



ISO 9001 Company

**Heavy Engineering Corporation Limited**

(A Govt. of India Enterprise)

Heavy Machine Building Plant

Ancillary & Contract Department

No. ACD/HMB/20/SA/2141/OTE-6132

Date: 28/09/2020

## **OPEN TENDER ENQUIRY**



### **Procurement of Sub Assembly Items**

Tender on sale	:	up to 28/09/2020 upto 5:00 PM
Schedule of Tender receipt	:	19/10/2020, upto 1:00 PM
Opening of tender	:	19/10/2020 at 3:00 PM

#### **Submission of offer**

The complete tender is to be submitted in a separate sealed envelope super scribing the tender no., before the scheduled date of submission of tender in the tender box at the office of ACD/ HMBP, Room no. 28, HMBP ADM Building, HEC Ltd, Ranchi 4. If the tender is bulky & voluminous the tenders are to be submitted at office of MM/HMBP

#### **The offer has to be given in two part bids.**

- Part-I of the offer will contain the technical and commercial aspects as per Annexure 1 in the enquiry. The duly filled Annexure 1 along with all documents (PO copy, Manufacturing Facilities, EMD, Tender Fee, Exemption Certificate, Annexure 3 etc.) will form Part-I of the offer. All above documents should be kept in one envelope and super scribe name of the enquiry and "Techno-Commercial Bid (Part-I)" over the envelope.
- Part-II of the offer will contain Price Bid which is to be given in the format as per Annexure 2 of the enquiry. This price bid should be kept in a separate envelope and super scribe name of the enquiry and "Price Bid (Part-II)" over the envelope.

Both the above sealed envelopes should be kept in one single envelope and super scribe name of the enquiry, opening date and mention part I & II over this envelope.

**Part (I) and Part (II) should be strictly submitted in the format as given in this enquiry as Annexure – 1 and Annexure – 2 respectively.**

**Future changes/notifications/Corrigendum including extension of bid due date if any, pertaining to this tender will be published/hosted only on HEC website/CPP Portal.**



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

No. ACD/HMB/20/SA/2141/OTE-6132

Date: 28/09/2020

**(A) Scope of Supply:**

HEC intends to procure the "Sub Assembly Items". Interested firms are requested to submit their most competitive offer for supply of following item as per the technical Instructions and the terms & conditions given below.

Sl. No.	Drg.No.	Desc.	Set	Wt/Set in Kg	Material Grade
1	1040.03.068	Tie Rod Assly	10	197.00	As per Drg.
2	1040.03.251	Friction Block	10	25.90	As per Drg.
3	1040.03.400	Cooling Duct Inst.	5	30.00	As per Drg.
4	1040.03.500	Guide Roller Inst.	5	111.00	As per Drg.
5	1040.03.700	Crowd Motor Brake	5	110.00	As per Drg.
6	1040.03.900	Handle T. Limiter	5	35.00	As per Drg.
7	1050.01.200	Door Breaking Mech.	5	169.00	As per Drg.
8	1040.09.520	Drum Drive Guard	5	146.00	As per Drg.
9	1040.11.100	Swing Motor Brake	10	112.00	As per Drg.
10	1040.18.200	Travel Mech. Brake	5	96.00	As per Drg.
11	1040.04.000	Dipper Trip Mech.	5	167.00	As per Drg.
12	44.1011.100	Current Collector	20	7.80	As per Drg.
13	1050.09.600	Hoist Brake	5	276.00	As per Drg.

**(B) Technical Instructions:**

1. Items are to be supplied as per HEC drawings and its technical instructions.
2. Items should be of good surface finish as per HEC drawing and free from any defect.
3. Items have to be supplied with Ultrasonic Quality (conforming to Standards) in case it is mentioned in the HEC drawings.

Note - Drawings are enclosed with the NIT & detailed drawings are available in our office (ACD)/HMBP, HEC Ltd. for study on any working day before opening of tender.

**Terms & Conditions**

1. The rate quoted shall be Inclusive of all packing & forwarding, Freight charges & insurance on F.O.R HMBP Stores.
2. The Price quoted by the tenderer should be exclusive of GST. The rate and nature of GST applicable should be shown separately. GST will be paid to the seller at the rate at which it is liable to be assessed or has actually been assessed on the date of supply provided the transaction of sale is legally liable to GST and within the delivery period.
3. **Validity of offer** - The rates quoted must be firm and the offer made must remain valid for acceptance up to **three months** from the date of opening of the tender. The rate quoted must be in word and figure as well. In case any discrepancy in rate given in figures and word, the rate given in words will prevail.



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

4. **Payment terms:** 90% payment along with 100% taxes and duties within two months of receipt of material in HMBP and 10% against C.R.V (to be issue by our Stores after receipt and acceptance of material at HMBP). In case of any deviation by the bidders necessary loading @ 1% Per Month (12% max Per Year) on quoted price shall be applicable and L-1 firm will be decided based on landed cost after loading on quoted price.
5. **Delivery Schedule –within 3 month from the date of issue of PO.**
6. Full particular i.e. specification, literature and or drawing wherever applicable should be submitted along with the quotation.
7. The Corporation does not pledge itself to accept the lowest or any tender and reserve to itself the right of accepting the whole or any part of tender or portion of the quantity offered and you shall supply the same at the rate quoted.
8. Inspection of the manufactured items will be done by QCA/HMBP or his authorized representative at supplier's works, Necessary tools and measuring instruments to be provided by the supplier.
9. Corporation reserves the right to call for and examine at any time the books of accounts and other document and papers of the firm for the purpose of ascertaining whether any excess payment has been made or the firm likely to be received / received undue benefit out of execution of the particular contract.
10. **Earnest Money Deposit -Rs 30,000/-** will have to be deposited by demand draft on any of the nationalized banks in favor of "Heavy Engineering Corporation Limited, payable at Ranchi" or in the form of Bank Guarantee as per annexure. EMD in form of DD/BG will have to enclose in the Techno- Commercial bid (Part I). Exemption of EMD shall be applicable on submission of valid SSI/NSIC/MSME certificate and as per prevailing govt guidelines. SSI/NSIC/MSME Certificate to be enclosed in Techno Commercial Bid Part I.
11. **Tender Fee (Non Refundable) –Rs 300/-** will have to be deposited by demand draft on any of the nationalized banks in favor of "Heavy Engineering Corporation Limited, payable at Ranchi. The copy of Tender Fee in form of DD will have to enclose in the Techno- Commercial bid (Part I).Exemption of Tender Fee shall be applicable on submission of valid SSI/NSIC/MSME certificate and as per Govt rules. SSI/NSIC/MSME Certificate to be enclosed in Techno Commercial Bid Part I.
12. **Security deposit (SD) –** Successful tenderers will have to deposit security equal to 5 % of the value of the contract within the desired period i.e. within 21 days of PO date. Failing this, the contract will be cancelled at the risk and expenses of the suppliers. SD will have to be deposited by demand draft on any of the nationalized banks in favor of "Heavy Engineering Corporation Limited, payable at Ranchi" or in the form of Bank Guarantee as per Annexure.
13. **Delivery :** The time for and the date of delivery of the Stores stipulated in the acceptance of tender shall be deemed to be the essence of the Contract and delivery must be completed not later that the dates specified therein. Otherwise:
  - a. The purchaser to recover from the Contractor a sum of 0.5% per week (Completed week) of the price of the Stores (upto maximum 10%) as liquidated damages, which the contractor has failed to deliver as a foresaid or
  - b. The purchaser may procure the undelivered stores/ similar items from elsewhere, without notice to the contractor at the risk of the contractor without canceling the contract in respect of the consignment not yet due for delivery or
  - c. To cancel the contract or a portion thereof.



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

14. There is no obligation on our part to accept delayed / late tenders. Tenders received after the due date of opening are liable to be summarily rejected.
15. The rates quoted shall also be inclusive of embossing on the material. The ownership namely HMBP should be at a predominant place of the material to a size/ thickness upon the volume of the material.
16. The corporation reserves the right to reject any / all tender partly / fully and no tenderer can ask any explanation anywhere in this regard.
17. Successful Bidders have to sign the confidentially agreement in HEC's format.
18. **Guarantee clause** - The items supplied shall be guaranteed for a period of 12 months from the date of commissioning or 18 months from the date of delivery whichever is earlier against defective materials or bad workmanship
19. The repeat order for 100% quantity may be placed on successful bidder/bidders within one year from the date of delivery of the original Purchase Order on mutual agreement.
20. Order placed as a result of this tender will be governed by the Corporation's General Terms and Conditions of Contract which can be referred in HEC's website [www.hecltd.com](http://www.hecltd.com)

**Note:-**

1. As per the govt. Guidelines it is to be specified clearly in your offer whether your firm is registered with SSI/NSIC/MSME and also confirm whether the firm is owned by SC/ST Entrepreneurs or not.
2. Pl. provide UAM no to avail Facilities of MSME.
3. Please get registered your firm with HEC Ltd.

