Contract|अनुबंध

Contract No|अनुबंध क्रमांक: GEMC-511687761871746
Generated Date|अनुबंध तिथि: 01-Sep-2023
Bid/RA/PBP No.|बोली/आरए/पीबीपी संख्या: GEM/2023/B/2955826

Organisation Details|संगठन विवरण

Type|प्ररूप :	Central PSU
Ministry|मंत्रालय :	Ministry of Coal
Department|विभाग :	MAHANADI COALFIELDS LIMITED
Organisation Name|संगठन का नाम :	MAHANADI COALFIELDS LIMITED
Office Zone|कार्यालय क्षेत्र:	MAHANADI COALFIELDS LIMITED

Buyer Details|खरीदार विवरण

Designation|पद :	R N PATEL MGR MM
Contact No.|संपर्क नंबर :	0663-2542461-5313
Email ID|ईमेल आईडी :	mmpur1a.mcl@nic.in
GSTIN|जीएसटीआईएन :	21AABCM5188P1Z3
Address|पता :	MAHANADI COALFIELDS LIMITED, PO - JAGRUTI VIHAR, BURLA, SAMBALPUR, ODISHA-768020, India

Financial Approval Detail|वित्तीय स्वीकृति विवरण

IFD Concurrence|आईएफडी सहमति:	Yes
Designation of Administrative Approval| प्रशासनिक अनुमोदन का पदनाम:	GM (MM)/HoD
Designation of Financial Approval| वित्तीय अनुमोदन का पदनाम :	Sr. Manager (F)

Paying Authority Details|भुगतान प्राधिकरण विवरण

Role:	PAO
Payment Mode| भुगतान का तरीका:	Internet Banking
Designation|पद :	DEEPAK KUMAR BURMA MGR FIN
Email ID|ईमेल आईडी :	dkburma@coalindia.in
GSTIN|जीएसटीआईएन :	21AABCM5188P1Z3
Address|पता:	MAHANADI COALFIELDS LIMITED, AT /PO - JAGRUTI VIHAR, BURLA, SAMBALPUR, ODISHA-768020, India

Seller Details|विक्रेता विवरण

GeM Seller ID|जेम विक्रेता आईडी :	B050190001006855
Company Name|कंपनी का नाम :	PAB ENGINEERING WORKS PRIVATE LIMITED
Contact No.|संपर्क नंबर :	09926809741
Email ID|ईमेल आईडी :	marketingpab@gmail.com
Address|पता :	OFFICE NO. 602, 6TH FLOOR,THE CHAMBERS,1865, RAJDANGA MAIN ROAD,RB CONNECTOR, Kolkata, WEST BENGAL-700107, -
MSME Registration number|एमएसएमई पंजीकरण संख्या :	UDYAM-WB-10-0004541
MSE Social Category|एमएसई सामाजिक श्रेणी :	General
MSE Gender|एमएसई लिंग श्रेणी :	Male
GSTIN|जीएसटीआईएन:	19AAFCP2314Q2Z0

*GST / Tax invoice to be raised in the name of|जिसके नाम के पक्ष में GST/TAX इनवॉइस पेश किया जाएगा - Consignee

Delivery Instructions|वितरण निर्देश : NA

Product Details|उत्पाद विवरण

#	Item Description|आइटम विवरण	Ordered Quantity| आइटम विवरण	Unit | इकाई	Unit Price (INR)| इकाई मूल्य (INR)	Tax Bifurcation (INR)| कर विभाजन (INR)	Price (Inclusive of all Duties and Taxes in INR)| मूल्य (INR में सभी शुल्क और कर सहित)
1	**Product Name|उत्पाद का नाम :** TELE HANDLER CAPACITY-4 T **Brand|ब्रांड :** MANITOU **Brand Type|ब्रांड प्रकार :** Registered Brand **Catalogue Status|कैटलॉग की स्थिति:** Catalogue not verified by OEM **Selling As|कैसे बेचा जा रहा है :** Reseller not verified by OEM **Category Name & Quadrant|श्रेणी का नाम और चतुर्थांश :** TELE HANDLER CAPACITY-4 T (Q3) **Model|मॉडल:** MXT 840 **HSN Code|एचएसएन कोड:** 84279000	8	set	7,934,152.44	NA	63,473,219.52
Total Order Value |कुल ऑर्डर मूल्य (in INR)						**63,473,219.52**

Consignee Detail|परेषिती विवरण

S.No| क्र.सं.	Consignee|परेषिती	Item|वस्तु	Lot No.| लॉट नंबर	Quantity| मात्रा	Delivery Start After| दिनांक के बाद डिलीवरी शुरू करना है	Delivery To Be Completed By| वितरण पूरा कब तक करना है
	Designation|पद : - Email ID|ईमेल आईडी : depot-off-basa.mcl@coalindia.in					

1	Contact|संपर्क : 94384-93690- GSTIN|जीएसटीआईएन : 21AABCM5188P1Z3 Address|पता : Mahanadi Coalfields Limited, At & Po- Basundhara, Sundargarh, Basundhara-770076, SUNDERGARH, ODISHA-770076, India	TELE HANDLER CAPACITY-4 T	-	1	01-Sep-2023	30-Nov-2023
2	Designation|पद : - Email ID|ईमेल आईडी : nvikram@mcl.gov.in Contact|संपर्क : - GSTIN|जीएसटीआईएन : 21AABCM5188P1Z3 Address|पता : GM OFFICE CWS(X), IB-VALLEY, AT/PO: BANDHABAHAL DIST: JHARSUGUDA, JHARSUGUDA, ODISHA-768211, India	TELE HANDLER CAPACITY-4 T	-	1	01-Sep-2023	30-Nov-2023
3	Designation|पद : - Email ID|ईमेल आईडी : depot-off-lina.mcl@coalindia.in Contact|संपर्क : 06760-240467-123456 GSTIN|जीएसटीआईएन : 21AABCM5188P1Z3 Address|पता : LINGARAJ AREA, MAHANADI COALFIELDS LIMITED, AT/PO: Deulbera Colliery, ANGUL, ODISHA-759102, India	TELE HANDLER CAPACITY-4 T	-	1	01-Sep-2023	30-Nov-2023
4	Designation|पद : - Email ID|ईमेल आईडी : depot-off-lkpa.mcl@coalindia.in Contact|संपर्क : 094-38877590- GSTIN|जीएसटीआईएन : 21AABCM5188P1Z3 Address|पता : Office of the Chief General Manager, Mahanadi Coalfields Limited, Lakhanpur Area, At/PO Bandhbahal, Via, Belpahar, JHARSUGUDA, ODISHA-768211, India	TELE HANDLER CAPACITY-4 T	-	2	01-Sep-2023	30-Nov-2023
5	Designation|पद : - Email ID|ईमेल आईडी : crnayak9951.mcl@nic.in Contact|संपर्क : 06760-260294- GSTIN|जीएसटीआईएन : 21AABCM5188P1Z3 Address|पता : Mahanadi Coalfields Limited Office of the General Manager Central Workshop Excv Talcher Area Purchase Cell MM Deptt PO Balanda Dist Angul 759116, ANGUL, ODISHA-759116, India	TELE HANDLER CAPACITY-4 T	-	1	01-Sep-2023	30-Nov-2023
6	Designation|पद : - Email ID|ईमेल आईडी : depot-off-hina.mcl@coalindia.in Contact|संपर्क : 06760-265350- GSTIN|जीएसटीआईएन : 21AABCM5188P1Z3 Address|पता : Office of the Depot Officer, Regional Stores, Hingula Area , AT/P.O/P.S – Gopal Prasad, ANGUL, ODISHA-759103, India	TELE HANDLER CAPACITY-4 T	-	1	01-Sep-2023	30-Nov-2023
7	Designation|पद : - Email ID|ईमेल आईडी : depot-off-bhra.mcl@nic.in Contact|संपर्क : 06760-296236- GSTIN|जीएसटीआईएन : 21AABCM5188P1Z3 Address|पता : OFFICE OF THE GENERAL MANAGER, BHARATPUR AREA, AT PO N.S.Nagar, Bharatpur, Via Talcher, Dist Angul 759148, ANGUL, ODISHA-759148, India	TELE HANDLER CAPACITY-4 T	-	1	01-Sep-2023	30-Nov-2023

Product Specification for TELE HANDLER CAPACITY-4 T

Specification|विनिर्देश	Sub-Spec|उप-विनिर्देश	Value|मूल्य
Custom Specification	Custom Specification	Yes

Seller Specification Document\|विक्रेता विशिष्टता दस्तावेज़:

1. SpecificationDocument1	mkp.gem.gov.in/catalog_data/catalog_support_document/78/77/030/CatalogAttrs/SpecificationDocument/2023/1/24/2023_01_24_18_54_30_mxt-840-8-pager_2023-01-24-18-54-39_746c0ce459b2dad8b95a412fda2adee7.pdf

Buyer Specification Document\|खरीदार विशिष्टता दस्तावेज़:

1. SpecificationDocument	mkp.gem.gov.in/catalog_data/catalog_support_document/buyer_documents/352955/54/78/703/CatalogAttrs/SpecificationDocument/2023/1/6/tps_2023-01-06-12-54-42_1181b565dbe8b9c522ed89b7765d84ab.pdf

Corrigendum\|शुद्धिपत्र

1. **GeM-Bidding-Corr-4237121-1.pdf :**click here\|यहां क्लिक करें
2. **Extended Upto\|तक बढ़ाया गया :** 2023-02-04 12:00:00
3. **Extended Upto\|तक बढ़ाया गया :** 2023-02-18 12:00:00

ePBG Detail \| ईपीबीजी विवरण

Advisory Bank | सलाहकार बैंक :	State Bank of India
ePBG Percentage(%) | ईपीबीजी प्रतिशत (%) :	3.00
The bidder shall furnish ePBG as applicable as per bid's terms and conditions | बोली लगाने वाले को बोली के नियमों और शर्तों के अनुसार लागू ईपीबीजी प्रस्तुत करना होगा	

Terms and Conditions \| नियम और शर्तें

1. General Terms and Conditions-

1.1 This contract is governed by the General Terms and Conditions, conditions stipulated to this Product/Service as provided in the Marketplace.

1.2 This Contract between the Seller and the Buyer, is for the supply of the Goods and/ or Services, detailed in the schedule above, in accordance with the General Terms and Conditions (GTC) unless otherwise superseded by Goods / Services specific Special Terms and Conditions (STC) and/ or BID/Reverse Auction Additional Terms and Conditions (ATC), as applicable

2. Buyer Added Bid Specific Terms and Conditions-

2.1 *Scope of Supply*:
Scope of supply (Bid price to include all cost components) : Supply Installation Testing Commissioning of Goods and Training of operators and providing Statutory Clearances required (if any)

2.2 *Buyer Added Bid Specific ATC*:
Buyer uploaded ATC document Click here to view the file .

2.3 *Buyer Added Bid Specific ATC*:
Buyer Added text based ATC clauses

1. Delivery period for the items to be delivered shall be read as 120 days from the date of placement of order, instead of 90 days.
2. The successful L-1 bidder shall submit Security deposit for 3% for a period of 7 months (i.e., 4 months delivery period + 3 months additional) which is opted in place of e-P BG, and 10% PBG to be submitted which shall be valid for 15 months from the date of commissioning of equipment.
3. Product / Product delivery should comply with, ensuring the quality of service, protection of the environment and health & safety during and after their activities, as per C ompany / Govt. norms.
4. Mahanadi Coalfields Limited (MCL) has on boarded the TReDS platform through Receivables Exchange of India Limited (RXIL). TReDS is an online discounting platform pri marily meant for MSME vendor to get their trade receivables financed through auction mechanism where multiple financiers can participate in a very transparent manne r. MSME vendors of MCL are requested to register themselves on RXIL TReDS platform to avail the above benefits. For more details, visit: https://www.rxil.in/.

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2.4 *Generic*:
Buyer Organization specific Integrity Pact shall have to be complied by all bidders. Bidders shall have to upload scanned copy of signed integrity pact as per Buyer organizations policy along with bid. Click here to view the file

2.5 *Certificates*:
Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

Bid Number: GEM/2023/B/2955826
Dated: 24-01-2023

Bid Corrigendum

GEM/2023/B/2955826-C1

Following terms and conditions supersede all existing “Buyer added Bid Specific Terms and conditions” given in the bid document or any previous corrigendum. Prospective bidders are advised to bid as per following Terms and Conditions:

Buyer Added Bid Specific Additional Terms and Conditions

1. Scope of supply (Bid price to include all cost components) : Supply Installation Testing Commissioning of Goods and Training of operators and providing Statutory Clearances required (if any)
2. Buyer uploaded ATC document Click here to view the file.
3. Buyer Added text based ATC clauses
    1. Delivery period for the items to be delivered shall be read as 120 days from the date of placement of order, instead of 90 days.
    2. The successful L-1 bidder shall submit Security deposit for 3% for a period of 7 months (i.e., 4 months delivery period + 3 months additional) which is opted in place of e-PBG, and 10% PBG to be submitted which shall be valid for 15 months from the date of commissioning of equipment.
    3. Product / Product delivery should comply with, ensuring the quality of service, protection of the environment and health & safety during and after their activities, as per Company / Govt. norms.
    4. Mahanadi Coalfields Limited (MCL) has on boarded the TReDS platform through Receivables Exchange of India Limited (RXIL). TReDS is an online discounting platform primarily meant for MSME vendor to get their trade receivables financed through auction mechanism where multiple financiers can participate in a very transparent manner. MSME vendors of MCL are requested to register themselves on RXIL TReDS platform to avail the above benefits. For more details, visit: https://www.rxil.in/.

    .
4. Buyer Organization specific Integrity Pact shall have to be complied by all bidders. Bidders shall have to upload scanned copy of signed integrity pact as per Buyer organizations policy along with bid. Click here to view the file
5. Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

Disclaimer

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority in Buyer Organization, whereby Buyer organization is solely responsible for the impact of these clauses on the bidding process, its outcome, and consequences thereof including any eccentricity / restriction arising in the bidding process due to these ATCs and due to modification of technical specifications and / or terms and conditions governing the bid. Any clause(s) incorporated by the Buyer regarding following shall be treated as null and void and would not be considered as part of bid:-

1. Definition of Class I and Class II suppliers in the bid not in line with the extant Order / Office Memorandum issued by DPIIT in this regard.
2. Seeking EMD submission from bidder(s), including via Additional Terms & Conditions, in contravention to exemption provided to such sellers under GeM GTC.
3. Publishing Custom / BOQ bids for items for which regular GeM categories are available without any Category item bunched with it.
4. Creating BoQ bid for single item.

5. Mentioning specific Brand or Make or Model or Manufacturer or Dealer name.
6. Mandating submission of documents in physical form as a pre-requisite to qualify bidders.
7. Floating / creation of work contracts as Custom Bids in Services.
8. Seeking sample with bid or approval of samples during bid evaluation process.
9. Mandating foreign / international certifications even in case of existence of Indian Standards without specifying equivalent Indian Certification / standards.
10. Seeking experience from specific organization / department / institute only or from foreign / export experience.
11. Creating bid for items from irrelevant categories.
12. Incorporating any clause against the MSME policy and Preference to Make in India Policy.
13. Reference of conditions published on any external site or reference to external documents/clauses.
14. Asking for any Tender fee / Bid Participation fee / Auction fee in case of Bids / Forward Auction, as the case may be.

Further, if any seller has any objection/grievance against these additional clauses or otherwise on any aspect of this bid, they can raise their representation against the same by using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller within 4 days of bid publication on GeM. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

*This document shall overwrite all previous versions of Bid Specific Additional Terms and Conditions.

This Bid is also governed by the General Terms and Conditions

Technical Specifications

Technical Specifications Preface - Instructions to Bidders

Introduction:

These Technical Specifications identify the technical requirements of the Goods and Services which are the subject of this tender.

The Technical Specifications are presented in four parts as follows:

A. Scope of Supply

B. Specific Project Requirements

C. General Requirements

1) Geography and Climatic Conditions
2) Goods (Equipment and Machinery)
3) Services
4) Standards
5) Supplier's Responsibility
6) Spare Parts Provisions
7) Availability Provisions
8) Deemed Breakdown
9) Composite Warranty / Guarantee
10) Quality Assurance

D. Equipment Specifications

Technical Response

Bidders shall provide a Clause by Clause commentary demonstrating compliance with the Purchaser's Technical Specifications, together with full supporting technical literature and data sheets.

Wherever graphical representation of data (e.g. load, power, performance curve) is required, the grid axis and data shall be properly and clearly labeled for ready comprehension.

Additionally, Bidders shall provide the information specifically requested in the Attachment to the Technical Specifications.

Failure to demonstrate compliance in all respects with the requirements of the Technical Specifications may render the bid non-responsive.

Failure to provide any information requested in any part of this specification may deem the bid non-responsive.

Site Visits

The Bidder prior to making any Bid calculation and as part of the preparation of its Bid, shall be deemed to have visited and inspected the Site(s), made all enquiries and collected all information documentary or otherwise, including climatic conditions, as considered necessary by the Bidder for the proper and accurate preparation of its bid.

A Bidder may visit the Site(s) by prior appointment with the purchaser. The number of Bidder's representatives permitted to make visits to the Site(s) shall be limited to a maximum of two. Bidders wishing to make appointments for Site Visits should do so in writing or by facsimile directly with the subsidiary company and concerned officer as detailed in the following schedule. Copies of all such communications should be sent to:

General Manager (MM) / HOD
Mahanadi Coalfields Limited
JV, Burla, Sambalpur
Odisha 768020

Part: A:

Scope of Supply

A.1 Equipment Package

The Supplier is required to bid as per the equipment package detailed in the Tender Document as per the Technical Specifications provided in Part D.

The supplier is required to supply the equipment along with accessories, consumables, training, installation, commissioning and testing at the coal mining project.

The package also includes Consumable Spares and Consumables for 3000 working hours/12 months of warranty period from the date of commissioning of the equipment

A.2 Supplementary Items

The equipment shall be provided with a comprehensive tool kit which shall include any special tools required for erection and commissioning of equipment. First fill of all oils, greases and lubricants needed for test, erection and commissioning of equipment.

A.3 Information and Drawings

At least one month before the scheduled installation date, the Supplier shall provide not less than:

(a) Suitably illustrated copies of Operating, Repair and Maintenance Manuals for each type/model of equipment and accessories, written in English language, substantially bound in book form; Three (3) copies to each project site; and

One (1) copies each along with soft copy to the concerned Project In-charge, Area Manager / Staff officer (Excv), General Manager (Excv.)/HOD, MCL Hq. & General Manager (MM)/HOD, MCL Hq.

(b) Suitably illustrated copies of detailed Spares Parts Manuals for each type/model of equipment and accessories, written in English language, substantially bound in book form; Three (3) copies to each project site; and

One (1) copies each along with soft copy to the Project In-charge, Area Manager / Staff officer (Excv), General Manager (Excv.)/HOD, MCL Hqrs. and General Manager (MM)/HOD, MCL Hqrs.

In addition to the Equipment drawings, where appropriate the Supplier shall supply detailed drawings (in the same number of copies) illustrating erection/assembly site(s), foundation and accommodation requirements for such items as drive motors, switch installations etc.

A.4 Erection/Assembly, Commissioning and Performance Testing:

The Supplier shall provide the Services of Specialist Technicians (refer Part – C.3) and required manpower (skilled/semi-skilled/unskilled) to undertake the installation/erection/assembly, commissioning and any performance testing of the plant, Equipment and accessories supplied.

The technicians shall remain at site following commissioning until all necessary personnel are fully conversant with the maintenance and operation of the equipment.

A.5 Training:

The supplier in consultation with the project in-charge / HOD [Excavation] of the respective site shall make available experienced personnel to conduct training of engineers, supervisors, technicians and operation personnel for specified period as mentioned in table given in 'Schedule of Requirement of Services' from the date of issue of acceptance certificate of the equipment. The training shall cover the following:

a) Training on simulator module by the bidder at their works/suitable location in India/suitable end user's location is preferable.

b) Equipment system, safety and risk assessment.

c) Equipment operation and maintenance.

d) Trouble shooting, localization of fault and their remedies covering:

1. Electrical and electronics
2. Mechanical
3. Hydraulic system
4. Lubrication system
5. Pneumatic system etc.

Comprehensive training manuals with clear illustration shall be provided to each participant in English language. The training courses shall be conducted in both English and Hindi language.

Details of purchaser's estimates of the minimum training programme required for total number of equipment is described in Sec-V.

Note: - The training shall be completed in batches within warranty period from the date of commissioning of first equipment in the respective project.

Part: B:

Specific Site Requirements

B.1 Project Specific Requirements

The equipment shall be suitable for use at the specific site projects under the conditions detailed below.

B.1.1 Belpahar OCP, Lakhanpur OCP, Lingaraj OCP, Garjanbahal OCP, Bharatpur OCP, CWS)T), CWS(IBV) and Hingula OCP, MCL.

The Consignee Opencast Project/ (Projects) is/ (are) owned by the Mahanadi Coalfields Limited, a wholly owned subsidiary of Coal India Limited (the "Purchaser"). The mines of MCL are located in the different Districts of Odisha.

The PH value of all above OCPs are nearby 6-8 (approx).

Belpahar OCP: Belpahar OCP is the opencast project of Lakhanpur Area. The Belpahar OCP is located near Jharsuguda, Odisha.

Power Supply*:* The project is received power from 132 KV Jorabaga Substation.

Lakhanpur OCP: Lakhanpur OCP is the opencast project of Lakhanpur Area. The Lakhanpur OCP is located near Jharsuguda, Odisha.

Power Supply: The project is received power from 132 KV Jorabaga Sub station

Lingaraj OCP: Jagannath OCP is the opencast project of Lingaraj Area. The Lingaraj OCP is located in Talcher Coalfields, District Angul, Odisha. (759103)

Power Supply*:* The project is received power from 132 KV Nandira Substation.

Garjanbahal OCP: Garjanbahal OCP is the opencast project of Basundhara Area. The Garjanbahal OCP is located in P.O. Basundhara, District: Sundargarh, Odisha (770076)

Power Supply: The project is received power from 220 KV Tiklipara Substation.

Hingula OCP: Hingula OCP is the opencast project of Hingula Area. The Hingula OCP is located in Talcher Coalfields, P.O. Gopalprasaad, District Angul, Odisha. (759103)

Power Supply: The project is received power from 132 KV Nandira Substation.

Bharatpur OCP: Bharatpur OCP is the opencast project of Bharatpur Area. The Bharatpur OCP is located in Talcher Coalfields, District Angul, Odisha. (759103)

Power Supply*:* The project is received power from 132 KV Nandira Substation.

CWS (Talcher): CWS (Talcher) is located in Talcher Coalfields, District Angul, Odisha. (759103)

Power Supply*:* The project is received power from 132 KV Nandira Substation.

CWS (IB Valley): CWS (IBV) is located in IB Coalfields, near Jharsuguda, Odisha

Power Supply*:* The project is received power from 132 KV Jorabaga Sub station

Part: C:

General Requirements

C.1 Geography and Climatic Conditions

Elevation

The natural surface varies from 100 to 1000m above mean sea level.

Climate

The climate is sub-tropical to tropical, dusty, with a hot and humid atmosphere. Monsoon rains occur in the period from June to October.

- Ambient Conditions

  - Relative Humidity - Maximum 98%
  - Temperature - Minimum 0° C
    Maximum 50° C

  - Rainfall-The mean annual rainfall is 1,000 mm, 90 to 95% of which may fall in rainy season from June to October.
  -
  - Wind April to September -South to South Westerly
  - October to March - North Westerly
  - Speed - 8 km per hr average
  - -100 km per hr maximum

Under foot Slushy and highly abrasive.

C.2 Goods (Equipment and Machinery)

Detailed specifications of the Equipment to be supplied are given in **Part D** of this section. In general, all items shall be:

1. Designed and constructed to handle without overload and for the working hours stated, the maximum volumes/rates specified;
2. Designed to facilitate ready access, cleaning, inspection, maintenance and repair of component parts;
3. Designed to facilitate rapid changeover of consumable items.

The component parts of all items shall, wherever possible, be selected from the standard ranges of reputable manufacturers.

The Equipment and accessories shall be physically robust and where necessary capable of dismantling for transportation and ready re-assembly using simple tools. All Equipment items provided shall be designed to be compatible within the proposed overall Scope of Supply.

Electrical Equipment shall provide all protection devices, controls and interfaces for the Equipment to operate safely and efficiently.

All workmanship and materials shall be of first class quality in every respect.

All parts and surfaces, which are exposed to corrosive environment, shall be suitably protected to prevent any effects of corrosion or erosion.

C.3 Services

The supplier shall be responsible for the erection and commissioning of the equipment at site. The supplier shall depute qualified and competent Engineer(s) and specialist technicians to supervise the entire assembly, erection and commissioning of equipment free of cost.

C.4 Standards

The design, supply, erection, testing and commissioning of all Equipment under this Contract shall in all respects comply with the requirement of this specification and with the appropriate current Indian standards and codes, or relevant Standards issued by the Bureau of Indian Standard or International Standards Organization or any other equivalent international standards, which corresponds to specific ISO/Indian standards indicated in the technical specification. Such equivalent international standards are to be supported by documentary evidence certifying that offered standards are identical to the corresponding ISO/Indian standards.

The equipment shall comply with requirements of the statutory government authorities, including

Director General of Mines Safety (DGMS) having jurisdiction over the equipment and its use.

The system of units for all measurements shall be the **System of International Unites (S.I.)**

C.5 Suppliers Responsibility

The Purchaser requires that the Supplier shall accept responsibility for the provision of complete operable and compatible Equipment and systems within the Scope of Supply. This document identifies only the major items required for the installation and the Supplier shall ensure that the total supply includes all necessary Equipment for it to function effectively, safely and efficiently. Any additional items the Supplier considers necessary to ensure compliance with such a requirement shall be identified and included.

If the Supplier observes that this Specification document contains any anomalies, ambiguities, flaws, errors or omissions, the Supplier shall immediately bring these to the attention of the Purchaser but not later than 15 days prior to the due date of opening.

The Supplier shall be responsible for the testing and commissioning of the Equipment and ensure that it meets the requirements as specified. The commissioning and setting to work of the whole Equipment Supply package shall be carried out under the supervision of the Supplier in conjunction with the Purchaser's nominated personnel

C.6 Spare Parts Provisions

C.6.1.a. Availability of Spare Parts

All items and Equipment proposed shall be of current design and manufacture. The Supplier shall warrant that sufficient spares and servicing facilities will be available to maintain the Equipment in use throughout its life.

C.6.1.b Bought-out assemblies and sub-assemblies

The supplier is required to furnish the details of all Major bought-out items as indicated in the technical specification against "Information to be provided by the bidder".

C.6.2 Provision of Spare Parts

C.6.2.1 Within the Contract Price, the Purchaser shall agree to purchase all filters and O-rings including standard engine filters required for first 3000 hours of operations of each equipment. Further it is specified that the cost of these items for initial 3000 hours of operation for each equipment shall be included in your quoted basic price of the equipment or as per BOQ.

The Bidder shall stock sufficient fast moving & maintenance spares as well as critical assemblies and their repair parts in their Local Depots to ensure maximum availability of their equipment during its life time.

C.6.2.2 In the event that the spare parts and consumables, as recommended by the Supplier, in any way fall short of actual requirements during the period for which they are said to be adequate, the supplier shall provide such additional spare parts and consumables as are necessary at the final destination. Such additional spare parts and consumables shall be provided by the Supplier to the Purchaser free of all cost and shall be transported to Site by air freight internationally and by air, rail or fast road transport within India.

C.6.2.3 In the event that the spare parts, Insurance items and consumables, as recommended by the Supplier, are in excess of actual requirements. The Purchaser may at its option.

a) Retain such excess spare parts and consumables as, in its discretion it may elect to do so

b) Require the Supplier to repossess or repatriate or otherwise dispose of such excess spare parts and consumables in exchange for payment to the Purchaser of the Contract Price of the spare parts and Consumables concerned.

The Purchaser shall notify the Supplier, in writing of its requirements under this Clause within thirty (30) days of completion of the period referred to in Clause C.6.2.1 hereof.

C.6.2.4 In the event that operation of the Plant is inhibited or frustrated as a direct result of lack of spare parts and consumables, pursuant to Clause C.6.2.2 hereof, then the period referred to in Clause C.6.2.1 hereof shall be extended by a period of not less than the period during which operation as aforesaid was inhibited or frustrated.

C.6.2.5 The supplier shall not be liable for the supply of additional spare parts and consumables, nor to extend the period referred to in Clause C.6.2.1 hereof, if and to the extent that, additional Spare Parts and Consumables are required by reason of unforeseen accidents, negligence or misuse on the part of the Purchaser.

C.6.2.6 The assessment of the Supplier of the spare parts requirements shall be based upon the expected working hours per year as defined in the TPS clause Performance Guarantee

C.6.3. Emergency Spare Parts

C.6.3.1 Emergency spare parts required by the Purchaser to repair breakdowns shall be dispatched to the site by the Supplier by the fastest, practicable means as directed from time to time by the Purchaser.

C.6.3.2 For the purpose of Clause C.6.2.6, "Emergency Spare Parts" shall mean those spare parts or components required by the Purchaser to repair any item of Plant supplied pursuant to the Contract in the event of a breakdown not attributable to a failure covered by guarantee or a failure of the Supplier to provide adequate Spare Parts or Consumables.

C.6.3.3 Payment in respect of the supply and delivery of such Emergency Spare Parts shall be made promptly, retrospectively, by the Purchaser, in a manner consistent with the terms of payment described in the contract.

C.6.3.4 Lifetime Spare Parts

The Supplier undertakes and guarantees to produce and maintain stocks, to be available for purchase by the Purchaser under separate agreement, of all Spare Parts and Consumables as may be required for maintenance and repair of the Plant throughout its working life. In the event that the Supplier wishes to terminate production of such Spare Parts, the Supplier shall:

(a) give not less than six months' notice in writing of its intention to terminate production in order to permit the Purchaser reasonable time in which to procure needed requirements; and

(b) immediately following termination, provide to the Purchaser at no cost, manufacturing drawings, material specifications and all necessary permissions to facilitate manufacture of the Spare Parts elsewhere.

(c) any change in part number or superseded part number should be informed to the HOD of Excavation department / MM department of MCL hqrs. and the project site wherever the equipment is operating.

In any event, the Supplier shall not seek to terminate manufacture of spare parts for period of not less than (15) years from taking over or the life time of the equipment whichever is later.

C.6.4 Oils, Lubricants and Fluids

The Supplier shall provide to the Purchaser a detailed schedule of all necessary oils, lubricants, fluids for the operation and maintenance of Equipment. The schedule shall indicate estimated annual consumption and specify the appropriate international standard number or the name and reference number of an equivalent available in India considered to be acceptable by the Supplier.

C.6.5 General

C.6.5.1 Nothing in this Clause C.6 shall relieve the Supplier of any Guarantee, Availability, Performance or other obligations or liabilities under this Contract.

C.7 Guaranteed Availability

Minimum Annual Guaranteed Percentage Availability for Tele-handler- shall be not less than 85% (eighty-five percent) annually for a period of 12 months from the date of commissioning.

C.7.1 Introduction

C.7.1.1 The Supplier shall guarantee that the Equipment supplied pursuant to this Contract shall be available for use by the Purchaser and shall meet the performance criteria specifications at the level and in accordance with the terms and conditions of the Availability Guarantee herein contained.

C.7.1.2 Where Equipment supplied under the Contract fails to meet the criteria of the Availability Guarantee, the Supplier shall, at its own cost, provide suitably qualified and experienced personnel at Site to demonstrate to the Purchaser's satisfaction that the required level of availability can be achieved and maintained.

C.7.1.3 The Supplier shall provide the Services of such personnel at Site within seven (7) days of notification by the Purchaser that the availability criteria have not been met in any one (1) month.

C.7.2 Guarantee

C.7.2.1 The Supplier shall guarantee that the Equipment supplied pursuant to the Contract shall be available to the Purchaser at the level hereinafter defined to perform to criteria of not less than that defined in the Technical Specifications incorporated in the Contract.

C.7.2.2 The Supplier shall guarantee that the Equipment shall be available to perform its duty to minimum criteria and to the minimum availability percentage level as defined in the individual Equipment specifications included in the Technical Specifications.

The method of assessment applied shall be as follows:

Method of Assessment:

The following calculation shall determine the availability of the Equipment:

$$\%\text{Availability} = \frac{(\text{Scheduled Available Time} - \text{Downtime}) \times 100}{\text{Scheduled Available Time}}$$

Scheduled Available Time shall equate to 24 hours daily

Downtime:-

Downtime shall mean all hours of work lost due to mechanical, electrical or other failure, including:

a) routine servicing and maintenance in accordance with the manufacturer's published recommendations, including changing oils, oil filters and air filters; lubrication; changing identified consumable or wear parts.

b) planned preventative maintenance programs; It shall not however include:

I. damage due to abusive use or incorrect operation methods by the purchaser;

II. accidents;

III. strikes or stoppage of work by the Purchaser's personnel;

IV. natural disaster;

V. lack of Spare Parts not attributable to a failure of the Supplier, it's Agents or Representatives.

Downtime shall also specifically include all hours lost due to failures determined to be guarantee failures.

The Supplier shall provide a schedule of maintenance required to carry out (a) and (b) above for the 01 year (12months) period of operation and shall state the number of hours required to carry out each maintenance task. The time stated shall, with the agreement of the Purchaser, form the basis of the assessment of the availability.

This schedule of tasks and time will be reviewed periodically by the Purchaser and the Supplier, jointly, to monitor the practicality of the schedule.

The Purchaser will assist the Supplier, without relieving the Supplier of any other obligations under the Contract, to achieve the guaranteed availability by:

1. Providing normal and proper maintenance, including preventative maintenance in accordance with the Supplier's standard/published recommendations, and making all necessary repairs using only spare parts provided by the Supplier in accordance with the requirements specified in part C6.
2. Providing co-operation to all Suppliers' authorized representatives, complying with all reasonable procedural suggestions to improve efficiency of machine operation or reduce downtime.
3. Where appropriate, providing and maintaining such conditions as:

- Proper Electrical Supply
- Terrain Area
- Bench Preparation
- Reasonable Floor Conditions

4. Providing all Suppliers' authorized representatives access at all reasonable times to the machine service and repair facilities.

Maintaining a logbook for each shift wherein the working hours, breakdown hours, maintenance hours, idle hours, etc. shall be recorded. This record will be available for examination and signature by the Supplier's representative.

C.7.3 Effect and Duration of Guarantee

C.7.3.1 This Guarantee shall become effective on the day on which the Equipment is commissioned at the Site. Commissioning shall be evidenced by the issue of the Purchaser's Acceptance Certificate.

C.7.3.2. This Guarantee shall remain effective for 12 (Twelve) from the date of commissioning irrespective of the hours operated by the Equipment during the period of the guarantee.

C.7.3.3.1 Compensation for not achieving Guaranteed Availability

In the event that Equipment fails to achieve the Availability herein provided in Performance Guarantee clause of TPS, measured over each twelve (12) month period, the Supplier shall be liable for and pay to the Purchaser, as liquidated damages, a sum equal to as indicated here under for each equipment against the PBG submitted by the bidder as per clause-2 of SCC

a. 1% of the delivered landed price of the equipment including the price of spares and Consumables for every percentage reduction from the Guaranteed Availability for the first 5%.

b. 10% of the delivered landed price of the equipment including the price of spares and Consumables for reduction beyond 5% from the Guaranteed Availability.

C.8 Deemed Breakdown

When the supplier is unable to supply the replacement of a failed part during the contract period, and if the machine is commissioned by using the spares from the stock of the project, the period after 21 days till the supplier replaces the part shall be treated as 'deemed breakdown' (the credit for keeping machine available shall not be given to the supplier.)

The supplier shall not in any way be allowed to take out spare parts from other equipment, which are under breakdown and covered within the scope of this contract. However, MCL, in the interest of work, reserves the right to advise the supplier to commission the breakdown equipment covered under this contract by taking out spare parts from other breakdown equipment. Nevertheless, during this period also, the equipment shall be treated as 'deemed breakdown' till the supplier replaces the spare parts.

C.9 Composite-warranty/guarantee

The supplier shall warrant that the equipment supplied under this contract is:

a) In accordance with the contract specifications.

b) The equipment shall have no defects arising out of design, material or workmanship & the complete equipment shall be warranted for 12 months from the date of commissioning. Any defect arising observed on this account will have to be attended immediately.

c) The supplier must ensure that there is no major breakdown due to manufacturing / design defects during the warranty period. In case such breakdown occurs, the purchaser reserves the right to extend the warranty period suitably.

The warranty shall cover for total equipment so that comprehensive responsibility lies only with the equipment supplier although components may be supplied by different suppliers to the bidder.

C.10 Quality Assurance

C.10.1 The Supplier should furnish in detail its quality assurance plan for various stages of manufacture. The Quality Assurance plan shall comply with an internationally recognized quality assurance standard such as ISO 9000 or its equivalent.

C.10.2 The Supplier shall provide facilities to Purchaser or their authorized representatives for progress inspection during manufacture at his works and furnish all test data available in this regard for quality control, both for bought-out items and his own manufactured items.

C.10.3 The Purchaser or his agent, when so required by him, shall also be provided with samples of "bought-out" materials for the purposes of undertaking independent tests, which independent tests shall be at the expense of the Purchaser.

PART D:- EQUIPMENT SPECIFICATIONS

EQUIPMENT SPECIFICATION OF 4T ROUGH TERRAIN, FOUR WHEEL DRIVE TELE-HANDLER: Bidder must be agreed with the following specification, if a bidder is quoting against the BID, it shall be assumed that the firm does agree with all the specification as follows:

1. Scope of specification

This specification is intended to cover the technical requirements for the design, manufacture, testing, delivery, on-site erection and commissioning of a self-propelled, tyre mounted Tele-handler with four types of attachments as follows:
(i). Fork
(ii). Jib with 02 hooks
(iii). 01 Cum Loader Bucket
(iv). Platform Basket/ Man-lifting Basket

2. Design Criteria

The 4T Rough Terrain Tele-handler shall be capable of continuous operation for protracted periods on a system of 3 shifts each of 8 hours duration per day throughout the year
The Tele-handler shall have the following design criteria:

a) Minimum vertical reach of Platform Basket/ Man-lifting Basket and Fork should not be less than 7.5 meters.
b) Platform Basket/ Man-lifting Basket capacity should not be less than 250 kg.
c) Lifting capacity (m) @ 500mm should not be less than 4T (4000 Kg)
d) Ground Clearance should not be less than 350 mm.
e) Frame outer turning radius should not be more than 4 meter.
f) Platform Basket/ Man-lifting Basket dimensions should not be less than 2000x1200x1300 (mm)
g) Unladen weight with forks should not be less than 8000 Kg.

3. Technical requirements

3.1 Engine: The tele-handler shall be powered by a direct injection, 4 Cylinder, diesel engine of net power ranging from 70HP to 80HP

Note: *- The Engine shall meet the latest emission norms as recommended by CMVR or any other regulation issued by central/state Government. Self certificate of the Engine Manufacturer to be submitted at the time of pre-dispatch inspection/supply.*

3.2 Transmission: Torque-converter type transmission consisting of gears for forward and reverse movements.

3.3 Hoses: Fire resistant/ heat resistant hydraulic hoses in place of ordinary hoses to decrease the chance of fire. All the sleeves and conduits in which cable/wire are laid shall be of fire resistant /fire retarder type.

3.4 Steering: Three steering modes with 04 wheels steer, 02 wheels steer and crab steer for quick maneuverability

3.5 Fuel tank: The fuel tank shall be of sufficient capacity for 16 hours operation without refueling, and be provided with a level indicator and a lockable-hinged cap.
Construction of the tank should be such that it provides for easy accumulation and drainage of water with minimum loss of fuel.

3.6 Operator's Protective Structures: Tele-handler shall be equipped with FOPS & ROPS.

3.7 Operator's Cabin and Seats: A fully insulated, high-visibility, rigidly mounted, sound-suppressed, vibration-suppressed, fully air conditioned, operator's cab with tinted safety glass

should be so positioned to facilitate a clear and unrestricted view of the travel & work areas of the machine necessary for its intended use.
The Operator's Station shall be fitted with an ergonomically designed adjustable seat that supports the operator in a position that allows the operator to control the machine under the intended operating conditions. The seat and its suspension shall be so designed to reduce vibration transmitted to the operator to the lowest level that can be reasonably achieved.
Seat Belt for operator with reminder shall be provided as per DGMS circular no. DGMS (Tech) Circular No. 06 of 2020 Dhanbad dated 27.02.2020.

3.8 Operator's Controls and Indicators: The controls shall be of suitable design and construction and arranged so that they are able to be operated with ease from the operator's seat and within the operator's force limits. Controls shall be laid out and designed to allow easy and safe operation based on the principle that a given direction of movement of any control produces a consistent and expected effect. The surfaces of frequently used pedals shall be fitted with skid resistant type materials.

3.9 Gauges and indicators/ Electronic Display: The following shall be provided:

a) Water temperature gauge
b) Engine oil pressure gauge/ indicator
c) Fuel capacity gauge.
d) Engine tachometer
e) Engine hour-meter
f) Operating parameter & diagnostic code display

In case any of these gauge(s) is/are not provided, then it may be adequately explained that how job of the same shall be accomplished in the offered product.

