned special guarantee period as indicated against individual item. The special guarantee shall be limited for the period of contract only.

9. *Performance Guarantee:*

In accordance with the provisions of clause C 6.2.6 of the technical specifications the expected working hours per annum are 4000 (four thousand) hours. The expected working hours per annum as indicated are only approximate hours and may vary +/- 500 hours.

In accordance with the provisions of clauses C 7.2.2 and C 7.3.2 of the technical specifications the supplier shall guarantee that the availability of each equipment shall be not less than 85% (eighty-five percent) annually for a period of 36 months from the date of accepted date of commissioning and 80% (eighty percent) annually for following 24 months.

[Note - Expected annual working hours may be decided by the subsidiary company as per actual requirement]

10. Expected life of major assemblies:

Manufacturer shall give expected life of major assemblies also in the Format given in Table below, duly signed.

Table

Equipment	Major Assemblies	Expected Life* (in Hours)
Dumpers	Body Chassis	
	Engine	
	Transmission	
	Differential	
	Final Drive	

Note - * Expected life means life before first overhaul

11. Information to Be Provided by the Bidder

The bidder shall furnish the following information. All technical information shall be in SI units.

11.1 General

a) Number of similar models supplied during the last five (5) years. The information shall be given in the following format and in the order of most recent first:

Company Name	Mine Name	Mine Location	Mine type	Sl No. of Machines	Model & Capacity	Commissioned date (DD/MM/YYYY)

The information in the above format should be self-certified.

b) Details of special tools to be provided with the equipment.

c) Details of erection programme for the bid.

d) Details of nearest Depot/Warehouse and Service Facility available for the present offer

11.2 Technical Details

a) Latest engine performance curves showing net power, net torque and a specific fuel consumption of the installed engine, measures according to ISO 9249.
b) Maximum speed determined according to ISO 6014
c) Latest Rim-pull - Speed - gradeability Curves of the offered model clearly indicating Driving speed fully loaded up 14% effective grade.
d) Latest retarding performance chart of the offered model in accordance with ISO 10268 clearly indicating: Maximum constant speed fully loaded down 10% effective grade.
e) Calculations determining the time for the operating cycle specified in clause 11.3.12.
f) Result of service and secondary brake stopping tests carried out according to ISO 3450.

Braking system tested	Slope (%)	Machine Speed (km/h)	Stopping distance(m)
Service			
Secondary			

g) Turning diameter in accordance with ISO 7457.
h) Detail technical description of all systems of the dumper.
i) Detail technical description of Electronic Control Module used, its integration with other components of power train, details of data capturing (active, intermittent & calculated) & full feature, Diagnostic Tool's software version, data storage capacity & features and Payload Monitoring System fitted in the Dumper.
a) Layout drawings and detailed technical descriptions of hydraulic systems and components
b) Details of major bought out assemblies and sub-assemblies including manufacturer's name & full address, type, model etc.
c) Comprehensive commercial literature specifications, the content of which must comply with ISO 7132.
d) Operation and Maintenance manuals in accordance with ISO 6750 as indicated in clause A-3 of section VI.
e) Details and layout of Automatic lubricating system.
f) Details and layout of Automatic fire detection and suppression system.
g) Details of rear vision system
h) Details of proximity warning device.
i) Calculations and drawings verifying the body capacity.

11.3 Dimensions, Weights and Performance Details

11.3.1 Dimensions

a. Maximum Overall length (m)
b. Maximum overall width (m)
c. Maximum height without body (m)
d. Maximum height with body (m)
e. Loading height (m)

f. Dump height (m)
g. Discharge height (m)
h. Maximum body depth (m)
i. Body target area [inside length and width at top] (m^2)
j. Wheel base (m)

11.3.2 Weight Distribution

a) Empty vehicle (kg)
Front axle (kg)
Rear axle (kg)
Total (kg)

b) Loaded vehicle (kg)
Front axle (kg)
Rear axle (kg)
Total (kg)

c) Payload (kg)

11.3.3 Engine

a. Manufacturer and model
b. Number of cylinders
c. Bore (mm)
d. Stroke (mm)
e. Displacement (litre)
f. ISO net power at .....r / min (kW)
g. Maximum torque at .....r/min (Nm)
h. ECM /alternate - make, model & data storage capacity
i. Diagnostic tool's make, model, software version, data storage capacity & features.

11.3.4 Mechanical Drive System)

I Transmission

a) Manufacturer and model
b) Type
c) Number of gear speeds: forward and reverse
d) Travel speeds: forward and reverse

II Differential

a) Manufacturer and model
b) Type
c) Ratio

III Final Drive

a) Manufacturer and model
b) Type
c) Ratio

11.3.5 Suspension

I Front

a) Type
b) Stroke
c) Load - deflection rate: loaded and empty

II Rear

a) Type

b) Stroke
c) Load - deflection rate: loaded and empty

11.3.6 Steering

a) Type
b) Emergency steer method

11.3.7 Brakes

11.3.7.1 Service Brake:

I. Front

a) Type
b) Actuating System

II. Rear

a) Type
b) Actuating System

11.3.7.2 Emergency Brakes

a) Type
b) Actuating System

11.3.7.3 Parking brakes

a) Type
b) Actuating System

11.3.8 Retarder

a) Type
b) Actuating System

11.3.9 Tyres

a) Manufacturer
b) Size and type
c) Tread
d) Rim size
e) TKPH

11.3.10 Hydraulic System

a) Make & model, Number, flow rates and operating pressures of pumps
b) Make & model, Number, piston diameters and stroke length of cylinders
c) Relief valve operating pressures

11.3.11 Electrical System

a) Starter make and model
b) Alternator make and model
c) Batteries numbers and rating
d) Lighting details (number, type & rating)

11.3.12 **Operating Cycle**

The operating cycle, for which the bidder shall provide the information required in clause 11.2 (e), shall be:

Time for hauling, rated payload and returning empty to the place of loading on a haul road of the following profile with a rolling resistance of 2%.

First 1500 meters up a 12% grade, next 200 meters level, next 200 meters up a 10% grade, last 100 meters level.

A fixed time of six (6) minutes for loading and dumping shall be added to this time to calculate the total operating cycle.

Equipment Acceptance

The Equipment ordered will be finally accepted subject to the Supplier demonstrating to the Purchaser or its authorised representative (may be third party) that the equipment, or assembly or sub-assembly (selected at random by the Purchaser) when tested, meets the Performance Data provided by the Supplier in accordance with the requirements of clause 11. In case if testing facility for a particular parameter is not available at site, the Equipment ordered will finally be accepted subject to submission of Manufacturer's certified test copy for that parameter of performance data provided by the supplier in accordance with the requirements of clause 11. A detrimental deviation of up to 2½% will be accepted.

1	Specific Fuel Consumption for engine	To be tested at Works/engine manufacturer plant. Minimum of 3 (three) readings at full load to be averaged- Manufacturer test data in respect of fuel consumption in terms of gm/kw-hr is to be submitted.
2	Pay load Capacity	To be tested at Works / Project Site.
3	Engine Net Power & RPM	Manufacturer's test report shall be submitted. However, the inspector should ensure the above during pre-dispatch inspection/acceptance of Equipment at site to ensure acceptance of Equipment.
4	Driving Speed - fully loaded up 14% effective gradient (assuming 2% Rolling resistance)	To be tested at Works / Project Site.
5	Retard Speed - fully loaded down 10% effective gradient (assuming 2% Rolling resistance)	To be tested at Works / Project Site.
6	Service Brake Stopping Distance as per ISO 3450	To be tested at Works / Project Site.
7	Secondary Brake Stopping Distance as per ISO 3450	To be tested at Works / Project Site.
8	Turning Dimension as per ISO 7457	To be tested at Works / Project Site.
9	Dump body should accommodate 6 pass loads from 5 CuM shovel & 5 pass loads from 6 CuM Shovel without spillage.	To be tested at Project Site.

LIST OF SPARES REQUIRED FOR ONE NOS BH60M DUMPER FOR FIRST YEAR

ANNEXURE-B 41/199

Customer: BCCL
1ST YEAR SPARES

SL.NO	PART NO.	DESCRIPTION	UNIT PRICE 1ST YEAR	1ST Year qty	1st year Extn	HSN Code	GST %	GST 1st year
1	4328040	SEPARATOR FUEL WATER	16003.00	4	64012.00	84212300	18%	11522.16
2	5279609	FILTER FUEL	4836.00	16	77376.00	84212300	18%	13927.68
3	5417137	FILTER FUEL	14313.00	16	229008.00	84212300	18%	41221.44
4	4367100	FILTER LUBRICATING OIL	7008.00	16	112128.00	84212300	18%	20183.04
5	4072352	RESISTOR CORROSION	397.00	8	3176.00	84213100	18%	571.68
6	3816985	KIT COOLANT TEST	1148.00	4	4592.00	38200000	18%	826.56
8	4957708	ELEMENT AIR CLEANER OUTER	13715.00	8	109720.00	84213100	18%	19749.60
9	4957709	ELEMENT AIR CLEANER INNER	8718.00	8	69744.00	84213100	18%	12553.92
12	958HSB0127	BH60M-KIT1000	64560.00	4	FOC	87089900	28%	FOC
13	C600230002	API15W40 CI4 PLUS ENGINE OIL PER LITRE	189.00	840	158760.00	27101980	18%	28576.80
14	C600212000	C4SAE30 HYDRAULIC OIL & TM OIL PER LITRE	237.00	2100	497700.00	27101980	18%	89586.00
15	C600205000	SAE140 FINAL DRIVE AND DIFF OIL PER LITRE	263.00	1050	276150.00	27101980	18%	49707.00
16	C600219000	VG68 ANTI WEAR SUSPENSION OIL PER LITRE	195.00	210	40950.00	27101980	18%	7371.00
17	Y600302100	SC-HT 2 GREASE FOR FRONT AXLE PER KG	583.00	10	5830.00	34031900	18%	1049.40
18	C600302000	MOLEX-M32 GREASE FOR ENGINE OUTPUT SHAFT PER KG	394.00	1	394.00	34031900	18%	70.92
19	C600304000	NLGI-2 EP-2 GREASE PER KG	377.00	364	137228.00	34031900	18%	24701.04
		GRAND TOTAL 1st YEAR			17,86,768.00			3,21,618.24

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LIST OF SPARES REQUIRED FOR ONE NOS BH60M DUMPER FOR SECOND YEAR

Customer: BCCL
2ND YEAR SPARES

SL.NO	PART NO.	DESCRIPTION	UNIT PRICE 2ND YEAR	2nd Year qty	2nd year Extn	HSN Code	GST %	GST Value 2nd year
1	4328040	SEPARATOR FUEL WATER	16003.00	4	64012.00	84212300	18%	11522.16
2	5279609	FILTER FUEL	4836.00	16	77376.00	84212300	18%	13927.68
3	5417137	FILTER FUEL	14313.00	16	229008.00	84212300	18%	41221.44
4	4367100	FILTER LUBRICATING OIL	7008.00	16	112128.00	84212300	18%	20183.04
5	4072352	RESISTOR CORROSION	397.00	8	3176.00	84213100	18%	571.68
6	3816985	KIT COOLANT TEST	1148.00	4	4592.00	38200000	18%	826.56
7	3816981	PRE MIXED COOLANT	59764.00	1	59764.00	38200000	18%	10757.52
8	4957708	ELEMENT AIR CLEANER OUTER	13715.00	8	109720.00	84213100	18%	19749.60
9	4957709	ELEMENT AIR CLEANER INNER	8718.00	8	69744.00	84213100	18%	12553.92
10	5412987	BELT V RIBBED	1676.00	2	3352.00	40103190	18%	603.36
11	5413015	BELT V RIBBED	32492.00	1	32492.00	40103190	18%	5848.56
12	958HSB0127	BH60M-KIT1000	66497.00	4	FOC	87089900	28%	FOC
13	C600230002	API15W40 CI4 PLUS ENGINE OIL PER LITRE	198.00	630	124740.00	27101980	18%	22453.20
14	C600212000	C4SAE30 HYDRAULIC OIL & TM OIL PER LITRE	249.00	2100	522900.00	27101980	18%	94122.00
15	C600205000	SAE140 FINAL DRIVE AND DIFF OIL PER LITRE	276.00	1050	289800.00	27101980	18%	52164.00
16	Y600302100	SC-HT 2 GREASE FOR FRONT AXLE PER KG	612.00	15	9180.00	34031900	18%	1652.40
17	C600302000	MOLEX-M32 GREASE FOR ENGINE OUTPUT SHAFT PER KG	414.00	1	414.00	34031900	18%	74.52
18	C600304000	NLGI-2 EP-2 GREASE PER KG	396.00	364	144144.00	34031900	18%	25945.92
19	953EG72117	MAINTENANCE FREE BATTERY,160AH	41329.00	2	82658.00	84314200	18%	14878.44
				GRAND TOTAL 2nd Year	19,39,200.00			3,49,056.00

LIST OF SPARES REQUIRED FOR ONE NOS BH60M DUMPER FOR THIRD YEAR

Customer: BCCL
3RD YEAR SPARES

SL.NO	PART NO.	DESCRIPTION	UNIT PRICE 3RD YEAR	3rd year qty	3rd year Extn	HSN Code	GST %	GST Value 3rd year
1	4328040	SEPARATOR FUEL WATER	16003.00	4	64012.00	84212300	18%	11522.16
2	955HSB0165	HOSE ASSY KIT	32465.00	1	32465.00	87089900	28%	9090.20
3	958SU00048	R/S SEAL KIT ASSY	47680.00	2	95360.00	87089900	28%	26700.80
4	955SU11767	SNAP RING	2763.00	4	11052.00	87089900	28%	3094.56
5	955SU91496	BUSHING	17117.00	4	68468.00	87089900	28%	19171.04
6	0600006217	BEARING	19006.00	1	19006.00	84099990	28%	5321.68
7	564300008740	GROMMET	58.00	4	232.00	87089900	28%	64.96
8	565410150000	STUB SHAFT	61120.00	1	61120.00	87089900	28%	17113.60
9	575400001330	BALL STUD	6117.00	2	12234.00	87089900	28%	3425.52
10	952DA62065	RUBBER	518.00	4	2072.00	87089900	28%	580.16
11	952DA62073	RUBBER	530.00	4	2120.00	87089900	28%	593.60
12	952DA92084	SEAL	4666.00	1	4666.00	87089900	28%	1306.48
13	955EI11247	BEARING	858.00	1	858.00	87089900	28%	240.24
14	5279609	FILTER FUEL	4836.00	16	77376.00	84212300	18%	13927.68
15	5417137	FILTER FUEL	14313.00	16	229008.00	84212300	18%	41221.44
16	4367100	FILTER LUBRICATING OIL	7008.00	16	112128.00	84212300	18%	20183.04
17	4072352	RESISTOR CORROSION	397.00	8	3176.00	84213100	18%	571.68
18	3816985	KIT COOLANT TEST	1148.00	4	4592.00	38200000	18%	826.56
19	3816981	PRE MIXED COOLANT	59764.00	1	59764.00	38200000	18%	10757.52
20	4957708	ELEMENT AIR CLEANER OUTER	13715.00	8	109720.00	84213100	18%	19749.60
21	4957709	ELEMENT AIR CLEANER INNER	8718.00	8	69744.00	84213100	18%	12553.92
22	5412987	BELT V RIBBED	1676.00	2	3352.00	40103190	18%	603.36
23	5413015	BELT V RIBBED	32492.00	1	32492.00	40103190	18%	5848.56
24	C600230002	API15W40 CI4 PLUS ENGINE OIL PER LITRE	208.00	630	131040.00	27101980	18%	23587.20
25	C600212000	C4SAE30 HYDRAULIC OIL & TM OIL PER LITRE	261.00	1890	493290.00	27101980	18%	88792.20
26	C600205000	SAE140 FINAL DRIVE AND DIFF OIL PER LITRE	290.00	1050	304500.00	27101980	18%	54810.00
27	C600219000	VG68 ANTI WEAR SUSPENSION OIL PER LITRE	215.00	210	45150.00	27101980	18%	8127.00
28	Y600302100	SC-HT 2 GREASE FOR FRONT AXLE PER KG	643.00	15	9645.00	34031900	18%	1736.10
29	C600302000	MOLEX-M32 GREASE FOR ENGINE OUTPUT SHAFT PER KG	435.00	1	435.00	34031900	18%	78.30

LIST OF SPARES REQUIRED FOR ONE NOS BH60M DUMPER FOR THIRD YEAR

Customer: BCCL
3RD YEAR SPARES

SL.NO	PART NO.	DESCRIPTION	UNIT PRICE 3RD YEAR	3rd year qty	3rd year Extn	HSN Code	GST %	GST Value 3rd year
30	C600304000	NLGI-2 EP-2 GREASE PER KG	416.00	364	151424.00	34031900	18%	27256.32
31	958HSB0127	BH60M-KIT1000	68492.00	4	FOC	87089900	28%	FOC
32	955HSB0198	HOSE ASSY KIT (AUX, STEERING & TRANS)	106717.00	1	FOC	87089900	28%	FOC
33	571820020000	THROTTLE SENSOR CABLE	106308.00	1	FOC	87089900	28%	FOC
				GRAND TOTAL	22,10,501.00			4,28,855.48

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LIST OF SPARES REQUIRED FOR ONE NOS BH60M DUMPER FOR FOURTH YEAR

Customer: BCCL
4TH YEAR SPARES

SL.NO	PART NO.	DESCRIPTION	UNIT PRICE 4TH YEAR	4th year qty	4th year Extn	HSN Code	GST %	GST Value 4th year
1	4328040	SEPARATOR FUEL WATER	16003.00	4	64012.00	84212300	18%	11522.16
2	5279609	FILTER FUEL	4836.00	16	77376.00	84212300	18%	13927.68
3	5417137	FILTER FUEL	14313.00	16	229008.00	84212300	18%	41221.44
4	4367100	FILTER LUBRICATING OIL	7008.00	16	112128.00	84212300	18%	20183.04
5	4072352	RESISTOR CORROSION	397.00	8	3176.00	84213100	18%	571.68
6	3816985	KIT COOLANT TEST	1148.00	4	4592.00	38200000	18%	826.56
7	3816981	PRE MIXED COOLANT	59764.00	1	59764.00	38200000	18%	10757.52
8	4957708	ELEMENT AIR CLEANER OUTER	13715.00	8	109720.00	84213100	18%	19749.60
9	4957709	ELEMENT AIR CLEANER INNER	8718.00	8	69744.00	84213100	18%	12553.92
10	5412987	BELT V RIBBED	1676.00	2	3352.00	40103190	18%	603.36
11	5413015	BELT V RIBBED	32492.00	1	32492.00	40103190	18%	5848.56
12	958HSB0127	BH60M-KIT1000	70547.00	4	282188.00	87089900	28%	79012.64
13	C600230002	API15W40 CI4 PLUS ENGINE OIL PER LITRE	218.00	630	137340.00	27101980	18%	24721.20
14	C600212000	C4SAE30 HYDRAULIC OIL & TM OIL PER LITRE	274.00	1890	517860.00	27101980	18%	93214.80
15	C600205000	SAE140 FINAL DRIVE AND DIFF OIL PER LITRE	305.00	840	256200.00	27101980	18%	46116.00
16	Y600302100	SC-HT 2 GREASE FOR FRONT AXLE PER KG	675.00	15	10125.00	34031900	18%	1822.50
17	C600302000	MOLEX-M32 GREASE FOR ENGINE OUTPUT SHAFT PER KG	457.00	1	457.00	34031900	18%	82.26
18	C600304000	NLGI-2 EP-2 GREASE PER KG	437.00	364	159068.00	34031900	18%	28632.24
19	958SU00031	F/S SEAL KIT ASSY	55002.00	2	FOC	87089900	28%	FOC
20	955HC00017	STEERING CYL SEAL KIT	26933.00	2	53866.00	87089900	28%	15082.48
21	953EG72117	MAINTENANCE FREE BATTERY,160AH	43846.00	2	87692.00	84314200	18%	15784.56
				GRAND TOTAL	22,70,160.00			4,42,234.20

LIST OF SPARES REQUIRED FOR ONE NOS BH60M DUMPER FOR FIFTH YEAR

Customer: BCCL
5TH YEAR SPARES

SL.NO	PART NO.	DESCRIPTION	UNIT PRICE 5TH YEAR	5th year qty	5th Year Extn	HSN Code	GST %	GST Value 5th Year
1	4328040	SEPARATOR FUEL WATER	16003.00	4	64012.00	84212300	18%	11522.16
2	5279609	FILTER FUEL	4836.00	16	77376.00	84212300	18%	13927.68
3	5417137	FILTER FUEL	14313.00	16	229008.00	84212300	18%	41221.44
4	4367100	FILTER LUBRICATING OIL	7008.00	16	112128.00	84212300	18%	20183.04
5	4072352	RESISTOR CORROSION	397.00	8	3176.00	84213100	18%	571.68
6	3816985	KIT COOLANT TEST	1148.00	4	4592.00	38200000	18%	826.56
7	3816981	PRE MIXED COOLANT	59764.00	1	59764.00	38200000	18%	10757.52
8	4957708	ELEMENT AIR CLEANER OUTER	13715.00	8	109720.00	84213100	18%	19749.60
9	4957709	ELEMENT AIR CLEANER INNER	8718.00	8	69744.00	84213100	18%	12553.92
10	5412987	BELT V RIBBED	1676.00	2	3352.00	40103190	18%	603.36
11	5413015	BELT V RIBBED	32492.00	1	32492.00	40103190	18%	5848.56
12	958HSB0127	BH60M-KIT1000	72663.00	4	290652.00	87089900	28%	81382.56
13	C600230002	API15W40 CI4 PLUS ENGINE OIL PER LITRE	229.00	630	144270.00	27101980	18%	25968.60
14	C600212000	C4SAE30 HYDRAULIC OIL & TM OIL PER LITRE	288.00	1890	544320.00	27101980	18%	97977.60
15	C600205000	SAE140 FINAL DRIVE AND DIFF OIL PER LITRE	320.00	840	268800.00	27101980	18%	48384.00
16	Y600302100	SC-HT 2 GREASE FOR FRONT AXLE PER KG	709.00	15	10635.00	34031900	18%	1914.30
17	C600302000	MOLEX-M32 GREASE FOR ENGINE OUTPUT SHAFT PER KG	480.00	1	480.00	34031900	18%	86.40
18	C600304000	NLGI-2 EP-2 GREASE PER KG	459.00	364	167076.00	34031900	18%	30073.68
				GRAND TOTAL	21,91,597.00			4,23,552.66

ANNEXURE-C

QUALITY ASSURANCE PLAN

MODEL : BH60M DUMP TRUCK
CLIENT : M/s BEML LIMITED
CUSTOMER:

QAP Ref : QAP/BH60M/2022-23
Date of issue: 13/06/2022

SL NO	COMPONENT	CHARACTER/ PARAMETER	NATURE OF CHECK	QUANTITY OF CHECK	ACCEPTANCE STANDARD	RECORDING FORMAT	INSPN. AGENCY			REMARKS
							PERF	WIT	VERIFY	
1.	Equipment	Model	Visual			JIR	2	1		
		Frame	Visual			JIR	2	1		
		Engine Slno	Visual			JIR	2	1		
2.	Engine	Model	Visual			Test Certificate	2		1	
		Rated HP, Torque	Test Bench performance	100%	BEML acceptance stds.					
		Lub. Oil Pr at Lo and Hi Idle.								
3.	Major Assembly	Engine-T/M alignment.	Measure	100%	BEML assembly stds.	Beml in-process/ stage check sheets	2			
		Torque on Critical Bolts.	Measure	100%	BEML assembly stds.					
4.	Transmission	Pressures	Measure	100%	BEML assembly stds.		2			
5.	Hydraulic System	System flushing	Visual	100%	BEML assembly stds.		2			
		Pressure & Leak checks			BEML assembly stds.		2			
		Hoist operations	Measure	100%	BEML assembly stds.		2			
6.	Strg. & Brake	Effectiveness	Function	100%	BEML assembly stds		2			
		Pressure checks	Measure		BEML assembly stds		2			
7.	Checks on completed equipment									
a	Engine	Engine Hi and Lo Idle rpm.	Measure		BEML assembly stds.	JIR	2	1		
		Engine Hi and Lo Idle pressures.	Measure	100%			2	1		
b	Transmission	Effective Gear shifting	Function	100%	BEML assembly stds.		2	1		
		Neutral start feature	Function				2	1		
c	Brake & Steering	Effective Braking and Brake Lock.	Function		BEML assembly stds.		2	1		
		Normal Steering	Function	100%			2	1		
		Function of Gauges	Visual				2	1		
d	Gauges & Electricals	Electrical checks (working of accessories)	Function		BEML assembly stds.		2	1		
		Interlock tests (Parking Brake)								
		Proper routing of Wire Harness .	Visual	100%			2	1		
		Correct actuation of Warning systems.	Function				2	1		

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
4 वां तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
4th Floor, Unity Buildings, J.C. Road
बेंगलूरु / BENGALURU - 560 002.

BEML LIMITED * 4th FLOOR Unity Buildings J.C. Road BANGALORE 560002

SL NO	COMPONENT	CHARACTER/ PARAMETER	NATURE OF CHECK	QUANTITY OF CHECK	ACCEPTANCE STANDARD	RECORDING FORMAT	INSPN. AGENCY			REMARKS
							PERF	WIT	VERIFY	
e	Equipment	Oil levels (Engine , Transmission , Final Drive and Hydraulics)	Visual	100%	BEML assembly stds.	JIR	2	1		
		Painting & aesthetics	Visual				2	1		
		Lubrication at all points	Visual				2	1		
		Physical condition & Charging of Battery	Visual				2	1		
		Socket clearances for : • Hyd. Cylinder Piping flange bolts • Suction and Delivery line bolts (Hyd Pump , Transmission Pump and Steering Pump)	Visual				2	1		
		Proper routing and clamping of Hoses .	Visual				2	1		
f	Optional Items	Optional items as per PO	Visual	100%	As per order terms.		2	1		

The QAP meets the requirements of ISO9001-2015 Quality Management System Standard.

SIGNATURE OF BEML REP. **SIGNATURE OF CUSTOMER REP.**

Note : 1. CUSTOMER 2. BEML JIR – JOINT INSPN. REPORT

APPROVED BY	R. RAMESH DGM – CORPORATE QUALITY		13.06.2022

BEML LIMITED bemi V FLOOR Unity Buildings J C Road BANGALORE-560002

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
4 वां तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
4th Floor, Unity Buildings, J.C. Road
बेंगलूरू / BENGALURU - 560 002.

आर रमेश / R Ramesh
उप महाप्रबंधक (गुणवत्ता)
Deputy General Manager (Quality)
सामूहिक गुणवत्ता / Corporate Quality

CERTIFICATE OF COMPLIANCE

INTERNATIONAL CERTIFICATION SERVICES PVT. LTD.

This is to certify that the
QUALITY MANAGEMENT SYSTEM of

BEML LIMITED, EQUIPMENT DIVISION

Belavadi Post Mysore - 570018, Karnataka, India.

has been assessed and registered as complying with the requirements of the following International Standard:

ISO 9001:2015

The Quality Management System applicable to:

Scope : **Design & Development, Manufacture and Servicing of Off - Highway Dumpers, Motor Graders, Water Sprinklers, Defence Equipments and Dredgers Spares.**

Registration No.	: RQ91/11038
Registered Date	: 23rd November, 2021
Issue Date	: 07th December, 2021
Expiry Date	: 22nd November, 2024

QMS 009

ATTESTED BY
S. VIJAYAKUMAR
Advocate & Notary
430/A, 8th Cross, 1st [illegible]
Jayanagar, Bangalore - [illegible]
Mob: 98860 63348

Director (Technical)
International Certification Services Pvt. Ltd.

Accredited by National Accreditation Board For Certification Bodies, India.

Validity of this certificate is based on periodic audits of the management system defined by the above scope and is contingent upon prompt, written notification of significant changes to the management system and/or its components thereof shall be immediately communicated to ICS.
Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2015 requirements may be obtained at www.icsasian.com/ www.icspl.org

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ಬಿಇಎಂಎಲ್ ಲಿಮಿಟೆಡ್
बीईएमएल लिमिटेड
BEML LIMITED

Schedule 'A' Company under Ministry of Defence, Govt. of India

Defence & Aerospace | Mining & Construction | Rail & Metro

Ref: MT: TC-1572/BCCL (BH60M)

Date: 29.06.2022

To:
Bharat Coking Coal Limited
Koyla Bhawan, Koyla Nagar
Dhanbad - 826005

Sub: ISO Standards Undertaking.

Ref.: 1. NIT No. : BCCL/Pur/422011/60T Dumper/OTE-RA/22-23/24 dtd 01.06.2022

2. Tender Id No. : 2022_BCCL_245460_1

Dear Sir,

We hereby confirm that our offered model BH60M Dumper specifications are identical to the corresponding ISO standards of NIT.

Thanking you,

Yours faithfully,

For BEML LIMITED

BEML LIMITED bemi V FLOOR Unity Buildings J C Road BANGALORE-560002

(Authorised Signatory)

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
4 था तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
4th Floor, Unity Buildings, J.C. Road
बेंगलूरु / BENGALURU - 560 002.

ಪ್ರಧಾನ ಕಛೇರಿ **Corporate Office**
ಬಿಇಎಂಎಲ್ ಸೌಧ, ೨೩/೧, ೪ನೇ ಮುಖ್ಯ ರಸ್ತೆ, ಸಂಪಂಗಿರಾಮನಗರ, ಬೆಂಗಳೂರು – ೫೬೦ ೦೨೭
ದೂರವಾಣಿ ಸಂಖ್ಯೆ : +೯೧ ೮೦ ೨೨೯೬ ೩೨೦೦, ೧೮೦೦ ೪೨೫ ೨೩೬೫
BEML Soudha, 23/1, 4th Main, S R Nagar, Bengaluru - 560 027
Tel: +91 80 2296 3200, 1800 425 2365
CIN: L35202KA1964GOI001530, GST NO. 29AAACB8433D1ZU

ಮಾರ್ಕೆಟಿಂಗ್ ಪ್ರಧಾನ ಕಛೇರಿ **Marketing HQ:**
ಬಿಇಎಂಎಲ್ ಲಿಮಿಟೆಡ್, ೪ನೇ ಮಹಡಿ, ಯೂನಿಟಿ ಬಿಲ್ಡಿಂಗ್ಸ್, ಜೆ.ಸಿ ರಸ್ತೆ, ಬೆಂಗಳೂರು – ೫೬೦ ೦೦೨
ದೂರವಾಣಿ ಸಂಖ್ಯೆ : +೯೧ ೮೦ ೨೨೯೬ ೩೫೦೫
BEML Limited, 4th Floor, Unity Buildings, J.C Road, Bengaluru - 560 002
Tel: +91 80 2296 3505
mt@beml.co.in, mtt@beml.co.in

Annexure-D

Section-General Conditions of Contract (GCC)

1. Definitions

In the interpretation of the contract and the general and special conditions governing it, unless the context otherwise requires, the following terms shall be interpreted as indicated below:

a) "The Contract" means the agreement entered into between the Purchaser and the Supplier including all attachments and appendices thereto and all documents incorporated by reference therein including Invitation to tender, Instructions to tenderers, Acceptance of tender, Particulars and the General and Special Conditions specified in the acceptance of tender;

b) "Contract Price" means the price payable to the Supplier under the Contract for the full and proper performance of its contractual obligations;

c) "Goods" means all of the equipment, plant, machinery, and/or other materials which the Supplier is required to supply to the Purchaser under the Contract;

d) "Services" means those Services ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental Services, such as installation, commissioning, provision of technical assistance, training and other such obligations of the Supplier covered under the Contract;

e) "GCC" means the Conditions of Contract contained in this section;

f) "SCC" means the Special Conditions of Contract;

g) "Purchaser" means the organization purchasing goods and services, i.e., Coal India Limited or its subsidiaries or areas falling under various subsidiaries of Coal India Limited;

h) "Purchaser's country" is India;

i) "Supplier/Contractor" means the individual, firm or company with whom the contract has been concluded for supplying the Goods and Services under the Contract. The Supplier/Contractor shall be deemed to include its successors (approved by the purchaser), representatives, heirs, executors, administrators and permitted;

j) "CIL" means Coal India Limited or the Subsidiary Company of CIL or areas falling under various subsidiaries of CIL where Goods are deployed/ used;

k) "Year" means the Calendar Year.

l) "Chairman" means the Chairman of Coal India Limited.

m) "Chairman-cum-Managing Director" means Chairman-cum-Managing Director of any of the Subsidiary Companies of Coal India Limited, presently Central Coalfields Limited, Eastern Coalfields Limited, Western Coalfields Limited, Bharat Coking Coal Limited, Central Mine Planning & Design Institute Limited, South Eastern Coalfields Limited, Northern Coalfields Limited and Mahanadi Coalfields Limited.

n) "Drawing" means the drawing and plans specified in or annexed to the schedule or specifications.

o) "Inspector" means any person nominated by or on behalf of the purchaser to inspect supplies, stores or work under the contract or his duly authorized agent.

p) "Progress Officer" means any person nominated by or on behalf of the Purchaser to visit supplier's works to ascertain position of deliveries of Goods ordered.

q) "Materials" shall mean anything used in the manufacture or fabrication of the stores.

r) "Stores" means the goods specified in the Supply Order or schedule which the supplier / contractor has agreed to supply under contract.

s) "Test" means such test or tests as are prescribed by the specifications or considered necessary by the Inspector or any agency acting under direction of the Inspector.
t) "Site" mean the place or places named in the "Supply Order" or such other place or places at which any work has to be carried out as may be approved by the purchaser.
u) Words denoting the persons shall include any company or association or body of individuals whether incorporated or not.
v) Words in singular include the plural and vice-versa.
w) Words denoting the masculine gender shall be taken to include the feminine gender.
x) "Writing" shall include any manuscript, typewritten or printed statement under or over signature or seal as the case may be.
y) "Unit" and "Quantity" means the unit and quantity specified in the schedule.
z) "Purchase Order" or "Supply Order" or "Order" or "Contract" means an order for supply of stores and includes an order for performance. The terms "Supply Order", "Purchase Order", "Order" and "Contract" are interchangeable.
aa) "Particulars" shall mean the following:
    i. Specifications;
    ii. Drawing;
    iii. Sealed pattern denoting a pattern sealed and signed by the Inspector;
    iv. Certified or sealed sample denoting a copy of the sealed pattern or sample sealed by the purchaser for guidance of the Inspector;
    v. Trade pattern denoting a standard of the ISI or other standardising authority or Coal India Ltd. and / or any of its subsidiary companies or a general standard of the industry and obtainable in the open market;
    vi. Proprietary make denoting the product of an individual manufacturer;
    vii. Any other details governing the construction, manufacture and / or supply as existing in the contract.
bb) Terms and expressions not defined herein shall have the meanings assigned to them in the Indian Sale of Goods Act, 1930 or the Indian Contract, 1872 or the General Clauses Act, 1897, as amended, as the case may be.

2. Application

These Conditions shall apply to the extent that they are not superseded by provisions in other parts of the Contract.

3. Standards

The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications. Such standards shall be the latest issued by the concerned institution.

4. Use of Contract Documents and Information

4.1. The Supplier shall not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

4.2. The Supplier shall not, without the Purchaser's prior written consent, make use of any document or information enumerated in sub-clause 4.1 above, except for purposes of performing the Contract.

4.3. Any document, other than the Contract itself, enumerated in sub-clause 4.1 above shall remain the property of the Purchaser and shall be returned (in all copies) to the Purchaser on completion of the Supplier's performance under the Contract if so, required by the Purchaser.

5. Patent Rights

The Supplier shall indemnify the Purchaser against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the Goods or any part thereof in the Purchaser's country.

6. Security Deposit

6.1. The successful tenderers will have to submit Security Deposit for the 3% value of the total landed value of the contract including all taxes, duties and other costs and charges, without considering Input Tax Credit.

6.2. The Security Deposit shall be in the form of a Bank Demand Draft or in the form of a Bank Guarantee in the prescribed format from an RBI Scheduled Bank in purchaser's country (on a non-judicial stamp paper) within 15 days from date of notification of award or placement of order.

6.3. The Security Deposit shall be in the same currency (ies) in which contract is to be signed/ issued. In case of multi-currency contract, separate Security Deposit Bank Guarantee (SDBG) in respective currency for required value as above shall be submitted.

6.4. In case of equipment, SDBG shall not be individual equipment wise. However, multiple Bank Guarantees for Security Deposit shall be permissible provided value of all the SDBGs totals to 3% of the contract value, and all are submitted simultaneously within the specified time schedule and all of them are in the same prescribed format of SDBG without linking to any particular equipment.

6.5. The SDBG shall remain valid up to 3 months after completion of supplies and acceptance of materials by the consignee in case of supply contracts/ rate/running contracts and in case of contracts for equipment involving installation and commissioning, 3 months after the supply and commissioning of all the equipment covered in the contract.

6.6. If the successful tenderer fails to deposit the security deposit within 15 (fifteen) days from date of notification of award/ placement of order, another opportunity may be given to them for submission of Security Deposit within next 15 days. If the successful tenderer still fails to deposit the security deposit within the extended period but executes the supplies within the extended security deposit submission period, the submission of Security Deposit may be waived, as the purpose of submission of SD is fulfilled.

6.7. In cases where the successful tenderer did not submit the security deposit even within the extended period for SD submission but has supplied the materials either in full or in part after the extended period for SD submission, the SD may be deducted from the first bill or in case of insufficient amount from subsequent bill(s) of the supplier till the full SD amount is deducted. Further, a penalty equivalent to 0.5% (half percent) of SD amount for delay of each week or part thereof (period of delay is to be calculated from the 31st day from the date of notification of award/placement of order to the date of receipt of full SD/deduction of full SD) shall be levied subject to a maximum of 10% of the contract value.

6.8. Security Deposit will be released with the approval of HOD of MM Department/ Area GM within 30 days after completion of supplies and acceptance of material by the consignee in case of supply contractor after successful commissioning and on receipt of confirmation of Performance Bank Guarantee(s) for all the equipment covered in the contract in case of contracts for equipment and all those items/ goods involving installation and commissioning and PBG.

6.9. Security Deposit may be converted into Performance Bank Guarantee (PBG) wherever PBG is required at the option of the supplier. At the time of conversion of security money into PBG, it should be ensured that the amount of PBG should not be less than 10% of landed value of order. Wherever Security Deposit is converted into PBG, the operation of such SDBG/ Performance BG shall be guided by Performance Bank Guarantee Clause.

6.10. All Central/State Government Organization/PSUs shall be exempted from submission of Security Deposit. OEM/OES shall also be exempted from submission of Security Deposit in case of procurement of Spare Parts for equipment against Single Tender Enquiry/Open/Limited Tenders.

6.11. Submission of Security Deposit is exempted for the contracts having value up to Rs.2 lakhs.

6.12. The SDBG will be submitted Through Structured Financial Management System (SFMS).

7. Performance Bank Guarantee

7.1. Wherever applicable, the successful bidder shall be required to furnish a Performance Guarantee equivalent to 10% value of the total landed value of the contract including all taxes, duties and other costs and charges, without considering Input Tax Credit.

7.2. The Performance Guarantee shall be in the form of a Bank Guarantee issued by an RBI scheduled bank in India in the prescribed format on a non-judicial stamp paper.

7.3. The Performance Bank Guarantee (PBG) shall be in the same currency (ies) in which contract has been signed. In case of multi-currency contract, separate PBG in respective currency for required value shall be submitted.

7.4. If the contract is for procurement of equipment, the PBG (s) may be submitted equipment wise also. For this purpose, the value of each equipment will be worked out by dividing the total value of contract for a particular item of NIT, worked out as per provisions contained in clause-7 above, by the number of equipment ordered for that particular item of the NIT.

7.5. The PBG (s) shall remain valid till 3 months after the completion of warranty period.

7.6. The PBG shall be submitted sufficiently in advance (say 3-4 weeks) to enable its verification from the issuing bank, before submission of the invoice for 80% payment of the particular goods/ equipment(s).

7.7. The release of the Performance Bank guarantee(s) after above indicated period, shall be subject to satisfactory performance of the equipment/ items during the warranty period and fulfilment of contractual obligations failing which, action for further extension or encashment of PBG, as deemed suitable shall be taken. The Performance Bank Guarantee shall be released after expiry of validity period if no claim is pending, with the approval of the concerned HOD (MM)/ Area GM.

7.8. In case of procurement of equipment, if the successful tenderer which does not have the After Sales Service Support facilities in India like Depot/ Warehouse for supply of spare parts, Workshop facilities for servicing and repair of assemblies, sub-assemblies and equipment, availability of trained technical manpower etc., training facilities for providing training to CIL's personnel, wherever required, additional Performance Bank Guarantee for the 30% value of the total landed value of the contract including all taxes, duties and other costs and charges shall have to be submitted. This 30% PBG will be released after establishment of After Sales Service Support facilities in India subject to confirmation of the same by concerned Head of Technical Department. However, the supplier shall have to submit PBG for 10% of the total contract value to be kept valid for the remaining period of the contract plus 3 months processing period before release of 30% PBG. This 10% PBG will be released after satisfactory performance of all equipment/ items and fulfilment of contractual obligations including warranty obligations.

7.9. The PBG will be submitted through Structured Financial Management System (SFMS).

8. Inspections and Tests

8.1. The Purchaser or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Contract Specifications at no extra cost to the Purchaser. Generally, the Goods shall be of the best quality and workmanship and comply with the contract or supply order in all respect. The Technical Specifications shall specify what inspections and tests the Purchaser requires and where they are to be conducted. The Purchaser shall notify the Supplier in writing, of the identity of the inspector(s). The Purchaser reserves the right, at the Purchaser's cost, to depute its own inspector(s) and/or to engage any other third party inspecting agency, to conduct inspections and tests pursuant to the Contract. Sufficient time, at least 30 days in advance will be given for inspection.

8.2. The inspections and tests may be conducted on the premises of the Supplier, at point of delivery and/or at the Goods' final destination. If conducted on the premises of the Supplier, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Purchaser. However, any drawing and proprietary information provided for this purpose shall remain in control of the supplier. The inspector shall have full and free access at the supplier's works for the purpose of carrying out inspection. The Inspector shall have the right to put all the stores or materials forming part of the same or any part thereof to such tests as he may think fit and proper. The supplier shall not be entitled to object, on any ground whatsoever, to the method of testing adopted by the Inspector. Unless otherwise provided for in the contract, all stores / materials expended in test will be to supplier's account. In the event of Goods found acceptable by the Inspector during inspection, he shall furnish the supplier with necessary copies of Inspection notes for attaching to the supplier's bill.

8.3. Should any inspected or tested Goods fail to conform to the Specifications, including acceptance tests and periodic tests to verify guaranteed performance, the Purchaser may reject the Goods, and the Supplier shall either replace the rejected Goods or make alterations necessary to meet Specification requirements free of cost to the Purchaser within thirty days of such rejection. Replaced or altered goods shall be subjected to repeated inspection or tests to demonstrate conformity with the Specifications. In the event that replacement or alteration is not done within thirty day period as aforesaid, or, replaced or altered goods fail to demonstrate conformity with the Specifications in repeated inspections or tests as aforesaid, the Purchaser reserves the right to terminate the Contract in part or in whole and the Supplier shall repay forthwith to the Purchaser all monies paid including all costs incurred in the inspection and tests, in respect of Goods and Services associated therewith, for which the termination is applicable and, subsequently remove the same from the Purchaser's Site at the Supplier's cost.

8.4. Any Goods rejected at a place other than the premises of the supplier, shall be removed by the supplier within 14 days of the date of receipt of intimation of such rejection. The Inspector may call upon the supplier to remove what he considers to be dangerous, infected or perishable Goods, within 48 hours of the receipt of such intimation. The rejected stores shall under all circumstances lie at the risk of the supplier from the moment of rejection and if such stores are not removed by the supplier within the above mentioned period, the Inspector / Purchaser may either return the same to the supplier at the supplier's risk and cost (a public tariff rate) by such mode of transport as the Purchaser or Inspector may select or dispose of such stores at the supplier's risk on his account and retain in such portion of the proceeds as may be necessary to cover any expense incurred in connection with such disposal.

The purchaser shall also be entitled to recover handling and storage charges for the period during which the rejected stores are not removed.

8.5. The Purchaser's right to inspect, test and where necessary, reject the Goods after the Goods' arrival in the Purchaser's country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Purchaser or its representative prior to the Goods' shipment from the Supplier's premises.

