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1. PURPOSE

The purpose of this document is to define the services needed from a contractor to rebuild engines to OEM specifications for ERI – BMS Yellow Plant.

2. BRIEF OVERVIEW OF OUR BUSINESS

Eskom Rotek Industries` (ERI) Bulk Material Services (BMS) division provide amongst other services mobile (yellow) plant equipment for bulk materials handling (ash and coal) to ERI BMS division in various power stations across the country mainly fossil power station. The fossil power stations are concentrated in Mpumalanga, Limpopo and Gauteng. The mobile plant equipment is used to build and maintain coal stockyard, ash dams and dumps. In order to provide high standard of service a well maintained and reliable mobile plant is essential.

ERI has invested on diverse makes and types of mobile plant equipment. The mobile plant comprises of Articulated Dump Trucks (ADTs), Motor Graders (MGs), Bulldozers (BDs), Front End Loaders (FELs), Excavators (EXs), Tractor Loader Backhoes (TLBs), Smooth Drum Rollers (SDRs), Tipper Trucks (TPs) and Water Tankers (WTs) i.e., brand makes such as Komatsu, Caterpillar, Doosan, Volvo, Man, Iveco, Nissan, Mercedes Benz, Hitachi, Bell and JCB.

Table 1 : ERI Mobile Plant - Possible Fleet Engine Overhaul

Make	Plant Type	Model	QTY	Engine Make	Engine Model
BELL	ADT	B30D	10	Mercedes-Benz	OM906LA
BELL	MG	770D	2	John Deere	4045HT
		670G	4	John Deere	PowerTech PSS 9.0L
CAT	ADT	730	1	Caterpillar	C11 with ACERT
		730C	6	Caterpillar	C13
		730C2	1	Caterpillar	C13 with ACERT
CAT	BD	D8R	15	Caterpillar	3406C
CAT	FEL	966H	3	Caterpillar	C11 with ACERT
CAT	MG	140H	10	Caterpillar	3176C DITA ATAAC VHP
CAT	SDR	CS533	2	Caterpillar	3054C
CAT	TLB	422E	2	Caterpillar	3054C
VOLVO	TLB	SDLG	2	Weichai	WP4G95E2 21
KOMATSU	ADT	HM300	1	Komatsu	SAA6D125 E-3

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KOMATSU	BD	D155AX-6	4	Komatsu	SAA6D140 E-5
		D155AX-5	1	Komatsu	SA6D140E-2
Mercedes	WT	Axor 2628	5	Mercedes -Benz	OM 906 LA EURO 3
Iveco	TP	Trakker 380	2	Iveco	Cursor 13
MAN	TP	TGA33-360	4	MAN	D2866 LF37
Kato	EX	HD2045BM H	1	Mitsubishi	C 6D24-TLE2A
HITACHI	FEL	ZW310	5	Mercedes -Benz	OM460LA
JCB	SDR	VM115	5	Perkins	JBC444TA
HYUNDAI	FEL	HL770-9s	5	Cummins	QSL

3. DESCRIPTION OF SERVICES

The services required are for provision on an as and when basis of a qualified and competent service provider with a minimum of five years' experience in the repair and rebuild of engines (See Table 1 for types of equipment and pricing) with genuine OEM parts to OEM standards.

4. SCOPE OF WORK

The Service provider is responsible for:

- 4.1.1 Collection and return of the engine from ERI workshop at Rosherville JHB.
- 4.1.2 The engine overhaul is to be undertaken at the supplier's facility and not a 3rd party's facility unless approved by an ERI representative prior to commencement of the work.
- 4.1.3 The supplier will strip the component down, clean and lay bare all parts for inspection by an ERI representative, if so requested.
- 4.1.4 The supplier will supply ERI with a quote for the rebuilding of the engine with new OEM parts and labour with travel included. Where parts are sourced from a supplier other than the OEM or agent this should be indicated on the quote.
- 4.1.5 No work will commence without ERI approval by an Area Manager or more senior representative on email.
- 4.1.6 In carrying out the overhaul the supplier will record all specifications of parts that are deemed reusable against the manufacturer's specifications. These parts should be clearly marked in the quote as reusable.
- 4.1.7 The supplier will supply all specialised tools, equipment and requisite software for the rebuild.
- 4.1.8 ERI reserves the right to inspect the works at any stage of the rebuild process for as many times as deemed necessary.
- 4.1.9 On completion of the rebuild the engine will be Dynamometer load tested to confirm that the engine performs to the original OEM parameters. Load testing duration will be no

less than four continuous hours in duration and will be run at 100% load for 5% of the time.