3.10 Electrical Equipment: The tele-handler shall be provided with the following:
a. 24V/12V DC electrical system with suitable rated alternator of reputed make
b. 24V/12V Electrical starter motor of reputed make
c. High capacity maintenance free batteries of reputed make.
d. Battery isolation switch / Relay

All Electrical wires & sleeves are to be of fire resistant quality to decrease chance of fire.
Electrical wires are to be passed through flexible metallic conduit to avoid damage of insulation of the wire due to friction that may cause short circuit. All electrical circuits shall be protected by adequately rated fuses/ circuit breakers.

3.11 Lighting: Adequate lighting shall be provided for safe nightshift operation. All lighting system shall be of LED type.

3.12 Lubrication System: A centralized automatic lubrication system of positive pressure type shall be provided, with warning alarms for identification of failed lubrication points on the machine, except where use of high viscosity lubricants prevents the application of pumped systems.
Lubricants used shall be preferably of reputed Indian make.

3.13 Brakes: Auto parking brakes, neutral brakes and brakes on both the axels shall be provided.

3.14 Fire Detection and Suppression System: A suitable automatic fire detection and suppression system of reputed manufacturer (indigenous or imported), shall be provided on the equipment complying Clause-5 of DGMS (Tech) Circular No. 06 of 2020 dated 27.02.2020.

Note: Periodical refilling and maintenance shall be done by the supplier during the contract period

3.15 Safety Features: All safety features & devices as per Govt. Of India Gazette notification no. Z 20045/01/2018/S&T (HQ) dated 01.10.2018, DGMS Circular No. DGMS (Tech) Circular No. 06 of 2020 Dhanbad dated 27.02.2020 and subsequent amendments, if any, including following shall be provided in the equipment. Bidder shall submit a Certificate as an undertaking in this regard that all safety features and devices applicable for the subject equipment are incorporated in the equipment.

The following safety features shall be provided in the equipment

a. All function cut off switch/Emergency shut-off buttons.
b. Roll over protection.
c. Seat belt & Seat belt reminder- Should comply as per requirement of Clause 10 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020
d. Rear Vision Camera - Should comply as per requirement of Clause -1 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020
e. Warning System for Operator Fatigue - Should comply as per requirement of Clause-2 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020
f. Mirrors right and left
g. Blind spot mirror or any other device a part from rear view mirror to enable operator to have clear visibility of blind spot in and around tele-handler

4 Other requirements:

a) Overload Movement Hydraulic Cut off
b) Battery cut-off to keep the battery not in use while maintenance and idle time.

5 Performance Guarantee: In accordance with the provisions of clause C 6.2.6 the Technical Specifications, the expected scheduled working hours of the equipment per year are 3000 (three thousand) hours. [The bidder should note that the expected scheduled working hour indicated is only approx. hour and there may be variation in the range +/- 500 hours]. In accordance with the provisions of C 7.2.2 and C 7.3.2 of the Technical Specifications, the Supplier shall guarantee that the availability of the equipment shall be not less than 85% (Eighty five percent) for a period of 12 months from the accepted date of commissioning.

29. Information To Be Provided By The Supplier: *The Supplier shall furnish the following information. All technical information shall be in SI units.*

29.1 General

a) Number of offered model commissioned during the last five years from the date of opening of tender.
The information shall be given in the following format and in the order of most recent first:
Company-Mine Name-Mine Location-Mine Type-No of machine – Model-Comm. Date
b) Details of nearest Depot/Warehouse and Service Facility available for the present offer.
c) Details of tools to be provided with the equipment.
d) Details of erection programmes for the equipment.
e) Details of maintenance schedule.

29.2 Technical Details

a) Latest engine performance curves showing net power, net torque and specific fuel consumption of the installed engine, measured according to ISO 9249
b) Detailed technical description and specification of the tele-handler
c) Layout drawings and detailed descriptions of all machinery
d) Performance curves for all motions.
e) Layout drawings and complete hydraulic and air circuit with detailed descriptions of all components
f) Details of major bought-out assemblies and sub-assemblies including manufacturer, type, etc.
g) Comprehensive commercial literature specifications.
h) Operation and maintenance manuals

#BringTheRevolution

REACH NEW HEIGHTS

Max: Lifting Height -7.6 m/24.9 feet, Max: Lifting Capacity - 4T

MANITOU
HANDLING YOUR WORLD

WHAT IS A MANITOU TELEHANDLER?

Manitou telehandlers are handling equipment perfectly adapted to work in the most difficult conditions and terrains. Equipped with a telescopic boom, they will save you time on a daily basis when handling all types of loads in height and outreach.

Versatile and true tool carriers, they allow a wide variety of attachments to be used in a simple, fast and safe way for the operator and his working environment.

The Manitou brand also offers a wide range of services and attachments to support you throughout the life cycle of your machine.

Move Loads in All Conditions
The telescopic arm passes above obstacles and enables you to move your load safely. It also allows you to move suspended loads using an assortment of jibs, cranes and winches.

Place the load where you want to.
The MTX 840 can place loads up to 4 tons at a height of up to 7,6 meters with an outreach of up to 4.20 meters.

Scoop & dump
Allows you to scoop and dump the loose material in one go without giving repeated jerks to the machine.

Loading & Unloading Trucks and Containers
Carry out operations quickly on many terrains that require substantial maneuverability.

Versatility
When matched with one of our many available attachments, the MXT 840 will satisfy your construction and job sites handling needs.

Preparing and Cleaning the Ground
The drawbar pull and breakout force of the MXT 840 means it can be used to level the ground and clear excess soil and waste.

"With the help of my Manitou, I only need one machine to make a multitude of applications on a daily basis. It's a real toolbox! »

DESIGNED FOR PERFORMANCE

A Maneuverable All-Terrain Machine

- A turning circle of just 3.9 meters combined with 4 wheels steering.
- Gradient up to 47%.
- Ground clearance of 38 cm.

An ultra-manageable machine with three steering modes

Front wheel steering ideal for long distance

Four wheel steer for cramped spaces

Crab steer to drive diagonally to avoid an obstacle rather than trying a multipoint turn

EFFICIENCY AND PRODUCTIVITY GUARANTEED

Simplicity, driver of productivity

2 front steering wheels for excellent steering for greater safety on the road very quick and easy to use

Easy access cabin

- Grab handle to access the cab
- Non-slip steps
- Helps to reduce operator fatigue and avoid falls

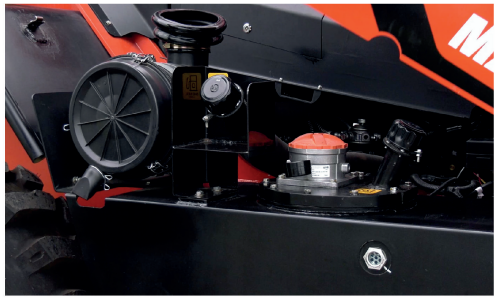
Lifting/lowering of the boom, telescopic boom extension and retraction, scooping/tipping, attachment hydraulic line dashboard & levers easy to use start-up in less than 30 seconds

Safe cabin

The MXT 840 cab meets the level 2 FOPS/ ROPS standards. It is capable of supporting the machine rollover and protecting the operator from falling objects.

SIMPLE AND EFFICIENT MAINTENANCE

Wide access to engine compartment allows operator to inspect daily checkpoints easily



EASY ACCESSIBILITY FOR MAINTENANCE

The machine has been designed to enable easy access to the various maintenance elements

- Wide opening engine cover
- Brake fluid fill level displayed on the dashboard
- Accessible lubrication points
- Fuel tank and battery isolator switch remain accessible with the engine cover closed

MANITOU HANDLING YOUR WORLD

STANDARD TELEMATICS -EASY MANAGER

- Now get digital twin of your machine on smartphone with easy manager app.
- Plan your Manitou fleet better and optimise your business. Access live machine information

Easy MANAGER | **THE CONNECTED SOLUTION** to improve your productivity.

SERVICE	Running Hours	Engine Parameters (Including Fuel Level)*	Schedule Service Alert
OPERATION	Machine Status	Machine Unitisation Report	
SECURITY	GPS Tracking	Geofencing	Geofencing Curfew alert

MANITOU HANDLING YOUR WORLD

INCREASED VERSATILITY

The MXT 840 is a genuine tool holder. It comes with a large selection of attachments that offer users precisely the kind of versatility needed on a work site. The Manitou fork carriage enables you to change your attachment in just a few seconds. .

Attachments for all your material handling needs

TFF
Floating fork carriage
(also with Side Shift)*

PFB
Tilting Fork Carriage

CBR
General Purpose Bucket

P 4000
Crane jib

PC 50
Frame mounted hook

P 600
Extension jib

CB 4x1
4-in-1 bucket

CBC
Construction bucket

NE 100
Platform basket**

HBB
Big Bag handler

BB 500
Concrete skip

GL 400 / GL 600
Crane Skip

**Controls will be from Cabin and not from Man Basket. It does not comply to EN 280 standards.
*Optional

A SIMPLE AND PROVEN COUPLING SYSTEM

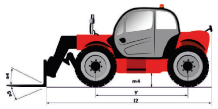
The Manitou fork carriage can easily change your attachment in just a few seconds.

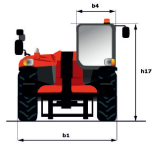
Technical Specifications

Capacities		Metric
Max. capacity		4000 kg
Max. lifting height		7.6 m / 24.9 feet
Platform height		7.6 m / 24.9 feet
Working height		9.6 m / 31.5 feet
Maximum Horizontal Outreach		4.23 m / 13.87 feet
Weight and dimensions		
Overall length to carriage	l2	4.67 m
Overall width	b1	2.38 m
Overall height	h17	2.59 m
Wheelbase	y	2.58 m
Ground clearance	m4	0.38 m
Overall cab width	b4	0.85 m
Tilt-up angle	a4	12 °
Tilt-down angle	a5	114 °
External turning radius (over tyres)	Wa1	3.9 m
Unladen weight (with forks)		8420 kg
Unladen weight		8060 kg
Tyres type		Inflatable
Standard tyres		16.0/70-20 14PR- EM936 SPL
Forks length / width / section	l / e / s	1200 mm x 125 mm / 50 mm
Performances		
Lifting		13 s
Lowering		9 s
Extension		9 s
Retraction		5 s
Scoop		4.6 s
Crowd		4.6 s
Dump		3.9 s
Engine		
Engine brand		Kirloskar
Engine norm		BS IV CEV
Max. fuel sulphur content		300 ppm
Engine model		4R1190NA1
Number of cylinders / Capacity of cylinders		4 - 4760 cm³
I.C. Engine power rating - Power hp / kW		74.5 hp / 54.8 kW
Max. torque / Engine rotation		300 Nm @ 1320 rpm
Drawbar pull (Laden)		8300 daN
Transmission		
Transmission type		Torque Converter
Number of gears (forward / reverse)		4 / 4
Max. travel speed		28 km/h
Parking brake		Oil-Immersed Multi-Disc Braking front and rear Axle
Service brake		Hydraulic rear & front
Hydraulics		
Hydraulic pump type		Gear pump
Hydraulic flow / Pressure		92 l/min / 250 Bar

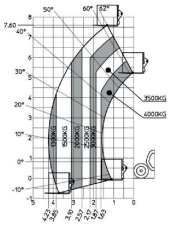
Tank capacities		
Engine oil		9.50 l
Hydraulic oil		120 l
Fuel tank		78.50 l
Performances		
Noise at driving position (LpA)		90 dB(A)
Noise to environment (LwA)		110 dB(A)
Vibration on hands/arms		< 2.5 m/s²
Miscellaneous		
Drive / Steering		4 / 4
Safety / Safety cab homologation		Standard EN 15000 / ROPS - FOPS cab (level 2)
Controls		Monolever

Dimensional drawing





Load chart



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Effective Date: March, 2022. All dimensions, weights & timings are variable within 1.5%, Company reserves the right to change specications without prior notice. The illustration do not nece of the machine. Product specications & prices are subject to change without notice or obligation. The photographs and/or drawings in this document are for illustrative purposes only. Refer to the appropriate Operator's Manual for instruction on the proper use of this equipment. Failure to follow the appropriate Operator's Manual when using our equipment or to otherwise act irresponsibly may result in serious injury or death. The only warranty applicable to our equipment is the standard written warranty applicable to the particular product & sale & we make no other warranty, express or implied.

Your dealer:

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HANDLING YOUR WORLD

Manitou South Asia Pvt. Ltd.
Regd.Office: 1st Floor, Plot No. A-10, Block-B1, Main Mathura Road, Mohan Co-op Indl. Estate, New Delhi -110044
Tel.: 011- 407 42701 E-mail: info.mind@manitou-group.com Web: www.manitou.com

TOLL-FREE 1800 103 7600

TECHNICAL DOCUMENTS

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company

CIN No. U29130WB2009PTC138256

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 1

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Number of offered model commissioned during the last five years from the date of opening of tender

(As per Clause -29.1.a)

Company	Mine Name	Mine Location	Mine Type	No of machine	Model	Comm. Date
CELITE TYRE Corp	Zawar	Udaipur	U/G- Zinc	1	MXT840	07.08.2021
SMS LIMITED	Hindustan Copper	Malanchk hand	U/G- Copper	2	MXT840	18.04.2022 30.12.2022
JSW STEEL LIMITED	Jajang Iron Mines	Barabil	Opencast -Iron	3	MXT840	23.06.2022 24.06.2022 29.06.2022
RK Transport	Hindustan Copper	Malanchk hand	U/G- Copper	2	MXT840	22.08.2022 30.01.2023

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Corporate Office The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
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ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 2

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Details of nearest Depot/Warehouse and Service Facility available for the present offer:

(As per Clause -29.1.b)

Major Depot/Warehouse			Service Facility		
Location	**Contact Nos**	**Inventory Value (Approx)**	**Location**	**Type of Facility available**	**No of Engineers**
128, Developed Plots, Perungudi Industrial Estate, Estate Main Road, Chennai (T.N.) 600096	9978855656	100,00,000.00 INR	128, Developed Plots, Perungudi Industrial Estate, Estate Main Road, Chennai (T.N.) 600096	Regular Maintenance & Repair	3
Office No. 602, The Chambers, 1865, Rajdanga Main Road, Kolkata (W.B.) 700107	033-40089503/603 7980198262	25,00,000.00 INR	Office No. 602, The Chambers, 1865, Rajdanga Main Road, Kolkata (W.B.) 700107	Regular Maintenance & Repair	2
3, Chadda Badi, Nehru Nagar, Bilaspur (C.G.) 495001	07752-407803, 433900	10,00,000.00 INR	3, Chadda Badi, Nehru Nagar, Bilaspur (C.G.) 495001	Regular Maintenance & Repair	1

For, PAB Engineering Works Pvt. Ltd.

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ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 3

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Details of tools with quantity to be provided with the each equipment

(As per clause -29.1.c)

S. No.	PART No.	DESCRIPTION & SIZE	QTY
1	1E0001	ALLEN KEY 14 MM	1
2	1E0002	SOCKET 3 4 24 MM	1
3	1E0003	SOCKET 3 4 32 MM	1
4	1E0004	COMBINATION SCREW DRIVER	1
5	1E0005	CIRCLIP PLIER EXTERNAL	1
6	1E0006	FILTER TOOL	1
7	1E0007	SLIDING BAR HANDLE 3 4	1
8	1E0008	EXTENSION 3 4 LENGTH 12	1
9	1E0009	TYRE GUAGE 100 PSI	1
10	1E0010	HAMMER 5 SOUND	1
11	1E0011	DE SPANNER 6 7 MM	1
12	1E0012	DE SPANNER 8 9 MM	1
13	1E0013	DE SPANNER 10 11 MM	1
14	1E0014	DE SPANNER 12 13 MM	1
15	1E0015	DE SPANNER 14 15 MM	1
16	1E0016	DE SPANNER 18 19 MM	1
17	1E0017	DE SPANNER 20 22 MM	1
18	1E0018	DE SPANNER 21 23 MM	1
19	1E0019	DE SPANNER 24 27 MM	2
20	1E0020	DE SPANNER 25 28 MM	1
21	1E0021	DE SPANNER 30 32 MM	2
22	1E0023	RING SPANNER 16 17MM	1
23	1E0025	TUBULAR SPANNER 11 MM	1

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24	1E0026	1 2 SQ DRIVE KEY SPANNER	1
25	1E0027	TESTER 12 V	1
26	1E0028	TOOL BOX	1
27	1E0033	HEAVY DUTY ADAPTOR	2
28	1E0084	1/4 ALLEN KEY	1

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

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ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 4

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Details of erection programmes for the bid

(As per Clause -29.1.d)

SL No	Description	Nos of Days/Machine
1	Operational Training to Operators	1
2	Maintenance & Safe Operation Procedure	1

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

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KVQA

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 5

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Details of maintenance schedule
(As per Clause – 29.1.e)

LUBRICANTS

S No.	GRADE	DESCRRIPTION	SERVICE INTERVAL	RQD QTY PER SERVICE (Liters/Kgs)
1	API SJ/CF	ENGINE OIL	FIRST 100hrs + EVERY 500hrs	12 L
2	PRE-MIX READY TO USE COOLANT	COOLANT	5000hrs	16 L
3	ISO VG 46	HYDRAULIC OIL	2000hrs	120 L
4	UNITRAC FR2	GEAR BOX OIL	500hrs	15 L
5	UNITRAC FR2	DIFFERENTIAL AXLE OIL	FIRST 100hrs + EVERY 500hrs	16 L
6	SAE 80W/90 (API GL4 OR GL5)	WHEEL REDUCTION OIL	FIRST 100hrs + EVERY 500hrs	3.2 L
7	MINERAL BRAKE FLUID HLP-15	BRAKE OIL	1000hrs	1 L
8	ELF LEX EP2	GREASE	DAILY	NA

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Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

FILTERS & CONSUMABLES

S No.	PART NUMBER	DESCRIPTION	SERVICE INTERVAL	RQD QTY/ SERVICE
1	06.436.01.0.00	SPIN ON LUBE OIL FILTER	FIRST 100hrs + EVERY 500hrs	1
2	5H.019.001.0.00	SPIN-ON CARTRIDGE PRE FILTER for BS IV	FIRST 100hrs + EVERY 500hrs	1
3	5H.019.002.0.00	MAIN FUEL FILTER CARTRIDGE FOR BSIV	FIRST 100hrs + EVERY 500hrs	1
4	6H.411.01.0.00	SAFETY AIR FILTER ELEMENT	1000 hrs	1
5	6H.411.02.0.00	PRIMARY ELEMENT	1000 hrs	1
6	4H.1664.02.0.00	POLY V BELT	1500 hrs	1
7	53109420	FILTER ELEMENT (HYD SYSTEM)	500 hrs	1
8	53102113	AC FILTER	500 hrs	1
9	53102108	COMPRESSION BELT	1000 hrs	1
10	6112184M1	TRANSMISSION FILTER	500 hrs	1
11	3515254M1	SUCTION ELEMENT	2000 hrs	1
12	6194313M1	SUCTION STRAINER (TRANS)	2000 hrs	1
13	53111162	FILTER BS4 AIRCON	1000 hrs	1

For, PAB Engineering Works Pvt. Ltd.

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ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN : 19AAFCP2314Q2Z0

Annexure – T 6

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Engine net power, net torque and specific fuel consumption

(As per Clause -29.2.a)

SL No	Description	Remarks
1	Latest engine performance curves showing net power, net torque and specific fuel consumption of the installed engine	Attached below

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Encl: Page 1-3

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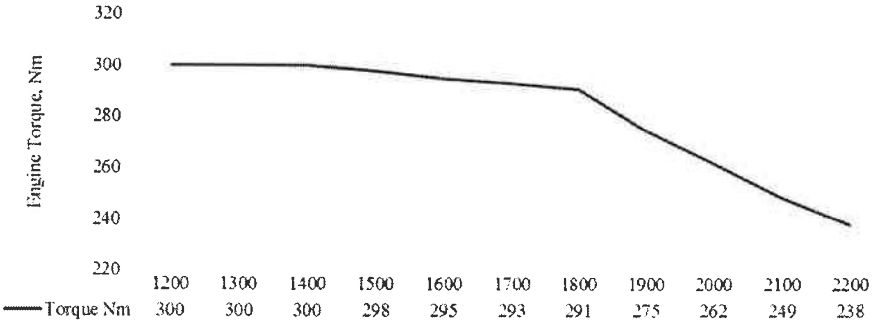
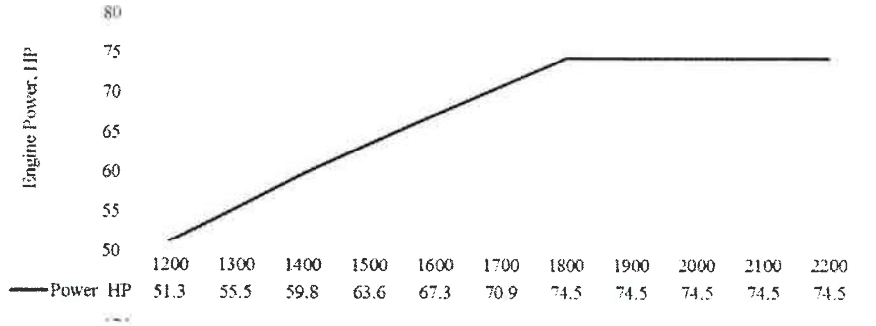
MXT840-Engine Characteristics (BS4-74.5 NA engine)
At engine level



	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
Torque Nm	300	300	300	298	295	293	291	275	262	249	238



	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
Power HP	51.3	55.5	59.8	63.6	67.3	70 9	74.5	74.5	74.5	74.5	74.5

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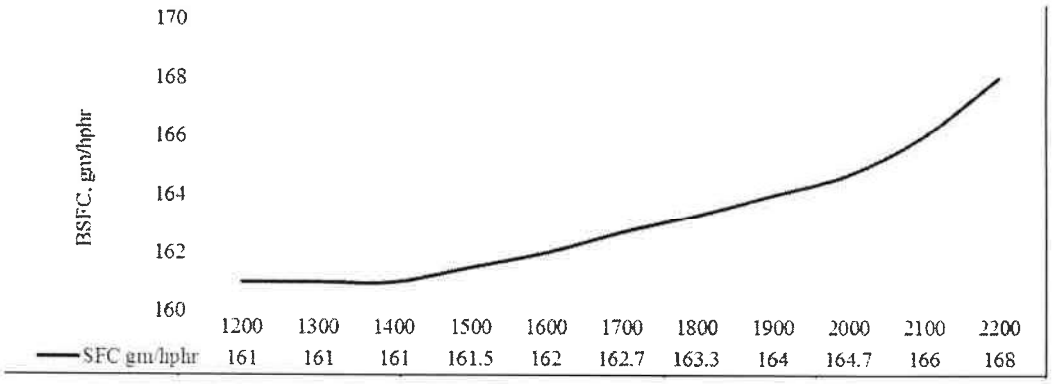
PAB ENGINEERING WORKS PVT. LTD. KOLKATA

MXT840-Specific fuel Consumption (BS4-74.5 NA engine)- At engine level



	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
SFC gm/hphr	161	161	161	161.5	162	162.7	163.3	164	164.7	166	168

MANITOU GROUP

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Fuel Consumption of MXT 840 (BS4-74.5 NA engine)
At machine level

MXT 840 NA BSIV	
Operations	**Average FC (l/hr)**
Loading	10.9
Roading	11.3
Handling	10.5
Idle	1.6

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Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 7

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Detailed technical descriptions & Specifications of the tele-handler

(As per Clause -29.2.b)

SL No	Description	Remarks
1	Detailed technical descriptions & specifications of the tele-handler	Technical Catalog attached below

For, PAB Engineering Works Pvt. Ltd.

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

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Encl: Page 1-4

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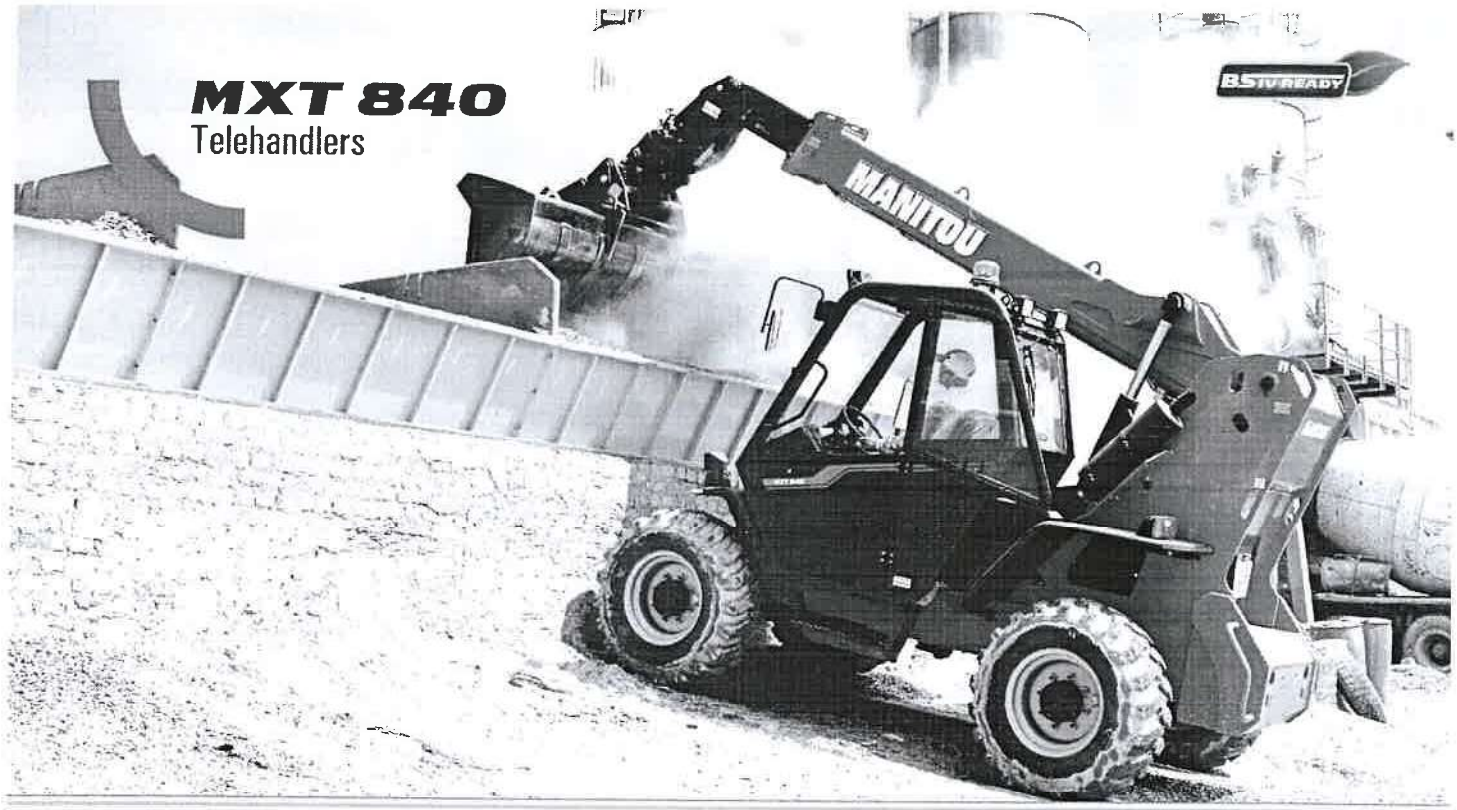


#BringTheRevolution

REACH NEW HEIGHTS

Max: Lifting Height -7.6 m/24.9 feet, Max: Lifting Capacity - 4T

MANITOU
HANDLING YOUR WORLD

MXT

WHAT IS A MANITOU TELEHANDLER?

Manitou telehandlers are handling equipment perfectly adapted to work in the most difficult conditions and terrains. Equipped with a telescopic boom, they will save you time on a daily basis when handling all types of loads in height and outreach.

Versatile and true tool carriers, they allow a wide variety of attachments to be used in a simple, fast and safe way for the operator and his working environment.

The Manitou brand also offers a wide range of services and attachments to support you throughout the life cycle of your machine.

Move Loads in All Conditions
The telescopic arm passes above obstacles and enables you to move your load safely. It also allows you to move suspended loads using an assortment of jibs, cranes and winches.

Place the load where you want to.
The MTX 840 can place loads up to 4 tons at a height of up to 7.6 meters with an outreach of up to 4.20 meters

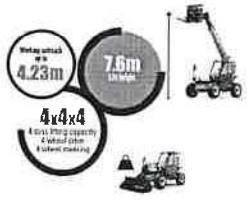
Scoop & dump
Allows you to scoop and dump the loose material in one go without giving repeated jerks to the machine.

Loading & Unloading Trucks and Containers
Carry and operations quickly on many terrains that require substantial maneuverability.

Versatility
When matched with one of our many available attachments, the MXT 840 will satisfy your construction and job sites handling needs.

Preparing and Cleaning the Ground
The drawbar pull and breakout force of the MXT 840 means it can be used to level the ground and clear excess soil and waste.

With the help of my Manitou, I am not one machine to make a multitude of applications on a daily basis. It is my toolbox.



DESIGNED FOR PERFORMANCE

A Maneuverable
All-Terrain Machine
- A turning circle of just 3.9 meters combined with 4 wheels steering.
- Gradient up to 47%
- Ground clearance of 28 cm

An ultra-manageable machine with three steering modes

Front wheel steering ideal for long distance

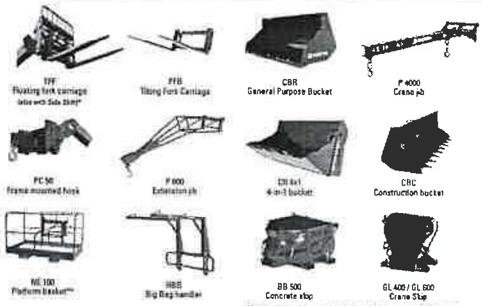
Rear wheel steer for cramped spaces

Crab steer to drive diagonally to avoid an obstacle rather than trying a multipoint turn

INCREASED VERSATILITY

The MXT 840 is a genuine tool holder. It comes with a large selection of attachments that offer users precisely the kind of versatility needed on a work site. The Manitou fork carriage enables you to change your attachment in just a few seconds...

Attachments for all your material handling needs



TFF Floating fork carriage (also with Side Shift)*; FFB Tilting Fork Carriage; CBR General Purpose Bucket; P 4000 Crane jib; PC 50 Frame mounted hook; P 600 Extension jib; CB 4x1 4-in-1 bucket; CBC Construction bucket; NE 100 Platform basket**; HBB Big Bag handler; BB 500 Concrete skip; GL 400 / GL 600 Crane Skip

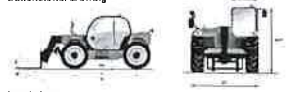
A SIMPLE AND PROVEN COUPLING SYSTEM

The Manitou fork carriage can easily change your attachment in just a few seconds.

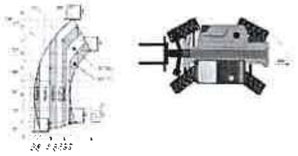
Technical Specifications

[illegible]	[illegible]	[illegible]

Dimensional drawing



Load chart



PAB ENGINEERING WORKS PVT.LTD. KOLKATA

MXT

EFFICIENCY AND PRODUCTIVITY GUARANTEED

Simplicity, driver of productivity

2 front steering wheels for excellent steering for greater safety on the road very quick and easy to use

Easy access cabin

- Grab handle to access the cab
- Non-slip steps
- Helps to reduce operator fatigue and avoid falls

Lifting/lowering of the boom, telescopic boom extension and retraction, scraping/tipping, attachment hydraulic line, dashboard & levers: easy to use start-up in less than 30 seconds

Safe cabin

The MXT 840 cab meets the level 2 FOPS/ ROPS standards. It is capable of supporting the machine rollover and protecting the operator from falling objects.

SIMPLE AND EFFICIENT MAINTENANCE

Wide access to engine compartment allows operator to inspect daily checkpoints easily

EASY ACCESSIBILITY FOR MAINTENANCE

The machine has been designed to enable easy access to the various maintenance elements:

- Wide opening engine cover
- Brake fluid fill level displayed on the dashboard
- Accessible lubrication points
- Fuel tank and battery isolator switch remain accessible with the engine cover closed

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STANDARD TELEMATICS -EASY MANAGER

- Now get digital twin of your machine on smartphone with easy manager app
- Plan your Manitou fleet better and optimise your business
  Access live machine information

Easy MANAGER | **THE CONNECTED SOLUTION** to improve your productivity.

SERVICE	Running Hours	Engine Parameters (including Fuel Level)*	Schedule Service Alert
OPERATION	Machine Status	Machine Utilization Report	
SECURITY	GPS Tracking	Geofencing	Geofencing Curfew alert

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Manitou South Asia Pvt. Ltd.

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Tel.: 011- 407 42701 E-mail: info.india@manitou-group.com Visit: www.manitou.com

1800 103 7600

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KOLKATA

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ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 8

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Layout drawings and detailed descriptions of all machinery components.

(As per Clause -29.2.c)

SL No	Description	Remarks
1	Layout drawings and detailed descriptions of all machinery components.	Enclosed

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

Encl: Page 1-22

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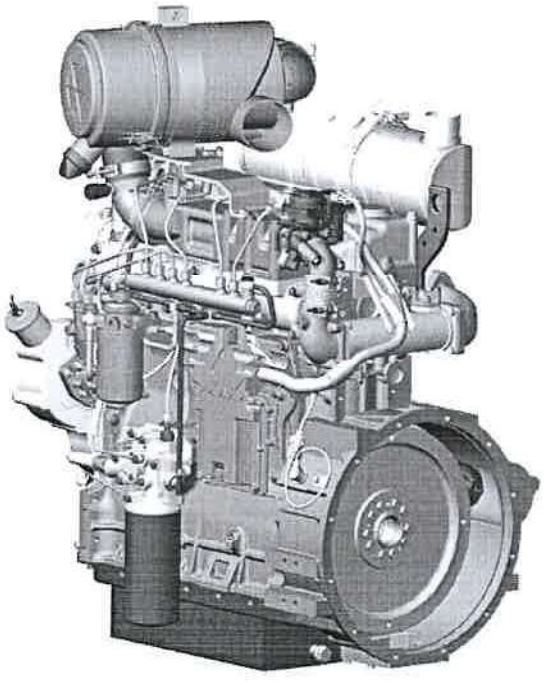
10

ENGINE



ENGINE

ENGINE	KIRLOSKAR
Type	KOEL 4R1190 NA1 BS IV
Fuel	Diesel
Number of cylinders	4 IN LINE
Suction	NATURALLY ASPIRATED
Type Of Combustion Chamber	RE-ENTRANT
Ignition sequence	1-3-4-2
Total Displacement Lts	4.76
Bore and stroke mm	110X125
Compression ratio	18+/-1:1
Min. rpm rpm	900±50
Max. rpm (No load) rpm	2332
Max. Net Power HP - kW	74.5 - 54.8 @ 2200 RPM
Maximum torque Nm	300 Nm @ 1320 RPM
Type of cooling	WATER+GLYCOL(50:50)
Fan	METALLIC / PLASTIC , SUCKER/PUSHER TYPE
Max. Speed Of Fan rpm	3334
Lubrication System	FORCED

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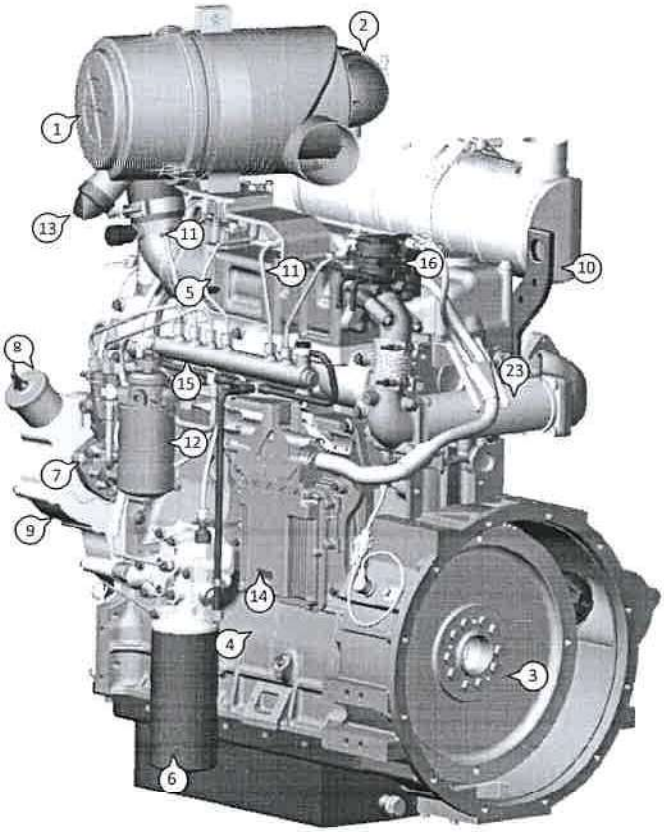
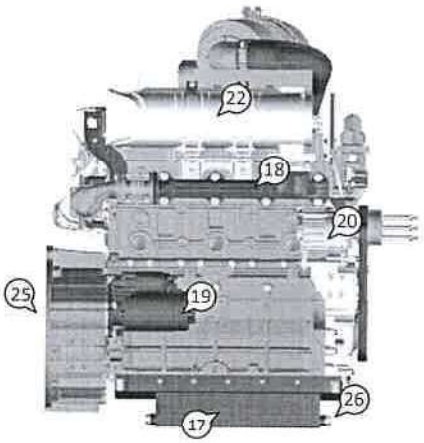
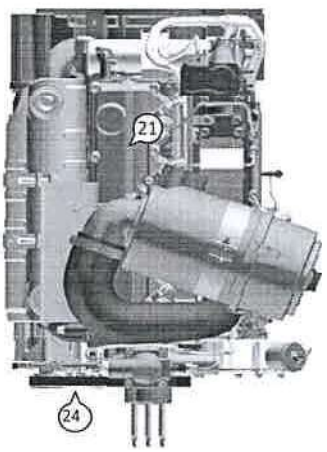
10.1 ENGINE COMPONENTS LOCATION

10.1.1 ENGINE COMPONENTS

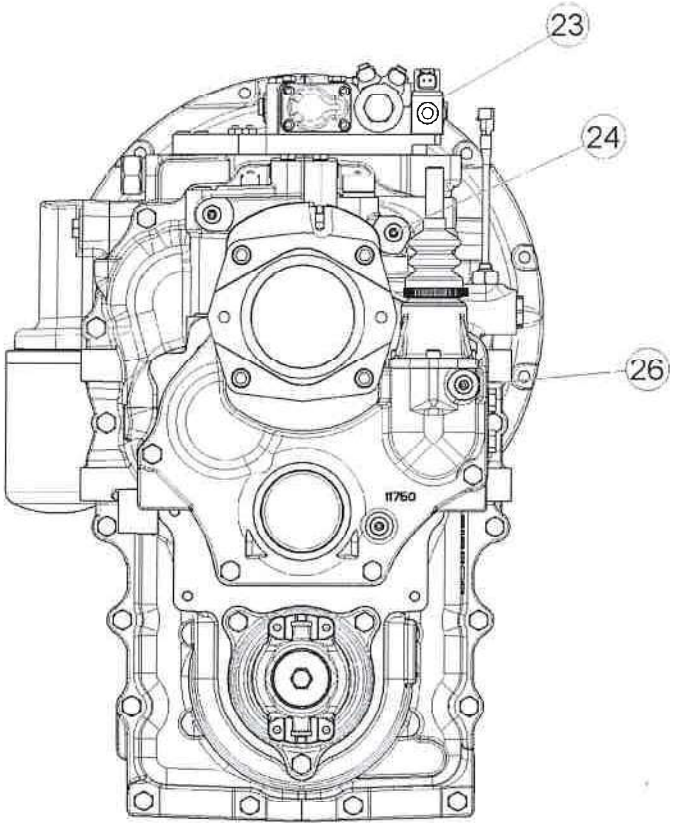




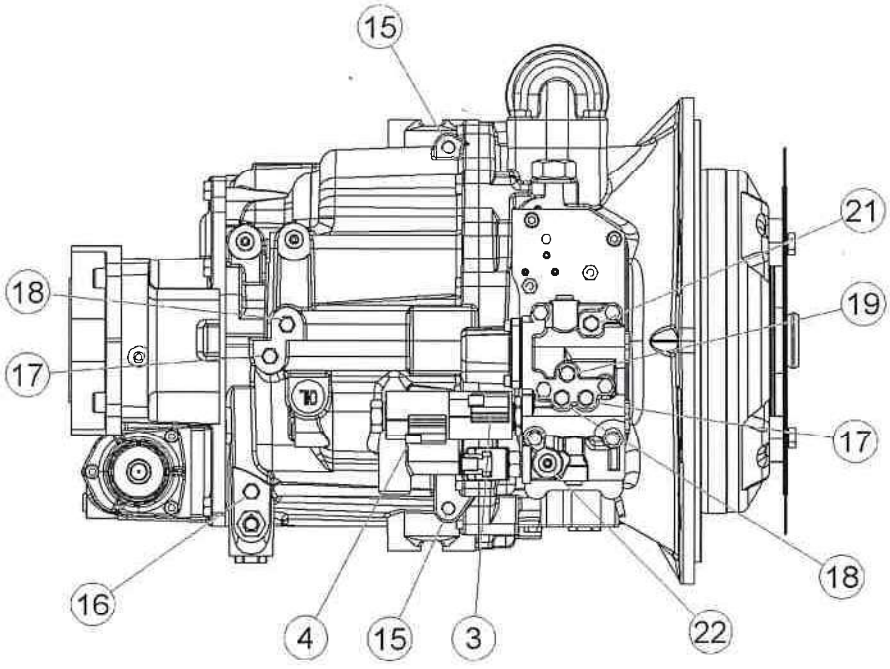
1	Air Filter Assy
2	Air Intake Hose
3	Flywheel
4	Crankcase
5	Air Inlet Manifold
6	Spin On Lube oil Filter
7	Fuel Pump (HP Pump)
8	Oil Filling Body
9	Gear Casing
10	Lifting Hook
11	HP Pipes
12	Fuel Filter with Hand Primer
13	Vacuator Valve
14	ECU
15	Common Rail
16	EGR Valve
17	Lube Oil Sump
18	Exhaust Manifold
19	Starter Motor
20	Charging Alternator
21	Rocker Cover
22	Diesel Oxidised Catalyst (DOC)
23	EGR Cooler
24	V Belt
25	Flywheel Housing
26	Drain Plug



REAR VIEW



UPPER VIEW



CAfm008320

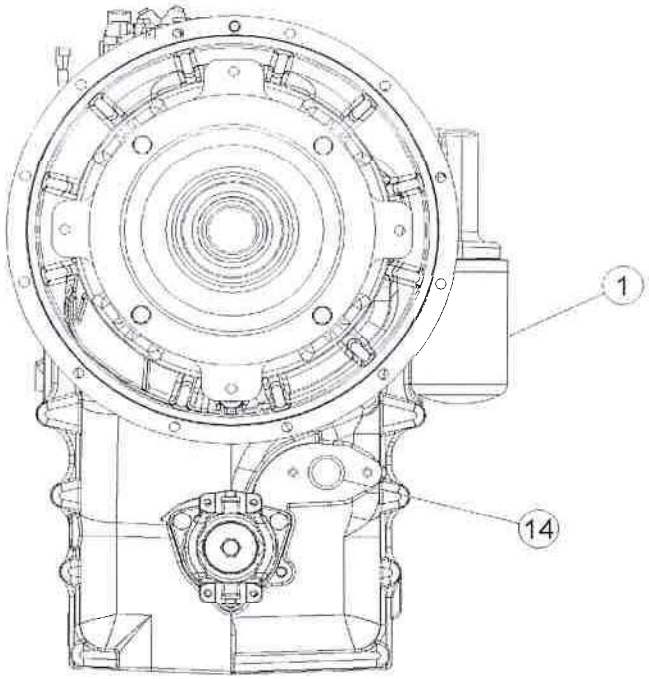
TRANSMISSION

20.1 TRANSMISSION ASSEMBLY

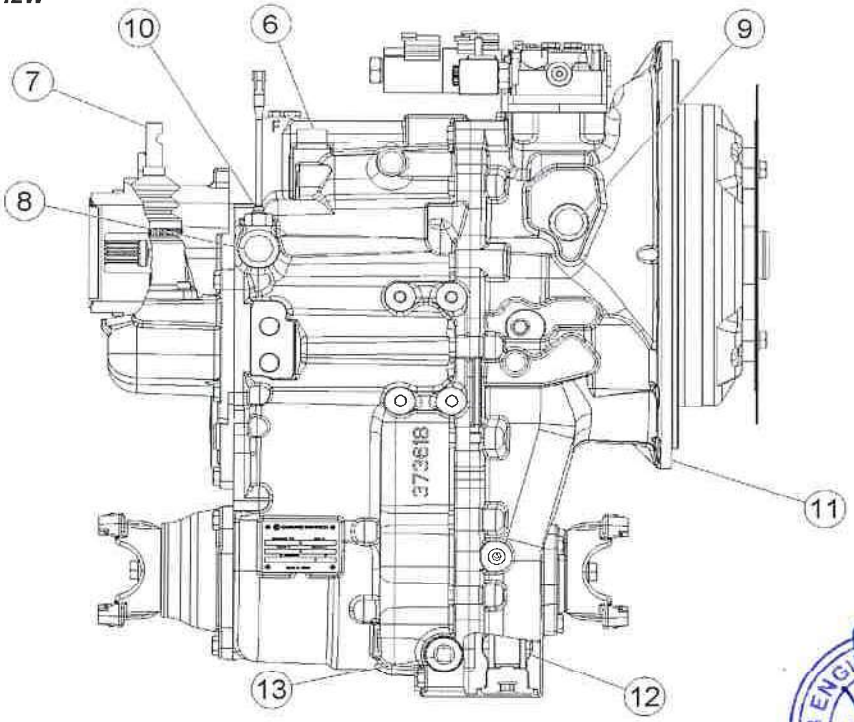
To understand the repair information presented in this section, it is necessary that the operator/mechanic be familiar with the names and locations of the major assemblies of the transmission. The following illustration identifies the components that are referred to throughout this section.