8.6. Nothing in this clause shall in any way relieve the Supplier of any warranty or other obligations under this Contract.

9. Packing and Marking

9.1. The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

9.2. All packing cases, containers, packing and other similar materials shall be supplied free by the Supplier and these shall not be returned unless otherwise specified in the Contract/Purchase order.

9.3. The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in the contract and in any subsequent instructions ordered by the Purchaser. Packages will be stamped with identification marks both outside the packages as well as on the contents inside. Packages containing articles liable to be broken by rough handling like glass or machinery made of cast iron will be marked with cautionary works like 'Fragile' 'Handle with care'.

9.4. The marking of the Goods must comply with the requirements of the law relating to Merchandise Mark, in force in India.

9.5. Packing instructions: The Supplier will be required to make separate packages for each consignee. Each package will be marked on three sides with proper paint with the following:

i. Project;
ii. Contract No;
iii. Country of origin of Goods;
iv. Supplier's name;
v. Packing list Reference Number;
vi. The gross weight, net weight and cubic measurement;
vii. Consignee Name and Address;

9.6. A complete list of contents in each package called the packing list will be prepared and one copy of the packing list shall be inserted inside the package.

10. Delivery and Documents

10.1. The delivery period stipulated in the Contract / Purchase Order shall be deemed to be the essence of the contract and delivery of the Goods must be completed within the specified period.

10.2. Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in the Schedule of Requirements. The delivery of Goods shall be deemed to take place on delivery of the Goods in accordance with the terms of the contract after approval of Goods by the Inspector.

10.3. For purposes of the Contract, "EXW", "FOB", "FCA", 'CFR", "CIF", "CIP" and other trade terms used to describe the obligations of the Parties shall have the meanings assigned to them by the prevailing edition of *Incoterms* on the date of tender opening, published by the International Chamber of Commerce, Paris.

10.4. The details of shipping documents to be furnished by the Supplier are specified below:

a) For Imported Goods:

Within forty eight (48) hours of shipment, the Supplier shall notify the Purchaser, Port Consignee and Ultimate Consignee by fax and email, full details of the shipment including Contract number, description of Goods, quantity, the vessel, the bill of lading number and date, port of loading, date of shipment, port of discharge, etc. The Supplier shall deliver by express courier service the following documents to the Purchaser, with a copy to the Port Consignee and Ultimate Consignee:

i. Supplier's shipping invoice showing Contract Number, Goods description, quantity, unit price, total amount and GST number of ultimate consignee;
ii. Clean on-board bill of lading indicating the Importer-Exporter Code (IEC) of the concerned Subsidiary Company of CIL and non-negotiable bill of lading;
iii. Packing list identifying contents of each package;
iv. Manufacturer's/Supplier's warranty / guarantee certificate;
v. Manufacturer's Test & Inspection certificate;
vi. Certificate of Country of Origin issued by the Chamber of Commerce of Manufacturer's Country;
vii. Documentary evidence of marine freight & marine insurance.

The above documents shall be sent by supplier well in advance, so that the same are received by the Purchaser at least one (1) week before arrival of the Goods at the port or place of arrival and, if not received, the Supplier will be responsible for any consequent expenses.

b) For Domestic Goods from within India:

Upon dispatch of the Goods to the consignee, the Supplier shall notify the Purchaser and Ultimate Consignee and deliver by express courier service the following documents to the Purchaser with a copy to the Ultimate Consignee:

i. Supplier's invoice showing Contract Number, Goods description, quantity, unit price, total amount;
ii. Railway receipt / Transporter's consignment note / acknowledgement of receipt of Goods from the consignee(s);
iii. Manufacturer's / Supplier's warranty / guarantee certificate;
iv. Manufacturer's Test & Inspection certificate.

The above documents shall be provided by the supplier at the time of arrival of the Goods at the consignee's end. In case of delay, the Supplier will be responsible for any consequent expenses.

11. Insurance

11.1. Wherever necessary, the goods supplied under the contract, shall be fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, delivery, storage and erection and commissioning at site (wherever applicable) in the manner specified in the contract. The insurance is to be done for coverage on "all risks" basis including war risks and strike clauses.

The amount to be covered under insurance should be 110% of the invoice value to take care of the overall expenditure to be incurred by the purchaser for receiving the goods at the destination.

11.2. Where delivery of imported goods is required by the purchaser on CIF / CIP basis, the supplier shall arrange and pay for marine / air insurance, making the purchaser as the beneficiary. Where delivery is on FCA / FOB / CFR basis, marine / air insurance shall be the responsibility of the purchaser.

11.3. In case of domestic supplies on Free Delivery at site / FOR Destination basis, the supplier has to arrange insurance at its cost. For Ex-works and FOR station of dispatch contracts, it is the responsibility of the purchaser to arrange for insurance.

11.4. Where the delivery of the Goods is on CIP Basis, the supplier shall deliver the goods at the named place of destination at its own risks and costs. CIL has no obligation to the supplier for arranging insurance. However, CIL will provide the supplier upon request, with necessary information for obtaining insurance.

11.5. Where the delivery of the Goods is on FOR destination Basis, the supplier shall deliver the goods at the FOR destination site at its own risks and costs. CIL has no obligation to the supplier for arranging insurance. However, CIL will provide the supplier upon request, with necessary information for obtaining insurance".

12. Transportation

12.1. In case of FOB (Port of Shipment) contracts, the purchaser has to arrange transportation its own cost and risk.

12.2. In case of CIF (Port of Destination) contracts, transport of the goods to the port of destination in the Purchaser's country, as shall be specified in the contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price. In case of inland transportation of goods, the same is to be done through registered common carriers only.

12.3. In case of CIP (Final Place of Destination) contracts, transport of the goods to the port of destination and further to the named place of Final Destination in the Purchaser's country, as shall be specified in the contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price. In case of inland transportation of goods, the same is to be done through registered common carriers only.

12.4. In case of FOR Destination contracts, transport of goods to the Destination site shall be arranged and paid for by the supplier and the cost thereof shall be included in the contract price. Transportation of goods is to be done through registered common carriers only.

13. Warranty

13.1. The Supplier warrants that the Goods supplied under the Contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that all Goods supplied under this Contract shall have no defect arising from design, materials or workmanship or from any act or omission of the Supplier that may develop under normal use of the supplied Goods in the conditions prevailing in the purchaser's country.

13.2. This warranty shall remain valid for twelve (12) months from the date of commissioning of the equipment.

13.3. The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. The Supplier shall, within thirty days, repair or replace the defective Goods or parts thereof, free of cost at the ultimate destination. The Supplier shall take over the replaced parts / Goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts / Goods thereafter.

13.4. If the Supplier, having been notified, fails to remedy the defect(s) within thirty days, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

14. Payment

14.1. As stipulated in the NIT and the resultant contracts.

14.2. **Payment for Indian Agency Commission**

The payment of Indian Agency Commission, if any, involved, may be considered in case of necessity, subject to compliance of the Government of India guidelines issued from time to time. Agency commission, if any, shall be paid in equivalent Indian Rupees, after erection and commissioning of the equipment, wherever applicable, within twenty-one days of submission of bills along with following documents:

A) Copy of foreign principal's invoice.
B) Copy of bill of lading.
C) Certificate from State Bank of India regarding Bill selling exchange rate ruling on the date of bill of lading (in case of bank holiday on date of bill of lading, Bill Selling exchange rate on next working day shall be considered).
D) In case of procurement of equipment, commissioning certificate signed by the concerned officials of the Project and counter-signed by the Area General Manager and HOD of Technical Dept. of the subsidiary company, where the equipment has been deployed.

14.3. In order to enable the purchaser to avail Input Tax Credit as per applicable Indian laws, the supplier shall furnish all the necessary documents to the consignee / paying authority as required, failing which the equivalent deduction will be made from the supplier's bills. In case of successful bidder(s), if at the time of supply, it is found that Input Tax Credit as per Invoice (Credit available to CIL / Subsidiary on this account) is less than the "Input Tax Credit Amount" declared in the Price Bid, the differential amount between the two shall be deducted from the Supplier's bills while making payment to them.

If the evaluation of the supplier has been made considering the concessional rate of customs duty applicable for import from certain countries under trade agreements / treaties with Govt. of India, all the required documentation for availing concessional customs duty and subsequent customs clearance etc. will be provided by the supplier failing which the equivalent deduction will be made from their bills.

15. Changes in Order

The Purchaser may at any time, by a written order given to the Supplier, make changes within the general scope of the Contract in any one or more of the following:

a) drawings, designs or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;
b) the method of shipment or packing;
c) the place of delivery; and/or
d) the place of Services to be provided by the Supplier.

16. Contract Amendments

Subject to relevant clause of GCC, no variation in or modification of the terms of the Contract / Purchase Order shall be made except by written amendment issued against the Contract / Purchase Order.

17. Assignment

The Supplier shall not assign, in whole or in part, its obligations to perform under this Contract, except with the Purchaser's prior written consent. However, the consent of the Purchaser shall not relieve the supplier from any obligation, duty or responsibility under the contract.

18. Subcontracts

The Supplier shall notify the Purchaser in writing of all subcontracts awarded by it to discharge the works under this Contract. Such notification, in the original bid or later, shall not relieve the Supplier of any liability or obligation under the Contract and the supplier will be solely responsible for all obligations under the contract.

19. Delays in the Supplier's Performance

19.1. Delivery of the Goods and performance of Services shall be made by the Supplier in accordance with the time schedule prescribed by the Purchaser in the Schedule of Requirements.

19.2. If at any time during performance of the Contract, the Supplier or its Subcontractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Supplier shall promptly notify the Purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, with or without liquidated damages, by way of an amendment to the Contract / Purchase Order.

19.3. Except as provided under Force Majeure clause, a delay by the Supplier in the performance of its delivery obligations shall render the Supplier liable to the imposition of liquidated damages, unless an extension of time is agreed upon pursuant to relevant clause without the application of liquidated damages.

20. Liquidated Damages

20.1. In the event of failure to deliver or dispatch the equipment / stores within the stipulated date / period in accordance with the terms and conditions and the specifications mentioned in the supply order and in the event of breach of any of the terms and conditions mentioned in the supply order, the Purchaser shall have the right:

(a) To recover from the successful bidder as agreed liquidated damages, a sum not less than 0.5% (Half Percent) of the price of any equipment / stores which the successful tenderer has not been able to supply as aforesaid for each week or part of a week during which the delivery of such stores may be in arrears limited to 10% (Ten Percent) of the total contract value, or

(b) To purchase elsewhere after due notice to the successful tenderer on the account and at the risk of the defaulting supplier, the equipment / stores not supplied or others of similar description without cancelling the supply order in respect of the consignment not yet due for supply, or

(c) To cancel the supply order or a portion thereof, and if so desired to purchase the equipment / stores at the risk and cost of the defaulting supplier and also,

(d) To extend the period of delivery with or without penalty as may be considered fit and proper. The penalty, if imposed, shall not be more than the agreed liquidated damages referred to in clause (a) above.

(e) To forfeit the security deposit fully or in part.

(f) Whenever under this contract any sum of money is recoverable from and payable by the supplier, the Purchaser shall be entitled to recover such sum by appropriating in part or in whole by deducting any sum or which at any time thereafter may become due to the successful tenderer in this or any other contract. Should this sum be not sufficient to recover the full amount recoverable, the successful tenderer shall pay the Purchaser on demand the remaining balance. The supplier shall not be entitled to any gain on any such purchase.

20.2. For the purpose of the calculation of the liquidated damages amount, the basic FOR Destination price shall be considered. For direct imports, the CIP price at Final Place of destination will be considered. Taxes and duties shall not be taken into account for calculation of LD. However, when prices indicated in the order are inclusive of taxes and duties, such prices will be taken for calculation of LD.

21. Termination for Default and breach of contract

21.1. The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate the Contract in whole or in part:

(a) If the supplier fails to deliver any or all of the stores within the time period(s) specified in the contract, or any extension thereof granted by the Purchaser; or

(b) If the supplier fails to perform any other obligation under the contract within the period specified in the contract or any extension thereof granted by the purchaser; or

(c) If the Supplier, in the judgement of the Purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

21.2. Code of Integrity for Public Procurement (CIPP):

The supplier shall observe the highest standard of ethics while competing for and during execution of contracts.

The following practices would amount to violation of CIPP:

i. "Corrupt Practice" means making offers, solicitation or acceptance of bribe, rewards or gifts or any material benefit, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process or contract execution;

ii. "Fraudulent Practice" means any omission or misrepresentation that may mislead or attempt to mislead so that financial or other benefits may be obtained or an obligation avoided. This includes making false declaration or providing false information for participation in a tender process or to secure a contract or in the execution of a contract;

iii. "Anti-competitive Practice" means any collusion, bid rigging or anti-competitive arrangement, or any other practice coming under the purview of The Competition Act 2002, between two or more bidders, with or without the knowledge of the Purchaser, that may impair the transparency, fairness and the progress of the procurement process or to establish bid prices at artificial, non-competitive levels;

iv. "Coercive Practice" means harming or threatening to harm, directly or indirectly, at any stage, persons or their property to influence their participation in the procurement process or affect the execution of a contract;

v. "Conflict of interest" means participation by a bidding firm or any of its affiliates that are either involved in the consultancy contract to which this procurement is linked; or if they are part of more than one bid in the procurement; or if the bidding firm or their personnel have relationships or financial or business transactions with any official of Procuring Entity who are directly or indirectly related to tender or execution process of contract; or improper use of information obtained by the (prospective) bidder from the

Procuring Entity with an intent to gain unfair advantage in the procurement process or for personal gain; and

vi. "Obstructive practice" means materially impede the Procuring Entity's investigation into allegations of one or more of the above mentioned prohibited practices either by deliberately destroying, falsifying, altering; or by concealing of evidence material to the investigation; or by making false statements to investigators and/or by threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or by impeding the Procuring Entity's rights of audit or access to information.

21.3. In the event the Purchaser terminates the Contract in whole or in part, pursuant to relevant clause, the Purchaser may procure on such terms and in such manner as it deems appropriate, Goods or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

22. Force Majeure

22.1. Force Majeure means an event beyond the control of the supplier and not involving the supplier's fault or negligence and which is not foreseeable. Such events may include, but are not restricted to, acts of the purchaser either in its sovereign or contractual capacity, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, freight embargoes and act of God.

22.2. If there is delay in performance or other failures by the supplier to perform its obligation under the contract due to an event of a Force Majeure and the contract is governed by Force Majeure Clause, the supplier shall not be held responsible for such delays / failures.

22.3. In such a situation, the supplier shall promptly notify the purchaser in writing of such conditions and the cause thereof, duly certified by the local Chamber of Commerce or Statutory authorities, the beginning and end of the causes of the delay, within twenty-one days of occurrence and cessation of such Force Majeure Conditions. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

22.4. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side.

22.5. For delays arising out of Force Majeure, the supplier will not claim extension in completion date for a period exceeding the period of delay attributable to the causes of Force Majeure.

22.6. There may be a Force Majeure situation affecting the purchaser also. In such a situation, the purchaser is to take up with the supplier on similar lines as above for further necessary action.

22.7. The contract shall be governed by the following Force Majeure Clause:

"If at any time, during the continuance of this contract, the performance in whole or in part by either party of any obligation under this contract shall be prevented or delayed by reason of any wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, freight embargoes or act of God (hereinafter referred to "events") provided, notice of the happening of any such event is given by either party to the other within 21 days from the date of occurrence thereof, neither party shall by reason of such event, be entitled to terminate this contract nor shall either party have any claim for damages against the other in respect of such non- performance or delay in

performance, and deliveries under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist, PROVIDED FURTHER that if the performance in whole or part or any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 60 days, either party may at its option terminate the contract provided also that if the contract is terminated under this clause, the purchaser shall be at liberty to take over from the contractor at a price to be fixed by the CIL / Subsidiary Company, which shall be final, all unused, undamaged and acceptable materials, bought out components and stores in course of manufacture in the possession of the contractor at the time of such termination or such portion thereof as the purchaser may deem fit excepting such materials, bought out components and stores as the contractor may with the concurrence of the purchaser elect to retain. "

23. Termination for Insolvency

The Purchaser may at any time terminate the Contract by giving written notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Purchaser.

24. Termination for Convenience

24.1. The Purchaser, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.

24.2. The Goods that are complete and ready for shipment within thirty (30) days after the Supplier's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:

a) to have any portion completed and delivered at the Contract terms and prices; and / or

b) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Services and for materials and parts previously procured by the Supplier.

25. Governing Language

The Contract shall be written in English language. All correspondence and other documents pertaining to the Contract which are exchanged by the Parties shall be written in the same language.

26. Taxes and Duties

26.1. A foreign Supplier shall be entirely responsible for all taxes, duties, license fees and other such levies imposed outside the Purchaser's country. The foreign supplier shall also be responsible for all taxes & duties in Purchaser's country legally applicable during execution of the contract other than those which are to be paid by purchaser, as specified in as per relevant clause of NIT.

26.2. A Domestic Supplier shall be entirely responsible for all taxes, duties, licence fees etc., incurred until the execution of the contract, other than those which are to be paid by purchaser, as specified in as per relevant clause of NIT.

27. Limitation of Liabilities

Except in case of criminal negligence or willful misconduct.

27.1. Notwithstanding anything herein to the contrary, no party shall be liable for any indirect, special, punitive, consequential or exemplary damages, whether foreseeable or not, arising out of or in relation to this contract, loss of goodwill or profits, lost business however characterised, any/ or from any other remote cause whatsoever.

27.2. The supplier shall not be liable to the purchaser for any losses, claims, damages, costs or expenses whatsoever arising out of or in connection with this contract in excess of the contract value of the equipment supplied hereunder which caused such losses, claims, damages, costs or expenses.

27.3. However, the limitation of liability of the supplier indicated above shall not apply to Liquidated damages.

28. Settlement of commercial disputes in case of contracts with Public Sector Enterprises/ Govt. Dept.(s)

28.1. In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between CPSEs and Government Departments / Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for its resolution through Administrative Mechanism for Resolution of CPSEs Disputes (AMRCD), as per the guidelines stipulated in the Office Memorandum No. 4(1)/2013-DPE(GM)/FTS-1835 dated 22.05.2018 of Department of Public Enterprises, Ministry of Heavy Industries and Public Enterprises, Govt. of India.

28.2. In case of contract with a Public Sector Enterprise or Govt. Dept., the following Arbitration Clause shall be incorporated in the contract: -

"In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/ Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD as mentioned in DPE OM No. 4(1)/2013-DPE(GM)/FTS- 1835 dated 22.05.2018."

29. Progress Reports

29.1. The Supplier shall from time to time render such reports concerning the progress of the contract and/or supply of the stores in such form as may be required by the Purchaser.

29.2. The submission, receipt and acceptance of such reports shall not prejudice the right of the Purchaser under the contract nor shall operate as an estoppel against the Purchaser merely by reason of the fact that he has not taken notice of or objected to any information contained in such report.

30. Provisions of CIL's Purchase Manual

The provisions of CIL's Purchase Manual and its subsequent amendments (Available on CIL's website, www.coalindia.in) shall also be applicable, if not specified otherwise in this Bid document.

31. Applicable Law

The Contract shall be governed by the laws of the Republic of India, unless otherwise specified in the bid document.

32. Jurisdiction of Courts

32.1. Irrespective of the place of delivery, the place of performance or place of payment under the contract, the contract shall be deemed to have been made at the place from where the acceptance of tender or supply order has been issued.

32.2. The courts of the place from where the acceptance of tender has been issued shall alone have jurisdiction to decide any dispute arising out of or in respect of the contract.

33. Notices

33.1. Any notice given by one Party to the other pursuant to this Contract shall be sent to the other Party in writing or facsimile to be confirmed in writing, to the other Party's address. For the purpose of all notices, the following shall be the addresses of the Purchaser and the Supplier:
Purchaser:
General Manager (MM)
Bharat Coking Coal Limited
Materials Management Division
Level-III, Commercial Block, Koyla Bhawan
Koyla Nagar, Dhanbad, Jharkhand, India- 826 005.
Fax No.: +91 0326-2230183, Phone: +91 0326-2230181.
Supplier:
[----------
Fax No.: +91 ----------
Phone: +91 ----------]

33.2. A notice shall be effective when delivered or on the notice's effective date, whichever is later.

33.3. In case of change in address, the Supplier shall immediately notify the same to the Purchaser in writing. The supplier shall be solely responsible for the consequences of omission to notify the change of address to the Purchaser.

Section -Special Conditions of the Contract (SCC)

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions contained herein shall prevail over those in the General Conditions of Contract. The corresponding Clause number of the General Conditions is indicated in parentheses.

1. Security Deposit (GCC clause–6)

1.1 In case of FOR destination contract in Indian Rupees, the total landed value of the contract will be arrived at after adding GST and any other tax and duty, if applicable and any other cost and charge, if applicable, to the FOR Destination price of the ordered Equipment and Spares & Consumables for first 12 months warranty period from installation of equipment and thereafter Spares & Consumables for a period of 48 months.

1.2 The Security Deposit may be in the form of a Bank Demand Draft/Banker's Chequeor in the form of a Bank Guarantee as per format enclosed at Annexure-4 Sample Forms, Section-VII, from a RBI Scheduled Bank in purchaser's country (on a non- judicial stamp paper) within 15 days from date of notification of award.

1.3 The SDBG will be submitted Through Structured Financial Management System (SFMS). The SDBG issued by issuing bank on behalf of the bidder in favour of "Bharat Coking Coal Ltd.," shall be in paper form (Stamp Paper) as well as issued under "Structured Financial Messaging System". Issuing Bank should send the underlying confirmation to either of following banks:

Name of beneficiary & its details	Name	Bharat Coking Coal Limited
	Area	HQ,BCCL
	Bank Account no.	35160317947
	Deptt.	MM Department
Beneficiary Bank, Branch & Address	State Bank of India	
	Main Branch Dhanbad	
IFSC code	SBIN0000066	

Or

Name of beneficiary & its details	Name	Bharat Coking Coal Limited
	Area	HQ,BCCL
	Bank Account no.	019605001057
	Deptt.	MM Department
Beneficiary Bank, Branch & Address	ICICI Bank	
	ICICI Bank, Dhanbad	
IFSC code	ICIC0000196	

Original copy of the Bank Guarantee issued by the Issuing Bank shall be sent by the issuing bank to MM department, BCCL.

1.10 If the successful tenderer fails to deposit the security deposit within 30 (thirty) days from date of notification of award, or fails to extend the Bank Guarantee for Security Deposit, suitably as required, the same shall be recorded as unsatisfactory performance for future dealings apart from taking any other penal action as may be deemed fit by BCCL.

1.11 Failure of the successful bidders to comply with the above requirement of Security Deposit shall constitute sufficient ground for the annulment of the award and forfeiture of the Earnest Money Deposit.

2. Performance Bank Guarantee (PBG) (GCC Clause7)

2.1 The PBG will be required to be submitted to Paying Authority of BCCL.

2.2 The Performance Guarantee shall be in the form of a Bank Guarantee issued by a RBI scheduled bank in India in the format attached at Annexure-5 ,Sample Forms, Section-VII on a non-judicial stamp paper.

2.3 The PBG(s) shall remain valid till 3 months after the completion of 60 months period from the date of commissioning of respective equipment covered in the contract.

2.4 The PBG issued by Issuing bank on behalf of the bidder in favour of "Bharat Coking Coal Limited" shall be in paper form (Stamp Paper) as well as issued under "Structured Financial Messaging System". The details of beneficiary Bank for issue of BG through SFMS Platform is mentioned in above SDBG clause.

Original copy of the PBG issued by the Issuing Bank shall be sent by the issuing bank to concerned subsidiary.

2.5 The release of the Performance Bank Guarantee(s) after above indicated period shall be subject to satisfactory performance of the equipment during 60 months period from the date of commissioning of the equipment and fulfillment of contractual obligations failing which, action for further extension or encashment of PBG, as deemed suitable shall be taken. Release of PBG for each equipment may be done separately on satisfactory performance of the respective equipment as above.

2.6 In case of successful tenderer which does not have the After Sales Service Support facilities in India, Performance Bank Guarantee for the 30% value of the total landed value of the contract including all taxes, duties and other costs and charges as defined in clauses 1.2 above shall have to be submitted to BCCL (HQ). This 30% PBG will be released after establishment of After Sales Service Support facilities in India for the ordered equipment within completion of warranty period of the first equipment commissioned or earlier subject to confirmation of the same by GM Area, BCCL Area where the equipment(s) have been deployed in consultation with GM/HOD (Excavation) BCCL. However, the supplier shall have to submit PBG for 10% of the total contract value to be kept valid for the remaining period of the contract plus 3 months processing period before release of 30 % PBG. The total contract period is 60 months from the date of commissioning of respective equipment covered in the contract. This10% PBG will be released after satisfactory performance of all equipment and fulfillment of contractual obligations.

2.7 In cases where the supplier does not submit the PBG in time or as per the prescribed format in line with the contract stipulations, the PBG amount may be deducted from the first bill or in case of insufficient amount, from subsequent bill(s) of the supplier till the full PBG amount is deducted. This amount shall be refunded to the supplier upon acceptance of PBG submitted by them.

3. Inspection and Test (GCC Clause 8)

3.1 Pursuant to Clause 8.1 of the GCC, details of specific inspections and/or tests to be carried out at the Supplier's works and/or at the Site(s) are given in Section VI, Technical Specifications.

4. Payment (GCC Clause 14)

4.1 Payment shall be made in the currency or currencies specified in the contract in the following manner:

4.1.1 For Payment of equipment and consumable spares and consumables for first 12 months of warranty period from the date of commissioning of the equipment in Indian Rupees:

i) 80% value of the equipment and consumable spares and consumables for first 12 months of warranty period from the date of commissioning of the equipment and 100% taxes and duties and other charges excluding erection & commissioning charges shall be made within 21 days after receipt and acceptance of materials at site at the consignee's end and acceptance of Performance Bank Guarantee valid till 3 months after the completion of 60 months period from the date of commissioning of all the equipment covered in the contract.

ii) Balance 20% payment including erection & commissioning charges shall be made after successful completion of erection, testing, commissioning and final acceptance of the equipment (along with the accessories) upon presentation of successful commissioning certificate, signed by the concerned officials of the Project and counter-signed by the Area General Manager and HOD of Excavation Deptt. Of BCCL, where the equipment has been deployed and confirmation of receipt of spares and consumables for first 12 months of warranty period from the date of commissioning of the equipment by the paying authority.

iii) Freight and transit insurance charges shall be paid at actual subject to ceiling of the quoted rates/prices.

4.1.2. For Payment of spares and consumables for 48 months after the warranty period of 12 months from the date of commissioning of the equipment in Indian Rupees:

100% value of the supplementary items as per scope of supply and 100% taxes and duties and other charges shall be made within 21 days after receipt and acceptance of materials at consignee's end.

4.2.1. Submission of Documents for Payment in Indian Rupees for equipment

For payment for equipment in Indian Rupees, the supplier will submit the following documents along with bills to the paying authority:

a. Four copies of the Supplier's invoice, Pre-Receipted and Stamped showing Contract Number, Goods description, quantity, unit price, total amount and GST No. of Ultimate Consignee.
b. Receipted Challan/ Consignment Note of all the consignments.
c. Manufacturer's Test & Inspection Certificate.
d. Manufacturer's Warranty /Guarantee Certificate.
e. Lowest Price Certificate
f. Copy of Performance Bank Guarantee
g. Documentary evidence for freight and transit insurance charges up to the destination.
h. Copy of Certificate of Insurance.
i. Any other document(s) required as per contract.

4.2.2. Submission of Documents for Payment in Indian Rupees for spares and consumables as per scope of supply:

For payment for Spares and consumables in Indian Rupees, the supplier will submit the following documents along with bills to the paying authority:

a. Four copies of the Supplier's invoice, Pre-Receipted and Stamped showing Contract Number, Goods description, quantity, unit price, total amount and GST No. of Ultimate Consignee.
b. Receipted Challan/ Consignment Note of all the consignments.
c. Lowest Price Certificate
d. Any other document(s) required as per contract.

4.3 Paying Authority

The Paying Authority shall be HoD (Finance) MM of company Headquarter i.e. BCCL.

5. **Lowest Price Certificate**

The Tenderer should submit a certificate along with the offer confirming the prices quoted in the Tender are the lowest and not higher than as applicable to other Govt. Deptts./ Undertakings including other Subsidiaries of CIL/ Private Organisations for equipment of same specifications.

6. Price Fall Clause

The Bidder undertakes in CPS that it has not offered to supply/ supplied/ is not supplying same or similar product/ systems or sub systems at a price lower than that offered in the present bid in respect of any Organization/ Ministry/ Department of the Govt. of India or Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization during the currency of the contract and if it is found at any stage that same or similar product/ systems or sub systems was supplied by the bidder to any Organization/ Ministry / Department of the Govt. of India or Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization at a lower price during the currency of the contract, then that very price will be applicable to the present case and the difference in the cost would be refunded by the bidder to buyer, if the contract has already been concluded.

(i) The currency of contract will mean the period till completion of supply.

(ii) The bidder will be asked to submit a copy of the last (latest) purchase order for the similar/ordered item(s)received by them from any Organization / Ministry / Department of the Govt. of India Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization, along with the offer. Bidder may opt to mask the price portion and submit an undertaking that price copy will be submitted on being L-1 on opening of price bid/ reverse auction.

(iii) It shall be responsibility of the supplier to inform the purchaser of offer to supply /supply of the similar/ordered item(s) at a lower rate to any Organization / Ministry / Department of the Govt. of India or Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization during the currency of the contract.

(iv) The supplier shall submit a certificate along with the bill(s) that it has not offered to supply/ supplied the similar/ordered item(s) at a lower rate to any Organization/ Ministry/ Department of the Govt. of India or Coal India Ltd. and/or its Subsidiaries or other PSU or any other private organization.

7. Banned or De-listed suppliers

The bidders as well as the manufacturer (if bidder is not the manufacturer) would give a declaration in CPS that they have not been banned or de- listed or debarred or 'Put on Holiday' by any Government or Quasi-Government agencies or PSUs in India. If a bidder has been banned by any Government or Quasi-Government agencies or PSU in India, this fact must be clearly stated and it may not necessarily be a cause for disqualifying him. If this declaration is not given, the bid may be liable for rejection. The declaration format is built in the Letter of Bid (LOB) which shall be filled in by the bidder suitably. In case India Agent or Indian Office or Indian Subsidiary of a Foreign Manufacturer / Indian Subsidiary of an Indian Manufacturer is quoting against the tender, the equipment manufacturer will also give a declaration towards' Banned or De-listed suppliers in the Manufacturer's Authorisation Form, Annexure-3, Sec-VII, Sample Forms.

8. Distribution of Order

(i) BCCL reserves the right to distribute the total required/tendered quantity. If L1 bidder is not capable of quoting the full tendered quantity due to capacity constraints, BCCL may place order on the L2 (next higher) bidder for the balance tendered quantity subject to L2 bidder matching the price of L1 bidder on Landed Price (FOR Destination/CIP named place of destination inclusive of all taxes & duties) basis. In case L2 bidder does not match the L1 price, BCCL reserves the right to go to higher ranked bidders in sequence (i.e. L3, L4 ....) and place order for balance tendered quantity on the next higher bidder matching the price of L1 bidder. In case the higher bidder turns out to be an Overseas

Bidder quoting the price on CIP Basis, the bidder shall be asked to match the L-1 price by proportionately working out the CIP price on the basis of their Landed Price in Indian Rupees calculated for evaluation, as on the date of price bid opening.

Above distribution will also be subject to Purchase Preference to certain categories of bidders falling under 'Make In India' policy and MSEs.

(ii) While counter offering, the L1 price comprising the sum total of Landed Price of Equipment + Net Landed Price of supplementary items, to be supplied as per scope of supply offered by the L1 bidder shall be considered. L2 or higher bidder as the case maybe, shall match this sum total comprising above three elements.

9. Deemed Exports

If the bidder has quoted the items under the deemed exports, then it will be the responsibility of the bidder to get all the benefits under deemed exports from the Government. CIL/Subsidiary Companies responsibility shall only be limited to the issuance of required certificates. The quotation will be unconditional and phrases like "subject to availability of deemed exports benefit" etc. will not be accepted.

10. Deviation

Deviations sought by the bidders, whether these are commercial or technical deviations, must only be given in the prescribed schedules. Any attempt by the bidders to camouflage the deviations by giving them in the covering letter or other documents than the prescribed schedules may render the bid non-responsive.

11. Extension of Delivery Period

If the supplier is unable to complete the supply within the stipulated delivery period for which the supplier is responsible, it (supplier) is required to request for extension of delivery period. Delivery extension may be granted with or without reserving purchaser's right to levy LD depending upon the merit of the case, provided the materials are still required by the consignee (s) even after expiry of the stipulated delivery period. The above extension of delivery date will also be subject to the following further conditions:-

a) That no increase in price on account of any statutory increase in or fresh imposition of customs duty, excise duty, sales tax, CST, VAT, GST or on account of any other tax or duty leviable in respect of the stores specified in the said contract which takes place after.....(Insert here the original delivery date) shall be admissible on such of the said stores as are delivered after the said date and

b) That notwithstanding any stipulation in the contract for increase in price on any other ground (including foreign exchange rate variation) no such increase which takes place after.....(Insert here the original delivery date) shall be admissible in such of the said stores as are delivered after the said date.

c) But, nevertheless, the purchase shall be entitled to the benefit of any decrease in price on account of reduction in or remission of customs duty, excise duty, sales tax, GST or on account of any other tax or duty or on any other ground, stipulated in the price variation clause which takes place after the expiry of the above mentioned date namely..... (Insert here the original delivery date),

d) Imposition of liquidated damages shall be as per GCC

12. Grace Period

a) A grace period of 25% of original delivery period or 21 days, whichever is earlier, will be provided automatically in all the contracts, unless specifically disallowed. Where supplies are made within the grace period, there is no necessity for any extension in delivery period and the paying authorities will make payment without any amendment to the contract delivery period. No liquidated damages are leviable in respect of supplies made within the grace period. The extra expenditure, the purchaser may have to incur on account of increase/fresh imposition of GST/CST/VAT, Excise/Customs Duty etc. which takes place within the above grace period will also not be recoverable from the suppliers.

b) The grace period is allowed as a matter of grace and is not intended to operate as extension of the delivery period and the same will be available only for delivery and not for offering stores for inspection(in cases of pre-dispatch inspections) which should be made within the original delivery period or the re-fixed date of delivery.

c) If the stores are tendered for pre-dispatch inspection within the original delivery period stipulated in the contract and the firm delivers the stores within the grace period, the purchaser is bound to accept the stores even though the inspection was completed after the delivery date.

d) The grace period will only apply to the original contract delivery period/refixed delivery period and will not be applicable once an extension of delivery has been granted.

e) In case of phased delivery, the grace period will be applicable to each phase separately, within the original Contract Delivery Period / Re-fixed Delivery Period.

13. Risk Purchase

a) In the event of failure of the supplier to deliver or dispatch the stores within the stipulated date/period of the supply order or in the event of breach of any of the terms and conditions mentioned in the supply order/ contract, BCCL shall have the right to purchase the stores from elsewhere after due notice to the defaulting supplier at the risk and cost of the defaulting supplier. The cost as per risk purchase exercise may be recovered from the Earnest Money Deposit/ Security Deposit/ Performance Security of the supplier and/or bills submitted by the supplier against the same contract or any other contract pending in the BCCL and/or in any other Subsidiary Companies / CIL.

b) Risk purchase action may be initiated as a last resort, under any of the following conditions:

(i) When the supplier fails to deliver the materials even after extending the delivery period.

(ii) When the supplier fails to respond to purchaser's request for supply of the materials and fails to provide any genuine and bonafide reason for the delay in supply.

(iii) When the supplier breaches any of the terms and conditions of the supply order/ contract and as a result fails to execute the order satisfactorily.

14. TReDS: Trade Receivables Discounting System (TReDS) is an initiative of Reserve bank of India (RBI) to facilitate MSME receivable payments from corporates. BCCL has on boarded TReDS platform thro' Receivables Exchange of India Ltd (RXIL) (URL - https://www.rxil.in/Home/Index). MSE bidders willing to get payment thro' this system may get registered on TReDS platform and confirm in offer and the same would be mentioned in the purchase order. The bidder may contact Mr. Mainak Mandal, AVP, Business Development, RXIL, Mob: +91 9475622182 (email-mainak.mandal@rxil.in) for help in registration.

15. Price : Prices stated in the contract shall remain firm and fixed throughout the period of the Contract.

16. Applicability of GST on Liquidated damages, EMD and/or Security Deposit forfeiture:
GST shall be applicable on liquidated damages, EMD and/or Security Deposit forfeiture and will be extra and recovered from suppliers/bidders

17. Spare Parts

The Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier:

a) Such spare parts as the Purchaser may elect to purchase from the Supplier, provided that this election shall not relieve the Supplier of any warranty obligations under the Contract ;and

b) In the event of termination of production of the spare parts;

i. advance notification to the Purchaser of the pending termination, in sufficient time to permit the Purchaser to procure needed requirements and

ii. following such termination, furnishing at no cost to the Purchaser, the manufacturing drawings, material specifications and all necessary permissions to facilitate manufacture of the Spare Parts elsewhere

c) Supplier shall carry sufficient inventories to assure ex-stock supply of consumable and fast moving spares. The provision of Spare Parts by the Supplier to the Purchaser shall be governed by Part C.6 of Section VI (Technical Specifications).

18. Incidental Services

The Supplier may be required to provide any or all of the following Services, including additional Services as given below:

a) Performance or supervision of on-site assembly and/or start-up of the supplied Goods;

b) Furnishing of tools required for assembly and/or maintenance of the supplied Goods;

c) Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;

d) Performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the Parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract.

e) Training of the Purchaser's personnel, at project site and manufacturer's training facility available in India.

The following Services, pursuant to above, shall be provided by the Supplier:

(a) Erection, Testing and Commissioning

The supplier shall be responsible for the delivery, erection, commissioning and testing of each equipment as detailed in the Schedule of Requirements (Section-V) and the Technical Specifications (Section-VI).

The purchaser will provide necessary facilities like erection tools and tackles etc. (supplied by the bidder as per Clause A2. with the equipment for this purpose), electricity and fuel required for testing only.

If the supplier fails to commission the equipment within the specified period as incorporated in the NIT, Liquidated damages will be recovered @ 0.5% of the landed price of the equipment along with accessories per week or part thereof for the delayed period subject to a maximum of 10% of the landed price of equipment along with accessories including erection and commissioning charges.

(b)Tools

Furnishing of tools required for assembly and maintenance of the supplied Goods as detailed in the Schedule of Requirements (Section-V) and the Technical Specifications (Section-VI). A complete list as per clause-A.2 of Technical Specifications (section-VI) is to be furnished by the supplier.

(c) Manuals

Furnishing of detailed operating, repair, maintenance and spare parts manuals as detailed in the Technical Specifications (Section-VI).

(d) Training

Training of the Purchaser's personnel as detailed in the Schedule of Requirements (Section-V) and the Technical Specifications (Section-VI). The cost of such Services shall be included in the Contract Price.

The Supplier shall be responsible for arranging and the cost of all necessary tickets, visas, permits, foreign exchange and any other matter or facility for visits of the Supplier's personnel for the purposes of Erection, Testing and Commissioning the Equipment and/or Training of the Purchaser's personnel - the Purchaser shall have no responsibility in this regard except in respect of issuance of letters supporting visa applications as may reasonably be requested by the Supplier. The Supplier shall be responsible for paying taxes, if any, including personal income tax and surcharge on income tax, for which it or its personnel may become liable.

19 . Jurisdiction of Courts (clause no. 32of GCC) , any dispute arising out of this enquiry shall come under the sole jurisdiction of the Dhanbad/Jharkhand High Court, (INDIA).

xxx

ANNEXURE-E 74/199

Tender Inviting Authority: GM (MM) BCCL HQ	
Name of Work: Supply, Installation and Commissioning of 26 nos of 60T Rear Dumpers along with 5 (1+4) years spares & Consumables	
NIT Tender No.: BCCL/Pur/422011/60T Dumper/OTE-RA/22-23/24 dated: 01.06.2022	
Bidder Name:	BEML LIMITED

TECHNICAL PARAMETER SHEET

S. No *	Item Code *	Description of Item *	Bidder's Eligibility Status	Specification Parameter *	Unit of Measure *	Evaluation Criteria (To be selected from drop down box in each cell) *	Required Value *	Bidder's value *	Eligibility		Remarks by bidder, if any
									Specification wise	Overall	
1	Item1	Supply, Installation and Commissioning of 60T Rear Dumper along with 5 (1+4) years spares & Consumables	0	"Scope of supply" as per NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Schedule of Requirements" as per Section-V of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Schedule of Requirements of Services" as per Section-V of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Instruction to Bidders" as per Section-V of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical response" as per Section-V of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Site Visit" as per Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				PART B:- "Specific Site Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"General Requirements" as per Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Geography and Climatic Conditions "PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Goods (Equipment and Machinery) "PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Services"PART C:- General Requirements" of of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Standards"PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Suppliers Responsibility"PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Spare Parts Provisions"PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Gauranteed Availability Provisions "PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Deemed Breakdown "PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Composite-warranty/guarantee "PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Quality Assurance "PART C:- General Requirements" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Scope of specification" as per "Equipment Specification" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"References" as per "Equipment Specification" of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Design criteria" as per "Equipment Specification" of Section-VI ofNIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Engine" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification-Transmission" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Drive System" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- "Propel and final drive" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification-"Suspension" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification-"Steering" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Hoses" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Breaks" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Service breaks" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Secondary Break" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Parking Break" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification-Retarder " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	COMPLIED	
				"Technical Specification- Tyre" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Frame" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Dump Body" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
				"Technical Specification- Fuel Tank" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		

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"Technical Specification- Lubrication System" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification-AFDSS " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Fire Extinguisher " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Operator's station " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Operator's Cab " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Operator's protective structure " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Operator's seat " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Operator's control and indicators " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- starting and stopping system " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Guages & Indicator " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Warning alarm/Lights " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Engine Electrical system" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Linghtings" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- Guards & Shields " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Ancillary equipment and other safety requirements " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
Safety Features " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification- productivity and health monitoring system " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Special Guarantee" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification-Performance guarantee " as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Expected life of major assemblies" as per "Equipment Specification" of Section-VI NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
"Technical Specification-11.1 General,11.2 Technical details, 11.3 Dimensions, weights and performance details" as per Section-VI of NIT(details to be uploaded separetly in relevent upload section)	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
Supplementary Items, Information and drawing, Erection, Assembly, Commissioning, Performance testing, and Training as per Scope of Supply of Section-VI of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
All other remaining Technical Clauses & Terms of the NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
Specify make and model	NA	NOT NULL	NOT NULL	Make: BEML Model: BH60M Dumper	TRUE		
Specify Offered Quantity within the specified Delivery Schedule of NIT	No.	NOT NULL	NOT NULL	26	TRUE		

***TECHNICAL PARAMETER SHEET

***PLEASE ENTER THE DETAILS AS PER THE INFORMATION AND DOCUMENTS YOU HAVE W.R.T. YOUR OFFERED ITEM/S

BY TENDER INVITING AUTHORITY

ANNEXURE-F

STANDARD TOOL LIST

Model: BH60M (Per Eqpt)

Sl. No	Part No	Part description	Qty / Eqpt	UOM
1	**958TI02018**	**ALLEN KEY SET consists of following**	1 Set	
a	990TI11126	ALLEN KEY 3/8"	1	NO
b	990TI11118	ALLEN KEY 1/4"	1	NO
c	990TI11101	ALLEN KEY 7/32"	1	NO
d	990TI11094	ALLEN KEY 3/16"	1	NO
e	985TI11274	ALLEN WRENCH - 8MM	1	NO
f	985TI11282	ALLEN WRENCH - 6 MM	1	NO
g	985TI11777	ALLEN KEY 4mm	1	NO
2	**958TI02026**	**SOCKET 1/2" SQUARE DRIVE HEX/ BI-HEX consists of following**	1 Set	
a	990TI11183	BI-HEX/HEX SOCKET 1/2"SQ.DRIVE 3/4"	1	NO
b	985TI11371	BI-HEX/HEX SOCKET 1/2"SQ.DRIVE 5/8"	1	NO
c	935TI11741	BI-HEX/HEX SOCKET 1/2"SQ.DRIVE 1/2"	1	NO
d	451TI11202	BI-HEX / HEX SOCKET 1/2" SQ. DR - 30MM	1	NO
e	451TI11186	BI-HEX/ HEX SOCKET 1/2" SQ.DRIVE - 24 MM	1	NO
f	451TI11161	BI-HEX/ HEX SOCKET 1/2" SQ.DRIVE - 19 MM	1	NO
g	985TI11809	BI-HEX/HEX SOCKET 1/2" SQ DR - 18 MM	1	NO
h	451TI11153	BI-HEX/ HEX SOCKET 1/2" SQ.DR - 17 MM	1	NO
i	985TI11793	BI-HEXAGONAL SOCKET 1/2" SQ DR - 16 MM	1	NO
j	451TI11145	BI-HEX/ HEX SOCKET 1/2" SQ. DR - 14MM	1	NO
3	**958TI02034**	**BIHEXAGONAL/HEXAGONAL SOCKET SET consists of following**	1 Set	
a	958TI11017	3/4" SQ DR SOCKET 1 7/8"	1	NO
b	990TI11231	BI-HEX SOCKET 3/4" SQ.DR. - 1-1/2"	1	NO
c	985TI11914	3/4" SQ DR BI-HEXAGONAL SOCKET 32 MM	1	NO
d	985TI11882	3/4" BI-HEXAGONAL SOCKET 24 MM	1	NO
4	**958TI02042**	**SOCKET 1' SQUARE DRIVE consists of following**	1 Set	
a	985TI11939	BI HEX SOCKET 1" SQ DR - 46 MM	1	NO
5	**990TI01074**	**SCREW DRIVER SET consists of following**	1 Set	
a	451TI11032	ENGG. PATTERN SCREW DRIVER - 5 X 75 MM	1	NO
b	990TI11329	ENGG. PATTERN SCREW DRIVER - 8 X 200 MM	1	NO
c	990TI11337	ENGG. PATTERN SCREW DRIVER - 10 X 300 MM	1	NO
6	**990TI01106**	**ADJUSTABLE SCREW SPANNER SET consists of following**	1 Set	
a	985TI11306	ADJUSTABLE SCREW SPANNER -250 MM LONG	1	NO
b	990TI11353	ADJUSTABLE SCREW SPANNER - 380 MM LONG	1	NO
c	997TI11098	ADJUSTABLE SCREW SPANNER - 300 MM LONG	1	NO
7	**955TI11006**	**SPANNER WRENCH**	1	NO
8	**451TI11007**	**SOCKET EXTN.BAR 1/2" SQ.DRIVE-125mm**	1	NO
9	**990TI11345**	**SLIDING T HANDLE 1/2" SQ.DR.**	1	NO
10	**997TI11024**	**SLIDING T HANDLE - 3/4" SQ.DR.**	1	NO

BEML LIMITED, V FLOOR, Unity Buildings, J C Road, BANGALORE-560002

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बेंगलूरु / BENGALURU - 560 002.

