

Procurement Technical Specification
of
HYDRAULIC AGGREGATES
(Pumps, Valves, Hydraulic Winch)
for
Hydraulic System of MML Project



BEML LTD

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1. INTRODUCTION:

BEML is developing special purpose High Mobility Vehicle on 8x8 wheeled platform for MML project. There is a requirement of Hydraulic Winch along with hydraulic power source tapping power from vehicle PTO.

This document explains the requirement technical specification for supply of hydraulic aggregates, hydraulic winch and Hydraulic piping for MML Hydraulic system.

2. OPERATING ENVIRONMENT

- a. Vehicle has to work mostly in desert kind of dusty conditions.
 - i. Ambient temperature range: -10°C to +45°C
 - ii. Oil temperature range: -10°C to +80°C.
- b. The oil specification was finalized based on the functional requirements, ambient temperature range, OEM supplier requirements and special requirements of Hydraulic Oil for Hydrostatic transmissions delivering Power. Use of SEROV HYVIS EE 46 Oil having the required viscosity is recommended.

3. TECHNICAL REQUIREMENTS

Sl No.	Description	Provisional Technical requirement
1	Pump	<ul style="list-style-type: none"> Type : Gear Pump Displacement : 50 cc/rev (1550 rpm, 70 l/min) Operating pressure : 200 bar Direction of rotation : Anticlockwise Vendor has to submit make, model and detailed technical specifications of pump to BEML along the proposal meeting the technical requirements mentioned in this document
2	Pump spline adaptor	<p>Connecting the drive from Vehicle PTO spline (dia 28x18x1.5, teeth 18, module 1.5) with Pump spline (Approx. 110 x 60 x 60),</p> <p>Hot rolled Case hardened steel Grade 2, Material supplied in normalised condition, with hardness</p>

Sl No.	Description	Provisional Technical requirement
		<p>values between 180 and 229 BHN, Post spline cutting heat treatment to be carried out to HRC 56-60</p> <p>On receipt of PO, Vendor has to submit drawing of component to BEML for approval. Based on approval from BEML, vendor has to manufacture the part and submit the part to BEML Quality for inspection. Component to be supplied to BEML based on clearance from BEML quality.</p>
3	Pump mounting bracket	<ul style="list-style-type: none"> Bracket for installation of Pump on PTO 120 x 90 x 200 (Approx) (Material Fe410) On receipt of PO, Vendor has to submit drawing of component to BEML for approval. Based on approval from BEML, vendor has to manufacture the part and submit the part to BEML Quality for inspection. Component to be supplied to BEML based on clearance from BEML quality
4	Winch Mounting bracket	<ul style="list-style-type: none"> Bracket for installation of Winch on Chassis Based on the winch configuration, 20 thick 800 x 600x 20 thk (Approx) (Material Fe540) On receipt of PO, Vendor has to submit drawing of component to BEML for approval. Based on approval from BEML, vendor has to manufacture the part and submit the part to BEML Quality for inspection. Component to be supplied to BEML based on clearance from BEML quality
4	Check valve	<ul style="list-style-type: none"> Max Operating Pressure 200 bar Max Flow rate 70 l/min Cracking Pressure 0.5 bar with spring. Vendor has to submit make, model and detailed technical specifications of valve to BEML along the proposal meeting the technical requirements mentioned in this document
6	Hydraulic winch	<ul style="list-style-type: none"> Positioning : Side mounted winch (Mounting on LH chassis frame) exclusively front winching operation only Free spooling : Pneumatic Third wrap warning Max Pulling force <ol style="list-style-type: none"> Bottom rope layer : 120 kN (Atleast) Top rope layer : 70 kN (Atleast) Rope length: 60 m (effective) + 7m

SI No.	Description	Provisional Technical requirement
		<ul style="list-style-type: none"> • Rope Dia : 16 mm / equivalent • Overall Winch weight (including rope): approx. 400 kg • Rope speed - bottom rope layer : 4 m/min (atleast) • Rope speed - top rope layer : 6 m/min (atleast) • Overall length < 850 mm • Overall height < 550 mm • Overall width < 500 mm • Hydraulically driven winch with suitable overload safety devices integrated as part of winch supply. • Winch should be provided with direction control valve with provision of electrical remote joystick and manual lever override. • Electrical control system & electric wire harness, wired remote joystick for operating the winch from 10 mtr radius. • Vehicle Electrical parameters : 24VDC, 200 Ah • Rope guide pulley 2 nos per equipment (To be finalized upon mutual consultation with BEML) • Fording Requirement as the winch is likely to be positioned below chassis level there is a possibility of complete winch to be immersed in water for 5 mins: (During Fording winch will not be operated) <ul style="list-style-type: none"> 1. Limit Switch/ Equivalent provided with suitable IP protection level 2. Height of Breather plug shall be increased by adding tube on breather plug, as it shall be above than water level 3. Oil Seals shall be double type to avoid water ingress • Vendor has to submit make, model and detailed technical specifications of winch to BEML along the proposal meeting the technical requirements mentioned in this document
7	Hydraulic routing kit	<ul style="list-style-type: none"> • Suction line <ul style="list-style-type: none"> 1.Hose : SAE100R1 2.Flow Dia : 1 inch (BSPP) (ISO 1179)