20.1.1 COMPONENTS

FRONT VIEW



RIGHT SIDE VIEW



1	*Spin-on filter (nom. 10 µm)*
2	*Oil pump group: max pressure 16 bar*
3	*Forward shift solenoid valve 28W-12V D.C.*
4	*Reverse shift solenoid valve 28W-12V D.C.*
6	*Breather plug*
7	*Speed shift lever*
8	*Oil inlet port from cooler*
9	*Oil outlet port to cooler*
10	*Oil thermostat* 105±5 °C
11	*SAE 3 torque converter housing*
12	*Suction filter (nom. 250 µm)*
13	*Magnetic oil drain plug (SW 1/2")*
14	*Dipstick fitting hole*
15	*Holes eyebolt threads for lifting*
16	*Oil cooler back pressure check point (0.5÷3.5 bar on FWD/RVS clutch position and 0.5÷5.0 bar on NEUTRAL clutch position).*
17	*FWD clutch pressure check point (11.0÷13.0 bar) max pressure in NEUTRAL (0.3 bar)*
18	*RVS clutch pressure check point (11.0÷13.0 bar) max pressure in NEUTRAL (0.3 bar)*
19	*FWD/RVS clutch pressure check point (11.0÷13.0 bar) max pressure in neutral (0.3 bar)*
21	*Converter pressure check point (0.5÷9.0 bar)*
22	*Oil outlet port to hydraulic differential lock (11.0÷13.0 bar) max pressure in NEUTRAL (0.3 bar)*
23	*Hydraulic differential lock valve 20W - 12 Vcc*
24	*Oil outlet port to brake power Minimum pressure 13 bar at 900 RPM*
25	*Speedometer interface*
26	*Oil inlet port from transport lock*

20.1.2 TRANSMISSION SERIAL NUMBER PLATE

Transmission serial number plate is located on side of the transmission case below the lever gear shift . Serial number plate provides information of Transmission manufacturer, Type of transmission, Part number and serial number of the Transmission fitted on the machine.

⚠ WARNING

DO NOT service the machine without following all safety precautions as outlined in "Safety Practices," section of this manual.

⚠ CAUTION

Before attempting to remove transmission, thoroughly clean exterior of transmission to help prevent dirt from entering during replacement process. Do not spray wa-ter or cleaning solution onto or near transmission sole-noid and other electrical components.

40.1 BRAKES - SERVICE BRAKE AND PARKING BRAKE

The service brake is the system that is designed to slow down the vehicle and bring it to a stop. The service brake is activated every time you step on the brake pedal and it distributes the braking force hydraulically to the front and rear wheels, 75% front and 25% rear, on average.

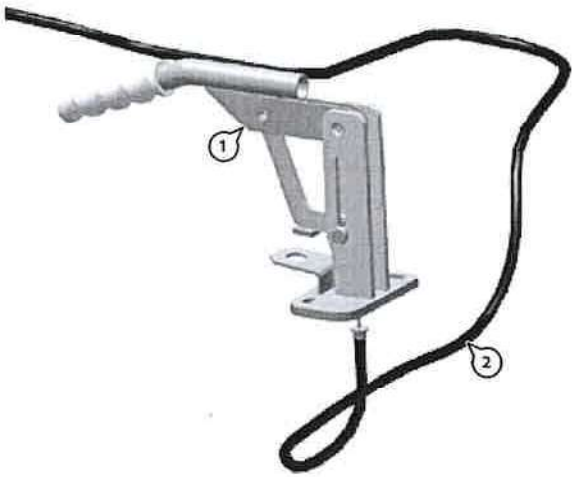
The parking brake is the brake that is designed to hold the vehicle. Parking brakes are also referred to as emergency brakes although, in an emergency they would never slow down a vehicle in a safe manner. The parking brake is typically cable operated and applies force to either dedicated brake shoes inside the rear rotor or, through the piston in the caliper. It can be operated by a seperate hand lever, usually located beside the driver's seat.

40.1.1 SERVICE BRAKE COMPONENTS

Key:
1. Brake Master Cylinder
2. Brake Master Cylinder - Push Rod
3. Hair Pin
4. Weldment Brake Pedal Pin
5. Spring
6. Service Brake Pedal
7. Pump To Brake-Hose
8. Hose-Brake Cylinder To Return Pipe
9. Hose-Brake Fluid Tank To Master Cylinder
10. Hose-Brake Cylinder To Front Axle - T-Fitting
11. Brake Fluid Reservoir.

40.1.2 PARKING BRAKE COMPONENTS

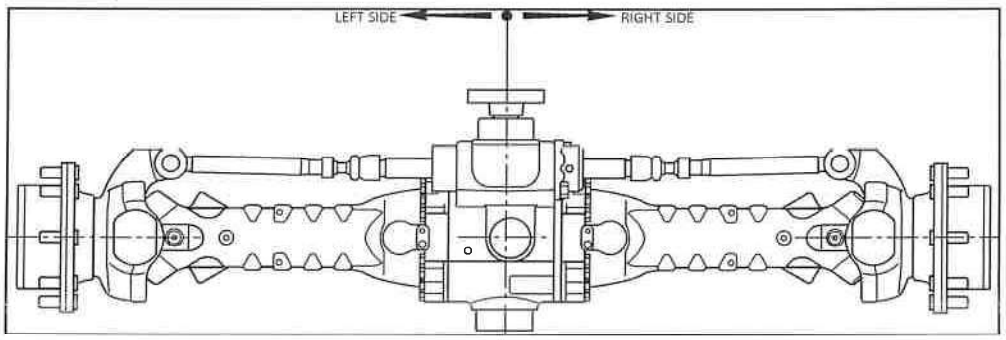
Key:
1. Hand Brake assembly
2. Brake Cable



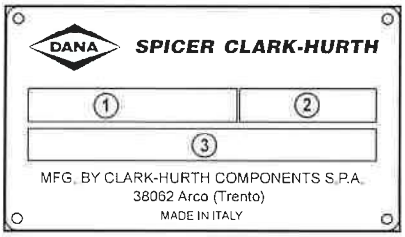
AXLE

30.1 SPECIFICATIONS

30.1.1 DEFINITION OF VIEW POINTS



30.1.2 DATA PLATE



1. Model number
2. Serial number
3. Lubricant

30.1.3 CONVERSION TABLES

UNITS OF PRESSURE

	Atm	Bar	MPa	Pa	PSI
Atm	1	1	0.1	10^5	14.4
Bar	1	1	0.1	10^5	14.4
MPa	10	10	1	10^6	144
Pa	0.00001	0.00001	10^{-6}	1	-
PSI	-	-	-	-	1

UNIT OF WEIGHT

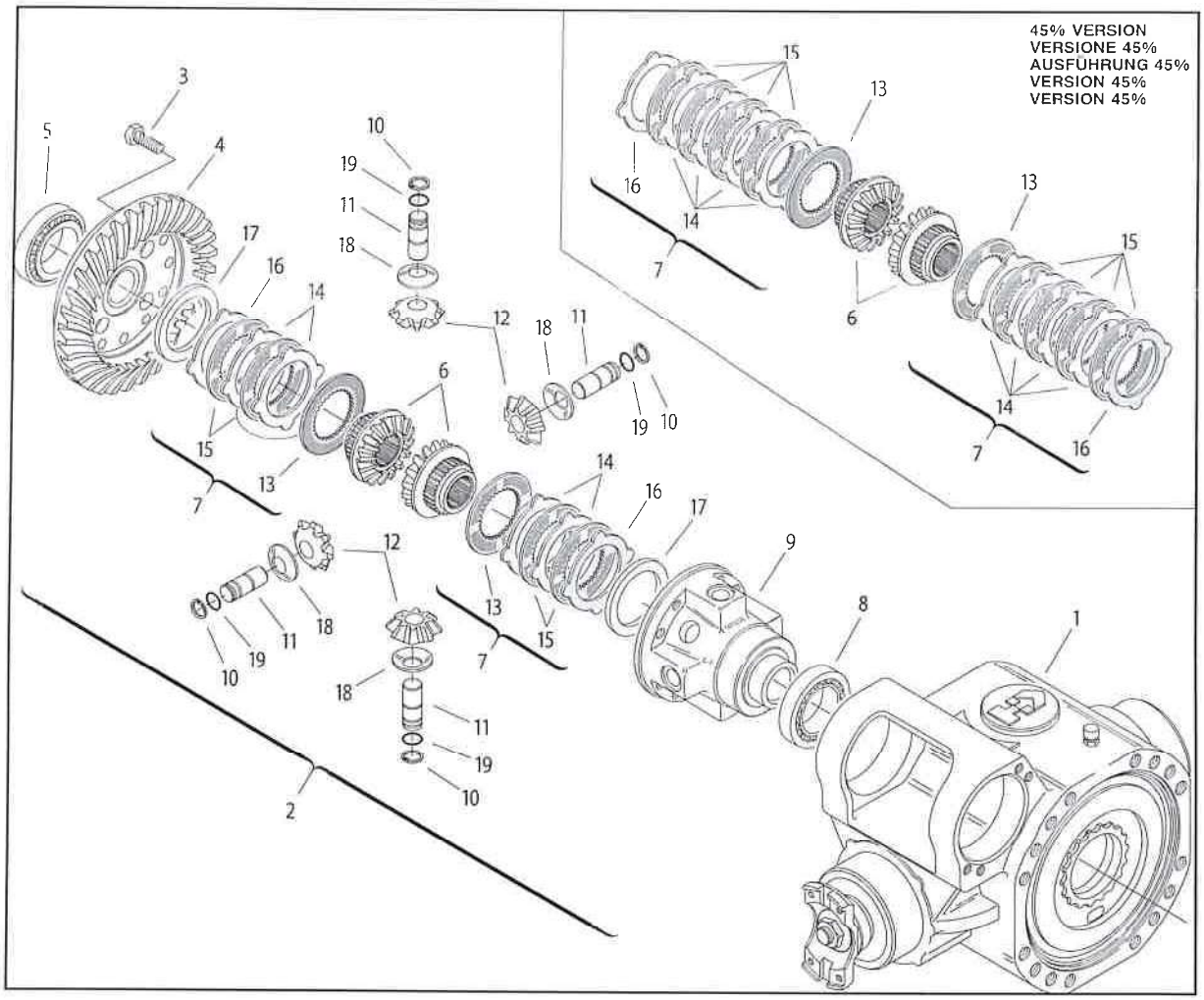
	N	daN	kN	kg	lbs
1N	1	0.1	0.001	0.102	0.225
1daN	10	1	0.01	1.02	2.25
1kN	1000	100	1	102	225
1Kg	9.81	0.981	0.00981	1	2.205

UNITS OF TORQUE

	N·m	daN·m	kN·m	kg·m	lb·in
1N·m	1	0.1	0.001	0.102	8.854
1daN·m	10	1	0.01	1.02	88.54
1kN·m	1000	100	1	102	8854
1Kg·m	9.81	0.981	0.00981	1	86.8
1 lb·in	0.1129	0.01129	0.0001129	0.01152	

30.12 LIMITED SLIP DIFFERENTIAL UNIT (25% AND 45%)

30.12.1 EXPLODED VIEW



1. Center Axle Unit
2. Complete Differential Unit
3. Cap Srew
4. Crown
5. Bearing
6. Planetary Gears
7. Friction Assembly
8. Bearing
9. Differential Unit
10. Snap Rings
11. Pin
12. Planetary Gear
13. Friction Ring
14. Intermediate Disc
15. Friction discs
16. Outer Disc
17. Spacer
18. Ring Washer
19. Lock Ring

50

BOOM

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50.1 BOOM CHARACTERISTICS AND SPECIFICATIONS

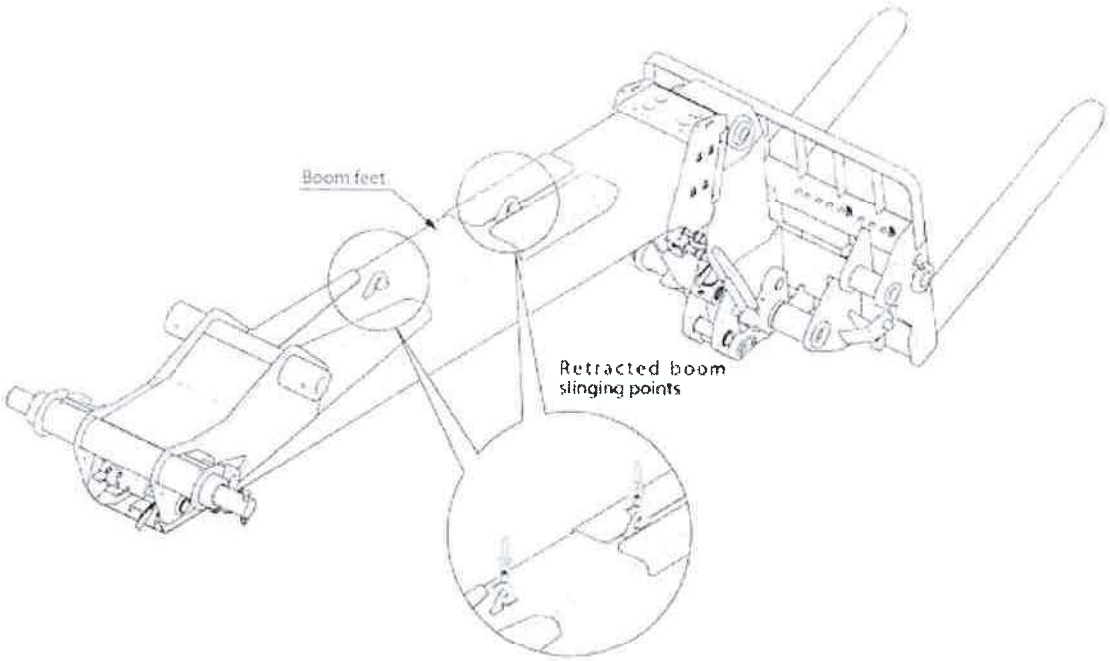
50.1.1 DUPLEX BOOM

Consisting of 2 elements:

- 1 FIXED (Boom feet)
- 1 MOBILE (T1)

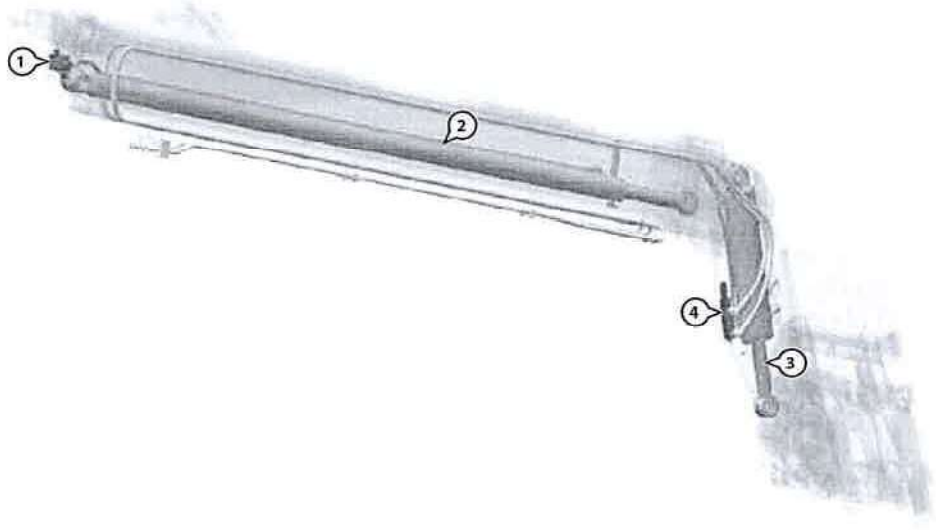
Boom weight:

- ≈ 1600 kg (3520 lbs)



50.1.2 BOOM LOCATION - DUPLEX BOOM (7 M)

Item	Designation
1	Counterbalance valve
2	Telescopic cylinder
3	Tilting cylinder
4	Tilting cylinder Valve



70.1 HYDRAULICS-GENERAL INSTRUCTIONS

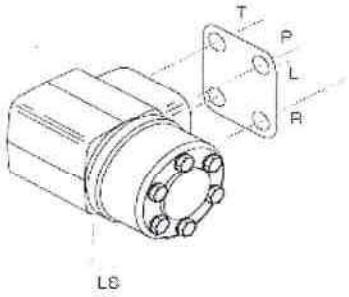
70.1.1 SAFETY INFORMATION

Petroleum-based hydraulic fluids are used in this machine. The temperature of hydraulic fluid increases during operation of various hydraulic functions. A heated petroleum-based hydraulic fluid presents a fire hazard, especially when an ignition source is present. Hydraulic fluid has a flash point that ranges from 300–600° F (150–318° C) and an auto-ignition temperature of 500–750° F (262–402° C).
Accordingly, periodically inspect all hydraulic system components, hoses, tubes, lines, fittings, etc. Carefully examine any deterioration and determine whether any further use of the component would constitute a hazard. If in doubt, replace the component. Operate the hydraulic controls after the engine has stopped to relieve trapped pressure.

A major cause of hydraulic component failure is contamination. Keeping hydraulic fluid as clean as possible will help avoid downtime and repairs. Sand, grit and other contaminants can damage finely machined surfaces within hydraulic components. If operating in an exceptionally dirty environment, change filters and inspect fluid more often. When servicing system, cap or plug hydraulic fittings, hoses and tube assemblies. Plug all cylinder ports, valves and the hydraulic reservoir, and pump openings until installation occurs. Protect threads from contamination and damage.

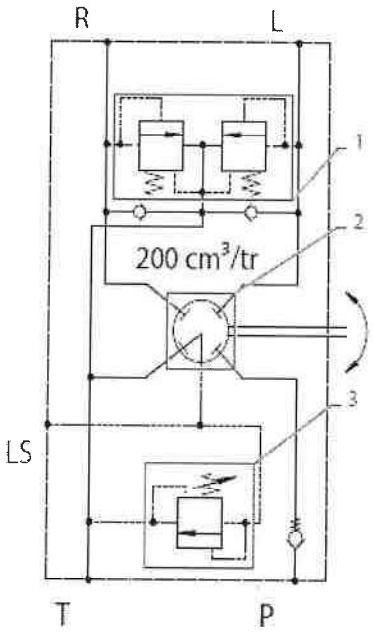
70.1.2 OSPC 200 LS STEERING BLOCK

Values for information purposes only.



Role:

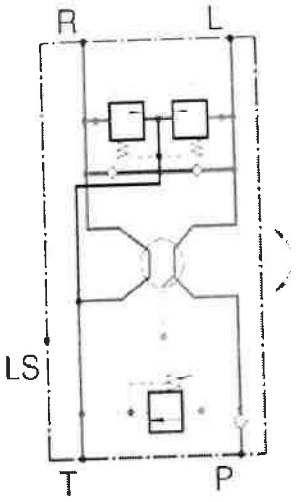
– Direct and dose the flow in order to supply the steering circuit.
– It is a rotating distributor.



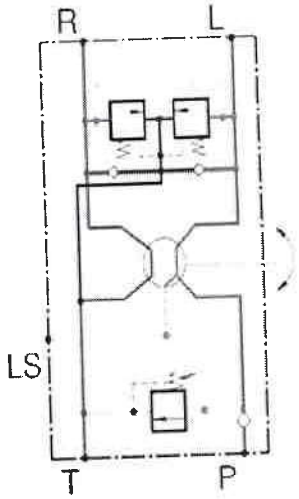
1. Secondary relief valve.
2. Distributor pump.
3. Main relief valve.

- **P** : Pressure.
- **T** : Tank return.
- **R** : Exit towards the right side.
- **L** : Exit towards the left side.
- **LS** : Pilot line.

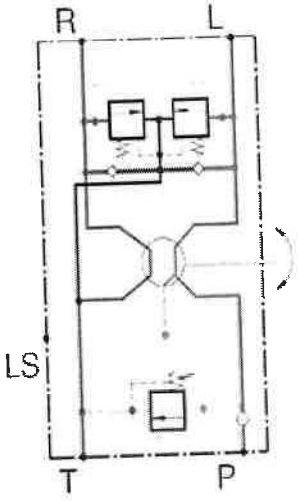
Values for information purposes only.



When the driver turns the steering wheel towards the right, he passes the flow rate from P to R and sends pilot pressure towards the divisor to get priority.



When there is an impact on a wheel, the pressure increases in the line. This pressure opens the valve which enables the resulting pressure to be evacuated and therefore protects the hydraulic and mechanical steering components.



When the wheels are on full lock, the pressure in the steering circuit rises. The LS line operates the relief valve and directs the flow to the tank.

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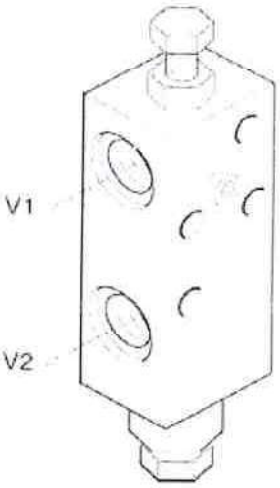
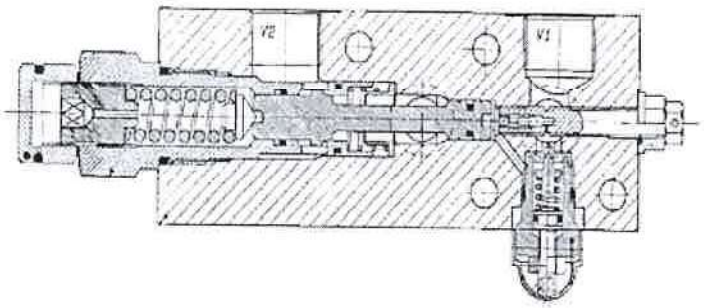
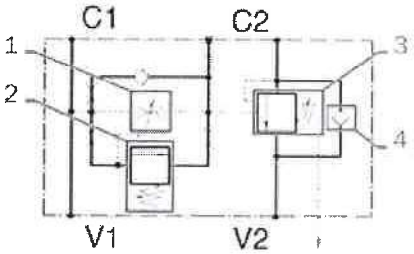
70.1.3 PILOT SAFETY VALVE

Values for information purposes only.



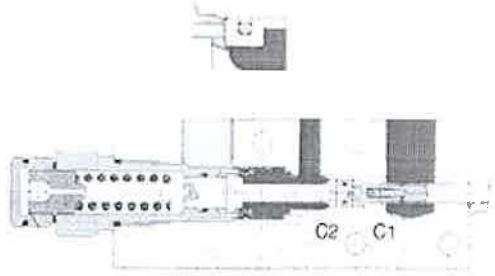
Role:
– Insulates the cylinder in case of hose breakage.
– Cylinder movement requires the starting of the I.C. engine.
– Limits max. pressure from impacts.

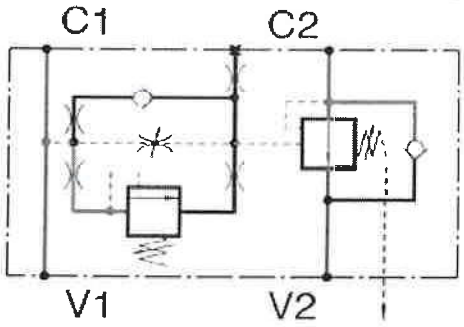




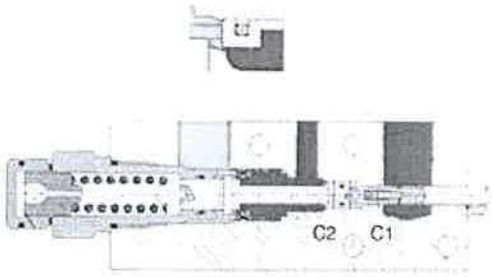
1 - Temporization screws.
2 - By-pass valve.
3 - Slide with max. adjustment screw.
4 - One way valve.

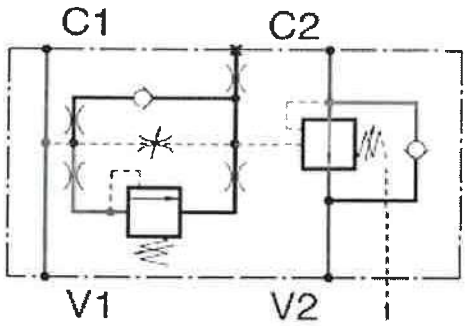
Values for information purposes only



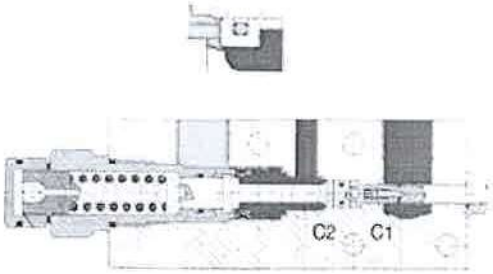


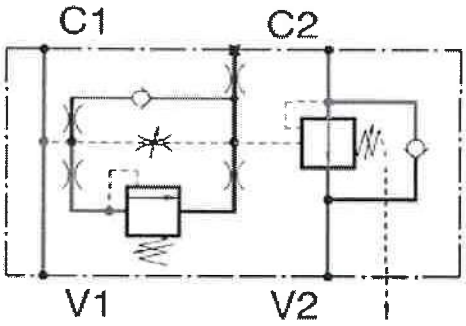
Return control during cylinder descent.





When a position is secured, no component is able to exert sufficient pressure to open the valve. Only a pressure peak due to an impact can open it.

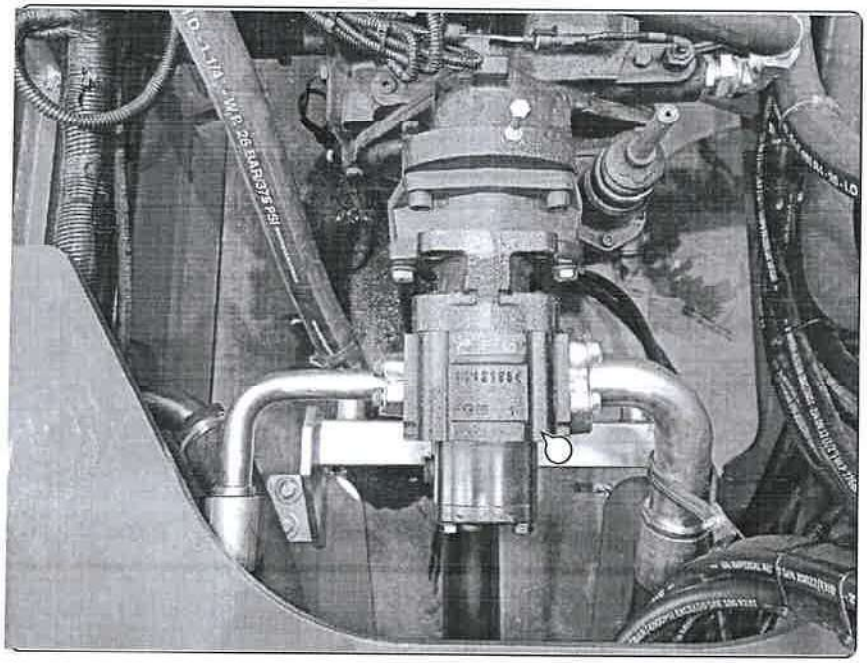




When the cylinder is pushed, the supply (no-return valve to pass) and return are free.

70.3 GEAR PUMP-REMOVAL AND INSTALLATION

70.3.1 COMPONENT LOCATION

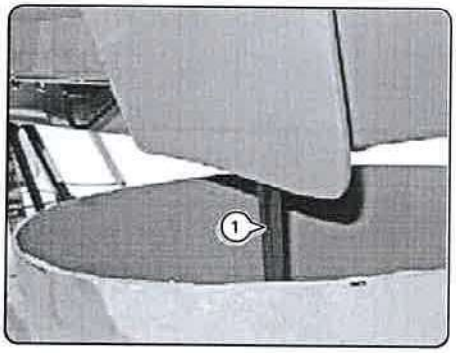


70.3.2 PREPARATION AND SAFETY INSTRUCTIONS

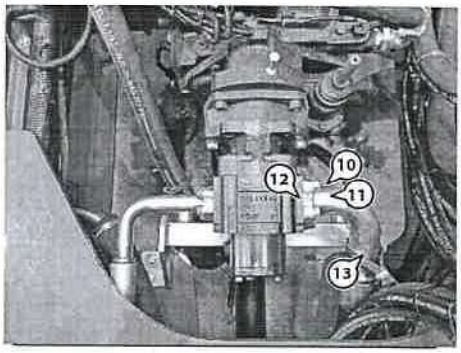
- Stabilize the machine on level ground, fully retract the boom,place transmission control lever in neutral position.
- Ensure the engine is Shut OFF.
- Disconnect the battery

70.3.3 PROCEDURE

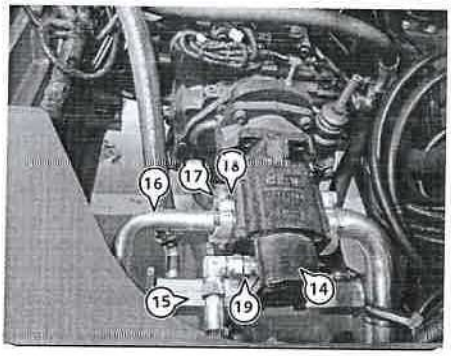
⚠ CAUTION
Hot oils and fluids must be left to cool down before performing any disassembly procedure.



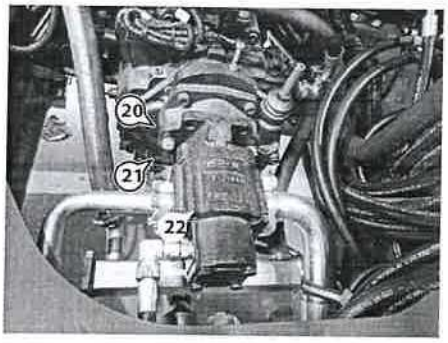
Drain the Hydraulic Oil (1)



- Uninstall the 4 Hex socket head bolts (10) and lock Washers(11) and remove the split flanges (12)
- Remove the Suction Hose (13) .



- Uninstall the Hose- Pump to Brake(15) and the adapter (19) from the Gear Pump(14).
- Uninstall the Hex Socket Head Bolts(17) and Split Flange Half (18) and remove the Hose-Pump to Main Valve(16).



- Uninstall the 2 Hex head bolts (20) and Washers(21) and remove the hydraulic pump assembly (22) by pulling out.