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STANDARD TOOL LIST

Model: BH60M

Sl. No	Part No	Part description	Qty / Eqpt (Per Eqpt)	UOM
11	950TI02073	SOCKET STR	1	NO
12	JG9389	SOCKET STR.30T	1	NO
13	985TI01002	TOOL BOX	1	NO
14	955TI02023	DOUBLE ENDED OPEN JAW SPANNER SET consists of following	1 Set	
a	452TI11021	D.E.O.J. SPANNER - 36 X 41 MM	1	NO
b	451TI11097	D.E.O.J. SPANNER - 30 X 32 MM	1	NO
c	451TI11081	D.E.O.J. SPANNER - 24 X 27 MM	1	NO
d	955TI11103	D.E.O.J. SPAN - 21X23 MM	1	NO
e	955TI11096	D.E.O.J. SPAN - 20X22 MM	1	NO
f	955TI11088	D.E.O.J. SPAN - 18X19 MM	1	NO
g	955TI11071	D.E.O.J. SPAN - 16X17 MM	1	NO
h	955TI11063	D.E.O.J. SPAN - 14X15 MM	1	NO
i	955TI11055	D.E.O.J. SPAN - 12X13 MM	1	NO
j	955TI11047	D.E.O.J SPANNER - 10X11 MM	1	NO
15	955TI02031	RING SPANNER SET consists of following	1 Set	
a	955TI11177	RING SPANNER 12X13 MM	1	NO
b	955TI11185	RING SPANNER 14X15 MM	1	NO
c	955TI11193	RING SPANNER 16X17 MM	1	NO
d	955TI11209	RING SPANNER 18X19 MM	1	NO
e	955TI11217	RING SPANNER 20X22 MM	1	NO
f	958TI11033	RING SPANNER 1/2" X 9/16"	1	NO
g	955TI11169	RING SPANNER 10X11 MM	1	NO
16	935TI11425	T HANDLE	1	NO
17	985TI11963	STEEL SCALE 12"	1	NO
18	TL3995	O RING	4	NO
19	WA3049	O RING	4	NO
20	WA3052	O RING	4	NO
21	SV9812	O RING	4	NO
22	955HS61435	O RING	4	NO
23	564300004540	O RING	4	NO
24	TX5167	PIN	2	NO
25	955TI11014	PULLER SCREW	2	NO
26	935TI11799	QUICK COUPLER(FEMALE)	1	NO
27	787SS03024	PIN STR.	1	NO
28	935TI02191	TYRE INFLATION KIT consists of following	1 Set	
a	935TI03009	TYRE INFLATOR	1	NO
b	935TI11782	ADOPTOR	1	NO
29	997TI11146	S.E.O.J. SPANNER - 55 MM	1	NO

BEML LIMITED V FLOOR Unity Buildings J C Road BANGALORE-560002

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बैंगलूरु / BENGALURU - 560 002.

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STANDARD TOOL LIST

Model: BH60M

(Per Eqpt)

Sl. No	Part No	Part description	Qty / Eqpt	UOM
30	CFP0108080	COTTER PIN	2	NO
31	997TI11016	BI-HEX SOCKET 3/4" SQ.DR.-1 5/16 OR 3/4W	1	NO
32	958BR11333	SCREW M20 X 2.5 - (BI-HEX SPECIAL)	8	NO
33	958BR11877	BI-HEX SCREW (L=205)	4	NO
34	958BR11382	NUT (FLANGED)	12	NO
35	958BR11909	CLAMP (ASSEMBLY TOOL)	6	NO
36	CFS0131225	SCREW HEX HD M12X25	12	NO

BEML LIMITED bemi V FLOOR Unity Buildings J C Road BANGALORE-560002

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Clause No. 11.1.b

ELECTRONIC DIAGNOSTIC TOOL

Model : BH60M

Sl. No.	Part No.	Description	QTY
1	985TI91757	Laptop	1 Set/ Project
2	985EG86687	USB to Serial Port Converter	
3	2892092	Inline Adaptor Kit*	
4	3886388	Insite Software**	
5	3886390	Insite Lite registration***	

Note: * Kit consists of cable wire, cable backbone & Cable Adapter

** Software is freely downloadable, Separate software need not be issued

*** Insite lite Registration will be activated at field once required data is furnished by customer.

BEML LIMITED bemd V FLOOR Unity Buildings J C Road BANGALORE 560001

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बेंगलूरु / BENGALURU - 560 002.

Clause No. 11.1.b

ELECTRONIC DIAGNOSTIC TOOL

Model: BH60M **Customer : M/s. BCCL**

Description	Name of the Project	No. of set / Project
Laptop & Accessories with Compatible Software	Barora Area	1
	B-II Area	1
	Govindpur Area	1
	Bastacolla Area	1
	Lodna Area	1
	CV Area	1

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BEML LIMITED
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V FLOOR
Unity Buildings
J C Road
BANGALORE-560002

Annexure-G
Performance Bank Guarantee Format

M/s. Bharat Coking Coal Ltd.
Koyla Bhawan
Koyla Nagar
Dhanbad – 826005

Re : Bank Guarantee in respect of Notification of Award/Purchase order vide no……dated… between . . . . . (Name of Purchaser Company) and (Name of Supplier Company)

Messers …… a Company Firm having its office at No. . . . . (hereinafter called the Contractor) has received the Notification of Award/Purchase order vide no……dated ..... (hereinafter called 'the said agreement') with Coal India Limited , Kolkata on behalf of Bharat Coking Coal Limited /Purchaser Company (hereinafter called 'the Company') to supply ……...stores/materials amounting to Rs . . . . on the terms and conditions contained in the said agreement.

The ……..(Name of the Bank) having its Office at…… has at the request of the Contractor agreed to give the guarantee as hereinafter contained.

We ……(Name of the Bank) do hereby unconditionally agree with the Company that if the Contractor shall in any way fail to observe or perform the terms and condition of the said agreement or shall commit any breach of its obligations thereunder, the Bank shall on demand and without any objection or demur pay to the Company the said sum of Rs …….. or any portion thereof without requiring the company to have recourse to any legal remedy that may be available to it to compel the Bank to pay the same or calling on the company to compel such payment by the contractor.

Any such demand shall be conclusive as regards the liability of the Contractor to the company and as regards the amount payable by the Bank under this guarantee. The Bank shall not be entitled to withhold, payment on the ground that the contractor has disputed its liability to pay or has disputed the quantum of the amount or that any arbitration proceeding or legal proceeding is pending between the Company and the contractor regarding the claim.

We, the Bank- further agree that the guarantee shall come into force from the date hereof and shall remain in full force and effect till the period that will be taken for the performance of the said agreement which is likely to be the .... day of . . . …. but if the period of agreement is extended either pursuant to the provisions in the said agreement or by mutual agreement between the contractor and the Company the Bank shall renew the period of the guarantee failing which it shall pay to the Company the said sum of Rs……. or such lesser amount out of the said sum of Rs…… as may be due to the Company and as the Company may demand. This guarantee shall remain in force until the dues of the Company in respect of the said sum of Rs……. are fully satisfied and the company certifies that the agreement has been fully carried out by the contractor and discharges the guarantee.

The Bank further agrees with the Company that the Company shall have the fullest liberty without the consent of the Bank and without affecting in any way the obligations hereunder to vary any of the terms and conditions of the said agreement or to extend the time for performance of the said agreement from time to time or to postpone for any time or from time to time any of the powers exercisable by the Company against the contractor and to forbear to enforce any of the terms and conditions relating to the said agreement and the Bank shall not be relieved from its liability by reason of such failure or extension being granted to the contractor or through any forbearance, act or omission on the part of the Company or any indulgence by the Company to the contractor or any other matter or thing whatsoever which under the law relating to sureties would but for this provisions have the effect of relieving or discharging the Guarantor.

The Bank further agrees that in case this guarantee is required for a longer period and it is not extended by the Bank beyond the period specified above, the Bank shall pay to the Company the said sum of Rs …… or such lesser sum as may then be due to the Company and as the Company may require.

Notwithstanding anything herein contained the liability of the Bank under this guarantee is restricted to Rs..... only. The guarantee shall remain in force till the …….. day of ……20… and unless the guarantee is renewed or a claim is preferred against the Bank within the validity period and/or the claim period from the said date ,all rights of the company under this guarantee shall cease and the Bank shall be released and discharged from all liability hereunder except as provided in the preceding clause.

The Bank has under its constitution power to give this guarantee and …… (Name of the person) who has signed it on behalf of the Bank has authority to do so.

Dated this……Day of……..20…..
Place…….. Signature of the authorized person

For and on behalf of the Bank

ANNEXURE-H

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BH60M

REAR DUMP TRUCK

bemi
NEW FRONTIERS. NEW DREAMS

(As per ISO 7132)

- High Performance
- Enhanced Productivity
- Increased Reliability
- Excellent Serviceability
- Exceptional Manoeuvrability
- Superior Operator Comfort
- Improved Safety

	Rock Body	Coal Body
Max. payload	54,500 kg	45,440 kg
Capacity (heaped) SAE/ISO 2:1 :	36.4 m³	45.44 m³
Capacity (Struck volume) 2:1 :	28 m³ (* optional)	
Flywheel power (net) : 480kW (644hp)@2000 rpm		

* THIS SPECIFICATION SHEET IS APPLICABLE FOR COAL INDIA SUBSIDARIES ONLY

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BEML LIMITED
V FLOOR
Unity Buildings
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BANGALORE-560002

www.bemlindia.in

84/199

BH60M REAR DUMP TRUCK

Salient Features :

Performance :
High power engine, AVTEC with Electronic Control (ECS) System planetary drive axle for optimum combination of speed and tractive effort.

Productivity :
High power to weight ratio allows higher acceleration and gradeability. Wide target area, large volumetric capaciy body and low loading height ensure high productivity.

Reliability :
AVTEC Automatic power shift transmission with ECS for ease of operation .AVTEC torque convertor ensures steady engine revolutions in response to variation of load, eliminates lugging and stalling of engine.

Serviceability :
Easier to maintain and repair due to unitised design and easy accessibility.

Manoeuvrability :
Orbitrol full time power steering, shorter turning radius provides higher manoeuvrability.

Comfort :
Ideally located spacious cabin with ergonomically designed operator control offers maintenance comfort and operational ease.

Safety :
Features include ROPS cabin, emergency steering, sealed oil cooled disc brake.

ENGINE

Make	**Cummins**
Model	**QSK19-C**
Type	Diesel, 4-stroke, turbocharged, Charged air cooled, Electronic Engine & water cooled
Flywheel power	480kW(644hp)@2000 rpm
Maximum torque	2875Nm @1400 rpm(Net)
Cylinders	6 inline
Bore & Stroke	Dia 159x159mm
Displacement	19.0 ℓ
Electricals	**Cummins**
Alternator	24V, 75A
Starting motor	24V, 9 kW
Battery	2 x 12 V, 160Ah

POWER TRAIN

Transmission AVTEC M6610A

Electronic shift control (ECS), TC 682 Torque Converter, reverse and downshift inhibitor, Six Forward and two reverse speeds. Reverse is torque convertor drive. First gear has both convertor drive and direct drive. Gears second through sixth are direct for maximum efficiency (convertor drive is used momentarily for smooth shifting).

Final Drive
Planetary final drive with full floating axle shafts and plug-in differential carrier assembly.

RATIOS :

Bevel set (differential)	:	3.85:1
Planetary	:	5.70 :1
Total reduction	:	21.945:1
Maximum speed	:	51.00 km/h

Travel Speeds (km/h) AVTEC

Range	1st	2nd	3rd	4th	5th	6th
Forward	8.6	12.8	17.0	25.4	34.3	51.0
Reverse		R1:-5.7			R2:-8.5	

STEERING SYSTEM

Orbitrol power steering control with pressure compensating steering pump and two double-acting steering cylinders. Front Hydrair suspensions serve as steering kingpins to provide excellent manoeuvarability. Automatic supplemental, accumulator steering is standard.

Turning circle radius	10.5 m
Vehicle clearance diameter	24 m
Steering pump capacity	85.9ℓ / min

STANDARD EQUIPMENT

Cab : Operator seat, Rubber floor mat, Sun visor, Windshield safety glass, Windshiled wiper and washer

General equipment : Air cleaner, dry type, Alternator, Body position indicator, Brakes, Caliper disc (front) Brakes oil disc (rear) Cold weather start aid (BEML Engine), Drive line protector, Electric system - 24 Volt, Fan, Guard, engine & transmission belly, Mirrors, rectangle LH, convex RH, Mud flaps for deck and tanks, Rock ejectors, Starter, electric, Starter key switch Two hooks, front & rear, Tow pins, rear, Air conditioner system.

Lighting : Back-up light, Dual combination stop and tail, Four headlamps with dimmer all Halogen, Turn signal + Hazard

Instrumentation gauges : Brake oil temperature, Engine oil pressure, Speedometer, Tachometer, Transmission oil pressure, Transmission oil temperature, Voltmeter.

Warning lights with Alarm : Brake lock, Brake /Hydraulic oil temperature , Coolant temperature , Low Brake pressure , Emergency steering , Engine oil pressure , Filter restriction -hydraulic , transmission , Parking brake , Steering accumulator pre-charge, Reverse flash

Standard Safety equipments : Battery relay, Back-up alarm (Audio-Visual), Body, prop pin and storage, Brakes, emergency-manual & automatic, Brake, wheel lock, Brake, Parking, Fan guard, handrails, Horn electric, Auto Retarder, Seat belts, operator and passenger seat, Engine coolant level, Automatic lubrication system, Electrically operated emergency steering system, Automatic fire suppression system, Skid resistant coating on walkways, Body lock, Steering lock

OPTIONAL EQUIPMENT & ACCESSORIES

Coolant level - Engine, Cab heater, Coal body, Body wear bars, Cold weather starting aid, Tyre inflation kit, Suspension and accumulator charging kit, On board payload system, Rear view Camera, VIMS (Vital Information Management System, Driver fatique monitor system

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TYRES

Standard tyre	**24 x 35, 48 PR (E-4)**
Optional	24 R 35, (Radial)
Rim	17 x 35

BEML recommends the user to evaluate all job conditions and consult the tyre manufacture to make proper tyre selection

BRAKES

Front : Hydraulically actuated Rockwell calliper disc Braking Surface: 2.632 cm^2

Rear : Oil-cooled hydraulically actuated multiple disc brakes provide both service and dynamic retarding. Brakes are sealed for protection from environmental contaminants. Braking Surface : 58193 cm^2

Automatic emergency brake system : Unique designed brake control module constantly monitors brake pressure in the dual brake accumulators and will activate an audio - visual alarm if pressure on either accumulator drops below a tolerable level. If pressure should continue to drop, service brakes will automatically apply.

Manual emergency braking system: In the event of failure of the brake pedal, the service brakes can be manually applied by an operator switch located on the instrument panel.

Parking brake : Spring applied hydraulically released inboard parking brake. Parking brake will automatically apply if hydraulic pressure is lost.

Dynamic retarder : Constant speed retarder is provided by a separate foot pedal for the retarder function, allowing the operator to apply the retarder without removing his hands from the steering wheel. The foot operated valve controls the hydraulically actuated oil-cooled wet disc brakes on the rear axle.

Wheel brake lock : Controlled by a switch on control panel activates and locks brakes while loading and dumping.

SUSPENSION

Hydrair : Variable rate independent oil pneumatic suspension cylinders with integral rebound control. Suspension stroke front 276 mm and rear is 200.5 mm

Load/Deflection rate	Front	Rear
Empty (kg/cm)	469	495
Loaded (kg/cm)	1769	27725

SYSTEM REFILL CAPACITIES

System	Capacity (l)
Engine lube oil	73
Cooling systems	181.7
Fuel tank	790
Hydraulic tank	360
Transmission (sump plus ext. filters, lines, etc...)	79.6
Final drive	212.2
Suspension	63
Front spindle grease	9.24 kg

V-BODY

ROCK TYPE

V-shaped body with single-slope flat floor provides optimum carrying capacity and smooth, controlled dumping. Wide horizontal bolsters provide rigid support for the high tensile, heat-treated steel side. Bolt on body rubber pads cushion prevents the frame from loading shocks and are easily replaceable. Pivot exhaust heating is Standard.

Material Thickness	
Floor Plates	20 mm
Front Plates	12 mm
Side Plates	10 mm

Volumetric Capacity	Rock body	*optional	Coal body
Struck Capacity	26.0 m^3	*28.0 m^3	36.0 m^3
Heaped Capacity (SAE/ISO)2:1	36.4 m^3	*36.4 m^3	45.4 m^3

* STRUCK VOLUME INCREASED TO 28 m^3 TO AVOID SPILLAGE OF MATERIAL AS PER UNIFORM NIT REQUIREMENT FROM M/s CIL

CABIN

Integral ROPS cabin, engineered to provide superb working comfort, excellent visibility and maximum production efficiency. Features include tinted safety-glass, fully adjustable operator's seat with seat belt, fresh air fan, insulation for sound and temperature control, convenient gauge arrangement, left and right hand external mirrors and sun visor

MASS

Net vehicle mass	43,500 kg
Rated payload	54,500 kg
Gross vehicle mass	98,000 kg

Mass distribution	Empty (kg)	Loaded (kg)
Front axle	21,385	33,040
Rear axle	22,115	64,960

FRAME

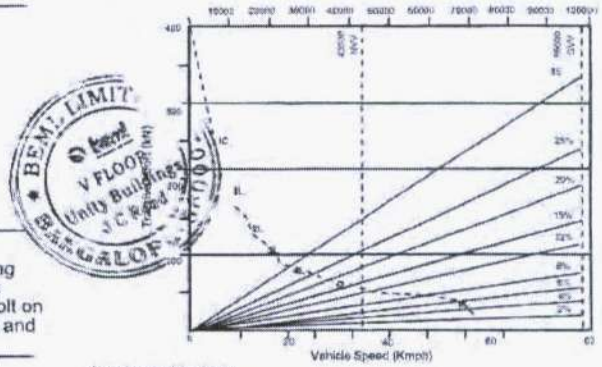
Box section main rails, proportioned to accommodate relative behind and torsional loads, are connected by tubbular cross members, an integral front bumper and rugged, continuous horse collar. Cross member to frame joints use large radii to minimise stress.The frame rails and other structural plates are fabricated from high yield strength steel. Castings at the rear cross members incorporate the body pivot, body-up pins and rear suspension strut pivot, as well as the Panhard rod attachment.

BODY HOIST

Twin, two-stage hydraulic cylinders mounted outside frame rails for accessibility. Electro-hydraulic control provides quick response. Hydraulic system has dual full-flowremote-mounted filters.

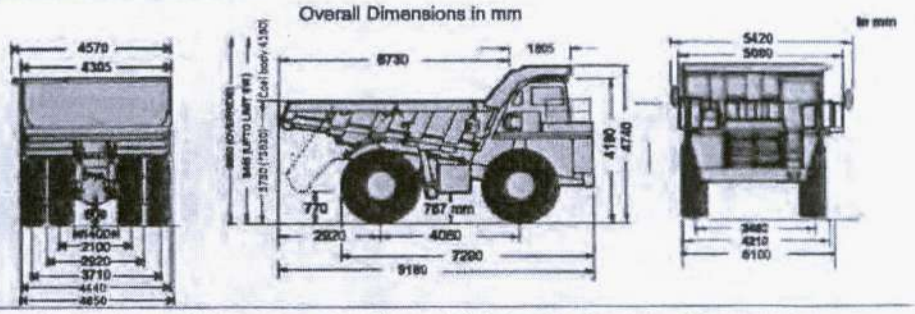
Pump capacity	316 l / min
Relief valve setting	18.96 Mpa (193.34 kg/cm^2)
Body raise time	13±2 seconds

PERFORMANCE



How to use this chart :
1. Enter chart at (gross vehicle weight)
2. Determine total resistance, (grade in percent plus rolling resistance)
3. Connect point on weight scale with point on total resistance scale and project it to tractive effort scale effort scale. Read required tractive effort.
4. Read horizontally from required tractive effort to intersect to appropria

Overall Dimensions in mm



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Material and specifications are subject to change without notice, Illustrations may include optional equipment & accessories

BH60M BEML BELL TRUCK **TECHNICAL SPECIFICATIONS**

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BH60M, QSK19C (CAC, T-III), rated 700 HP @ 2000 RPM, FR4556, CPL3240														
Engine speed, rpm	Gross Torque (Lb-ft)	Gross Torque (N-m)	Gross Power HP	Gross Power kW	Torque rise, %	Accessory power, HP (Fan)	Accessory power, HP (Alt)	Total Acc. Power HP	Net power, HP	Net power, kW	Net Torque, N-m	Gross SFC lb/ bhp-hr	Gross SFC gms/ kW-hr	Net SFC gms/ kW-hr
2000	1838	2492	700	522	20%	53	3	56	644	480	2293	0.369	224	244
1900	1910	2590	691	515		45	3	48	643	479	2408	0.362	220	237
1800	1983	2689	680	507		39	3	42	638	476	2524	0.358	218	232
1600	2128	2885	648	484		27	3	30	618	461	2751	0.354	215	226
1500	2200	2983	628	469		22	3	25	603	450	2863	0.363	221	230
1400	2200	2983	586	437		18	3	21	565	422	2875			
1300	2125	2881	526	392		15	3	18	508	379	2785			
Production tolerence : Within +/ - 5 %														

Torque Output

RPM	lb-ft	N-m
800	1,125	1,525
1,200	2,000	2,712
1,300	2,125	2,881
1,400	2,200	2,983
1,500	2,200	2,983
1,600	2,128	2,885
1,800	1,983	2,689
1,900	1,910	2,590
2,000	1,838	2,492

Power Output

RPM	hp	kW
800	171	128
1,200	457	341
1,300	526	392
1,400	586	437
1,500	628	468
1,600	648	483
1,800	680	507
1,900	691	515
2,000	700	522

Fuel Consumption

RPM	lb/hp-hr	g/kW-hr
1,500	0.363	221
1,600	0.354	215
1,700	0.356	217
1,800	0.358	218
1,900	0.362	220
2,000	0.369	224

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ANNEXURE-I

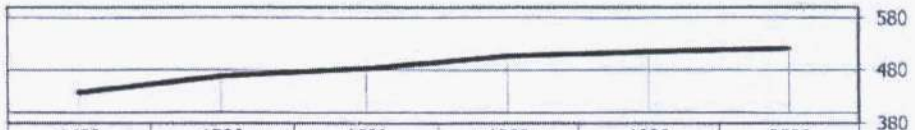
87/1999

QSK19C_CAC_T-III_BH60M_gross and net curve

CUMMINS INDIA LIMITED	Basic Engine Model	Ref.Curve No.:	
Kothrud , Pune 411038	QSK19C	FR4556	
ENGINE PERFORMANCE CURVE FOR QSK19C EMISSION CERTIFICATION: T-III	CPL	Date	By
	3240	Sep-13	

Displacement Cu.in (lts): **1,159 (19 L)**	Aspiration: **Turbocharged and Charge Air Cooled**	No. of Cylinders : **Six, In-line**
Bore, Inch (mm) : **6.25(159)**	Stroke, Inch (mm) : **6.25(159)**	Fuel System : **Cummins MCRS**

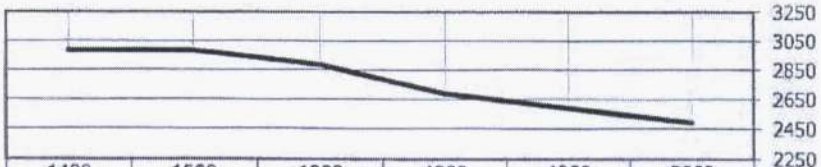
GROSS POWER- kW



	1400	1500	1600	1800	1900	2000
Gross Power kW	437	469	484	507	515	522

SPEED, RPM

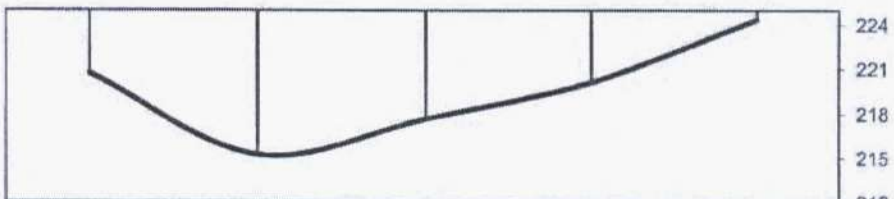
GROSS TORQUE (N-m)



	1400	1500	1600	1800	1900	2000
Gross Torque N-m	2983	2983	2885	2689	2590	2492

SPEED, RPM

GROSS SPECIFIC FUEL CONSUMPTION (gms/kW-hr)



	1500	1600	1800	1900	2000
Gross Bsfc gms/kw-hr	221	215	218	220	224

SPEED- RPM

Notes: Production Tolerence : Within + / - 5 %

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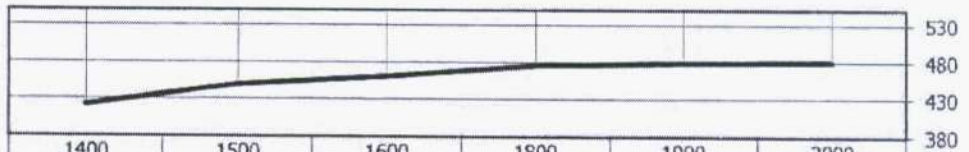
QSK19C_CAC_T-III_BH60M_gross and net curve

CUMMINS INDIA LIMITED	Basic Engine Model	Ref.Curve No.:	
Kothrud , Pune 411038	QSK19C	FR4556	
ENGINE PERFORMANCE CURVE FOR QSK19C EMISSION CERTIFICATION: T-III	CPL	Date	By
	3240	Sep-13	

Displacement Cu.in (lts): **1,159 (19 L)**	Aspiration: **Turbocharged and Charge Air Cooled**	No. of Cylinders : **Six, In-line**
Bore, Inch (mm) : **6.25(159)**	Stroke, Inch (mm) : **6.25(159)**	Fuel System : **Cummins MCRS**

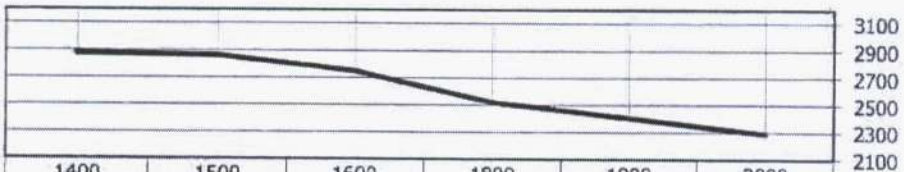
NET POWER- kW



	1400	1500	1600	1800	1900	2000
NET Powe kW	422	450	461	476	479	480

SPEED-RPM

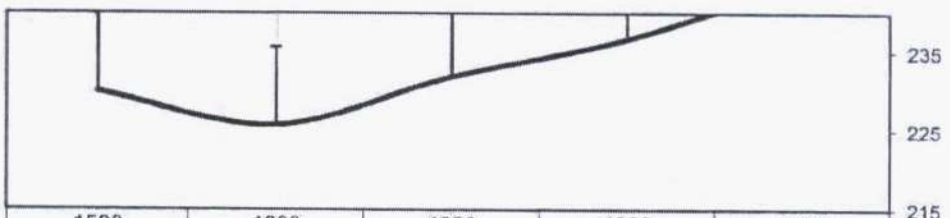
NET TORQUE (N-m)



	1400	1500	1600	1800	1900	2000
NET Torque N-m	2875	2863	2751	2524	2408	2293

SPEED-RPM

NET SPECIFIC FUEL CONSUMPTION (gms/kW-hr)



	1500	1600	1800	1900	2000
Net Bsfc gms/kw-hr	230	226	232	237	244

SPEED- RPM

AS PER ISO 9249 CONDITIONS

Note: As per recommendation of Manufacturer of Equipment (BEML), CIL Pune has derived Engine Performance Net Curves from Engine Gross power Curve FR4456 by deducting the accessory power

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Notes: **Production Tolerence : Within + / - 5 %**

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To whomsoever it may concern

This is to certify that Cummins QSK19C Engine being fitted on BEML – BH60M dumper application meets the EPA Tier 3 norms having FR 4556.

Regards,
Sourabh Rajoria
Cummins India Limited

CUMMINS INDIA LIMITED * KOTHRUD, PUNE *

BEML LIMITED * beml * V FLOOR Unity Buildings J C Road * BANGALORE-560002

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उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
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Cummins India Limited
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Cumminsindia.com

Registered Office
Cummins India Office Campus, Tower A, 5th Floor
Survey No.21, Balewadi, Pune 411045 Maharashtra, India
CIN : L29112PN1962PLC02276

Engine Performance Data

Cummins Inc
Columbus, Indiana 47202-3005
http://www.cummins.com

Industrial

QSK19

FR 4556

700 BHP (522 kW) @ 2000 RPM
2,200 lb-ft (2,983 N-m) @ 1500 RPM

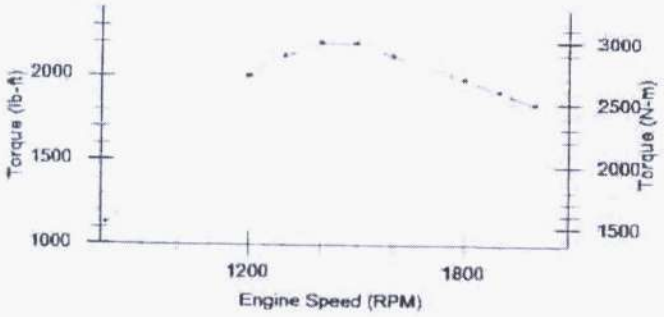
Configuration	CPL Code	Revision
D193101CX03	3240	9-Nov-2011

Compression Ratio: **15.8:1**
Fuel System: **Cummins MCRS**
Emission Certification: **U.S. EPA Tier 3, CARB Tier 3, EU Stage IIIA**

Displacement: **1,159 in3 (19.0 L)**
Aspiration: **Turbocharged and Charge Air Cooled**

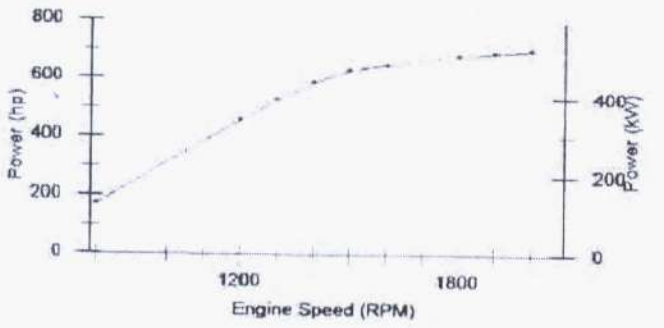
All data is based on the engine operating with fuel system, water pump, and 20 in H2O (4.98 kPa) inlet air restriction with 5.8 in (147 mm) inner diameter, and with 2 in Hg (7 kPa) exhaust restriction with 8 in (203 mm) inner diameter, not included are alternator, fan, optional equipment and driven components. Coolant flows and heat rejection data based on coolants as 50% ethylene glycol/50% water. All data is subject to change without notice.

Rating Type: Intermittent



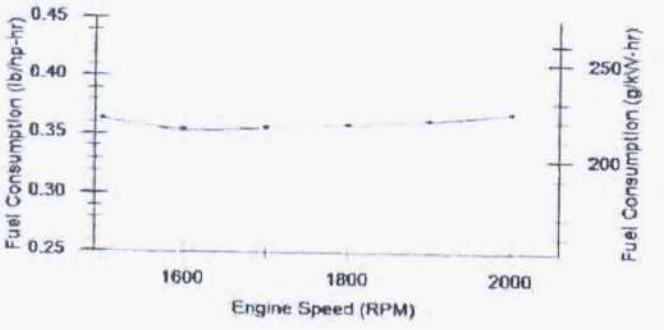
Torque Output

RPM	lb-ft	N-m
800	1,125	1,525
1,200	2,000	2,712
1,300	2,125	2,881
1,400	2,200	2,983
1,500	2,200	2,983
1,600	2,128	2,885
1,800	1,983	2,689
1,900	1,910	2,590
2,000	1,838	2,492



Power Output

RPM	hp	kW
800	171	128
1,200	457	341
1,300	526	392
1,400	586	437
1,500	628	468
1,600	648	483
1,800	680	507
1,900	691	515
2,000	700	522



Fuel Consumption

RPM	lb/hp-hr	g/kW-hr
1,500	0.363	221
1,600	0.354	215
1,700	0.356	217
1,800	0.358	218
1,900	0.362	220
2,000	0.369	224

Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with SAE J1995 conditions of 29.61 in Hg (100 kPa) barometric pressure [300ft (91m) altitude] 77 deg F (25 deg C) inlet air temperature, and 0.30 in Hg (1kPa) water vapor pressure with No. 2 diesel fuel. The engine may be operated up to 5,000 ft (1,524 m) altitude before electronic derate is applied.

STATUS FOR CURVES AND DATA: Measured data
TOLERANCE: Within +/- 5 %

CHIEF ENGINEER:
Herbert C Moore

BEML LIMITED 5th FLOOR Unity Buildings J.C. Road BANGALORE 560002

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Intake Air System

Maximum allowable air temperature rise over ambient at Intake Manifold (Naturally Aspirated Engines) or Turbo Compressor inlet (Turbo-charged Engines): (This parameter impacts emissions, LAT and/or altitude capability)	30 delta deg F	16.7 delta deg C

Cooling System

Maximum intake manifold temperature at 25 deg C (77 F) ambient	120 deg F	49 deg C
Maximum allowable pressure drop across charge air cooler and OEM CAC piping (IMPD):	4 in-Hg	13.5 kPa
Maximum Intake Manifold Temperature Differential (Ambient to IMT) (IMTD):	43 delta deg F	23.9 delta deg C
Intake manifold temperature for full Fan-ON	125 deg F	52 deg C
Maximum coolant temperature for engine protection controls	212 deg F	100 deg C
Maximum coolant operating temperature at engine outlet (max. top tank temp):	212 deg F	100 deg C

Exhaust System

Maximum exhaust back pressure:	3 in-Hg	10 kPa
Recommended exhaust piping size (inner diameter):	8 in	203 mm

Lubrication System

Nominal operating oil pressure		
@ minimum low idle	20 psi	138 kPa
@ maximum rated speed	70 psi	483 kPa
Minimum engine oil pressure for engine protection devices		
@ minimum low idle	17 psi	117 kPa

Fuel System

Fuel cooling requirements (with diesel fuel)		
Maximum heat rejection to return fuel at max. coolant and inlet fuel temperature:	150 BTU/min	3 kW
@ fuel return flow rate of:	603 lb/hr	274 kg/hr
@ fuel return temperature prior to cooler:	150 deg F	66 deg C
Maximum supply fuel flow:	864 lb/hr	392 kg/hr
Maximum return fuel flow:	603 lb/hr	274 kg/hr
Engine fuel compatibility (consult Service Bulletin #3379001 for appropriate use of other fuels)	DF1, DF2	
Maximum fuel inlet pressure:	5 psi	34 kPa

Performance Data

Maximum low idle speed:	1,200 RPM
Minimum low idle speed:	600 RPM
Minimum engine speed for full load sustained operation:	

	Rated Power		Maximum Power	Torque Peak	
Engine Speed	2,000 RPM			1,500 RPM	
Output Power	700 hp	522 kW		628 hp	469 kW
Torque	1,838 lb-ft	2,492 N-m		2,200 lb-ft	2,983 N-m
Friction Horsepower	95 hp	71 kW		57 hp	43 kW
Intake Manifold Pressure	68 in-Hg	230 kPa		63 in-Hg	213 kPa
Turbo Comp. Outlet Pressure	72 in-Hg	243 kPa		66 in-Hg	223 kPa
Turbo Comp. Outlet Temperature	392 deg F	200 deg C		375 deg F	191 deg C
Inlet Air Flow	1,900 ft3/min	897 L/s		1,450 ft3/min	684 L/s
Charge Air Flow	136 lb/min	61.7 kg/min		103 lb/min	47 kg/min
Exhaust Gas Flow	4,430 ft3/min	2,091 L/s		3,850 ft3/min	1,817 L/s
Exhaust Gas Temperature	875 deg F	468 deg C		1,000 deg F	538 deg C
Maximum Fuel Flow to Pump	864 lb/hr	392 kg/hr		726 lb/hr	329 kg/hr
Heat Rejection to Coolant	9,900 BTU/min	174 kW		10,200 BTU/min	179 kW
Heat Rejection to Fuel	150 BTU/min	3 kW		124 BTU/min	2 kW
Heat Rejection to Ambient	2,825 BTU/min	50 kW		2,450 BTU/min	43 kW
Heat Rejection to Exhaust	29,500 BTU/min	519 kW		25,700 BTU/min	452 kW

**When operating Naturally Aspirated engines above SAE J1995 conditions, it should be noted that power levels will increase due to combustion inefficiencies associated with a reduction in the air to fuel mixture.

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Cranking System (Cold Starting Capability)

Unaided Cold Start:		
Minimum cranking speed	150 RPM	
Minimum ambient temperature for unaided cold start	10 deg F	-12.2 deg C
Breakaway torque at minimum unaided cold start temperature	1,302 lb-ft	1,765 N-m
Aided Cold Start:		
Minimum ambient temperature with Ether only	-5 deg F	-21 deg C
Minimum ambient temperature with coolant and lube heater only	-5 deg F	-21 deg C
Cold starting aids available	Ether	
Maximum parasitic load at 10 deg F @		

Noise Emissions

Top	96.6 dBa
Right Side	102.2 dBa
Left Side	100 dBa
Front	102.1 dBa
Exhaust noise emissions	122.2 dBa

Estimated Free Field Sound Pressure Level at 3.28ft (1m) and Full-Load Governed Speed
(Excludes Noise from Intake, Exhaust, Cooling System and Driven Components)

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End of Report

California Environmental Protection Agency AIR RESOURCES BOARD	CUMMINS INC.	EXECUTIVE ORDER U-R-002-0527-1 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2010	ACEXL019.AAD	19.0	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Direct Diesel Injection, Turbocharger, Charge Air Cooler, Engine Control Module	Loader and Dozer

The engine models and codes are attached.

The following are the exhaust certification standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			HC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
75 ≤ kW < 130	Tier 3	STD	N/A	N/A	4.0	5.0	0.30	20	15	50
130 ≤ kW < 225	Tier 3	STD	N/A	N/A	4.0	3.5	0.20	20	15	50
		FEL	N/A	N/A	3.9	N/A	0.17	N/A	N/A	N/A
		CERT	--	--	3.8	1.9	0.13	9	4	12

BE IT FURTHER RESOLVED: That the family emission limit(s) (FEL) is an emission level declared by the manufacturer for use in any averaging, banking and trading program and in lieu of an emission standard for certification. It serves as the applicable emission standard for determining compliance of any engine within this engine family under 13 CCR Sections 2423 and 2427.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

This Executive Order hereby supersedes and cancels Executive Order U-R-002-0527 dated November 19, 2009.

Executed at El Monte, California on this 15 day of June 2011.

