



Invitation for Expression of Interest (EoI)

Sub: Supply of AdBlue dosing system and training for calibration of BEML engine to meet BS-IV(CEV).

Reference No. : GP/GP-1/EoI/Dosing_System/156

Due on : Extended till 25.06.2020 @ 1700 Hrs

**Issued by
M/s. BEML, Limited
(Under Ministry of Defense)
Engine Division, Belavadi post
Mysore-570018**

INTRODUCTION:

BEML Limited (formerly Bharat Earth Movers Limited) was established in May 1964 as a Public Sector Undertaking for manufacture of Rail Coaches & Spare Parts and Mining Equipment at its Bangalore Complex. The Company has partially disinvested and presently Government of India owns 54 percent of total equity and rest 46 percent is held by Public, Financial Institutions, Foreign Institutional Investors, Banks and Employees. BEML Limited, a 'Miniratna-Category-1', plays a pivotal role and serves India's core sectors like Defence, Rail, Power, Mining and Infrastructure. The Company started with a modest turnover of Rs. 5 Cr during 1965 and today, thanks to its diverse business portfolio, the company has been able to achieve a turnover of more than Rs.3,500 Cr.

The Company operates under three major Business verticals viz., Mining & Construction, Defence and Rail & Metro. The three verticals are serviced by nine manufacturing units located at Bangalore, Kolar Gold Fields (KGF), Mysore, Palakkad and Subsidiary - Vignyan Industries Ltd, in Chikmagalur District. Each Business vertical is headed by a Director who reports to the Chairman & Managing Director of the company. For more details please visit www.bemlindia.com.

BEML has charted out a program to optimize the 11L, 15.24L and 23L of BEML engines to meet BS-IV(CEV) norms by adopting AdBlue dosing system for SCR catalyst. BEML required manufacturer to supply AdBlue dosing system with OBD requirements, integration with engine ECU and training for calibration of AdBlue dosing system.

ENGINE DETAILS

11 L ENGINE SPECIFICATION:

| | |
|-------------------------|---|
| Engine Type | In-line, 4 Stroke, Coolant Cooled, Direct Injection & Diesel engine |
| Bore X Stroke | 125x150 mm |
| Displacement | 11.05 lit |
| No Of Cylinder | 6 |
| Aspiration System | Turbo Charged & Charge Air cooler |
| FIP | Mechanical FIP with Electronic Governor |
| Rated Power, kW @ rpm | 184 @ 1800 |
| Maximum Torque, Nm | 1069 @ 1400 |
| Exhaust Flow, kg/h | 1513 @ rated & 803 @ peak torque |
| Exhaust temperature, °C | 439 @ rated & 471 @ peak torque |

15.24 L ENGINE SPECIFICATION:

| | |
|-------------------------|---|
| Engine Type | In-line, 4 Stroke, Coolant Cooled, Direct Injection & Diesel engine |
| Bore X Stroke | 140x165 mm |
| Displacement | 15.24 lit |
| No Of Cylinder | 6 |
| Aspiration System | Turbo Charged & Charge Air cooler |
| FIP | Mechanical FIP with Electronic Governor |
| Rated Power @ rpm | 220 kW @ 2100 rpm |
| Maximum Torque | 1256 Nm @ 1500 rpm |
| Exhaust Flow, kg/h | 1680 @ rated & 1200 @ peak torque |
| Exhaust temperature, °C | 460 @ rated & 471 @ peak torque |

23 L ENGINE SPECIFICATION:

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|-------------------------|---|
| Engine Type | In-line, 4 Stroke, Coolant Cooled, Direct Injection & Diesel engine |
| Bore X Stroke | 170x170 mm |
| Displacement | 23.15 lit |
| No Of Cylinder | 6 |
| Aspiration System | Turbo Charged & Charge Air cooler |
| FIP | Mechanical FIP with Electronic Governor |
| Rated Power @ rpm | 423 kW @ 1700 rpm |
| Maximum Torque | 2609 Nm @ 1300 rpm |
| Exhaust Flow, kg/h | 2916 @ rated & 2344 @ peak torque |
| Exhaust temperature, °C | 552 @ rated & 541 @ peak torque |

SCR ADBLUE DOSING SYSTEM COMPONENTS:

SCR AdBlue dosing system kit as given below,

- a. Urea Pump
- b. Urea Dosing Unit / Nozzle
- c. ECU with Software and Calibration / Service tool
- d. OBD functionality in ECU

Following parts are also preferred to supply or expected to sourcing the parts:

- e. Temperature sensor
- f. Differential pressure sensors
- g. NOx Sensor
- h. Mass Air Flow Sensor
- i. Urea level Sensor
- j. Urea quality sensor
- k. Wire Harness (7.5 m)
- l. Urea Tank
- m. Urea Hoses

SCR ADBLUE DOSING SYSTEM COMPONENT REQUIREMENTS:

SCR AdBlue dosing system ECU:

- SCR AdBlue dosing system ECU should meet OBD requirements as per BS-IV(CEV) norms.
- The ECU should integrate with engine ECU through SAE J1939 CAN signal.

Urea Pump:

- Flow rate : 0 to 7.5 / 0 to 9.0 lph.
- Minimum Pressure : 6 bar.
- Air / Airless pump is required. (**Airless pump is preferred**)
- Auto priming and purging facilities are required.

Urea Nozzle:

- Fine atomization is required.
- Nozzle should not choke during any conditions.

Other Items:

- Temperature sensor
- Differential pressure sensors
- NOx Sensor - Smart type (SAE J1939 CAN signal)
- Mass Air Flow Sensor
 - Smart type (SAE J1939 CAN signal) or 0 to 5 V Analogue Output
 - Flow rate : 1500, 2000 and 3000 kg/h
- Urea level Sensor
- Urea quality sensor
- Wire Harness (7.5 m)
- Urea Tank
- Urea Hoses

TRAINING SUPPORT:

Training required for,

- Sensors configuration with ECU
- Optimization of Urea flow rate
- OBD configuration
- OBD integration with engine ECU

PROPOSED SCOPE OF SUPPLY:

- Detailed ECU architecture or complete list of parameters and its usage.
- Initial requirement will be for proto trial and the approximate production quantity requirement is given in the below table.

| | DESCRIPTION | Proto QTY | Serial Production / Year |
|---|---|------------------|---------------------------------|
| 1 | SCR AdBlue Dosing system kit (As per Point 2.0, a to d) | 5 set | 500 set |
| 2 | Other Items (As per Point 2.0, e to m) | 5 set | 500 set |

- Production support is required for minimum 10 years.
- Firm shall express their interest on supply of AdBlue dosing system as indicated in Point No. 2.0 as well training as per point 4.0.
- Proto supply requirement : Within 3 Months from P.O. release date
- Any change in specifications can be decided mutually.
- Serial production shall start April 2022.

PRE-REQUISITE OF VENDOR

1. Firm submitting their proposal should have their manufacturing facilities / Service support for AdBlue dosing pump with ECU and nozzle in India.
2. The Adblue dosing system shall be proven to STAGE-IV / STAGE-V / TREM- IV,TREM- V / BS IV-(CEV) and reliable
3. Firm must have core expertise in the following areas of work:
 - a) ECU development (OBD support, Engine /vehicle integration) & calibration - Related to AdBlue dosing pump
 - b) Engine test bed support like software support
 - c) Quality assurance and testing

THE FOLLOWING DETAILS SHOULD BE SUBMITTED ALONG WITH EOI TO THE CONTACT DETAIL MENTIONED IN THIS EOI DOCUMENT:

- a) Company profile, giving details of current activities and management structure.
- b) The firm should have executed similar assignment with at least 3 year experience of similar work.
- c) Highlight the infrastructure available / modalities to take up the project.
- d) Any other relevant information considered necessary for successful implementation of the proposed scope of work.

- e) Financial background and stability including detailed audited financial statements for the last 3 years.
- f) Details of warranty practices and services in after sales, number of years for which Spares and Service support offered to customers.
- g) Supplier's base, leverage and relationship.

GENERAL GUIDELINES:

The firm should submit a detailed technical proposal comprising the following points:-

- a) Project approach for the activities mentioned in scope of work.
- b) Duration required by the firm for executing work.
- c) Additional services the Company can offer.
- d) Company flexibility for production of varied products and quantity.
- e) Have the firm executed any joint development program to any customer?

CONTACT DETAILS:

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