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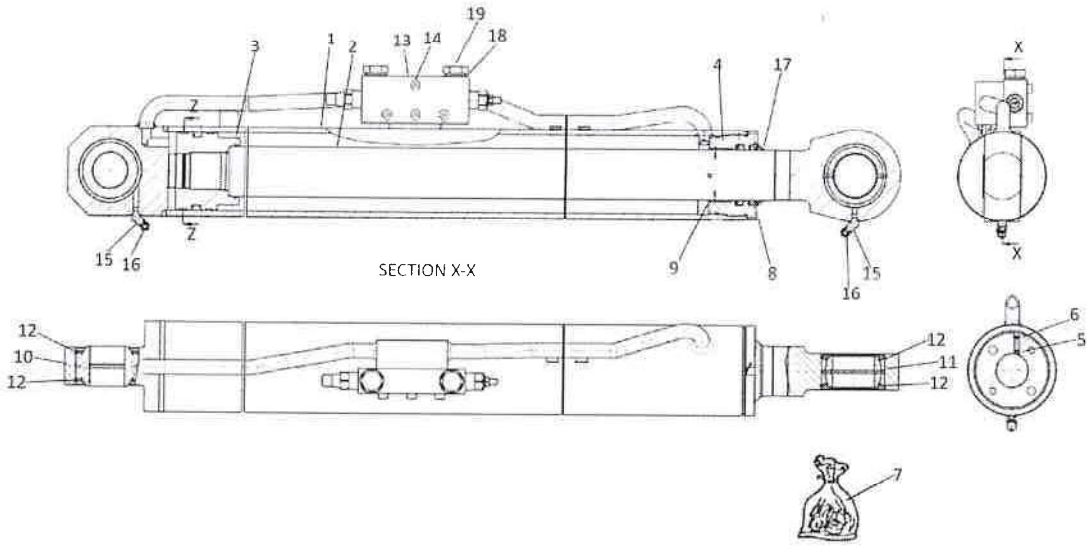
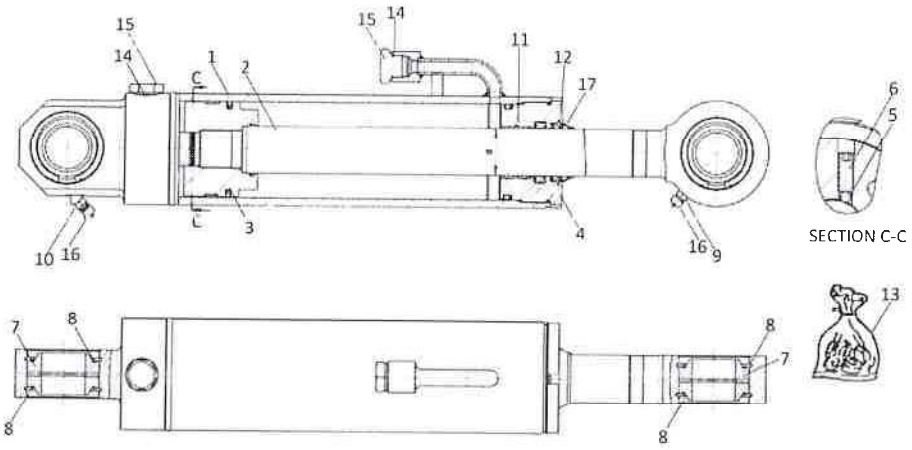
70.6 CYLINDER DRAWINGS

70.6.1 LIFT CYLINDER



Item	Part No.	Name	Qty
1	53108028	TUBE S/A	1
2	53108023	PISTON ROD S/A	1
3	53108024	PISTON	1
4	53108025	HEAD END COVER	1
5	53108026	STEEL BALL	1
6	53108027	SCREW	1
7	53108029	SEAL KIT	1
8	53108030	SNAP RING	1
9	53108031	BIMETAL BUSH	1
10	53108032	SPHERICAL BEARING	1
11	53108033	SPHERICAL BEARING	1
12	53108034	CIRCLIP	4
13	53108035	MANIFOLD BLOCK	1
14	53108036	SCREW	4
15	53108037	GREASE NIPPLE	2
16	53108038	GN PROTECTION CAP	2
17	53108039	WIPER GUARD	1
18	53108040	BONDED SEAL	2
19	53108041	PLUG	2

70.6.2 COMPENSATION CYLINDER



Item	Part No.	Name	Qty
1	53108042	TUBE S/A	1
2	53108043	PISTON ROD S/A	1
3	53108044	PISTON	1
4	53108045	HEAD END COVER	1
5	53108026	STEEL BALL	1
6	53108027	SCREW	1
7	53108046	SPHERICAL BEARING	2
8	53108047	CIRCLIP	4
9	53108048	GREASE NIPPLE	1
10	53108037	GREASE NIPPLE	1
11	53108049	BIMETAL BUSH	1
12	53108050	SNAP RING	1
13	53108053	SEAL KIT	1
14	53108051	O-RIN	2
15	53108041	PLUG	2
16	53108038	GN PROTECTION CAP	2
17	53108052	WIPER GUARD	1

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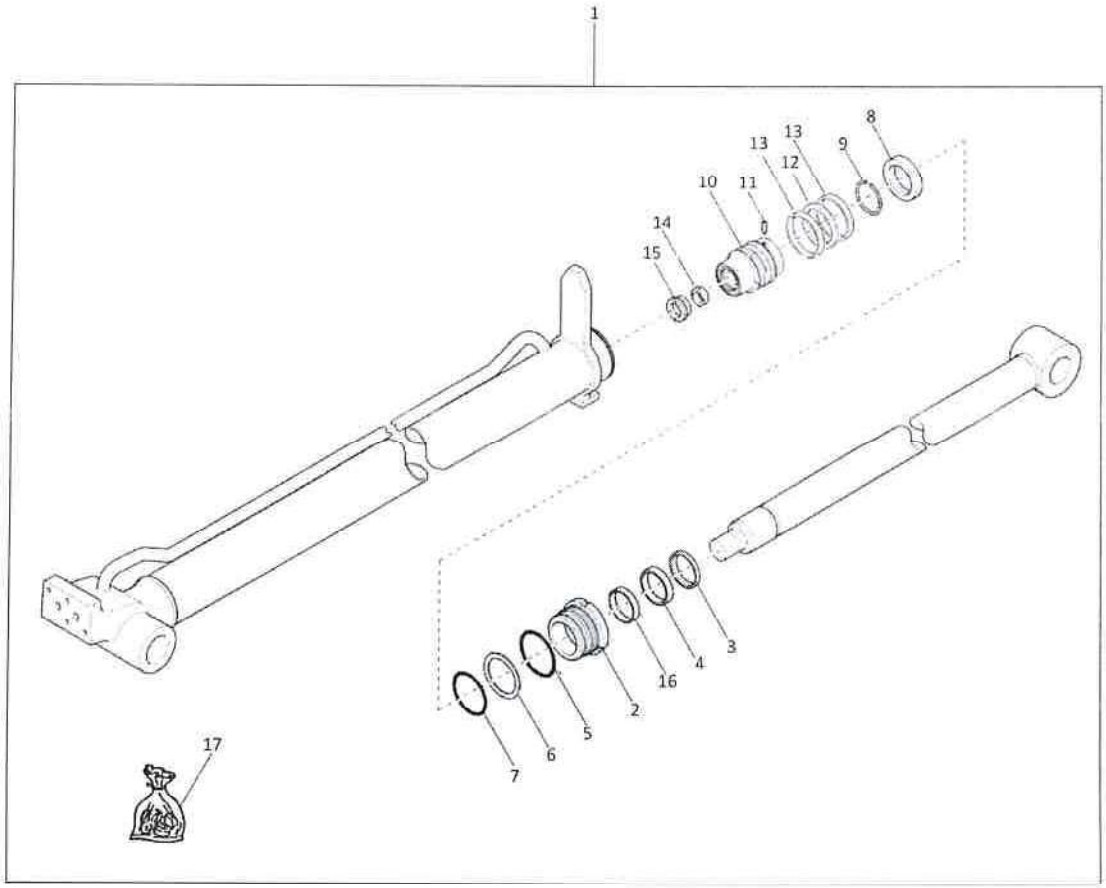
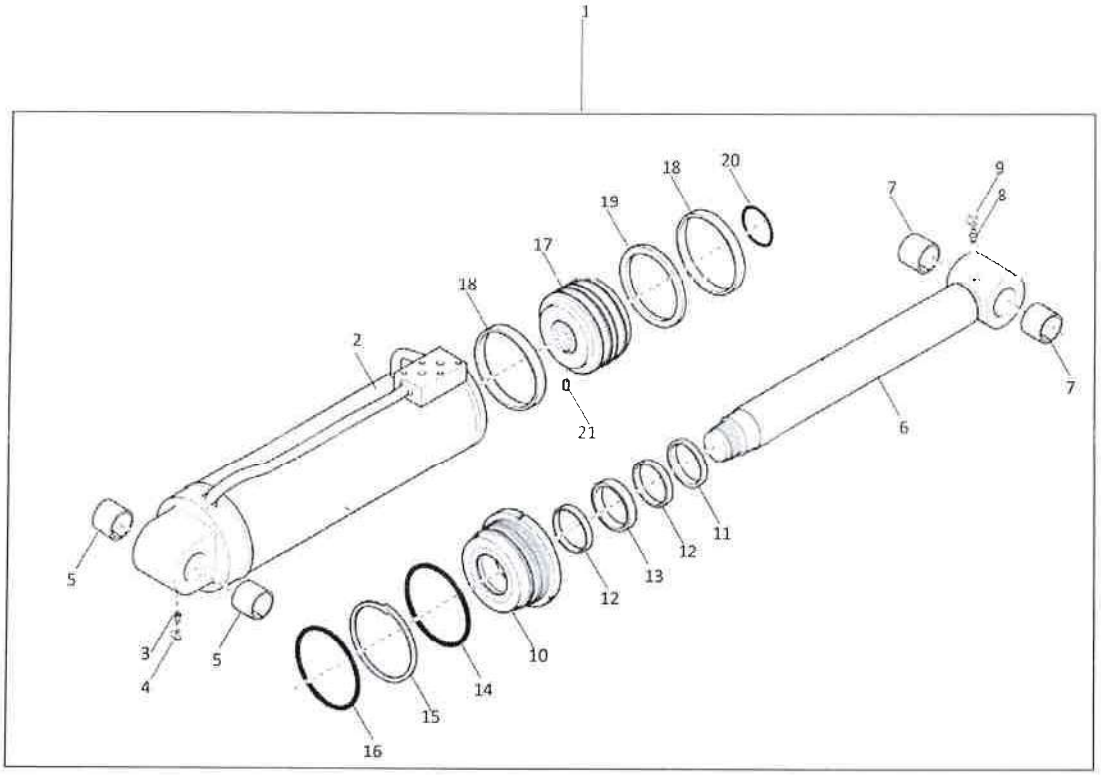
70.6.3 TELESCOPE CYLINDER



Item	Part No.	Name	Qty
1	240930	TELESCOPE CYLINDER	1
2	603528	FASTENING RING	1
3	239270	SEAL	1
4	601873	SEAL	1
5	187453	O-RING	1
6	561330	ANTI-EXTRUSION SEAL	1
7	603529	O-RIN	1
8	562911	BUSHING	1
9	161784	SNAP RING	1
10	562914	CYLINDER PISTON	1
11	31140	STUD BOLT AHC, M8-25-33H-ZN8/C, M8	1
12	603530	SEAL	1
13	603531	SEAL	2
14	550701	BUSHING	1
15	562789	BUSHING	1
16	564675	WATERING SEAL	1
17	603532	SEAL KIT	1

70.6.4 TILT CYLINDER



Item	Part No.	Name	Qty
1	264265	TILTING CYLINDER	1
2	746257	CYLINDER BODY	1
3	125963	grease nipple	1
4	192777	COVER	1
5	227111	BUSHING	2
6	746256	CYLINDER ROD	2
7	227111	BUSHING	2
8	125963	grease nipple	1
10	705012	FASTENING RING	1
9	192777	COVER	1
11	5241	SEAL	1
12	943022	SEAL	2
13	603659	SEAL	1
14	133028	O-RIN	1
15	705013	ANTI-EXTRUSION SEAL	1
16	601932	O-RIN	1
17	563201	PISTON	1
18	563199	SEAL	2
19	563200	SEAL	1
20	4040	O ring	1
21	199446	Cone-pint set screw	1
22	603540	SEAL KIT	1

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company
CIN No. U29130WB2009PTC138256

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 9

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Performance curves for all motions

(As per Clause -29.2.d)

SL No	Description	Remarks
1	Performance curves for all motions	attached below

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

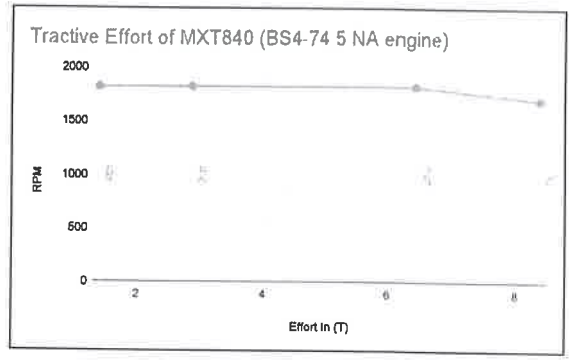
PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Encl: Page 1

Corporate Office : The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
Phone No. : 033 4008-9503/ 4008 9603, e-mail : pab.kolkata@gmail.com
Branch Office : 3, Chadda Badi, Nehru Nagar, Bilaspur 495001 (C.G.)
Ph. : 07752-407803, 433900, E-mail : pab_eng@yahoo.com, marketingpab@gmail.com

Tractive Effort of MXT (BS4-74.5 NA engine)

Machine 840-NA-BS4			Tire Skid / Engine Lagging
With 4T Load			
Gear	RPM	Effort In (T)	
1st	1700	8.4	Skid
2nd	1825	6.45	Skid
3rd	1825	2.89	Lagging
4th	1820	1.42	Lagging



MANITOU GROUP

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company

CIN No. U29130WB2009PTC138256

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 10

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Layout drawings and complete hydraulic and air circuit with detailed descriptions of all components

(As per Clause -29.2.e)

SL No	Description	Remarks
1	Layout drawings and complete hydraulic and air circuit with detailed descriptions of all components.	Technical Catalog attached below

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Encl: Page 1-28

Corporate Office The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
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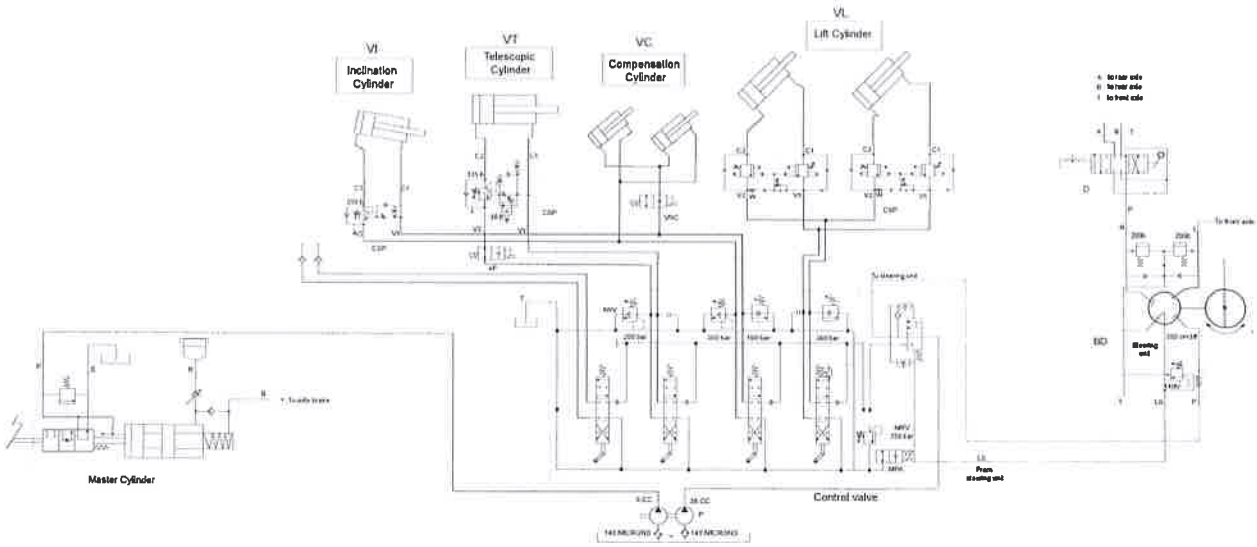
HYDRAULICS

70.8 HYDRAULIC SCHEMATIC DIAGRAM

70.8.1 HYDRAULIC SCHEMATIC WITH AGGRAVATING VALVE



VI	TILT CYLINDER
VT	TELESCOPIC CYLINDER
VC	COMPENSATION CYLINDER
VL	LIFT CYLINDER
CSP	COUNTER BALANCE VALVE
VNC	COMPENSATION LOCKING VALVE
PA	ATTECHMENT VALVE
CA	SUCTION STRAINER
M	ENGINE
P	HYDRAULIC PUMP

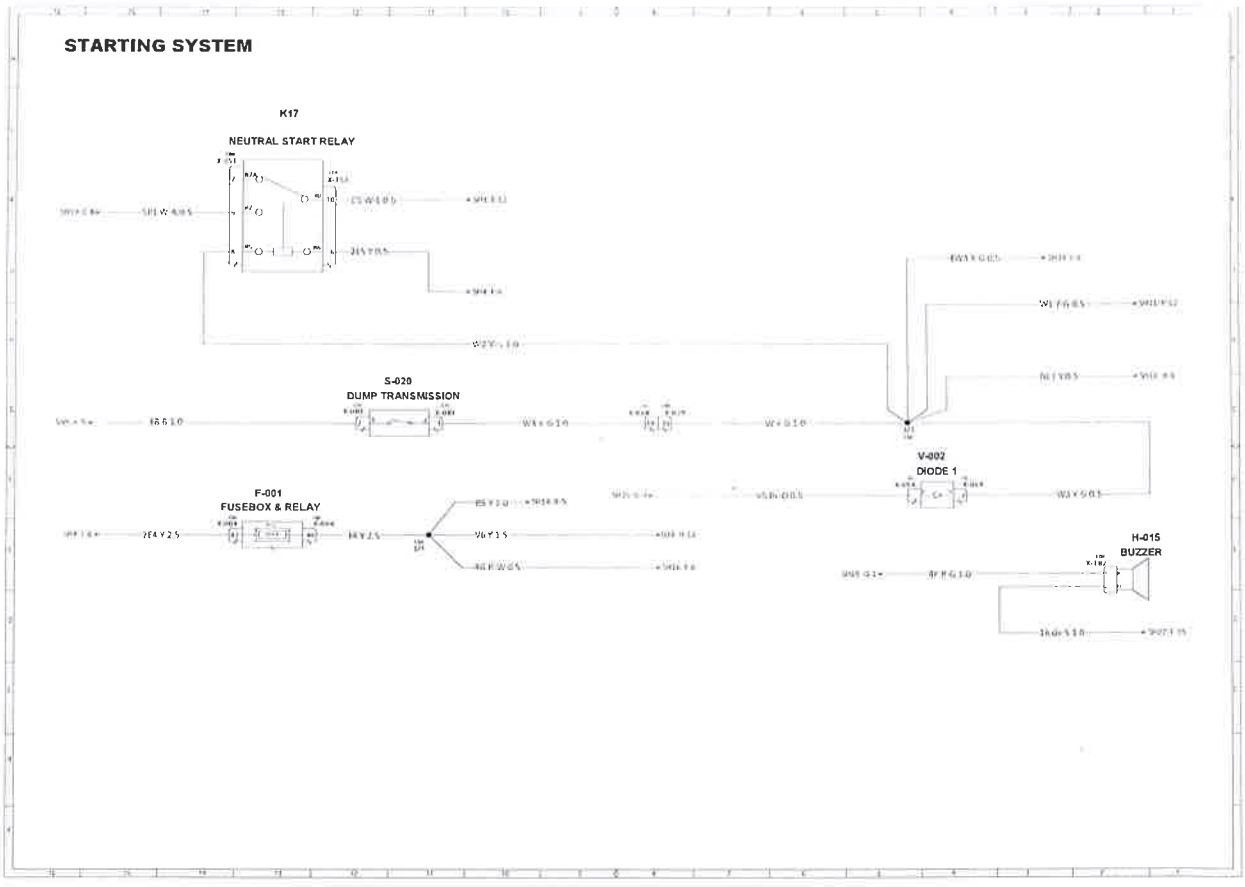
BD	STEERING BLOCK
D	STEERING SELECTOR
AP	AGGRAVATING CUT-OFF
MPA	MOVEMENT CUT-OFF VALVE

80

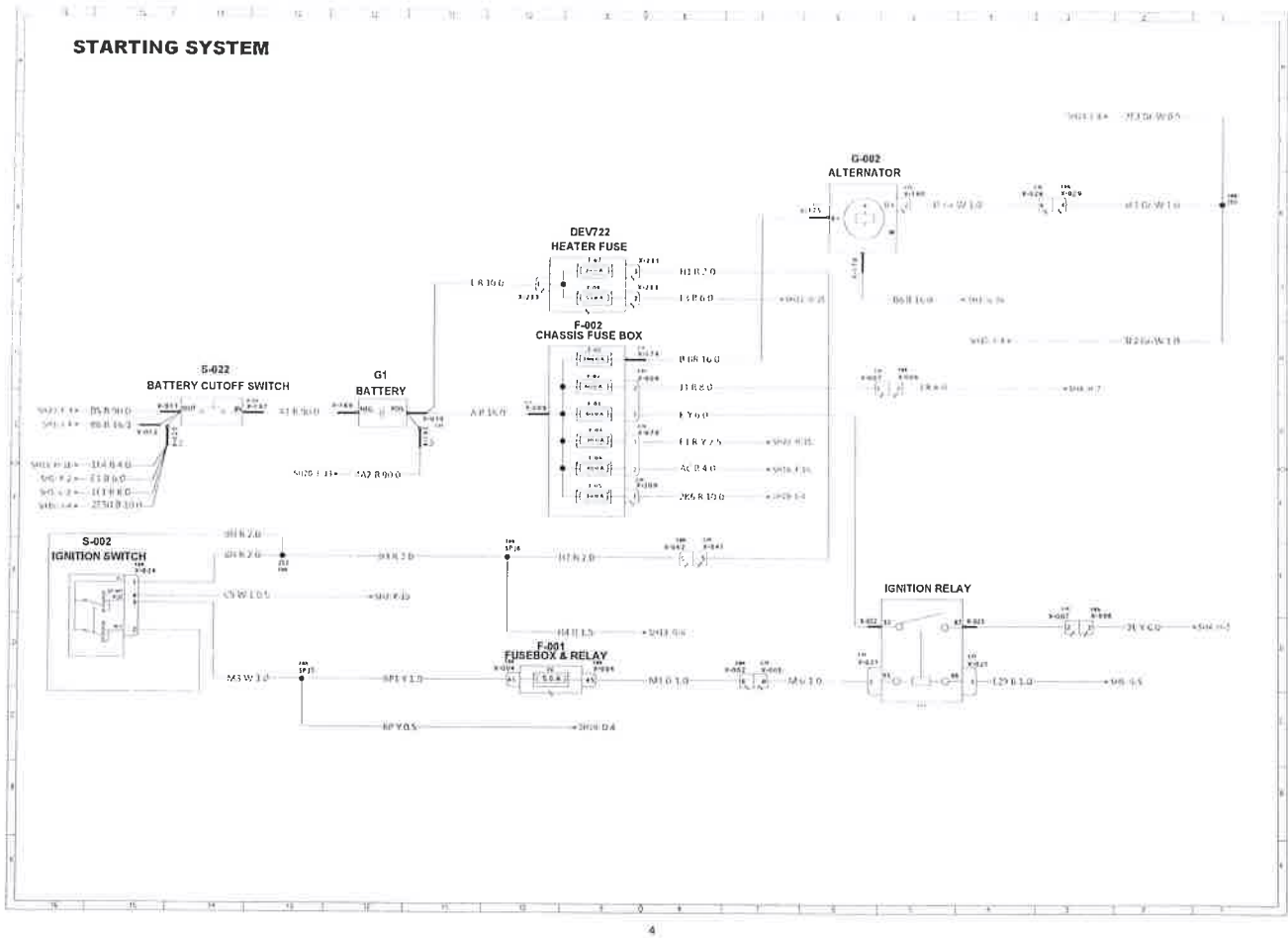
ELECTRICITY

80.1 ELECTRICAL SCHEMATIC

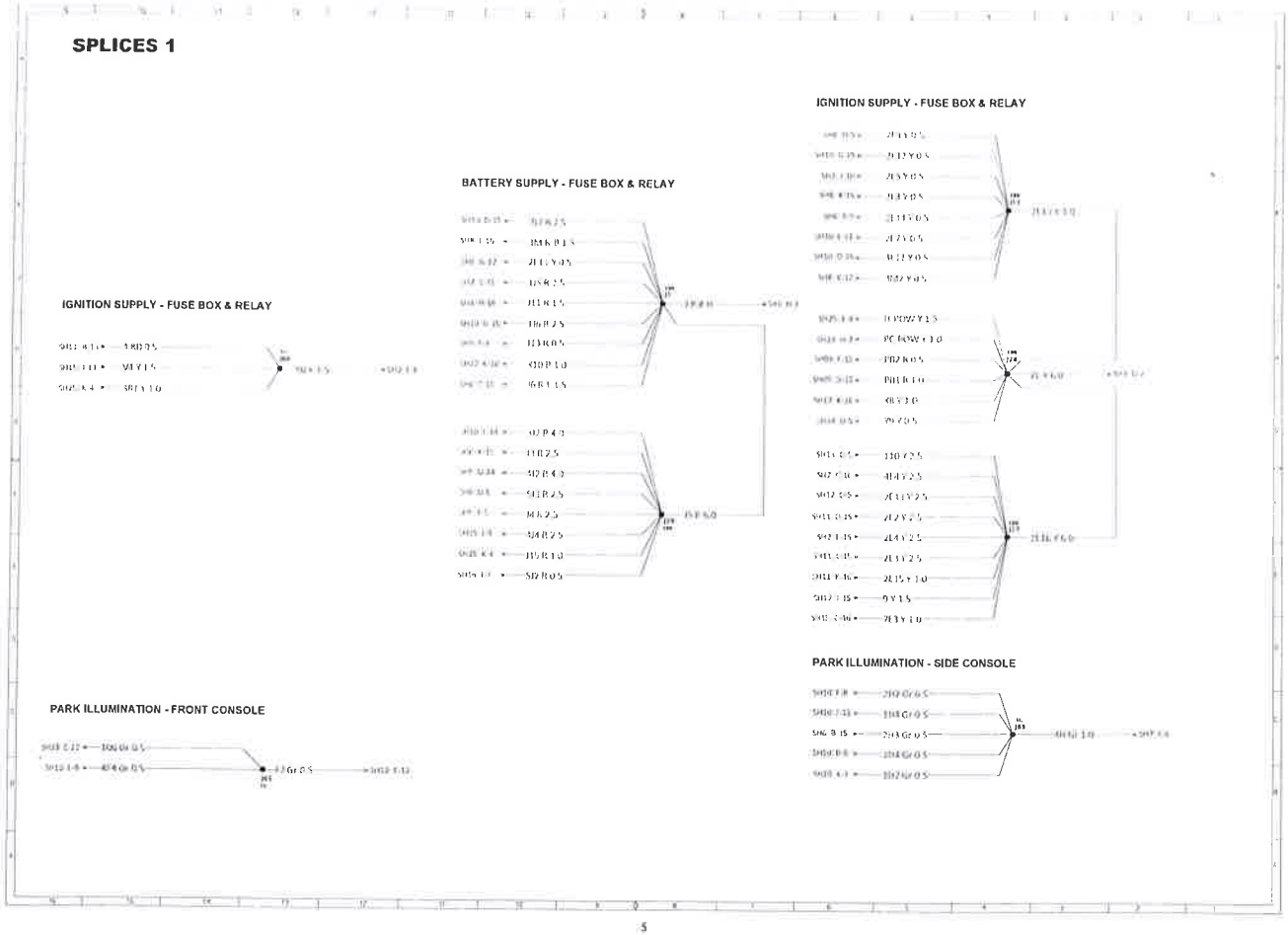
80.1.1 STARTING SYSTEM (SH 02)



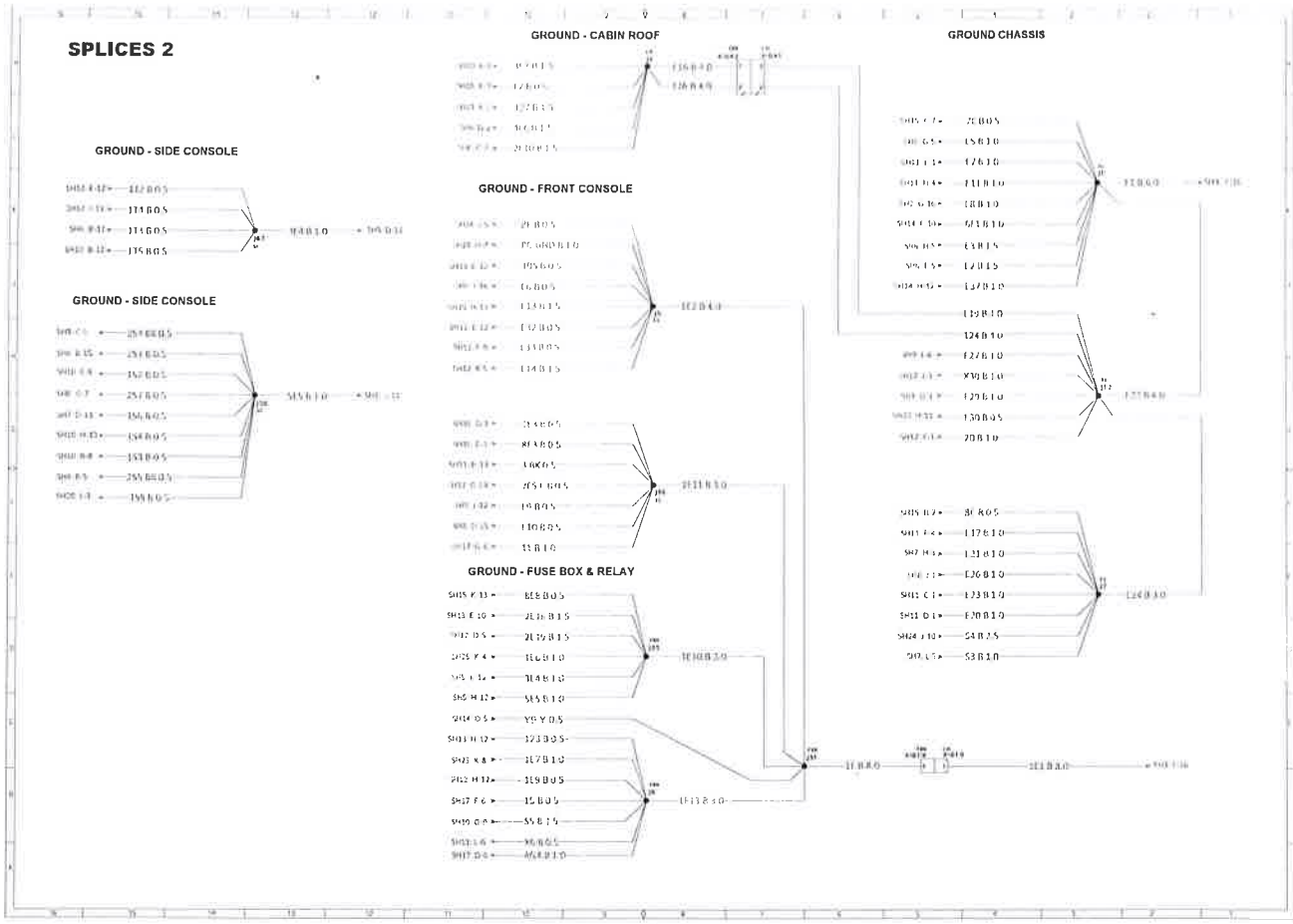
80.1.2 STARTING SYSTEM (SH 03)



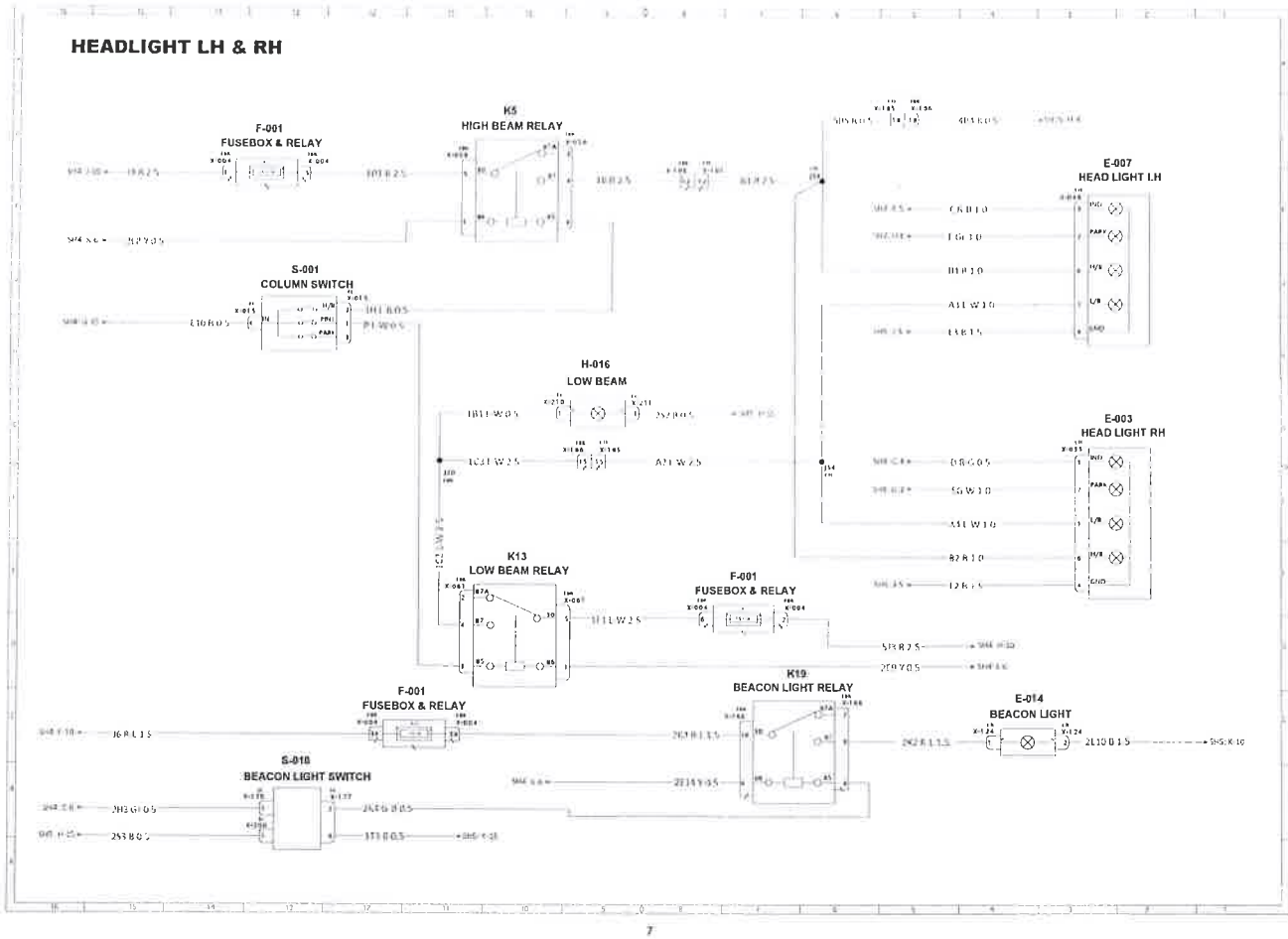
80.1.3 SPLICES 1 (SH 04)



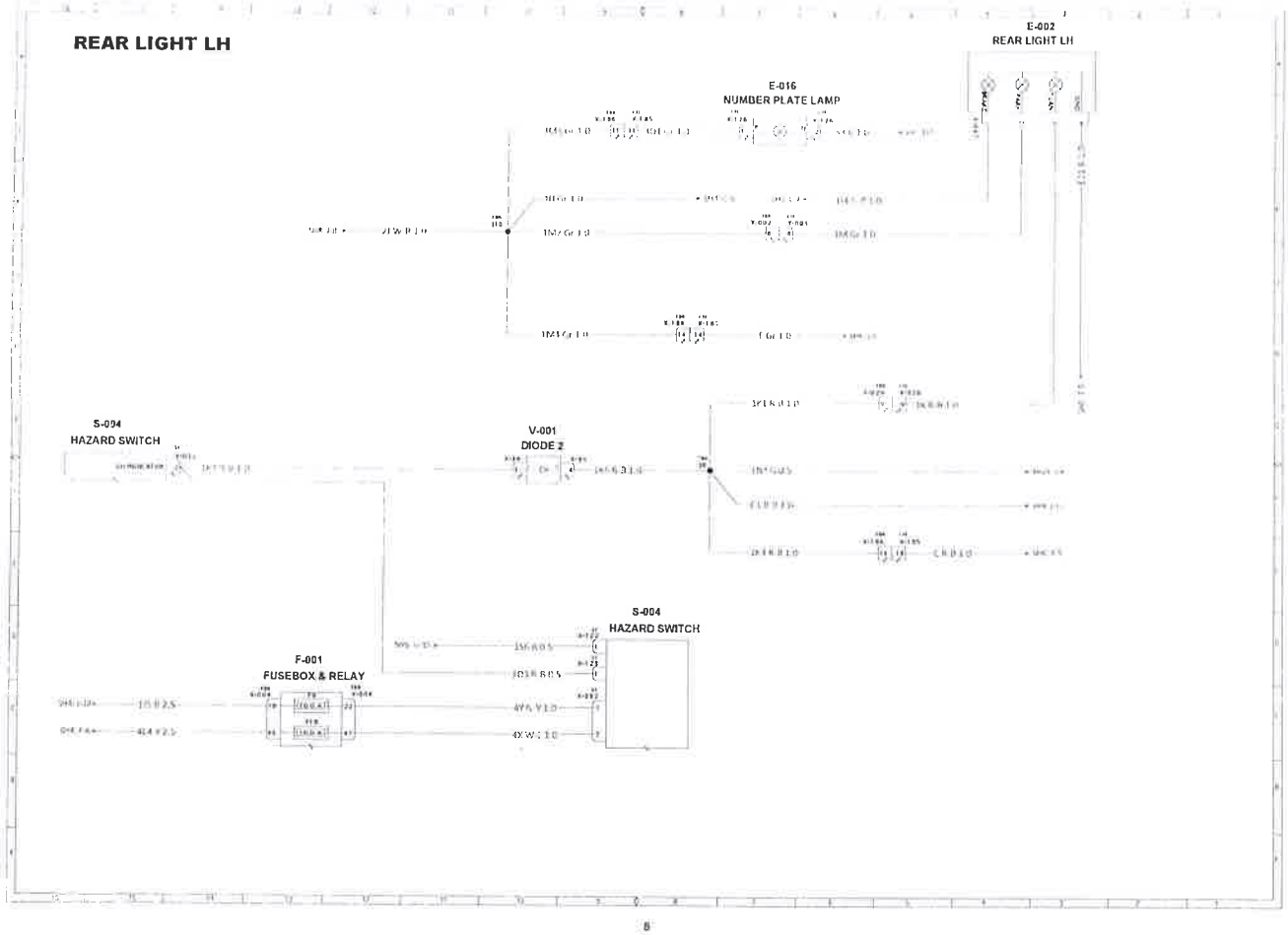
80.1.4 SPLICES 2 (SH 05)



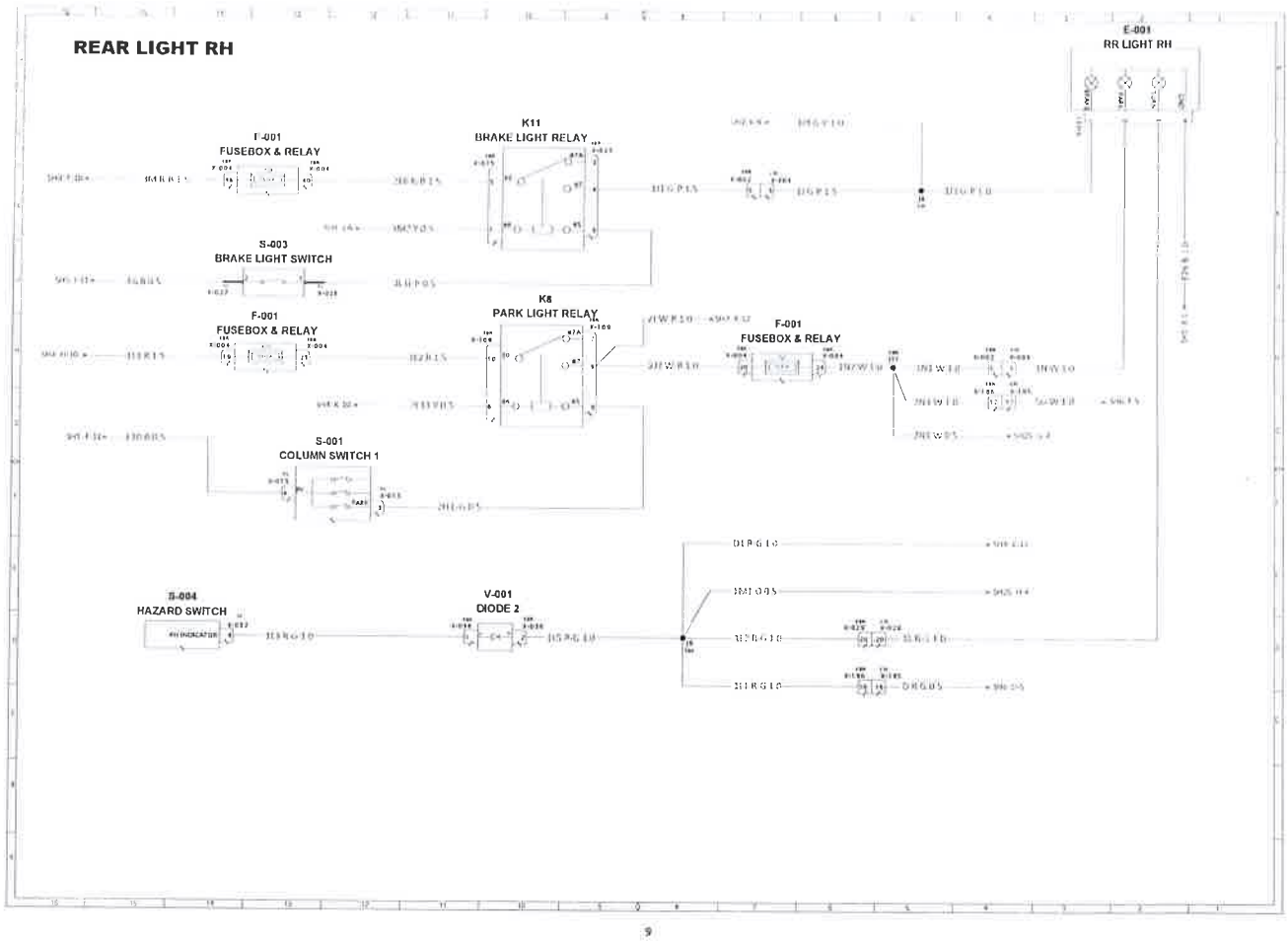
80.1.5 HEAD LIGHT LH & RH (SH 06)



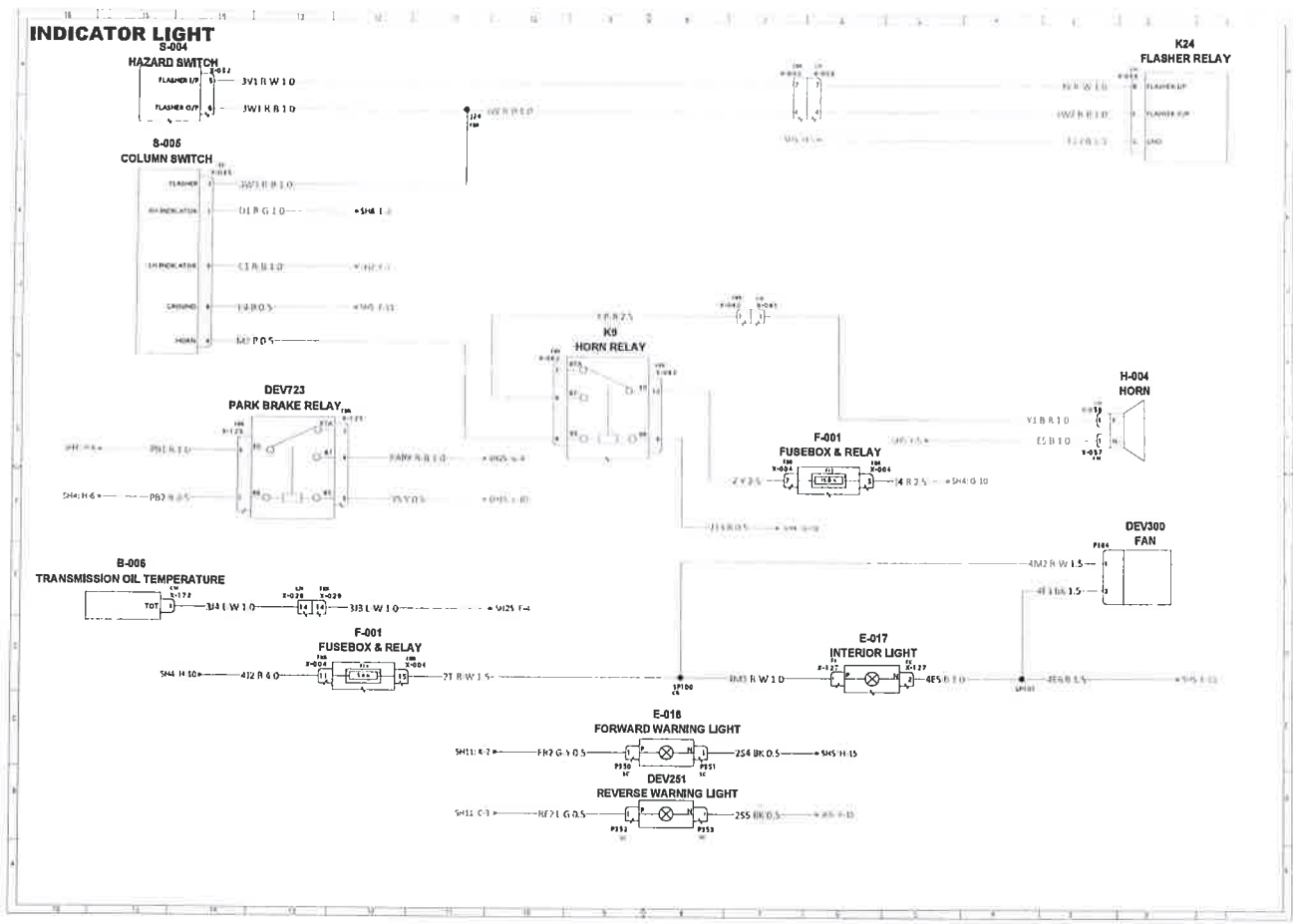
80.1.6 REAR LIGHT LH (SH 07)