BEML LIMITED beml V FLOOR Unity Buildings J C Road BANGALORE ISO 9001:2000

Annette Hebert, Chief
Mobile Source Operations Division

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उप महाप्रबंधक(विपणन) / Dy. General Manager(Marketing)
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Engine Model Summary Template

U-R-002-0527-1
Attachment
4/25/2011

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr) @peak torque	9.Emission Control Device Per SAE J1930
ACEXL019.AAD	8533:FR4431	QSK19-C	750@2000	417	281	2200@1500	457	231	DDI,ECM,TC,C.C.
ACEXL019.AAD	2754:FR4466	QSK19-C	700@2000	389	263	2200@1500	457	231	DDI,ECM,TC,
ACEXL019.AAD	2754:FR4468	QSK19-C	700@1800	417	253	2200@1500	457	231	DDI,ECM,TC,
ACEXL019.AAD	2754:FR4467	QSK19-C	675@1800	407	247	2200@1500	457	231	DDI,ECM,TC,
ACEXL019.AAD	2755:FR4473	QSK19-C	560@2000	314	212	1755@1500	386	195	DDI,ECM,TC,
ACEXL019.AAD	2755:FR4472	QSK19-C	525@2000	298	201	1775@1500	391	198	DDI,ECM,TC,
ACEXL019.AAD	2755:FR4501	QSK19-C	600@2000	334	226	1950@1500	417	211	DDI,ECM,TC,
ACEXL019.AAD	2757:FR4497	QSK19-C	506@1800	321	195	2032@1300	417	183	DDI,ECM,TC,
ACEXL019.AAD	2757:FR4498	QSK19-C	506@1800	321	195	2032@1300	417	183	DDI,ECM,TC,
ACEXL019.AAD	8466;FR92058	QSB6.7	195@2300	100	77.7	542@1200	109	44	ECM TC CAC
ACEXL019.AAD	8610;FR92113	QSB6.7	190@2500	98	82.3	520@1500	112	56.9	ECM TC CAC
ACEXL019.AAD	8466;FR92212	QSB6.7	185@2200	99	73.3	546@1400	113	53.5	ECM TC CAC
ACEXL019.AAD	8466;FR93357	QSB6.7	186@2200	99	73.4	435@1500	114	58.0	ECM TC CAC
ACEXL019.AAD	8610;FR92095	QSB6.7	186@2200	99	73.4	547@1500	114	58.0	ECM TC CAC
ACEXL019.AAD	8466;FR91496	QSB6.7	200@2100	107	75.8	547@1500	117	59.2	ECM TC CAC
ACEXL019.AAD	8611;FR92276	QSB6.7	260@2500	124	104.5	550@1500	120	60.6	ECM TC CAC
ACEXL019.AAD	8466;FR91439	QSB6.7	189@2050	109	75.3	548@1500	121	61.3	ECM TC CAC
ACEXL019.AAD	8611;FR92515	QSB6.7	275@2500	129	108.7	575@1500	125.9	63.7	ECM TC CAC
ACEXL019.AAD	8610;FR92419	QSB6.7	205@2500	90	76.1	625@1500	128	64.9	ECM TC CAC
ACEXL019.AAD	8610;FR91688	QSB6.7	185@2500	97	81.8	575@1500	128	64.7	ECM TC CAC
ACEXL019.AAD	8466;FR92059	QSB6.7	220@2300	110	110.2	597@1500	128	64.5	ECM TC CAC
ACEXL019.AAD	8610;FR92441	QSB6.7	215@2500	105	88.7	620@1500	129	65.3	ECM TC CAC
ACEXL019.AAD	8611;FR92599	QSB6.7	275@2500	125	105.7	620@1500	129	65.4	ECM TC CAC
ACEXL019.AAD	8610:FR93156	QSB6.7	205@2500	97.9	85.75	575@1700	130.9	66.1	ECM TC CAC
ACEXL019.AAD	8610:FR93156	QSB6.7	205@2500	97.9	85.75	575@1700	130.9	66.1	ECM TC CAC
ACEXL019.AAD	8610;FR92288	QSB6.7	220@2500	110	92.8	640@1500	135	66.5	ECM TC CAC
ACEXL019.AAD	8466;FR91955	QSB6.7	220@2200	116	86.1	650 @ 1500	135	66.3	ECM TC CAC
ACEXL019.AAD	8611;FR92866	QSB6.7	240@2200	124	92	650@1500	136	69	ECM TC CAC

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95/199

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Model: BH60M Dumper

Maximum speed determined according to ISO 6014:	**51 Kmph**

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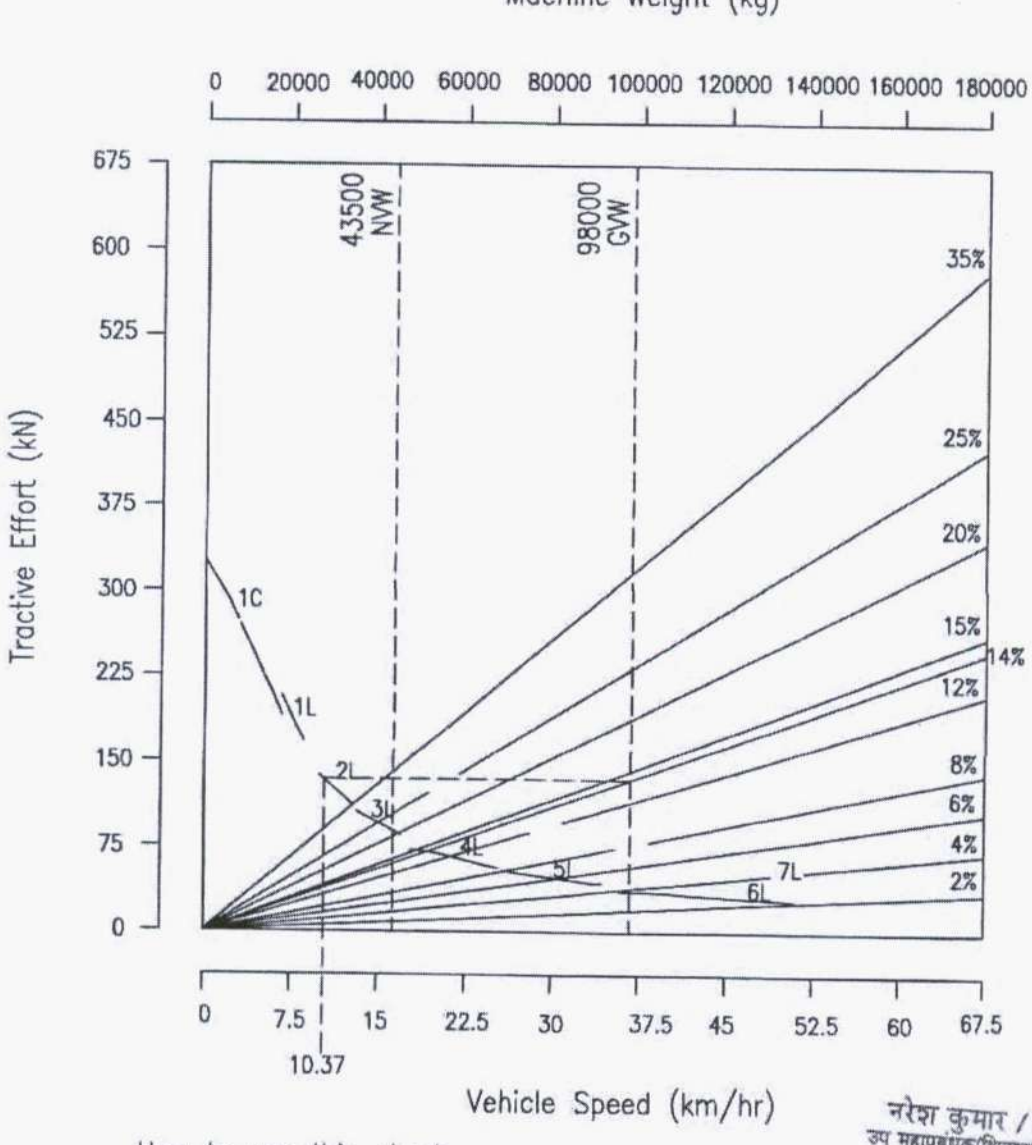
Gradeability/Speed/Rimpull of BH60M

Engine	:	QSK19C
Axle Ratio	:	5.7:1
Total Reduction Ratio	:	21.945:1
Tyre Size	:	24.00 x 35 – 48PR
GVW	:	98000 kg



How to use this chart:

1. Enter Chart at GVW.
2. Determine Total resistance (Grade in percent plus rolling resistance).
3. Connect point on weight scale with point on total resistance scale and project it to tractive effort scale. Read required tractive effort.
4. Read horizontally from required tractive effort to intersect to appropriate speed.

BEML LIMITED V FLOOR Unity Buildings J C Road BANGALORE-560002

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DYNAMIC RETARDING CHART

BH60M HAULPAK REAR DUMP (As per ISO 10268)

ENGINE CUMMINS QSK19C
TRANSMISSION: AVTEC M6610A
ENGINE POWER : 480kw (644hp) @2000rpm

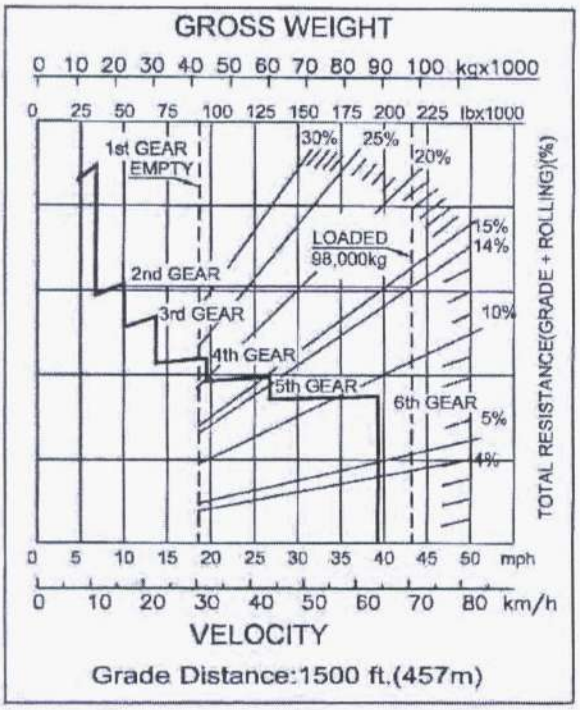
TOTAL REDUCTION: 21.945:1
TIRE SIZE: 24x35-48PR(E-4)

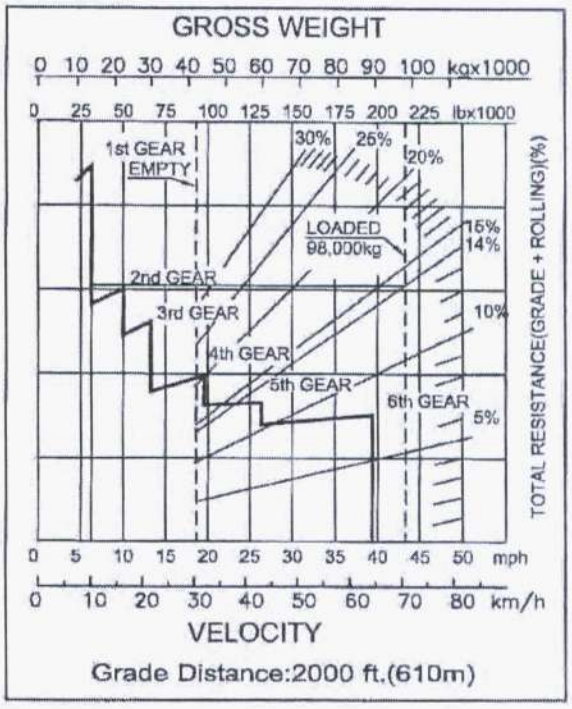
To use standard retarding charts for oil cooled brakes:

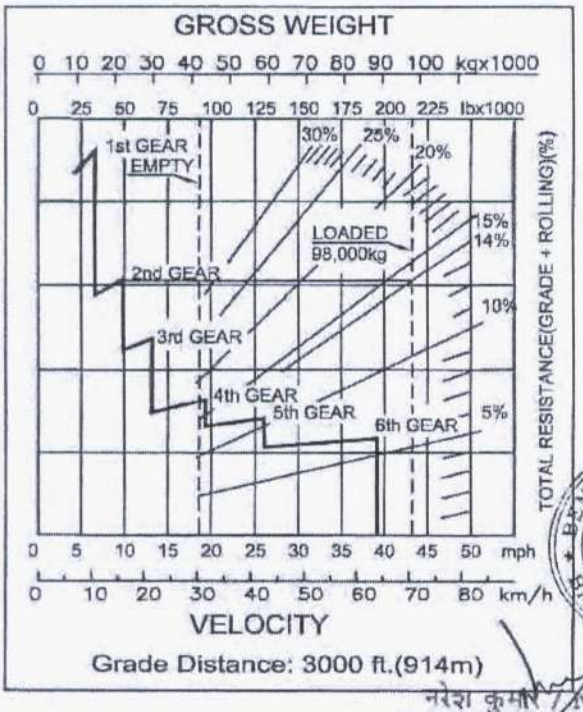
1. Select The Proper Chart by adding the lengths of all downhill segments of the haulage profile.
2. Determine The Gross Weight and locate on the horizontal scale at the top of the chart.
3. Select The Grade to be considered. Effective grade is the percent favorable grade minus the percent rolling resistance.
4. Determine The Retarding Force by dropping a vertical line from the gross weight to its intersection with the diagonal effective grade line.
5. Read The Maximum Speed on the grade by projecting a horizontal line from the retarding force point to its intersection with the appropriate gear section of the curve. Read vertically to the speed on the horizontal scale at the bottom of the chart.

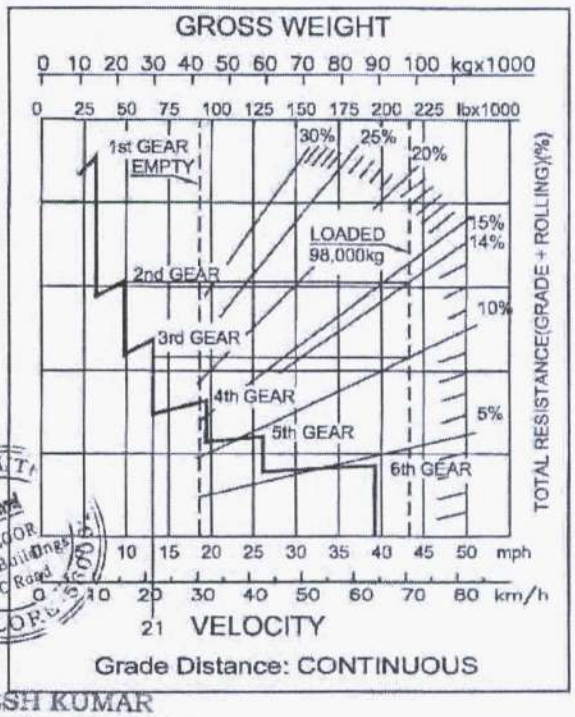
Note:
The above procedure may be used to determine the minimum retarding capability on the typical downhill profiles.
For unusual applications, contact BEML Marketing Division.

When retarding, engine RPM should be maintained at the highest possible level without overspeeding. If cooling oil overheats, reduce ground speed to allow transmission to shift to next lower gear.









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Theroretical Productivity Cycle calculations for BH60M with QSK19C Engine

	Total Haul & return distance	Distance in Mts	Grade	Rolling Resistance	Total Resistance	Speed Range	Max Travel Speed from the curve	Speed factor	Avg Speed	Time taken with speed factor	Time taken without speed factor
			%	%	%		Km/hr		Km/hr	Min	Min
Haul	up	1500	12	2	14	F2	10.37	0.9	9.333	9.64	8.68
	level	200	0	2	2	F6	51	0.75	38.25	0.31	0.24
	up	200	10	2	12	F2	12.57	0.75	9.4275	1.27	0.95
	level	100	0	2	2	F6	51	0.7	35.7	0.17	0.12
									Haul time	11.40	9.99
Return	level	100	0	-2	-2	F6	51	0.7	35.7	0.17	0.12
	down	200	10	-2	8	F5	43	0.75	32.25	0.37	0.28
	level	200	0	-2	-2	F6	51	0.75	38.25	0.31	0.24
	down	1500	12	-2	10	F5	43	0.9	38.7	2.33	2.09
									Return time	3.18	2.73

Haul & Return Time	14.58	12.71
Loading & Dumping Time	6.00	6.00
G. Total	20.58	18.71

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ANNEXURE-J

DETAILED TECHNICAL DESCRIPTION OF BH60M REAR DUMP TRUCK

BEML, BH60M Dumper model is designed for 60 Ton payload capacity is diesel powered, self propelled, wheeled mechanical rigid frame rear dumper with following configuration.

POWER TRAIN :

Powered by Direct injection, 4-stroke diesel engine model QSK19C Engine which is compact engine for better accessibility and serviceability.

Fitted with remote mounted AVTEC, M6610A model power shift hydraulic transmission with Electronic Control system (ECS), torque converter, lock-up clutch and reverse inhibitor. The trim booster ensures smooth shifting both at high idle and low idle. Also transmission is provided with two reverse gears for higher productivity.

Heavy duty planetary axle with anchor structure and completely sealed oil cooled wet multiple disc forms the best power train combination.

BRAKES :

The equipment is provided with dry caliper disc brake on the front axle and oil cooled wet multiple disc brakes on rear axle. The rear brakes also act as retarder. Brake application is through highly reliable all hydraulic system.

Automatic emergency braking feature is provided . Uniquely designed brake control module which constantly monitor brake pressure in the dual brake accumulators and will activate an audible and visible alarm, if pressure on either accumulator drops below tolerable level. If pressure continues to drop, service brakes will be automatically applied. Rear brakes are completely sealed to be free from dust and water contaminants. Rear wheel brake lock is provided through a switch on control panel for locking brakes while loading and dumping.

HYDRAULICS :

Hydraulic system consists of one tandem pump and one energy conserving variable piston pump. The tandem vane pump provides oil for hoist operation and brake cooling. The piston pump provides oil for steering and brake application through accumulators.

The equipment is provided with orbitrol power steering control with pressure compensating steering pump and two double acting steering cylinders .Front hydrair suspension serves as steering king pins to provide excellent maneuverability. Automatic emergency steering feature is provided as standard through steering accumulators.

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SUSPENSIONS :

The frame is suspended on four independent hydro-pneumatic suspension cylinders with integral rebound control for excellent riding comfort.

FRAME :

The equipment is built on a lab tested/field proven frame structure of ladder type design with deep box section construction frame rail with integral bumper cross member and rugged continuous circular horse collar. Castings at the rear cross member incorporate the body pivot, body up locking pins and rear suspension strut pivots as well as the pan -hard rod arrangement. The frame is built with special alloy steel and is designed to take integral ROPS cabin mounting.

BODY :

V-shaped body with single slope flat floor provides optimum carrying capacity and smooth controlled dumping . The body is built up with high tensile strength, high hardness abrasion resistant plates with rugged bolster, sill construction . Body Front exhaust arrangement is provided for exhaust heated body as standard . The rock body and coal body are interchangeable.

Body is provided with spill guard to protect the tyres from spillage and canopy structure protecting the operator's cab. Body hoisting is through two nos. twin stage hydraulic cylinders. Heavy duty body guide structure is provided to ensure proper alignment of body.

TYRES :

The equipment is provided with 24.00 x 35 - 48 PR tubeless rock grip tyres of reputed make.

CABIN :

Equipment is fitted with deluxe interior fully enclosed sound suppressed integral **ROPS Air conditioned cabin** with tinted glass, rear view mirror, wind shield washer and wipers for superb working comfort.

Logically located instrument panel with controls and easy to read parameters on LCD display /symbols/ diagnostic message to enhance operator's efficiency. Brake oil temperature , engine coolant temperature, hour meter, speedometer, tachometer, fuel level and voltmeter are provided to monitor real time vehicle parameter.

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CENTRALISED AUTO LUBE SYSTEM :

Centralised auto lubrication system of injector type distribution is provided on equipment. If there is any stoppage of flow of lubricant to lube points due to non operation of the pump or blockages, the fault indicator lamp and alarm will be activated to warn the operator. The pumps are designed for intermittent operation to provide regular pre programmed lubrication cycle as per operational requirement.

GENERAL :

Parking brake inter lock ensures that gear shifting from neutral position does not takes place while parking brakes are on, to enhance brake life and avoid fire hazards.

Reverse inhibition feature is provided, which prevents equipment reversing while body hoisting operation. However reverse movement is possible after completing hoist operation.

Over center valve in hoist circuit prevents damage and sudden jerks to the hoist cylinder as they approach maximum extension and the weight of the load is at the rear edge of the dump body.

Electric system operated with 24V & all equipment control system are interfaced with colour coded high quality wire harness, four head lights, fog lamps, combination lamps, turn signal lights, battery isolation switch, back up lights and back up alarm. Alternator of 24V, 75 amps rating is provided for battery charging.

Drive line protector, fan guard, engine belly guard, transmission belly guard, hand rails and large convex rear view mirror are provided as safety features. Rock ejectors are provided between rear tyres.

The equipment is provided with portable extinguisher of dry chemical powder ABC type.

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DGMS Requirments as per Notification Dt. 01.10.2018

Model: BH60M Dumper

1.0 General Requirements:		
	DGMS Requirement	**BEML Remarks**
A.	**Access:**	
(i)	Safe access to the Operator Station and to routine maintenance points of HEMM shall be provided. Proper placement of components of the access system shall permit and encourage a person to use three-point support while ascending, descending or moving about the access system, when more than 1m above the ground. Two-point support is acceptable for stairs, stairways, ramps, walkways and platforms. Three- point support should be used for all ladder systems. Track shoe and track pad surfaces are accepted as access steps if three-point support is provided when the HEMM is in 'OFF' condition.	**Complied / Provided.**
(ii)	On machines with articulated frames and in the fully articulated steering position, a minimum clearance of 150 mm shall be provided between firm structures and components with relative movement in the path of the access systems to the operator's station.	**Complied / Provided.**
(iii)	An alternative exit path shall be provided on a different location of the machine than the 'primary access path from the operator platform. If the alternative exit path is not obvious, it shall be identified. The alternative exit path is intended for emergency situations (e.g. machine tip-over) and therefore does not need to meet the primary access requirements.	**Complied / Provided.**
B.	**Operator's Station (Cabin):**	
(i)	The cabin shall protect the operator against foreseeable adverse climatic conditions, heat, dust, noise etc. Air-conditioning system shall be provided in the Operator's Station. A ventilation system, an adjustable heating system and a system for defrosting windows shall be provided wherever required.	**Complied / Provided.**
(ii)	Alternative opening (Emergency Exit): An alternative opening shall be provided on a side other than that of the primary opening. A window panel or another door is acceptable if they are easy to open or remove without the use of keys or tools. Latches may be used if they can be opened from the inside without the use of keys or tools. The breaking of a suitable size of glass pane is considered to represent a suitable alternative opening, provided that the necessary pane hammer, immediately accessible to the operator, is provided and stored in the cab. When the window panel is used as an emergency exit, it shall bear an appropriate marking.	**Complied / Provided.**
(iii)	Doors and Windows: Doors, Windows and flaps shall be securely held in their intended operating positions. Doors shall be retained at their intended operating positions by a positive engagement device. The front window shall be fitted with motorized windscreen wipers and washers. The tank of the window washers shall be easily accessible.	**Complied / Provided.**
(iV)	Pipes and hoses that contain fluids at pressures exceeding 5 MPa or temperatures above 60°C located inside the cab shall be suitably guarded.	**Complied / Provided.**

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DGMS Requirement		BEML Remarks
C. Operator's protective Structures:		
(i)	All HEMM with a seated operator shall be equipped with a roll-over protective structure (ROPS). The ROPS shall comply with ISO 3471. Further, it shall also be fitted with FOPS, when they are intended for applications where there is a risk of falling objects. The fitted FOPS shall be in accordance with ISO 3449.	**Complied / Provided.**
D. Seats:		
(i)	The Operator's Station shall be fitted with an ergonomically designed adjustable seat that supports the operator in a position that allows the operator to control the machine under the intended operating conditions. The seat and it's suspension shall be so designed to reduce vibration transmitted to the operator to the lowest level that can be reasonably achieved.	**Complied / Provided.**
(ii)	If an additional seat for a trainer is installed in the Operator's Station, it shall be padded and shall provide adequate space for the trainer. The trainer shall also have available a conveniently placed handhold.	**Complied / Provided.**
(iii)	Seat Belt for Operator with reminder shall be provided.	**Complied / Provided.**
E. Operator's Controls and Indicators:		
(i)	The controls shall be of suitable design and construction and arranged so that they are able to be operated with ease from the operator's seat and within the operator's force limits. Controls shall be laid out and designed to allow easy and safe operation based on the principle that a given direction of movement of any control produces a consistent and expected effect. The surfaces of frequently used pedals shall be fitted with skid resistant type materials.	**Complied / Provided.**
(ii)	Controls that can cause a hazard due to inadvertent activation shall be so arranged, deactivated or guarded as to minimize the risk - particularly while the operator is getting into or out of the operator's station. The deactivation device shall either be self- acting or shall act by compulsory actuation of the relevant device.	**Complied / Provided.**
(iii)	A device/system shall be provided to release the residual pressure in each hydraulic and pneumatic circuits which can cause a risk.	**Complied / Provided.**
F. Starting and Stopping System:		
(i)	All HEMM shall be equipped with a starting and stopping device (e.g. key). The starting system shall have a provision for protection against unauthorized use.	**Complied / Provided.**
(ii)	The starting and Stopping system shall be designed such that movement of the machine, working equipment and attachment, shall not be possible, while starting or stopping the engine, without activating the controls. (E.g. Transmission Neutral-Engine Start safety arrangement).	**Complied / Provided.**
(iii)	In case of Remote control operated equipment, the Starting and Stopping system shall conform to any National/Internationally accepted standard.	**Not Applicable.**
G. Steering System:		

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	DGMS Requirement	BEML Remarks
(i)	The steering system shall be such that the movement of the steering control corresponds to the intended direction of steering.	Complied / Provided.
(ii)	Hydraulic Steering circuits shall, if used, incorporate the following features: (a) Pressure control devices as required to avoid excessive pressures in the hydraulic circuit; (b) Hydraulic hoses, fittings and tubing with test burst pressures at least four times the working circuit pressure control device(s) for normal and emergency steering systems; (c) Plumbing arrangements which avoid excessively tight hose bends, torsion in the installed hoses, or scrubbing and chafing of hoses.	Complied / Provided.
(iii)	An emergency steering system shall be provided which also function with reverse machine movement if the maximum rated speed in reverse exceeds 20 km/h.	Complied / Provided.
(iV)	A warning device indicating a normal steering power source shall be provided. This warning device shall be audible or visual, and shall be activated by failure of the normal steering power source.	Complied / Provided.
(V)	Articulation safety lock shall be provided in articulated steering equipment. All articulated equipment shall be equipped with a safety bar or a device, which can readily be fitted without special tools, to prevent movement of the articulation joint during maintenance work in the vicinity of this joint	Not Applicable.
H.	**Brake System:**	
	All HEMM shall be equipped with the following brake systems and all these systems shall be effective under all conditions of service, load, speed, terrain and slope, according to the intended use of the machine:	-
(i)	Service brake to be used as the primary braking system during normal operation of the equipment.	Complied / Provided.
(ii)	Emergency brake - to be applied by the operator in the event of a failure of the service brake.	Complied / Provided.
(iii)	Parking brake - used to prevent movement of stationary equipment.	Complied / Provided.
	Provided that at least one of the brakes shall be "fail safe", i.e. the spring applied- hydraulically released (SAHR) or any other means.	Complied / Provided.
	All HEMM shall have a brake system -in accordance with ISO 3450 except for crawler machines with a travel speed less than 20 km/h, which shall have a brake system in accordance with ISO 10265.	Complied / Provided.
J.	**Visibility:**	
(i)	All HEMM shall be designed so that the operator has sufficient visibility from the operator's station in relation to the travel and work areas of the machine necessary for its intended use. The performance criteria shall be in accordance with ISO 5006.	Complied / Provided.
(ii)	Rear Vision Camera shall be provided in all HEMM.	Complied / Provided.
J.	**Stability:**	

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	DGMS Requirement	BEML Remarks
(i)	All HEMM with attachments, including optional equipment, shall be designed and constructed so that stability is provided under all intended operating conditions including maintenance, assembling, dismantling, and transportation, as specified by the manufacturer in the operation manual.	Complied / Provided.
(ii)	Devices (e.g. outriggers, oscillating axle locking) intended to increase the stability of HEMM in working mode shall be fitted with interlocking devices or check valves which keep them in position in case of hose failure or in case of oil leakage.	Not Applicable for Dumper.
K.	**Noise:**	
(i)	The operator and persons near to the HEMM shall not be exposed to noise level that exceeds an eight hour equivalent continuous sound pressure level of 85 dB(A) and wherever it exceeds 85 dB (A), Personnel Protection Equipment (PPE) of adequate strength shall be used by the operators and the persons.	Complied / Provided.
L.	**Warning devices and safety signs:**	
(i)	All the HEMM shall be equipped with an audible warning device (horn) controlled from the operator's station	Complied / Provided.
(ii)	Warning system for Operator's fatigue shall be provided in all HEMM.	Complied / Provided.
(iii)	Audio Visual Alarm (A V A) system for reversing shall be provided in all HEMM.	Complied / Provided.
(iv)	Safety signs and hazard pictorials shall be displayed at conspicuous places.	Complied / Provided.
(v)	Retro- Reflective Reflectors shall be provided on 'all sides of the HEMM at suitable positions.	Complied / Provided.
M.	**Protective measures and devices:**	
(i)	All dangerously exposed moving parts of the equipment shall be provided with suitable guards of substantial construction to prevent injury to person(s).	Complied / Provided.
(ii)	Guards or shields shall be provided in the vicinity of exhaust and turbocharger to prevent fuel or oil spraying on hot surfaces.	Complied / Provided.
J.	**Electrical and Electronic Systems:**	
(i)	Electrical components and conductors shall be installed in such' a way as to avoid damage from exposure to environmental conditions (corresponding to the intended use of the machine) that can cause deterioration. Electrical component insulation shall have flame-retardant properties. ,	Complied / Provided.
(ii)	Degree of protection: Depending on the location/installation of electrical and electronic components, the following degrees of protection are required: (a) All components installed exterior to the machine or directly exposed to the environment shall have a minimum degree of protection corresponding to according IEC 60529, IP 55; (b) All components installed in the operator's cab or protected against the environment, the protection shall be designed and executed to safeguard a correct function under expected and intended conditions.	Complied / Provided.

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	DGMS Requirement	BEML Remarks
(iii)	Electronic controls, connectors in control circuits, multi-pin connectors and control switches external to the cab, shall have a minimum protection of IP 55.	Complied / Provided.
(iv)	All HEMM powered by electrical power source shall be provided with tripping device in Operator's Cabin to cut off Electric supply at Principal Switch Gear (PSG) end.	Not Applicable.
J.	**Fire Protection,**	
(i)	All HEMM shall be equipped with suitable portable Fire Extinguisher(s) in addition to Automatically operated Fire Detection and Suppression device or System.	Complied / Provided.
(ii)	Hydraulic hoses, Electric Wires, sleeves and conduits (where cable/wire is passed) of fire resistant quality shall be provided in all HEMM	Complied / Provided.
2.0 Additional Requirement specific to Machines;		
2.1 Dumper		
(a)	Mechanical steering locking to prevent untoward movement of steering wheel and tyre during work persons working below the cabin while engine is running.	Complied / Provided.
(b)	Mechanical type device to protect operator in case of head to tail collision of dumpers.	Complied / Provided.
(c)	Limiting speed device to limit the speed as per working conditions.	Limiting Speed of vehicle by selecting Gear Range on Shift Selector.
(d)	Propeller shaft guard.	Complied / Provided.
(e)	Proximity warning device:	Complied / Provided.
(f)	Dump body raised position indicator with Warning.	Complied / Provided.
(g)	Retarder System in addition to Service, Parking and Dump Brakes.	Complied / Provided.
(h)	Rock ejectors for tandem tyres.	Complied / Provided.
(i)	Body raised position mechanical locking arrangement	Complied / Provided.
(j)	Engine cut off arrangement / Battery Cut-off switch on front lower portion of the Dumper.	Complied / Provided.
(k)	Cabin Guard Extension / Canopy fully covering operator's cabin.	Complied / Provided.
(l)	Load Indicator.	Complied / Provided.
(m)	Auto dipping System.	Complied / Provided.

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DGMS Requirments as per Notification Dt. 27.02.2020

Model: BH60M Dumper

DGMS Requirement		BEML Remarks
Point	Description	
1.0	Rear Vision System: Consisting of Points 1.1 (1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6)	Complied / Provided
2.0	Warning System for Operator Fatigue: Consisting of Points 2.1 (2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6)	Complied / Provided
3.0	Auto Dipping System: Consisting of Points 3.1 (3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5)	Complied / Provided
4.0	Mechanical Device to avoid head to tail collision of Dumpers: Consisting of Points 4.1 (4.1.1, 4.1.2, 4.1.3, 4.1.4)	Complied / Provided
5.0	Automatic Fire Supression Detection and Suppression System (AFDSS): Consisting of Points 5.1 (5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5)	Complied / Provided
6.0	Dump Body raised position indicator with warning: Consisting of Points 6.1 (6.1.1, 6.1.2, 6.1.3)	Complied / Provided
7.0	Exhaust Brake: Consisting of Points 7.1 (7.1.1, 7.1.2, 7.1.3, 7.1.4)	Not Applicable
8.0	Load Indicators: Consisting of Points 8.1 (8.1.1, 8.1.2, 8.1.3, 8.1.4, 8.1.5, 8.1.6)	Complied / Provided
9.0	Dump Body Stabilizers for Tippers:	Not Applicable
10.0	Seat Belt and Seat Belt Reminder: Consisting of Points 10.1 (10.1.1, 10.1.2)	Complied / Provided
11.0	No Bump Circuit for Drills:	Not Applicable
12.0	Breakout Wrench for Drills: Consisting of Points 12.1, 12.2, 12.3	Not Applicable
13.0	Propel joystic-spring loaded type to return to neutral (Dead-man Safety) for Drills:	Not Applicable
14.0	Proximity Warning Device: Consisting of Points 14.1 (14.1.1, 14.1.2, 14.1.3, 14.1.4, 14.1.5, 14.1.6, 14.1.7, 14.1.8, 14.1.9)	Complied / Provided

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BEML LIMITED

Schedule 'A' Company under Ministry of Defence, Govt. of India

Defence & Aerospace | Mining & Construction | Rail & Metro

Ref: MT: TC-1572/BCCL (BH60M) Date: 29.06.2022

Undertaking – Safety Provision

"We here by confirm that the offered equipment shall comply all the safety provision and devices required as per Gazette Notification dated 1st Oct 2018 pertaining to Ministry of Labour and Employment (Director General of Mines Safety) against point No 1.0 General Requirement and point No.2.1 Dumper and DGMS (Tech) Circular No.06 of 2020 Dhanbad dated 27.02.2020 and subsequent amendment if any.

Date: 29.06.2022

Signature of the Bidder

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
4 वां तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
4th Floor, Unity Buildings, J.C. Road
बेंगलूरु / BENGALURU - 560 002.

Seal of the Firm

प्रधान कचेरी **Corporate Office**
ಬಿಇಎಂಎಲ್ ಸೌಧ, ೨೩/೧, ೪ನೇ ಮುಖ್ಯ ರಸ್ತೆ, ಸಂಜಯನಗರ, ಬೆಂಗಳೂರು – ೫೬೦ ೦೨೭
दूरभाष संख्या : +೯೧ ೮೦ ೨೨೯೬ ೩೨೦೦, ೧೮೦೦ ೪೨೫ ೨೩೬೫
BEML Soudha, 23/1, 4th Main, S R Nagar, Bengaluru - 560 027
Tel: +91 80 2296 3200, 1800 425 2365
CIN: L35202KA1964GOI001530, GST NO. 29AAACB8433D1ZU

मार्केटिंग प्रधान कचेरी **Marketing HQ:**
ಬಿಇಎಂಎಲ್ ಲಿಮಿಟೆಡ್, ೪ನೇ ಮಹಡಿ, ಯೂನಿಟಿ ಬಿಲ್ಡಿಂಗ್ಸ್, ಜೆ.ಸಿ. ರಸ್ತೆ, ಬೆಂಗಳೂರು – ೫೬೦ ೦೦೨
मूरभाष संख्या : +೯೧ ೮೦ ೨೨೯೬ ೩೫೦೫
BEML Limited, 4th Floor, Unity Buildings, J.C Road, Bengaluru - 560 002
Tel: +91 80 2296 3505
mt@beml.co.in, mtt@beml.co.in

www.bemlindia.in

Clause 10: Expected Life of Major Assy.

The expected life of the following major assemblies/ sub-assemblies based on data from operating fleet of offered model: -

Major Assemblies	Expected Life* (in hours)
a. Body Chassis	> 25,000
b. Engine	18,000 ~ 20,000
c. Transmission	18,000 ~ 20,000
d. Differential	22,000 ~ 24,000
e. Final Drive	16,000 ~ 18,000

Note:*Expected life means before first overhaul.

Signature of the bidder

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BRAKE TEST – BH60M DUMPER

Results of Service & Secondary Brake stopping Tests carried out according to ISO 3450:

Brake System Tested	Slope (%)	Machine Speed (km/h)	Stopping distance (m)
Service	9	50	47.00
Secondary	9	25	20.60

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Model: BH60M Dumper

Turning diameter as defined in clause 3.2 of ISO 7457:	**21 m**

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DETAILED TECHNICAL DESCRIPTION OF BH60M REAR DUMP TRUCK

BEML, BH60M Dumper model is designed for 60 Ton payload capacity is diesel powered, self propelled, wheeled mechanical rigid frame rear dumper with following configuration.

POWER TRAIN :

Powered by Direct injection, 4-stroke diesel engine model QSK19C Engine which is compact engine for better accessibility and serviceability.

Fitted with remote mounted AVTEC, M6610A model power shift hydraulic transmission with Electronic Control system (ECS), torque converter, lock-up clutch and reverse inhibitor. The trim booster ensures smooth shifting both at high idle and low idle. Also transmission is provided with two reverse gears for higher productivity.

Heavy duty planetary axle with anchor structure and completely sealed oil cooled wet multiple disc forms the best power train combination.

BRAKES :

The equipment is provided with dry caliper disc brake on the front axle and oil cooled wet multiple disc brakes on rear axle. The rear brakes also act as retarder. Brake application is through highly reliable all hydraulic system.

Automatic emergency braking feature is provided . Uniquely designed brake control module which constantly monitor brake pressure in the dual brake accumulators and will activate an audible and visible alarm, if pressure on either accumulator drops below tolerable level. If pressure continues to drop, service brakes will be automatically applied. Rear brakes are completely sealed to be free from dust and water contaminants. Rear wheel brake lock is provided through a switch on control panel for locking brakes while loading and dumping.

HYDRAULICS :

Hydraulic system consists of one tandem pump and one energy conserving variable piston pump. The tandem vane pump provides oil for hoist operation and brake cooling. The piston pump provides oil for steering and brake application through accumulators.

The equipment is provided with orbitrol power steering control with pressure compensating steering pump and two double acting steering cylinders .Front hydrair suspension serves as steering king pins to provide excellent maneuverability. Automatic emergency steering feature is provided as standard through steering accumulators.

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SUSPENSIONS :

The frame is suspended on four independent hydro-pneumatic suspension cylinders with integral rebound control for excellent riding comfort.

FRAME :

The equipment is built on a lab tested/field proven frame structure of ladder type design with deep box section construction frame rail with integral bumper cross member and rugged continuous circular horse collar. Castings at the rear cross member incorporate the body pivot, body up locking pins and rear suspension strut pivots as well as the pan -hard rod arrangement. The frame is built with special alloy steel and is designed to take integral ROPS cabin mounting.

BODY :

V-shaped body with single slope flat floor provides optimum carrying capacity and smooth controlled dumping . The body is built up with high tensile strength, high hardness abrasion resistant plates with rugged bolster, sill construction . Body Front exhaust arrangement is provided for exhaust heated body as standard . The rock body and coal body are interchangeable.

Body is provided with spill guard to protect the tyres from spillage and canopy structure protecting the operator's cab. Body hoisting is through two nos. twin stage hydraulic cylinders. Heavy duty body guide structure is provided to ensure proper alignment of body.

TYRES :

The equipment is provided with 24.00 x 35 - 48 PR tubeless rock grip tyres of reputed make.

CABIN :

Equipment is fitted with deluxe interior fully enclosed sound suppressed integral **ROPS Air conditioned cabin** with tinted glass, rear view mirror, wind shield washer and wipers for superb working comfort.

Logically located instrument panel with controls and easy to read parameters on LCD display /symbols/ diagnostic message to enhance operator's efficiency. Brake oil temperature , engine coolant temperature, hour meter, speedometer, tachometer, fuel level and voltmeter are provided to monitor real time vehicle parameter.

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CENTRALISED AUTO LUBE SYSTEM :

Centralised auto lubrication system of injector type distribution is provided on equipment. If there is any stoppage of flow of lubricant to lube points due to non operation of the pump or blockages, the fault indicator lamp and alarm will be activated to warn the operator. The pumps are designed for intermittent operation to provide regular pre programmed lubrication cycle as per operational requirement.

GENERAL :

Parking brake inter lock ensures that gear shifting from neutral position does not takes place while parking brakes are on, to enhance brake life and avoid fire hazards.

Reverse inhibition feature is provided, which prevents equipment reversing while body hoisting operation. However reverse movement is possible after completing hoist operation.

Over center valve in hoist circuit prevents damage and sudden jerks to the hoist cylinder as they approach maximum extension and the weight of the load is at the rear edge of the dump body.

Electric system operated with 24V & all equipment control system are interfaced with colour coded high quality wire harness, four head lights, fog lamps, combination lamps, turn signal lights, battery isolation switch, back up lights and back up alarm. Alternator of 24V, 75 amps rating is provided for battery charging.

Drive line protector, fan guard, engine belly guard, transmission belly guard, hand rails and large convex rear view mirror are provided as safety features. Rock ejectors are provided between rear tyres.

The equipment is provided with portable extinguisher of dry chemical powder ABC type.

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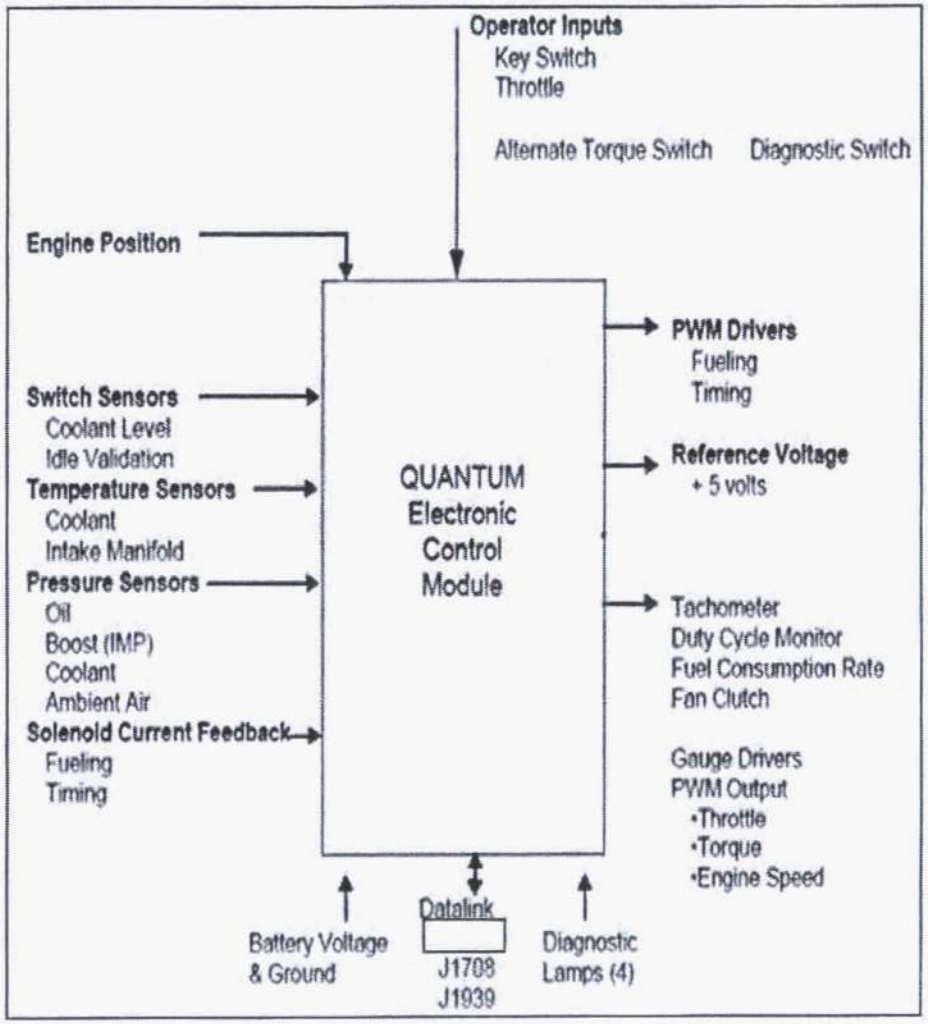
ENGINE FULL INTERATED ELECTRONIC SYSTEM

ENGINE MONITORING SYSTEM : THE SYSTEM MONITORS CRITICAL PARAMETER LIKE ENGINE TEMPERATURES ,COOLENT LEVEL , PRESSURE AND PROVIDES THE REAL TIME DISPLAY OF PARAMETER VALUE ON MURHPY LCD SCREEN PROVIDED ON THE DASH BOARD

WHENEVER ANY SENSED PARAMETER AND DERIVED PARAMETER OF THE ENGINE CROSSES THE DESIRED SET LIMIT OF SAFETY A FAULT CONDITION IS DETECTED BY ECM THIS FAULT IS LOGGED IN THE ECM AS AN ACTIVE FAULT AND DISPLAY ON SCREEN WITH MEASGAGE AND ALSO AUDIO/VISUAL ALARM TO ALERT THE OPERATOR

ONCE THE FAULT CONDITION IS OVER OR FAULT IS CORRECTED THE FAULT GOES TO INACTIVE FAULT CODE HISTORY OF THE ECM & ALL THE ACTIVE FAULT CODES AND INACTIVE FAULT CODES CAN BE SEEN THROUGH FAULT CODE DETECTION FEATURE OF THE INSITE TOOL .



