

IT SPECIFICATIONS FOR MAJOR OVERHAULING OF C-9 ENGINES ALONGWITH ZF GEAR BOX
FRB 160 – OSRON 23

1.	Ship's Name	FRB-160
2.	Parent Equipment	<ul style="list-style-type: none"> ➤ Stbd & Port C-9 Caterpillar marine engines (USA) (Serial numbers Stbd X9Y01059 & Port X9Y01058) ➤ ZF Marine gear boxes
3.	Sub Equipment	As per serial number 9 mention below
4.	Assembly Component	As per serial number 9 mention below
5.	Make & Model	<ul style="list-style-type: none"> ➤ Caterpillar C 9 Marine Engine (565 HP), USA ➤ 305 ZF Marine gear box, Germany
6.	Quantity	<ul style="list-style-type: none"> ➤ 02 x Main Engines (Stbd and Port) ➤ 02 x ZF gear boxes (Stbd and Port)
7.	Justification i.e PMS/ Failure/ FWT etc	<ul style="list-style-type: none"> ➤ Performance of Engines and gear boxes degraded due FWT ➤ Boat failed to achieve optimum performance upto 2500 ERPMs (35 Knots) speed. ➤ MoH of both engines and gear boxes alongwith electronic control system complete required for satisfactory operation.
8.	Work Required/ Defect	MoH of both engines and gear boxes alongwith electronic control system complete required for satisfactory operation upto 2500ERPMs at full load (upto 35 knots speed)
9.	Detail Scope of Work	<p><u>MAIN ENGINES</u></p> <p>a. Both main engine performance degraded. Engine alongwith all accessories, fittings, piping, valves etc are to be inspected and replaced. Accordingly, engines performance is to be restored to .95% of the original through repair/ major overhauling as considered appropriate with the consent of PMSA.</p> <p>b. <u>Replacement of Components</u> Replace the following components during the major overhaul:</p> <ul style="list-style-type: none"> ➤ Camshaft bearings. ➤ Connecting rod bearings. ➤ Crankshaft seals. ➤ Crankshaft thrust washers. ➤ Electronic unit injectors. ➤ Gear train bushings. ➤ Gear train bearings. ➤ Main bearings. ➤ Piston rings. ➤ After cooler core. ➤ Engine electronic control system. <p>c. <u>Inspection, Reconditioning or Exchanging of Components</u> Inspect the following components according to the instructions in light of caterpillar reusability publications/ manuals. Recondition the worn components or exchange the components (if necessary):</p> <ul style="list-style-type: none"> ➤ Camshaft followers. ➤ Camshaft thrust washers. ➤ Connecting rod. ➤ Crankshaft vibration damper. ➤ Cylinder head assembly. ➤ Cylinder liners. ➤ Engine mounts. ➤ Scavenge oil pump. ➤ Engine wiring harness. ➤ Exhaust manifold seals. ➤ Exhaust manifold seals. ➤ Exhaust manifold bellows.

- Fuel pressure regulating valves.
- Fuel priming pump.
- Fuel transfer pump.
- Inlet manifold gasket.
- Inlet manifold seals.
- Oil cooler core.
- Oil pump.
- Pistons.
- Piston pins.
- Pre-lube pump.
- Pushrods.
- Rocker arms.
- Spacer plate.
- Software update.
- Turbocharger.
- Starter motor.
- Alternator.
- Speed sensors.
- All sensors.
- Injector harness.
- Main and extension harness.
- Power cable.
- Services of protection module, start panel.
- ECM.

d. Inspection of Components Inspect the following components according to the instructions in light of Caterpillar reusability publications:

- Camshaft.
- Crankshaft.
- Driven equipment (alignment).
- Engine cylinder block.
- Engine control module.
- Flywheel.
- Front gear train (gears).
- Oil suction screen.
- Rear gear train.
- Sea water strainer.

- Inspect the camshaft for damage to the journals and the lobes.
- Inspect the crankshaft for any of the following conditions:
 - Deflection.
 - Damage to the journals.
 - Bearing material that has seized to the journals.

 - Check the journal taper and the profile of the crankshaft journals.
- Check these components by interpreting the wear patterns on the following components:
 - Rod bearing.
 - Main bearings.

Note: If the crankshaft or the camshaft is removed for any reason, use the magnetic particle inspection process to the check for cracks.

- Replace the crankshaft vibration damper if any of the following conditions occur:

- Engine failure due to a broken crankshaft.
- Excessive wear of the front bearing for the crankshaft.
- Excessive wear of the gear train that is not caused by a lack of lubrication.