DGM/ACD/HMBP  
FOR AND ON BEHALF OF HEC Ltd.



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

**Annexure – 1**

PART – I (Techno - Commercial Bid)

**No. ACD/HMB/20/SA/2141/OTE-6132**

**Date: 28/09/2020**

Quotation No.....

Sl.No.	Requisite		Remark
1	Whether the scope of Supply (A) & technical instruction (B) mentioned in the tender enquiry is acceptable.	Yes / No	
2	Reference & Photocopies of Major PO's placed on you by HEC /Other companies for same/similar items.	Yes / No	(enclose the relevant documents)
3	Duly notarized/Self Attested copies of Manufacturing Facilities (Casting, Forging, Machining etc.) available at your works for the same work/similar work. <b>In case you don't have own Casting/Forging facility, Pl provide the tie up letter &amp; Credential of tie up from where the casting/forging will be procured.</b>	Yes / No	(enclose the relevant documents)
4	Whether SSI/NSIC/MSME (For exemption of Tender Fee and EMD only), Also mention UAN No.....	Yes / No	(enclose the relevant documents)
5	Whether EMD & Tender Fee deposited (As per clause 10 & 11 of Terms & conditions)	Yes / No	(enclose the copy of DD/ BG)
6	F.O.R. HMBP (As per clause 1 of Terms & condition)	Yes / No	
7	Payment Term(As per clause 4 of Terms & condition)	Yes / No	(In case your answer is No, then please mention your term)
8	Delivery Term(As per clause 5 of Terms & condition)	Yes / No	(In case your answer is No, then please mention your term)
9	Validity (As per clause 3 of Terms & conditions)	Yes / No	
10	L.D. Clause(As per clause 13(a) of Terms & conditions)	Yes / No	
11	Risk Purchase Clause (As per clause 13(b) of Terms & conditions)	Yes / No	
12	Guarantee Clause (As per clause 18 of Terms & conditions)	Yes / No	
13	Security Deposit (As per clause 12 of Terms & conditions)	Yes / No	
14	GST Registered	Yes / No	GST rate..... GST No.....
15	Inspection Clause (As per clause 8 of Terms & conditions)	Yes / No	
16	Firm is owned by SC/ST Entrepreneurs	Yes / No	
17	Whether Terms & Condition/Note etc. mentioned in the tender enquiry is acceptable to the tenderer	Yes / No	
18	Contact person Name: Email: Contact number:		

**Note :** In case of non-submission / submission of incomplete documents, your offer may not be considered for the said Enquiry.

(Signature of Tenderer)  
With official Seal



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

**Annexure – 2**

PART-II (Price Bid)

**No. ACD/HMB/20/SA/2141/OTE-6132**

**Date: 28/09/2020**

Quotation No.....

To,  
The DGM  
Ancillary & Contract Department  
HMBP, HEC Ltd.  
Ranchi- 834004

Dear Sir,

In response to your enquiry for supply of following items. We give herewith our best offer without any deviation or rebate:-

Sl.No.	Drg.No.	Desc.	Wt/set in Kg	Set	Basic Rate in Rs /Set (F.O.R HMBP Stores)	
					In Figures	In word
1	1040.03.068	Tie Rod Assly	197.00	10		
2	1040.03.251	Firction Block	25.90	10		
3	1040.03.400	Cooling Duct Inst.	30.00	5		
4	1040.03.500	Guide Roller Inst.	111.00	5		
5	1040.03.700	Crowd Motor Brake	110.00	5		
6	1040.03.900	Handle T. Limiter	35.00	5		
7	1050.01.200	Door Breaking Mech.	169.00	5		
8	1040.09.520	Drum Drive Guard	146.00	5		
9	1040.11.100	Swing Motor Brake	112.00	10		
10	1040.18.200	Travel Mech. Brake	96.00	5		
11	1040.04.000	Dipper Trip Mech.	167.00	5		
12	44.1011.100	Current Collector	7.80	20		
13	1050.09.600	Hoist Brake	276.00	5		

GST .....(Rate in %) Extra

(Name of the Tenderer with Official Seal)

Important Note: -

1. Rate must be given in figure as well as in words.
2. Over writing in tender will not be accepted.
3. L-1 will be decided on the basis of individual item.
4. Note that the quantities and rates should be indicated both in figures, as well as in words. In case of any ambiguity, the writing in words will be considered. In case where amount written after multiplication of rate and quantity and there is some error, the total value or calculated value with rate whichever is lower to be considered.

-----  
Ancillary & Contract Department, Ground Floor Administrative Building, HMBP, HEC, Ranchi 834004,  
Jharkhand, Phone: 0651 2400935,2400987 Fax: 0651 2401166, email: sunilksingh@hectd.com/  
raviverma@hecltd.com/ alok.singh@hecltd.com



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

**Annexure – 3**

**No. ACD/HMB/20/SA/2141/OTE-6132**

**Date: 28/09/2020**

**Self-Declaration**

I \_\_\_\_\_, Son / Daughter of  
Shri \_\_\_\_\_ age \_\_\_\_\_ years, resident of  
\_\_\_\_\_ in the District of \_\_\_\_\_, do hereby  
declare that all the information given in the offer and in the enclosed documents is true to  
the best of my knowledge and belief and nothing has been concealed therein. I am well  
aware of the fact that if the information given by me is proved false / not true at any point  
of time, I will have to face punishment as per any provision of Law for the time being in  
force as well as the benefit availed of by me or the benefit accrued to me shall be  
summarily cancelled.

Date: -

(Signature of Tenderer)  
With official Seal



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

**Annexure 4**

Format for  
**BANK GUARANTEE FOR EARNEST MONEY DEPOSIT**

*(to be issued by any Nationalized bank preferably State bank of India negotiable at their counters in Ranchi )*

NO.

Dated:

TO  
M/S HEAVY ENGINEERING CORPORATION LIMITED  
PLANT PLAZA ROAD,  
DHURWA,  
RANCHI – 4

Dear Sirs,

In consideration of your agreeing to accept the Earnest money deposit of Rs.-----  
(Rs----- ) furnishable to you by M/s-----  
------(Hereinafter  
Referred to As Contractor) In terms of the Enquiry No. -----  
-----Dtd. ----- for Supply of ----- (Hereinafter  
Referred to as the Contract) in the form of a Bank Guarantee in the Manner hereinafter  
contained we -----, having registered office at ----  
-----do hereby covenant and agree with you as follows.

1. We hereby undertake to indemnify you up to a sum of Rs. ----- (Rs. -----  
----- only) against any loss or damage caused to or suffered by you or  
that may be caused to or suffered by you by reason of any breach or breaches on the part  
of the contractor of any of the terms and conditions contained in the said contract and in  
the event the Contractor shall make any default or defaults in carrying out any of the  
works under the said contract or otherwise in the observance and performance of any of  
the terms and conditions relating thereto in accordance with the true intent and meaning  
thereof, we shall forthwith on demand and without any protest or demur pay to you such  
sum or sums not exceeding in total the said sum of Rs.----- (Rs. -----  
*amount*-----only) as may be claimed by you as your losses and/or damages,  
costs, charges or expenses by reason of such default or defaults on the part of the  
contractor.

2. Notwithstanding anything to the contrary contained in this guarantee your decision as  
to whether the contractor has made any such default or defaults and the amount or  
-----





ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

amounts to which you are entitled by reasons thereof will be binding on us and we shall not be entitled to ask you to establish your claim or claims or damages or losses suffered by you but will pay the amount demanded by you under this guarantee forthwith on your demand without any protest or demur.

3. This guarantee shall continue and hold good until it is released by you on the application by the contractor after expiry of the related warranty period of the said contract and after the contractor have discharged all their obligations under the said contract and produced a certificate of due completion of the work under the said contract and submitted a "NO Demand Certificate" provided always that this guarantee shall in no event remain in force after the date of----- without prejudice to your claim or claims arisen and demanded from or otherwise notified to us in writing before the expiry of six months from the said date which will be enforceable against us not withstanding that the same is or are enforced after the said date.