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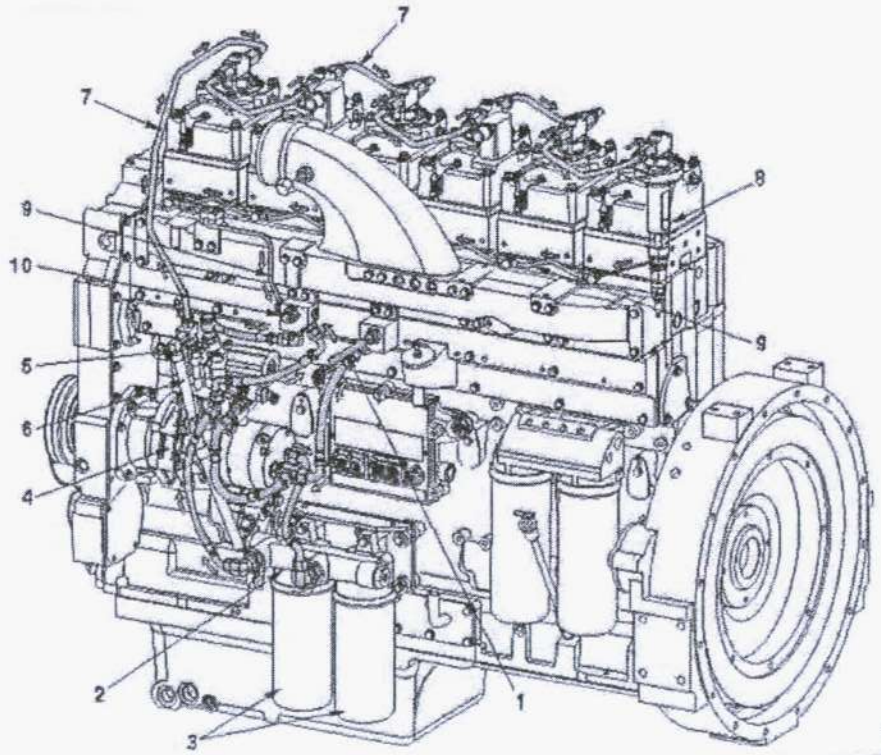
ENGINE ELCTRONIC CONTROL FUEL MANAGEMENT & MONITORING SYSTEM

The QSK19 MCRS engine incorporates a Cummins high pressure fuel pump and a modular common rail fuel system. The fuel pump, solenoid-controlled electronic injectors, and the engine ECM provide full-authority electronic control for fuel delivery. With this system, both injection pressure and timing can be accurately controlled. The Modular Common Rail System (MCRS) is designed to enable engines to meet emission requirements and improve performance. These fuel systems can provide rapid response to load changes and multiple injection events per engine cycle for emission control and optimized fuel consumption.



1. Fuel supply from geroter
2. Fuel filter head assembly
3. Second stage fuel filters
4. Fuel pump
5. Mechanical dump valve
6. Vent for injector supply lines
7. Injector supply line
8. Injector
9. Fuel return line
10. Air bleed valve and fuel return to original equipment manufacturer (OEM) fuel tank.

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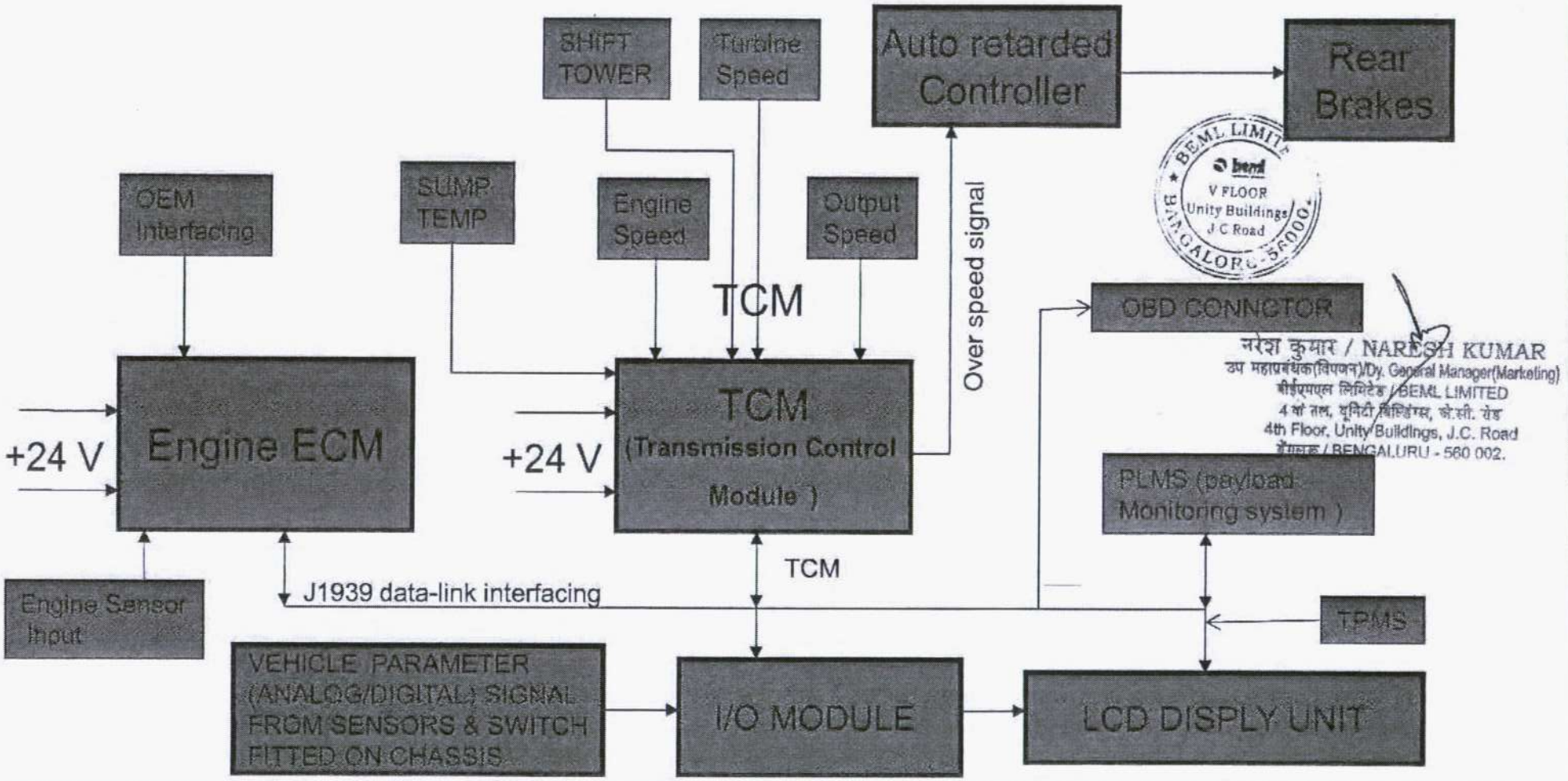
System Integration of Engine Transmission and Auto retarder interface



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SYSTEM INTEGRATION : TRANSMISSION CONTROLLER RECEVIES SIGNAL FROM SHIFT TOWER INPUT, THROTTEL INPUT SGINAL FROM ENGINE ECM THROUGH J1939 , SUMP TEMP , INPUT SPEED, TURBINE SPEED AND TRANSMISSION OUT PUT SPEED ON REAL TIME BASE FOR ALL VECHICLE TRAVEL LOAD CONDITION TO PERFORM SMOOTH UP SHIFTING / DOWN SFIFTING OF GEAR AND ALSO SYSTEM IS INTEGRATE WITH BRAKE SYSTEM BY 24V TRIGGERING SIGNAL FROM TRANSMISSION CONTROLLER TO AUTORETADER CONTOLLER WHEN INPUT SPEED IS ATTAINED PRE PROGRAMED VALUE IN TURN AUTORETADER ACTUVATE REAR BREAK SOLENOID

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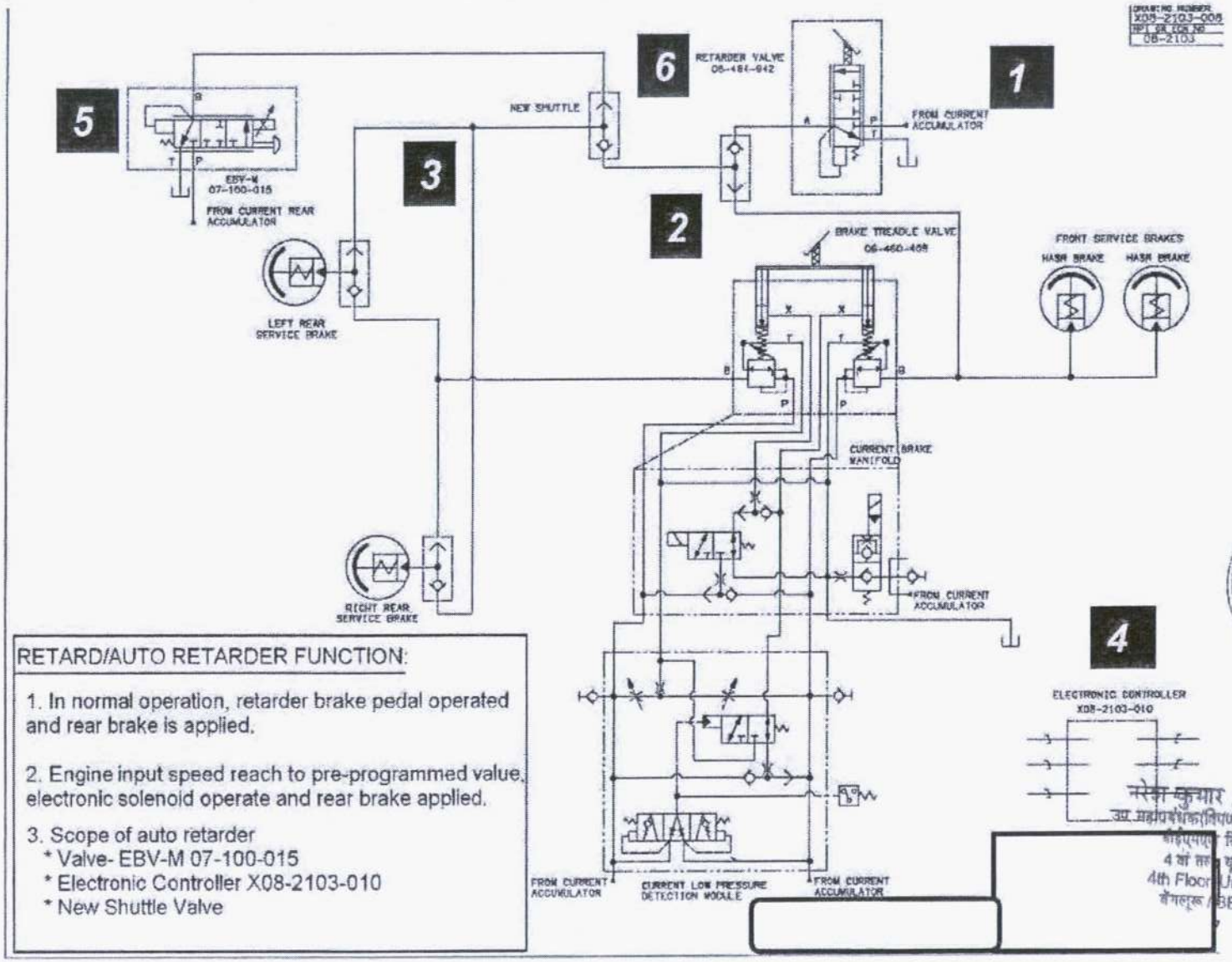
AUTO RETARDER FUNCTION BLOCK DIAGRAM



RETARD/AUTO RETARDER FUNCTION:

1. In normal operation, retarder brake pedal operated and rear brake is applied.

2. Engine input speed reach to pre-programmed value, electronic solenoid operate and rear brake applied.

3. Scope of auto retarder
   * Valve- EBV-M 07-100-015
   * Electronic Controller X08-2103-010
   * New Shuttle Valve

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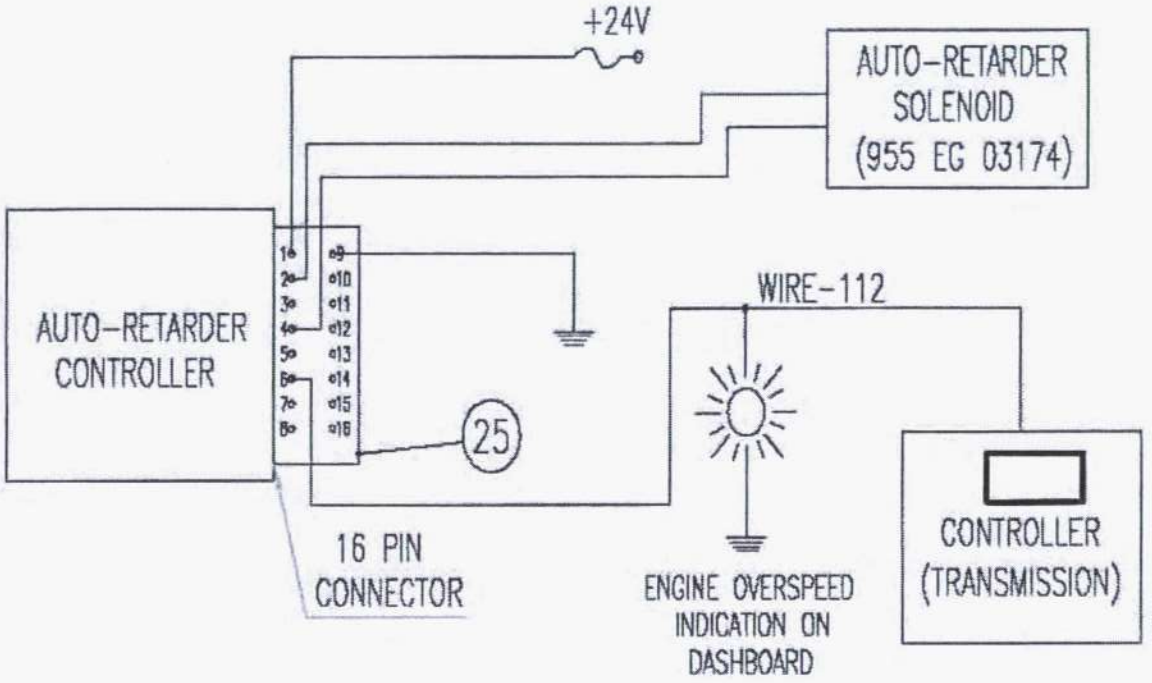
NORMAL RETADER : FLOW FROM PEDAL **1** . SHUTTLE VALVE **2** REAR BRAKE **3**

AUTO RETARDER : ELEC SIGNAL FROM - 4 RETARD VALVE 5 SHUTTLE VALVE 6 REAR BRAKE →

AUTO RETARDER ELECTRICAL BLOCK DIAGRAM



WORKING : WHEN DUMP TRUCK IS TRAVEL IN DOWENHILL TRANSMISSION I/P SPEED (ENGINE INPUT SPEED) IS REACHED TO PRE PROGRAMED SPEED THE RETARDER SOLENOID WILL BE ENERGISED

1. INPUT : i. 24V POWER FOR AUTO RETADER CONTROLLER
II. OVER SPEED SIGNAL(24V) FROM TCM CONTOLLER

2.OUT PUT : i. PROPORTIONAL SOLENOID VALUE

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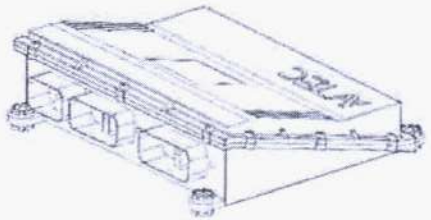
FUNCTIONAL BLOCK DIAGRAM OF HATS (Hauling Automatic Transmission System))



SHIFT SELECTOR

RANGE ,MODE,PROGNOSTIC

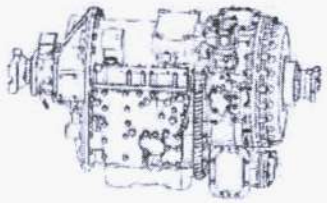
DISPLAY
DIAGNOSTIC , PROGNOSTIC ,
CHECK TRANS INFORMATION

TRANSMISSION
- OUTPUT SPEED SENSOR
- TURBINE SPEED SENSOR
- ENGINE SPEED SENSOR
- TEMPERATURE SENSOR

- SOLENOIDS

TCM
Transmission Control Module

THROTTLE SIGNAL
- THROTTLE POSITION SENSOR
- CAN



MACHINE INTERFACE MODULE or
MACHINE INTERFACE WIRING

INPUT FUNCTION

OUTPUT FUNCTION

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FUNCTIONAL BLOCK DIAGRAM OF HATS (Hauling Automatic Transmission System))

Position Selection - Lever Type – with built in locking mechanism

Mode selection - Programmable top gear selection as required by customer

Indication - 128 x 64 GLCD display to indicate - selected gear, attained gear, error code, body up, delta p hold, parking brake, check trans, lock up / converter, primary / secondary mode, rpm values.

Positions -1, 2, 3, 4, 5, D, N, R1 and R2

Communication with TCM - CAN J1939 standard

Operating voltage - 24V dc

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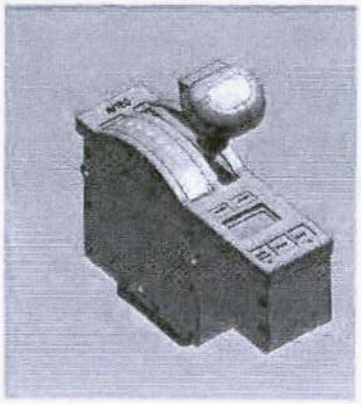

Florescent Gear selected Indicator

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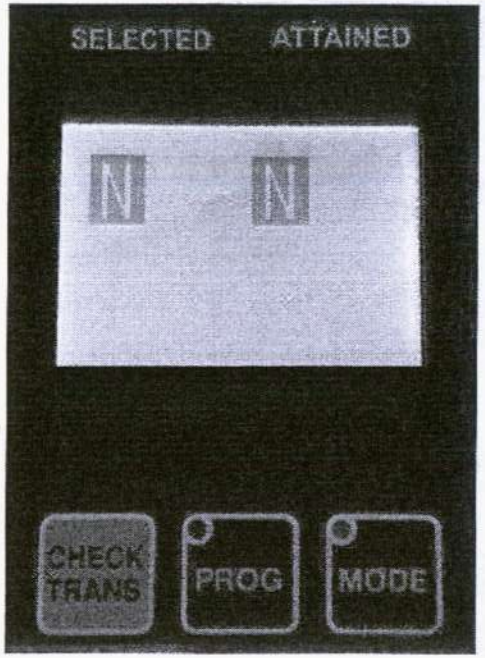
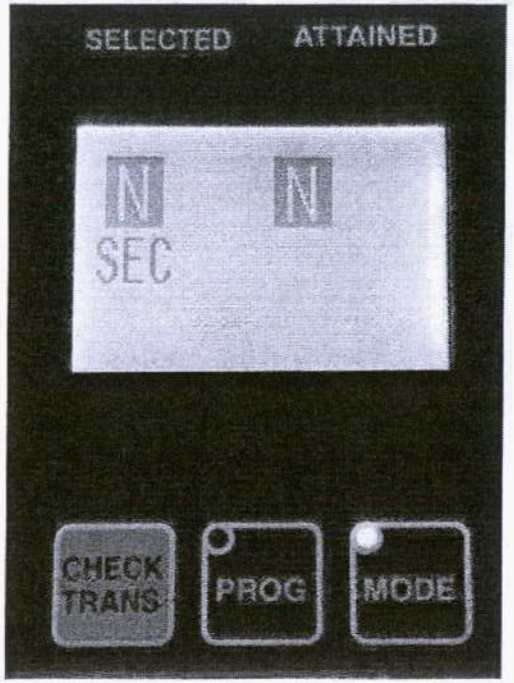
FUNCTIONAL BLOCK DIAGRAM OF HATS (Hauling Automatic Transmission System))

HATS SHIFTER TOWER DISPLAY FEATURE



SHIFTER DISPLAYING INFORMATION ON GEAR SELECTED AND ATTAINED IN PRIMARY MODE



SHIFTER DISPLAYING INFORMATION ON GEAR SELECTED AND ATTAINED IN SECONDARY (SEC) MODE . ALSO MODE BUTTYON IS ILUMINATED

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FUNCTIONAL BLOCK DIAGRAM OF HATS (Hauling Automatic Transmission System))

HATS SHIFTER TOWER DISPLAY FEATURE

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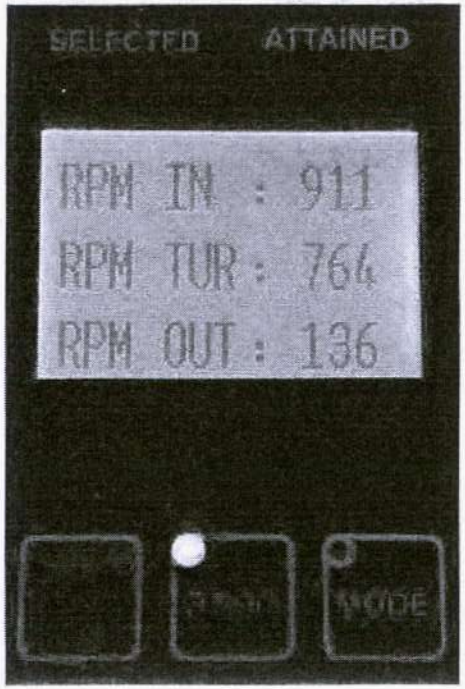

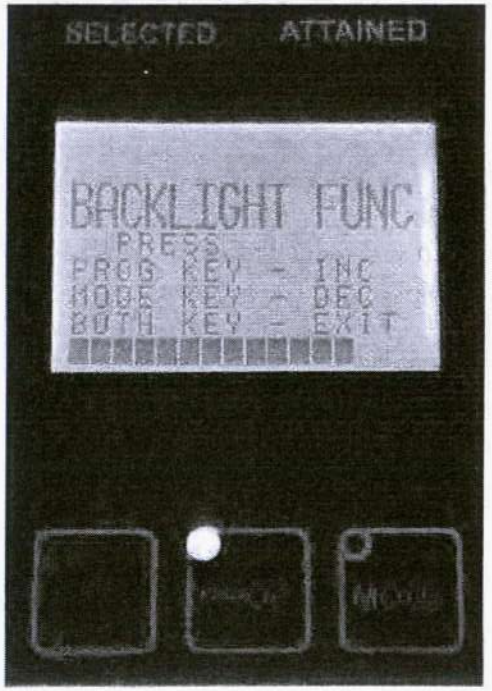

DISPLAY INFORMATION ON INPUT TURBINE AND OUTPUT RPM FOR EASY TROUBLE SHOOTING

DISPLAY ILIMINATION BRIGHTNESS CAN BE CONTROLLED BY THE OPERATOR SUITING HIS COMFORT LEVEL BY ADJUSTING WITH THE HELP OF MODE KEY AND PROGNOSTIC KEY

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FUNCTIONAL BLOCK DIAGRAM OF HATS (Hauling Automatic Transmission System))

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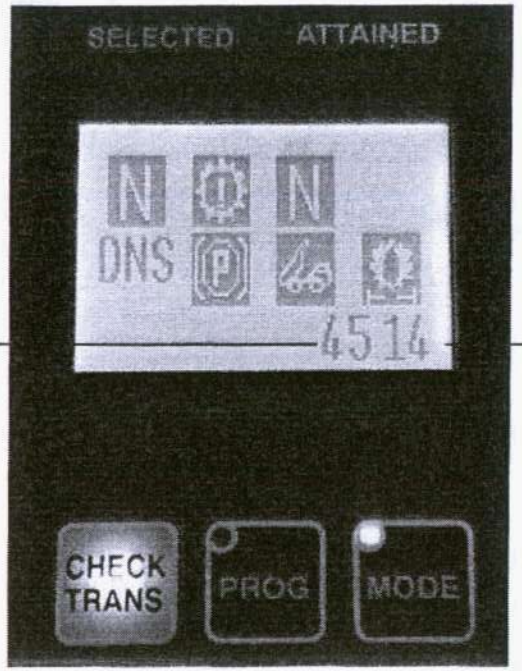
HATS SHIFTER TOWER DISPLAY FEATURE



MAIN ERROR CODE

SUB ERROR CODE

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SHIFT SELECTOR DISPLAY INDICATING MAIN ERROR CODE AND SUB ERROR CODE AND ALSO CAUSING DO NOT SHIFT SYMBOL TO BE DISPLAYED (DNS) AND CHECK TRANSMISSION TO GLOW

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DIAGANOSTIC CODE MEMORY

Diagnostic codes are logged in a list in memory listing and logging up to 10000 data.
The codes contained in the list have information recorded as shown in the table below (codes are examples). Access to the code list position, from date & time, to date & time main code, sub code, event counter and status is through PC based diagnostic tool.
Access to main code, sub code, event counter and status is through Hand Held Diagnostic tool.

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Code List Position	From Date	From Time	To Date	To Time	Main Code	Sub Code	Event Counter	Status
6	20-04-2018	16:44:12	20-04-2018	16:51:43	66	00	3	1
18	20-04-2018	16:50:25	20-04-2018	16:51:43	23	12	1	1
47	20-04-2018	16:50:25	20-04-2018	16:52:25	23	16	1	0
6	20-04-2018	12:59:29	20-04-2018	16:44:02	66	00	2	0
37	20-04-2018	16:43:58	20-04-2018	16:44:00	56	55	14	0

Status : 1 is Active , 0 is Inactive

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FUNCTIONAL BLOCK DIAGRAM OF HATS (Hauling Automatic Transmission System))

DECODING OF CODE

HATS DIAGANOSTIS MEMORY DETAILS

A. Code List Position.

The position which a code occupies in the code list. Positions are displayed as 1,2,3 and so on.

B. From Date

Date when the diagnostic code occurred.

C. From Time

Time when the diagnostic code occurred.

D. To Date

Date when the diagnostic code is cleared.

E. To Time

Time when the diagnostic code is cleared.

F. Main Code.

The general condition or area of fault detected by the ECU.

G. Sub code.

The specific area or condition related to the main code in which a fault is detected.

H. Event Counter.

Counts the number of occurrences of a diagnostic code.

I. Status

Indicates when a diagnostic code is active, 1 is active and 0 is inactive.

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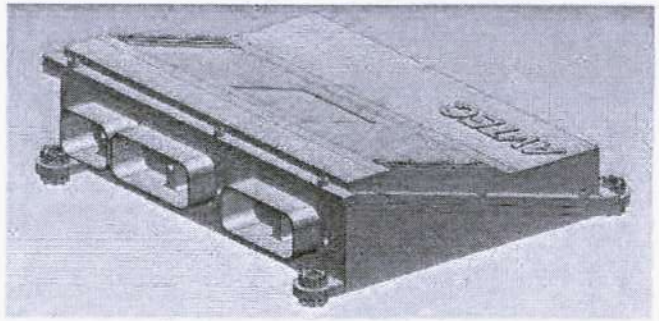
FUNCTIONAL BLOCK DIAGRAM OF HATS (Hauling Automatic Transmission System))

HATS DIAGANOSTIS MEMORY DETAILS



Controller - 32 bit Microcontroller with built in flash memory of 512Kbytes working @ 150MHz

Memory - 8 M bytes of memory to store 10,000 records of error code and 10,000 records of gear shift patterns. Expandable up to 8Gbytes through SD card.

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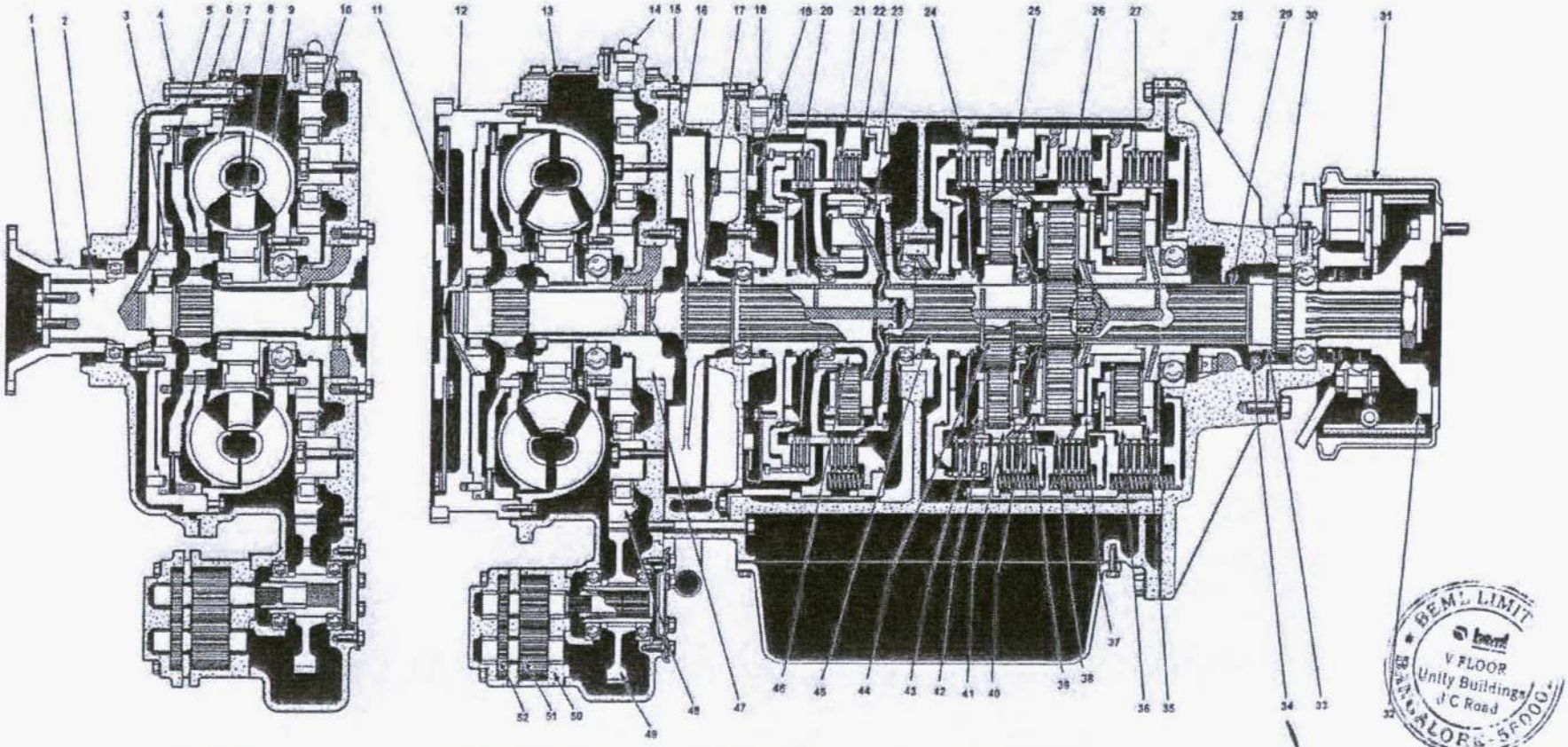
M6610A TRANSMISSION COMPONENTS DETAILS

AVTEC HINDUSTAN TRANSMISSIONS

CLBT-6063, M6600 and S6600 Series Transmission

AVTEC Limited
Power Products Division



1 - Input flange
2 - Torque converter drive hub
3 - Torque converter drive housing
4 - Front cover
5 - Lockup clutch
6 - Torque converter housing
7 - Torque converter turbine
8 - Torque converter stator
9 - Torque converter pump
10 - PTO gear
11 - Flexplate assembly
12 - Flywheel
13 - PTO cover
14 - Input (engine) speed sensor
15 - Retarder housing
16 - Retarder rotor
17 - Turbine shaft
18 - Turbine speed sensor
19 - Pitot tube
20 - Splitter-low clutch
21 - Splitter-high clutch
22 - Splitter ring gear
23 - Splitter planetary carrier
24 - High-range clutch
25 - Intermediate-range clutch
26 - Low-range clutch
27 - Reverse-range clutch
28 - Rear cover
29 - Output shaft
30 - Output speed sensor
31 - Parking brake
32 - Output flange
33 - Speedometer drive gear
34 - Speedometer driven gear
35 - Reverse-range planetary carrier
36 - Reverse-range ring gear
37 - Reverse-range sun gear
38 - Low-range ring gear
39 - Low-range planetary carrier
40 - Low-range sun gear
41 - Intermediate-range ring gear
42 - High-range clutch hub
43 - Intermediate-range planetary carrier
44 - Intermediate-range sun gear
45 - Splitter output shaft
46 - Splitter sun gear
47 - Converter ground sleeve
48 - Oil pump drive idler gear
49 - Oil pump drive gear
50 - Oil pump assembly
51 - Input pump
52 - Scavenge pump

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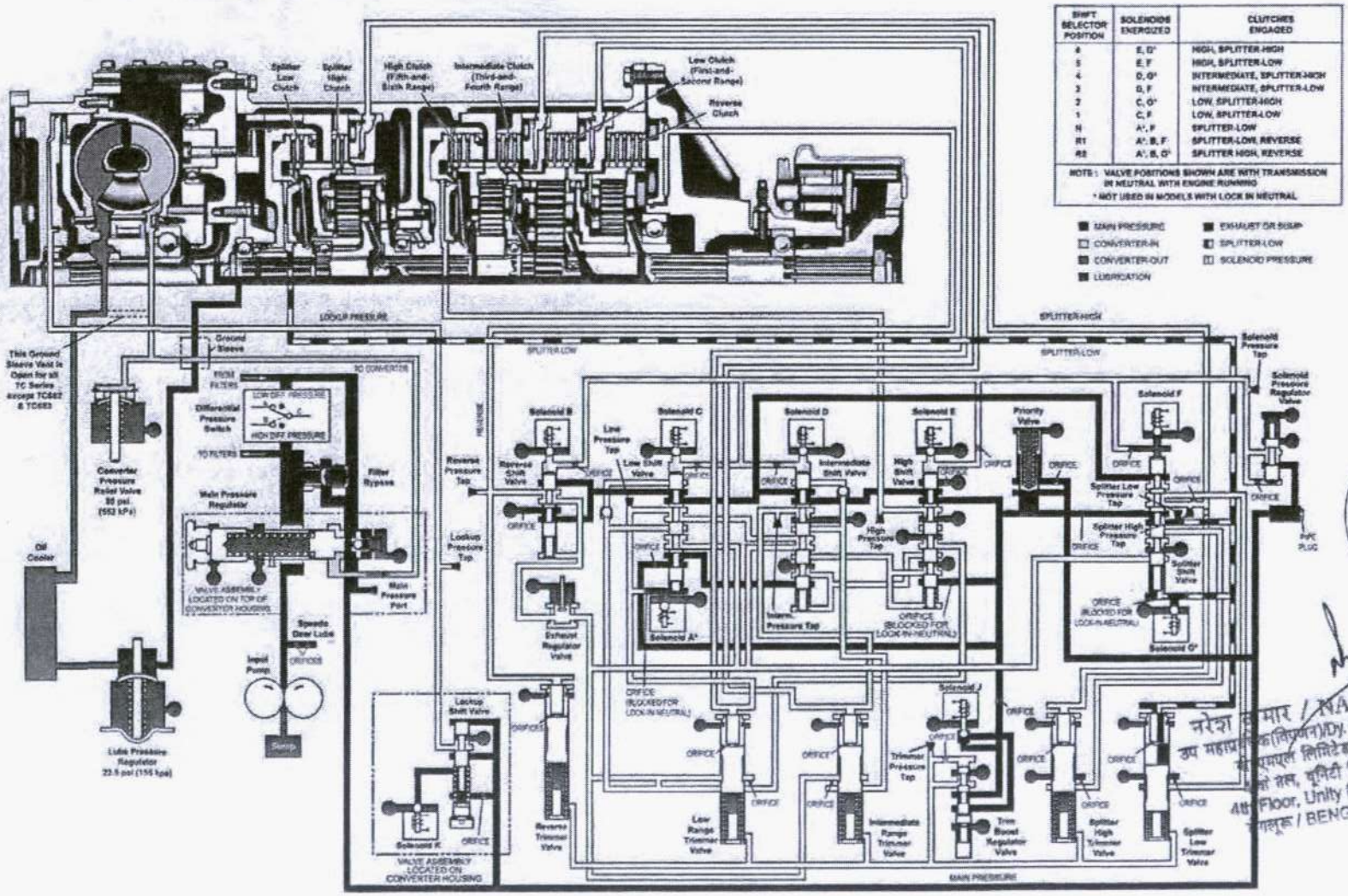
M6610A TRANSMISSION HYDRAULIC SCHEMATIC

AVTEC HINDUSTAN TRANSMISSIONS

CL(B)T 5963, 6063, M 5600, S5600 Series and M 6600, S 6600 Series Transmissions – Hydraulic Schematic

(Models with Trim Boost and Electric Lockup)

AVTEC Limited
Power Products Division



SHIFT SELECTOR POSITION	SOLENOIDS ENERGIZED	CLUTCHES ENGAGED
6	E, G*	HIGH, SPLITTER-HIGH
5	E, F	HIGH, SPLITTER-LOW
4	D, G*	INTERMEDIATE, SPLITTER-HIGH
3	D, F	INTERMEDIATE, SPLITTER-LOW
2	C, G*	LOW, SPLITTER-HIGH
1	C, F	LOW, SPLITTER-LOW
N	A*, F	SPLITTER-LOW
R1	A*, B, F	SPLITTER-LOW, REVERSE
R2	A*, B, G*	SPLITTER HIGH, REVERSE

NOTE: VALVE POSITIONS SHOWN ARE WITH TRANSMISSION IN NEUTRAL WITH ENGINE RUNNING
* NOT USED IN MODELS WITH LOCK IN NEUTRAL

- MAIN PRESSURE
- CONVERTER-IN
- CONVERTER-OUT
- LUBRICATION
- EXHAUST OR SUMP
- SPLITTER-LOW
- SOLENOID PRESSURE

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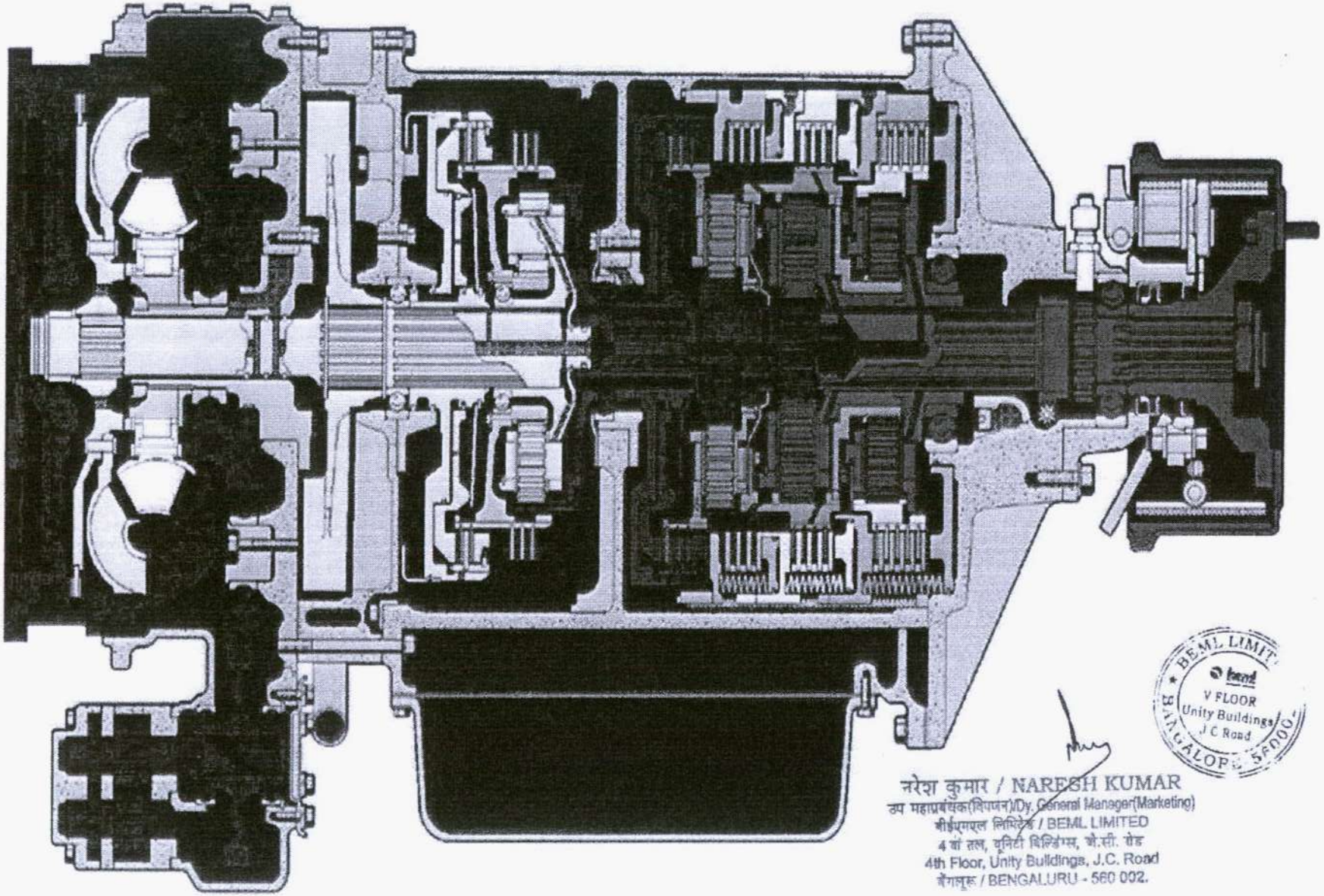
M6610A TRANSMISSION CROSS SECTION VIEW



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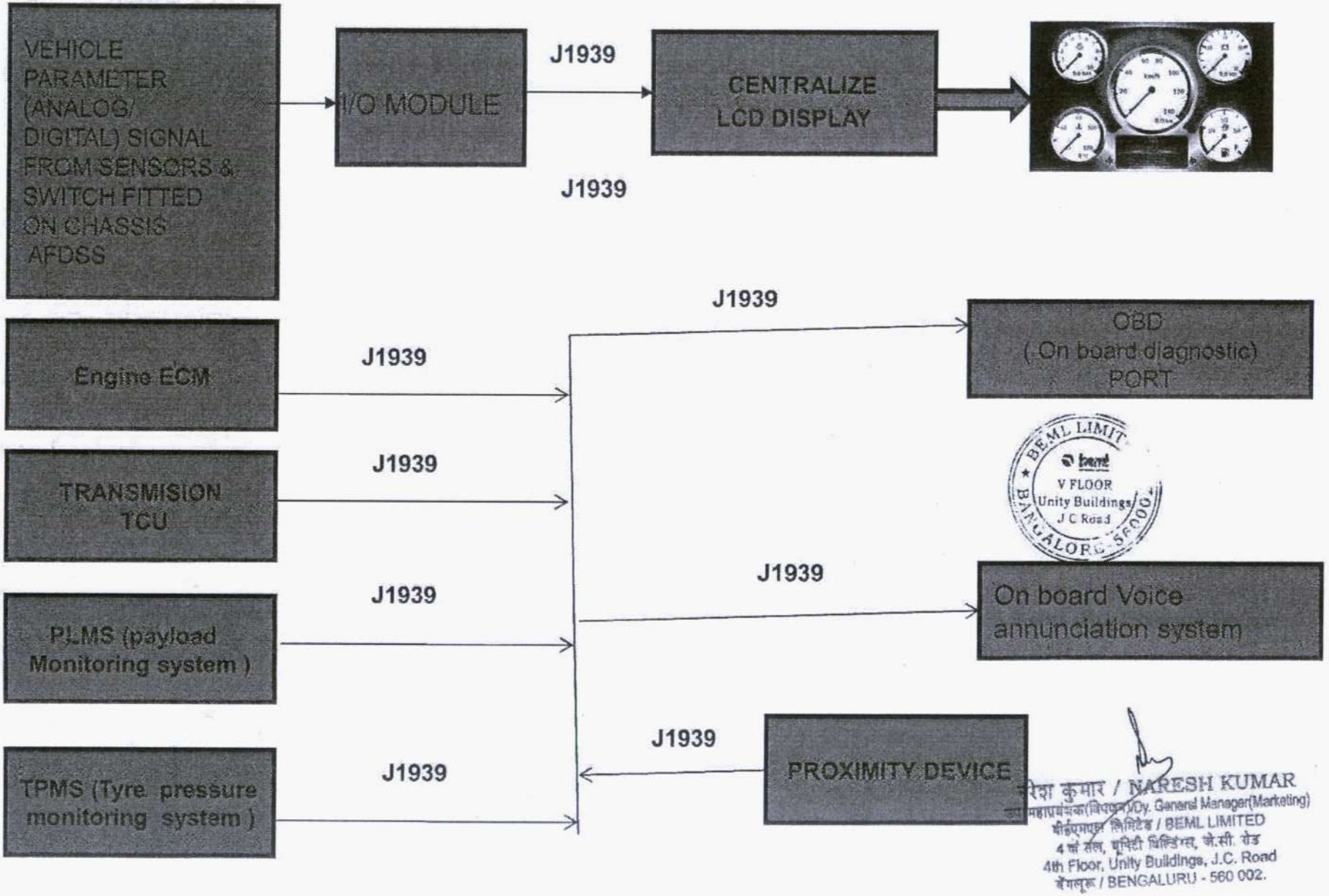
Productivity & Health monitoring system)



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Productivity & Health monitoring system

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In equipment productivity & health monitoring is real time equipment critical parameter data will be monitored by respective control (ref: block diagram) and data will available on J1939 net work to centralized display with OBD Self-diagnostic & error alarm features to operator for indicating equipment health during equipment operation and also same data is available to interface GPS-based transfer of equipment performance data (PMS and HMS) to third party equipment management system by single port available on the dash board .