Sl No.	Description	Provisional Technical requirement
		3.Hose Length : 3 m (Provisional) 4.Qty : 1 no. (Provisional) • Delivery line (Pump to Control valve) 1.Hose : SAE100R2 2.Flow Dia : 1/2 inch (BSPP) (ISO 1179) 3.Hose Length : 3 m (Provisional) 4.Qty : 1 no. (Provisional) • Return line (Control valve to Tank) 1.Hose : SAE100R1 2.Flow Dia : 1 inch (BSPP) (ISO 1179) 3.Hose Length : 3 m (Provisional) 4.Qty : 1 no. (Provisional) • On receipt of PO, Vendor has to submit hydraulic routing schematic and details of hoses, seals, end fittings to BEML for approval. Based on approval from BEML, vendor can initiate procurement action.
8	Hydraulic Tank 100 ltrs (external to vehicle only for testing)	• Hydraulic tank capacity 100 ltrs • Tank wall thickness 3 mm thk approx. • Tank mounted suction strainer 100 microns - 1 no. • Tank mounted return line filter 20 microns - 1 no. • Tank mounted filler cum breather - 1 no. • Internal surface to be phosphated to 35-40 microns • External painting OG colour • Vendor has to submit make, model and detailed technical specifications of hydraulic tank components like strainer, filters, breather to BEML along the proposal meeting the technical requirements mentioned in this document. • On receipt of PO, Vendor has to submit drawing of component to BEML for approval. Based on approval from BEML, vendor has to manufacture the part and submit the part to BEML Quality for inspection. Component to be supplied to BEML based on clearance from BEML quality.
9	Hydraulic seals kit	• Hydraulic O-Ring Materials, Properties, and Sizes must conform to SAE J515 / Equivalent • As per requirement of Pump ports, Winch ports, tank ports, Oil operating Temperature, Max system Pressure, Vendor has to submit technical details of component to BEML for

Sl No.	Description	Provisional Technical requirement
		approval. Based on approval from BEML, vendor has to supply the seals kit.
10	Hydraulic adaptors kit	<ul style="list-style-type: none"> Forged end fittings meeting ISO 8434 / DIN 2353, 24° Compression Fittings / Equivalent to be incorporated. Surface coating for end fittings Zinc Plating with Blue Passivation (White) / Equivalent. Max operating pressure for end fittings to be 250 bar. As per requirement of Pump ports, Winch ports, tank ports, Oil operating Temperature, Max system Pressure, Vendor has to submit technical details of component to BEML for approval. Based on approval from BEML, vendor has to supply the adaptors.
12	Special Maintenance Tools kit	As per requirement Vendor has to submit technical details of component to BEML for approval. Based on approval from BEML, vendor has to supply the tools
13	Special Testing Equipment kit	As per requirement - a) Pressure gauge 400 bar - 1 no. , b) Minimesse hose-1 no., c) Minimesse test point M16x2-1 no, d) D shackles - 12 t, 4 nos. Vendor has to submit technical details of component to BEML for approval. Based on approval from BEML, vendor has to supply the tools
14	Hydraulic Spares Kit	Vendor has to submit list and supply recommended spares for 2 years. Vendor has to submit technical details of component to BEML for approval. Based on approval from BEML, vendor has to supply the spares

4. SCOPE OF WORK

On placement of order the firm has to sign a NDA for exchange of technical information. Scope of Work described in this document includes the following activities:

1. Selection of hydraulic aggregates based on technical requirements

2. Supply of hydraulic aggregates
3. Installation of Winch, Winch mounting bracket on Vehicle chassis
4. Installation of Hydraulic pump on Vehicle PTO
5. Hydraulic Routing for Pump, Winch on Vehicle Chassis

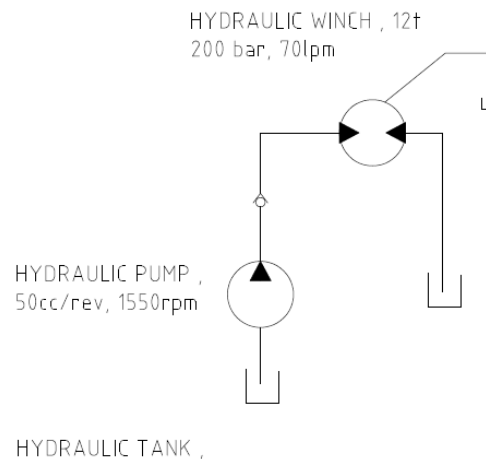
The firm has to submit a report on past hydraulic system turn key projects undertaken for other reputed suppliers. The report should consist of write up with system description, pictures of manufacturing, installation, welding facilities, details of trained man power, Pipe and Hose test facilities, etc.,

Firm shall bring the skilled manpower, tools and fixtures for effective completion of scope of work. During installation firm should have flexibility in adopting insitu changes for routing of Hydraulic lines.

