

DATE: 24.08.2016

AMENDMENT

**Tender: Ref: ASE/SRCH/030/2016- (The new specification of GDI Engine dated 24.8.16
Amendment no.1 for IITM WEBSITE & CPP Portal ADVERTISEMENT.**

The following Amendments were discussed and agreed in the Purchase committee Meeting scheduled on 24.8.2016 at Admin.2nd floor conference room.

1. Purchase committee extended the tender due date till 14, September 2016 (Wednesday) for tender submission for GDI Engine new specification.
2. Technical bid opening date will be on 15th September 2016 (Thursday) at Admin.Building 2nd floor conference room at 3.00 P.M.
3. The new specification of the GDI Engine (24-8-2016) attached herewith for tender submission before due date.
4. Old specification of GDI Engine stands cancelled.

*Other Commercial terms and EMD Amount will remain the same.

The New Specifications of the GDI Engine (24-08-2016)

supply qty: 1 set

Part-A: The Engine Setup and The Open ECU

1. The Engine

Gasoline Direct Injection (GDI), two or three cylinders, about one litre capacity, with turbocharger and variable valve timing mechanism, water or air cooled engine, power rating to be about 120 kW.

2. The Open ECU

Above engine should be interfaced with an open ECU with complete wiring harness, calibration cable and connectors. The ECU should have PC based engine control software capable of varying: fuel line injection pressure, fuel injection timing, and dwell and duration of pulses, number of pulses of fuel injection of each cylinder. The ECU should also have the provisions for calibration and visualization of the varying parameters. The supplier should provide a user manual and training for the operation of the open ECU. The supplier should also make the above engine to work with its original ECU and supply it also.

3. Motoring Provision

The setup should have a provision to motor the engine at different speeds ranging from about 500 to 5000 rev/min.

4. Engine Mounting

The supplier should provide a common frame standing on cushioning dampers that can mainly accommodate the engine, dynamometer, and if possible dyno-controller and all the other accessories with a compact design. The whole frame should be possible to mount on the floor without isolated base plate.

Note: IIT Madras will provide the dynamometer, certain sensors, actuators and other items indicated in Part B of this tender in good working condition which have to be integrated with the engine and the ECU by the supplier of the engine and the open ECU. The supplier of the engine and open ECU should ensure that all these after integration work satisfactorily. The items in Part B need not be provided by the supplier.

Part-B: Dynamometer, Sensors, Actuators and Other Items to be Provided by the IIT Madras

Note: The following items will be procured by the IIT Madras and supplied to the supplier of the engine and the open ECU.

1. The Dynamometer with Controller and Drive Shaft

A dynamometer suitable for the above engine with a dynamometer controller to control the speed, torque and mode of operation with the display of them. Also, a drive shaft with a safety-cover to connect the engine to the dynamometer.

2. The Engine Instrumentation and Other Accessories

1. Cylinder pressure sensor: One uncooled piezoelectric pressure sensor with adapter (to be fitted to the engine).
2. Charge amplifier.
3. Crank angle encoder: Capable to resolve for 0.1 crank angle degree (to be fitted to the engine).
4. Two piezo-resistive pressure sensors including adapters and mounting accessories for measurement of absolute pressure in the inlet and exhaust manifolds (to be fitted to the engine).
5. One fuel line pressure sensor with adapter and mounting accessories (to be fitted to the engine).
6. Active current clamp for acquisition of fuel injection and ignition signals.
7. Air flow meter along with air drum (to be fitted to the engine).
8. Fuel flow rate measuring system (to be fitted to the engine).
9. Lambda sensor in the exhaust line (to be fitted to the engine).
10. DAQ system for acquiring temperatures and pressures at various engine locations.

Specific Conditions:

1. The supplier should supply the engine and the open ECU as specified in Part A and integrate with the items indicated in Part B and provide the full system as a whole in proper operating condition.
2. The costs of individual items are to be given separately under Part A. Timeline of manufacturing, testing and installation should be provided in detail. The working of the entire engine set up should be demonstrated at the site before delivery.

3. **Past experience:** The supplier should have past experience in building such systems operating under above operating conditions. A list of customers to whom the supplier has supplied such systems with details such as item description, their value and supply date, customer's addresses, etc., must be provided. Also the committee has the discretion to vouch the capacity of the firm in such installation and arrive at a decision.
4. Method of manufacturing and assembly to be specified in the quote.
5. Performance guarantee of (all components including bolts, nuts, studs, etc.) uniformly one year minimum to be given.
6. Make and models of bought-out items (e.g., sensors and meters, etc.,) should be mentioned.
7. Any technical clarifications will be made on or before **5 PM of 13-09-2016**, in the office of **Dr. J. M. Mallikarjuna**, IC Engines Laboratory, Department of Mechanical Engineering. Phone: +91-044-9444931941, email: jmmallik@iitm.ac.in.

----- XXXXXXXX -----