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Each system having memory capacity to store above measured data in batch form for at least one month period and the individual system having port to download these data to a laptop / data storage system.

Productivity & Health monitoring system

The HMS & PMS module of the equipment will be monitor following parameter

a. Working hour, idle hour, based on the duration of a shift for which the equipment is switched on for operation (data from engine ECM & PLMS module)
b. Maximum speed, average speed, distance travelled, waiting time, loading time, unloading time, load carried by dumper for each trip and cumulative.(data from PLMS module)
c. Engine oil pressure & temperature (data from Engine ECM module)
d. Coolant temperature (data from Engine ECM module)
e. Coolant level (data from Engine ECM module)
f. Engine RPM (data from Engine ECM module)
g. Fuel level (data from Engine ECM module & I/O module)
h. Hyd. oil temperature (data from I/O module)
i. Engine electrical system - Battery voltage and Alternator out put (data from I/O module)
k. All vital parameters of drive system including transmission Fault codes along with details (data from transmission TCM)
l. Tyre inflation pressure & temperature (data from transmission TPMS)

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Productivity & Health monitoring system

a. Alert audio messages to be given to Dumper Operators and control room person for the following events:

b. In the case of operator exceeds pre-defined maximum speed for different dumpers.

Compliance b : a) OBD broadcast the over speed diagnostic message & provided central warning

c. In the event of dumpers travelling in opposite direction falls in line.

Compliance c : Proximity system broadcast any object/dumper fall in range of detection zone of the system will pop-up alert diagnostic message on OBD & warning alarm if object in warning zone

d. To maintain safe distance between dumpers travelling in the same direction.

Compliance d : In line with Compliance c

e. Fire warning to operator

Compliance e The message will be pop up OBD along with central warning in the event of fire

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Productivity & Health monitoring system

f. Dump Body hoist indication to be given in the event of dumper travelling in dump body hoist position.

Compliance f : e) The message will be pop up OBD along with central warning dumper travelling in dump body hoist position.

Productivity & Health monitoring system supplier scope

BEML will provide protocol details for interface and M/s.BCCL has to facilitate entire process including tripartite agreement for confidentiality. BEML will not provide Fleet management solution and only the protocols details of equipment parameters will be shared after tripartite agreement. BEML will provide the interface connector(J1939 connector) on the dash board for interfacing of equipment data with Fleet management. The integration, configuration and development of software's are not in BEML scope.

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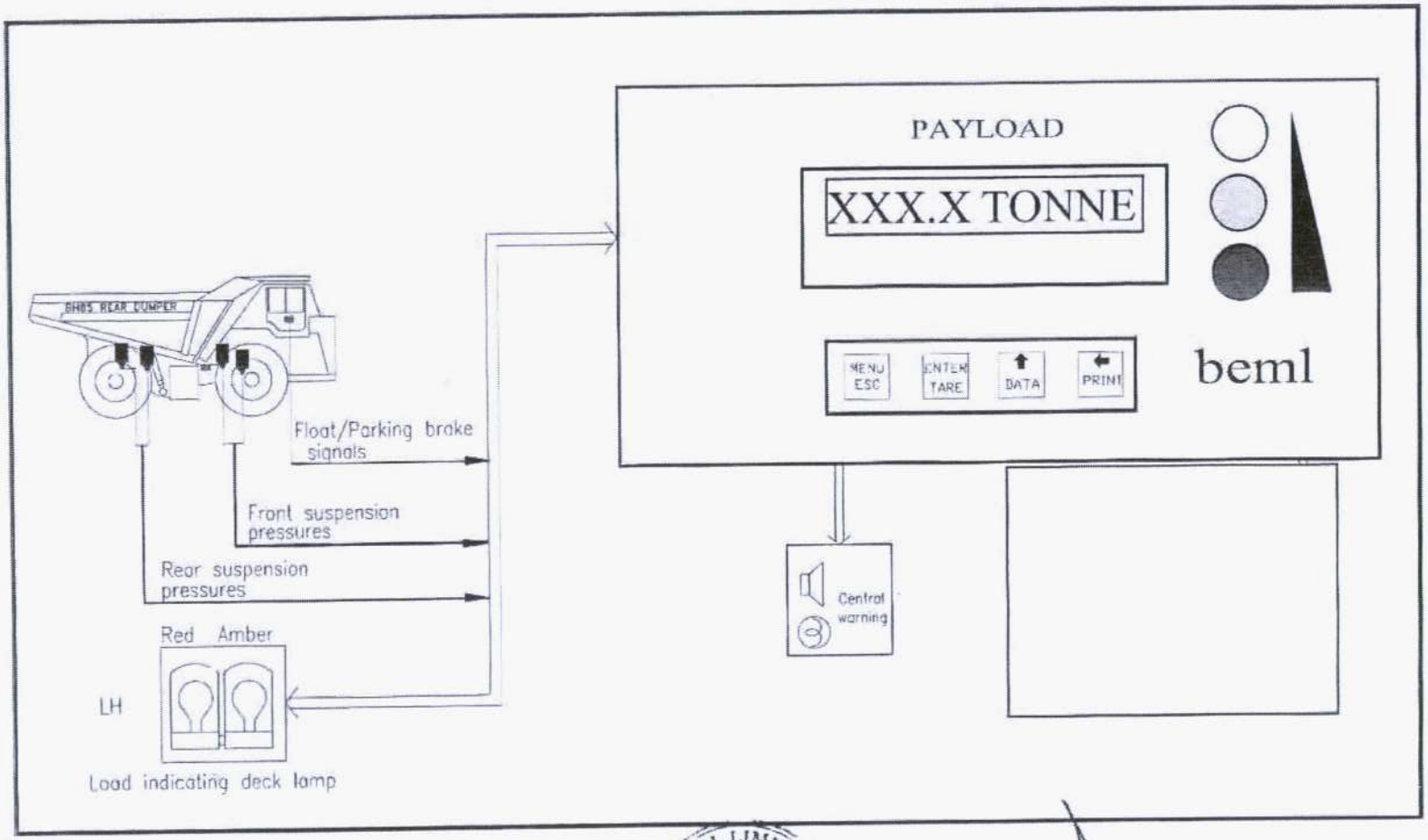
FUNCTIONAL BLOCK DIGRAM OF PAYLOAD SYSTEM



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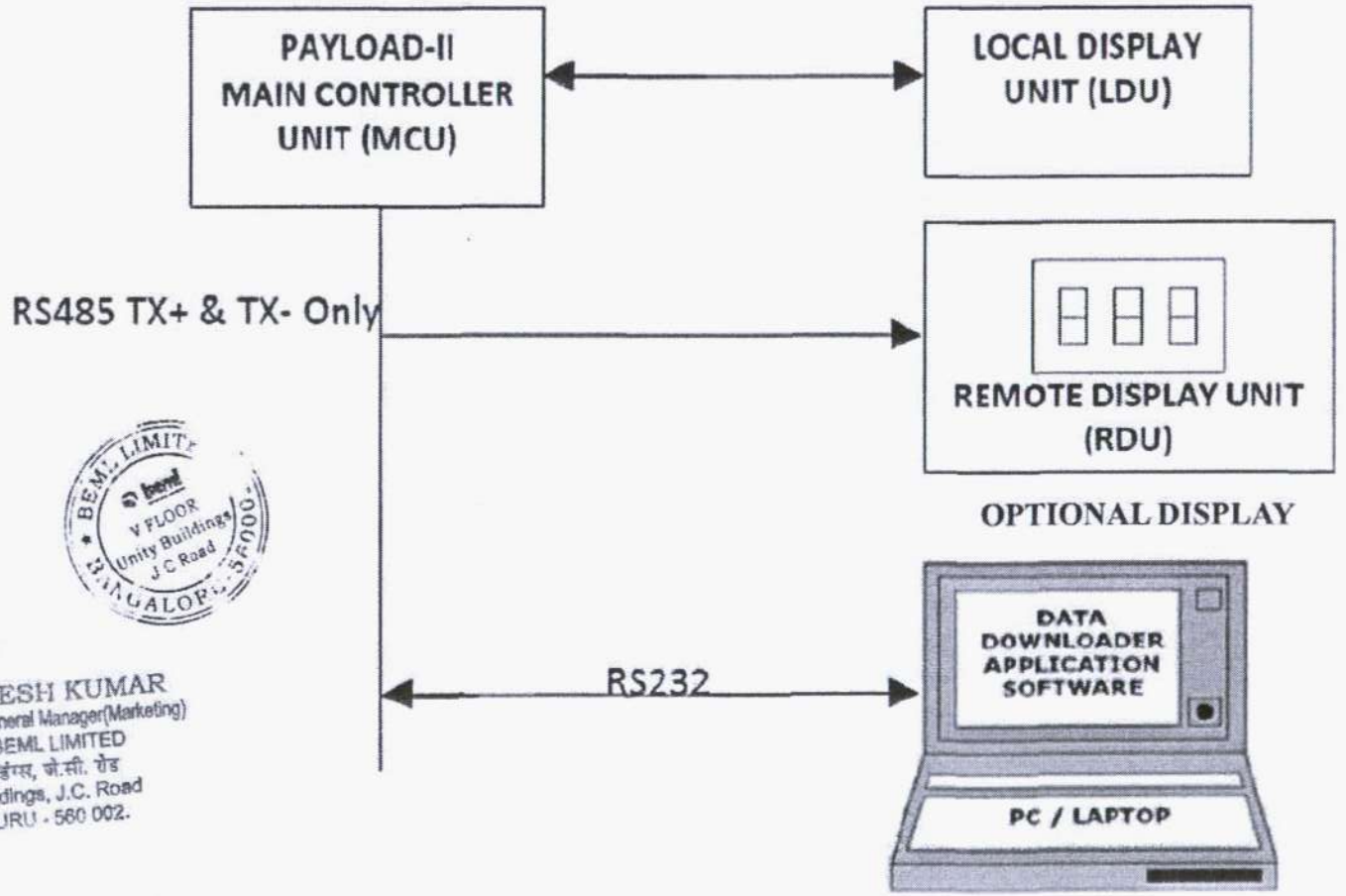
FUNCTIONAL BLOCK DIGRAM OF PAYLOAD SYSTEM



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PRINCIPLE OF OPERATION

- On-board payload monitoring system consists of a microcontroller based electronic unit, pressure sensors fitted on vehicle suspensions and Deck lamps.
- Vehicle load is reflected on pressure variation in four hydraulic suspensions. Based on this, individual load appearing on each suspension is computed and added to get total payload.
- In addition, parking brake and float signals are sensed to ensure proper load measurement and display only when it is in parked condition.
- An intelligent algorithm has been formulated to reduce uncertainty of payload measurement considering vehicle structure and loading pattern.
- The system alerts both shovel operator and dumper operator upon overload thro' a set of deck lamps and audio-visual warning.

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SALIENT FEATURES

- Provides on-line, on-board payload data
- Quick coupling for pressure sensors
- Deck lamp to indicate load status
- Records following data
  a. Trip no/weight with date/time
  b. Cycle time (load, haul, stop, dump, return ,stop total)
  c. cycle distance (Haul, return & total)
  d. Haul speed (MAX/ AVG)
  e. Return speed (MAX/AVG)
- Password protected reset facility
- Indicates no. of overload trips
- Self-diagnostic for pressure sensor status
- Payload display only when equipment is parked

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PAYLOAD REPORT FORMAT AND DATA STORAGE CAPACITY

PAY LOAD REPORT

Report Date : May 22, 2018
Period : 30-10-2017 to 22-05-2018
Shift Time : 00:00 to 24:00

Serial Number : 60388
Model Number : BH60M
Customer : CCL KMP

Sl No	Time	Weight (tons)	Cycle Time (min:secs)							Cycle Distance (km)			Haul Speed km/hr		Return Speed km/hr	
			Load	Haul	Stop	Dump	Return	Stop	Total	Haul	Return	Total	Max	Avg.	Max	Avg.
Date: 30/10/2017											Operator ID : 00003000 Operator Name :					
1	7:50:45	52.0	03:13	03:47	007:39	00:11	03:52	000:10	018:52	0.54	0.49	1.03	20.62	10.83	24.89	10.60
2	8:09:37	56.0	03:50	02:56	000:20	00:18	03:39	004:09	015:12	0.54	0.49	1.03	21.72	12.48	24.18	10.36
3	8:24:49	59.5	04:10	04:42	006:30	00:09	04:46	000:37	020:54	0.59	0.70	1.29	19.20	10.62	24.18	11.58
4	8:45:43	46.1	03:26	05:14	000:30	00:12	19:32	013:36	042:30	0.76	2.39	3.15	18.98	10.27	33.70	10.09
5	12:09:15	50.5	03:13	04:06	000:07	00:12	05:12	020:15	033:05	0.51	0.46	0.97	18.82	8.20	19.14	6.72
6	12:42:20	57.5	03:47	03:15	000:07	00:11	07:02	028:07	042:29	0.49	0.62	1.11	24.78	10.11	21.00	6.73
7	13:24:49	59.0	04:34	03:01	000:05	00:31	12:30	011:25	032:06	0.57	2.07	2.64	27.96	12.60	29.60	10.82
8	15:28:16	59.0	03:22	03:45	000:10	00:27	04:46	002:58	015:28	0.60	0.54	1.14	20.30	10.86	19.42	8.20
9	15:43:44	52.0	03:52	03:31	000:04	00:28	03:48	006:22	018:05	0.59	0.59	1.18	23.25	10.93	23.79	10.36
10	16:01:49	43.5	04:56	04:01	000:05	00:26	04:55	009:06	023:29	0.64	0.57	1.21	16.52	10.67	18.76	9.22
11	16:25:18	50.0	05:14	04:17	000:04	00:22	05:04	008:00	023:01	0.64	0.60	1.24	20.73	10.09	19.36	8.63
12	16:48:19	43.5	04:13	03:53	000:04	00:32	18:10	013:26	040:18	0.64	2.54	3.18	18.60	11.50	26.48	10.50
13	18:35:09	59.0	04:01	03:58	000:29	00:15	08:47	002:40	020:10	0.58	2.15	2.73	19.04	10.07	31.79	16.11
14	18:55:19	53.5	08:09	04:54	007:09	00:40	04:39	000:01	025:32	0.55	0.52	1.07	16.68	9.12	20.84	8.32
15	19:20:51	50.0	04:47	05:00	007:25	00:21	04:23	000:41	022:37	0.54	0.49	1.03	18.82	9.22	15.97	8.55
16	19:43:28	60.0*	05:58	03:44	000:04	00:20	04:37	000:01	014:44	0.56	0.53	1.09	16.19	10.44	18.65	8.99
17	19:58:12	47.6	07:40	05:16	003:34	00:20	04:52	019:17	040:59	0.58	0.51	1.09	19.20	9.29	16.08	8.37
18	20:39:11	54.5	06:48	05:01	000:44	00:20	14:10	000:20	027:23	0.57	2.22	2.79	15.75	7.91	29.05	10.39
19	23:36:07	46.5	03:47	03:55	000:09	00:12	04:39	003:29	016:11	0.55	0.50	1.05	16.35	9.63	15.15	7.11
20	23:52:18	55.0	03:58	04:18	000:07	00:17	22:07	016:15	047:02	0.56	2.89	3.45	14.00	8.63	35.89	11.68
		1,054.7	Tons		Trips by Operator :		20		OL Trips :	1						
30/10/2017		1,054.7	Tons		Trips in the Day :		20		OL Trips :	1						

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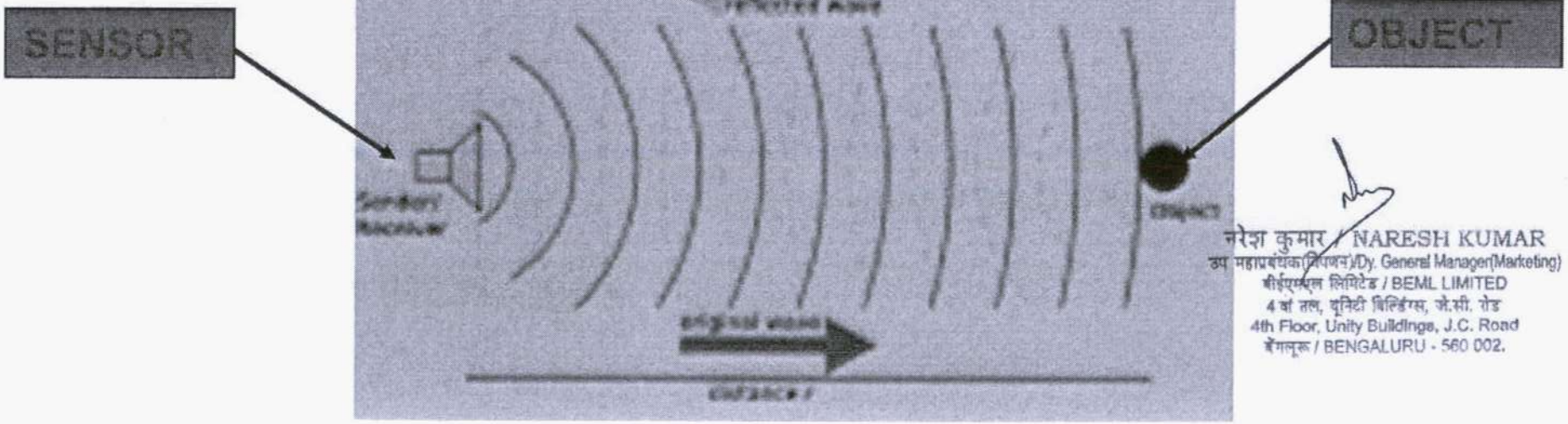
THE MEMORY CAPACITY OF PROPOSED UNIT IN ABOVE FORMAT IS 3000 RECORD

ANTICOLLISION SYSTEM USING PROXIMITY TECHNOLOGY

Working Principle : The system will detect both moving and stationary objects in pre define coverage area and reports the distance of closest object through visual range indicators and audible signal to vehicle operator.

Proximity system :



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Proximity warning system

Radar based technology is designed to detect people and objects in blind spots, significantly reducing collisions. The system detects both stationary and moving objects and works effectively in harsh environments with poor visibility including darkness, smoke, fog and dust. The radar sensor features an internal CAN interface for network connectivity, allowing the user to link more sensors and a network host on a single CAN bus, enabling monitoring of multiple detection areas around the vehicle.

A radar system operates by emitting electromagnetic energy and detecting this energy when it is reflected from an object or target. Information about the target, such as range and direction of movement, can be acquired by analyzing this reflected energy. The technology is well suited for proximity warning because it is not affected by rain, snow, dust, or even a moderate buildup of mud on the sensors.

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SYSTEM COMPONENTS PROXIMITY WARNING SYSTEM

Proximity warning system

Features :

- Proximity warning device / system detects static and moving objects including human beings on its own during the vehicle movement for a specified range, and warn the operator in the operator's station.

- Two sensors are provided (Front and rear side).

- The system will provide an adjustable audio visual warning when it detects static and moving objects including human beings within the virtual target area of respective Dumper.

- Virtual Target Area in Front of Dumper

  - Width of the virtual target area equal to the width of the Dumper plus 0.5m on both sides(Programmable),

- The Length of the virtual target area will conform to maximum stopping distance as mentioned in the IS: 16479 (Performance requirements and test procedures of braking systems for wheeled high-speed rubber-tracked Earth Moving Machines and construction equipment vehicles) at a speed of 30KM/h and slope 6.25%. (The stopping distance calculated at the speed of 30Km/h by considering speed limitation specified by DGMS in their earlier circulars).

- The Control Unit of the system dynamically and automatically change the detection range with relation to vehicle's speed(at a speed of 10, 20 and 30Km range).

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SYSTEM COMPONENTS PROXIMITY WARNING SYSTEM

Proximity warning system

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Features :

- Virtual Target Area in Rear of Dumper/Truck:

- Width of the virtual target area will be equal to the width of the Dumper plus 0.5 m on both
  - sides(Programmable).
  - Length of the virtual target area will be equal to the length of the Dumper(Programmable based on vehicle model .

- The System is provided with provisions for recording of details of warning generated with time stamp to enable easy retrieval and analysis of the immediate past 96 deployment operating hours.

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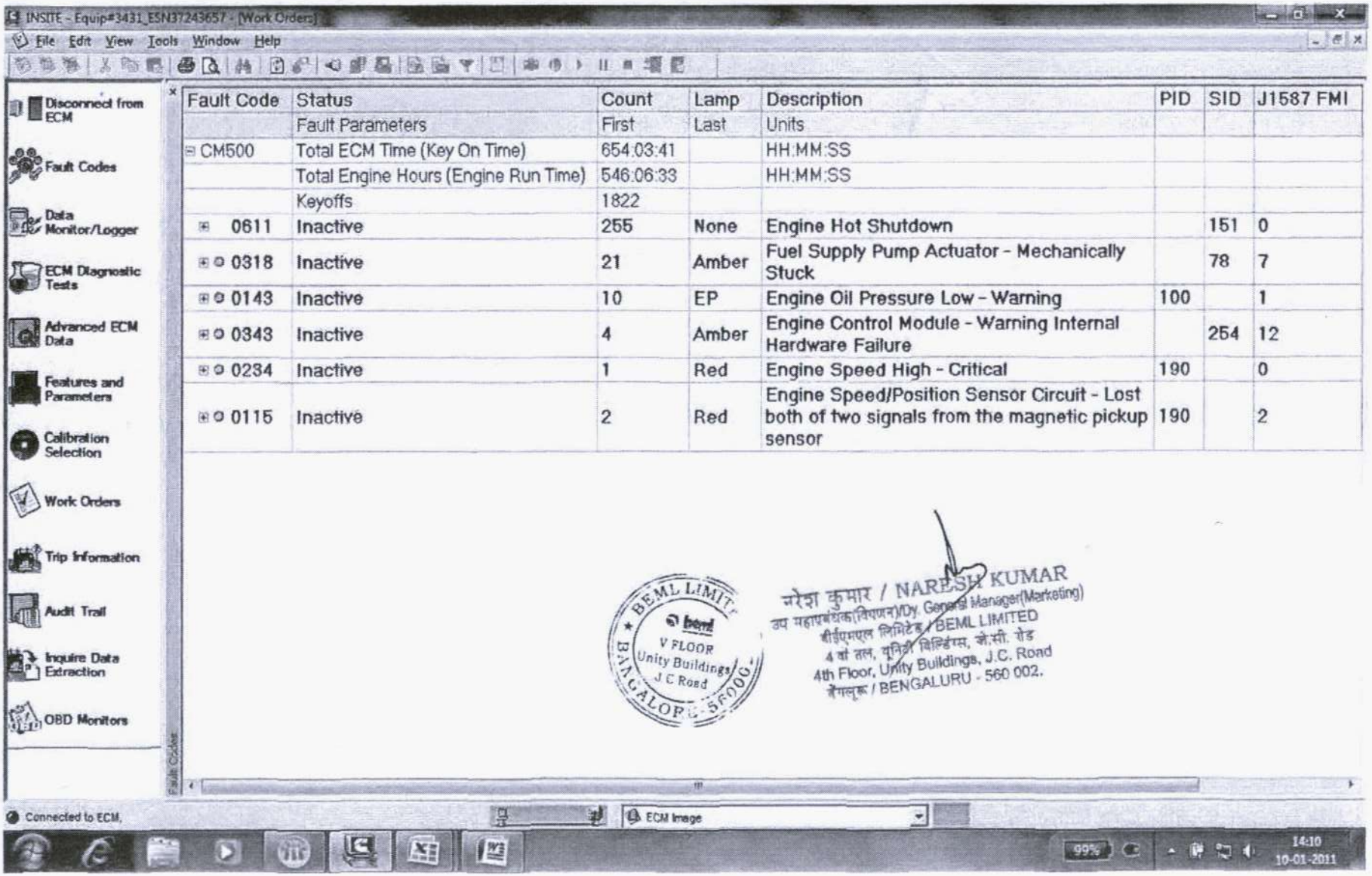
ENGINE FAULT CODE REPORT

DUMPER SI.NO. 3431



Fault Code	Status	Count	Lamp	Description	PID	SID	J1587 FMI
	Fault Parameters	First	Last	Units			
⊟ CM500	Total ECM Time (Key On Time)	654:03:41		HH:MM:SS			
	Total Engine Hours (Engine Run Time)	546:06:33		HH:MM:SS			
	Keyoffs	1822					
⊞ 0611	Inactive	255	None	Engine Hot Shutdown		151	0
⊞ 0318	Inactive	21	Amber	Fuel Supply Pump Actuator - Mechanically Stuck		78	7
⊞ 0143	Inactive	10	EP	Engine Oil Pressure Low - Warning	100		1
⊞ 0343	Inactive	4	Amber	Engine Control Module - Warning Internal Hardware Failure		254	12
⊞ 0234	Inactive	1	Red	Engine Speed High - Critical	190		0
⊞ 0115	Inactive	2	Red	Engine Speed/Position Sensor Circuit - Lost both of two signals from the magnetic pickup sensor	190		2

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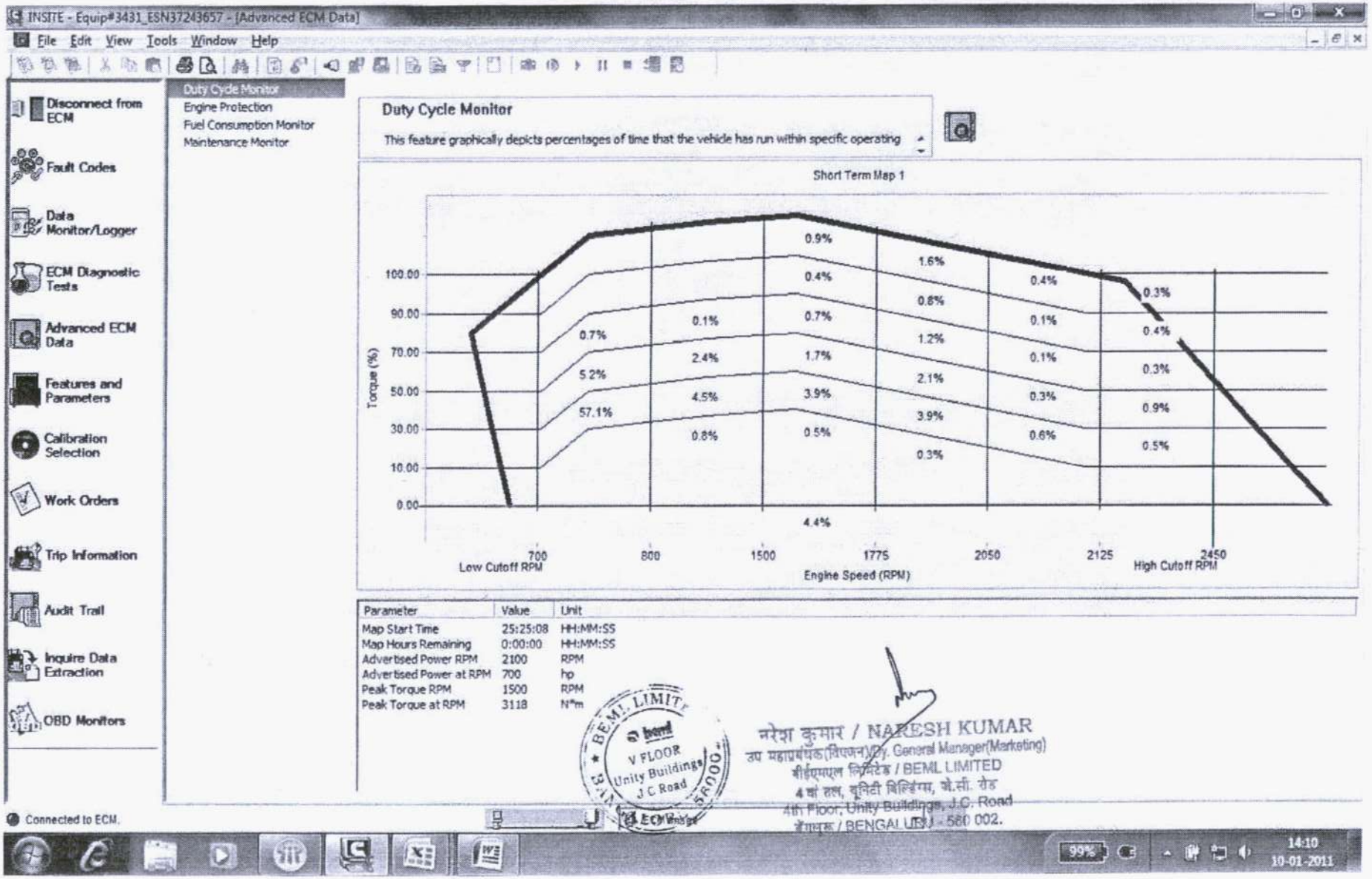
ENGINE DUTY CYCLE REPORT

DUMPER SI.NO. 3431



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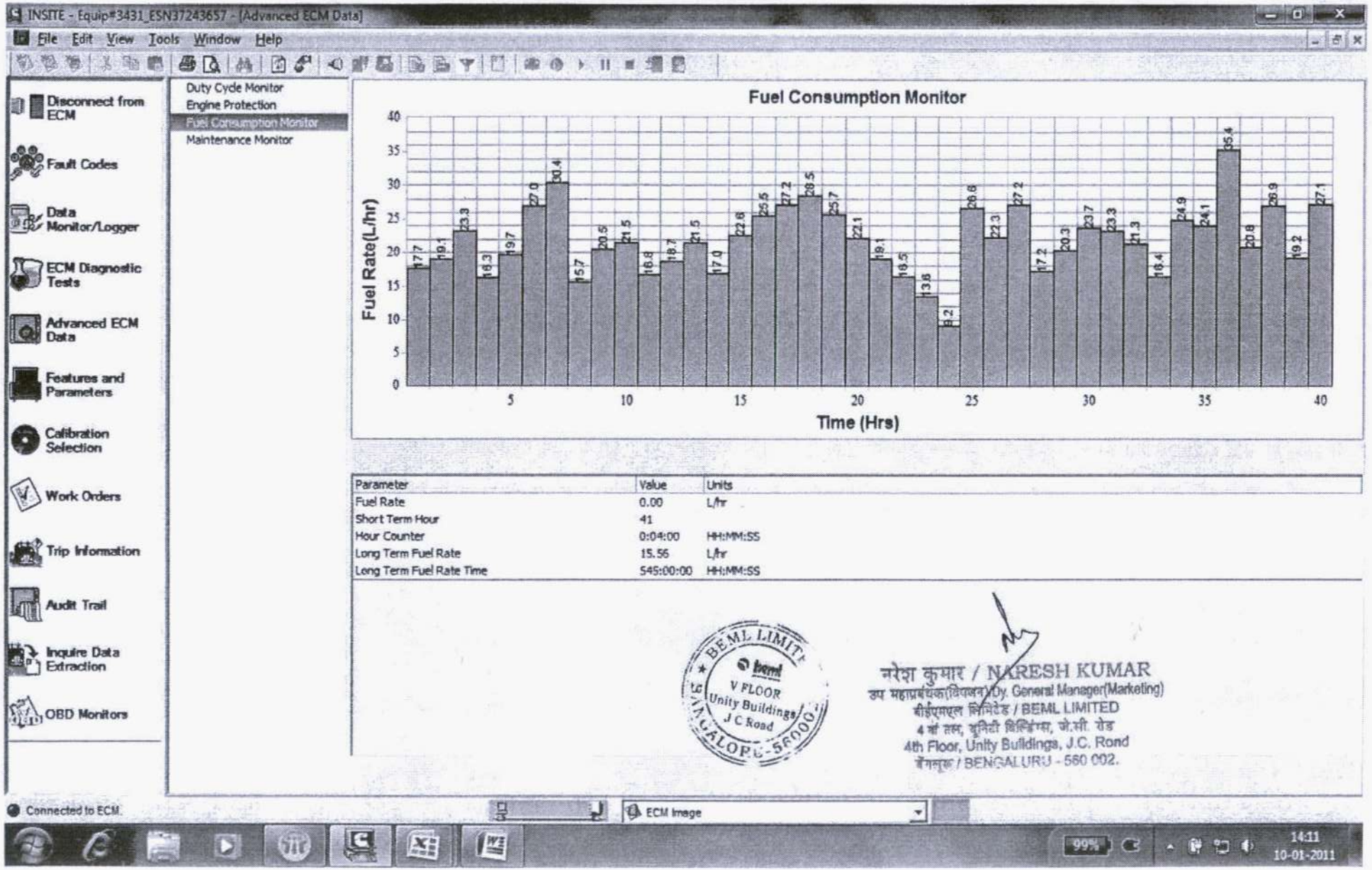
ENGINE FUEL CONSUMPTION REPORT

DUMPER SI.NO. 3431



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DESCRIPTION OF HYDRAULIC SYSTEM OF BH60M DUMPER

Hydraulic system consists of Hoist, Steering, Brake cooling and Brake circuits. Common Hydraulic tank supplies oil for the entire system.

Two numbers of Pumps are used for the complete system, one number of tandem pump supplies oil to Hoist and Brake cooling and one number of Piston Pump supplies oil to Steering & brake system.

Shaft end of Tandem Pump supplies oil to Hoist Valve. "Hoist Valve" is a four position valve with float, lower, hold and raise position. Hoist Valve is actuated hydraulically through a solenoid operated pilot valve, provided in the auxiliary manifold. In the auxiliary manifold, pressure reducer valve is provided, which takes oil from steering accumulator, reduces pressure from 2750 psi to 150 psi for supplying to solenoid operated pilot valve. When the Hoist Valve is actuated, body hoisting and lowering functions are carried-out through two stage Hoist Cylinders.

Over center valve is provided between Hoist Valve and Hoist Cylinder. Over center valve prevent damage to the Hoist Cylinders as they approach maximum extension and the weight of the load is at the rear edge of the dump body. Auxiliary manifold also contain parking brake solenoid and pressure switches.

Oil from the cover end of the pump is routed through second filter. The filtered oil is combined with return oil from the hoist valve, which is also filtered and is routed to rear brake, to cool the rear brakes.

A portion of the oil leaving the cooler is routed to the inlet of the Piston Pump. The piston pump is provided with inbuilt pressure compensator, set at 2750 psi. The piston pump supplies oil to three accumulators through check valves. One accumulator is for steering, remaining two accumulators for rear and front brake system. Oil from the steering accumulator is routed to steering control valve through an inline filter. When the steering valve is operated, oil is supplied to steering cylinders, for steering function. In case of emergency oil is automatically supplied to steering control valve from the accumulator for carrying-out emergency steering function.

Oil from the rear and front brake accumulators is routed to low pressure detection module. The low pressure detection module contains emergency brake apply valve, set at 1650 psi, manual bleed down valve and shuttle valves. Part of the oil going to low pressure detection module, from the front brake accumulator is routed to retarder valve. Oil from the retarder valve is routed to rear brakes for rear brake actuation. Oil from the low pressure detection module is routed to brake module. The brake module consisting of brake lock solenoid, steering bleed down solenoid and shuttle valves. Bleed down solenoid is provided to drain the oil from steering accumulator, when the engine is shut down and the key switch is turned "off". Oil from the brake manifold is supplied to right/ left brake treadle valves for actuating the front/rear brakes.

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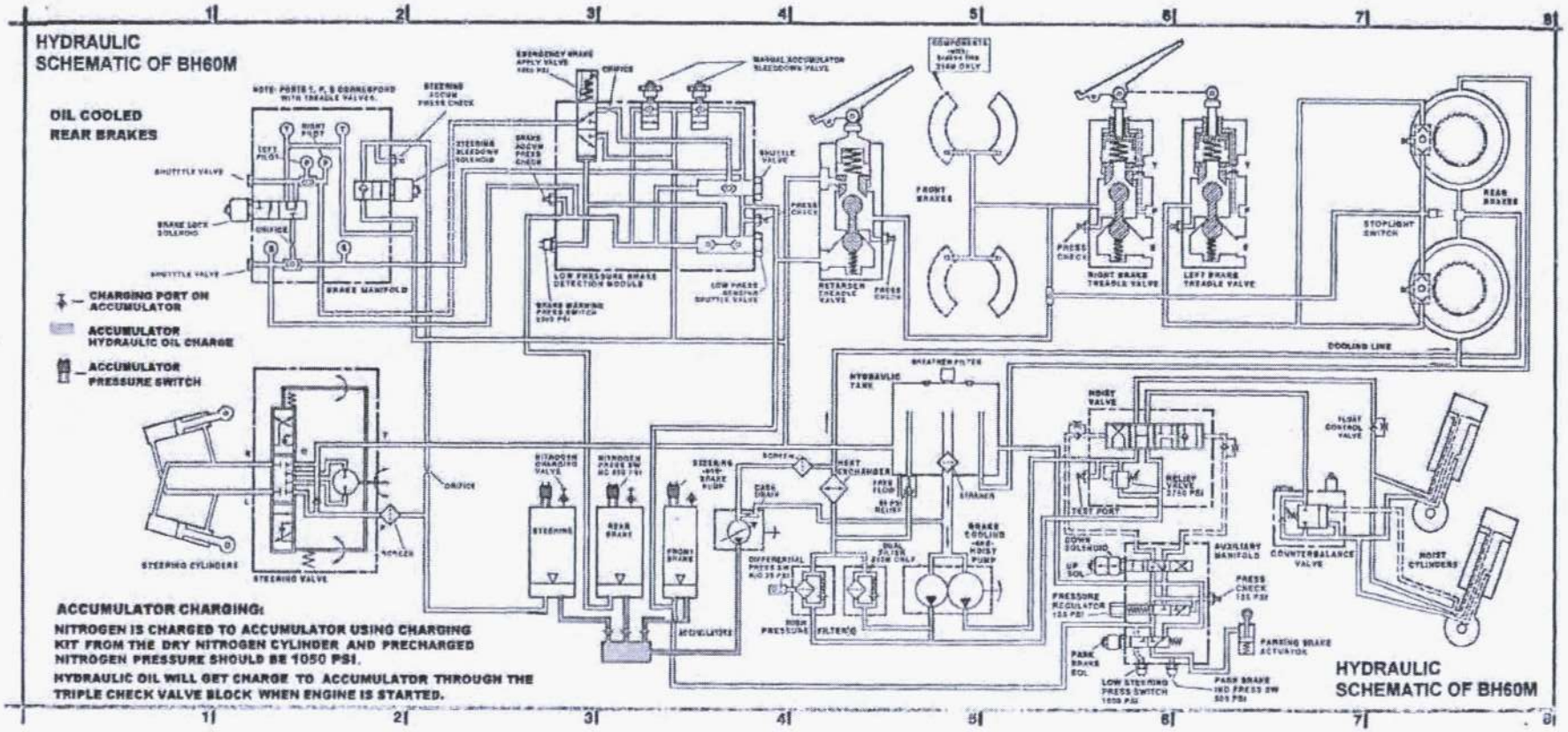

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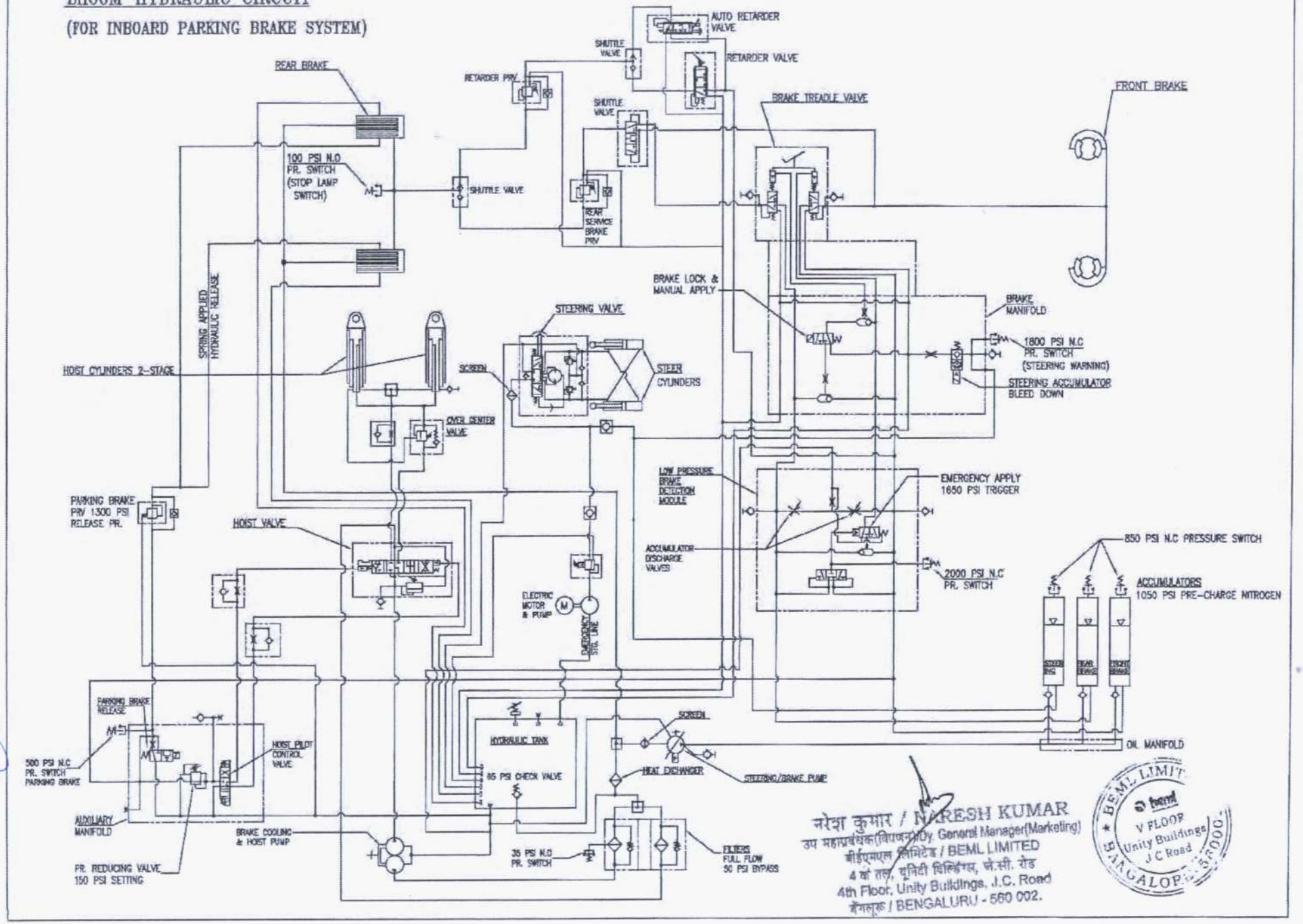
BH60M-HYDRAULIC CIRCUIT

(FOR INBOARD PARKING BRAKE SYSTEM)



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बीईएमएल लिमिटेड
BEML LIMITED

Azadi Ka Amrit Mahotsav

बी ई एम एल beml

Schedule 'A' Company under Ministry of Defence, Govt. of India

Defence & Aerospace | Mining & Construction | Rail & Metro

Ref: MT: TC-1572/BCCL (BH60M) Date: 29.06.2022

To:

Bharat Coking Coal Limited
Koyla Bhawan, Koyla Nagar
Dhanbad - 826005

Dear Sir,

Sub: Operating and Maintenance manuals.

Ref.: 1. NIT No.: BCCL/Pur/422011/60T Dumper/OTE-RA/22-23/24 dtd 01.06.2022

2. Tender Id No.: 2022_BCCL_245460_1

We hereby confirm that Operation and Maintenance Manuals in accordance with ISO 6750, with copies in CDs as stipulated in clause A.3 will be supplied along with the equipment.