4. We-----, further undertake to extend the validity of this beyond the period prescribed in clause 3 or as extended from time to time for such further period as may be required in writing before the Expiry of this and upon such extension(s), all terms and conditions of this shall remain in full force till the expiry of this extended period(s).

5. You will have the fullest liberty without affecting this guarantee from time to time to vary any of the terms and conditions of the said contract or extend the time of performance of the contractor or to postpone for any time or from time to time any of your rights or powers against the contractor and either to enforce or forbear to enforce any of the terms and conditions of the said contract and we shall not be released from our liability under this guarantee by the exercise of your liberty with reference to matters aforesaid or by reason of any time being given to the contractor or any other forbearance, act or omission on your part or any indulgence by you to the contractor or by any other variation or modification of the said contract or any other act, matter or things whatsoever, which, under the law relating to sureties, would but for the provisions hereof, have the effect of so releasing us from our liability hereunder provided always that nothing herein contained will enlarge our liability hereunder beyond the limit of Rs. ----- (Rs. -----) as aforesaid or extend the period of the guarantee beyond the said Date of ----- unless expressly agreed to by us in writing in terms of clause 4 hereof.

6. This guarantee shall not in any way be affected by your taking or varying or giving up any securities from the contractor or any other person, firm or company on its behalf or by the winding up, dissolution, insolvency or death as the case may be of the contractor.

7. In order to give full effect to the guarantee herein contained, you shall be entitled to act as if we are your principal debtors in respect of all your claims against the contractor hereby guaranteed by us as aforesaid and we hereby expressly waive all our rights of suretyship and other rights, if any, which are in any ways inconsistent with any of the provisions of this guarantee.



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

8. Subject to the maximum limit of our liability as aforesaid this guarantee will cover all your claim or claims against the contractor from time to time arising out of or in relation to the said contract and in respect of which your claim in writing is lodged on us before expiry of six months from the date of expiry of this guarantee.
9. Any notice by way of demand or otherwise hereunder shall be in writing and may be sent by special Courier or Telefax to us or our Local Address as aforesaid.
10. This guarantee and the powers & provisions herein contained are in addition to and not by way of limitation or substitution for any other guarantee or guarantees heretofore given to you by us whether jointly with others or alone and now existing uncanceled and that this guarantee is not intended to and shall not revoke or limit such guarantee or guarantees.
11. This guarantee shall not be affected by any change in the constitution of the contractor or us nor shall it be affected by any change in your constitution or by any Amalgamation or absorption thereof or therewith but will ensure for the benefit or and be available to and enforceable by the absorbing or amalgamated company or concern.
12. This guarantee is irrevocable during the period of its currency and shall not be revoked without your previous consent in writing.
13. We further agree and undertake to pay you the amount demanded by you in writing irrespective of any dispute or controversy between you and the contractor or any reference to arbitration of the said dispute/controversy pending or a civil suit filed by the contract or in respect of the dispute or controversy.
14. Notwithstanding anything contained herein above our liability under this guarantee is restricted to Rs.----- (Rs. -----only) and this guarantee shall remain in force until -----unless a written claim is lodged on us for payment under this guarantee within six months from the date of expiry of this guarantee . i.e. On or before-----all your rights under this guarantee shall be forfeited and we shall be deemed to have released and discharged from all liabilities there under, irrespective of whether or not the original guarantee is returned to us.
15. We have power to issue this guarantee in your favour under the memorandum and articles of association of the bank and the undersigned has full power to execute this guarantee under the power of Attorney Granted to them by the Bank.

FOR AND ON BEHALF OF



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

**Annexure 5**

**Format for**  
**BANK GUARANTEE FOR SECURITY DEPOSIT**

( to be issued by any Nationalized bank preferably State bank of India negotiable at their counters in Ranchi )

TO,

M/S HEAVY ENGINEERING CORPORATION LIMITED  
PLANT PLAZA ROAD,  
DHURWA,  
RANCHI – 4

Dear sir,

In consideration of your agreeing to accept the security deposit of rs. ....'amount'..... furnishable to you by m/s ..... 'firms name'..... (hereinafter referred to as contractor) in terms of the contract no. ....'hec's purchase order no'.....for supply of ..... 'details of items'.....(hereinafter referred to as the 'contract' ) in the form of a bank guarantee in the manner hereinafter contained we....'bank details'..... branch, having registered office at ..... 'place'..... do hereby covenant and agree with you as follows:

1. We hereby undertake to indemnify you up to a sum of rs. ....'amount'.....(rupees ..... 'amount in words'.....) against any loss or damage caused to or suffered by you or that may caused to or suffered by you by reason of any breach or breaches on the part of the contractor of any of the terms and conditions contained in the said contract and in the event the contractor shall make any default or defaults in carrying out any of the works under the said contract or otherwise in the observance and performance of any of the terms and conditions relating thereto in accordance with the true intent and meaning thereof, we shall forthwith on demand and without any protest or demur pay to you such



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

sum or sums not exceeding in total the said sum of rs. ....'amount'.....(rupees ..... 'amount in words'.....) as may be claimed by you as your losses and / or damages, costs, charges or expenses by reason of such default or defaults on the part of the contractor.

2. Notwithstanding anything to the contrary contained in this guarantee your decision as to whether the contractor has made any such default or defaults and the amount or amounts to which you are entitled by reasons thereof will be binding on us and we shall not be entitled to ask you to establish your claim or claims or damages or losses suffered by you but will pay the amount demanded by you under this guarantee forthwith on your demand without any protest or demur.
3. This guarantee shall continue and hold good until it is released by you on the application by the contractor after expiry of the related warranty period of the said contract and after the contractor have discharged all their obligations under the said contract and produced a certificate of due completion of the work under the said contract and submitted a 'no demand certificate' provided always that this guarantee shall in no event remain in force after the date of ...'date'..... without prejudice to your claim or claims arisen and demanded from or otherwise notified to us in writing before the expiry of six months from the said date which will be enforceable against us notwithstanding that the same is or are enforced after the said date.
4. We ..... 'bank name'....., further undertake to extend the validity of this beyond the period prescribed in clause 3 or as extended from time to time, for such further period as may be required in writing before the expiry of this and upon such extension(s), all terms and conditions of this shall remain in full force till the expiry of this extended period(s).
5. You will have the fullest liberty without affecting this guarantee from time to time to vary any of the terms and conditions of the said contract or extend the time of performance of the contractor or to postpone for any time or from time to time any of your rights or powers against the contractor and either to enforce or forebear to enforce any of the terms and conditions of the said contract and we shall not be released from our liability under this guarantee by the exercise of your liberty with reference



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

to matters aforesaid or by reason of any time being given to the contractor or any other forbearance, act or omission on your part or any indulgence by you to the contractor or by any other variation or modification of the said contract or any other act, matter or things whatsoever, which, under the law relating to sureties, would but for the provisions hereof, have the effect or so releasing us from our liability hereunder provided always that nothing herein contained will enlarge our liability hereunder beyond the limit of rs. ....'amount'.....(rupees ..... 'amount in words'.....) as aforesaid or extend the period of the guarantee beyond the said date of ...'date'... unless expressly agreed to by us in writing in terms of clause 4 hereof.

6. This guarantee shall not in any way be affected by your taking or varying or giving up any securities from the contractor or any other person, firm or company on its behalf or by the winding up, dissolution, insolvency or death as the case may be of the contractor.
7. In order to give full effect to the guarantee herein contained, you shall be entitled to act as if we are your principal debtors in respect of all your claims against the contractor hereby guaranteed by us as aforesaid and we hereby expressly waive all our rights of suretyship and other rights, if any, which are in any way inconsistent with any of the provisions of this guarantee.
8. Subject to the maximum limit of our liability as aforesaid this guarantee will cover all your claim or claims against the contractor from time to time arising out of or in relation to the said contract and in respect of which your claim in writing is lodged on us before expiry of six months from the date of expiry of this guarantee.
9. Any notice by way of demand or otherwise hereunder shall be in writing and may be sent by special courier, speed post or telefax to us at our local address as aforesaid.
10. This guarantee and the powers & provisions herein contained are in addition to and not by way of limitation of or substitution for any other guarantee or guarantees heretofore given to you by us whether jointly with others or alone and now existing uncancelled and that this guarantee is not intended to and shall not revoke or limit such guarantee or guarantees.