➤ Inspection the gears of the gear train and inspect the gear train bushings for the following conditions:

- Worn gear teeth.
- Unusual fit.
- Unusual wear.

➤ In addition to the inspection of components, inspect the alignment of the driven equipment. See the application and installation guide for the engine or see the literature that is provided by the OEM of the driven equipment.

e. Cleaning of Components Clean the oil suction screen. Also, remove side covers in order to clean the oil sump. For instructions on removal and installation of components, see the service manual, "Disassembly and Assembly module."

f. 03 x gel batteries 12 volt 180 AH. Capacity tested at 97%.

g. All flexible piping including sea water, fresh water and hydraulic related to engine systems are to be inspected, tested and replaced/ repaired (if necessary).

h. Engines control/ electrical system including wiring, panels, harness, protection modules, displays, batteries, ACR switches, all sensors etc, are to inspected, repaired/ replaced and calibrated/ STW as per OEM standards.

GEAR BOX

a. 02 x ZF marine gear boxes associated with C-9 caterpillar engines is to be overhauled for satisfactory operation. OEM certified spare/ parts are to be used/ arranged by the firm.

b. All pressure and temperature sensors inspection/ replacement.

c. Fwd/ Aft engagement solenoid inspection/ replacement.

d. Inspection and replacement (if required) of following accessories/ parts:

- PTO covers.
- Oil pump.
- Output shaft.
- Strainer/ oil filter.
- Drain plugs.
- Rear half housing.
- Front half housing.
- Oil dipstick.
- Breather.
- Oil cooler.
- Filter plug.
- Identification plate.
- Control valve.
- Valve control lever.
- 1/8 NPTF pressure connector.
- Oil filter.

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10.	Technical Specs	Technical specs for caterpillar C-9 marine engine are appended below:																																																																																																																																																																																																																																								
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50.	3587876	Sleeve space	11
51.	2444500	Spring	9
BREATHER GP (305-2909)			
52.	2400041	Breather As	1
53.	9F4446	Ring	1
54.	2132410	Gasket	1
GEAR GP FRONT (205-1321)			
55.	1136069	Plate	1
56.	1154219	Plate	1
57.	2132410	Gasket	1
BELT TENSIONER GP (245-4596)			
58.	2792589	Pulley As	1
59.	2016699	Tightner	1
TURBOCHARGER GP (267-8925)			
60.	2719416	Cartridge GP	1
61.	3110827	Seal O ring	1
62.	4319388	Clamp	2
63.	7M7273	Gasket	1
64.	3E8017	Locknut	4
65.	5417108	Hose BK	57
PUMP GP OIL (195-8098)			
66.	3318906	Pump GP	1
LINE GP ENGINE OIL (199-8098)			
67.	2089793	Hose As	1
68.	3K0360	Seal	1
69.	6V8398	Seal O ring	1
COOLER GP MARINE XMSN (197-5989)			
70.	2026706	Hose	1
71.	8T6703	Clamp	4
72.	2003916	Core	1
73.	2H3931	Seal	4
74.	6L2280	Rod	2
PUMP GP FUEL INJECTON (267-9717)			
75.	5734231	Injector GP	6
76.	2359651	Bolt socket	12
WIRING GP UNIT INJECTOR (306-8280)			
77.	4190841	Harness As	1
PUMP GP UNIT INJECTOR HYDRAULIC (416-2712)			
78.	3190678	Pump GP	1
79.	2147568	Seal O Ring	1
80.	2287090	Seal O Ring	1
81.	2275904	Seal O Ring	1
82.	2385082	Seal O Ring	1
83.	2385081	Seal O Ring	1
84.	2147568	Seal O Ring	1
85.	2287090	Seal O Ring	1
PUMP GP FUEL PRIMING (154-9283)			
86.	1375541	Pump As	1
87.	1P0436	Gasket	1
COOLER GP FUEL (197-6006)			
88.	5P4868	Clamp	1
89.	2094573	Clamp T Bolt	2
90.	4640509	Seal O Ring	2
91.	3718122	CM hose Bulk	8
FILTER GP FUEL (245-4782)			
92.	2S3992	Spring	1
93.	2147566	Seal O ring	1
94.	6N6250	Gasket	1
95.	2293218	Valve As	1
96.	1470182	Seal O Ring	2
AIR CLEANER GP (223-7456)			