4.1.10 Supply load test results which need to be recorded and included in the final report. It is preferable that the load test results are system produced.

4.1.11 Issue a technical report detailing the cause of failure, rebuild overview with key specifications against OEM parameters and load test data. Photographic evidence must support failure text.

5. MANDATORY PARTS REPLACEMENT

The service provider shall replace the following parts with new OEM parts regardless of the condition of the existing parts

- a) Camshaft bearings and thrust washers
- b) Connecting rod bearings
- c) All seals, gaskets, O rings, Welsh plugs, manifold sealing rings etc.
- d) Crankshaft thrust washers
- e) Gear train bearings and bushings
- f) Main bearings and thrust washers
- g) Small end bearings
- h) Piston rings, piston pins and circlips, liners
- i) Oil pump
- j) Fuel, oil and air filters
- k) Water pump, thermostat and water associated hoses
- l) Fuel pump elements, transfer pump and injector nozzles.

6. ALL OTHER PARTS

6.1.1 All other parts will on inspection, be either replaced, repaired or rebuilt to OEM standards or if still within OEM standards be reused.

7. ENGINE REPAIR REPORT

Information obtained whilst repairing the machine shall be recorded by the Contractor. A copy shall be returned to the Purchaser's Technical Planning Department. Records of repairs shall be kept for at least 2 years whereupon it will be sent to ERI should the Contractor decide not to keep the records any longer.

Payment shall not be made for the repair if these reports are not submitted.

Test to be conducted:

- 7.1 Dyno test engine for a minimum period of four hours
- 7.2 Carry out crack test on cylinder head
- 7.3 Carry out crank test on the block and crankshaft

The crank shaft must be crank detected using a magnetic crack detection method.

The Dyno test report must include:

- 7.4. OEM performance specifications
- 7.5. Full engine power achieved
- 7.6. Full engine torque achieved
- 7.7. Speed of engine in relation to power and torque
- 7.8. Engine oil pressure at high and low idle
- 7.9. Engine oil temperature
- 7.10. Turbo boost pressure and Engine coolant temperature. These Tests must be conducted according to the OEM specifications.

The Dyno test report must be submitted after testing and before commissioning.

Other reports:

- 7.11. Engine defect report must be submitted
- 7.12. List of all spares used during repairs

8. COMMISSIONING

- 8.1.1** ERI shall notify the service provider when the engine is ready for commissioning and startup.
- 8.1.2** The service provider will within 24 hours have a representative present to approve the startup and installation.
- 8.1.3** The installation could be anywhere within a 350 Km radius of Johannesburg or in Johannesburg itself. There will be no charge for commissioning.
- 8.1.4** In the event that the service provider is unable to attend commissioning then he is entitled to ask for photographic evidence of various key points of the installation. Once supplied he will authorize by Email that ERI are able to continue with startup on their behalf and in their absence. Such an event as described herein will not negate any warranty responsibility of the service provider.

9. WARRANTY

- 9.1.1** The service provider will warrant the full scope of the repair including OEM parts, labour and travel for a period of 5000 hours or twelve months, whichever comes first.
- 9.1.2** Should the engine be problematic within the warranty period then the provider undertakes to have a technician on the jobsite within 24 hours to establish whether the problem is warranty related or not. There will be no charge for warranty call-outs.
- 9.1.3** In the event of warranty work being carried out by the service provider there will be no pro – rata contribution from ERI. All costs to reinstate the engine to OEM specs will be for the provider's account.

10. QUALITY

- 10.1.1** Work shall be carried out in accordance with the relevant OEM approved specifications. Quality checks/ QCPs shall be compiled by the provider based on the scope of work approved prior to work being executed and submitted upon completion. Hold and Witness points must be agreed to by the provider and ERI representatives upon compilation of QCP and these shall not be by-passed under any circumstances without consent of an authorized ERI person.
- 10.1.2** The successful service provider will be ISO 9001 accredited.

11. INSURANCE

- 11.1.1** The service provider should have Professional Indemnity (PI) or other insurance to the value of two million rand to cover the cost of a claim against themselves in the event of an engine loss by ERI through poor workmanship.

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