ISO 9001 Company

**Heavy Engineering Corporation Limited**  
(A Govt. of India Enterprise)  
**Heavy Machine Building Plant**  
**Ancillary & Contract Department**

---

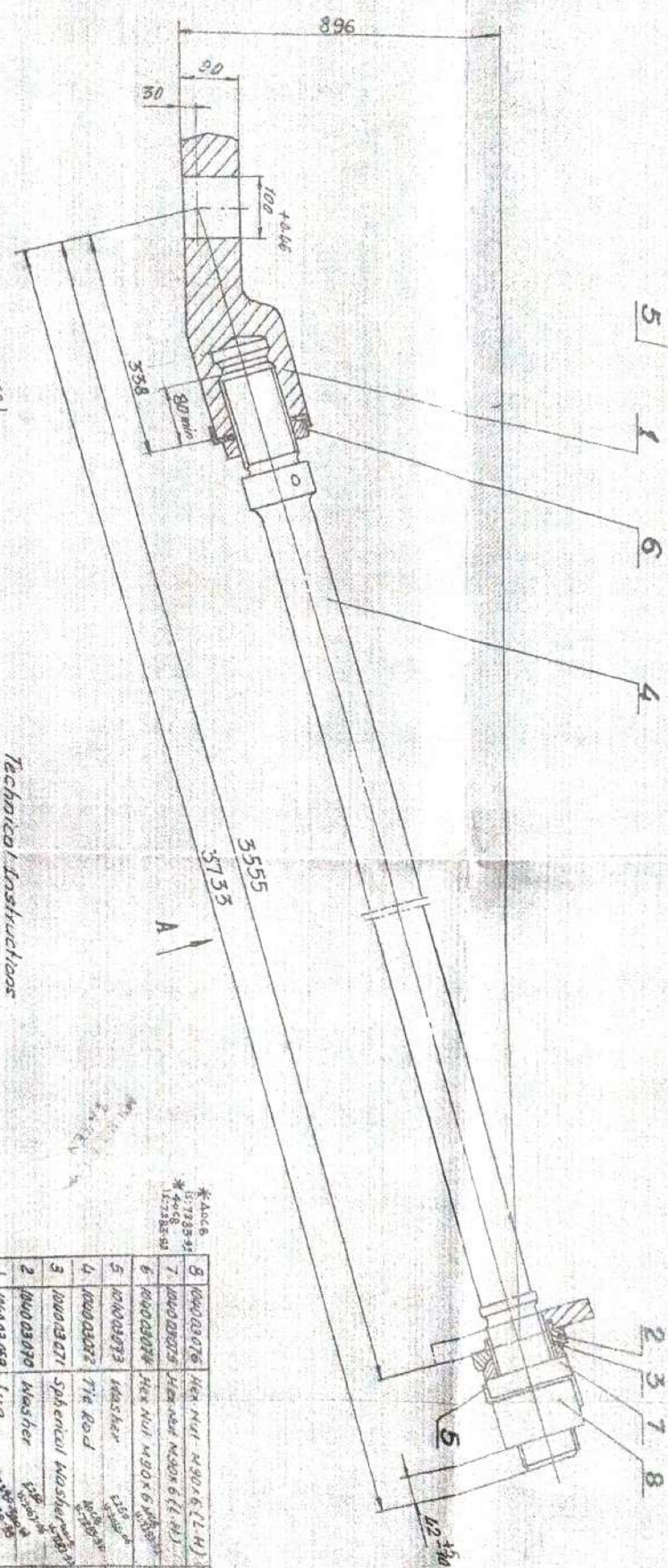
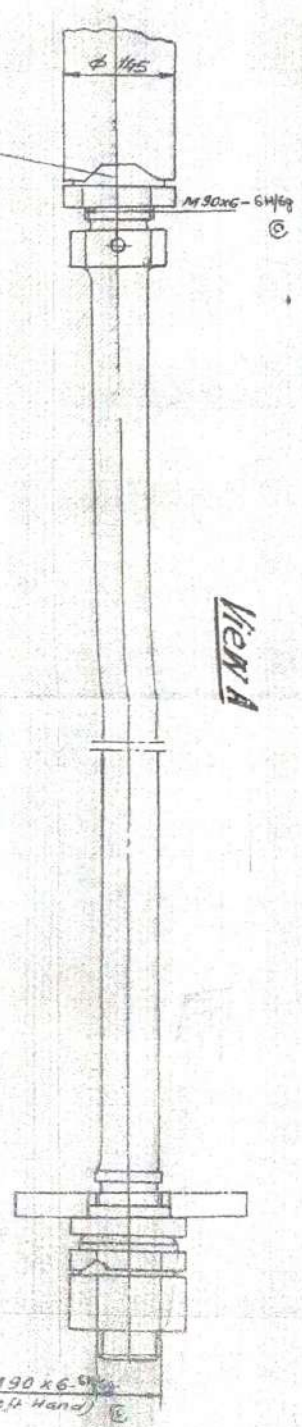
11. This guarantee shall not be affected by any change in the constitution of the contractor or us nor shall it be affected by any change in your constitution or by any amalgamation or absorption thereof or therewith but will ensure for the benefit of and be available to and enforceable by the absorbing or amalgamated company or concern.
12. This guarantee is irrevocable during the period of its currency and shall not be revoked without your previous consent in writing.
13. We further agree and undertake to pay you the amount demanded by you in writing irrespective of any dispute or controversy between you and the contractor or any reference to arbitration of the said dispute / controversy pending or a civil suit filed by the contractor in respect of the dispute or controversy.
14. Notwithstanding anything contained herein above our liability under this guarantee is restricted to rs. ....'amount'.....(rupees ..... 'amount in words'.....) and this guarantee shall remain in force until ..... 'date'.... unless a written claim is lodged on us for payment under this guarantee within six months from the date of expiry of this guarantee i.e. on or before ...'date' + '6 month'..... all your rights under this guarantee shall be forfeited and we shall be deemed to have released and discharged from all liabilities thereunder. irrespective of whether or not the original guarantee is returned to us.
15. We have power to issue this guarantee in your favour under the memorandum and articles of association of the bank and the undersigned has full power to execute this guarantee under the power of attorney granted to them by the bank.

FOR AND ON BEHALF OF  
'name of bank'

'signature with seal'



2300401



⑧ Serial Note - Item No. 1 (Lug, Qty. 1000-03-069)  
 Casting should be of ultrasonic quality.  
 DIM - 160-170  
 2. Item No. - 4 (Tie Rod, Qty. 1000-03-072)  
 Forging should be of ultrasonic quality.  
 3. Lug Casting should be free from cracks, gas holes and other casting defects.

**Technical Instructions**  
 1. Spherical surfaces of item no 2.3 are to be lubricated with grease while installing the tie rod on the boom

Rev. No.	Revision	Signature	Date
1	Steel note added	[Signature]	03-93
2	Change made	[Signature]	03-93

\* A006  
 5-733-41  
 4-4-8  
 1-7-85-44

Item No.	Qty	Description	Material	Part No.	Unit	Price	Total
1	1000	Lug	Steel	1000-03-069	1	4.25	4.25
2	1000	Washer	Steel	1000-03-070	1	0.50	0.50
3	1000	Spherical Washer	Steel	1000-03-071	1	4.60	4.60
4	1000	Tie Rod	Steel	1000-03-072	1	140.00	140.00
5	1000	Washer	Steel	1000-03-073	1	2.15	2.15
6	1000	Hex Nut	Steel	1000-03-074	1	2.00	2.00
7	1000	Hex Nut	Steel	1000-03-075	1	2.00	2.00
8	1000	Hex Nut	Steel	1000-03-076	1	4.25	4.25

REVALIDATED  
 Bureau Exp. 3/1/16  
 Ch. & Co. [Signature]