97.	5P4868	Clamp	1
98.	1537950	Hose As	1
99.	5p0599	Clamp	2
100.	1922153	Hose air inlet	1
101.	2237453	Hose	1
MANIFOLD GP CHARGING (206-2650)			
102.	1922133	Gasket Exhaust	1
ALTERNATOR GP CHARGING (206-2650)			
103.	2380364	Pulley ALT	1
104.	2667226	Alternator G	1
MOTOR GP STARTING ELECTRICAL (199-6919)			
105.	2006992	Motor GP ELE	1
KIT GASKET			
106.	4893312	Kit Gasket	1
107.	4893314	Kit Gasket	1
108.	4893316	Kit Gasket	1
109.	4893317	Kit Gasket	1
110.	2974841	Kit Gasket	6
111.	4805751	Kit Gasket	1
112.	4893319	Kit Gasket	1
CONSUMABLE			
113.	1R1808	Filter AS-LU	1
114.	1R0750	Filter As	1
115.	1968518	Element	1
116.	2447913	Element As C	1
PUMP GP WATER (209-4600)			
117.	2096400		1
LINE GP WATER (306-3019)			
118.	2S3440	Clamp	3
119.	8T4984	Clamp	4
120.	1591503	Clamp	4
121.	1922156	Hose	1
122.	1949567	Hose	1
123.	2058846	Hose	1
124.	3718094	CM Hose Bulk	20
125.	8T4983	Clamp	1
126.	8T7000	Seal face	1
127.	5417118	Hose BK	12
128.	3J7354	Seal O ring	2
129.	4J5477	Seal O ring	3
130.	2385081	Seal O ring	3
131.	7J9108	Seal	2
HEAT EXCHANGER GP SEA WATER (197-5988)			
132.	4184162	Regulator TE	1
133.	1255274	CAP	1
134.	0990187	O Ring	2
135.	2D8009	Seal O ring	4
136.	2H3931	Seal	1
137.	3S9643	Seal	1
138.	5B4399	Ring	1
139.	6L2280	Rod	1
AFTER COOLER GP RAW WATER (197-5991)			
140.	2093339	Seal	1
141.	4p3871	Gasket	2
142.	1949570	Gasket	2
LINE GP AUXILIARY SEA WATER (197-6009)			
143.	8T6703	Clamp	2
144.	1731819	Hose sea water	1
145.	4F8824	Ring	2
PUMP GP AUXILIARY SEA WATER (197-5993)			
146.	6L2280	Rod	1
147.	1359819	Seal	1

		148. 8C3080	Seal O Ring	2
		149. 1131110	CAM	1
		150. 1149088	Seal Pump	1
		151. 1750225	Ring retain	1
		152. 3665761	Shaft water pump	1
		153. 4P5926	Key stainless	1
		154. 5G5078	Ring	1
		155. 2D6392	Seal O Ring	1
		156. 7E0321	Impeller	1
		157. 7E0328	Plate As	1
		158. 8H4320	Bearing	2
		159. 8T2944	Seal O ring	1
		160. 3704053	Slinger	1
		161. 3704056	Spacer	1
11.	Eligibilities	Any local/ international firm having experience of undertaking repair/ maintenance and overhauling of marine version machinery/ equipment.		
12.	EDC	30 days.		
13.	Warranty	One year/ 1000 running hours of both engines alongwith associated system/ equipment whichever is earlier.		
14.	Acceptance Criteria	<ul style="list-style-type: none"> ➤ Use of USA origin or equivalent spares/ accessories (including electronic control system) for caterpillar C-9 marine engines is to be ensured by contracted firm. ➤ Inspection of spares arranged by the firm by SS/ Tech Dte staff. ➤ Successful completion of HATs/ SATs as per OEM defined parameters and subject to achieving of > 30 knots of FRB with both main engines with 90% - 100% designed RPMs. ➤ Test certificates or relevant documents for equipment/ accessories i.e injectors, fuel pumps etc are to be rendered by contracted firm in light of OEM standards. 		
15.	Any other relevant information	<ul style="list-style-type: none"> ➤ All consumables are to be arranged by the contractor. ➤ Engines or any other equipment removal and reinstallation will be the responsibility of contractor. ➤ Each and every equipment/ system/ section/ fitting including control, mechanical, electronic, electrical, piping, valves, pumps and display systems are to be checked and restored as per OEM technical manual. ➤ All replaced/ unserviceable old parts are to be returned to PMSA. ➤ OEM standard parts & tools are to be used alongwith documentary evidence. 		

1 H

Note: 100% Payment after completion by CNA

Director General

Pakistan Maritime Security Agency

Plot No 34-A, Dockyard Road

KARACHI

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INVITATION TO TENDER GENERAL INSTRUCTIONS

1. CONDITIONS GOVERNING CONTRACT:

All Procurement / Repairs / Maintenance Contract, Local Purchase Order (LPO) and work ordered made as a result of this IT shall mean the agreement entered into between the parties that is buyer and the supplier will be in accordance with the PPRA rules 2004 or any amendment issued from time to time. Therefore all open tender inquiry will be uploaded on PPRA Website and publish on print media as the case may be.