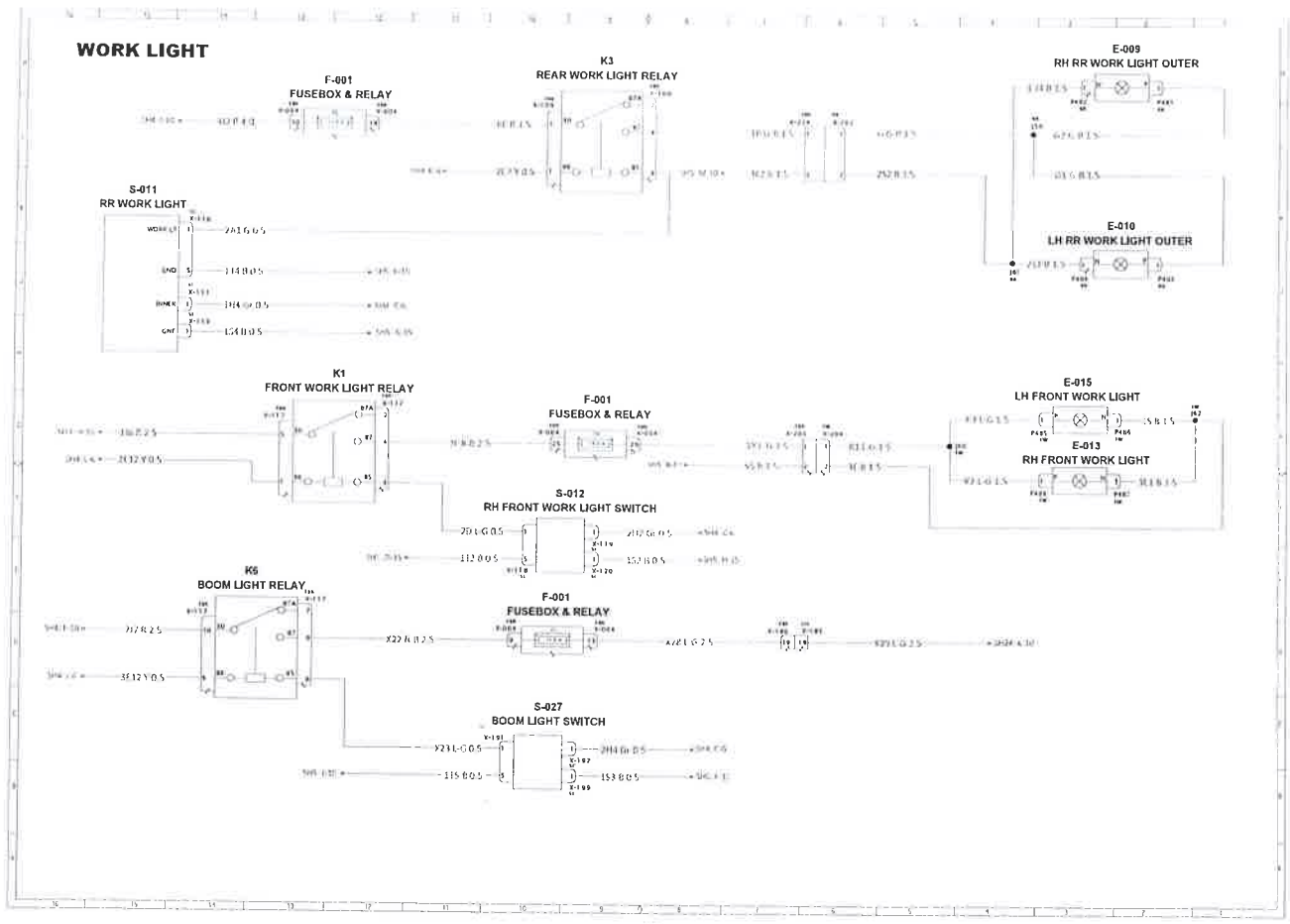
80.1.7 REAR LIGHT RH (SH 08)



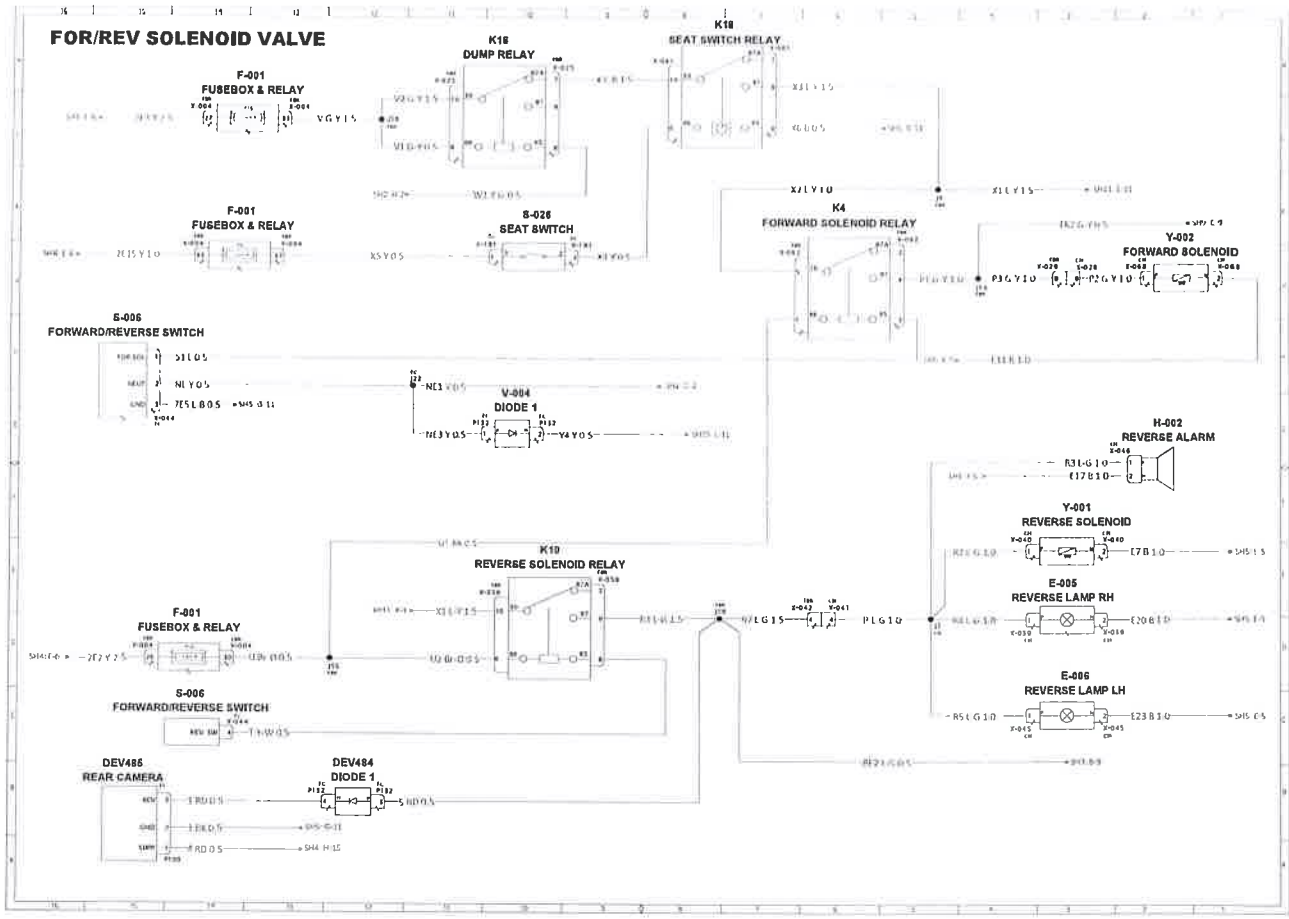
80.1.8 INDICATOR LIGHT (SH 09)



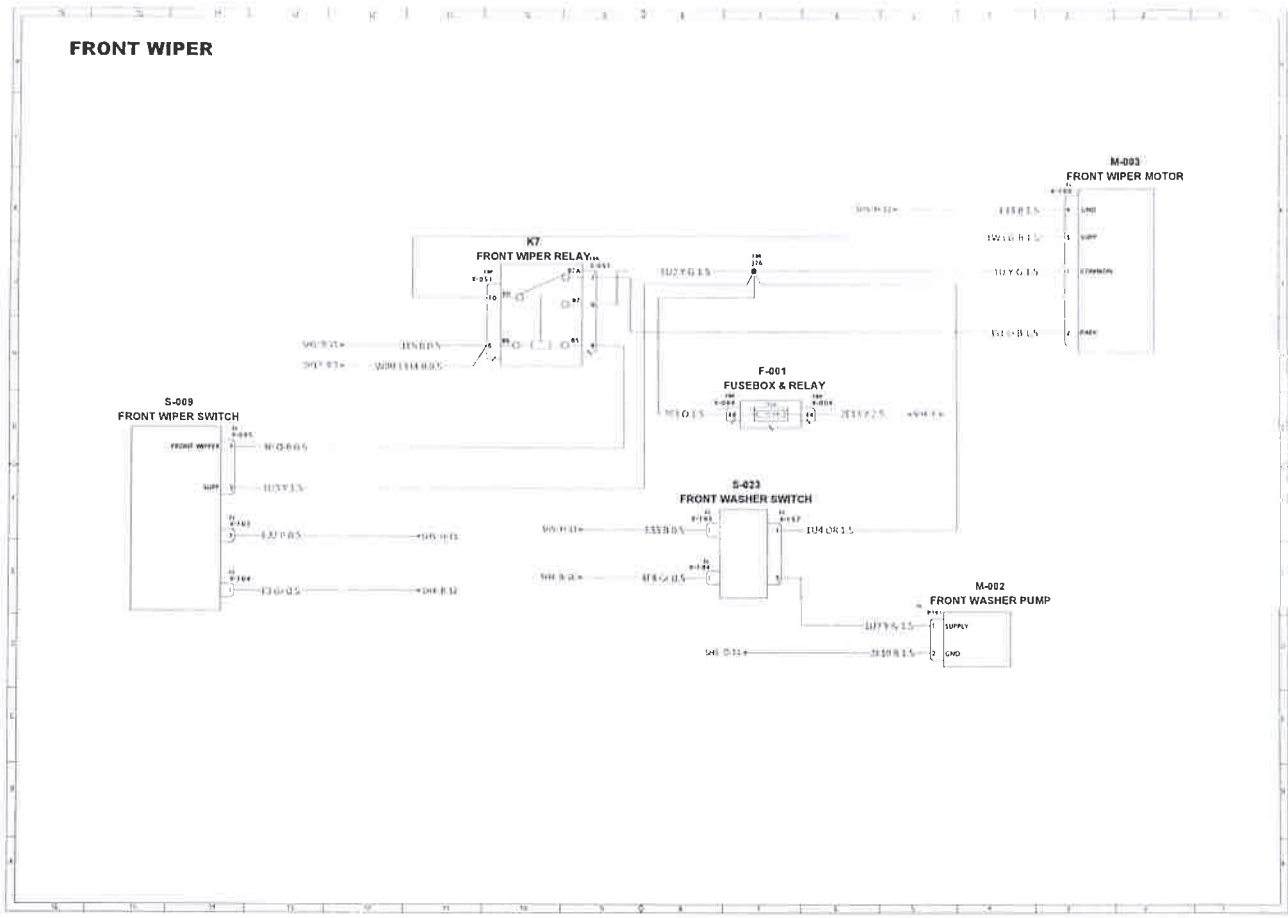
80.1.9 WORK LIGHT (SH 10)



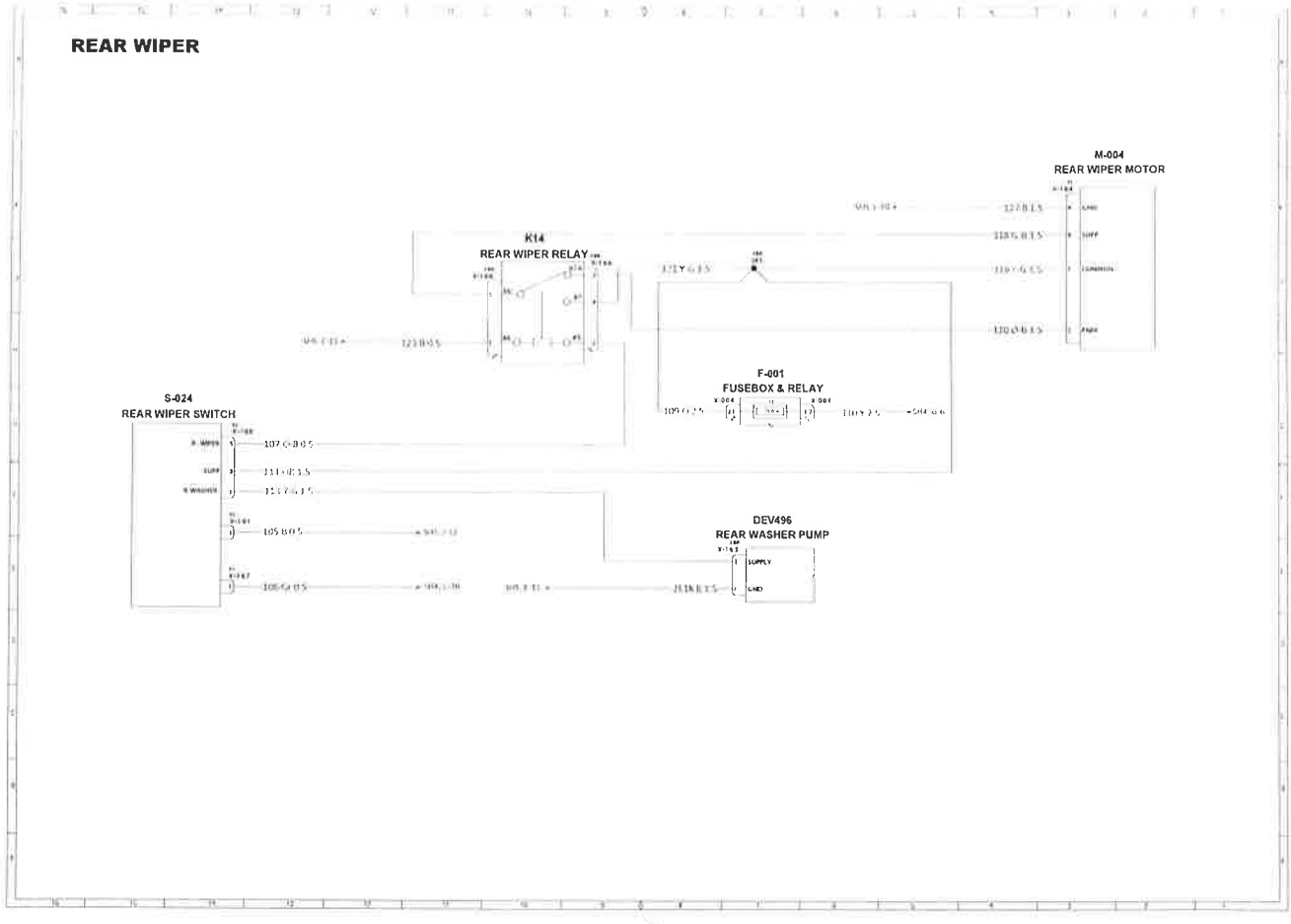
80.1.10 FOR/REV SOLENOID VALVE (SH 11)



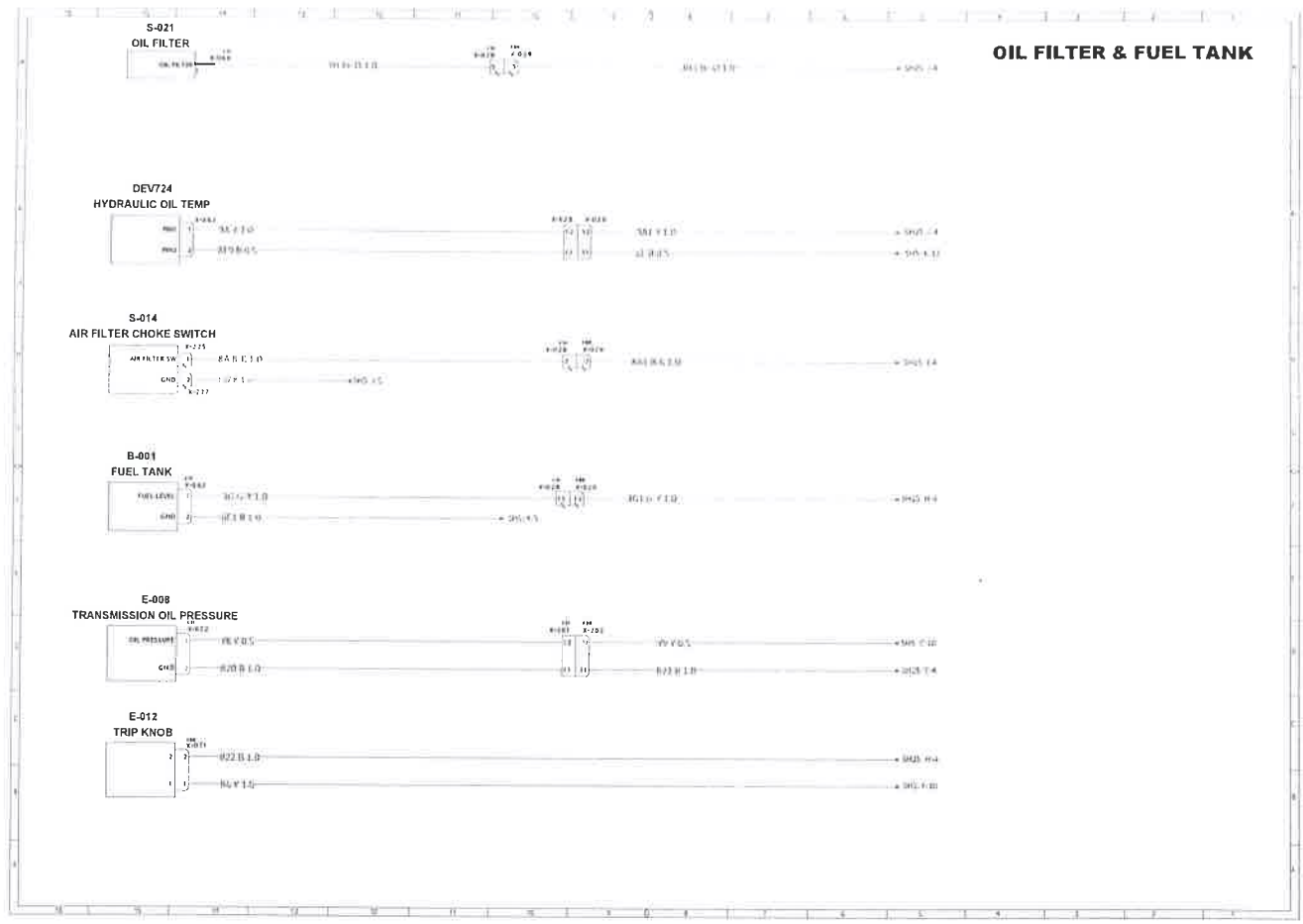
80.1.11 FRONT WIPER (SH 12)



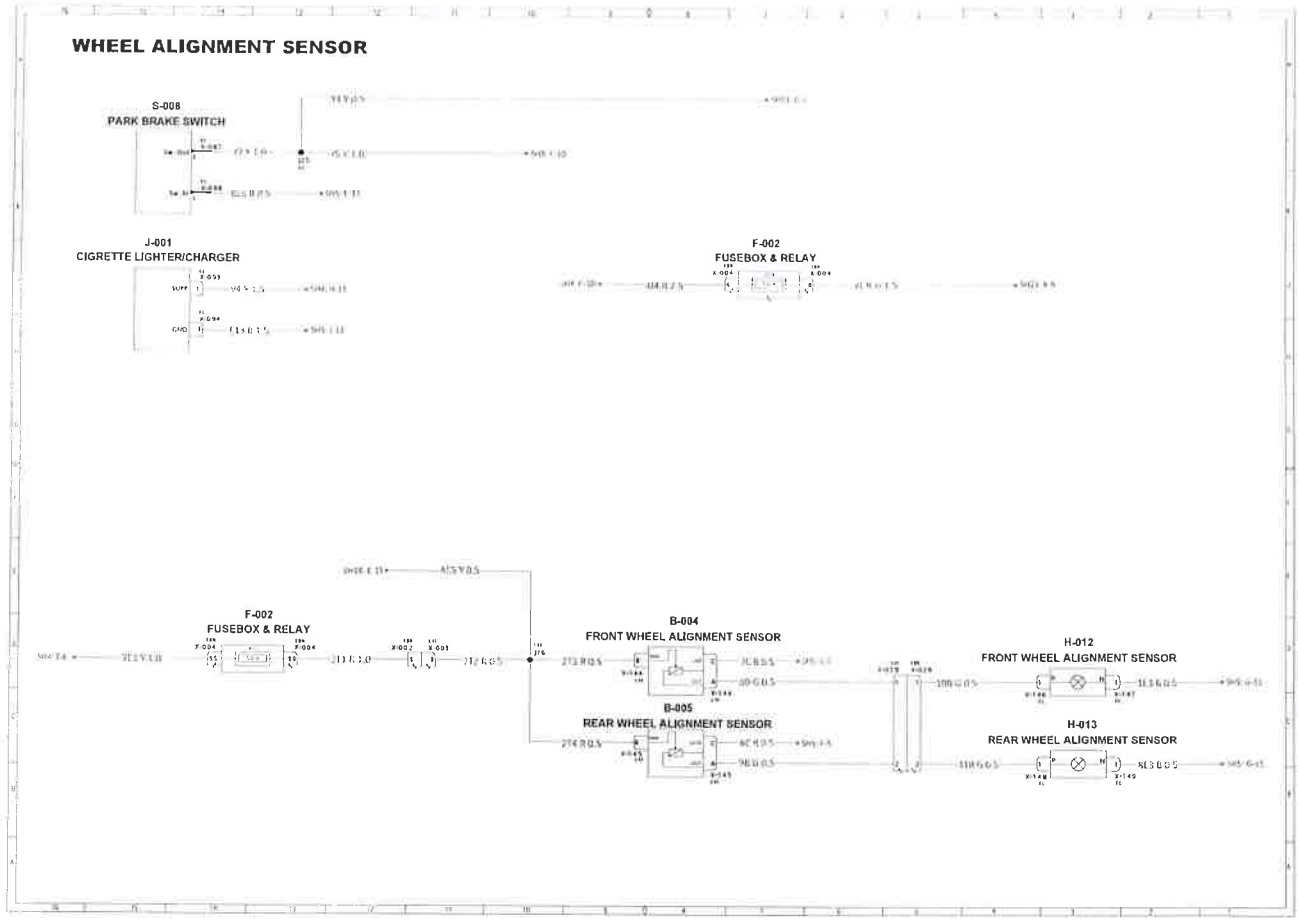
80.1.12 *REAR WIPER (SH 13)*



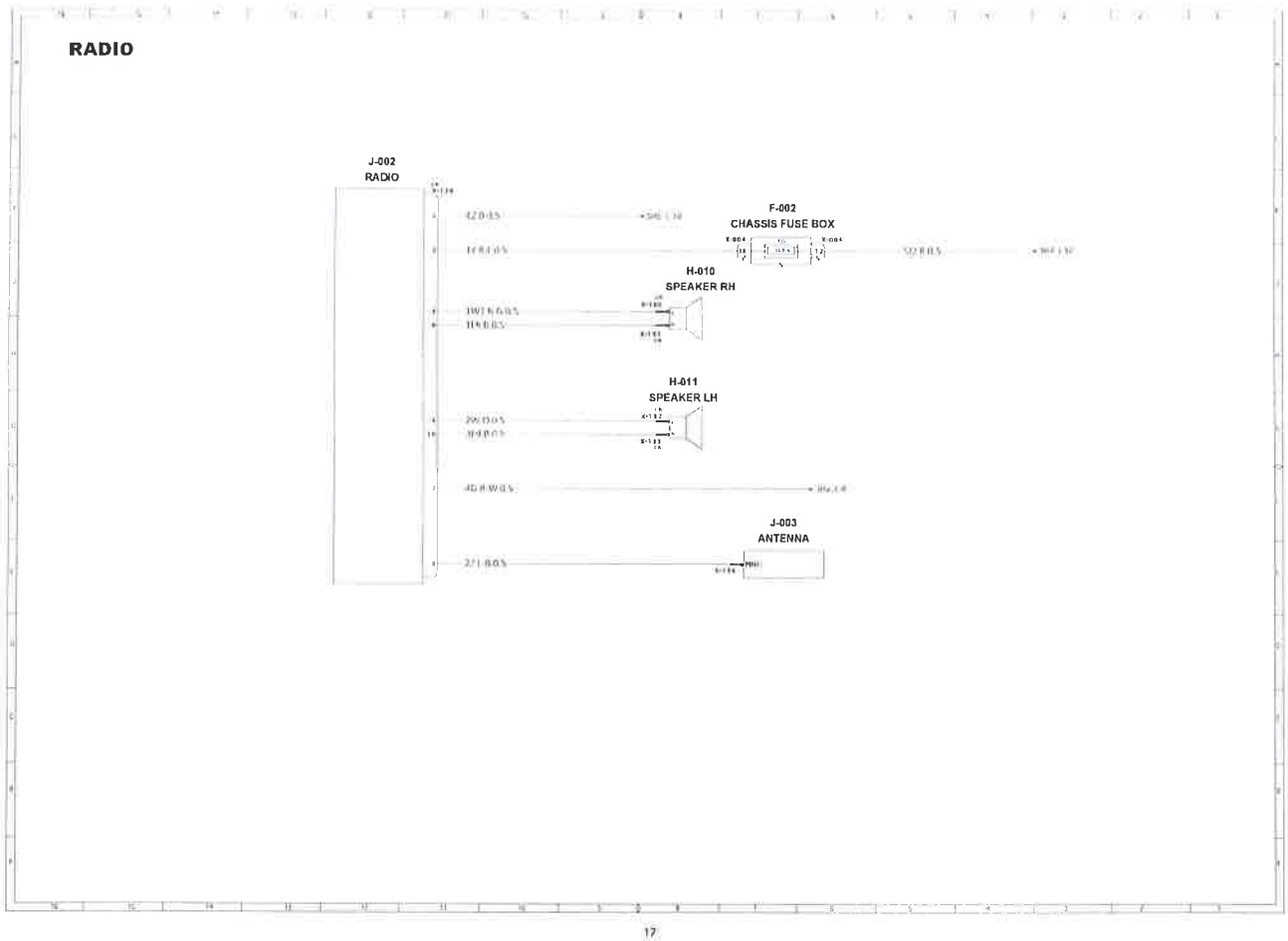
80.1.103 OIL FILTER & FUEL TANK (SH 14)



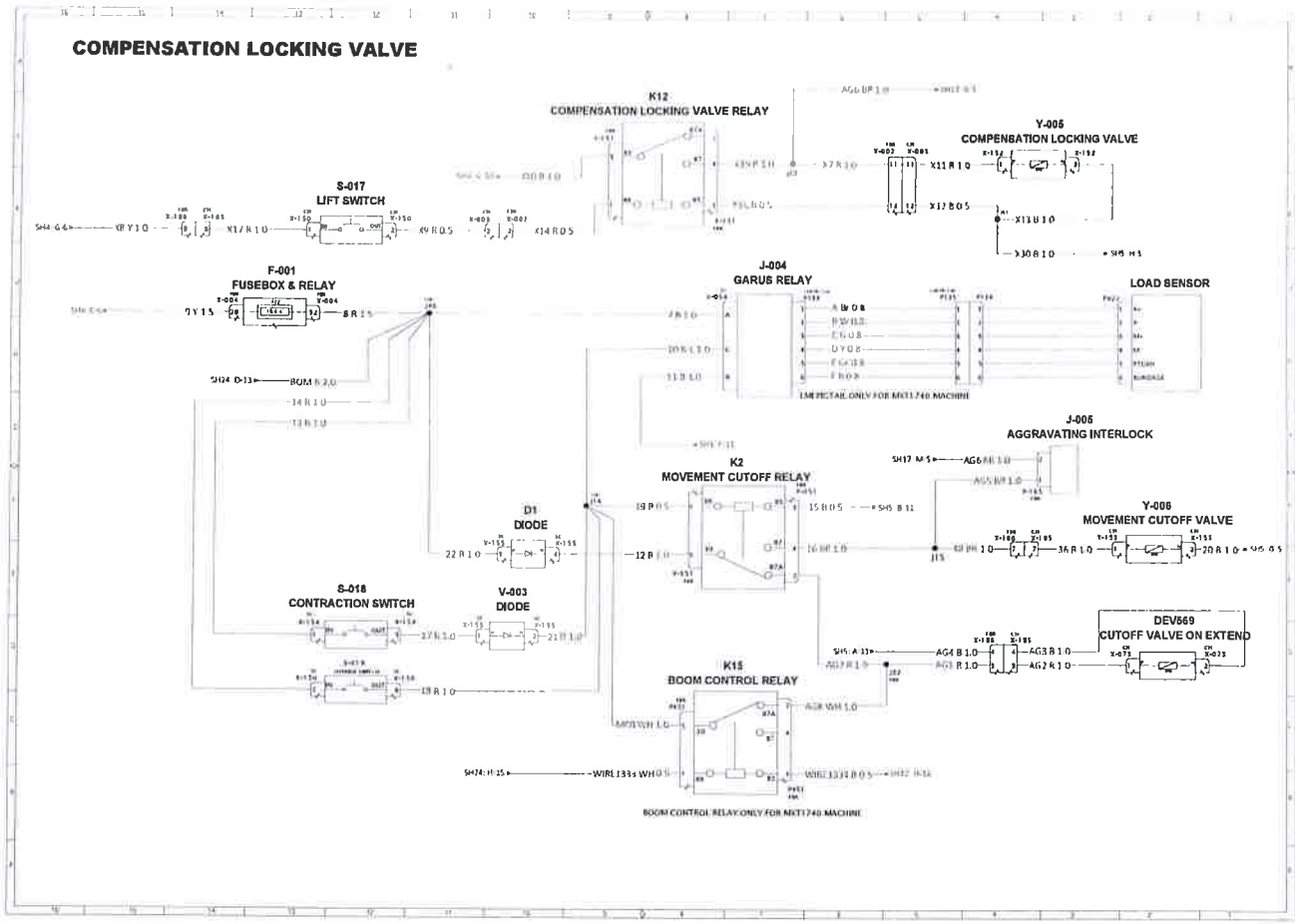
80.1.14 WHEEL ALIGNMENT SENSOR (SH 15)



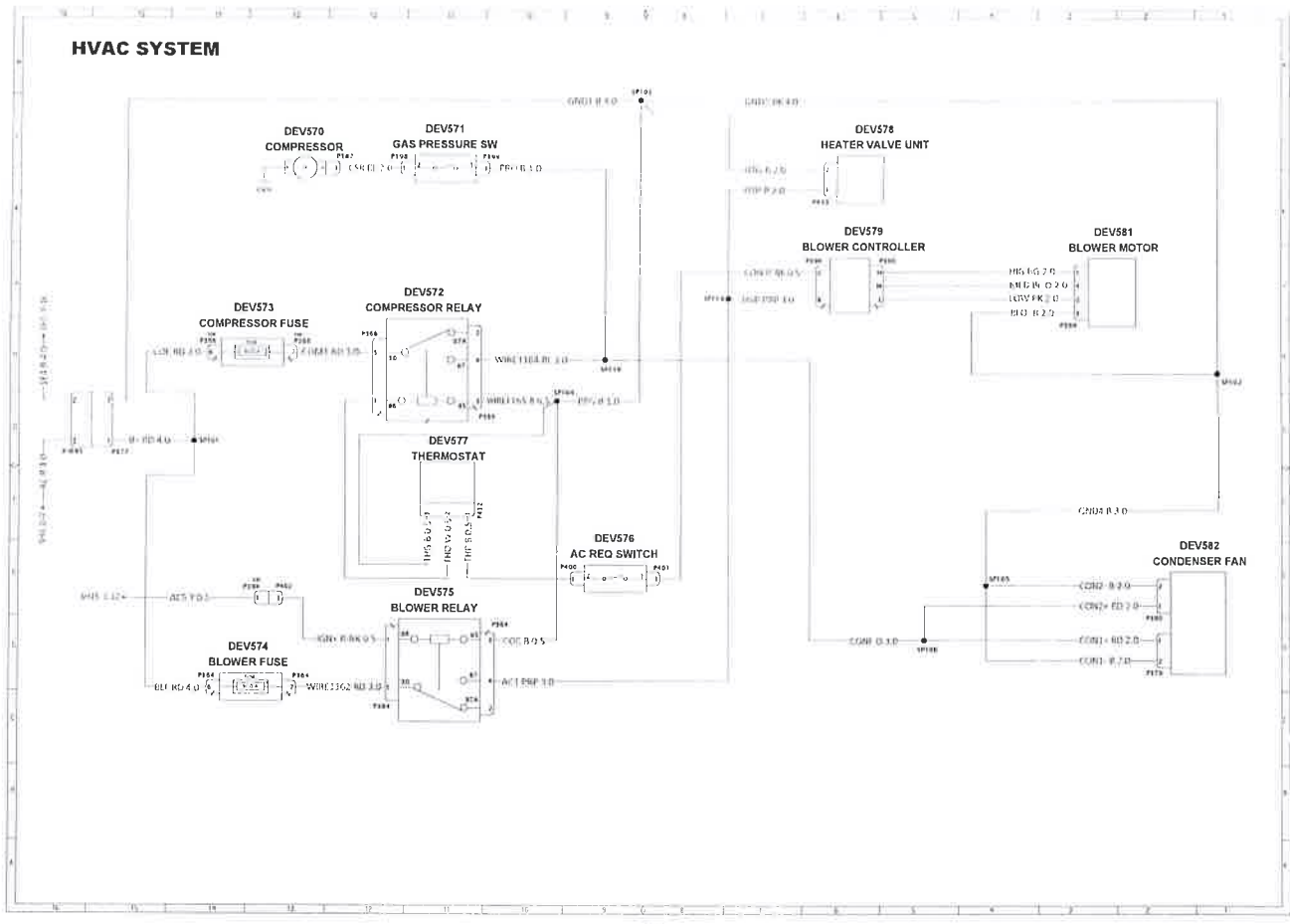
80.1.15 RADIO (SH 16)



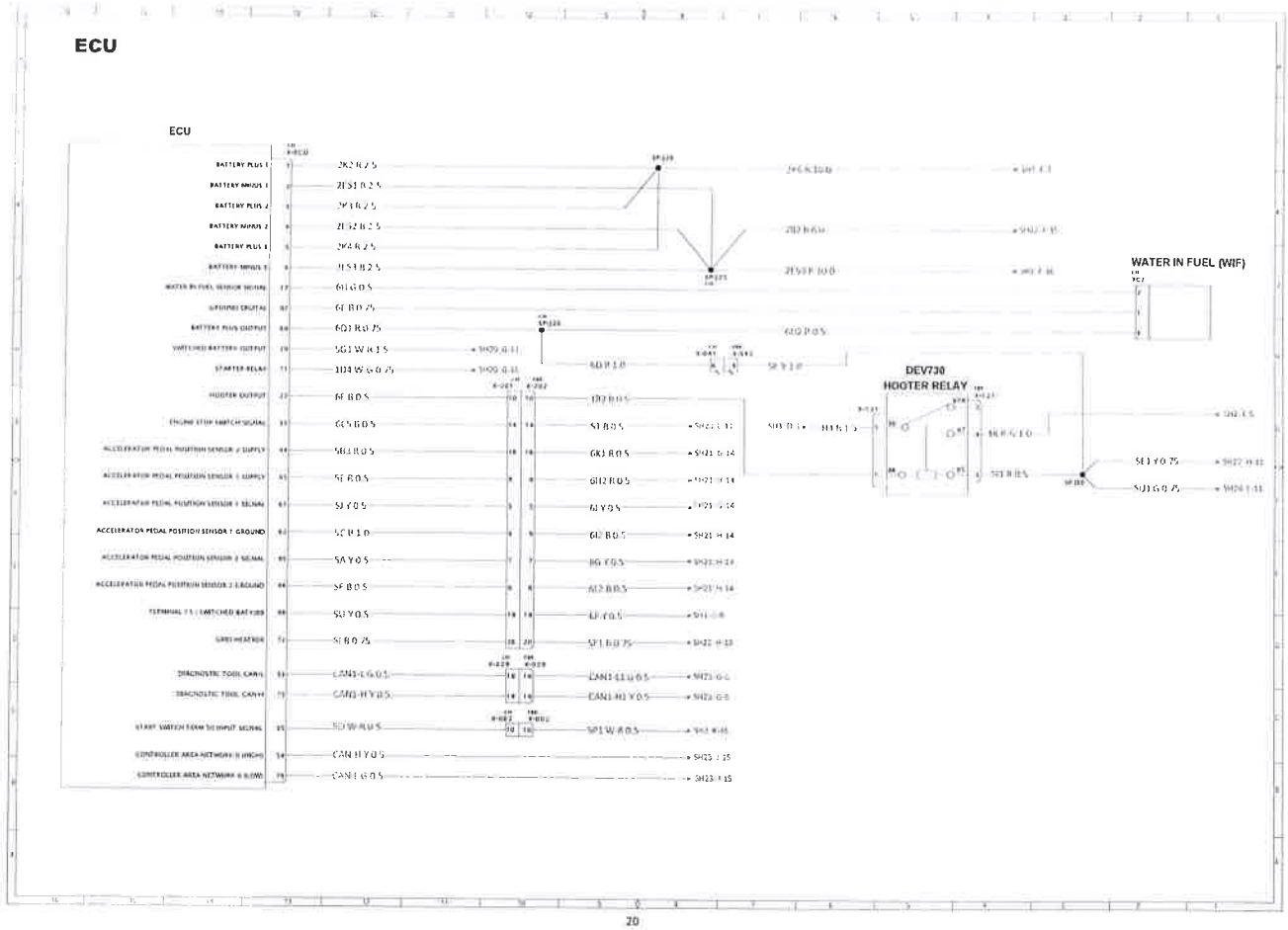
80.1.16 COMPENSATION LOCKING VALVE (SH 17)



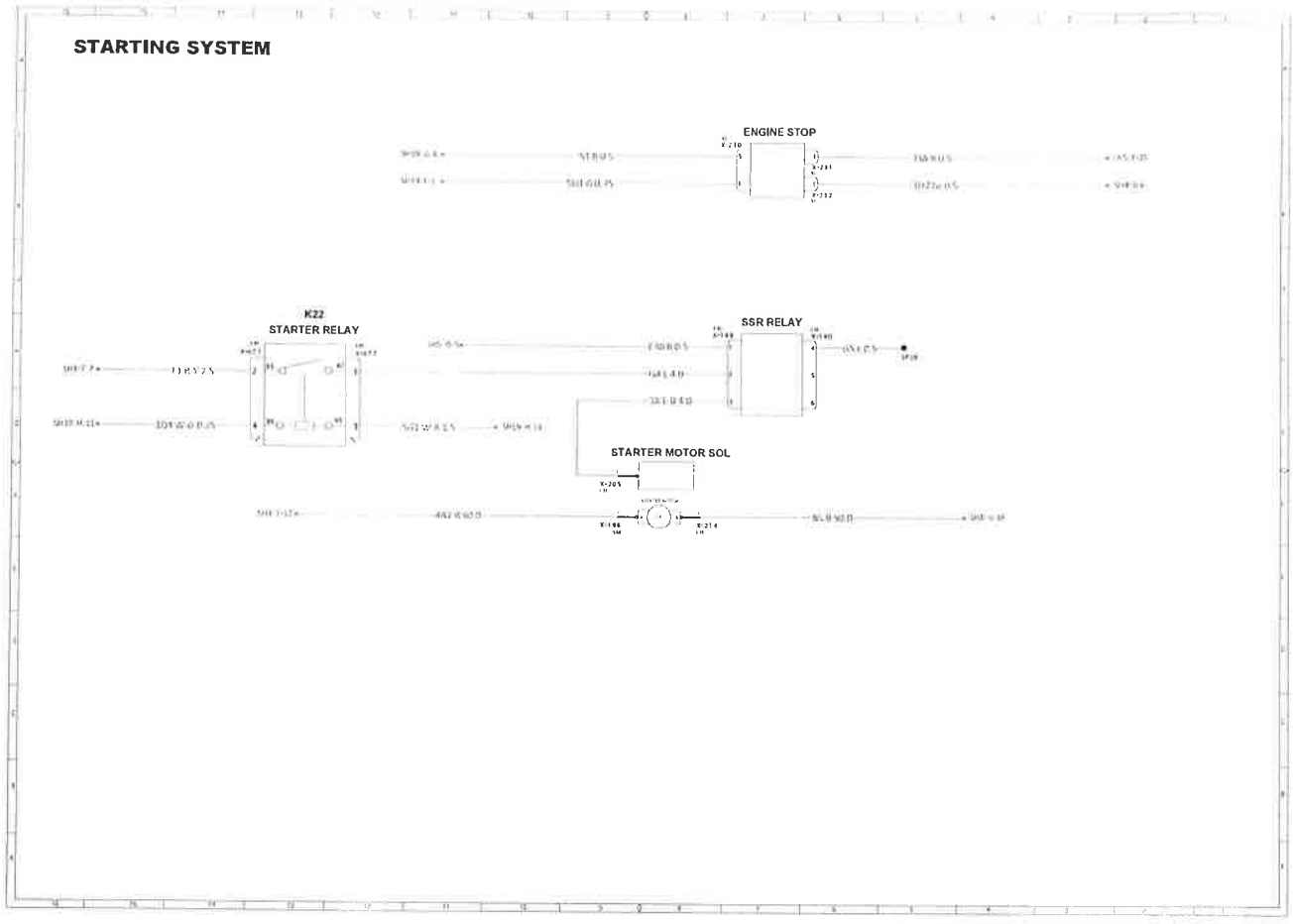
80.1.17 HVAC SYSTEM (SH 18)