**Tie Rod Assembly**

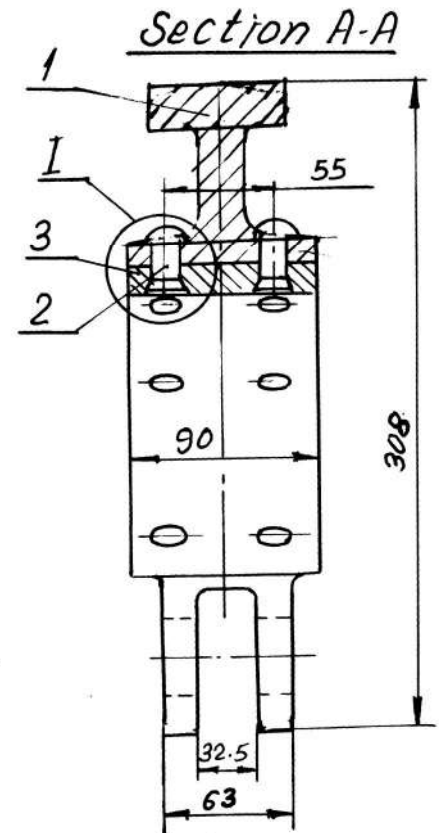
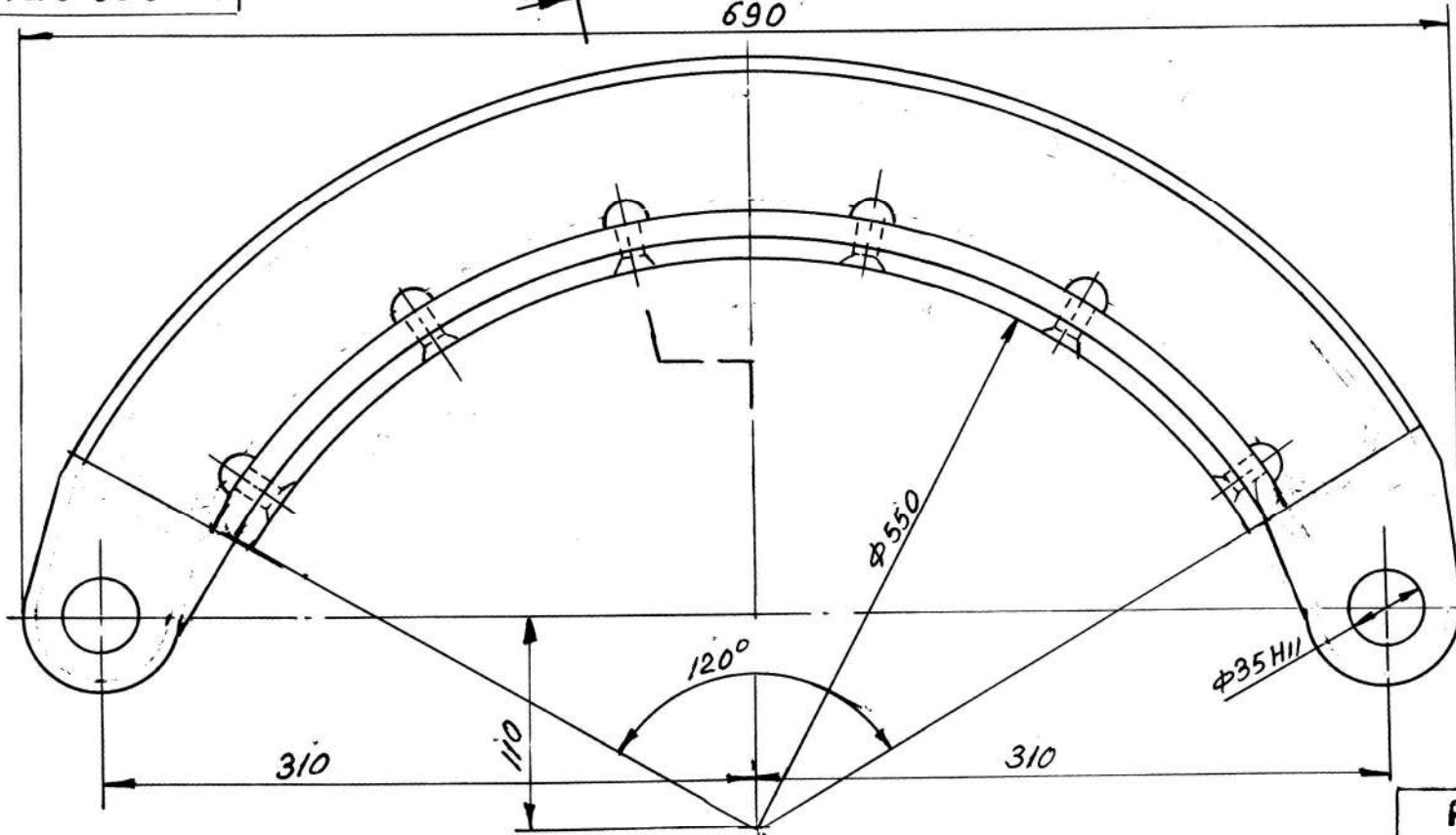
1000-03-088

70003100  
 Date: 03-93  
 Title of Design: S. G. 504  
 Design by: S. S. Jada  
 Checked by: G. R. Datta  
 Drawn by: S. S. Jada  
 HMB  
 No. 15  
 Date: 03-93



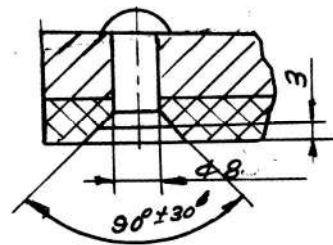
104003251

A 690



**REVALIDATED**  
 Bureau Exc-I/ME  
 Dtg & Dt WRS 15-7-96  
12-11-12

Detail I  
 Scale:- 1:1



Item No.	Drwg. No.	Description	Material	No. Of	Per piece Weight in Kg.	Total Weight in Kg.	Remarks
3	104003278	Ferodo Brake Lining 58.5 x 90 x 8	Ferodo B.A.	1	0.81	0.81	
2	104003277	Rivet 8x28	Aluminium	12	0.004	0.05	
1	104003276	Friction shoe	Assly	1	25	25	

1080.05.3336

Friction Block

104003251

Weight in Kg. 25.9

Head of Deptt.	S. Ghosh
Bureau Chief	S. S. JAG
Group Leader	B. Mukherjee
Designer	R. Jhg
Ref. Dwg. No.	Norm Cont.