Date: 29.06.2022

BEML LIMITED beml V FLOOR Unity Buildings J C Road BANGALORE

Signature of the tenderer

नरेश कुमार / NARESH KUMAR
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Seal of the Firm

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BEML Soudha, 23/1, 4th Main, S R Nagar, Bengaluru - 560 027
Tel: +91 80 2296 3200, 1800 425 2365
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mt@beml.co.in, mtt@beml.co.in

www.bemlindia.in

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CENTRALIZED AUTOMATIC LUBRICATION SYSTEM

Details of Supplier: M/s. Lincoln-Helios India Pvt.Ltd.

Type: Electrically operated Injector type

Model: 958ALB0103

OR

Details of Supplier: M/s. Lub Solutions Pvt. Ltd. (Graco)

Type: Electrically operated Injector type

Model: 955ALB0044

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DESCRIPTION OF AUTO LUBRICANT SYSTEM FOR BH60M DUMPER

It is a Single line parallel Centralized Lubrication System which feeds lubricant to various lubricating points on equipments both reality & economically.

OPERATION:

The operation is fully automatic it consists of flow master pump, vent valve, timer, pressure switch, injectors, tubing, fittings & accessories. The master flow pump used in the lubrication system is an electrically operated grease pump & operates on 24 dc power supply available in the equipment. The pump is driven by rotary motion through an accentric crank mechanism. The reciprocating action causes the pump cylinder to move up and down. The working pressure ranges from 130 – 240 bars.

The lubrication system is monitored by means of pressure switch provided along with the pump. The pressure required to charge all the injectors is set in the pressure switch. Signal from the pressure switch is used for control of the pump run and off times.

The sequence of operation of the lubrication system is controlled by a timer. The run time, pause time & other adjustment can be set in the timer. During run time power supply is maintained to the pump and the vent valve by the timer, the pump is in operation & the injectors are charged with set amount of grease. The power supply to the pump & vent valve is cut off by the timer as soon as the set pressure is reached and sensed by the pressure switch and vent valve opens. This causes the grease pressure in the line to relieve back to the reservoir through vent valve assembly. Once the grease line pressure relieves, the injectors will dispense the lubricant to the points and get ready for charging in the next cycle.

SPECIFICATIONS:

- Reservoir capacity 20 litres
- Lubricant operating pressure 130 – 240 bars
- Lubricant output – Adjustable from 0.13cc to 1.33 cc/stroke

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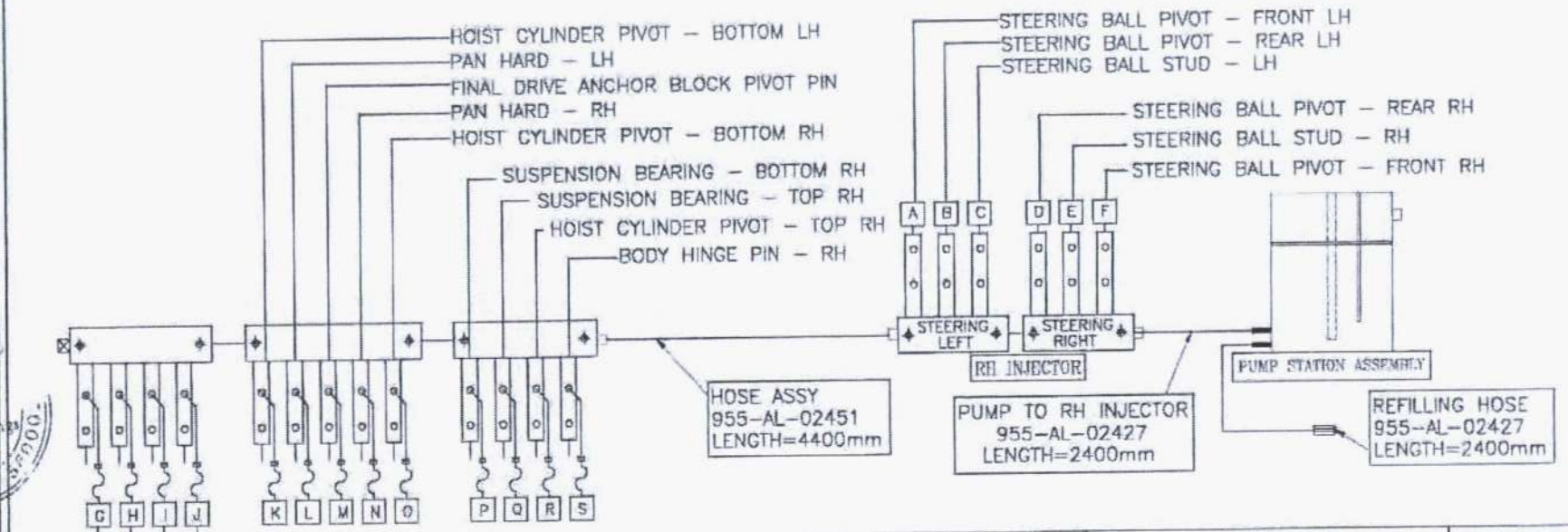
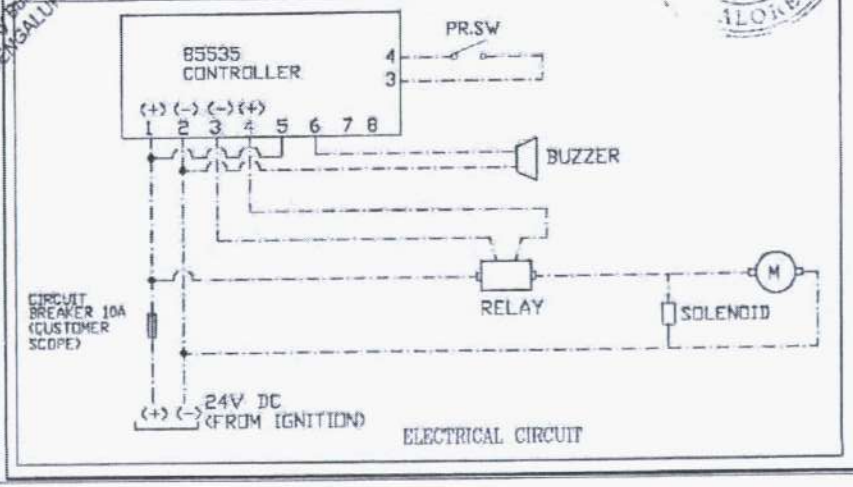
RM60M AUTO-LUBRICATION SYSTEM FOR ELECTRICALLY OPERATED INJECTOR TYPE





SL.No.	DRG NO.	AL.No.	DESCRIPTION	HOSE LTH IN mm
1	461816190000	A	STEERING BALL PIVOT – FRONT LH	3500
2	461816190000	B	STEERING BALL PIVOT – REAR LH	3500
3	461816190000	C	STEERING BALL STUD – LH	3500
4	461816060000	D	STEERING BALL PIVOT – REAR RH	1400
5	461816060000	E	STEERING BALL STUD – RH	1400
6	955 AL 02468	F	STEERING BALL PIVOT – FRONT RH	2000
7	461816040000	G	BODY HINGE PIN – LH	1200
8–a	955 AL 02131	H–a	HOIST CYLINDER PIVOT – TOP LH	1900
8–b	787 AL 02064	H–b	HOIST CYLINDER PIVOT – TOP LH	1000
9	461816030000	I	SUSPENSION BEARING – TOP LH	1100
10	787 AL 02072	J	SUSPENSION BEARING – BOTTOM LH	1300
11	461816190000	K	HOIST CYLINDER PIVOT – BOTTOM LH	3500
12	461816040000	L	PAN HARD – LH	1200
13	461816130000	M	FINAL DRIVE PIVOT PIN (A/BLOCK)	2500
14	461816010000	N	PAN HARD – RH	700
15	461816190000	O	HOIST CYLINDER PIVOT – BOTTOM RH	3500
16	787 AL 02072	P	SUSPENSION BEARING – BOTTOM RH	1300
17	461816030000	Q	SUSPENSION BEARING – TOP RH	1100
18–a	955 AL 02131	R–a	HOIST CYLINDER PIVOT – TOP RH	1900
18–b	787 AL 02064	R–b	HOIST CYLINDER PIVOT – TOP RH	1000
19	461816040000	S	BODY HINGE PIN – RH	1200

LUB SOLUTIONS

GRACO

CENTROMATIC CENTALISED LUBRICATION SYSTEM ON BH60M DUMPER

The centromatic centralised lubrication system on BH60M DUMPER comprises of the components listed in the enclosed schematic layout drawing enclosed in the succeeding sheets of this section. The system is connected in-line with schematic drawing.

The system is ready for operation the moment the ignition switch is switched on thereby switching on the timer. The Timer operates the solenoid valve and Pump is operated by electric motor and supplies the lubricant to the injectors through the lubrication lines connected from the pump. The feed-lines connected from the injectors cater the lubricant to the lub points connected to the systems. Thus, one lubrication cycle is completed.

As soon as all the injectors have cycled, the pump stalls against pressure. The timer switch contact is broken off and supply of lubricant to system the pump stops and the solenoid valve is de-energized, the system pressure is vented through the vent valve and the injectors re-set themselves for the next cycle. After expiry of the pause time, the timer starts a fresh cycle by switching on the solenoid valve.

The system is monitored by pressure switch. The operation of the central alarm system is based on the principle that the pressure developed at the end of the injector bank is effected by rise or drop in the system pressure which is detected by the pressure switch.

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बीईएमएल लिमिटेड / BEML LIMITED
4 वां तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
4th Floor, Unity Buildings, J.C. Road

BEML LIMITED beml V FLOOR Unity Buildings J C Road BANGALORE 560002

LUB SOLUTIONS

GRACO

The system pressure may rise due to:

1. Blockage in the main line and/or feed lines
2. Blockage in any of the injectors.

The system pressure may drop due to:

1. Leakage in the main line and/or feed lines.
2. Leakage from the inlet/ outlet fittings of the components and/ or intermediate connections.
3. Non- functioning of the pump (this may be due to non-functioning of the solenoid valve and/or timer and/or the pump itself).
4. Insufficient pressure developed at the pump outlet.

The working pressure of the lubrication system is between 80 bar and 160 bar. In case the pressure developed at the end of the injector-banks drops or exceeds the above range, the pressure switch does not operate.

The operation of the digital timer is based on the principle that and pressure switch should make or break the circuit at least once during the pump run time which is same as the supervisory time. In case of any fault caused due to the above reasons, the pressure switch does not operate and hence there is no make or break of the circuit. This is monitored by the respective supervisory signals in the timer and are indicated by the fault indicators on the timer unit. The fault should be reset by the reset switch on the timer(after rectifying the fault). The timer will start a fresh cycle after resetting.

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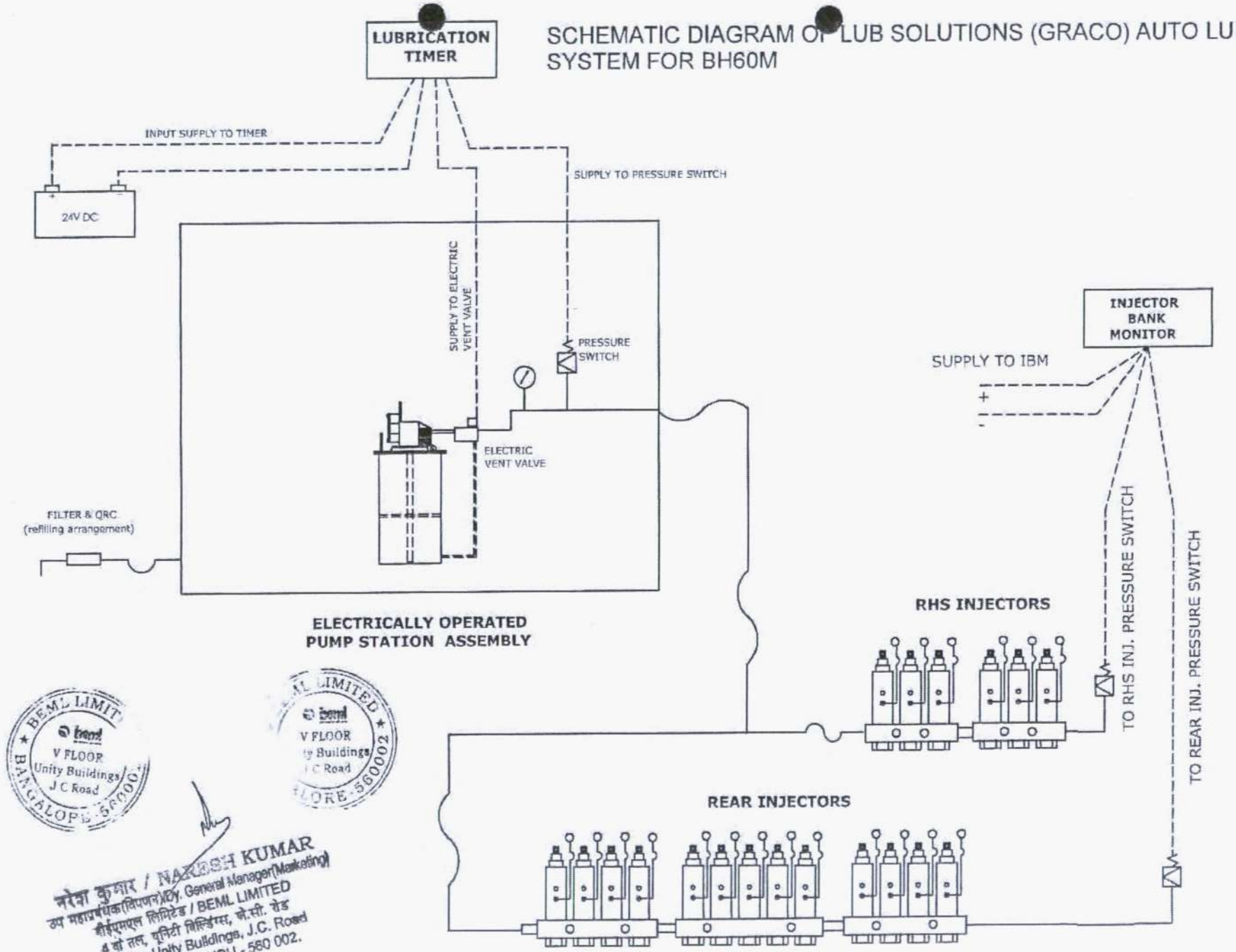
SCHEMATIC DIAGRAM OF LUB SOLUTIONS (GRACO) AUTO LUBE SYSTEM FOR BH60M



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AUTO FIRE DETECTION AND SUPPRESSION SYSTEM

Details of Supplier: **M/s. Southern Electronics (Bangalore) Pvt. Ltd.**

Type: 2-Zone specific type Auto fire detection & suppression system

Model / Number: 958FPB0034

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
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2 ZONE AUTOMATIC FIRE DETECTION & SUPPRESSION SYSTEM FOR BEML BH60M DUMPER (M/s SOUTHERN ELECTRONICS)

Southern Electronics, Bangalore's Automatic Fire Detection & Suppression System is pre-engineered system. The AFDSS System consist of, 2 Zone Control Unit-01No, Manual Override Unit, Horn Unit, Pilot Cylinder Assy – 1 No each, Linear Heat Detection Cable (Sensor Cable), Nitrogen Cylinder Assy & DCP Cylinder 2 Nos each.

The Control Unit is located inside the cabin and controls the operation of the system. It is connected to the battery of the equipment and contains an inbuilt power controlling circuit to enable isolation and operation of the system at an input voltage of 18V to 30 V DC.

The Control unit has the following features:

1. Zone wise activation and monitoring.
2. Engine Shut off

The Sensor cable (Linear Heat Detection Cable) is a continuous heat detector, which can respond to fire at any part of its length. The sensor cable is a fixed temperature sensor and will initiate an alarm once its rated temperature (180 deg C) is reached. The four Sensor cable are routed independently, Zone wise to cover Turbo charger, Starter motor, Engine , Battery, Transmission, Hydraulic Tank and Fuel Tank, Covering the total equipment so as to cover areas prone to fire due to spillage, overheat or Leakage and short circuit. The end of Sensor Cable is terminated with an end of line resistor.

Nitrogen Cylinder Assembly contains Nitrogen gas pressurisedup to 600 PSI and consist of a solenoid valve, Pressure gauge, filling adapter & Manual operation Knob. In the event of fire, the Control unit detects and will energise the solenoid valve fitted on the Nitrogen Cylinder, thereby activating the Dry Chemical Powder (The extinguishing agent is a 90% MAP Dry Chemical Powder suitable for extinguishing Class 'A', 'B', 'C' class fires). releasing the pressurised gas into the DCP Extinguisher cylinder. The Dry Chemical Powder will disperse and discharge through the pre-defined nozzle points.

The engine shut (Optional) off relay is also energised in the process, thereby shutting off the engine to prevent further spread of fire. The built-in buzzer and external Horn Unit starts sounding continuously and system fault indication appears in control unit and shows fire condition in the particular zone. The system can be reset only after isolating faulty Component.

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
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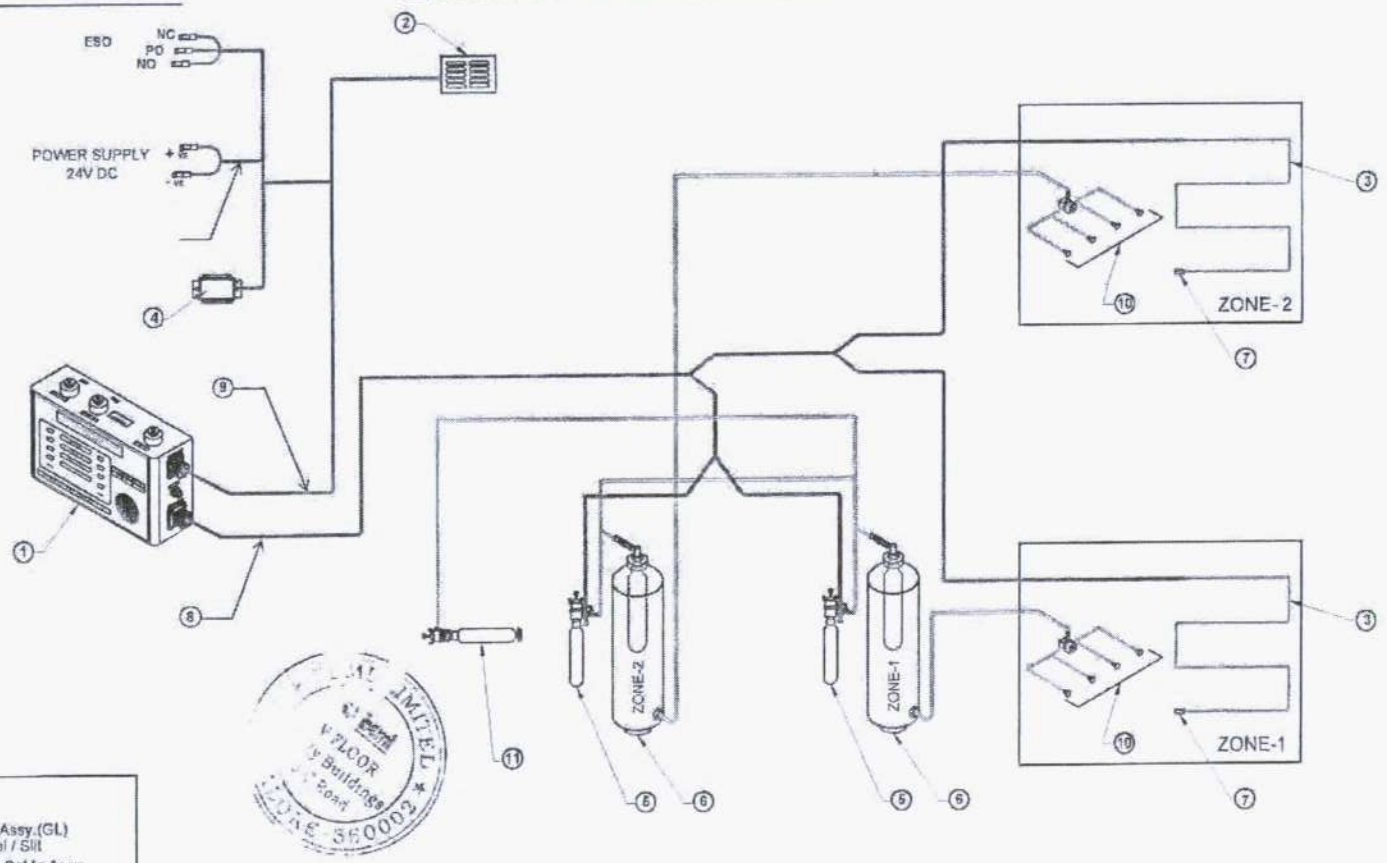
ZONE AUTOMATIC FIRE DETECTION & SUPPRESSION SYSTEM
M/s SOUTHERN ELECTRONICS



SL.NO.	Description
11	Pilot Cylinder Assy.(GL)
10	Nozzle Conical / Slit
9	Power Supply Cable Assy.
8	Cable Assy. Main.
7	EOLR Box Assy.
6	DCP Cylinder Assy (20Kgs). - 2
5	Nitrogen Cylinder Assy.
4	Override Switch (Cabin-Comm)
3	Sensor Cable Assy (180 Deg) -4
2	Horn Unit.
1	4 Zone Control Unit Assy.

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
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4th Floor, Unity Buildings, J.C. Road
बैंगलूरु / BENGALURU - 560 002.

SOUTHERN ELECTRONICS (BANGALORE) PVT. LTD.,
16-A, PEENYA INDUSTRIAL AREA, PHASE-1, PEENYA, BANGALORE - 560 058.
Phone : +91 - 80 - 39280341 - 64 Fax : +91- 80 - 39280365
e-mail : admin@seonics.co.in / marketing@seonics.co.in
http : //www.seonics.co.in, CIN No. U31909KA1971PTC002095

Date: 07-09-2021

TO WHOM SOEVERY IT MAY CONCERN

We hereby confirm that the supplied Automatic Fire Detection and Suppression System 4005DZ (958FPB0034) to be fitted on BH60M to M/s.BEML Limited, Mysore is as per DGMS Circular No. 6 of 2020 dt.27.02.2020.

For SOUTHERN ELECTRONICS (BANGALORE) PVT. LTD.,

Authorised signatory

Southern Electronics (Bangalore) Pvt. Ltd. BANGALORE 560 058

BEML LIMITED V FLOOR Unity Buildings J.C. Road

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
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4th Floor, Unity Buildings, J.C. Road
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ಬಿಇಎಂಎಲ್ ಲಿಮಿಟೆಡ್
बीईएमएल लिमिटेड
BEML LIMITED

Schedule 'A' Company under Ministry of Defence, Govt. of India

Defence & Aerospace | Mining & Construction | Rail & Metro

Ref: MT: TC-1572/BCCL (BH60M)

Date: 29.06.2022

To:
Bharat Coking Coal Limited
A Mini Ratna Company
Regt. Off: Koyla Bhawan, Koyla Nagar
Dhanbad-826005,
India

Dear Sir,

Sub: Undertaking for Fire Extinguisher

Ref.: 1. NIT No.: BCCL/Pur/422011/60T Dumper/OTE-R/V/22-23/24 dtd 01.06.2022

2. Tender Id.: 2022_BCCL_245460_1

We hereby undertake that a valid Test Certificate (valid as on the date of commissioning of the equipment at site) shall be submitted at the time of supply of equipment along with other documents, for Fire Extinguishers, including Materials and Chemicals used in fire suppression system from any Government or Government approved Laboratory in compliance with relevant Indian Standards as per DGMS Circular No. DGMS (Approval) Circular No. 02 dated 08th July 2013

Date: 29.06.2022

Signature of the tenderer

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
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4th Floor, Unity Buildings, J.C. Road
बेंगलूरु / BENGALURU - 560 002

Seal of the Firm

ಪ್ರಧಾನ ಕಛೇರಿ **Corporate Office**
ಬಿಇಎಂಎಲ್ ಸೌಧ, 23/1, 4ನೇ ಮುಖ್ಯ ರಸ್ತೆ, ಸಂಜಯನಗರ, ಬೆಂಗಳೂರು - 560 027
ದೂರವಾಣಿ ಸಂಖ್ಯೆ : +91 80 2296 3200, 1800 425 2365
BEML Soudha, 23/1, 4th Main, S R Nagar, Bengaluru - 560 027
Tel: +91 80 2296 3200, 1800 425 2365
CIN: L35202KA1964GOI001530, GST NO. 29AAACB8433D1ZU

ಮಾರ್ಕೆಟಿಂಗ್ ಪ್ರಧಾನ ಕಛೇರಿ **Marketing HQ:**
ಬಿಇಎಂಎಲ್ ಲಿಮಿಟೆಡ್, 4ನೇ ಮಹಡಿ, ಯೂನಿಟಿ ಬಿಲ್ಡಿಂಗ್ಸ್, ಜೆ.ಸಿ. ರಸ್ತೆ, ಬೆಂಗಳೂರು - 560 002
ದೂರವಾಣಿ ಸಂಖ್ಯೆ : +91 80 2296 3505
BEML Limited, 4th Floor, Unity Buildings, J.C Road, Bengaluru - 560 002
Tel: +91 80 2296 3505
mt@beml.co.in, mtt@beml.co.in

www.bemlindia.in

ಬಿಇಎಂಎಲ್ ಲಿಮಿಟೆಡ್
बीईएमएल लिमिटेड
BEML LIMITED

Azadi Ka Amrit Mahotsav

बी ई एम एल beml

Schedule 'A' Company under Ministry of Defence, Govt. of India

Defence & Aerospace | Mining & Construction | Rail & Metro

Ref: MT: TC-1572/BCCL (BH60M) Date: 29.06.2022

To:
Bharat Coking Coal Limited
A Mini Ratna Company
Regt. Off: Koyla Bhawan, Koyla Nagar
Dhanbad-826005,
India

Dear Sir,

Sub: Undertaking for AFDSS

Ref.: 1. NIT No.: BCCL/Pur/422012/5-6 Cum Shovel/OTE-RA/22-23/25 dtd 04.06.2022

2. Tender Id.: 2022_BCCL_245778_1

We hereby undertake that a valid Test Certificate (valid as on the date of commissioning of the equipment at site) shall be submitted at the time of supply of equipment along with other documents, for AFDSS including materials and chemicals used in fire suppression system from any Government or Government approved Laboratory in compliance with relevant Indian Standards as per DGMS (Approval) Circular No. 02 dated 08th July 2013.

Date: 29.06.2022

BEML LIMITED V FLOOR Unity Buildings J C Road BANGALORE-560002

Signature of the tenderer

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
4 वां तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
4th Floor, Unity Buildings, J.C. Road
बैंगलूरु / BANGALORE-560 002.

Seal of the firm

ಪ್ರಧಾನ ಕಛೇರಿ **Corporate Office**
ಬಿಇಎಂಎಲ್ ಸೌಧ, ೨೩/೧, ೪ನೇ ಮುಖ್ಯ ರಸ್ತೆ, ಸಂಜಯನಗರ, ಬೆಂಗಳೂರು – ೫೬೦ ೦೨೭
ದೂರವಾಣಿ ಸಂಖ್ಯೆ : +೯೧ ೮೦ ೨೨೯೬ ೩೨೦೦, ೧೮೦೦ ೪೨೫ ೨೩೬೫
BEML Soudha, 23/1, 4th Main, S R Nagar, Bengaluru - 560 027
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ದೂರವಾಣಿ ಸಂಖ್ಯೆ : +೯೧ ೮೦ ೨೨೯೬ ೩೫೦೫
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Tel: +91 80 2296 3505
mt@beml.co.in, mtt@beml.co.in

165/199

IW-1765

भारत सरकार /GOVERNMENT OF INDIA
श्रम एवं रोजगार मंत्रालय
MINISTRY OF LABOUR & EMPLOYMENT
खान सुरक्षा महानिदेशालय
DIRECTORATE GENERAL OF MINES SAFETY

No. S 29023/108/2008/S&T (HQ)/ 581 Dhanbad, dated 12/7/ 2013

From:
Director of Mines Safety (S&T),
DGMS, Dhanbad - 826001.

To:
Shri M. R. Bhaskar, Director,
M/s Southern Electronics (Bangalore) Private Ltd.,
No. 16-A, Peenya Industrial Area,
Phase –I, Peenya, Bangalore - 560 058.

Subject: Fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire fighting or suppression systems in mines both on surface and belowground including oil and gas mines/fields.

Sir,

I am enclosing herewith a copy of DGMS (Approval) Circular No. 02 dated 8th July, 2013 on the above subject which is self explanatory.

As mentioned at para 4.0 of this circular, no specific approval will be required from this Directorate in this regard.

For your ready reference, a copy of this circular has also been published in DGMS web site www.dgmsindia.in.

Should you have any further clarifications, you may contact this Directorate any time.

Yours faithfully,

12/7/13

Director of Mines Safety (S&T)

Encl.: As above.

BEML LIMITED V FLOOR Unity Buildings J C Road BANGALORE-560002

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
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165/199

GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
DIRECTORATE GENERAL OF MINES SAFETY

No. DGMS (Approval) Circular No. 02 dated, Dhanbad, 8th July '2013

To

All Owners/Agents/Managers of Coal Mines and Oil & Gas Mines/Fields.

Subject: Fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire fighting or suppression systems in mines both on surface and belowground including oil and gas mines/fields.

Sir,

1.0 Through a Gazette notification vide No. 35 dated New Delhi, August 24th – August 30th, 2008 in Part - II, Section 3, sub-section (i) vide GSR 159, the subject matter of fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire fighting or suppression systems in mines both on surface and belowground including oil and gas mines/fields, was brought under the approval regime of this Directorate from 1st November, 2008. Since then, many approvals have been accorded by this Directorate to various manufacturers of such fire fighting and fire suppression systems for being used in mines.

2.0 In order to simplify the matter of introduction and maintenance of proper fire fighting and suppression systems in mines so as to enable the mining industry to design appropriate Safety Management Plans, a Technical Workshop on "Fire Fighting Systems and Arrangements in Mines" was held on 17/8/2011 at DGMS, Dhanbad. The workshop was well attended by representatives of user mines, manufacturers and scientific organizations like CIMFR & ISM and many issues connected to the subject viz-a-viz fast changing mining technology in the country with import of latest mining machinery etc., were deliberated upon leading to better understanding.

3.0 In view of the technical workshop held and the experience gained till date on the subject, it is recommended that "all types of fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire fighting or suppression systems in mines both on surface and belowground including oil and gas mines/fields shall conform to the following minimum requirements";

a) All types of fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire fighting or suppression systems shall have valid test certificate(s) from any Government or Government approved Laboratory in compliance with relevant Indian Standards.

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
4 वां तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
4th Floor, Unity Buildings, J.C. Road
बेंगलूरु / BENGALURU - 560 002.

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b) All materials used in the fire fighting/fire suppressant systems shall be non-toxic and in no manner harmful to human beings during handling and use.

c) The high pressure storage vessels and hoses, if used with fire fighting and fire suppressant systems, shall conform to the requirements stipulated in the relevant Indian Standards.

3.1 As provided under Regulation 181(3) of the Coal Mines Regulations 1957, Regulation 73(1) of the Oil Mines Regulations, 1984 and the earlier published GSR 159 vide Gazette notification No. 35 dated New Delhi, August 24th – August 30th, 2008 in Part - II, Section 3, sub-section (i), the requirements stipulated at para 3.0 on the above subject is considered as approved by the Chief Inspector of Mines by this general order for the purpose. A fresh Gazette notification in this regard vide GSR 443(E), in Part - II, Section 3, sub-section (i) of Extraordinary Gazette Notification No. 315, dated New Delhi, Friday, June 28, 2013 has already been published for information and necessary compliance.

4.0 All Owners/Agents/Managers of Coal mines, oil and gas mines/fields are therefore, advised to ensure strict compliance with this circular in respect of all types of fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire fighting or suppression systems in mines both on surface and belowground including oil and gas mines/fields. It may be noted that no specific approval will be required from this Directorate in this regard.

9.7.13

(Rahul Guha)
Director General of Mines Safety.

IMITED
V FLOOR
y Buildings
J C Road
ILORE-560002

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
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4th Floor, Unity Buildings, J.C. Road
बेंगलूरु / BENGALURU - 560 002.

SOUTHERN ELECTRONICS (BANGALORE) PRIVATE LTD.,
16-A, PEENYA INDUSTRIAL AREA, PHASE-1, PEENYA, BANGALORE - 560 058.
Phone : +91 - 80 - 39280341 - 64 Fax : +91- 80 - 39280365
e-mail : admin@seonics.co.in / marketing@seonics.co.in
http : //www.seonics.co.in, CIN No. U31909KA1971PTC002095

25.11.2019

CERTIFICATE

This is to certify that the materials and chemicals used in the Fire Suppression System has been tested and the same is non-toxic and not harmful to human being during handling and use. This complies with relevant Indian Standards as per DGMS Circular No. 2 dated 08.07.2013.

The high pressure storage vehicles used in the Fire Fighting and Suppression System shall confirm to the requirement of stipulated IS 4947 : 2006 in the relevant Indian Standards.

The hose used in the Fire Fighting and Suppression System shall confirm to the requirement of stipulated DIN 20022/ EN 853-1 in the relevant Indian Standards.

For Southern Electronics (Bangalore) Private Limited

S. Santhakumar
General Manager 25/11/19

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
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4th Floor, Unity Buildings, J.C. Road
बेंगलूरु / BENGALURU - 560 002.

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CHEMICAL AND METALLURGICAL LABORATORIES

(Accredited by NABL ISO-IEC / 17025-For Chemical Certificate No. T - 0778 & T-1757)

#57, 1st Floor, 8th Main, Pete Chennappa Industrial Estate, Kamakshipalya,
Magadi Road, BANGALORE - 560 079. Phone : +91-80-2328 2539 / 2328 5931
E-mail : cml.blr1997@gmail.com / Website : www.chemicalandmetallurgicallab.com

TEST REPORT

Report No: CML/0512/SE /2017-18
Report Date: 12-06-2017
Date of test Completion: 12-06-2017

Your D.C No. 8941
Date: 02-06-2017
Sample recd. on: 02-06-2017

Name of the Customer	:	M/s. Southern Electronics Private Ltd, 16-A, Peenya industrial area, Phase - 1, Bangalore – 560 058
Nature of the Sample	:	Dry Chemical powder
Sample ID	:	ABC 90%, Mfr : Synergy Industries
Test Method	:	As Per IS 14609-1999
Type of Test	:	Chemical analysis

Parameter	Results
Monoammonium phosphate Content	91.65 %
Apparent Density	1.21
Moisture Content	0.10 %
Dye	Yellow Colour

-----X-----

Prepared by

Verified by

Prashanth.H.R
Authorized signatory

CHEMIST

Note: 1) This Certificate issued, refers only to the tested samples & parameters & not as an endorsement of products. Hence our liability in this, limited to the invoiced total amount.
2) Tested balance samples if any, will be destroyed after 15 days from the date of issue of Test Report, unless otherwise specified.
3) Reproduction of this Test Report either in full or in part or using this Report as an evidence in the court or using in any advertising media should not be done without our prior written permission.
4) Sampling is not done by CML.

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक(विपणन)/Dy. General Manager(Marketing)
बीईमएल लिमिटेड / BEML LIMITED
4 वां तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
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Electrical Signaling

Electrical protective signaling systems are configurations of components used to produce alarm signals indicative of fire, smoke, sprinkler waterflow or other emergency and to produce supervisory signals indicative of conditions needing attention with respect to protection equipment or watch service. System configurations are classified according to where and how the signals are received. The categories are commonly designated as local, municipal, remote station, proprietary, emergency voice/alarm communication, emergency communication, and central station. Auxiliary systems are either local or proprietary systems interconnected with a municipal system.

This category presents the major system component categories and the integrated system configurations. The selection of components to form a hybrid system should be made only by those skilled in system design. Also, the suitability of any system application should be judged on the basis of the hazard(s) being protected.

Alarm Signal Initiating Devices

Alarm signals are initiated either automatically or manually. Automatic detectors respond to changes in characteristic phenomena associated with fire or other emergency conditions.

Fire Detection, Heat-Actuated

Heat sensitive devices may be either "spot" or "line" type and operate at a fixed temperature or on a rapid increase in temperature (rate-of-rise). Some detectors combine the fixed and rate sensitive principles.

The spacing guides listed are indicative of each detector's relative sensitivity and, in each case, the spacing guide is the maximum recommended separation between detectors for smooth-ceiling installations. For a given temperature rating, a fixed-temperature detector which has a 30 ft (9 m) listing and one which has a 15 ft (5 m) listing will both respond at approximately the same time to a geometrically growing fire if each is installed at its listed spacing. FM Approved rate-of-rise detectors all have 30 ft (9 m) listed spacings, the maximum separation recommended by FM Approvals.

Installation of heat detectors at less than maximum spacing is necessary: to achieve earlier response; to compensate for ceiling obstructions such as beams and joists; and to compensate for ceiling heights greater than 15 ft (5 m). Proper location and use of heat detectors involves consideration of ceiling construction, the location of partitions, the maximum normal room temperature, heat produced by the occupancy, and whether detector function is to warn occupants or to automatically actuate protection equipment. Refer to Standard 72-1993 of the National Fire Protection Association and design specifications published by jurisdictional authorities, as appropriate.

Universal Low Resistance Series PLR, Types PLR, PLR-R, PLR-X and PLR-CR

Universal Low Resistance Series PLR, Types PLR, PLR-R, PLR-X and PLR-CR fixed temperature, heat-sensitive cable for area heat detection. Rated operating temperatures are: extra-low, 140°F (60°C) (Type PLR-X only); regular, 155°F (68°C); intermediate, 190°F (88°C), 220°F (105°C); high, 280°F (138°C). Type PLR and PLR-CR also has an extra high, 356°F (180°C) which is intended for proximity detection only. Rated for 30 V ac, 42 V dc. Spacing guide for "extra low", "regular", and 190°F (88°C) "intermediate" cable is 30 x 30 ft (9.1 x 9.1 m). 220°F (105°C) "intermediate" and "high" cables are rated 25 × 25 ft (7.6 × 7.6 m). "Extra high" cables are not intended for area coverage. PIM-530(LT) Interface Module operates on 12 or 24 V dc and provides relay and 4-20 mA outputs for connection to a compatible Approved control. PIM-530 operating temperature range is -20°F (-29°C){-40°F (-40°C) for LT version} to 120°F (49°C). PIM-530-EI, PIM -530-(LT)EI Interface Module is associated apparatus with intrinsically safe connections to Class I, II and III, Division 1, Groups A, B,C, D, E, F and G; [AEx ia Ga] IIC hazardous (classified) locations. Series PLR, Types PLR, PLR-R, PLR-X and PLR-CR fixed temperature, heat-sensitive cable heat detection and ZB-HD-5-QC Zone Boxes are intrinsically safe for use in Class I, II and III, Division 1, Groups A, B,C, D, E, F and G; Class I, Zone 0, AEx ia IIC T6 Ga -29°C ≤ Ta ≤ +49°C hazardous (classified) locations when connected via the PIM-530-EI or PIM -530-(LT)EI in accordance with Control Drawing IL1626.

Company Name:	The Protectowire Co., Inc
Company Address:	60 Washington St., Pembroke, Massachusetts 02359, USA
Company Website:	http://protectowire.com
New/Updated Product Listing:	No
Listing Country:	United States of America
Certificate Number:	
Certification Type:	FM Approved

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Heat-actuated Devices for Special Application

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Heat-actuated Devices for Special Application

See General Information for Heat-actuated Devices for Special Application

PROTECTOWIRE CO INC S480
60 WASHINGTON ST
PEMBROKE, MA 02359-1833 USA

Fiber-Optic Linear Heat Detector, Model(s) PTS-8101, PTS-8102, PTS-8103, PTS-8104, PTS-8106, PTS-8108, PTS-8110, PTS-8201, PTS-8202, PTS-8203, PTS-8204, PTS-8206, PTS-8208, PTS-8301, PTS-8302, PTS-8303, PTS-8304, PTS-8308, PTS-8401, PTS-8402, PTS-8403, PTS-8404, PTS-8406, PTS-8408

Fixed temperature fire detecting wire, "Protectowire", Model(s) EPC (a)(i), EPN (a), EPR (a)(j), PLR (c)(k), PLR-R (d)(h), PLR-X (e), XCR (), XLT (b)

Fixed temperature fire detecting wire, Model(s) CTI-XXX, CTI-XXXR, CTI-XXXX (l)

Interface module, Model(s) CTM-530 (m), CTM-530E (m) (p), CTM-530LT (m), CTM-530LTE (m) (p), PIM-530 (q), PIM-530E (p) (q), PIM-530LT (q), PIM-530LTE (p) (q)

Programming module, Model(s) CTMP-1 (r)

(a) - For use in signal circuits 30 Vac or 42.4 Vdc 1 amp or less. Temperature ratings: Ordinary (155 F) intermediate (190 F) intermediate+ (220 F) high (280 F) and extra high (356 F) degrees. Resistance: approximately 20 ohms per 100 ft of cable. Cables rated (155 F) are not to be used in ambient temperatures exceeding 100 F. Cables rated (190 F) are to be used in ambient temperatures exceeding 150 F.

(b) - For use in signal circuits 30 Vac or 42.4 Vdc, 1amp or less. Temperature ratings: Ordinary (135 F). Resistance: approximately 20 ohms per 100 ft of cable. Cables, rated 135 F are to be used in ambient temperatures between -60 F (-51 C) and 100 F (38 C).

(c) - For use in signal circuits 30 Vac or 42.4 Vdc, 1 amp or less. Temperature ratings: Ordinary (155 F) intermediate (190 F) intermediate+ (220 F) high (280 F) and extra high (356 F) degrees. Resistance: approximately 5 ohms per 100 ft of cable. Cables rated (155 F) are not to be used in ambient temperatures exceeding 100 F. Cables rated (190 F) are to be used in ambient temperatures exceeding 150 F.

(d) - For use in signal circuits 30 Vac or 42.4 Vdc, 1 amp or less. Temperature ratings: Ordinary (155 F) intermediate (190 F) intermediate+ (220 F) and high (280 F) degrees. Resistance: approximately 5 ohms per 100 ft of cable. Cables rated (155 F) are not to be used in ambient temperatures exceeding 100 F. Cables rated (190 F) are to be used in ambient temperatures exceeding 150 F.

(e) - For use in signal circuits 30 Vac or 42.4 Vdc, 1 amp or less. Temperature ratings: Ordinary (140 F). Resistance: approximately 5 ohms per 100 ft of cable. Cables, rated 140 F are to be used in ambient temperatures between -60 F (-51 C) and 100 F (38 C).

() - Cables rated (280 F) are not to be in ambient temperatures exceeding (200 F).

(l) - Cables rated (356 F) are not to be in ambient temperatures exceeding (221 F).

(j) - Cables rated (356 F) are not to be in ambient temperatures exceeding (250 F).

(k) - Cables rated (356 F) are not to be in ambient temperatures exceeding (220 F).

l - Where XXX represents the temperature rating, ordinary (155°F), intermediate (190°F and 220°F), high (280°F) and extra high (356°F) rating. All models can have the suffix ?M which represents the models with high tensile strength stainless steel wire

m - For use with Linear Heat Detector, model CTI-XXX, CTI-XXXR, and CTI-XXXX

Note - Distance between lines of fire detecting wire on smooth ceilings with large bays shall be not in excess of 50 ft and distance of lines of fire detecting wire from any wall or partition not more than 25 ft. Listing applies to thermostats only and not to wiring or other appliances of systems of which form a part.

p - Suitable for outdoor use.

q - For use with Linear Heat Detectors, model EPC, EPR, XCR, and PLR

r - For use with Interface module, model CTM-530LT, CTM-530LTE, PIM-530LT, and PIM-530LTE.

Last Updated on 2017-08-23

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REAR VIEW CAMERA SYSTEM

Rear vision system consists of colour camera, colour monitor and the connecting cables. The monitoring system has a rugged construction and reliable for use on heavy earth moving machinery. System is designed to work efficiently in all sorts of environmental conditions like moisture, dust, vibration, heat and cold.

When the key switch is ON the system starts and the power is available to the monitor and the monitor shall be in standby mode. The monitor is automatically turned ON when the gear shift lever is in reverse position.

Features:

- The system will boot automatically along with starting of Engine / Power source of Machine, it will perform an initial system check and shall give readiness indication. The system will shut down along with shutting down of Engine / Power source. The system provided with system readiness, standby and system mal-function indication to indicate its status.