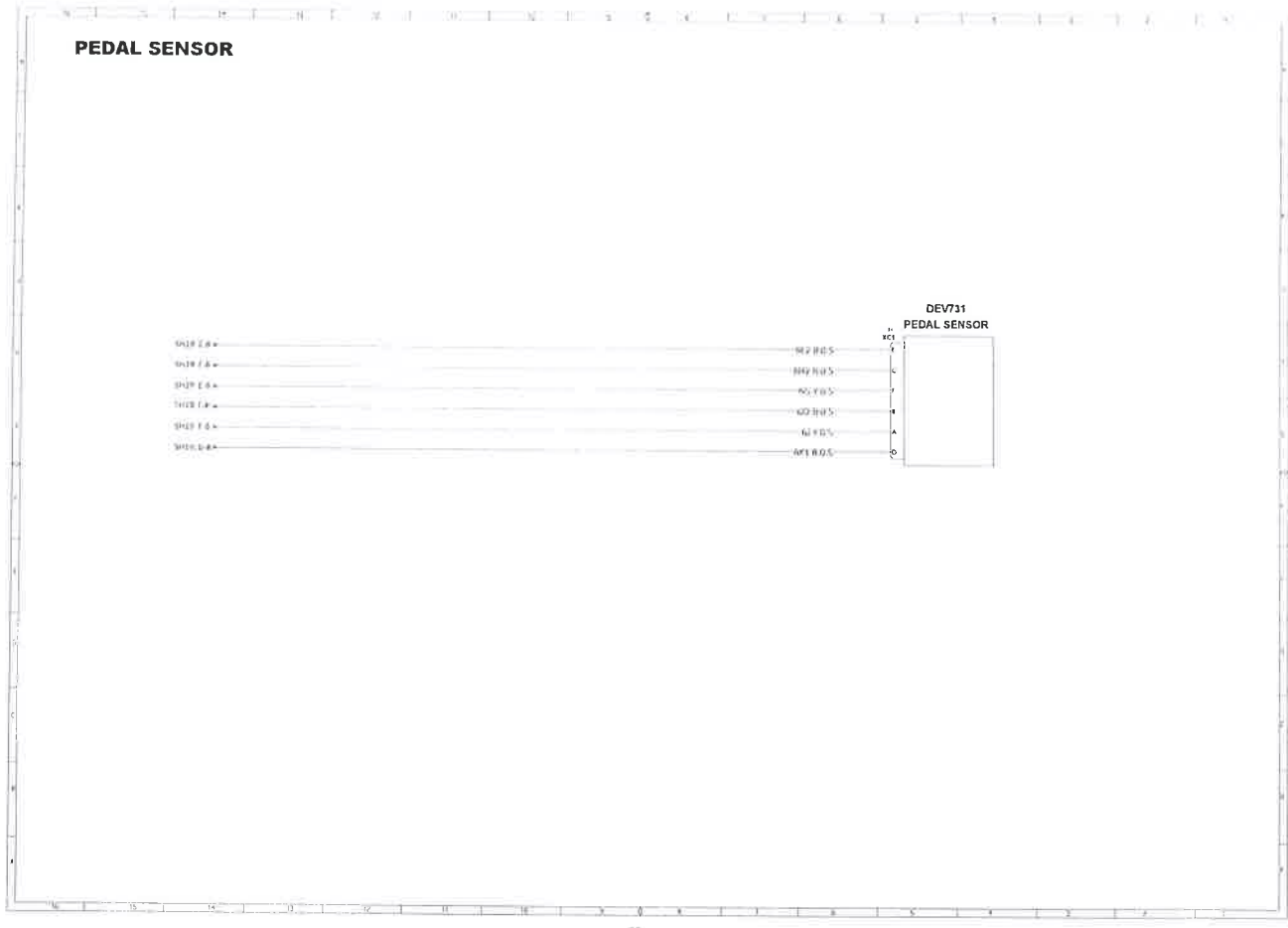
80.1.18 *ECU (SH 19)*



80.1.19 *STARTING SYSTEM (SH 20)*

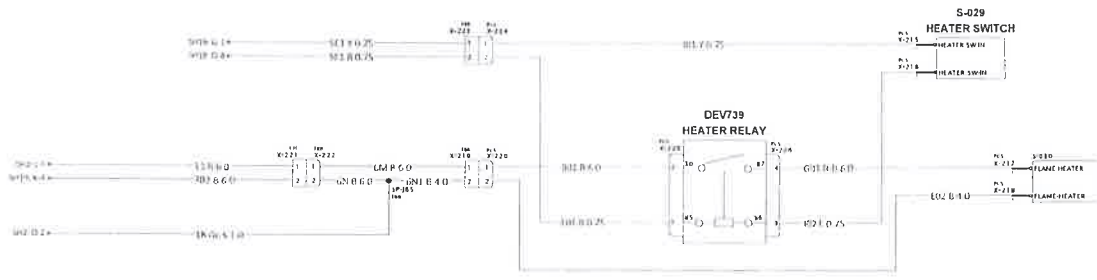


80_1_20 PEDAL SENSOR (SH 21)

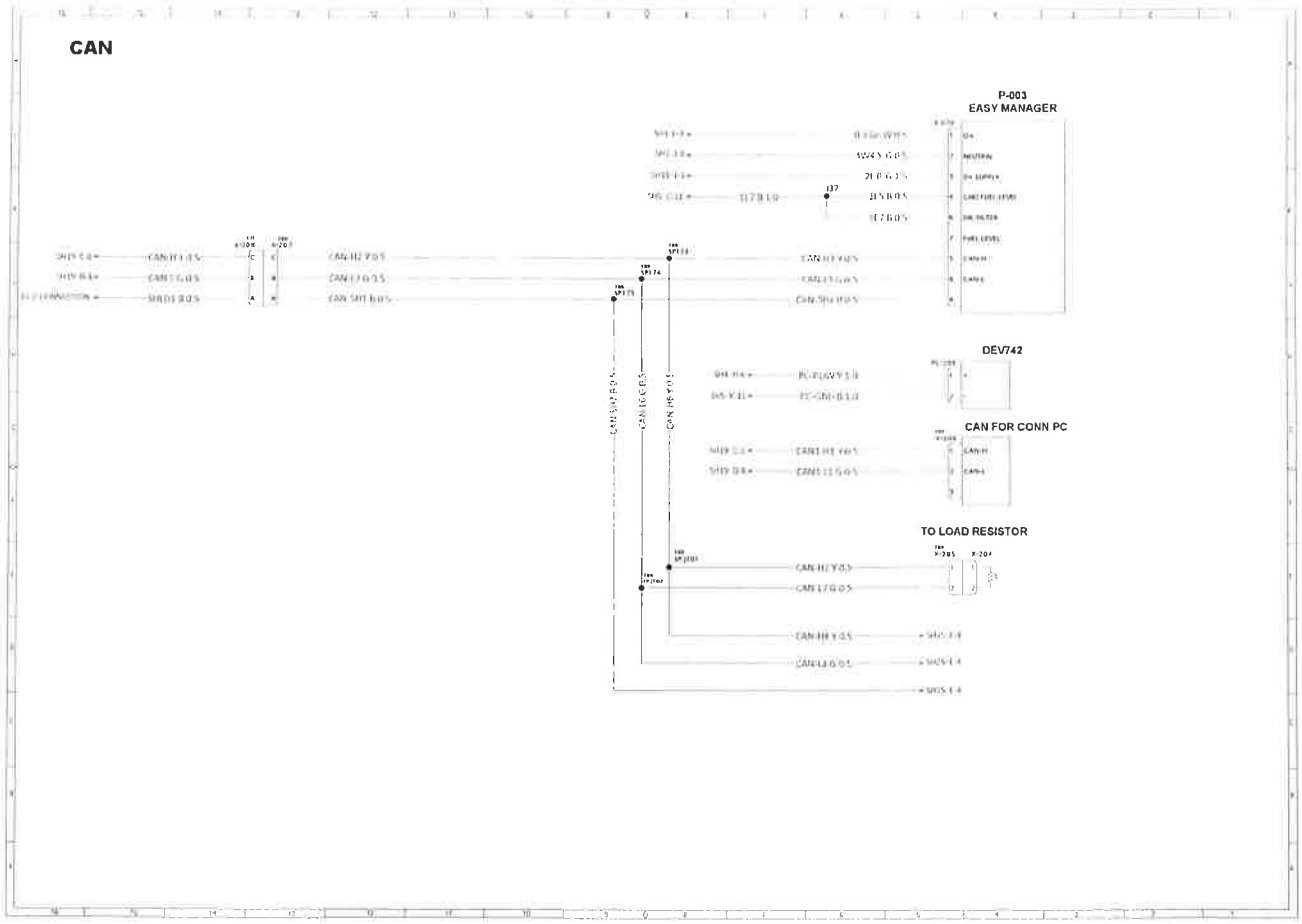


80.1.21 COLD START (SH 22)

COLD START



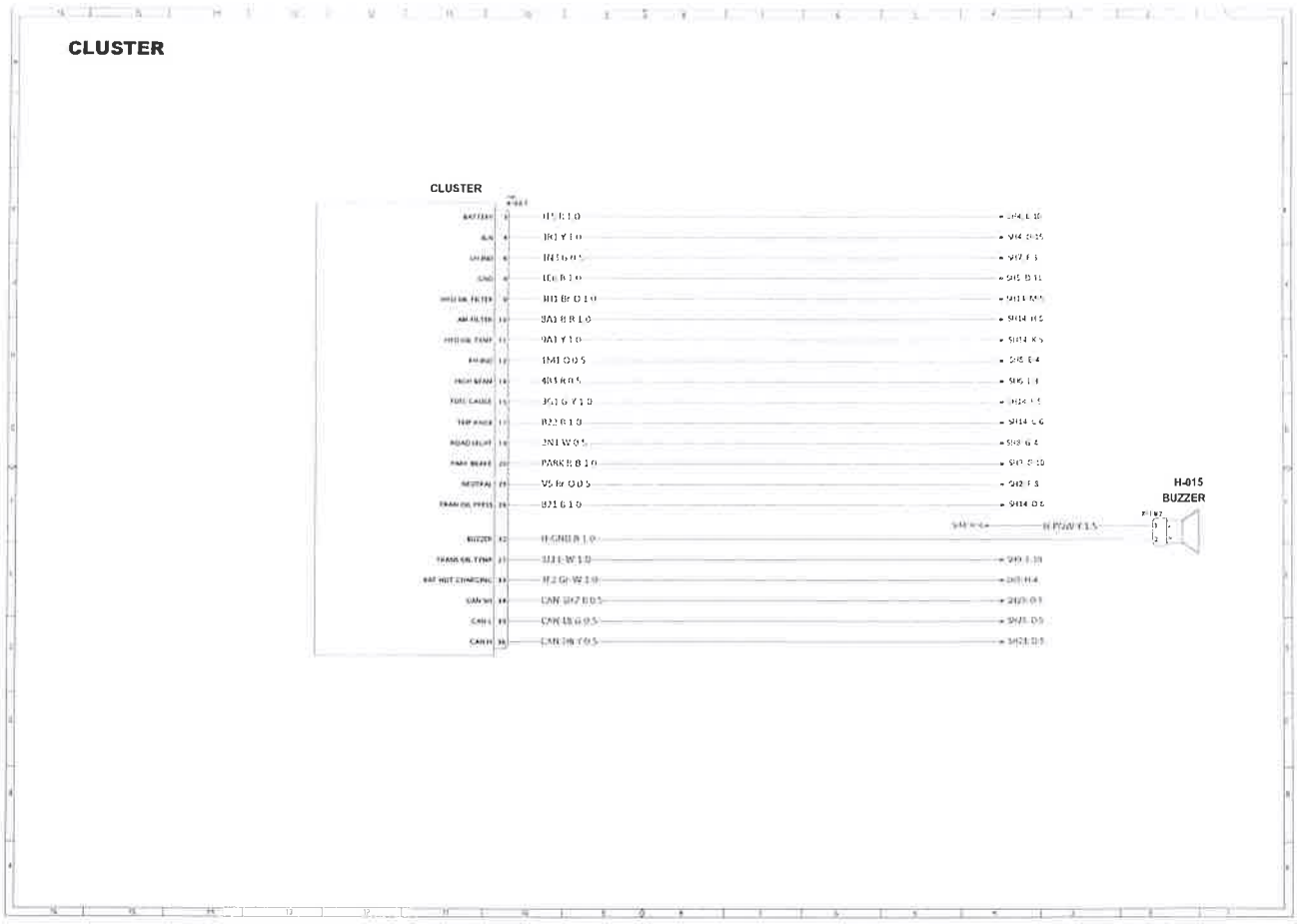
80.1.22 CAN (SH 23)



PAB ENGINEERING WORKS PVT. LTD. KOLKATA

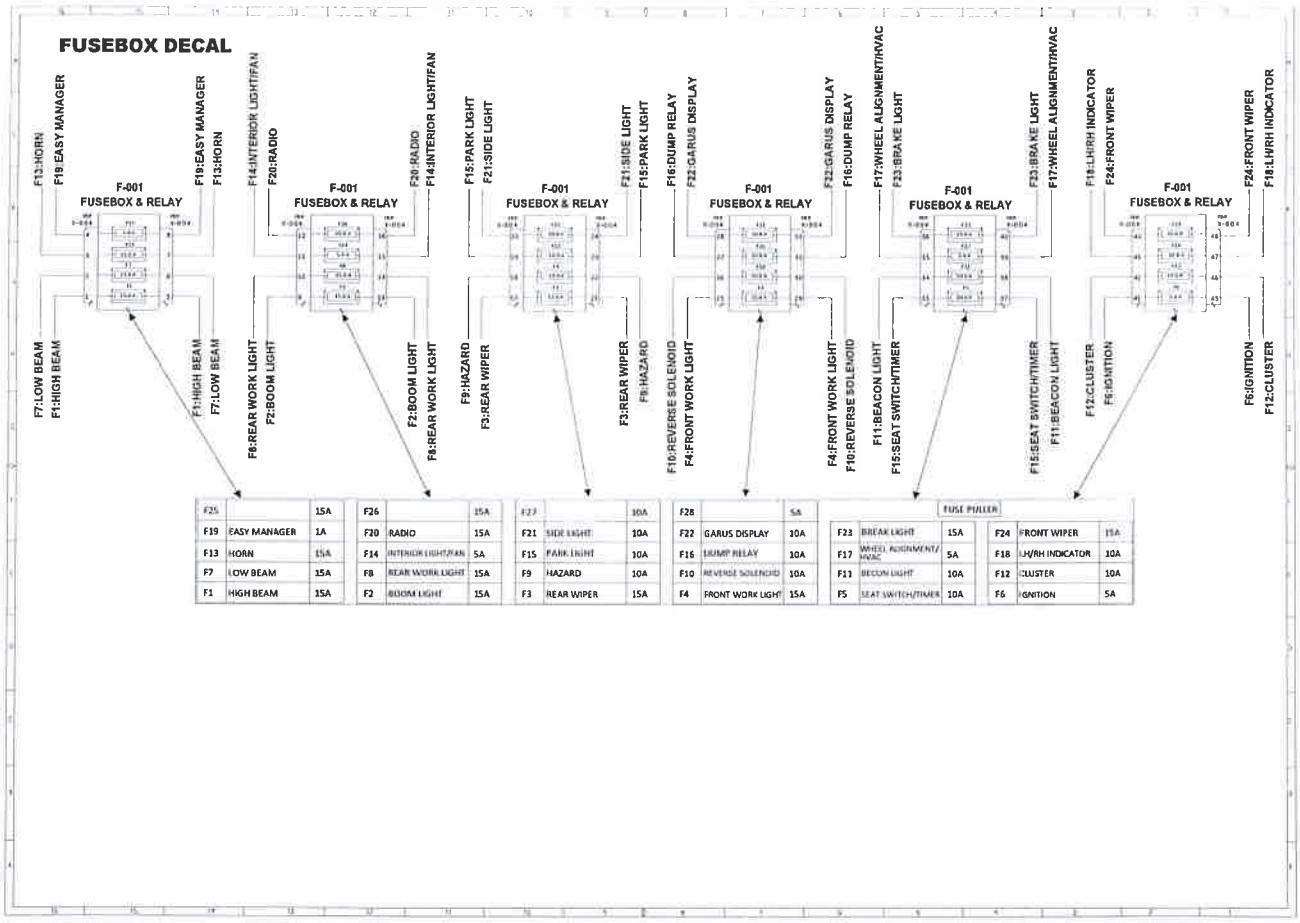
80_1_23 CLUSTER (SH 25)

CLUSTER



P.A.B ENGINEERING WORKS PVT. LTD. KOLKATA

80.1.24 ***FUSEBOX (SH 26)***

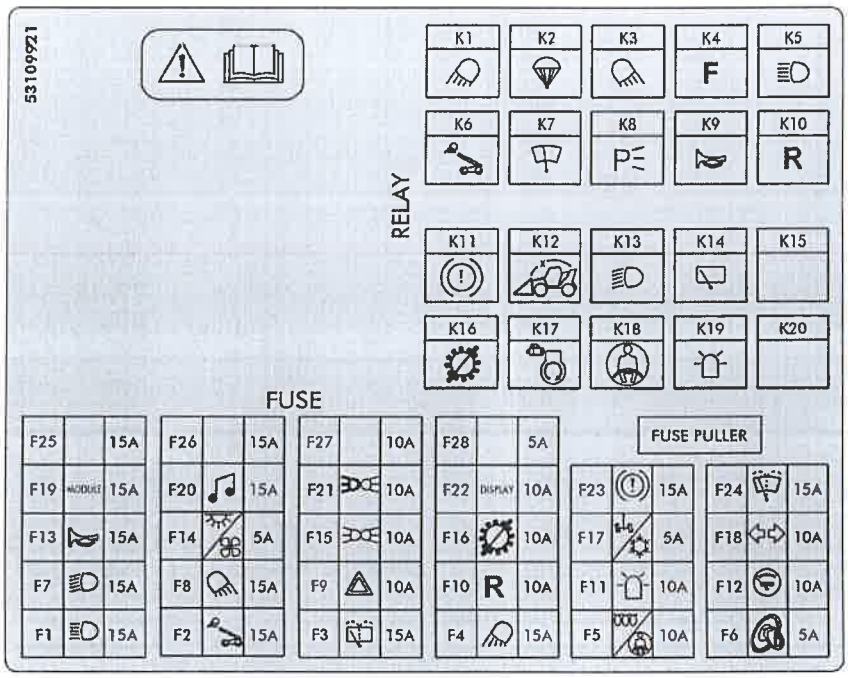


F25		15A	F26		15A	F27		10A	F28		5A	FUSE PULLER							
F19	EASY MANAGER	1A	F20	RADIO	15A	F21	SIDE LIGHT	10A	F22	GARUS DISPLAY	10A	F23	BREAK LIGHT	15A	F24	FRONT WIPER	15A
F13	HORN	15A	F14	INTERIOR LIGHT/FAN	5A	F15	PARK LIGHT	10A	F16	DUMP RELAY	10A	F17	WHEEL ALIGNMENT/ HVAC	5A	F18	LH/RH INDICATOR	10A
F7	LOW BEAM	15A	F8	REAR WORK LIGHT	15A	F9	HAZARD	10A	F10	REVERSE SOLENOID	10A	F11	BECON LIGHT	10A	F12	CLUSTER	10A
F1	HIGH BEAM	15A	F2	BOOM LIGHT	15A	F3	REAR WIPER	15A	F4	FRONT WORK LIGHT	15A	F5	SEAT SWITCH/TIMER	10A	F6	IGNITION	5A

80.2 FUSES AND RELAYS IN THE CAB

A decal on the protective lid gives you a quick view of how to use the components of the panel described below.

> **⚠ NOTE**
> - Always replace a faulty fuse with another of equivalent rating.
> - Never use a fuse that has been repaired.



RELAYS

K1 - FRONT WORK LIGHT
K2 - MOVEMENT CUT-OFF
K3 - REAR WORK LIGHT
K4 - FORWARD SOLENOID
K5 - HIGH BEAM
K6 - BOOM LIGHT
K7 - FRON WIPER
K8 - PARK LIGHT
K9 - HORN
K10 -REVERSE SOLENOID
K11 - BRAKE LIGHT
K12 - COMPENSATION LOCKING VALVE
K13 - LOW BEAM
K14 - REAR WIPER
K15 - BLANK
K16 - DUMP
K17 - NEUTRAL START
K18 - SEAT SWITCH
K19 - BEACON LIGHT
K20 - BLANK

FUSES

F1 - HIGH BEAM
F2 - BOOM LIGHT
F3 - REAR WIPER
F4 - FRONT WORK LIGHT
F5 - SEAT SWITCH
F6 - IGNITION SWITCH
F7 - LOW BEAM
F8 - REAR WORK LIGHT

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company
CIN No. U29130WB2009PTC138256

KVQA
ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 11

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

MANITOU MAKE TELE HANDLER, MODEL MXT 840

Details of major bought-out assemblies and sub-assemblies including manufacturer, type etc

(As per Clause -29.2.f)

Assemblies / Sub-Assemblies	Brand	Address
ENGINE	Kriloskar	Yamuna, Survey No. 98/(3-7), Baner Pune 411 045, India
AXLE	Dana	Global Industrial Park, Plot No. 1, Gat No. 51/1, Bhamboli village, Post – Vasuli, Tal- Khed, Pune – 410501.
Transmission	Carraro	Survey No B 2/2, Pune Nagar Road, Shirur, Pune - 412210
Cylinders	Wipro	Doddakannelli, Sarjapur Road · Bengaluru - 560 035, India
Battery	Exide	59E, Chowringhee, Kolkata - 700020
Chassis	Manitou	27, Ecotech-II, Udyog Vihar, Greater Noida, Uttar Pradesh 201306
Control Valve	Valvoline	315, 3rd Floor, World Trade Centre Barakhamba Road, Connaught Place, New Delhi
Safety device	Manitou	27, Ecotech-II, Udyog Vihar, Greater Noida, Uttar Pradesh 201306

For, PAB Engineering Works Pvt. Ltd.

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

(Authorized Signatory)

Corporate Office : The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
Phone No. : 033 4008-9503/ 4008 9603, e-mail : pab.kolkata@gmail.com

Branch Office : 3, Chadda Badi, Nehru Nagar, Bilaspur 495001 (C.G.)
Ph. : 07752-407803, 433900, E-mail : pab_eng@yahoo.com, marketingpab@gmail.com

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company

CIN No. U29130WB2009PTC138256

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 12

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Comprehensive commercial literature specifications

(As per Clause -29.2.g)

SL No	Description	Remarks
1	comprehensive commercial literature specifications	Machine Catalog attached below

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Encl: Page 1-4

Corporate Office The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
Phone No. : 033 4008-9503/ 4008 9603, e-mail : pab.kolkata@gmail.com

Branch Office 3, Chadda Badi, Nehru Nagar, Bilaspur 495001 (C.G.)
Ph. : 07752-407803, 433900, E-mail : pab_eng@yahoo.com, marketingpab@gmail.com

#BringTheRevolution

REACH NEW HEIGHTS

Max: Lifting Height -7.6 m/24.9 feet, Max: Lifting Capacity - 4T

MANITOU
HANDLING YOUR WORLD

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

MXT

WHAT IS A MANITOU TELEHANDLER?

Manitou telehandlers are handling equipment perfectly adapted to work in the most difficult conditions and terrains. Equipped with a telescopic boom, they will save you time on a daily basis when handling all types of loads in height and outreach.

Versatile and true tool carriers, they allow a wide variety of attachments to be used in a simple, fast and safe way for the operator and his working environment.

The Manitou brand also offers a wide range of services and attachments to support you throughout the life cycle of your machine.

Place the load where you want to

The MTX 840 can place loads up to 4 tons at a height of up to 7,6 meters with an outreach of up to 4,20 meters

Move Loads in All Conditions

The telescopic arm passes above obstacles and enables you to move your load safely. It also allows you to move suspended loads using an assortment of jibs, cranes and winches.

Scoop & dump

Allows you to scoop and dump the loose material in one go without giving repeated jerks to the machine

Loading & Unloading Trucks and Containers

Carry out operations quickly on many terrains that require substantial maneuverability.

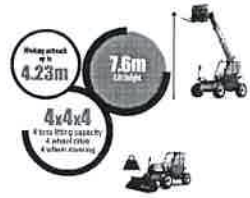
Versatility

When matched with one of our many available attachments, the MXT 840 will satisfy your construction and job sites handling needs.

Preparing and Cleaning the Ground

The drawbar pull and breakout force of the MXT 840 means it can be used to level the ground and clear excess soil and waste

"With the help of my Manitou, I only need one machine to make a multitude of applications on a daily basis. It's a real asset for me."

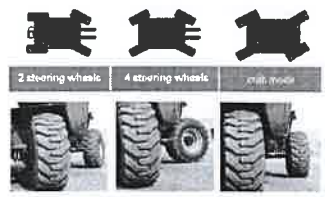


DESIGNED FOR PERFORMANCE

A Maneuverable All Terrain Machine

- A turning circle of just 3.9 meters combined with 4 wheels steering.
- Gradient up to 47%
- Ground clearance of 30 cm

An ultra-manageable machine with three steering modes



Front wheel steering ideal for long distance

Four wheel steer for cramped spaces

Crab steer to drive diagonally to avoid an obstacle rather than trying a multipoint turn

P.A.B. ENGINEERING WORKS PVT. LTD. KOLKATA

MXT

EFFICIENCY AND PRODUCTIVITY GUARANTEED

Simplicity, driver of productivity

2 front steering wheels for excellent steering for greater safety on the road very quick and easy to use

Easy access cabin

- Grab handle to access the cab
- Non-slip steps
- Helps to reduce operator fatigue and avoid falls.

Lifting/lowering of the boom, telescopic boom extension and retraction, scraping/tipping, attachment hydraulic line dashboard & levers easy to use start up in less than 20 seconds.

Safe cabin

The MXT 840 cab meets the level 2 FOPS/ ROPS standards. It is capable of supporting the machine rollover and protecting the operator from falling objects.

SIMPLE AND EFFICIENT MAINTENANCE

Wide access to engine compartment allows operator to inspect daily checkpoints easily

EASY ACCESSIBILITY FOR MAINTENANCE

The machine has been designed to enable easy access to the various maintenance elements

- Wide opening engine cover
- Brake fluid fill level displayed on the dashboard
- Accessible lubrication points
- Fuel tank and battery isolator switch remain accessible with the engine cover closed

MANITOU HANDLING YOUR WORLD

STANDARD TELEMATICS -EASY MANAGER

- Now get digital twin of your machine on smartphone with easy manager app.
- Plan your Manitou fleet better and optimize your business.
- Access live machine information

Easy MANAGER | THE CONNECTED SOLUTION to improve your productivity.

SERVICE	Running Hours	Engine Parameters (including Fuel Level)*	Schedule Service Alert
OPERATION	Machine Status	Machine Utilisation Report	
SECURITY	GPS Tracking	Geofencing	Geofencing Curfew alert

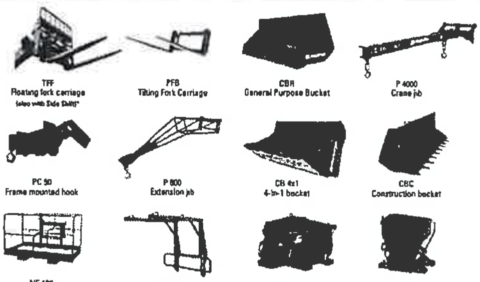
MANITOU HANDLING YOUR WORLD

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

INCREASED VERSATILITY

The MXT 840 is a genuine tool holder. It comes with a large selection of attachments that offer users precisely the kind of versatility needed on a work site. The Manitou fork carriage enables you to change your attachment in just a few seconds...

Attachments for all your material handling needs



**[illegible]
*Optional

A SIMPLE AND PROVEN COUPLING SYSTEM

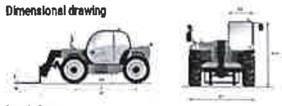
The Manitou fork carriage can easily change your attachment in just a few seconds.

Technical Specifications

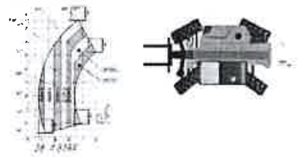
[illegible]		[illegible]
Max. capacity		4000 kg
Max. lifting height		[illegible]
[illegible]		[illegible]
Working height		[illegible]
Maximum Horizontal Outreach		[illegible]
[illegible]		
Overall length to carriage	[illegible]	[illegible]
Overall width	[illegible]	[illegible]
Overall height	[illegible]	[illegible]
Wheelbase	[illegible]	[illegible]
Ground clearance	[illegible]	[illegible]
Overall cab width	[illegible]	[illegible]
Tilt up angle	[illegible]	[illegible]
Tilt-down angle	[illegible]	[illegible]
External turning radius (over tyres)	[illegible]	[illegible]
Unladen weight (with forks)		[illegible]
[illegible]		[illegible]
Tyres type		[illegible]
Standard tyres		[illegible]
Forks length / width / section	[illegible]	[illegible]
[illegible]		
Lifting		[illegible]
Lowering		[illegible]
Extension		[illegible]
Retraction		[illegible]
[illegible]		[illegible]
Crowd		[illegible]
Dump		[illegible]
[illegible]		
Engine brand		[illegible]
[illegible]		[illegible]
Max. fuel sulphur content		[illegible]
Engine model		[illegible]
Number of cylinders / Capacity of cylinders		[illegible]
I.C. Engine power rating - Power hp / kW		[illegible]
Max. torque / Engine rotation		[illegible]
Drawbar pull (laden)		[illegible]
[illegible]		
Transmission type		Torque Converter
Number of gears (forward / reverse)		4 / 4
Max. travel speed		[illegible]
Parking brake		[illegible]
Service brake		[illegible]
[illegible]		
Hydraulic pump type		Gear pump
Hydraulic flow / Pressure		[illegible]

[illegible]		
Engine oil		[illegible]
Hydraulic oil		[illegible]
Fuel tank		[illegible]
[illegible]		
Noise at driving position (LpA)		[illegible]
Noise to environment (LwA)		[illegible]
Vibration on hands/arms		[illegible]
[illegible]		
Drive / Steering		[illegible]
Safety / Safety cab homologation		[illegible]
Controls		[illegible]

Dimensional drawing



Load chart



PAB ENGINEERING WORKS PVT. LTD.
KOLKATA

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Effective Date: March, 2022. All dimensions, weights & timings are variable within 1.5%. Company reserves the right to change specifications without prior notice. The illustration do not incl of the machine. Product specifications & prices are subject to change without notice or obligation. The photographs and/or drawings in this document are for illustrative purposes only. Refer to the appropriate Operator's Manual for instructions on the proper use of this equipment. Failure to follow the appropriate Operator's Manual when using our equipment or to otherwise act irresponsibly may result in serious injury or death. The only warranty applicable to our equipment is the standard written warranty applicable to the particular product. It sale & we make no other warranty, express or implied.

Your dealer:

MANITOU
HANDLING YOUR WORLD

Manitou South Asia Pvt. Ltd.
Regd.Office: 1st Floor, Plot No.A-10, Block-B1, Main Mathura Road, Mohan Co-op Indl. Estate, New Delhi -110044
Tel.: 011- 407 42701 E-mail: info.mindl@manitou-group.com Visit: www.manitou.com

1800 103 7600

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company
CIN No. U29130WB2009PTC138256

KVQA
ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN : 19AAFCP2314Q2Z0

Annexure – T 13

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Operation & Maintenance Manuals

(As per Clause -29.2.h)

SL No	Description	Remarks
1	Operation & Maintenance Manuals	attached below

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Encl: Pages 1-5

Corporate Office The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
Phone No. : 033 4008-9503/ 4008 9603, e-mail : pab.kolkata@gmail.com

Branch Office 3, Chadda Badi, Nehru Nagar, Bilaspur 495001 (C.G.)
Ph. : 07752-407803, 433900, E-mail : pab_eng@yahoo.com, marketingpab@gmail.com

3-MAINTENANCE

ORIGINAL MANITOU SPARE PARTS AND EQUIPMENT

OUR LIFT TRUCKS MUST BE SERVICED USING ORIGINAL MANITOU PARTS.

BY ALLOWING THE USE OF NON ORIGINAL MANITOU PARTS, YOU RISK:

⚠ IMPORTANT ⚠

THE USE OF COUNTERFEIT PARTS OR COMPONENTS NOT APPROVED BY THE MANUFACTURER, WILL CAUSE YOU TO LOSE THE BENEFIT OF THE CONTRACTUAL GUARANTEE.

- Legally - to be held responsible in the event of an accident.
- Technically - to cause operating malfunctions or shorten the life of the lift truck.

BY USING ORIGINAL MANITOU PARTS FOR MAINTENANCE OPERATIONS, YOU BENEFIT FROM OUR KNOW-HOW

Through its network, MANITOU provides the user with,

- Know-how and competence.
- The guarantee of high-quality work.
- Original replacement parts.
- Help with preventive maintenance.
- Efficient help with diagnosis.
- Improvements due to experience feedback.
- Operator training.
- Only the MANITOU network has detailed knowledge of the design of the lift truck and therefore the best technical ability to provide maintenance.

⚠ IMPORTANT ⚠

ORIGINAL REPLACEMENT PARTS ARE DISTRIBUTED EXCLUSIVELY BY MANITOU AND ITS DEALER NETWORK.
The dealer network list is available on the MANITOU web site: www.manitou.com

LIFT TRUCK MAINTENANCE

DAILY AND WEEKLY MAINTENANCE

⚠ IMPORTANT ⚠

THE OPERATOR IS AUTHORISED TO CARRY OUT THIS MAINTENANCE.

These maintenance operations enable the operator to maintain the lift truck in a clean and safe condition.

MANDATORY FIRST 500 HOURS OR 6 MONTHS SERVICE

⚠ IMPORTANT ⚠

THIS SERVICE MUST BE CARRIED OUT AFTER THE FIRST 500 HOURS OF SERVICE OR WITHIN THE 6 MONTHS FOLLOWING PUTTING THE MACHINE INTO SERVICE (WHICHEVER OCCURS FIRST).

PERIODIC MAINTENANCE

⚠ IMPORTANT ⚠

THE PERIODIC MAINTENANCE MUST BE CARRIED OUT BY A PROFESSIONAL APPROVED BY THE MANITOU NETWORK

MAINTENANCE SCHEDULE

This schedule enables the operator to keep up with the periodic maintenance of the lift truck by notifying the total number of hours of operation and the date of the service performed by the professional approved by the MANITOU network.

OCCASIONAL MAINTENANCE AND OPERATION

These maintenance tasks and operations are to be performed as required for the safety and upkeep of the lift truck.

PERIODIC MAINTENANCE

MAINTENANCE SCHEDULE

		↓ OR ↓				
WHEN DUE	**100 H**	**FIRST 6 MONTHS**	**FIRST 500 HOURS**	**500 H or 1 YEAR**	**1000 H or 2 YEARS**	**1500 H or 3 YEARS**
PERIODIC MAINTENANCE	1	MANDATORY SERVICE	MANDATORY SERVICE + 2	1 + 2	1 + 2 + 3	1 + 2

WHEN DUE	**2000 H or 4 YEARS**	**2500 H or 5 YEARS**	**3000 H or 6 YEARS**	**3500 H or 7 YEARS**	**4000 H or 8 YEARS**
PERIODIC MAINTENANCE	1 + 2 + 3 + 4	1 + 2	1 + 2 + 3 + 4	1 + 2	1 + 2 + 3 + 4

1. 100 H - ROUTINE SERVICING - FIRST 100 HOURS OF SERVICE

CHANGE	Front and Rear axle differential oil	3-19
CHANGE	Front and Rear wheel reducer oil	3-19
REPLACE	Engine Oil	3-20
REPLACE	Engine Oil Filter	3-20

1+2 500 H - ROUTINE SERVICING - EVERY 500 HOURS OF SERVICE OR 1 YEAR

CHECK	Hydraulic oil	3-21
REPLACE	Hydraulic return oil filter	3-21
REPLACE	Gear box oil filter	3-22
REPLACE	Cab fan filters	3-22
CHECK	Fork wear*	3-22

Consult your dealer.

1+2+3 1000 H - ROUTINE SERVICING - EVERY 1000 HOURS OF SERVICE OR 2 YEARS

ALSO PERFORM THE 500 HOUR PERIODIC MAINTENANCE OPERATIONS.

CHECK	Safety belt	3-23
REPLACE	Dry air filter cartridge**	3-23
REPLACE	Fuel pre-filter	3-24
REPLACE	Fuel Filter	3-24
REPLACE	Coolant	3-24
REPLACE	Gear box oil	3-25
REPLACE	Gear box oil filter	3-22
REPLACE	Alternator / Fan / Crankshaft belt	3-25
CHECK	Engine silent blocks *	3-27
CHECK	Valve lash*	3-26
CHECK	Gear box mountings/Isolators*	3-26
CHECK	Gear box controls*	3-26
CHECK	Brake system pressure*	3-26
CHECK	Boom pad wear*	3-26
CHECK	Condition of wiring harnesses and cables*	3-26
CHECK	Lights and signals*	3-26
CHECK	Warning indicators*	3-26
CHECK	Condition of the rear view mirrors*	3-26
CHECK	Cabin structure*	3-26
CHECK	Frame structure*	3-26
CHECK	Attachment carriage*	3-26
CHECK	Condition of attachments*	3-26
REPLACE	Brake fluid*	3-26
BLEED	Brake circuit*	3-26
ADJUST	Brake*	3-26

**** Consult your dealer.***

***** Can be replaced before the scheduled time depending upon the condition.***

1+2+3+4 2000 H - ROUTINE SERVICING - EVERY 2000 HOURS OF SERVICE OR 4 YEARS

ALSO PERFORM THE 500 HOUR AND 1000 HOUR PERIODIC SERVICE OPERATIONS.

CHECK	Wheel nut tightening torques	3-27
CLEAN	Air conditioning (OPTION)*	3-27
REPLACE	Safety dry air filter cartridge**	3-27
REPLACE	Hydraulic oil	3-28
REPLACE	Breather for the hydraulic oil tank	3-28
CLEAN	Hydraulic oil tank suction strainer	3-28
CLEAN	Fuel tank	3-29
CHECK	Radiator*	3-30
CHECK	Water pump and thermostat*	3-30
CHECK	Alternator and starter*	3-30
CHECK	Turbocharger*	3-30
CHECK	Transmission pressures*	3-30
CHECK	Steering*	3-30
CHECK	Steering swivel joints*	3-30
CHECK	Condition of boom assembly*	3-30
CHECK	Bearings and bushings of the boom *	3-30
CHECK	Condition of hoses and flexible pipes*	3-30
CHECK	Condition of cylinders (leakage, rods) *	3-30
CHECK	Hydraulic circuit pressures*	3-30
CHECK	Bearings and bushings of the frame*	3-30

**** Consult your dealer.***

*****Can be replaced before the scheduled time depending upon the condition.***

OCCASIONAL MAINTENANCE AND OPERATION

OCCASIONAL MAINTENANCE

REPLACE	Wheels	3-30
REPLACE	Battery failure	3-30
BLEED	Fuel supply system	3-31

OCCASIONAL OPERATION

TRANSPORT	Lift truck	3-32
RESET	Longitudinal Stability Limiter and Warning Device	3-33

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company
CIN No. U29130WB2009PTC138256

KVQA
ISO 9001:2015

Chhattisgarh GSTIN : 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Reference: GeM BID No. GEM/2023/B/2955826

Annexure - T 14
Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

List of Consumables Spares (all filters/o-rings including standard engine filters) and Consumables for initial 3000 working Hrs/12 months of warranty period as per maintenance schedule

(As per Clause -A.1 & C.6.2.1)

SL No	Description	Remarks
1	List of Consumables Spares (all filters/o-rings including standard engine filters) and Consumables for initial 3000 working Hrs/12 months of warranty period as per maintenance schedule	Given below

List of initial Spares for 3000 Hrs of machine operation for the each Equipment

S No.	PART NUMBER	DESCRIPTION	UOM	HSN CODE	SERVICE INTERVAL	RQD QTY/ SERVICE	1ST YEAR / 3500 Hrs
1	06.436.01.0.00	SPIN ON LUBE OIL FILTER	Nos	84212300	FIRST 100hrs + EVERY 500hrs	1	8
2	5H.019.001.0.00	SPIN-ON CARTRIDGE PRE FILTER for BS IV	Nos	84212900	FIRST 100hrs + EVERY 500hrs	1	8
3	5H.019.002.0.00	MAIN FUEL FILTER CARTRIDGE FOR BSIV	Nos	84212900	FIRST 100hrs + EVERY 500hrs	1	8
4	6H.411.01.0.00	SAFETY AIR FILTER ELEMENT	Nos	84213100	1000 hrs	1	3
5	6H.411.02.0.00	PRIMARY ELEMENT	Nos	84213100	1000 hrs	1	3
6	4H.1664.02.0.00	POLY V BELT	Nos	40103390	1500 hrs	1	2
7	53109420	FILTER ELEMENT (HYD SYSTEM)	Nos	84212300	500 hrs	1	7
8	53102113	AC FILTER	Nos	84314930	500 hrs	1	7
9	53102108	COMPRESSION BELT	Nos	84314930	1000 hrs	1	3
10	6112184M1	TRANSMISSION FILTER	Nos	84314930	500 hrs	1	7
11	3515254M1	SUCTION ELEMENT	Nos	84213100	2000 hrs	1	1
12	6194313M1	SUCTION STRAINER(TRANS)	Nos	84212300	2000 hrs	1	1
13	53111162	FILTER BS4 AIRCON	Nos	84314930	1000 hrs	1	3

Thanking you,

For, PAB Engineering Works Pvt. Ltd.