Scale: 1:2.5

**HMB**  
 H. E. C. LTD. RANCHI

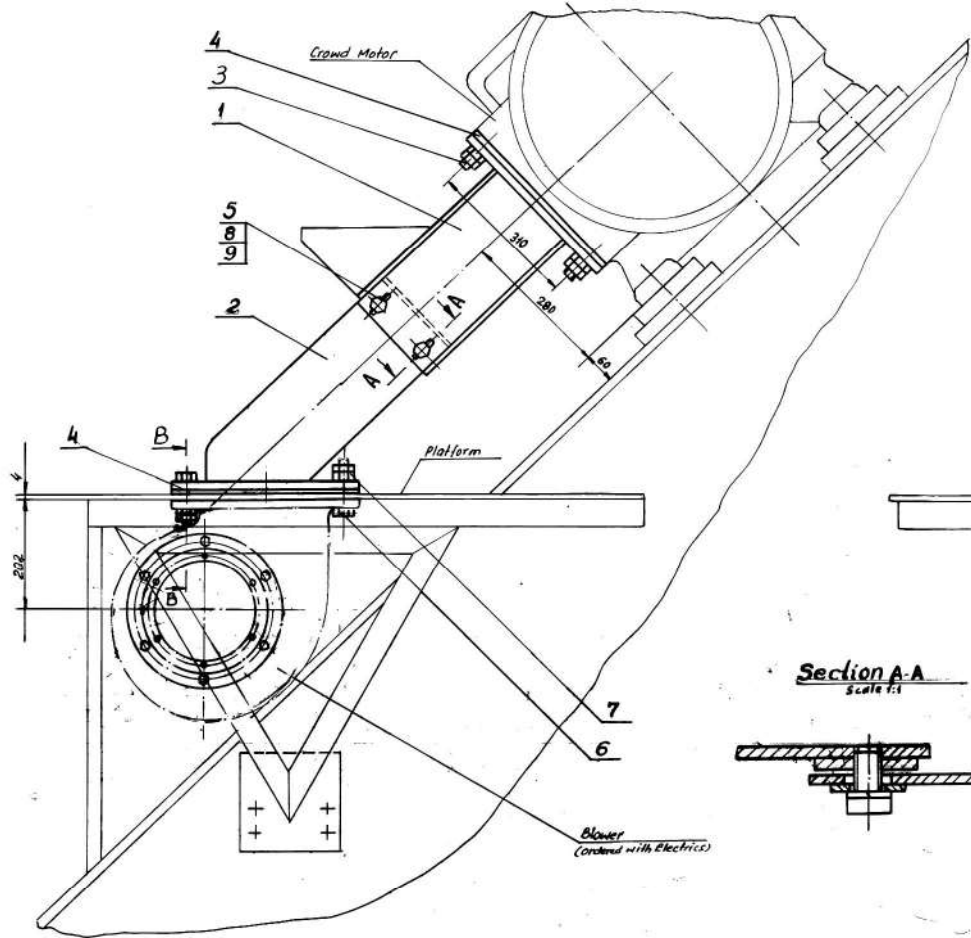
Nov. '84  
 Rev-0

No.	Revision	Signature	Date

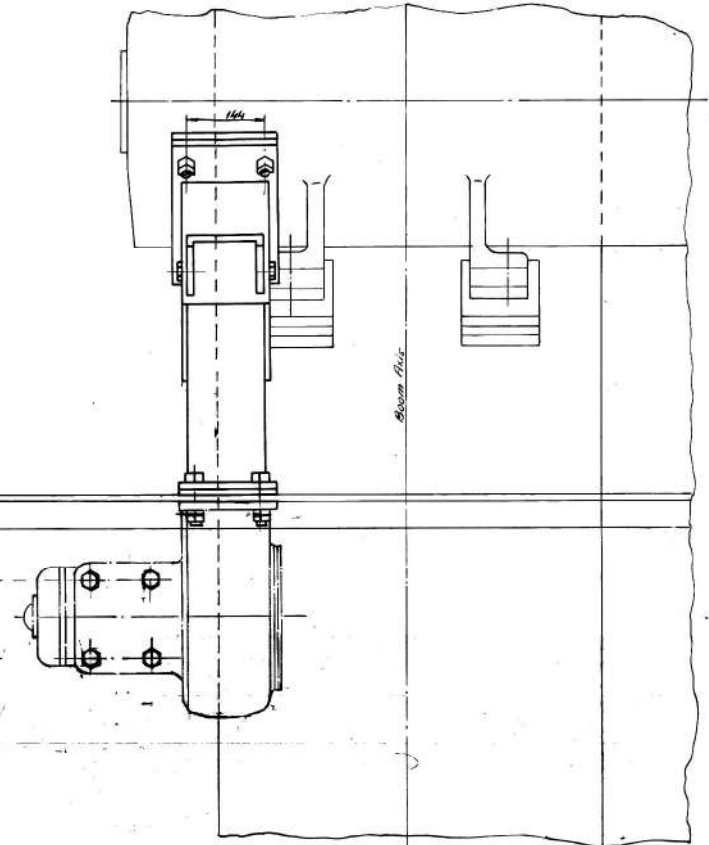
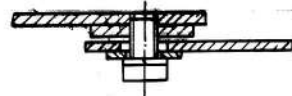
10-3-2867



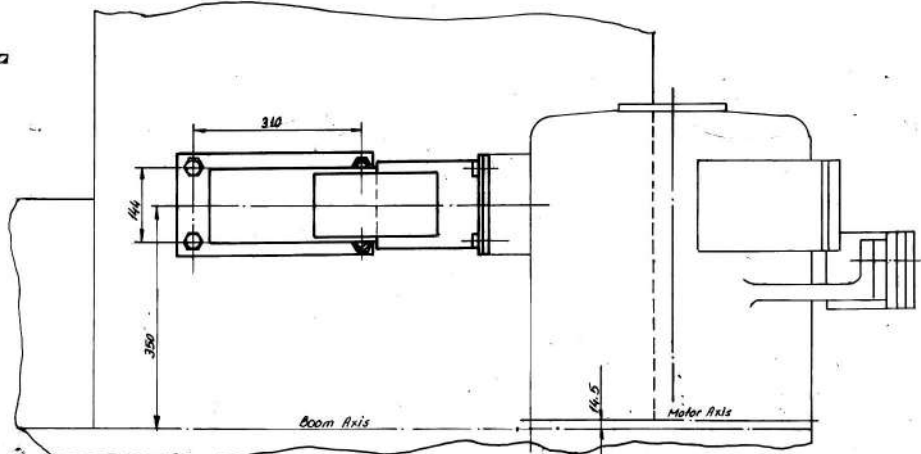
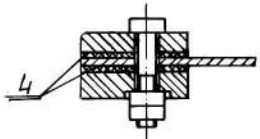
1040 03 400



Section A-A  
Scale 1:1



Section B-B  
Scale 1:2



Wt of weld metal = 0.50 kg

**QUOTED**  
Exec./M/E  
Bureau  
Fig & Det

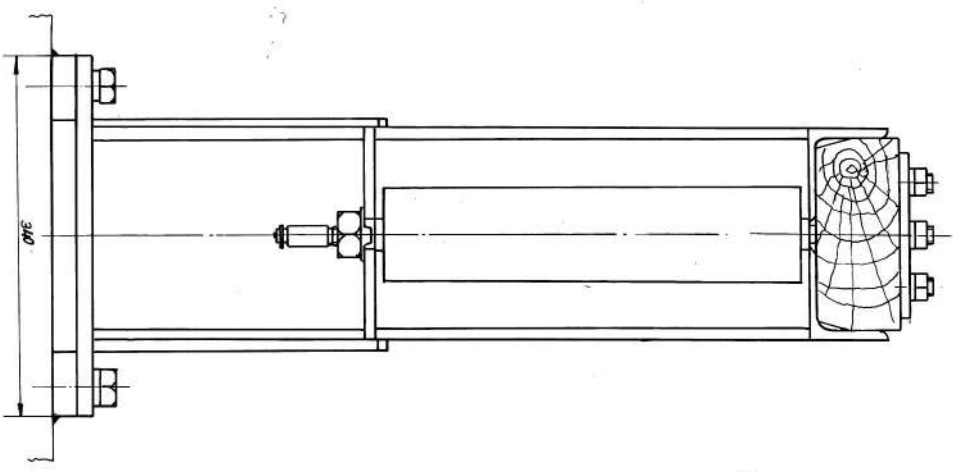
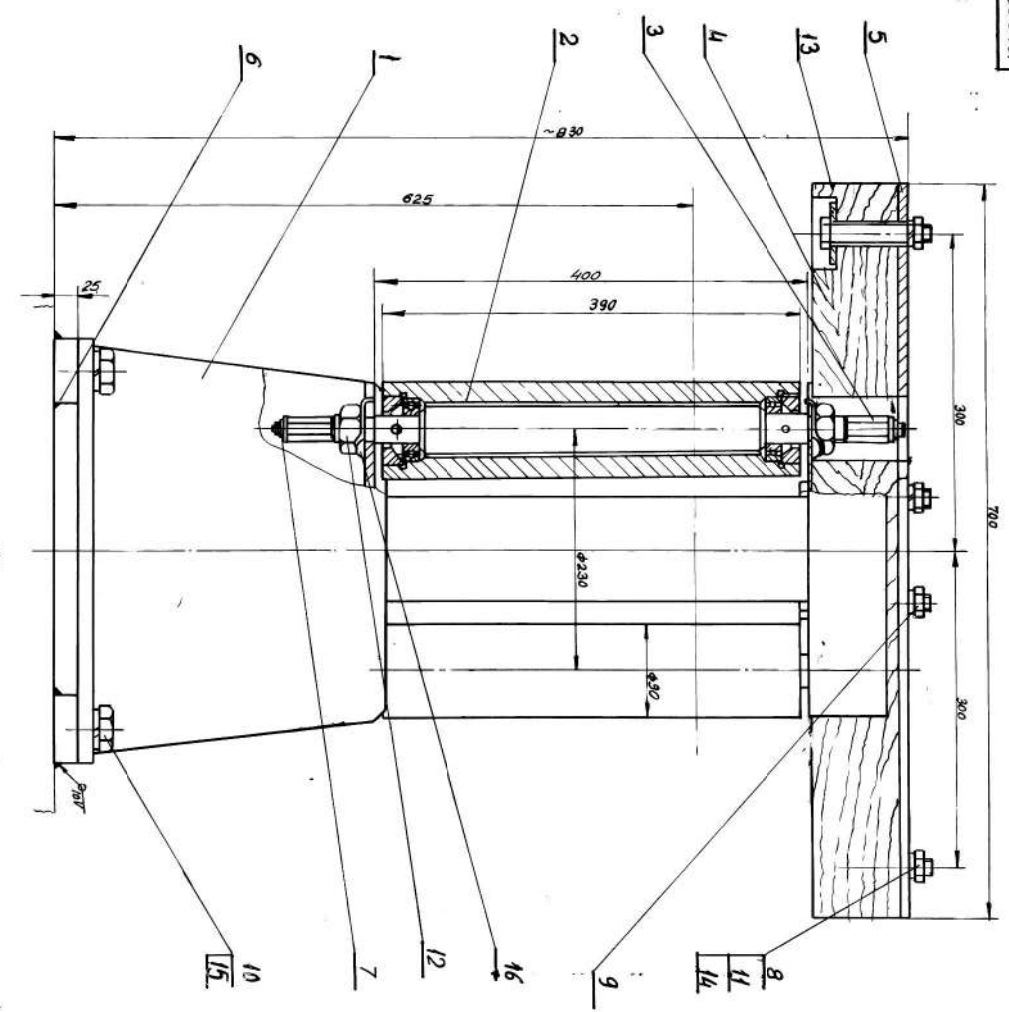
Qty	Part No.	Descriptions	Material	Unit	Wt in kg	Remarks
9	104003401	Punched Washer 14	STEEL	4	0.02	014-018-7
8	104003402	Spring Washer 10	STEEL	4	0.01	014-014-1
7	104003403	Hex Nut M16	STEEL	16	0.03	014-001-7
6	104003404	Hex bolt M16 x 7.5	STEEL	4	0.15	014-003-7
5	104003405	Hex screw M10 x 20	STEEL	4	0.02	014-003-7
4	104003406	Gasket	Rubber	3	0.20	014-003-7
3	104003407	Stand flange 250x250	STEEL	4	0.08	014-003-7
2	104003408	Sleeve	STEEL	1	12.15	12.15
1	104003409	Sleeve	STEEL	1	15.00	15.00
				NO	77.00	Total
				NO	0.50	Weld metal
				NO	14.13	Total
				NO	14.63	Total