5. SCOPE OF SUPPLY:

Assy Hydraulic kit are to be supplied to BEML P/N Kit 460 TW 02053 the quantities indicated below.

SI No.	Description	Qty
1	Pump	1
2	Pump spline adaptor	1
3	Pump mounting bracket	1
4	Winch Mounting bracket	1
4	Check valve	1
6	Hydraulic winch	1
7	Hydraulic routing kit	1 set
8	Hydraulic Tank 100 ltrs (external to vehicle only for testing)	1 set
9	Hydraulic seals kit	1 set
10	Hydraulic adaptors kit	1 set
12	Special Maintenance Tools kit	1 set
13	Special Testing Equipment kit	1 set
14	Hydraulic Spares Kit	1 set



SI No.	Description	Acceptance Criteria
	testing)	Air pressure test to be demonstrated to BEML Quality Hyd Tank : Air pressure test: 0.3 bar, 5 mins, no leakage to be observed.
9	Hydraulic seals kit	Vendor has to submit Quality certificate consisting of component model code, serial number, year of manufacture from OEM to BEML Quality during Factory inspection
10	Hydraulic adaptors kit	Vendor has to submit Quality certificate consisting of component model code, serial number, year of manufacture from OEM to BEML Quality during Factory inspection
12	Special Maintenance Tools kit	Vendor has to submit BEML approved tools list to BEML Quality for inspection, Physical inspection
13	Special Testing Equipment kit	Vendor has to submit BEML approved list to BEML Quality for inspection, Physical inspection
14	Hydraulic Spares Kit	Vendor has to submit BEML approved tools list to BEML Quality for inspection, Physical inspection

7. SERVICE INSTALLATION AND SUPPORT

1. Installation and commissioning at BEML Palakkad (5 days, 2 person)

- a) Firm should ensure effective installation of the hydraulic winch, pump and hydraulic system at BEML Palakkad factory premises. Suction Lines, return Lines from the Hyd Tank to Pumps. Delivery Lines, from the Pump to Winch. Installation of Pump, Hose clamps, etc
- b) Installation of clamps and blocks firmly holding the hoses so that the pipe/ hose installation is rigid for any jerks / vibration from the system.

2. Internal testing at BEML Palakkad (5 days, 2 person)

3. BEML will perform the operational performance tests of the hydraulic system on the equipment at BEML premises, during which the firm shall be responsible for any malfunctioning/defect of supplied components identified during the performance tests.

4. For any leakages for defects found must be rectified / repaired by the Firm at free of cost.

5. Final sign off for the installation will happen upon satisfactory functioning of the vehicle hydraulic system as defined in the scope of work.

6. Service completion report from BEML Quality based on satisfactory integration and completion of internal trials at BEML Palakkad.
7. Internal testing at Customer place Pune (5 days, 2 person)
8. Service completion report from BEML Quality based on satisfactory integration and completion of internal trials at Customer place.

8. WARRANTY

Notwithstanding inspection & acceptance by BEML of the hardware under this contract or any clause concerning the conclusiveness thereof, OEM shall provide warranty for a period of 36 months after hardware delivery, that hardware is free from defects/failures due to workmanship, material or manufacturing non-conformance. The OEM shall be responsible for any defect or failure of supplied aggregates, special tools, test and diagnostic equipment, maintenance and unit exchange spares due to defective design, material or workmanship.

The repair and/or replacement of failed components and installation of repaired/replaced components shall be taken by the OEM on his own charge at the Site (BEML' works, India). The OEM shall bear all duties and taxes, freight charges and all other expenses involved in collection of defective components and equipment from the Site, and transportation to the manufacturer's works in India or abroad and its return to Site after repairs. Further, OEM should do any design modification required to any components or equipment as a consequence of failure analysis and modification shall be carried out free of charge. The OEM shall carry out all replacement and repairs under the warranty promptly and satisfactorily on notification of the defect by BEML immediately.

9. DELIVERY SCHEDULE

- Milestone 1 :Design , Manufacture / Procurement approval: Vendor has to submit drawings, technical details for BEML approval: 2 weeks from date of PO.
- Milestone 2 :Factory Acceptance Test at firm premises followed by supply to BEML premises: 2 months from date of PO
- Milestone 3 : Installation, commissioning and internal trials on First Vehicle: Based on vehicle readiness from BEML