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

(Authorized Signatory)

Corporate Office : The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
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CIN No. U29130WB2009PTC138256

KVQA

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN : 19AAFCP2314Q2Z0

Annexure – T 15

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

A detailed Schedule & Specifications of necessary Oils, Lubricants, Fluids to be used in machine with a list of recommended brand names/IS Standard

(As per Clause –C.6.5)

SL No	Description	Remarks
1	A detailed Schedule & Specifications of necessary Oils, Lubricants, Fluids to be used in machine with a list of recommended brand names/IS Standard	Given below

LUBRICANTS

S No.	GRADE	DESCRRIPTION	SERVICE INTERVAL	RQD QTY PER SERVICE (Liters/Kgs)
1	API SJ/CF	ENGINE OIL	FIRST 100hrs + EVERY 500hrs	12 L
2	PRE-MIX READY TO USE COOLANT	COOLANT	5000hrs	16 L
3	ISO VG 46	HYDRAULIC OIL	2000hrs	120 L
4	UNITRAC FR2	GEAR BOX OIL	500hrs	15 L
5	UNITRAC FR2	DIFFERENTIAL AXLE OIL	FIRST 100hrs + EVERY 500hrs	16 L
6	SAE 80W/90 (API GL4 OR GL5)	WHEEL REDUCTION OIL	FIRST 100hrs + EVERY 500hrs	3.2 L
7	MINERAL BRAKE FLUID HLP-15	BRAKE OIL	1000hrs	1 L
8	ELF LEX EP2	GREASE	DAILY	NA

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CIN No. U29130WB2009PTC138256

KVQA

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Details of equivalent lubricants brands

DESCRRIPTION	KOEL	MANITOU	CASTROL	HP	SERVO	SHELL	VALVOLINE	GULF
ENGINE OIL	KOEL CARE PREMIUM GENUINE OIL							
HYDRAULIC OIL			HYSPIN AWS 46	ENCLO 46 PREMIUM	SYSTEM 46	TELLUS S2 V 46	VG 46	HARMONY ISO VG 46
GEARBOX OIL							UNITRAC FR2	
DIFFERENTIAL AXLE OIL							UNITRAC FR2	
WHEEL REDUCTION OIL			MANUAL 80W 90	GEAR OIL XP 80W 90	GEAR SUPER 80W 90	SPIRAX S2 A 80W 90	GEAR GARD SAE 80W 90	EP GEAR OIL 80W 90
BRAKE OIL		HLP-15 MINERAL OIL						
GREASE			MULTI PURPOSE EP L2	MULTI PURPOSE GREASE 2	MULTI PURPOSE GREASE MP2	MULTI PURPOSE GREASE	MULTI PURPOSE GREASE	MULTI PURPOSE GREASE MULTI PRO
COOLANT	K-COOL		READY COOL HD COOLANT	KOOLGARD	KOOL PLUS	COOLANT LONG LIFE HD		

For, PAB Engineering Works Pvt. Ltd.

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

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West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 16

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Self-Certificate about engine emission norms

(As per Clause - 3.1)

We hereby certify that the offered equipment shall meet the emission norms of the engine minimum EPA tier I or equivalent as per applicable emission norms of notification of Govt. of India at the time of tendering/supply.

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

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ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 17

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

ROPS which comply with ISO 3471 & FOBS which comply with ISO 3449 shall be provided.

(As per Clause-3.6)

SL No	Description	Remarks
1	ROPS which comply with ISO 3471 or Latest FOPS which comply with ISO 3449 or Latest	Attached below

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Encl: Page 1-6

Corporate Office : The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
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Ph. : 07752-407803, 433900, E-mail : pab_eng@yahoo.com, marketingpab@gmail.com

Vehicle Certification Agency

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk | www.dft.gov.uk/vca | +44(0) 300 3305797

Report Number: ISU443027 Issue: 0

Test Report: Earth-moving Machinery – Roll-over Protective Structures

Legislation

ISO 3471:2008

Test Details

Location of Test:	Fatigue Testing Lab, ICAT, Manesar
Date of Test:	16 October to 20 October 2018
VCA Representative(s):	Aekansh Saxena
Manufacturer's Representative(s):	Atul Kumar Singhal
Reason for Test Report:	Test report only

Manufacturer Details

Name and Address:	Manitou Equipment India Pvt. Ltd. Plot No. 22 , Udyog Vihar , Greater Noida P.O. Surajpur , Dist. – Gautam Budh Nagar – 201306 Uttar Pradesh , INDIA
Type:	MXT 840
Commercial Description:	Cabin ROPS for Heavy Earth Moving Machinery - Material Handling Equipment. Telescopic Handler - Rough Terrain Variable Reach Truck
Category:	Construction Equipment Vehicle

Conclusion

The above mentioned type was tested in accordance with the above mentioned legislation and was found to comply in all respects.

Signature:

Name:	Aekansh Saxena
Position:	Type Approval Engineer
Date:	22 February 2019

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

List of Annexes

Annex	No of Pages	Subject
I	14	Manufacturer Application Document

Vehicle Certification Agency

22-Feb-19

Vehicle Certification Agency

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk | www.dft.gov.uk/vca | +44(0) 300 330 5797

Worst Case Rationale

This Test Report has been issued as requested by the manufacturer.
Test conducted on Four post Cabin ROPS, mounted on Machine Type – MXT 840, as presented.
Testing was done as per Clause 6 of ISO 3471:2008
Testing was done considering highest Machine Mass declared by the manufacturer.

Note: Include information on variants and versions this report covers, as applicable

Tests Required

	Yes, NA, See Report ... / Approval ... / Annex ...
Specification:	Yes
Test Method and Test Facilities:	Yes
Test Loading Procedure:	Yes
Temperature and Material Criteria:	Yes
Acceptance Criteria:	Yes

Machine Specification

Type:	MXT 840
Manufacturer:	Manitou Equipment India Private Limited
Model Number:	MXT 840
Serial Number:	Proto
Machine Frame Part Number:	Proto

Manufacturer's Documentation

Manufacturer's documentation is complete and reflects the agreed specification for the ROPS tested, and covers all variants and versions agreed in the worst case rationale.	Yes

Facility and Equipment Checks

Calibration certificates checked and valid, recorded in the following table:	Yes

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Vehicle Certification Agency

22-Feb-19

Vehicle Certification Agency

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk | www.dft.gov.uk/vca | +44(0) 300 330 5797

Report Number: ISU443027 Issue: 0

Equipment	Serial/Certificate No.	Calibration due*
Hydraulic actuator (For lateral & longitudinal load test)	Load Cell -FAT/LDCL/MOOG/160kN/1.8 ETTL/18-19	29/03/2019
	LVDT - FAT/ACT/MOOG/160kN/1.8 10111703	29/03/2019
Hydraulic actuator (For Vertical load test)	Load Cell- FAT/LDCL/MOOG/160kN/1.7 ETTL/18-19 LVDT - FAT/ACT/MOOG/160kN/1.7 10111704	29/03/2019
	Load Cell -FAT/LDCL/MOOG/160kN/1.8 ETTL/18-19	29/03/2019

Specify calibration due date.

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Vehicle Certification Agency

22-Feb-19

Vehicle Certification Agency

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk | www.dft.gov.uk/vca | +44(0) 300 3305797

Report Number: ISU443028 Issue: 0

Test Report: Earth-moving machinery — Falling – Object Protective Structures — Laboratory Tests and Performance Requirements

Legislation

BS EN ISO 3449 :2008

Test Details

Location of Test:	Fatigue Testing Lab, ICAT, Manesar
Date of Test:	23 October to 26 October 2018
VCA Representative(s):	Aekansh Saxena
Manufacturer's Representative(s):	Atul Kumar Singhal
Reason for Test Report:	Test report only

Manufacturer Details

Name and Address:	Manitou Equipment India Pvt. Ltd. Plot No. 22, Udyog Vihar, Greater Noida P.O. Surajpur, Distt. – Gautam Budh Nagar – 201306 Uttar Pradesh, India
Type:	MXT 840
Commercial Description:	Cabin FOPS for Heavy Earth Moving Machinery - Material Handling Equipment. Telescopic Handler - Rough Terrain Variable Reach Truck
Category:	Construction Equipment Vehicle

Conclusion

The above mentioned type was tested in accordance with the above mentioned legislation and was found to comply in all respects. This report relates only to the items tested.

Signature:

Name:	Aekansh Saxena
Position:	Type Approval Engineer
Date:	20 February 2019

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

List of Annexes

Annex	No of Pages	Subject
I	14	Manufacturer's Information Document

Vehicle Certification Agency

20-Feb-19

Vehicle Certification Agency

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk | www.dft.gov.uk/vca | +44(0) 300 3305797

Report Number: ISU443028 Issue: 0

Worst Case Rationale

This Test Report has been issued as requested by the manufacturer.
Test conducted on Four post Cabin FOPS, mounted on Machine Type MXT 840 (FOPS Part No. 53108069) as presented.
Testing was done as per Clause 6 of BS EN ISO 3449:2008
Testing was done considering highest Machine Mass declared by the manufacturer.

Note: Include information on variants and versions this report covers, as applicable. Supporting documents may be annexed to this report.

Tests Required

	Yes, NA, See Report ... / Approval ... / Annex ...
Level I	Yes
Level II	Yes

Manufacturer's Documentation

Manufacturer's documentation is complete and reflects the agreed specification for the FOPS tested and covers all variants and versions agreed in the worst case rationale: Yes

Facility and Equipment Checks

Calibration certificates checked and valid, recorded in the following table: Yes

Equipment	Serial / Certificate No.	Calibration due*
DLV	ICAT/FTL/FOPS/02	02.01.2019
Vernier Calliper	ICAT/CCL/INST/DVC/01	23.04.2019
Drop Test Object (45Kg)	ICAT/FTL/FOPS/01	02.01.2019
Measuring Tape	ICAT/CCL/CERT/MT/01	02.08.2019
Steel Scale	ICAT/CCL/CERT/SS/06	03.08.2019
Weighing Balance	ICAT/CCL/WB/03	10.11.2018

**Specify calibrated date + (interval) or calibration due date.*

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Vehicle Certification Agency

20-Feb-19

Vehicle Certification Agency

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk | www.dft.gov.uk/vca | +44(0) 300 3305797

Report Number: ISU443028 Issue: 0

Machine Test Information

Specification

Protection Structure

Objective of Test	At the specific request of Manitou Equipment India Private Limited, to conduct the FOPS Level I &II , test on Falling Object Protective Structure as per BS EN ISO 3449:2008 fitted on Backhoe Loader Machine
Part numbers of FOPS	53108069

Machine

Make	Manitou Equipment India Private Limited
Model no	MXT 840
General arrangement drawing of protective structure	Refer Manufacturer Application Document
Maximum machine mass, M for which the FOPS is tested for.	10000Kgs
Material details	Refer Manufacturer Application Document

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Vehicle Certification Agency

20-Feb-19

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company

CIN No. U29130WB2009PTC138256

KVQA

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 18

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Provenness criteria compliance

SL No	Description	Remarks
1	Provenness criteria compliance (PO Copy, Commissioning Report, Performance Certificate)	Attached below

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Encl:

1. Duly Seal/Sign & Notarized PO Copy of M/s Celite Tyre Corporation
2. Duly Seal/Sign & Notarized commissioning report.
3. Duly Seal/Sign & Notarized performance certificate.

Corporate Office The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
Phone No. : 033 4008-9503/ 4008 9603, e-mail : pab.kolkata@gmail.com

Branch Office 3, Chadda Badi, Nehru Nagar, Bilaspur 495001 (C.G.)
Ph. : 07752-407803, 433900, E-mail : pab_eng@yahoo.com, marketingpab@gmail.com

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company

CIN No. U29130WB2009PTC138256

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Self Certificate for Proven-ness Source

" The items covered in the Purchase Order(s)/ Rate Contracts(s) copies enclosed with our offer have been fully executed and have performed satisfactorily as per the provisions of respective Purchase Order(s) / Rate Contract(s) and all the complaints /claims lodged by the purchaser , if any , have been attended to and no complaints / claim(s)are pending .'

Date : 23.01.2023.

Signature of Tenderer

Seal of the Firm

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Corporate Office : The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107,
Phone No. : 033 4008-9503/ 4008 9603, e-mail : pab.kolkata@gmail.com

Branch Office : 3, Chadda Badi, Nehru Nagar, Bilaspur 495001 (C.G.)
Ph. : 07752-407803, 433900, E-mail : pab_eng@yahoo.com, marketingpab@gmail.com

Celite Tyre Corporation

IMPORTERS AND DISTRIBUTORS OF TYRES

[illegible] Apartment, Near [illegible] Hotel, [illegible] Road, [illegible], Baroda [illegible], Gujarat, India
Phone: [illegible] Fax: [illegible] E-mail: [illegible]

Our Ref.: CTC/BRD/TM/001

Date: 8th Apr.2021

To,

MANITOU EQUIPMENT INDIA PVT. LTD
PLOT NO.23, SIKRI PIYALA ROAD
TEHSIL - BALLABGARH
FARIDABAD-121004 (HARYANA)

KIND ATTENTION: Mr. HAFEEZ KHAN

Sub: Order for Telehandler

Dear Sir,

We are pleased to place our order as under.

Sr.	DESCRIPTION	QTY	Price
1	Model no.- MXT840 K.Manitou Telehandler-7.60 m / 4T, Forks	1	Rs. 47,00,000

TERMS

PAYMENT : 90 days credit against LC
DELIVERY SCHEDULE : 8-12 weeks from the date of PO.
WARRANTY : 2 years or 2000 hours whichever is earlier.
Maintenance : 2 years AMC including spares under warranty.
Scope : Supply of MANITOU Telehandler MXT840 K (standard specification)
Commissioning by MANITOU After Sales Support representative
Supply of Operations & Maintenance manual with the machine

Thanking you,

For Celite Tyre Corporation

Authorized Signatory

NOTARY
RAKESH PANDEY
Bilaspur 30-12-2019
Distt. Bilaspur (C.G.)
GOVT. OF CHHATTISGARH

Attested True Copy
Rakesh Pandey
Notary
Bilaspur Distt. Bilaspur (C.G.)

30 JAN 2023

PAB ENGINEERING WORKS PVT. LTD.
KOLKATA

MANITOU GROUP

MANITOU GEHL MUSTANG BY MANITOU

ORIGINAL FOR RECIPIENT

TAX INVOICE

PAN No. : AABCT8105H
GSTIN No.: 06AABCT8105H1ZI
Tax Payable on reverse charge : No
Place of Supply RAJASTHAN Is Service : No

Name and Address of the Customer(Bill to) **CCW16335**
CELITE TYRE CORPORATION
B 16 BIHARI APARTMENT NEAR WELCOME HOTEL
R C DUTT ROAD, BARODA, GUJARAT - 390007

City BARODA State Code 24
State GUJRAT PIN No 390007
GST No. 24ACFPM7014D1Z2 PAN No
Transporter Trans State
SONU FREIGHT CARRIERS PVT LTD HARYANA

ERP Reg # HWOU05050

Sales Invoice No.	FEU00539
Sale Invoice Date	05/08/2021
Date of Preparation	05/08/2021
Time of Preparation	10:55:00

Invoice Type B2B
Insurance No. 22703140 (IFFCO-TOKIO General Insurance

Name and Address of the Consignee (Shipped To) 2
CELITE TYRE CORPORATION
GHH BHUMI MINING SERVICES PVT LTD
ZAWAR MALA, ZAWAR MINES
TIDI, UDAIPUR, RAJASTHAN - 313901
City UDAIPUR State Code 08 India
State RAJASTHAN PIN No. 313901
GST No. 08ACFPM7014D1ZW

Trans PIN	Trans GSTN No.	Vehicle No.	RR / LR No
121004	06AAFCS9171G	HR38W9882	053

Transit Insurance By MEI Freight By MEI

PO No. CTC/BRD/TM/002 DTD 08.04.2021 PROFORMA INV NO MIND/PI/MHA/AM/001 DTD 12.04.2021

IRN No. b135d3b412f6e9e1abe1506ad336ae46e95f132ab9b90ae4a1ef1d6980130085

LC ISSUING BANK: BANK OF BARODA, RAOPURA VADODARA, INDIA. L/C No. 0198ILC000468121 DATED-11.05.2021, HARMONIC CODE-8427.90

S.No.	Description MXT840KACTFFBSIII	HSN of Goods / Accounting code of Service	UOM	Quantity	Rate (Rs.)	Amount (Rs.)
1	MXT 840 (MANITOU TELEHANDLER) MAX. LIFTING HEIGHT:7.6M, MAX LIFTING CAPACITY @ 500MM LOAD CENTRE: 4000 KG, KIRLOSKAR ENGINE 4R1040 TA2, POWER: 96 HP - 71.50 KW, FORKS WITH STANDARD ACCESSORIES. **Machine No.** 92 Engine No. 4H3338/2020023 Chassis No >TEP0840KLM2000092<	84279000	Nos	1.00	4,700,000.00	4,700,000.00

Terms and Conditions

1) Any other taxes/levies that arise at the time of delivery, due to any change in Govt Policies or otherwise will be borne by the Customer Entry taxes, at any point shall be the liability of the Customer.
2) Concessional Taxes are subject to receiving of relevant Tax declaration forms, if the same are not provided within stipulated period you will be liable, to pay additional tax with interest, as applicable.
3) Our responsibility ceases on delivery of the goods to the customer, their representatives or common carriers arranged by any party.
4) All disputes are subject to jurisdiction of Delhi Courts only.

Total Value			4,700,000.00
Less Discount		(-)	0.00
Total Assesable Value			4,700,000.00
Loading & Lashing			0.00
Insurance			0.00
Misc Charges			0.00
Interest			0.00
Taxable Turnover			4,700,000.00
IGST Amount @	18.00	%	846,000.00
CGST Amount @	0.00	%	0.00
SGST Amount @	0.00	%	0.00
Total Amount with Tax			5,546,000.00
TCS Tax @	1.000	%	55,460.00
Other Charges			0.00
Gross Invoice Value			5,601,460.00

Bank Name :HDFC BANK LTD, Address :C1 ,ALPHA PLAZA,, ALPHA COMMERCIAL BELT,, GREATER NOIDA, UTTAR PRADESH, 201306, INDIA, Account No. - 02788470000172, IFSC Code- HDFC0000278
CIP: UDAIPUR RAJASTHAN (INCOTERMS 2020) [IT IS CERTIFIED THAT GOODS SUPPLIED ARE AS PER PI NO. MIND/PI/MHA/AM/001 DATED 12.04.2021

Dispatch Details:- MANITOU EQUIPMENT INDIA PVT LTD, Address:- SURVEY NO. 409, NEAR KHODAL HOTEL, NR FAIBABA, SANAND, SANATHAL CIRCLE, TALUKA SANAND, AHMEDABAD, GUJRAT, 382201, INDIA, 1204194100, MEI.MARKETING@MANITOU-GROUP.COM

Advance	0.00	IGST	18.00%	0.00	Net Invoice Value
CGST	0.00%	0.00	SGST	0.00%	0.00	5,601,460.00

Invoice Value (in words) Rupees Fifty Six Lacs One Thousand Four Hundred Sixty Only
GST Payable in Reverse Charge Rupees Eight Lacs Forty Six Thousand Only

Declaration: Certified that the particulars given above are true & correct and the amount indicated represent the price actually charged and that there is no flow of additional consideration, directly or indirectly, from the buyer.

PABA ENGINEERING WORKS PVT. LTD. KOLKATA

Attested True Copy

For Manitou Equipment India Pvt. Ltd.

(Authorised Signatory)

Manitou Equipment India Pvt. Ltd.
Plot No. 28, Sikri Piyala Road, Tehsil Ballabgarh, Faridabad, Haryana - 121004
Factory: Plot No. 22, Udyog Vihar, Greater Noida, P.O. Surajpur, Gautam Budh Nagar, U.P.-201306, India
Regd. Office: 1st Floor, Plot No. A-10 Block-BT, Main Mathura Road, Mohan Cooperative Indl. Estate, New Delhi - 110044
Tel. : +91-120-4194100, Fax : +91-120-2560541, Email: mei.marketing@manitou-group.com, Web: www.manitou.com
CIN: U74999DL2003PTC366808

30 JAN 2023

EQUIPMENT START-UP CERTIFICATE MANITOU

Copy to be returned by the dealer to MANITOU
SAV - 430 rue de l'Aubinière
BP 249 - 44158 Ancenis CEDEX

Model of machine MXT-840
Serial No. TEP08b0KLM2000092
Number of hours 14.4

The dealer:

Name: Manitou South Asia
Address: Mohan Co-operative Industrial Estate
Post code: 110044
Town: New delhi
Country: India
Dealer code:

Dealer's stamp:

Signature of dealer's representative: S. Satish

Name of signatory (in capitals): SATHISH KUMAR S

Customer:

Company: Celite Corporation
Address: 3rd Floor, Bihar Building, R.C. dutt Road.
Post code: 390007
Town: Vadodara
Country: India
Telephone: 9922438300
Service contact: 8385006888
NAF activity code:

Activity:

- ☐ Farming, Agriculture
- ☐ Manufacturing Industry
- ☑ Mining
- ☐ Construction/building and public works
- ☐ Retail and wholesale trade
- ☐ Rental
- ☐ Service and administration
- ☐ Sanitation and waste management
- ☐ Other (specify):

Customer's stamp:

CELITE TYRE CORPORATION NOTARY

RAKESH PANDEY
Bilaspur 30-12-2019
Dist. Bilaspur (C.G.)

Attested True Copy
Rakesh Pandey
Notary
Bilaspur, Dist. Bilaspur (C.G.)
30 JAN 2023

The customer confirms (tick as appropriate):

- ☑ That the equipment and attachments delivered are complete, in good working order and perfect condition,
- ☑ That the machine delivered is as ordered and free of obvious defects,
- ☑ That he/she has been handed the instruction manual, the CE certificate of conformity and the parts catalogue corresponding to the machine,
- ☑ That he/she has received the operating, maintenance and safety instructions specific to the machine.

Customer comments following start-up of equipment:

Date of start-up: 07-August-21

Customer signature: Ranjit

DB ENGINEERING WORKS PVT. LTD. KOLKATA

Celite Tyre Corporation

IMPORTERS AND DISTRIBUTORS OF TYRES

Issuing Date : 04th October 2022

To

Manitou South Asia Pvt.ltd

This is to certify that one number Manitou telehandler model MXT840 machine serial number MXT-840 TEP0840KLM2000092 with Tyre handler attachment has been procured from M/s Manitou South Asia Pvt.ltd and commissioned on 07.08.2021.

This machine has covered 970 hours of working till date and the machine is performing properly as per its design and specifications without any breakdown. Necessary service and preventive check support is also being offered by the supplier on a timely basis.

This is for your kind information please.

CELITE TYRE CORPORATION

Celite Tyre Corporation

NOTARY RAKESH PANDEY CG-14/Takhatpur Bilaspur 30-12-2019 Distt. Bilaspur OF CHHATTISGARH

Attested True Copy

Rakesh Pandey
Notary
Bilaspur, Distt. Bilaspur (C.G.)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

B-16, Bihari Apartment (Near Welcome Hotel, R C Dutt Road, Vadodara - 390007 Gujarat, India.
Tel: (91)-265-2333024 / 232-726 /2353198 Fax: (91)-(2333023 Email: celitetyre@vsnl.net / Vadodara@celitetyre.com

30 JAN 2023

PAB ENGINEERING WORKS PVT. LTD.

An ISO 9001 : 2015 Certified Company
CIN No. U29130WB2009PTC138256

KVQA

ISO 9001:2015

Chhattisgarh GSTIN :- 22AAFCP2314Q2ZD

West Bengal GSTIN :- 19AAFCP2314Q2Z0

Annexure – T 19

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Quality Assurance Plan as per ISO 9000 or equivalent

(As per Clause –C.10.1)

S. No.	Description	Remarks
1	Quality Assurance Plan as per ISO 9000 or equivalent	Enclosed herewith

For, PAB Engineering Works Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Encl: Pages 1-10

Corporate Office The Chambers, office No.-602, 1865, Rajdanga Main Road, Kolkata-700107.
Phone No. : 033 4008-9503/ 4008 9603, e-mail : pab.kolkata@gmail.com

Branch Office 3, Chadda Badi, Nehru Nagar, Bilaspur 495001 (C.G.)
Ph. : 07752-407803, 433900, E-mail : pab_eng@yahoo.com, marketingpab@gmail.com

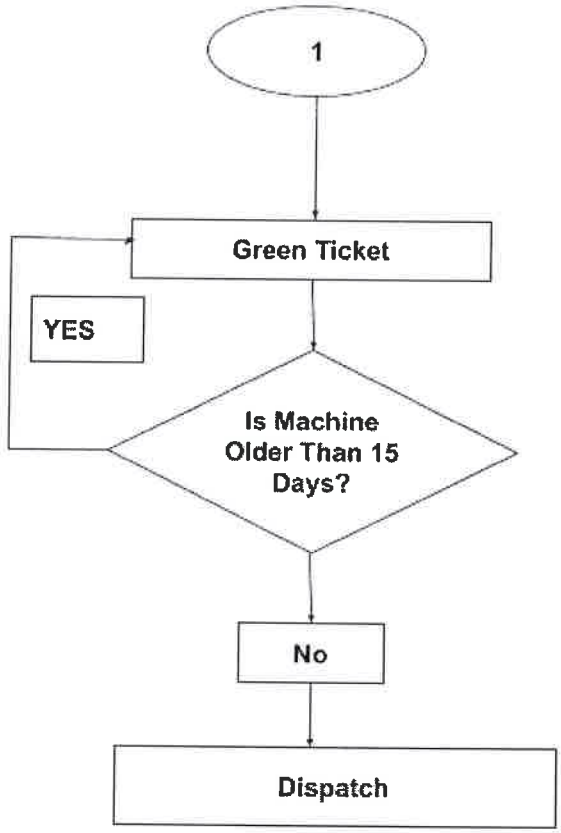
MANITOU GROUP	Manitou India - MACHINES FINAL INSPECTION Process Flow	Doc. No. : P-QAD-09 Rev. No. : 01 Page No. : 1/2 Eff. Date : 23/08/2022

RESPONSIBILITY	PROCESS FLOW	DOCUMENTS/ RECORDS
Line Quality Gate Leader	Quality Gate Check	C-ASY-01
Production Supervisor	Washing	
Production Supervisor	Hot Test Inspection	C-ASY-01
Production Supervisor	Hot Test Rework	
Production Supervisor	Paint Touch up	
Final Inspection Incharge	Final Control Inspection	C-QAD-04
Production Supervisor	Quality Alert Display at required Location	F-QAD-12 (QUALITY ALERT)
	Final Control Rework	
	YES	
	Is Machine Older Than 30 Days?	
	NO	

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Prepared By *Baljeet Singh*	Reviewed & Approved By: *Antoine Laroche*

MANITOU GROUP	Manitou India - MACHINES FINAL INSPECTION Process Flow	Doc. No. : P-QAD-09 Rev. No. : 01 Page No. : 2/2 Eff. Date : 23/08/2022

RESPONSIBILITY	PROCESS FLOW	DOCUMENTS/ RECORDS
Final Inspection Incharge Sales Supervisor		C-QAD-05

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Prepared By *Baljeet Singh*	Reviewed & Approved By: *Antoine Laroche*

MANITOU	INSTRUCTION	Doc. No. : C-QAD-14
Machine nb and date:	C-QAD-14_J_Final Control on India Telehandlers machines MXT-840 and MXT-1740	INDEX: 2

Line number	Description	clamping	conformity	operation	raise	setting	presence	option	Acceptation criteria	validated step
1	**Take the most urgent machine Check the presence of Roll off, EOLT,EOLT Rework and White AC fueling Stickers**								Roll off EOLT EOLT Rework WHITE => AC fueling is done (if option)	
2	Check machine configuration https://docs.google.com/spreadsheets/d/1l2QoBtGcuLtQzzbz8f7ld3KOfwQfdrJIpWYxynk9qyY/edit#gid=776678574		x				x	x	See ANC-DO-QU-011	
3	Check machine color		x					x	See production plan	
4	Machine booklet, consistency with configuration			x					Properly filled by production team	
5	Check options		x				x			
6	Identification number punched on chassis, as per booklet		x						See ANC-DO-QU-013	
7	Identification number on manufacturer plate (inside cabin for export / at the back of chassis for India)	x	x				x		Check also quality / clamping of plate	
8	Model of the machine on the data plate should punch correctly		x				x			
9	Information on data plate for export - Manufacturing Year = 2022 Model Year= 2022		x							
10	ROPS-FOPS plate	x	x				x		Check presence of plate, under seat	
11	Month and year on identification no should match with data plate for kirloskar machine		x				x			
12	Control folder for hot test								Must be complete	
13	Checksheet for BS4 Machines(840 & 1740 both)		x						If doubts match with PPT given by engineering	
14	Setting and control the mirrors	x	x			x			See ANC-DO-QU-041	
15	Keys		x						keys + keychains - ignition key (x2) - door key (x2) - filling engine oil key (x2)	
16	Engine oil filler No hole		x							
17	Hydraulic oil level		x						See ANC-DO-QU-016	
18	Engine oil level		x						See ANC-DO-QU-016	
19	Transmission oil level (in gear box)		x						See ANC-DO-QU-016	
20	Machine is clean?								See ANC-DO-QU-026	
21	Control aspect								turn anti-clockwise around the machine, from the front left-hand follow ANC-DO-QU-019	
22	No ok sticker sticked on the machine		x							
23	Check no bending on rear fenders		x							
24	1740: Lift cylinder not fouling with boom foot axis bracket								When boom is fully down position	

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

MANITOU	INSTRUCTION	Doc. No. : C-QAD-14
Machine nb and date:	C-QAD-14_J_Final Control on India Telehandlers machines MXT-840 and MXT-1740	INDEX: 2

Line number	Description	clamping	conformity	operation	noise	setting	presence	option	Acceptation criteria	validated step
25	Pressure of tyres 840:(58 PSI = 4bar) 1740: 65 PSI		x						should be on booklet. If doubt, check again with manometer	
26	Correct orientation of Tyre (Driving mark)		x							
27	Water proofing of cabin(check sealants at top of cabin)		x						Put water at top, rear and side of cabin. Check there is no leakage inside.	
28	Water proofing of Recirculation box"(applicable after SOP)"		x							
29	**CLIMB IN CABIN**									
30	Gap b/w cabin and chassis with some hard paper		x						if doubt shake cabin and check movement if fouling with footboard adjust the clamping position	
31	Floor mat		x			x	x			
32	Steering selection lever: not loose, nut tightened	x		x						
33	Check cleanliness under seat		x							
34	Seat operation			x						
35	Safety belt operation			x					Keep it on for all dynamic checks	
36	No play on auxiliary lever		x							
37	No Scratch on hydraulic and gear lever knobs also below position		x			x				
38	Monolever guide sticker orientation		x				x			
39	Brake liquid tank : cap and rotation	x		x					Black cap, 2 mm rubber strip	
40	Check proper pasting of cabing glass with gentle push		x							
41	Type of bolts : remove cross, use Hex type (if not possible, then CHC (socket head) or CBHC(button head))		x							
42	Fuses and relays as per drawing		x	x						
43	Tool kit: 840/**1740** - small, blue blag for Perkins - big, black bag for Kirloskar	x		x				x	At the back of the cabin, Check condition of bag and working of zip	
44	**PUT POWER ON**									
45	Put heater (if option). Check button color			x				x	Check 3 speeds of ventilator	
46	Keep heater with max ventilator speed. Take value in D4 after 5min: T=			x					on D4 : +18°C in 5min up to 37°C ambient Above 37°C ambient, target 55°C	
47	Heater off			x					Make sure air flow takes ambiant T°	
48	Check fuel level gauge AND NEEDLE (Should be more than 1/4)			x					See ANC-DO-QU-052.	
49	Autoradio			x				x	Radio station finding, and 2 speakers	
50	Hour meter			x					See ANC-DO-QU-052.	
51	Front and rear wipers / washers	x		x				x	See ANC-DO-QU-006.	
52	Roof curtain	x		x			x	x		
53	Ceiling light			x				x		
54	Fan			x				x		
55	Horn			x	x					
56	Spirit level	x	x			x			The "0" line should be over a part of the bubble See ANC-DO-QU-022	
57	Lights / beacon			x					Check also light of dashboard	

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

MANITOU	INSTRUCTION	Doc. No. : C-QAD-14
Machine nb and date:	C-QAD-14_J_Final Control on India Telehandlers machines MXT-840 and MXT-1740	INDEX: 2

Line number	Description	clamping	conformity	operation	noise	setting	presence	option	Acceptation criteria	validated step
58	Inner covers	x				x				
59	weldings		x						See ANC-DO-QU-031	
60	opening/closing hatchback			x		x			keeps it closed (against dust)	
61	Brake pedal floor clearance	x							90mm min height at rest 32mm min when pushing mox	
62	check load charts (for each accessory) and function sheets. **1740: with and without stabs**	x		x			x	x	See ANC-DO-QU-065	
63	No indicator should glow after cranking engine(except neutral and parking)		x	x						
64	Check indicators			x					See ANC-DO-QU-052 All indicators should glow	
65	Brake lights and reverse lights			x					See ANC-DO-QU-052	
66	Rear camera working		X							
67	Inverter startup safety check			x					Engine doesn't start	
68	**START ENGINE**									
69	Brake lights and reverse lights									
70	Put on AC (if option). Check air flow: *ventilation max speed. Open all ducts.* *Min values:* *- D1 towards operator: 2.2 m/s* *- D2 towards windscreen (left): 2.22 m/s* *- D3 towards windscreen (right): 2.42 m/s* *- D4 operator foot 4.56 m/s* *- D5 Next to LMI display: 5.5 m/s*			x	x			x	Air flow D1: D2: D3: D4: D5:	
71	Keep AC (if option). Check temperature: At blower top speed, after 5 minutes : - For ambient temp after 5min =< 2 + (ambiant temp /2) at vent in D4			x	x			x	Temperature Ambient: D4:	
72	**REMOVE PARKING BRAKE**									
73	Check parking brake. No fouling with safety belt			x					Indicator stops	
74	**GO TO THE TEST TRACK**								**Know the rules of the test track**	
75	No jerking: Boom fully retracted, in upper position, go down.			x	x	x			Motion should be smooth	
76	Gear shifting			x	x	x				
77	Brake pedal adjustment	x		x					A very slight looseness before it starts braking	
78	Speed (this test is not mandatory)		x						TOLERANCE = +/- 10% 25 km/h	
79	Emergency braking			x	x					
80	Seat cut-off			x					no more transmission if driver stands up + See ANC-DO-QU-023	
81	Other cut-offs (parking brake, release button)			x		x				
82	Check engine coolant temperature gauge			x					Needle should go up during testing	
83	**1740: Stabs operation (5 cycles). Smooth motions. Not fouling with lights**			x	x					
84	**1740: boom extension on wheels (test 1 in PPT)** **No stabs, no load. Extend boom horizontally**		x	x					**Boom should not extend more than 10m**	
85	**1740: boom extension on stabs (test 2 in PPT)** **Stabs, no load. Extend boom horizontally**		x	x					**Boom should extend all the way**	
86	**1740: stab retract (lift, test 3.1). Machine on stabs (lift front wheels from ground, but keep some stroke on stabs) - boom extended 1m** **Try to move stab cylinder up and down**		x	x					**Safety logic :** **- stab should not go up** **- stab should be allowed to go down**	
87	**1740: stab retract (lift, test 3.2).** **From previous situation, retract fully boom.** **Try to move stab cylinder up and down**		x	x					**All movements of stabs should be allowed**	

MANITOU	INSTRUCTION	Doc. No. : C-QAD-14
Machine nb and date:	C-QAD-14_J_Final Control on India Telehandlers machines MXT-840 and MXT-1740	INDEX: 2

Line number	Description	clamping	conformity	operation	noise	setting	presence	option	Acceptation criteria	validated step
88	**TAKE 4T LOAD**								**Know the rules of the test track**	
89	Check LMI security cut-off			x					See ANC-DO-QU-069	
90	Hour meter			x					See ANC-DO-QU-052	
91	Control response time back			x					See ANC-DO-QU-069	
92	Hydraulic motions (lift, tilt, extend, stabs)			x	x				See ANC-DO-QU-069	
93	**1740: monolever: up, down, tilting** (left = Cyl open/Bucket crowd towards up)			x						
94	Aggravating valve. Optional on 840 / standard on 1740		x	x						
95	Test 4- Stab load holding Action : extend horizontally until machine rear wheels are lifted (push parachute button)								**Setup : Machine on stabs - 2.5T to 4T load** **Safety logic : wait 3 minutes, stab cylinders should not retract.**	
96	**1740: stab cylinder**	x						x	Rod aspect and no leakage See ANC-DO-QU-010, 034	
97	Driving control (all direction modes, crabe mode drift, and L and R steering forwards and backwards)			x	x				See ANC-DO-QU-035	
98	Reverse beeper			x				x		
99	**REMOVE 4T LOAD. EXTEND BOOM HORIZONTALLY, STABS IF EQUIPPED, ENGINE OFF, GO OUT**									
100	**1740: left stabilizer**	x				x		x	axis clamping + grease nipple x5	
101	**1740: Telescope cylinder (MXT 1740)**		x						rod aspect, no leakage See ANC-DO-QU-010, 034	
102	**1740:Left circlip head of telescope cylinder**	x	x				x			
103	Boom left hand		x						Aspect et graissage.	
104	Hydraulic tubes under boom	x							rod aspect, no leakage See ANC-DO-QU-010/024	
105	Clamping of tubes under boom(Front)	x								
106	block (patin) / broom	x								
107	1740:Left circlip head of telescope cylinder									
108	tilting cylinder foot axis	x								
109	Tilting cylinder valve	x							Valve clamping, no leakage See ANC-DO-QU-010, 057	
110	Tilting cylinder		x						Rod aspect, no leakage See ANC-DO-QU-010, 034	
111	Coupling + caps	x	x					x	Sticker presence, no leakage See ANC-DO-QU-010	
112	Security instructions sticker on boom head		x				x			
113	tilting cylinder head axis	x								
114	Tie-rod axis ("axe de bielette")	x					x		Circlip + graissage	
115	Grease nipples (x4 on hitch + 1 on boom head) and greasing of axis and x7 on 1740	x					x		we must see that greasing was done	
116	Hook Weldment		x				x			
117	hitch axis	x					x		Circlip + grease	
118	840: R circlip telescope cylinder head						x			
119	Boom right hand								Aspect and grease	
120	**1740: R stabilizer**	x				x		x	MT1030S axis clamping + grease nipple x5	
121	Welding		x						See ANC-DO-QU-031	

MANITOU	INSTRUCTION	Doc. No. : C-QAD-14
Machine nb and date:	C-QAD-14_J_Final Control on India Telehandlers machines MXT-840 and MXT-1740	INDEX: 2