Cooling duct Installation 1040 03 400

SCALE 1:1

**HEC**  
1980

IND	NO	Revision	Signature	Date



*Technical Instructions*

1. Rollers should rotate freely on the axle by hand

**Special Note:**  
 Item no. 4 (wooden block, 40x40x100-03.502) of material Teak wood is to be ensured.

REV	NO	DESCRIPTION
1	1	Issued for work
2	1	Revised
3	1	Revised
4	1	Revised
5	1	Revised
6	1	Revised
7	1	Revised
8	1	Revised
9	1	Revised
10	1	Revised
11	1	Revised
12	1	Revised
13	1	Revised
14	1	Revised
15	1	Revised
16	1	Revised

Item	Qty	Description	Material	Unit	Remarks
1	1	Roller Support	Rusty	1	59.20 59.20
2	1	Roller Assembly	Rusty	1	16.80 16.80
3	1	Roller	Rusty	1	0.03 0.03
4	1	Roller	Rusty	1	0.03 0.03
5	1	Roller	Rusty	1	0.03 0.03
6	1	Roller	Rusty	1	0.03 0.03
7	1	Roller	Rusty	1	0.03 0.03
8	1	Roller	Rusty	1	0.03 0.03
9	1	Roller	Rusty	1	0.03 0.03
10	1	Roller	Rusty	1	0.03 0.03
11	1	Roller	Rusty	1	0.03 0.03
12	1	Roller	Rusty	1	0.03 0.03
13	1	Roller	Rusty	1	0.03 0.03
14	1	Roller	Rusty	1	0.03 0.03
15	1	Roller	Rusty	1	0.03 0.03
16	1	Roller	Rusty	1	0.03 0.03

**UNVALIDATED**  
 Bureau - ENCL. 1/1  
 Rev. 4.01

*Installation of Rollers*

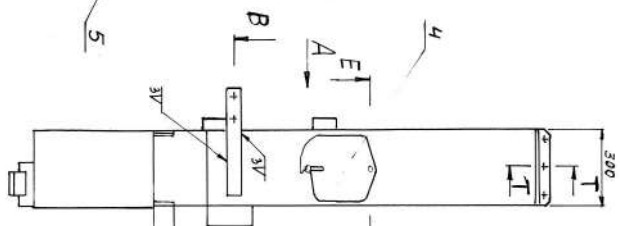
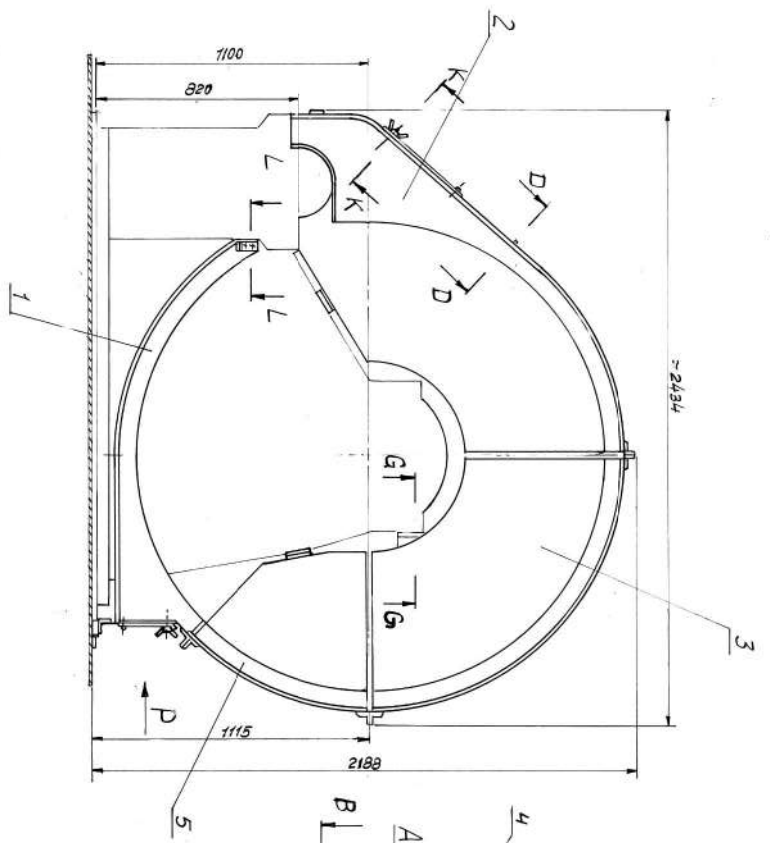
1040 03 500  
 447 in kg - 111.00





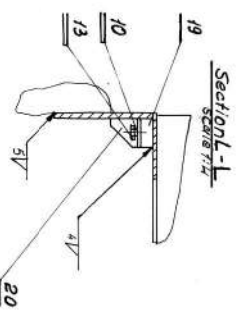






View A

Section B-B  
Scale 1:5



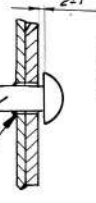
Section L-L  
Scale 1:1

Special Note:- Fabrication of Guard is to be done strictly as per drawing dimension.

Technical Instructions.

1. Use electrode as per specification Ref: IS:815-74 Coding: E317W
2. Details item Nos. 12, 14, 15, 18, 20 to be welded at the time of assembly after adjusting the guard in position.

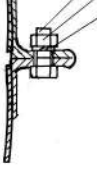
Section E-E  
Scale 1:1



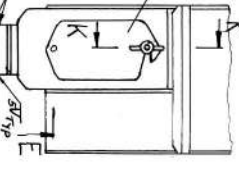
Section D-D  
Scale 1:1



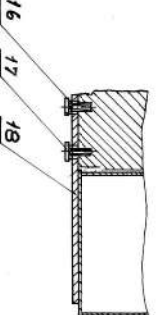
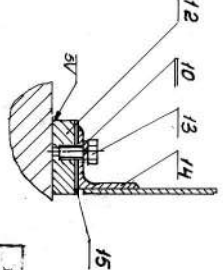
Section T-T  
Scale 1:2