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- The system will remain in stand-by mode (operation mode whereby the system is active, but no information is transmitted by the camera Or monitor) and will wake up automatically upon selection/engagement of appropriate control(s) (such as reverse gear, etc) by Machine Operator The-system will return to Stand-by mode upon release the appropriate controls by the operator.
- The camera is provided with Infrared LED system shall be provided with auto mode tail /reverse light for adequate illumination for better visibility during darkness, The system capable of operating in dark and will automatically switch to infrared when the brightness of field of view is too low or in case of failure of the tail light.
- The System provided with provisions for recording the images captured with time stamp to enable easy retrieval and analysis of the immediate past 24 deployment operating hours.

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Proximity warning system

Radar based technology is designed to detect people and objects in blind spots, significantly reducing collisions. The system detects both stationary and moving objects and works effectively in harsh environments with poor visibility including darkness, smoke, fog and dust. The radar sensor features an internal CAN interface for network connectivity, allowing the user to link more sensors and a network host on a single CAN bus, enabling monitoring of multiple detection areas around the vehicle.

A radar system operates by emitting electromagnetic energy and detecting this energy when it is reflected from an object or target. Information about the target, such as range and direction of movement, can be acquired by analyzing this reflected energy. The technology is well suited for proximity warning because it is not affected by rain, snow, dust, or even a moderate buildup of mud on the sensors.

Features :

- Proximity warning device / system detects static and moving objects including human beings on its own during the vehicle movement for a specified range, and warn the operator in the operator's station.
- Two sensors are provided (Front and rear side).
- The system will provide an adjustable audio visual warning when it detects static and moving objects including human beings within the virtual target area of respective Dumper.
- Virtual Target Area in Front of Dumper
  - Width of the virtual target area equal to the width of the Dumper plus 0.5m on both sides(Programmable),
  - The Length of the virtual target area will conform to maximum stopping distance as mentioned in the IS: 16479 (Performance requirements and test procedures of braking systems for wheeled high-speed rubber-tracked Earth Moving Machines and construction equipment vehicles) at a speed of 30KM/h and slope 6.25%. (The stopping distance calculated at the speed of 30Km/h by considering speed limitation specified by DGMS in their earlier circulars).
- The Control Unit of the system dynamically and automatically change the detection range with relation to vehicle's speed(at a speed of 10, 20 and 30Km range).
- Virtual Target Area in Rear of Dumper/Truck:
  - Width of the virtual target area will be equal to the width of the Dumper plus 0.5 m on both sides(Programmable).
  - Length of the virtual target area will be equal to the length of the Dumper(Programmable based on vehicle model).
- The System is provided with provisions for recording of details of warning generated with time stamp to enable easy retrieval and analysis of the immediate past 96 deployment operating hours.

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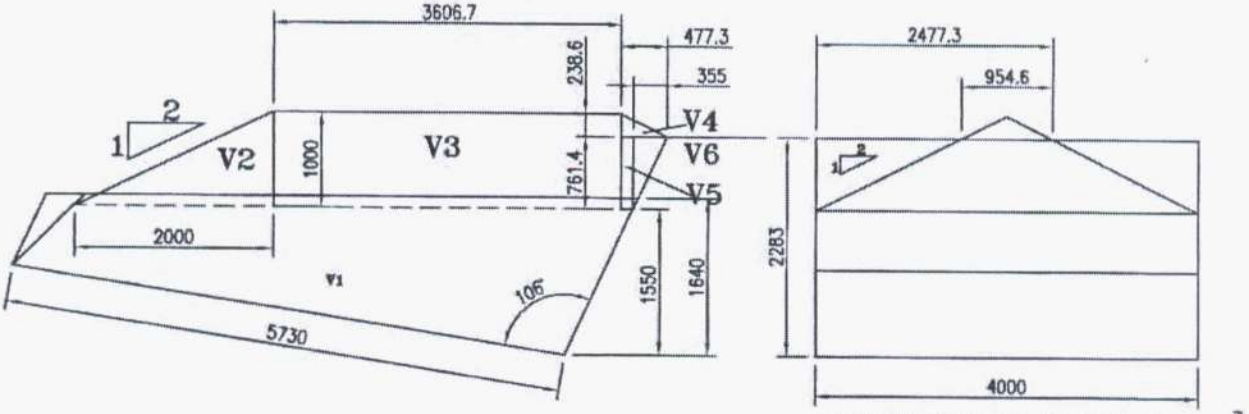
BH60M BODY VOLUME WITH 2:1 HEAP (1640 ht AND 4000 WIDTH)

28 cum STRUCK



CORNER VOLUME (APPRX) 0.35 m^3

V1= STRUCK VOLUME (TO AVOID SPILLAGE)
= (7.0946 x 4) − 0.35 = 28.02 m^3

V STRUCK FOR LOADING HEIGHT
= 6.58x4.00−0.35 = 26.3246−0.35 = 25.97m^3

V HEAP=V2+V3+V4+V5+V6

V2 =	1/3 X 2 X 1 X 4	= 2.6667m^3
V3 =	1/2 X 3.6067 X 1 X 4	= 7.2134m^3
V4 =	1/3 X 0.2386 X 0.4773 X 0.9546	= 0.0362m^3
V5 =	0.1223 X 0.7614 X 2.4773	= 0.2307m^3
V6 =	A X L = 0.13515 X 2.4773	= 0.3348m^3
	V HEAP =	10.4818m^3

TOTAL V = 25.9246 + 10.4818 = 36.4064m^3

WITH 1.5 DENSITY − 36.4064 X 1.5 = 54.5T

NOTE:

1) STRUCK VOLUME INCREASED TO 28 m^3 TO AVOID SPILLAGE OF MATERIAL AS PER UNIFORM NIT REQUIREMENT FROM M/s CIL
2) NOMINAL RATED PAYLOAD FOR 28 m^3 STRUCK VOLUME SHALL BE 54.5 T.

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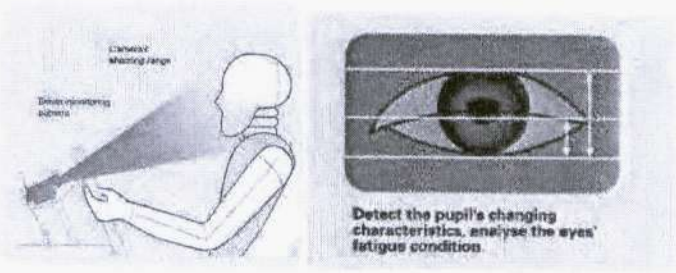
Drivers Fatigue Monitoring System



The real time and non intrusive Driver fatigue monitoring system to predict accurately and identify situations where drowsiness and fatigue may be setting into a driver, thereby it helps in preventing accidents and fatalities. The system will detect drowsiness based on drivers performance(considering physical signs).

The intelligent system will detect the onset of drowsiness in drivers, while the vehicle is in motion. Detection will be done by continuously looking out for symptoms of drowsiness, while considering physical signs. Physical cue including yawning, drooping eyelids, closed eyes and increased blink durations. The **percentage of eyelid closure over the pupil over time (PERCLOS).**

Features :

1)The device able to monitor the driver's alertness and level of Fatigue.

2) Ability to alert drive the driver to drive the vehicle without dozing off.

3) Non-contact infrared camera with proven technology to monitor the driver's eyes.

4) Buzzer to alert the driver to wake up.

5)Provision to change sensitivity settings.

6) Functions in all light levels (day and night) including heavy rain.

7) Functions if a driver wears glasses.

8) Proven sensing technology with PERCLOS algorithm to avoid false warnings.

9) Provisions for recording the warning generated with time stamp to enable easy retrieval and analysis of the immediate past 96 deployment operating hours.

10) Simultaneously flash externally mounted warning light easily visible to others for alerting the Operator and others in the vicinity to pay attention.

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11.3 Dimensions, Weights and Performance Details:

Tender requirement	Bidder's response
11.3.1 Dimensions	
a) Maximum overall length	9.180 m
b) Maximum overall width	5.420 m
c) Maximum height, without body	4.190 m
d) Maximum height, with body	4.740m
e) Loading height	3.820m
f) Dump height	8.445m
g) Discharge height	0.770m
h) Maximum body depth	1.550m
i) Body target area (inside length and width at top) m^2	6.730m x 4.000m
j) Wheelbase	4.060m
11.3.2 Weight Distribution	
a) Empty vehicle (Kg)	
Front axle (Kg)	21385 Kgs
Rear axle (Kg)	22115 Kgs
Total (Kg)	43500 Kgs
b) Loaded vehicle (Kg)	
Front axle (Kg)	33040 Kgs
Rear axle (Kg)	64960 Kgs
Total (Kg)	98000 Kgs
c) Payload (Kg)	54,500 Kgs
11.3.3 Engine	
a) Manufacturer and model	Cummins & QSK19C
b) Number of cylinders	6 nos
c) Bore (mm)	159 mm
d) Stroke (mm)	159 mm
e) Displacement	19 litres

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f) ISO net power at.....r/min (kW)	480 kW @ 2000 rpm
g) Maximum torque at .....r/min (Nm)	2875 N-m @ 1400 rpm
h) ECM /alternate - make, model & data storage capacity	Make: Continental, Model: CM2150 Data Storage Capacity: 500 MB
i) Diagnostic tool's make, model, software version, data storage capacity & features.	Diagnostic tool Make: Cummins Model: Inline 6, Software: Cummins Insite 8.8.0 or above for diagnostic tool
11.3.4 Mechanical Drive System	
I. Transmission	
a) Manufacturer and Model	Make: AVTEC, Model: M6610A / TC682 torque Convertor
b) Type	Power shift automatic (AVTEC) transmission M6610A with ECS Control
c) Number of gear speeds: forward and reverse	Travel speeds: Forward: 6 & Reverse: 2
d) Travel speeds: forward and reverse	Details enclosed in Annexure
II Differential	
a) Manufacturer & Model	BEML
b) Type	Plug-in differential
c) Ratio	3.85: 1
III Final Drive	
a) Manufacturer & Model	BEML
b) Type	Planetary final drive
c) Ratio	5.70:1
11.3.5 Suspension	
I Front	
a) Type	Frame mounted hydro-pneumatic with integral rebound control
b) Stroke	276 mm
c) Load - deflection rate, loaded and empty	Loaded: 1769 Kg/cm & Empty: 469 Kg/cm

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II Rear	
a) Type	Axle mounted, inverted hydro-pneumatic with integral rebound control
b) Stroke	200.5 mm
c) Load - deflection rate, loaded and empty	Loaded: 27725 Kg/cm & Empty: 495 Kg/cm
11.3.6 Steering	
a) Type	Orbitrol full time power steering. Steering Control Unit, Make: EATON
b) Emergency steer method	Automatic, through accumulator, (Addl. electrically operated system)
11.3.7 Brakes	
11.3.7.1 Service brakes	
I Front	
a) Type	Dry type Disc Caliper
b) Actuating system	All hydraulic actuated.
II Rear	
a) Type	Oil cooled Wet multiple disc brake
b) Actuating system	All hydraulic actuated
11.3.7.2 Emergency brakes	
a) Type	Either Front or Rear brakes independently meets the emergency braking requirement
b) Actuating system	Actuating System: Automatic actuation of emergency brake upon detection of low brake oil pressure.
11.3.7.3 Parking brakes	
a) Type	Wet multiple disc type in-bound in Rear axle
b) Actuating system	Spring loaded hydraulically released and will automatically apply whenever hydraulic pressure is low.
11.3.8 Retarder	
a) Type	Oil cooled wet multiple disc brake
b) Actuating system	Hydraulically actuated

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11.3.9 Tyres	
a) Manufacturer	Apollo / JK / Goodyear/ MRF / BKT
b) Size and type	24.00 x 35, E-4 type, tubeless
c) Tread	Deep tread Rock grip, E4
d) Rim size	17 x 35
e) TKPH	367
11.3.10 Hydraulic System	
a) Make & model, number, flow rates and operating pressures of pumps	Details enclosed as Annexure.
b) Make & model, number, piston diameters and stroke lengths of cylinders	
c) Relief valve operating pressures	
11.3.11 Electrical System	
a) Starter make and model	a) Make: Delco Remy / REIL Model: 50MT 400, 9 KW b) Make: Lucas TVS Model no: 4912939 ,9 KW
b) Alternator make and model	Make: NIEHOFF/Delco Remy/Remy Electricals (India) Ltd. & Model: C653A-1/ EE4057/33SI,24V, 75A
c) Batteries numbers, Make, AH rating and CCA rating	2 no's 12V, M/s. HBL Make, 160 Ah Maintenance free battery & CCA rating: 1600Amp
d) Lighting details (number, type & ratings)	
i) 4 nos. LED Headlight	24V, 35 W LED type (2 nos. low beam & 2 number high beam)
ii) Stop and tail LED lights	2 Nos, 24V LED type
iii) Hazard and turn signal lights (left and right) on both front and rear LED type	2 no's, 24V LED type
iv) Fog lamps 2 nos.	2 no's 24V, 35-watt LED type
v) Backup lights 2 nos.	2 no's 24V, 19W, LED type
vi) Cabin Dome & Ladder lights	1 no 24V LED type & 1 No. 24V, 19W, LED type
vii) Service light in rear axle & under hood (Wherever applicable)	2 no's 24V, 19W, LED type (LH & RH side of engine), 1 no. 24V, 19W LED type
viii) Manual / Auto backup light	As mentioned above (v)

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बीईएमएल लिमिटेड / BEML LIMITED
4 वां तल, यूनिटी बिल्डिंग्स, जे.सी. रोड
4th Floor, Unity Buildings, J.C. Road
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AHL

11.3.12 Operating Cycle	
The operating cycle, for which the bidder shall provide the information required in clause 11.2 (e), shall be:	
Time for hauling, rated payload and returning empty to the place of loading on a haul road of the following profile with a rolling resistance of 2%.	Annexure as per Clause 11.2.e. enclosed.
First 1500 meters up a 12% grade, next 200 meters level, next 200 meters up a 10% grade, last 100 meters level.	
A fixed time of six (6) minutes for loading and dumping shall be added to this time to calculate the total operating cycle.	

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BEML LIMITED V FLOOR Unity Buildings J C Road BANGALORE-560002

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11.3.4 Mechanical Drive System

I. Transmission

(d) Travel speeds: Forward

1st	: 8.6 Km/h
2nd	: 12.8 Km/h
3rd	: 17.0 Km/h
4th	: 25.4 Km/h
5th	: 34.3 Km/h
6th	: 51.0 Km/h

Reverse:

1st	: 5.7 Km/h
2nd	: 8.5 Km/h

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11.3.10 Hydraulic Systems	
a) Make & model, number, flow rates and operating pressures of pumps	Make: VELJAN Model: 955HS02312 Number: 1 No. Tandem Vane Pump for Hoist. Flow Rate: 316 ltr/min, Operating Pressure :193.34 Kg/Cm2 (18.96 Mpa)
	Make: Bosch Rexroth, Model: 955HS02183 Number: 1 No, Axial Piston Pump for Steering/ BRAKE Flow Rate: 85.9 Lit/min, Operating Pressure- 193.34 Kg/Cm2 (18.96 Mpa)
b) Make & model, number, piston diameters and stroke lengths of cylinders	Make: BEML Model: 958HS02704 Number: 2 Nos for Hoist Cylinder Cylinder — Piston — Stroke 1st — 165.10 mm — 880.36 mm 2nd — 95.25 mm — 880.36 mm Make: BEML Model: 958SS02213 Number: 2 nos. double acting cylinder for steering Piston dia: 50.80 mm, Stroke: 381 mm
c) Relief valve operating pressures	Relief valve operating pressures: 193.34 Kg/sq cm (18.96 Mpa)

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Theroretical Productivity Cycle calculations for BH60M with QSK19C Engine

	Total Haul & return distance	Distance in Mts	Grade	Rolling Resistance	Total Resistance	Speed Range	Max Travel Speed from the curve	Speed factor	Avg Speed	Time taken with speed factor	Time taken without speed factor
			%	%	%		Km/hr		Km/hr	Min	Min
Haul	up	1500	12	2	14	F2	10.37	0.9	9.333	9.64	8.68
	level	200	0	2	2	F6	51	0.75	38.25	0.31	0.24
	up	200	10	2	12	F2	12.57	0.75	9.4275	1.27	0.95
	level	100	0	2	2	F6	51	0.7	35.7	0.17	0.12
									Haul time	11.40	9.99
Return	level	100	0	-2	-2	F6	51	0.7	35.7	0.17	0.12
	down	200	10	-2	8	F5	43	0.75	32.25	0.37	0.28
	level	200	0	-2	-2	F6	51	0.75	38.25	0.31	0.24
	down	1500	12	-2	10	F5	43	0.9	38.7	2.33	2.09
									Return time	3.18	2.73

Haul & Return Time	14.58	12.71
Loading & Dumping Time	6.00	6.00
G. Total	20.58	18.71

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बेंगलूरु / BENGALURU - 560 002.

Major Bought Out Items List

Model : BH60M

Slno	Description	Type /Model	Make	Manufacturer's Address
1	ENGINE	QSK19C	Cummins	CUMMINS INDIA, KOTHRUD, PUNE - 411038
2	HATS TRANSMISSION ASSY. KIT (ELECTRONICS)	M6610A	AVTEC	AVTEC LIMITED, POWER PRODUCTS DIVN, MATHAGONDAPALLI, HOSUR-635114
3	Tyres	24.00 x 35 - 48 PR E-4, Tubeless	Apollo tyres	APOLLO TYRES LTD, VILLAGE LIMDA, TALUKA WAGHODIA, VADODARA-391760
			JK Tyres	JK TYRE & INDUSTRIES LIMITED, VIKRANT TYRE PLANT - 1, KRS ROAD, METAGALLI, MYSORE- 570016
			Goodyear	GOODYEAR SOUTH ASIA TYRES (P) Ltd, H-18, MIDC INDUSTRIAL AREA,, WALUJ, AURANGABAD-431136
			MRF Tyres	MRF LTD, # 124, GREAMS ROAD, CHENNAI-600006
			BKT	BALKRISHNA INDUSTRIES LIMITED (UNIT :- BALAKRISHNA TYRES), BHUJ-BHACHAU ROAD, KACHCHH, GUJARAT
4	Wheel Rim	17 x 35	Wheels India	WHEELS INDIA LTD, SINGAPERUMAL KOLI ROAD, PONDUR VILLAGE, SURVEY NO 449/A1, SRIPERUMPUDUR. CHENNAI - 602105
5	Propellar Shaft Front / Rear	958PI02002/ 958PI02035	Adroit Industries	ADROIT INDUSTRIES (INDIA) LTD., SECTOR D2, SANWER ROAD, INDORE-452015
			Dana Italia	DANA ITALIA SRL, VIA TORINO, 10, 13044 - CRESCENTINO (VC), ITALY
6	Auto Lube System	Electrically operated injector type / 958ALB0103/ 955ALB0044	Lincoln Helios	LINCOLN HELIOS (INDIA) LTD, PLOT NO. 249 & 250, BOMMASANDRA INDL. AREA, PHASE-3, HOSUR ROAD, BENGALURU-560099
			LUB SOLUTIONS (GRACO)	LUB SOLUTIONS PRIVATE LIMITED, NR COLONY, BENGALURU-19
7	Stg. Pump	955HS02183	Bosch Rexroth India Ltd	BOSCH REXROTH INDIA LTD, ANDRAHALLI, MUNICIPAL No. 31, SURVEY No. 37/1, NADAKERAPPA INDL. ESTATE, ANDRAHALLI, BENGALURU-560091

BEML LIMITED V FLOOR Unity Buildings J C Road BANGALORE-560002

NARESH KUMAR Dy. General Manager(Marketing) भेल लिमिटेड / BEML LIMITED 4th Floor, Unity Buildings, J.C. Road BENGALURU - 560 002.

ANNEXURE-K

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Major Bought Out Items List

Model : BH60M

Slno	Description	Type /Model	Make	Manufacturer's Address
8	Stg. Control unit	958SS02246	EATON	Eaton Fluid power limited, 145, Off Mumbai Pune road, Pimpri, Pune
9	Hyd. Pump	955HS02312	Veljan	VELJAN LIMITED, "9A, IDA", PATANCHERU, MEDAK-502319
10	AC UNIT	958ACB0088	Reddot / Millenium	MILLENNIUM RED DOT PVT. LTD., MAHADEVAPURA, 3RD CROSS, ITI INDUSTRIAL ESTATE, BENGALURU-48
			ARIES APPLIANCES	PLOT NO. 241, 3RD LINK STREET, NEHRU NAGAR, KOTTIVAKKAM, CHENNAI
11	Auto Dimmer sensor	958EG83521	EM Electronix	EM ELECTRONIX PRIVATE LIMITED, "No. 91/2, 3rd MAIN", "2nd STAGE, INDL. SUBURB", YESHWANTHPUR, BENGALURU - 560022
			ALTEK CIRCUITS	ALTEK CIRCUITS and SYSTEMS, C-279/1, 7th CROSS, 1st STAGE, PEENYA INDL. ESTATE BENGALURU
12	Payload Electronic Module	955EG04195	Epoch	EPOCH INSTRUMENTS & CONTROLS PRIVATE LTD, BHADRAPPA ESTATE, 54, MAGADI MAIN ROAD, KAMAKSHIPALYA, BENGALURU-560079
			EM Electronix	EM ELECTRONIX PRIVATE LIMITED, "No. 91/2, 3rd MAIN", "2nd STAGE, INDL. SUBURB", YESHWANTHPUR, BENGALURU - 560022
			Process Care	PROCESS CARE SYSTEMS(I) PVT LTD., (SISTER CONCERN OF M/s. DATA CARE SYSTEMS) # 2B - 11 & 12, FIRST FLOOR, 14TH CROSS, IV PHASE PEENYA INDL. AREA, BENGALURU
13	Collision Avoidence System-kit (Proximity)	958EGB0284	SENSATA TECHNOLOGIES INDIA PRIVATE LIMITED	FIRST FLOOR, UNIT 1,SAI TRINITY COMPLEX, A WEST WING,PASHAN, PUNE
			Daves men	Daves men, Kolkatta

BEML LIMITED bemi V FLOOR Unity Buildings J C Road BANGALORE-560002

NARESH KUMAR Senior Manager/Marketing

Major Bought Out Items List

Model : BH60M

Slno	Description	Type /Model	Make	Manufacturer's Address
14	Operator Fatigue sensor	958EG88675	OUTDU MEDIATECH PRIVATE LIMITED	Ground floor, J PClassic, 157/1 EPIP Phase II, KIADB, Whitefiled, BENGALURU
			Daves men	Daves men, Kolkatta
15	Auto Fire Protection System (Zone Specific)	2-Zone specific type / 958FPB0034	Southern Electronics	SOUTHERN ELECTRONICS (BANGALORE) PVT LTD, 16-A, PEENYA INDL AREA, PHASE-I, BENGALURU-560058
16	Rear view camera	958EGB0292	Daves men	Daves men, Kolkatta
			VK Industries	VK INDUSTRIES, No. D-4, GANESH COLONY, PILANI-333031, RAJASTHAN
17	Maintenance Free Battery 12V, 160AH	02X12V, 160Ah	HBL POWER SYSTEMS LTD,	HBL Power Systems Ltd, Hyderabad.
18	Self Starter	ST4100	Delco Remy / Remy Electricals (India Ltd)	Delco Remy/ Remy Electricals (India) Ltd.,
		4912939	Lucas TVS Ltd..	Lucas TVS Ltd., Padi, Chennai - 600050
19	Alternator	EE4057 / 33SI	Delco Remy / Remy Electricals (India Ltd)	Delco Remy/Remy Electricals (India) Ltd.

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बीईएमएल लिमिटेड
BEML LIMITED

Schedule 'A' Company under Ministry of Defence, Govt. of India

Defence & Aerospace | Mining & Construction | Rail & Metro

Ref: MT: TC-1572/BCCL (BH60M) Date: 29.06.2022

To:
Bharat Coking Coal Limited
Koyla Bhawan, Koyla Nagar
Dhanbad - 826005

Sub: Bought out items undertaking

Ref.: 1. NIT No. : BCCL/Pur/422011/60T Dumper/OTE-RA/22-23/24 dtd 01.06.2022

2. Tender Id No. : 2022_BCCL_245460_1

Dear Sir,

We hereby confirm that "All other components not identified / mentioned herein are manufactured by the bidder at their works exclusively i.e. the components are proprietary of bidder's firm".

Date: 29.06.2022

(Signature of the Bidder)

BEML LIMITED V FLOOR Unity Buildings J C Road BANGALORE 560002

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ಪ್ರಧಾನ ಕಛೇರಿ **Corporate Office**
ಬಿಇಎಂಎಲ್ ಸೌಧ, ೨೩/೧, ೪ನೇ ಮುಖ್ಯ ರಸ್ತೆ, ಸಂಜಯನಗರ, ಬೆಂಗಳೂರು – ೫೬೦ ೦೨೭
ದೂರವಾಣಿ ಸಂಖ್ಯೆ : +೯೧ ೮೦ ೨೨೯೬ ೩೨೦೦, ೧೮೦೦ ೪೨೫ ೨೩೬೫
BEML Soudha, 23/1, 4th Main, S R Nagar, Bengaluru - 560 027
Tel: +91 80 2296 3200, 1800 425 2365
CIN: L35202KA1964GOI001530, GST NO. 29AAACB8433D1ZU

मार्केटिंग प्रधान कार्यालय **Marketing HQ:**
बीईएमएल लिमिटेड, ४थी मंजिल, यूनिटी बिल्डिंग्स, जे.सी. रोड, बेंगलूरु – ५६० ००२
दूरभाष संख्या : +९१ ८० २२९६ ३५०५
BEML Limited, 4th Floor, Unity Buildings, J.C Road, Bengaluru - 560 002
Tel: +91 80 2296 3505
mt@beml.co.in, mtt@beml.co.in

www.bemlindia.in

ANNEXURE-L 190/199

DETAILS OF NEAREST DEPOT/WAREHOUSE & SERVICE FACILITIES AVAILABLE FOR THE PRESENT OFFER

MAJOR DEPOT/ WAREHOUSE & SERVICE FACILITY

MAJOR DEPOT/WAREHOUSE			SERVICE FACILITY		
LOCATION	CONTACT NOS.	INVENTORY VALUE	LOCATION	TYPE OF FACILITY AVAILABLE	NO. OF ENGINEERS
BEML Warehouse At KGF At Mysore BEML depots at Asansol Neyveli Singrauli Chandrapur Dhanbad Bilaspur Sambalpur Ranchi Kolkata Udaipur Hyderabad	08153-263280/ 263320 0821-2402202 0341-2252480/ 2252870 04142 - 268517 07805-267392 07172-287760 0326-2222385/ 2200180 07752-252142 0663-2533023 0651-2544054 033-24015286/ 24010780 0294-2452055 040-23221396	Approx Total Rs.150 Crores at various Warehouse/ depots	BEML :- Asansol, Neyveli, Chandrapur, Dhanbad, Bilaspur, Sambalpur, Bhubaneswar, Ranchi, Kolkata, Singrauli, Hyderabad	All these Regional / District offices have service set up with experienced service personnel, required instrument and tools to attend major & minor service problems. Kolkata and Bilaspurhas got service center for overhauling major sub-assemblies.	Adequate number of qualified, trained Engineers and Technicians are located at Asansol, Neyveli, Chandrapur, Dhanbad, Ranchi, Bilaspur, Sambalpur, Bhubaneswar, Kolkata and at project sites and at various other Regional / District offices of BEML.

Location of RegionalService Centre:	The total Engineers / Technicians employed to service the equipment either at the facility or on site is 28 personnel for BCCL projects.	Training Facilities:
▪ Kolkata ▪ Bilaspur ▪ Hyderabad ▪ Singrauli ▪ Delhi		▪ **Centre of Excellence, KGF** ▪ **Service Training Centre, KGF** ▪ **Service Training Centre, Mysore**

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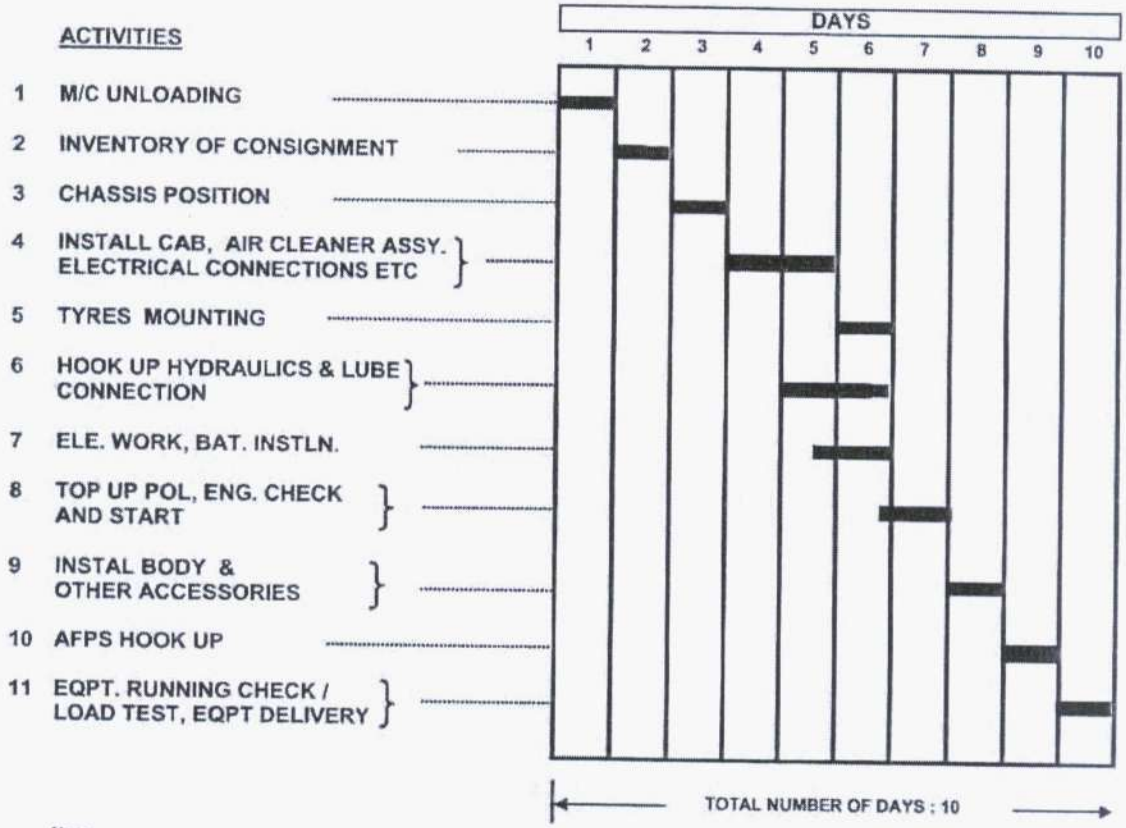
ANNEXURE-M

ERECTION CHART FOR BH60M REAR DUMPER



Note:

Erection work will be commenced after receipt of full consignment at site and commissioning will be completed within the period specified in the NIT.

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बेंगलूरु / BENGALURU - 560 002.

Oil & Lubricant Chart

Model: BH60M

SL NO.	RESERVOIR	PART NO.	GRADE OF OIL	CHANGE INTERVAL		REFILL CAPACITY (Litres)	Average Annual Consump.	PRODUCT NAME						
				INITIAL	EVERY			BEML	IOCL	BPCL	HPCL	BALMER LAWRIE	RAJ PETRO	Arablan Petroleum
1	ENGINE OIL QSK19C (T3)	C600230002	API15W40 CI 4 Plus	--	500	73	672 L	E15W-40 CI-4/CI-4 PLUS	SERVO PRIDE XL PLUS 15W-40 (CI-4 PLUS)	MAK CI4 PLUS 15W-40	HPMILCY NO.1 PLUS 15W40 (CI4/CI4 PLUS) (BM)	BALMEROL ULTIMA PLUS 15W-40 (CI-4 PLUS)	---	---
2	HYDRAULIC OIL	C600212000	C4-SAE-30	250	1000	360	1605 L	C4 SAE 30 TRANS. OIL	SERVO TRANS. C4 SAE 30	HYD. TRANS. FLUID C4 SAE30	---	BALMEROL PROTOMAC C4 SAE30	---	---
3	TRANSMISSION OIL	C600212000	C4-SAE-30	250	1000	79.6	369 L	C4 SAE 30 TRANS. OIL	SERVO TRANS. C4 SAE 30	HYD. TRANS. FLUID C4 SAE30	---	BALMEROL PROTOMAC C4 SAE30	---	---
4	FINAL DRIVE & DIFF OIL	C600205000	SAE140 (SAE 90 for below 30°C ambient temp)	250	1000	212.2	966 L	G140 GEAR OIL GL-5	SERVO GEAR SUPER140	MAK SPIROL HD140	HP GEAR OIL XP140	BALMEROL PROTOMAC HP140 SPL	---	---
5	SUSPENSION (INDIVIDUALLY 14LTRS-RS 17.5LTRS-FS)	C600219000	ANTI WEAR (VG- 68)	--	NOT REQUIRED (Top up as required)	63	84 L	--	SERVO SYSTEM 68	HYDRAL HLP-68	ENKOHLP-68	---	—	"SPL" HYDREX WW 68
6	GREASE FOR FRONT AXLE	Y600302100	GREASE SC-HT 2	--	5000	9.24 Kg	14 Kg	--	**SERVO SC-HT 2	**MAK SC-HT 2	**HP GREASE SC-HT 2	BALMEROL SC- HT 2	---	---
7	GREASE FOR ENGINE OUTPUT SHAFT	C600302000	GREASE MOLEX M-032 (Molybdenum disulphide grease)	--	5000	0.5 Kg	1.0 Kg	--	SERVO GREASE MOLEX	MAK MOLY GREASE	**HP MOLY GREASE	BALMEROL MOLEY GREASE	BEML Moly Grease	---
8	GREASE FOR JOINTS (Auto Lubrication System)	C600304000	NLGI-2 (EP-2) (Lithium Base Grease)	As per requirement			364 Kg	EP-2	SERVO GEM EP2	MAK LANTHAX EP GREASE 2	LITHON EP-2	BALMEROL LIPREX EP2	---	---

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ANNEXURE-N

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MAINTENANCE SCHEDULE

Model: BH60M

PERIODIC MAINTENANCE SCHEDULE

GROUP	TYPE OF P.M.	DETAILS OF P.M.	HRS. REQD.	MAN POWER REQD.
1	Daily Checks	Walk around check for oil leaks and loose fasteners. **CHECK:** Oil, Coolant level & Grease level, Tyre inflation pressure, Grease at all points, Air cleaner restriction and change air cleaner element if required, Suspension heights, Battery condition & function of Auto electrics and belt tension & adjust. **DRAIN:** Sediments form Air, Fuel tank & Water separator.	0.5 Hrs per Shift	2
2	Initial 250 hours	**Change:** Hydraulic and transmission filter elements. **Change:** Hydraulic oil, Transmission oil, Final Drive / Differential Oil.	4	2
3	Every 250 hrs	**Check:** Transmission oil level, hydraulic oil level, differential & final drive oil level and correct.	1	2
4	Every 500 Hrs.	**Engine 'B' - Check** **Change:** Replace engine oil & lube oil filters, , Fuel Filter, Resistor Corrosion. **Check:** pH value of coolant. **Clean:** Crank case breathers.	2	2
5	Every 1000 Hrs.	**Change:** Hydraulic oil & filter, Transmission oil & filter. **Change:** Fuel water separator **Change:** Final Drive & differential oil. **Change:** Hydraulic tank breather element. **Change:** Air Cleaner Elements. **Clean:** Transmission and Final Drive Breather Elements. **Clean :** Transmission magnetic strainer. **Check:** Drive shaft cross bolts torque and correct.	6	4
6	Every 1500 Hrs.	**Engine 'C' - Check:** Check and adjust Engine valve first 1500 Hrs clearance. Check fan hub/idler & water pump. Clean radiator fins. Check for front spindle grease level and pre-load of bearings	3	2

PREVENTIVE MAINTENANCE SCHEDULE:

GROUP	TYPE OF P.M.	DETAILS
A	Initial 50 hrs.	Check and tighten all critical fasteners like drive shaft bolts, cabin mounting bolts, front suspension mounting bolts etc.
B	Every 2000 hrs.	**Engine 'D' - Check** Check and record all system pressure, check function of AVTEC ECS system components.
C	Every 6000 hrs.	Clean and calibrate injector, clean turbo charger compressor wheel. Check turbo charger bearing clearance and vibration dampers, Air compressor.

The above preventive maintenance will be concurrently carried out during scheduled periodical maintenance.

BEML LIMITED V FLOOR Unity Buildings J C Road BANGALORE-560002

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ANNEXURE-O 194/199

Azadi Ka Amrit Mahotsav

बीईएमएल लिमिटेड
BEML LIMITED

बी ई एम एल

Schedule 'A' Company under Ministry of Defence, Govt. of India

Defence & Aerospace | Mining & Construction | Rail & Metro

Mandate Form for EFT / Internet Banking Payment

To
Bharat Coking Coal Limited
A Mini Ratna Company
(A Subsidiary of Coal India Limited- A Maharatna Company)
Regt. Off: Koyla Bhawan, Koyla Nagar
Dhanbad-826005

Dear Sir,

Sub: Authorization of all our payments through Electronic Fund Transfer system/RTGS/NEFT/ LC.

We here by authorize Bharat Coking Coal Ltd. To disburse all our payments through Electronic Fund Transfer system/ RTGS/ NEFT/ LC. The details for facilitating the payment are given below:

1	Name of the Beneficiary, address with Telephone No.	BEML LIMITED, MOUZA KANGALO, AMAGHATA, PO: GOVINDPUR, DHANBAD-828109 PH: 0326-2227085, 2227038, 2227089
2	Bank name, address with Telephone No.	STATE BANK OF INDIA, DHANBAD BRANCH, BANK MORE, DHANBAD 826001
3	Branch name & code	BRANCH NAME- DHANBAD BRANCH, BRANCH 9 DIGIT CODE NO OF THE BANK AND BRANCH 826002002 BRANCH 5 CODE NO OF SBI - 00066
4	Bank account number with style of account (Savings/Current)	10976587403 (CURRENT ACCOUNT)
5	IFSC Code No./Swift Code of the Bank	SBIN0000066
6	PAN No. of the Beneficiary	AAACB8433D
7	E-Mail No. and Mobile No. of the Beneficiary for intimation of release of payment.	EMAIL ID – AMF@BEML.CO.IN MOBILE NO - 9471192064

I/We hereby declare that particulars given above are correct and complete and if the transaction is delayed or credit is not affected due to incorrect information, I/we will not hold Bharat Coking Coal India Ltd. responsible.

DATE: 03.09.2021

Authorized Signatory
Name: PREM KUMAR MISRA
Official Stamp with date

Bank Certification

It is certified that above mentioned beneficiary holds a Bank Account No. 10976587403 with our branch and the Bank particulars mentioned above are correct.

Name:

नरेश कुमार / NARESH KUMAR
उप महाप्रबंधक (विपणन)/Dy. General Manager(Marketing)
बीईएमएल लिमिटेड / BEML LIMITED
4th Floor, Unity Buildings, J.C. Road
बेंगलूरु / BENGALURU - 560 002.

Authorized Signatory
03/09/2021
Official Stamp with date

मुख्य कार्यालय / Corporate Office:
बीईएमएल सौदा, 23/1, 4th मुख्य ,एसआर नगर
बैंगलोर, कर्नाटका, 560027.
BEML Soudha, 23/1, 4th. Main, S R Nagar, Bangalore – 560027,

क्षेत्रीय कार्यालय/ REGIONAL Office :
बीईएमएल लिमिटेड, जीटी रोड, कांडरा,
पोस्ट भितिया, गोविन्दपुर, धनबाद, झारखंड, 828109.
BEML LIMITED, GT road, Kandra, P.O. Bhitia,
Govind-ur, Dhanbad, Jharkhand, 828109.

ANNEXURE-9

Annexure-6

PRE CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made **on day of bid submission**, between on one hand, BCCL (hereinafter called the "BUYER / Principal", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part **and undersigned who is authorized to sign the bid** (hereinafter called the "BIDDER/Seller/Contractor" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure tendered stores/Equipment/Items/Goods) and the BIDDER/Seller is willing to offer/has offered the stores and

WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Central Public Sector Unit.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to :-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Section I -Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles.-

a. No employee of the Principal, personally or through family members , will in connection with the tender for , or the execution of a contract, demand ; take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

b. The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

c. Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/ PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

(1) The Bidder(s) / Contractor(s) commit themselves to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commit themselves to observe the following principles during participation in the tender process and during the contract execution.

a. The Bidder(s) / Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

b. The Bidder(s) / Contractor(s) will not enter with other Bidders info any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelisation in the bidding process.

c. The Bidder(s)/ Contractor(s) will not commit any offence under the relevant IPC/PC Act; further the Bidder(s) / Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d. The Bidder(s) / Contractors(s) of foreign origin shall disclose the name and address of the Agents/ representatives in India, if any. Similarly the Bidder(s) /Contractors(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/ Contractor(s). Further, as mentioned in the Guidelines all the payments made to the Indian agent/ representative have to be in Indian Rupees only. *The guidelines and terms and conditions for Indian agents of Foreign supplier shall be as per the provisions in the NIT.*

e. The Bidder(s)/ Contractor(s) will, when presenting their bid, disclose any and all payments made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

f. Bidder(s) / Contractor(s) who have signed the Integrity Pact shall not approach the Courts while representing the matter to IEMs and shall wait for their decision in the matter.

(2) The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3: Disqualification from tender process and exclusion from future contracts

If the Bidder, before contract award, has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or credibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

(1) If the Bidder / Contractor / Supplier has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is also entitled to exclude the Bidder / Contractor / Supplier from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case. In particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.
(2) A transgression is considered to have occurred if the Principal, after due consideration of available facts and evidences within his / her knowledge concludes that there is a reasonable ground to suspect violation of any commitment listed under Section 2 i.e. "Commitments of Bidder(s) / Contractor(s)".

(3) The Bidder accepts and undertakes to respect and uphold the Principal's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

(4) If the Bidder / Contractor / Supplier can prove that he has restored / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.
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Section 4 - Compensation for Damages

(1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the Contract value or the amount equivalent to Performance Bank Guarantee.

Section 5 - Previous transgression

(1) The Bidder declares that no previous transgressions occurred in the last three years with any other Company in any country conforming to the anti-corruption approach or with any Public Sector Enterprise in India that could justify his exclusion from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action can be taken as per the procedure mentioned in "Guidelines on Banning of business dealings".

Section 6 - Equal treatment of all Bidders / Contractors / Subcontractors

(1) In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor.

(2) The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.

(3) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

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Section 7 - Criminal charges against violating Bidder(s) / Contractor(s) / Subcontractor(s)

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Section 8 - Independent External Monitor

(1) The Principal appoints competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

(2) The Monitor is not subject to instructions by the representatives of the parties and performs his/ her functions neutrally and independently. The Monitor would have access to all Contract documents, whenever required. It will be obligatory for him / her to treat the information and documents of the Bidders/Contractors as confidential. He/ she reports to the CMD, BCCL.

(3) The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his/ her request and demonstration of a valid interest, unrestricted and unconditional access to their project documentation. The same is applicable to Sub-contractors.

(4) The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality. The Monitor has also signed declarations on 'Non-Disclosure of Confidential Information' and of 'Absence of Conflict of Interest'. In case of any conflict of interest arising at a later date, the IEM shall inform CMD, BCCL and recuse himself / herself from that case.

(5) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

(6) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he/ she will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

(7) The Monitor will submit a written report to the CMD, BCCL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

(8) If the Monitor has reported to the CMD, BCCL, a substantiated suspicion of an offence under relevant IPC/ PC Act, and the CMD, BCCL has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

(9) The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

If any claim is made / lodged during this lime, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by CMD ,BCCL.

Section 10 - Other provisions

(1) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

(2) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

(3) Should one or several provisions of this agreement tum out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(4) Issues like Warranty / Guarantee etc. shall be outside the purview of IEMs.

(5) In the event of any contradiction between the Integrity Pact and its Annexure, the Clause in the Integrity Pact will prevail.

Section 11- Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

Section 12- Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

Section 13 - Other Legal Actions.

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

(For & On behalf of Bidder/ Contractor)

This document is digitally signed

NARESH KUMAR

Digitally signed by NARESH KUMAR
Date: 2022.07.18 16:01:40 +05'30'