Line number	Description	clamping	conformity	operation	noise	setting	presence	option	Acceptation criteria	validated step
122	**AT PDI WORKSTATION, LIFT THE BOOM AND TURN ENGINE OFF**									
123	Tighten parking brake	x		x						
124	1740:Lift boom fully and check left lift cylinder not fouling with chassis		x							
125	**REAR RIGHT OF MACHINE**									
126	General aspect								No oil, no filings	
127	Strain gage	x					x			
128	Lift cylinder foot axis	x							Grease and tightening	
129	Rear right fender	x	x						sealant, weldings, clamping	
130	Rear right light	x							No damage	
131	**1740: adjustable rear lights. Smooth operation**	x	x							
132	Rear right wheel and reducer **1740: "16 PLY rating wheel"**	x	x						Nut + valve clamping Aspect of rim, tyre and nuts	
133	Safety wedge (visual check) and pins	x	x				x		If the machine is red, the wedge is yellow. Otherwise, wedge is red.	
134	No leakage of coolant inside plate	x	x							
135	**PUT PDI SILVER SAFETY WEDGE. PUT PROTECTION AND CLIMB ON REAR RIGHT FENDER**									
136	Boom right hand		x						Peinture / adhésif "Manitou"	
137	Clamping of tubes under boom (Rear and middle)									
138	Boom foot rear axis and grease nipple	x							Grease and tightening	
139	Compensation cylinder head axis and grease nipple	x							Tightening and greasing	
140	Compensation cylinder								Rod aspect, no leakage See ANC-DO-QU-010, 034	
141	840: Telescope cylinder foot axis (circlip)	x								
142	**1740: Telescope cylinder foot axis (clamping)**	x								
143	**1740: Valve for Telescope cylinder**	x								
144	Compensation locking valve	x								
145	Lift cylinder head axis and grease nipple	x							Tightening and greasing	
146	Lifting cylinder								Rod aspect, no leakage See ANC-DO-QU-010, 034	
147	Compensation cylinder foot axis and grease nipple	x							Grease and tightening	
148	Hoses and tubes	x							Tightening and routing	
149	Fixed cover bolt clamping	x								
150	Radiator cap operation + chain			x						
151	Lifting cylinder valve and foot grease nipple		x						See ANC-DO-QU-031	
152	Weldings		x						See ANC-DO-QU-031	
153	**1740: Counterbalance valve type as on picture. Part number = 228829**		x							
154	**BACK OF MACHINE**									
155	Rear hook	x						x	Presence of sticker, pin	
156	Caps for couterweight hole when no towing hook		x							
157	Counterweight	x								
158	Top of boom		x							
159	**REMOVE REAR GRILL**									
160	Coolant level + cap + sticker + hoses (no restrictions)	x	x						See ANC-DO-QU-016	
161	Radiator	x							Bouchon	
162	Check HOC if configured		x							
163	**REAR LEFT OF MACHINE**									
164	General aspect								No oil, no filings	
165	Rear left fender	x	x						sealant, weldings, clamping	
166	Rear lights	x	x						No damage	
167	**1740: adjustable rear lights. Smooth operation**	x	x							
168	Washer tanks	x	x							
169	Rear left wheel and reducer **1740: "16 PLY rating tire"**	x	x						Nut + valve clamping Aspect of rim, tyre and nuts	
170	Lift cylinder foot axis	x							Grease and tightening	
171	Compensator	x				x			Misalignement accepted 5mm max	

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

MANITOU	INSTRUCTION	Doc. No. : C-QAD-14
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Line number	Description	clamping	conformity	operation	noise	setting	presence	option	Acceptation criteria	validated step
172	Working lights: proper angle, connectors protected by plastic parts	x	x					x		
173	**PUT PROTECTION AND CLIMB ON REAR LEFT FENDER**									
174	Exhaust muffler + orientation (cap at the bottom)	x							135mm +/-5mm from chassis plate to exhaust drain plug	
175	Rear wiper	x		x		x				
176	L and R rear working lights and connectors protected with plastic parts	x	x					x		
177	**Grommets (rear and front)**									
178	Beacon	x	x					x		
179	General aspect at top of cabin								Sealant around roof glass no hole waterproofing of grommets	
180	AC set	x						x		
181	New washer for condenser mount	x	x				x			
182	Boom left hand		x						Peinture / adhésif "Manitou"	
183	Boom foot rear axis and grease nipple	x							Grease and tightening	
184	Compensation cylinder head axis and grease nipple	x							Tightening and greasing	
185	Compensation cylinder								Rod aspect, no leakage See ANC-DO-QU-010, 034	
186	840: Telescope cylinder foot axis (circlip)	x								
187	**1740: Telescope cylinder foot axis (circlip)**	x								
188	**1740: Valve for Telescope cylinder**	x								
189	Reverse beeper	x							Tightening and greasing	
190	Lift cylinder head axis and grease nipple	x							Tightening and greasing	
191	Lifting cylinder								Rod aspect, no leakage See ANC-DO-QU-010, 034	
192	Compensation cylinder foot axis and grease nipple	x							Grease and tightening	
193	Hoses and tubes	x							Tightening and routing	
194	Fixed cover bolt clamping	X								
195	Lifting cylinder valve and foot grease nipple		x						See ANC-DO-QU-031	
196	Weldings		x						See ANC-DO-QU-031	
197	**1740: Counterbalance valve type as on picture. Part number = 228829**		x							
198	**FRONT LEFT OF MACHINE**									
199	front left fender	x	x						sealant, weldings, clamping	
200	Front light	x	x			x	x		No damage	
201	front left wheel and reducer **1740: "16 PLY rating tire"**	x	x						Tightening nuts + valve Aspect of rim, tyre and nuts	
202	Front wiper	x				x			See ANC-DO-QU-006	
203	Foot board	x								
204	Door (upper and lower part)	x		x		x			See ANC-DO-QU-037	
205	New door for MXT1740 Export machines		x							
206	Upper and lower door locker no looseness		x							
207	Check loose or damage screw heads on door with the help of screw	x	x							
208	Weldings		x						See ANC-DO-QU-031	
209	Locking rod clamping and pin	x	x							
210	Locking rod not fouling with light bracket		x							
211	No rust on locking rod									
212	No air hoses between cover and cab		x					x		
213	**OPEN FRONT PLATE**									
214	Parking brake cable new design(one P-clamp front side of chassis and one under the cabin) Only one P-clamp under the cabin 1740									
215	Parking brake linkage	x		x						
216	**FRONT RIGHT OF MACHINE**									

Line number	Description	clamping	conformity	operation	noise	setting	presence	option	Acceptation criteria	validated step
217	Front light	x	x			x	x		No damage	
218	Number plate in front of machine		x							
219	Front R fender	x	x						sealant, weldings, clamping	
220	Front R wheel and reducer **1740: "16 PLY rating tire"**	x	x						Tightening nuts + valve Aspect of rim, tyre and nuts	
221	Weldings		x						See ANC-DO-QU-031	
222	**OPEN TANK AND SIDE COVERS**									
223	Gap between tank cover and rear right fender								Should be between 10mm to 18mm	
224	Air prefilter	x								
225	Tank cover	x							See ANC-DO-QU-017	
226	Screw length (should exceed nut) behind hydraulic tank	x	x							
227	Locking of tank cover. 1 hole without screw on latch (to prevent fouling) Latch bracket should have free slot at one end			x						
228	Tank cover guide and stop	x		x						
229	No paint on gas strut inner tube		x							
230	Tank cover (and air pre-filter on it) are properly adjusted on the below there should be no gap.		x			x				
231	Gap between Air intake hose bracket and FIP pipe (3mm) only 840 BS4		x							
232	Mounting of rod holder on side panel	x	x	x						
233	Glow plug timer relay for Hicap battery		x				x	x		
234	Battery switch			x					Presence of sticker	
235	Bellow for air filter and Check filter from inside	x								
236	Air filter and hose	x								
237	Oil tank	x							No leakage, trap, level gage, cap...	
238	Oil tank cap		x				x		Screw for locking	
239	Fuel tank	x							No leakage, trap, level gage, cap...	
240	Fuel tank cap		x				x		Presence of sealant	
241	Water separator / GO filter	x							No leakage, water separator sticker See ANC-DO-QU-050	
242	Heater hose routing (Perkins engine)		x							
243	Transmission oil temperature sensor			x			x		Control of the indicator will be possible in the future	
244	Battery	x	x						Tightening of cables	
245	Battery cable common for all Perkins machines	x	x						53109424 (120sq mm)	
246	Negative electrical	x					x			
247	Engine assembly	x							No leakage, clamping, connections...	
248	Hose/connector ~~*Accumulator -> only for 1740, with Comer axles (P3)*~~	x							No leakage See ANC-DO-QU-010 sticker on accumulator	
249	Weldings		x						See ANC-DO-QU-031	
250	Top cover and fixed cover	x								
251	**UNDER MACHINE**									
252	Counterweight	x	x						No gap between CW and stoppers	
253	Alternator and belt	x	x							
254	Interference between hoses and brackecket (under the rear left side)		X							
255	Rear brake tube	x							No leakage See ANC-DO-QU-010	
256	Rear steering cylinders	x							Rod aspect and no leakage See ANC-DO-QU-010, 034	
257	Rear wheels, reducers, grease nipple on top								Inner tyre aspect	
258	Rear shaft on rear axle	x								
259	Grease nipples on shafts (1 in each universal joint, 1 on each shaft, total 6)	x								

MANITOU	INSTRUCTION	Doc. No. : C-QAD-14
Machine nb and date:	C-QAD-14_J_Final Control on India Telehandlers machines MXT-840 and MXT-1740	INDEX: 2

Line number	Description	clamping	conformity	operation	noise	setting	presence	option	Acceptation criteria	validated step
260	Grease nipple on rear axle oscillator	x								
261	Hydraulic pump and shaft	x							No leakage Clamping of connectors and pump See ANC-DO-QU-010	
262	Hoses (through chassis at the level of distributor)		x						No leakage See ANC-DO-QU-010	
263	Distributor (main valve)								No leakage See ANC-DO-QU-010	
264	Convertor / Gear box/ check 10.9 grade bolt	x	x							
265	Gear box support	x								
266	Engine assembly isolators	x	x							
267	Under cabin -> NEW WASHERS (cf picture and dwg, 53100820)								Control hose routing, cables, harness ...	
268	Cabin isolators	x	x							
269	Tanks	x							No leakage on drain plug	
270	Front shaft on gear box	x								
271	Front shaft on axle	x								
272	Front steering cylinders	x							Stem aspect and no leakage See ANC-DO-QU-010, 034	
273	Clamping front axle / chassis	x								
274	Front wheels, reducers, grease nipple on top								Inner tyre aspect	
275	Heater / AC hoses		x					x	No elbow, no leakage	
276	Weldings		x						See ANC-DO-QU-031	
277	**REMOVE SAFETY WEDGE AND LOWER BOOM**									
278	Reflectors as per PPT (for India only)	x	x							
279	All stickers outside as per PPT		x							
280	**ADD USER MANUAL AND PARTS MANUAL**	- User manual: depending on the shipment country - Parts manual: Perkins or Kirloskar depending on the engine								
281	**MAKE AND SHARE REPORT WITH ALL DEFECTS (USE PICTURES)**									

Annexure – T 20

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Certificate

"We hereby certify that we have satisfactorily fulfilled the contractual obligations including warranty obligations for the total equipment supplied by us to the respective customers/end users during the last 5 years from the date of subject tender opening."

For, Manitou South Asia Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Annexure – I 21

Bid Reference: GeM BID No. GEM/2023/B/2955826 Dated 12.01.2023.

Schedule-1 (4T Tele Handler)

Undertaking

(As per Clause –3.15)

We undertake all safety features and devices as per Govt. of India Gazette notification No. Z 20045/ 01/2018/S&T(HQ) dated 01.10.2018 and DGMS Circular No. DGMS (Tech) Circular No. 06 of 2020 Dhanbad dated 27.02.2020 & subsequent amendments (if any), applicable for the subject equipment are incorporated in the offered equipment.

For, Manitou South Asia Pvt. Ltd.

(Authorized Signatory)

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

A Manitou Group Company
Manitou South Asia Private Limited
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|CIN: U29253DL2011FTC350804|
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Annexure-T22

Technical Specifications

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Technical Specifications Preface - Instructions to Bidders

Introduction:

These Technical Specifications identify the technical requirements of the Goods and Services which are the subject of this tender.

The Technical Specifications are presented in four parts as follows:

A. Scope of Supply

B. Specific Project Requirements

C. General Requirements

1) Geography and Climatic Conditions
2) Goods (Equipment and Machinery)
3) Services
4) Standards
5) Supplier's Responsibility
6) Spare Parts Provisions
7) Availability Provisions
8) Deemed Breakdown
9) Composite Warranty / Guarantee
10) Quality Assurance

D. Equipment Specifications

Technical Response

Bidders shall provide a Clause by Clause commentary demonstrating compliance with the Purchaser's Technical Specifications, together with full supporting technical literature and data sheets.

Wherever graphical representation of data (e.g. load, power, performance curve) is required, the grid axis and data shall be properly and clearly labeled for ready comprehension.

Additionally, Bidders shall provide the information specifically requested in the Attachment to the Technical Specifications.

Failure to demonstrate compliance in all respects with the requirements of the Technical Specifications may render the bid non-responsive.

Failure to provide any information requested in any part of this specification may deem the bid non-responsive.

Site Visits

The Bidder prior to making any Bid calculation and as part of the preparation of its Bid, shall be deemed to have visited and inspected the Site(s), made all enquiries and collected all information documentary or otherwise, including climatic conditions, as considered necessary by the Bidder for the proper and accurate preparation of its bid.

A Bidder may visit the Site(s) by prior appointment with the purchaser. The number of Bidder's representatives permitted to make visits to the Site(s) shall be limited to a maximum of two. Bidders wishing to make appointments for Site Visits should do so in writing or by facsimile directly with the subsidiary company and concerned officer as detailed in the following schedule. Copies of all such communications should be sent to:

General Manager (MM) / HOD
Mahanadi Coalfields Limited
JV, Burla, Sambalpur
Odisha 768020

PAB ENGINEERING WORKS PVT. LTD. KOLKATA

Part: A:

Scope of Supply

A.1 Equipment Package

The Supplier is required to bid as per the equipment package detailed in the Tender Document as per the Technical Specifications provided in Part D.

The supplier is required to supply the equipment along with accessories, consumables, training, installation, commissioning and testing at the coal mining project.

The package also includes Consumable Spares and Consumables for 3000 working hours/12 months of warranty period from the date of commissioning of the equipment

A.2 Supplementary Items

The equipment shall be provided with a comprehensive tool kit which shall include any special tools required for erection and commissioning of equipment. First fill of all oils, greases and lubricants needed for test, erection and commissioning of equipment.

A.3 Information and Drawings

At least one month before the scheduled installation date, the Supplier shall provide not less than:

(a) Suitably illustrated copies of Operating, Repair and Maintenance Manuals for each type/model of equipment and accessories, written in English language, substantially bound in book form; Three (3) copies to each project site; and

One (1) copies each along with soft copy to the concerned Project In-charge, Area Manager / Staff officer (Excv), General Manager (Excv.)/HOD, MCL Hq. & General Manager (MM)/HOD, MCL Hq.

(b) Suitably illustrated copies of detailed Spares Parts Manuals for each type/model of equipment and accessories, written in English language, substantially bound in book form; Three (3) copies to each project site; and

One (1) copies each along with soft copy to the Project In-charge, Area Manager / Staff officer (Excv), General Manager (Excv.)/HOD, MCL Hqrs. and General Manager (MM)/HOD, MCL Hqrs.

In addition to the Equipment drawings, where appropriate the Supplier shall supply detailed drawings (in the same number of copies) illustrating erection/assembly site(s), foundation and accommodation requirements for such items as drive motors, switch installations etc.

A.4 Erection/Assembly, Commissioning and Performance Testing:

The Supplier shall provide the Services of Specialist Technicians (refer Part – C.3) and required manpower (skilled/semi-skilled/unskilled) to undertake the installation/erection/assembly, commissioning and any performance testing of the plant, Equipment and accessories supplied.

The technicians shall remain at site following commissioning until all necessary personnel are fully conversant with the maintenance and operation of the equipment.

A.5 Training:

The supplier in consultation with the project in-charge / HOD [Excavation] of the respective site shall make available experienced personnel to conduct training of engineers, supervisors, technicians and operation personnel for specified period as mentioned in table given in 'Schedule of Requirement of Services' from the date of issue of acceptance certificate of the equipment. The training shall cover the following:

a) Training on simulator module by the bidder at their works/suitable location in India/suitable end user's location is preferable.

b) Equipment system, safety and risk assessment.

c) Equipment operation and maintenance.

d) Trouble shooting, localization of fault and their remedies covering:

1. Electrical and electronics
2. Mechanical
3. Hydraulic system
4. Lubrication system
5. Pneumatic system etc.

Comprehensive training manuals with clear illustration shall be provided to each participant in English language. The training courses shall be conducted in both English and Hindi language.

Details of purchaser's estimates of the minimum training programme required for total number of equipment is described in Sec-V.

Note: - The training shall be completed in batches within warranty period from the date of commissioning of first equipment in the respective project.

Part: B:

Specific Site Requirements

B.1 Project Specific Requirements

The equipment shall be suitable for use at the specific site projects under the conditions detailed below.

B.1.1 Belpahar OCP, Lakhanpur OCP, Lingaraj OCP, Garjanbahal OCP, Bharatpur OCP, CWS)T), CWS(IBV) and Hingula OCP, MCL.

The Consignee Opencast Project/ (Projects) is/ (are) owned by the Mahanadi Coalfields Limited, a wholly owned subsidiary of Coal India Limited (the "Purchaser"). The mines of MCL are located in the different Districts of Odisha.

The PH value of all above OCPs are nearby 6-8 (approx).

Belpahar OCP: Belpahar OCP is the opencast project of Lakhanpur Area. The Belpahar OCP is located near Jharsuguda, Odisha.

Power Supply: The project is received power from 132 KV Jorabaga Substation.

Lakhanpur OCP: Lakhanpur OCP is the opencast project of Lakhanpur Area. The Lakhanpur OCP is located near Jharsuguda, Odisha.

Power Supply: The project is received power from 132 KV Jorabaga Sub station

Lingaraj OCP: Jagannath OCP is the opencast project of Lingaraj Area. The Lingaraj OCP is located in Talcher Coalfields, District Angul, Odisha. (759103)

Power Supply: The project is received power from 132 KV Nandira Substation.

Garjanbahal OCP: Garjanbahal OCP is the opencast project of Basundhara Area. The Garjanbahal OCP is located in P.O. Basundhara, District: Sundargarh, Odisha (770076)

Power Supply: The project is received power from 220 KV Tiklipara Substation.

Hingula OCP: Hingula OCP is the opencast project of Hingula Area. The Hingula OCP is located in Talcher Coalfields, P.O. Gopalprasaad, District Angul, Odisha. (759103)

Power Supply: The project is received power from 132 KV Nandira Substation.

Bharatpur OCP: Bharatpur OCP is the opencast project of Bharatpur Area. The Bharatpur OCP is located in Talcher Coalfields, District Angul, Odisha. (759103)

Power Supply: The project is received power from 132 KV Nandira Substation.

CWS (Talcher): CWS (Talcher) is located in Talcher Coalfields, District Angul, Odisha. (759103)

Power Supply: The project is received power from 132 KV Nandira Substation.

CWS (IB Valley): CWS (IBV) is located in IB Coalfields, near Jharsuguda, Odisha

Power Supply: The project is received power from 132 KV Jorabaga Sub station

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Part: C:

General Requirements

C.1 Geography and Climatic Conditions

Elevation

The natural surface varies from 100 to 1000m above mean sea level.

Climate

The climate is sub-tropical to tropical, dusty, with a hot and humid atmosphere. Monsoon rains occur in the period from June to October.

- Ambient Conditions

- Relative Humidity - Maximum 98%
- Temperature - Minimum 0° C
  Maximum 50° C

- Rainfall-The mean annual rainfall is 1,000 mm, 90 to 95% of which may fall in rainy season from June to October.
-
- Wind April to September -South to South Westerly
- October to March - North Westerly
- Speed - 8 km per hr average
- -100 km per hr maximum

Under foot Slushy and highly abrasive.

C.2 Goods (Equipment and Machinery)

Detailed specifications of the Equipment to be supplied are given in **Part D** of this section. In general, all items shall be:

1. Designed and constructed to handle without overload and for the working hours stated, the maximum volumes/rates specified;
2. Designed to facilitate ready access, cleaning, inspection, maintenance and repair of component parts;
3. Designed to facilitate rapid changeover of consumable items.

The component parts of all items shall, wherever possible, be selected from the standard ranges of reputable manufacturers.

The Equipment and accessories shall be physically robust and where necessary capable of dismantling for transportation and ready re-assembly using simple tools. All Equipment items provided shall be designed to be compatible within the proposed overall Scope of Supply.

Electrical Equipment shall provide all protection devices, controls and interfaces for the Equipment to operate safely and efficiently.

All workmanship and materials shall be of first class quality in every respect.

All parts and surfaces, which are exposed to corrosive environment, shall be suitably protected to prevent any effects of corrosion or erosion.

C.3 Services

The supplier shall be responsible for the erection and commissioning of the equipment at site. The supplier shall depute qualified and competent Engineer(s) and specialist technicians to supervise the entire assembly, erection and commissioning of equipment free of cost.

C.4 Standards

The design, supply, erection, testing and commissioning of all Equipment under this Contract shall in all respects comply with the requirement of this specification and with the appropriate current Indian standards and codes, or relevant Standards issued by the Bureau of Indian Standard or International Standards Organization or any other equivalent international standards, which corresponds to specific ISO/Indian standards indicated in the technical specification. Such equivalent international standards are to be supported by documentary evidence certifying that offered standards are identical to the corresponding ISO/Indian standards.

The equipment shall comply with requirements of the statutory government authorities, including

Director General of Mines Safety (DGMS) having jurisdiction over the equipment and its use.

The system of units for all measurements shall be the **System of International Unites (S.I.)**

C.5 Suppliers Responsibility

The Purchaser requires that the Supplier shall accept responsibility for the provision of complete operable and compatible Equipment and systems within the Scope of Supply. This document identifies only the major items required for the installation and the Supplier shall ensure that the total supply includes all necessary Equipment for it to function effectively, safely and efficiently. Any additional items the Supplier considers necessary to ensure compliance with such a requirement shall be identified and included.

If the Supplier observes that this Specification document contains any anomalies, ambiguities, flaws, errors or omissions, the Supplier shall immediately bring these to the attention of the Purchaser but not later than 15 days prior to the due date of opening.

The Supplier shall be responsible for the testing and commissioning of the Equipment and ensure that it meets the requirements as specified. The commissioning and setting to work of the whole Equipment Supply package shall be carried out under the supervision of the Supplier in conjunction with the Purchaser's nominated personnel

C.6 Spare Parts Provisions

C.6.1.a. Availability of Spare Parts

All items and Equipment proposed shall be of current design and manufacture. The Supplier shall warrant that sufficient spares and servicing facilities will be available to maintain the Equipment in use throughout its life.

C.6.1.b Bought-out assemblies and sub-assemblies

The supplier is required to furnish the details of all Major bought-out items as indicated in the technical specification against "Information to be provided by the bidder".

C.6.2 Provision of Spare Parts

C.6.2.1 Within the Contract Price, the Purchaser shall agree to purchase all filters and O-rings including standard engine filters required for first 3000 hours of operations of each equipment. Further it is specified that the cost of these items for initial 3000 hours of operation for each equipment shall be included in your quoted basic price of the equipment or as per BOQ.

The Bidder shall stock sufficient fast moving & maintenance spares as well as critical assemblies and their repair parts in their Local Depots to ensure maximum availability of their equipment during its life time.

C.6.2.2 In the event that the spare parts and consumables, as recommended by the Supplier, in any way fall short of actual requirements during the period for which they are said to be adequate, the supplier shall provide such additional spare parts and consumables as are necessary at the final destination. Such additional spare parts and consumables shall be provided by the Supplier to the Purchaser free of all cost and shall be transported to Site by air freight internationally and by air, rail or fast road transport within India.

C.6.2.3 In the event that the spare parts, Insurance items and consumables, as recommended by the Supplier, are in excess of actual requirements. The Purchaser may at its option.

a) Retain such excess spare parts and consumables as, in its discretion it may elect to do so

b) Require the Supplier to repossess or repatriate or otherwise dispose of such excess spare parts and consumables in exchange for payment to the Purchaser of the Contract Price of the spare parts and Consumables concerned.

The Purchaser shall notify the Supplier, in writing of its requirements under this Clause within thirty (30) days of completion of the period referred to in Clause C.6.2.1 hereof.

C.6.2.4 In the event that operation of the Plant is inhibited or frustrated as a direct result of lack of spare parts and consumables, pursuant to Clause C.6.2.2 hereof, then the period referred to in Clause C.6.2.1 hereof shall be extended by a period of not less than the period during which operation as aforesaid was inhibited or frustrated.

C.6.2.5 The supplier shall not be liable for the supply of additional spare parts and consumables, nor to extend the period referred to in Clause C.6.2.1 hereof, if and to the extent that additional Spare Parts and Consumables are required by reason of unforeseen accidents, negligence or misuse on the part of the Purchaser.

C.6.2.6 The assessment of the Supplier of the spare parts requirements shall be based upon the expected working hours per year as defined in the TPS clause Performance Guarantee

C.6.3. Emergency Spare Parts

C.6.3.1 Emergency spare parts required by the Purchaser to repair breakdowns shall be dispatched to the site by the Supplier by the fastest, practicable means as directed from time to time by the Purchaser.

C.6.3.2 For the purpose of Clause C.6.2.6, "Emergency Spare Parts" shall mean those spare parts or components required by the Purchaser to repair any item of Plant supplied pursuant to the Contract in the event of a breakdown not attributable to a failure covered by guarantee or a failure of the Supplier to provide adequate Spare Parts or Consumables.

C.6.3.3 Payment in respect of the supply and delivery of such Emergency Spare Parts shall be made promptly, retrospectively, by the Purchaser, in a manner consistent with the terms of payment described in the contract.

C.6.3.4 Lifetime Spare Parts

The Supplier undertakes and guarantees to produce and maintain stocks, to be available for purchase by the Purchaser under separate agreement, of all Spare Parts and Consumables as may be required for maintenance and repair of the Plant throughout its working life. In the event that the Supplier wishes to terminate production of such Spare Parts, the Supplier shall:

(a) give not less than six months' notice in writing of its intention to terminate production in order to permit the Purchaser reasonable time in which to procure needed requirements; and

(b) immediately following termination, provide to the Purchaser at no cost, manufacturing drawings, material specifications and all necessary permissions to facilitate manufacture of the Spare Parts elsewhere.

(c) any change in part number or superseded part number should be informed to the HOD of Excavation department / MM department of MCL hqrs. and the project site wherever the equipment is operating.

In any event, the Supplier shall not seek to terminate manufacture of spare parts for period of not less than (15) years from taking over or the life time of the equipment whichever is later.

C.6.4 Oils, Lubricants and Fluids

The Supplier shall provide to the Purchaser a detailed schedule of all necessary oils, lubricants, fluids for the operation and maintenance of Equipment. The schedule shall indicate estimated annual consumption and specify the appropriate international standard number or the name and reference number of an equivalent available in India considered to be acceptable by the Supplier.

C.6.5 General

C.6.5.1 Nothing in this Clause C.6 shall relieve the Supplier of any Guarantee, Availability, Performance or other obligations or liabilities under this Contract.

C.7 Guaranteed Availability

Minimum Annual Guaranteed Percentage Availability for Tele-handler- shall be not less than 85% (eighty-five percent) annually for a period of 12 months from the date of commissioning.

C.7.1 Introduction

C.7.1.1 The Supplier shall guarantee that the Equipment supplied pursuant to this Contract shall be available for use by the Purchaser and shall meet the performance criteria specifications at the level and in accordance with the terms and conditions of the Availability Guarantee herein contained.

C.7.1.2 Where Equipment supplied under the Contract fails to meet the criteria of the Availability Guarantee, the Supplier shall, at its own cost, provide suitably qualified and experienced personnel at Site to demonstrate to the Purchaser's satisfaction that the required level of availability can be achieved and maintained.

C.7.1.3 The Supplier shall provide the Services of such personnel at Site within seven (7) days of notification by the Purchaser that the availability criteria have not been met in any one (1) month.

C.7.2 Guarantee

C.7.2.1 The Supplier shall guarantee that the Equipment supplied pursuant to the Contract shall be available to the Purchaser at the level hereinafter defined to perform to criteria of not less than that defined in the Technical Specifications incorporated in the Contract.

C.7.2.2 The Supplier shall guarantee that the Equipment shall be available to perform its duty to minimum criteria and to the minimum availability percentage level as defined in the individual Equipment specifications included in the Technical Specifications.

The method of assessment applied shall be as follows:

Method of Assessment:

The following calculation shall determine the availability of the Equipment:

$$\%\text{Availability} = \frac{(\text{Scheduled Available Time} - \text{Downtime}) \times 100}{\text{Scheduled Available Time}}$$

Scheduled Available Time shall equate to 24 hours daily

Downtime:-

Downtime shall mean all hours of work lost due to mechanical, electrical or other failure, including:

a) routine servicing and maintenance in accordance with the manufacturer's published recommendations, including changing oils, oil filters and air filters; lubrication; changing identified consumable or wear parts.

b) planned preventative maintenance programs; It shall not however include:

I. damage due to abusive use or incorrect operation methods by the purchaser;

II. accidents;

III. strikes or stoppage of work by the Purchaser's personnel;

IV. natural disaster;

V. lack of Spare Parts not attributable to a failure of the Supplier, it's Agents or Representatives.

Downtime shall also specifically include all hours lost due to failures determined to be guarantee failures.

The Supplier shall provide a schedule of maintenance required to carry out (a) and (b) above for the 01 year (12months) period of operation and shall state the number of hours required to carry out each maintenance task. The time stated shall, with the agreement of the Purchaser, form the basis of the assessment of the availability.

This schedule of tasks and time will be reviewed periodically by the Purchaser and the Supplier, jointly, to monitor the practicality of the schedule.

The Purchaser will assist the Supplier, without relieving the Supplier of any other obligations under the Contract, to achieve the guaranteed availability by:

1. Providing normal and proper maintenance, including preventative maintenance in accordance with the Supplier's standard/published recommendations, and making all necessary repairs using only spare parts provided by the Supplier in accordance with the requirements specified in part C6.
2. Providing co-operation to all Suppliers' authorized representatives, complying with all reasonable procedural suggestions to improve efficiency of machine operation or reduce downtime.
3. Where appropriate, providing and maintaining such conditions as:

- Proper Electrical Supply
- Terrain Area
- Bench Preparation
- Reasonable Floor Conditions

4. Providing all Suppliers' authorized representatives access at all reasonable times to the machine service and repair facilities.

Maintaining a logbook for each shift wherein the working hours, breakdown hours, maintenance hours, idle hours, etc. shall be recorded. This record will be available for examination and signature by the Supplier's representative.

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C.7.3 Effect and Duration of Guarantee

C.7.3.1 This Guarantee shall become effective on the day on which the Equipment is commissioned at the Site. Commissioning shall be evidenced by the issue of the Purchaser's Acceptance Certificate.

C.7.3.2. This Guarantee shall remain effective for 12 (Twelve) from the date of commissioning irrespective of the hours operated by the Equipment during the period of the guarantee.

C.7.3.3.1 Compensation for not achieving Guaranteed Availability

In the event that Equipment fails to achieve the Availability herein provided in Performance Guarantee clause of TPS, measured over each twelve (12) month period, the Supplier shall be liable for and pay to the Purchaser, as liquidated damages, a sum equal to as indicated here under for each equipment against the PBG submitted by the bidder as per clause-2 of SCC

a. 1% of the delivered landed price of the equipment including the price of spares and Consumables for every percentage reduction from the Guaranteed Availability for the first 5%.

b. 10% of the delivered landed price of the equipment including the price of spares and Consumables for reduction beyond 5% from the Guaranteed Availability.

C.8 Deemed Breakdown

When the supplier is unable to supply the replacement of a failed part during the contract period, and if the machine is commissioned by using the spares from the stock of the project, the period after 21 days till the supplier replaces the part shall be treated as 'deemed breakdown' (the credit for keeping machine available shall not be given to the supplier.)

The supplier shall not in any way be allowed to take out spare parts from other equipment, which are under breakdown and covered within the scope of this contract. However, MCL, in the interest of work, reserves the right to advise the supplier to commission the breakdown equipment covered under this contract by taking out spare parts from other breakdown equipment. Nevertheless, during this period also, the equipment shall be treated as 'deemed breakdown' till the supplier replaces the spare parts.

C.9 Composite-warranty/guarantee

The supplier shall warrant that the equipment supplied under this contract is:

a) In accordance with the contract specifications.

b) The equipment shall have no defects arising out of design, material or workmanship & the complete equipment shall be warranted for 12 months from the date of commissioning. Any defect arising observed on this account will have to be attended immediately.

c) The supplier must ensure that there is no major breakdown due to manufacturing / design defects during the warranty period. In case such breakdown occurs, the purchaser reserves the right to extend the warranty period suitably.

The warranty shall cover for total equipment so that comprehensive responsibility lies only with the equipment supplier although components may be supplied by different suppliers to the bidder.

C.10 Quality Assurance

C.10.1 The Supplier should furnish in detail its quality assurance plan for various stages of manufacture. The Quality Assurance plan shall comply with an internationally recognized quality assurance standard such as ISO 9000 or its equivalent.

C.10.2 The Supplier shall provide facilities to Purchaser or their authorized representatives for progress inspection during manufacture at his works and furnish all test data available in this regard for quality control, both for bought-out items and his own manufactured items.

C.10.3 The Purchaser or his agent, when so required by him, shall also be provided with samples of "bought-out" materials for the purposes of undertaking independent tests, which independent tests shall be at the expense of the Purchaser.

PART D:- EQUIPMENT SPECIFICATIONS

EQUIPMENT SPECIFICATION OF 4T ROUGH TERRAIN, FOUR WHEEL DRIVE TELE-HANDLER: Bidder must be agreed with the following specification, if a bidder is quoting against the BID, it shall be assumed that the firm does agree with all the specification as follows:

1. Scope of specification

This specification is intended to cover the technical requirements for the design, manufacture, testing, delivery, on-site erection and commissioning of a self-propelled, tyre mounted Tele-handler with four types of attachments as follows:
(i). Fork
(ii). Jib with 02 hooks
(iii). 01 Cum Loader Bucket
(iv). Platform Basket/ Man-lifting Basket

2. Design Criteria

The 4T Rough Terrain Tele-handler shall be capable of continuous operation for protracted periods on a system of 3 shifts each of 8 hours duration per day throughout the year
The Tele-handler shall have the following design criteria:

a) Minimum vertical reach of Platform Basket/ Man-lifting Basket and Fork should not be less than 7.5 meters.
b) Platform Basket/ Man-lifting Basket capacity should not be less than 250 kg.
c) Lifting capacity (m) @ 500mm should not be less than 4T (4000 Kg)
d) Ground Clearance should not be less than 350 mm.
e) Frame outer turning radius should not be more than 4 meter.
f) Platform Basket/ Man-lifting Basket dimensions should not be less than 2000x1200x1300 (mm)
g) Unladen weight with forks should not be less than 8000 Kg.

3. Technical requirements

3.1 Engine: The tele-handler shall be powered by a direct injection, 4 Cylinder, diesel engine of net power ranging from 70HP to 80HP

Note: *- The Engine shall meet the latest emission norms as recommended by CMVR or any other regulation issued by central/state Government. Self certificate of the Engine Manufacturer to be submitted at the time of pre-dispatch inspection/supply.*

3.2 Transmission: Torque-converter type transmission consisting of gears for forward and reverse movements.

3.3 Hoses: Fire resistant/ heat resistant hydraulic hoses in place of ordinary hoses to decrease the chance of fire. All the sleeves and conduits in which cable/wire are laid shall be of fire resistant /fire retarder type.

3.4 Steering: Three steering modes with 04 wheels steer, 02 wheels steer and crab steer for quick maneuverability

3.5 Fuel tank: The fuel tank shall be of sufficient capacity for 16 hours operation without refueling, and be provided with a level indicator and a lockable-hinged cap.
Construction of the tank should be such that it provides for easy accumulation and drainage of water with minimum loss of fuel.

3.6 Operator's Protective Structures: Tele-handler shall be equipped with FOPS & ROPS.

3.7 Operator's Cabin and Seats: A fully insulated, high-visibility, rigidly mounted, sound-suppressed, vibration-suppressed, fully air conditioned, operator's cab with tinted safety glass

should be so positioned to facilitate a clear and unrestricted view of the travel & work areas of the machine necessary for its intended use.
The Operator's Station shall be fitted with an ergonomically designed adjustable seat that supports the operator in a position that allows the operator to control the machine under the intended operating conditions. The seat and its suspension shall be so designed to reduce vibration transmitted to the operator to the lowest level that can be reasonably achieved.
Seat Belt for operator with reminder shall be provided as per DGMS circular no. DGMS (Tech) Circular No. 06 of 2020 Dhanbad dated 27.02.2020.

3.8 Operator's Controls and Indicators: The controls shall be of suitable design and construction and arranged so that they are able to be operated with ease from the operator's seat and within the operator's force limits. Controls shall be laid out and designed to allow easy and safe operation based on the principle that a given direction of movement of any control produces a consistent and expected effect. The surfaces of frequently used pedals shall be fitted with skid resistant type materials.

3.9 Gauges and indicators/ Electronic Display: The following shall be provided:

a) Water temperature gauge
b) Engine oil pressure gauge/ indicator
c) Fuel capacity gauge.
d) Engine tachometer
e) Engine hour-meter
f) Operating parameter & diagnostic code display

In case any of these gauge(s) is/are not provided, then it may be adequately explained that how job of the same shall be accomplished in the offered product.

3.10 Electrical Equipment: The tele-handler shall be provided with the following:
a. 24V/12V DC electrical system with suitable rated alternator of reputed make
b. 24V/12V Electrical starter motor of reputed make
c. High capacity maintenance free batteries of reputed make.
d. Battery isolation switch / Relay

All Electrical wires & sleeves are to be of fire resistant quality to decrease chance of fire.
Electrical wires are to be passed through flexible metallic conduit to avoid damage of insulation of the wire due to friction that may cause short circuit. All electrical circuits shall be protected by adequately rated fuses/ circuit breakers.

3.11 Lighting: Adequate lighting shall be provided for safe nightshift operation. All lighting system shall be of LED type.

3.12 Lubrication System: A centralized automatic lubrication system of positive pressure type shall be provided, with warning alarms for identification of failed lubrication points on the machine, except where use of high viscosity lubricants prevents the application of pumped systems.
Lubricants used shall be preferably of reputed Indian make.

3.13 Brakes: Auto parking brakes, neutral brakes and brakes on both the axels shall be provided.

3.14 Fire Detection and Suppression System: A suitable automatic fire detection and suppression system of reputed manufacturer (indigenous or imported), shall be provided on the equipment complying Clause-5 of DGMS (Tech) Circular No. 06 of 2020 dated 27.02.2020.

Note: Periodical refilling and maintenance shall be done by the supplier during the contract period

3.15 Safety Features: All safety features & devices as per Govt. Of India Gazette notification no. Z 20045/01/2018/S&T (HQ) dated 01.10.2018, DGMS Circular No. DGMS (Tech) Circular No. 06 of 2020 Dhanbad dated 27.02.2020 and subsequent amendments, if any, including following shall be provided in the equipment. Bidder shall submit a Certificate as an undertaking in this regard that all safety features and devices applicable for the subject equipment are incorporated in the equipment.

The following safety features shall be provided in the equipment

a. All function cut off switch/Emergency shut-off buttons.
b. Roll over protection.
c. Seat belt & Seat belt reminder- Should comply as per requirement of Clause 10 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020
d. Rear Vision Camera - Should comply as per requirement of Clause -1 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020
e. Warning System for Operator Fatigue - Should comply as per requirement of Clause-2 of DGMS Circular no: 06 of 2020 Dhanbad dated: 27.02.2020
f. Mirrors right and left
g. Blind spot mirror or any other device a part from rear view mirror to enable operator to have clear visibility of blind spot in and around tele-handler

4 Other requirements:

a) Overload Movement Hydraulic Cut off
b) Battery cut-off to keep the battery not in use while maintenance and idle time.

5 Performance Guarantee: In accordance with the provisions of clause C 6.2.6 the Technical Specifications, the expected scheduled working hours of the equipment per year are 3000 (three thousand) hours. [The bidder should note that the expected scheduled working hour indicated is only approx. hour and there may be variation in the range +/- 500 hours]. In accordance with the provisions of C 7.2.2 and C 7.3.2 of the Technical Specifications, the Supplier shall guarantee that the availability of the equipment shall be not less than 85% (Eighty five percent) for a period of 12 months from the accepted date of commissioning.

29. Information To Be Provided By The Supplier: *The Supplier shall furnish the following information. All technical information shall be in SI units.*

29.1 General

a) Number of offered model commissioned during the last five years from the date of opening of tender.
The information shall be given in the following format and in the order of most recent first:
Company-Mine Name-Mine Location-Mine Type-No of machine – Model-Comm. Date
b) Details of nearest Depot/Warehouse and Service Facility available for the present offer.
c) Details of tools to be provided with the equipment.
d) Details of erection programmes for the equipment.
e) Details of maintenance schedule.

29.2 Technical Details

a) Latest engine performance curves showing net power, net torque and specific fuel consumption of the installed engine, measured according to ISO 9249
b) Detailed technical description and specification of the tele-handler
c) Layout drawings and detailed descriptions of all machinery
d) Performance curves for all motions.
e) Layout drawings and complete hydraulic and air circuit with detailed descriptions of all components
f) Details of major bought-out assemblies and sub-assemblies including manufacturer, type, etc.
g) Comprehensive commercial literature specifications.
h) Operation and maintenance manuals

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