2. SUBMISSION OF TENDER:

Firms shall submit their offers in two separate envelopes clearly marked as "**Commercial Offer**" and "**Technical Offer**" for open tender. Both envelopes shall be properly sealed bearing the signature of the bidder. Thereafter both these envelopes shall be placed in one bigger envelope. This envelope should bear the address of the D (P&CC).

- a. **TECHNICAL OFFER:** Should contain all relevant details and specifications as per the IT specifications. Literature / Brochure or any other relevant technical details may also be included in it. Technical offer should not contain the price. Indication of price in technical offer may render it null and void. The word "Technical Offer" should be clearly mentioned alongwith the tender No and date on the envelope containing the technical offer.
 - b. **COMMERCIAL OFFER:** The price be quoted in figures as well as in words alongwith essential Literature / Brochures. The word "Commercial Offer", tender number should be clearly mentioned on the envelope. Taxes, duties, freight / transportation, insurance charges etc if any are to be indicated separately.
 - c. **BID SECURITY:** All registered firms are exempted from provision of bid security upto Rs.500,000/- and unregistered firms have to provide bid security equals to 02% for bids amounting upto Rs.500,000/- in the shape of Pay Order in favor of "IT Sale Account DG PMSA". Furthermore, firms are required to deposit bid security not exceeding 05% of the bid price for bid value amounting more than Rs.500,000/-. Moreover, following guidelines will be followed:
 - i. 2% from registered firms.
 - ii. 5% from un-registered firms.
 - d. Total price of the items quoted against the tender is to be clearly mentioned. It should also contain a **pay order 2% or 5% in the shape of pay order of the offered value** as earnest money. Cross cheque or cash is not acceptable in this case. The offer received without earnest money will be rejected.
 - e. **SPECIAL INSTRUCTIONS:** Tender documents and its conditions may please be read point to point and understood properly before quoting. All tender conditions should be responded properly. In case of any deviation due to non-acceptance of tender conditions, the same should be highlighted alongwith changed offer / conditions. Tender may however be liable to be rejected.
-

PREPARATION OF QUOTATION

Please prepare quotation in this format In case of GST @ 18% or SST @ 13%:

<u>S.NO</u>	<u>Description</u>	<u>Unit Price</u>	<u>Qty</u>	<u>Total</u>	<u>GST @ 18% or SST @ 13%.</u>	<u>T/Price</u>

Please prepare quotation in this format In case of without GST or SST:

<u>S.NO</u>	<u>Description</u>	<u>Unit Price</u>	<u>Qty</u>	<u>Total</u>	<u>T/Price</u>

Without this format quotation will not be accepted.

3. DATE AND TIME FOR RECEIPT OF TENDER:

Tender must be dropped in tender Box placed at main gate. HQ PMSA will not accept any excuse of delay occurring due to whatsoever reason. Tender received after the time indicated in IT will not be entertained. The tender opening time, however, fall on next working day in case of closed / forced holiday or any other unforeseen event. Only authorized representatives of firm will be allowed to attend tender opening. **The tender received through Fax, E-Mail will not be acceptable.**

4. TENDER OPENING:

Technical offer will be opened as per scope of work on the date and time mentioned in the tender. Commercial offer shall be retained with technical officer. It will be opened at a later stage. All technical offers will be scrutinized by a Technical Scrutiny Report (TSR) committee nominated by HQ PMSA. The offers which are not as per the IT specification will be rejected. The firms recommended by TSR Committee will be allowed to attend the commercial opening for which date and time will be intimated separately.

5. VALIDITY OFFER:

The validity period of quotations must be indicated and should invariably be for 90 days extendable to 30 days from the date of opening of Technical offer.

6. QUOTING OF RATES:

Unit price of the item, GST/ SST or any other Govt tax and Total price all these should be indicated separately in Pak Rupees in a very clear manner as follows:

S No	Description	Qty	U/Price	GST/SST/Taxes	Total Price
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7. ATL/ GST/ SST/ INCOME TAX NUMBER:

Only registered suppliers, who are on Active Taxpayers List (ATL) of FBR, are eligible to supply goods/ services to Government department. GST/SST and income tax number be clearly indicated on the quotations and all other relevant documents.

8. RETURN OF EARNEST MONEY:

a. Earnest money to the unsuccessful bidders will be returned **one week** after commercial opening date.

b. Earnest money to the firm who has won the purchase order/ work order & contract will be returned on submission of Bank Guarantee as per the contract.

9. TENDER FEE:

Each technical offer must be accompanied with Cash of **Rs.5,000/-** nonrefundable as tender fee (In favour of IT Sale Account DG PMSA) (**Separate Quotations required for each IT Specification**).

10. INSPECTION AUTHORITY:

Joint inspection of stores provided and work done will be carried out by committee appointed by HQ PMSA or as per the contract.

11. CONDITION OF STORES:

Spares, Stores, items and work done will be accepted on Warranty / Guarantee of the firm on Form DPL-15.

12. DOCUMENTS REQUIRED:

Following documents are required to be submitted along with the quotes where applicable:

- a. OEM / Authorized Dealer/Agent Certificate along with OEM Dealership Evidence as applicable.
- b. The Supplier is to provide OEM conformance certificate. In case of Fax or e-mail hard copy of conformance certificate must follow. On receipt of this PMSA HQ may approach the OEM to confirm the veracity of the documents submitted. Companies / firms rendering false OEM conformance certificate will be penalized as per rules in vogue.

13. SECURITY DEPOSIT / BANK GUARANTEE:

To ensure timely and correct supply of stores the firm will furnish an unconditional Bank Guarantee (BG) from a schedule bank for an amount of **10%** of the contract value (excluding taxes, duties / freight handling charges on a stamp paper of the value of (Rs.100/00) as per prescribed format in the shape of Bank Guarantee. Format of Bank Guarantee is at Annex „B“. Furthermore, it is imperative to mention that deposit of PBG for HMI and Core Exchange cases will be equal to the total value of engine.

14. CURRENT BANK STATEMENT:

For all contracts of Rs 1,000,000/- or more the firm is required to submit current bank statement of the firm.

15. INTEGRITY PACT:

Procurement exceeding Rs 1.00 M shall be subject to an integrity pact, between the Buyer and the Suppliers or Contractors.

16. CORRESPONDENCE:

All correspondence will be addressed to the Buyer. Correspondence with regard to payment or issue of delivery receipt may be addressed to D (P & CC) PMSA Karachi.

17. PRE SHIPMENT INSPECTION:

PMSA may send a team of Officers for the inspection of Major Equipment and Machinery items at OEM premises for inspection before dispatch if required at the Supplier's cost and arrangement.

18. AMENDMENT IN CONTRACT:

Contract may be amended / modified to include fresh clause modify the existing clauses with the mutual agreements by the Supplier and the Buyer such modifications shall form an integral part of the contract.

19. DISCREPANCY:

The Buyer will render a discrepancy report to all concerned within 45 days after receipt of stores for discrepancies found in the consignment. The quantities found short are to be made good by the Supplier free of cost.

20. PRICE VARIATION:

Price offered against IT are to be firm and final.

21. LIQUIDATED DAMAGES (LD):

Liquidated Damages upto 2% per month are liable to be imposed on the Suppliers by the Buyer in accordance with PPRA rules, if the stores supplied after the expiry of the delivery date without any valid reason. Total value of the LD shall not exceed 10% of the contract value.

22. RISK PURCHASE:

In the event of failure on the part of Supplier to comply with the contractual obligations the contract will be cancelled at the Risk and Expense of the Supplier in accordance with PPRA rules.

23. PENALTY:

In case of wrong supply of the item by the Supplier, a penalty of 10% of the contract value may be imposed by this HQ PMSA apart from any other penalties.

24. ALL RIGHTS RESERVED:

HQ PMSA may reject all bids or proposals at any time prior to the acceptance of a bid or proposal as per PPRA Rule 33(I).

25. PAYMENT:

The payment will be released through Controller of Naval Accounts (CNA) Karachi in Pak Rupees after completion of delivery / work.

26. **PARTIAL ORDER.** All participating firms are to comply acceptance of partial order. Partial supply as per lowest rates will be awarded to the lowest bidder.

27. **DISQUALIFICATION:** Offers are liable to be rejected if:-

- a. Received after time and date specified in the IT.
- b. Offers are found conditional or incomplete in any respect.

- c. There is any deviation from the General / Special / Technical Instructions contained in this tender.
- d. Taxes and duties, Freight, Transportation and Insurance charges not indicated separately as per required price breakdown mentioned above.
- e. Pay Order with Commercial Offer and Cash with Technical Offer is not received.
- f. Multiple rates quoted against one item.
- g. Manufacture's relevant Brochures and technical details on major equipment, assemblies are not attached in support of specification.
- h. Offers (Technical / Commercial) are containing amendments / corrections / overwriting etc.
- j. National Tax No (NTN) and GST/SST No are not indicated on technical and commercial offer.
- k. If validity of offer is not quoted as required in IT or made subject to confirmation late.