View P  
Scale 1:5



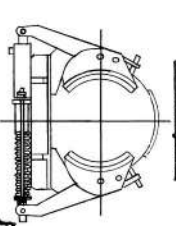
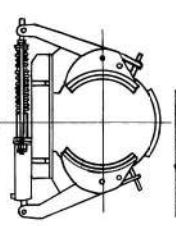
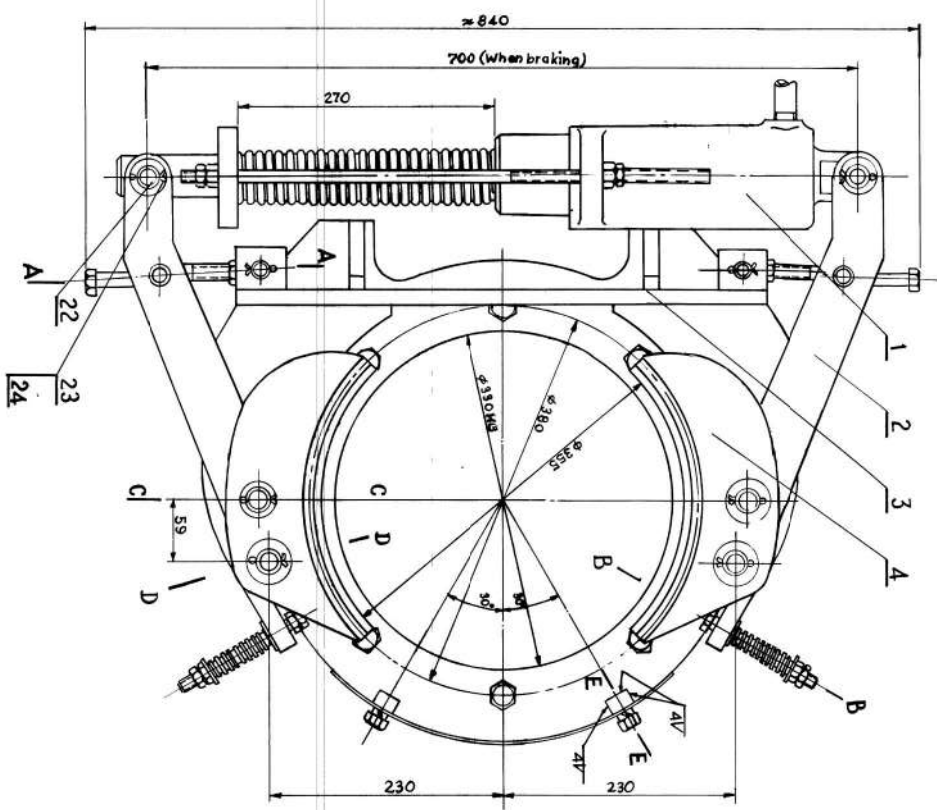
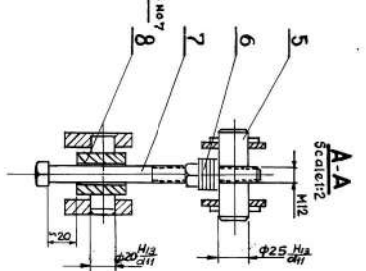
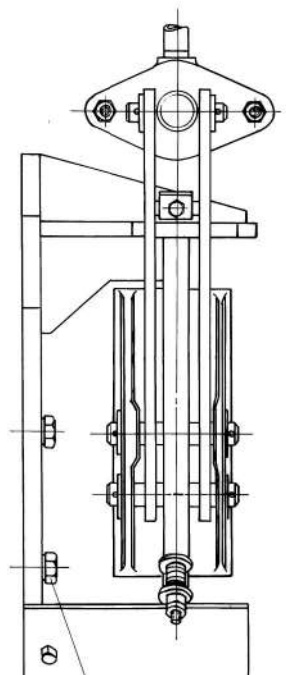
Section G-G  
Scale 1:2



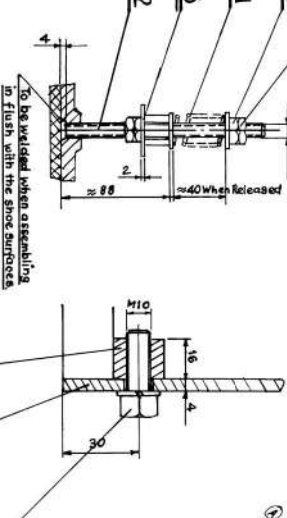
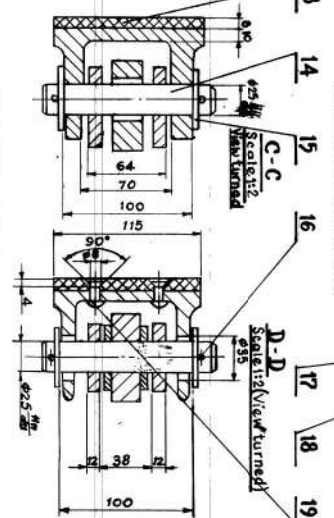
Drawn	Checked	Approved	Date

Sl. No.	Part No.	Description	Material	QTY	Weight (kg)	Remarks
1	1040-09-520	Guard	MS	1	14.6	
2	1040-09-521	Right hand Casting	Cast Iron	1	4.4	
3	1040-09-522	Left hand Casting	Cast Iron	1	4.4	
4	1040-09-523	Right hand Casting	Cast Iron	1	4.4	
5	1040-09-524	Left hand Casting	Cast Iron	1	4.4	
6	1040-09-525	Right hand Casting	Cast Iron	1	4.4	
7	1040-09-526	Left hand Casting	Cast Iron	1	4.4	
8	1040-09-527	Right hand Casting	Cast Iron	1	4.4	
9	1040-09-528	Left hand Casting	Cast Iron	1	4.4	
10	1040-09-529	Right hand Casting	Cast Iron	1	4.4	
11	1040-09-530	Left hand Casting	Cast Iron	1	4.4	
12	1040-09-531	Right hand Casting	Cast Iron	1	4.4	
13	1040-09-532	Left hand Casting	Cast Iron	1	4.4	
14	1040-09-533	Right hand Casting	Cast Iron	1	4.4	
15	1040-09-534	Left hand Casting	Cast Iron	1	4.4	
16	1040-09-535	Right hand Casting	Cast Iron	1	4.4	
17	1040-09-536	Left hand Casting	Cast Iron	1	4.4	
18	1040-09-537	Right hand Casting	Cast Iron	1	4.4	
19	1040-09-538	Left hand Casting	Cast Iron	1	4.4	
20	1040-09-539	Right hand Casting	Cast Iron	1	4.4	





Assembling the brakes



- Technical Instructions**
1. All hinges and bolt connections should be oiled with suitable oil.
  2. All parts on hinges should easily run without seizing.
  3. Before the cylinder is installed on the brake, bolts and studs (item 7 and 12) should be adjusted so that with the levers released, the clearance between the brake pulley and shoes should be uniform and within 2.8 to 3.2 mm.
  4. Cylinder, item 1, should be installed on the brake as shown in the drawing. See sketches for assembling the brakes.
  5. Test and adjust the brakes when testing the excavator as a whole.
  6. Use electrodes IS: 815-74 coating E 3174/2. Specification ref: 5.814-70
  7. Bolts M16x40 of the motor is to be made use of for fastening the brake.

**Special notes:**

1. Final adjustment of brake to be tested of vendor site.
2. Scrupulous work should be given from shoe holes and other casting defects.
3. Cylinder body should be free from shoe holes and other casting defects.
4. Brake lining should be of ferro or quality and of min. thickness 8mm (hardness 100).
5. Cylinder should be subjected to hydraulic test at 1.5 times work pressure (1.5 times design pressure).
6. White design '44', it should be ensure that there is no leakage of oil through the collar of cylinder.

Item No.	Qty	Description	Material	Weight in Kg	Remarks
1	1	Cylinder	Cast Iron	22.0	
2	4	Pin φ25	Steel	8.0	
3	2	Shoe	Steel	14.0	
4	2	Brake Housing	Steel	59.0	
5	2	Lever	Steel	8.0	
6	1	Cross member	Steel	22.0	
7	2	Bolt M16x70	Steel	0.34	
8	2	Washer φ25	Steel	0.6	
9	2	Pin φ25	Steel	8.0	
10	2	Washer φ25	Steel	0.6	
11	2	Pin φ25	Steel	8.0	
12	2	Washer φ25	Steel	0.6	
13	2	Pin φ25	Steel	8.0	
14	2	Washer φ25	Steel	0.6	
15	2	Pin φ25	Steel	8.0	
16	2	Washer φ25	Steel	0.6	
17	2	Pin φ25	Steel	8.0	
18	2	Washer φ25	Steel	0.6	
19	2	Pin φ25	Steel	8.0	
20	2	Washer φ25	Steel	0.6	
21	2	Pin φ25	Steel	8.0	
22	2	Washer φ25	Steel	0.6	
23	2	Pin φ25	Steel	8.0	
24	2	Washer φ25	Steel	0.6	
25	2	Pin φ25	Steel	8.0	
26	2	Washer φ25	Steel	0.6	
27	2	Pin φ25	Steel	8.0	
28	2	Washer φ25	Steel	0.6	
29	2	Pin φ25	Steel	8.0	
30	2	Washer φ25	Steel	0.6	
31	2	Pin φ25	Steel	8.0	
32	2	Washer φ25	Steel	0.6	
33	2	Pin φ25	Steel	8.0	
34	2	Washer φ25	Steel	0.6	
35	2	Pin φ25	Steel	8.0	
36	2	Washer φ25	Steel	0.6	
37	2	Pin φ25	Steel	8.0	
38	2	Washer φ25	Steel	0.6	
39	2	Pin φ25	Steel	8.0	
40	2	Washer φ25	Steel	0.6	

**SWING MOTOR BRAKE**

Weight in Kg. 112

1040.11.100

Scale: 1:2.5

April 88

M. ELECT. BANCH

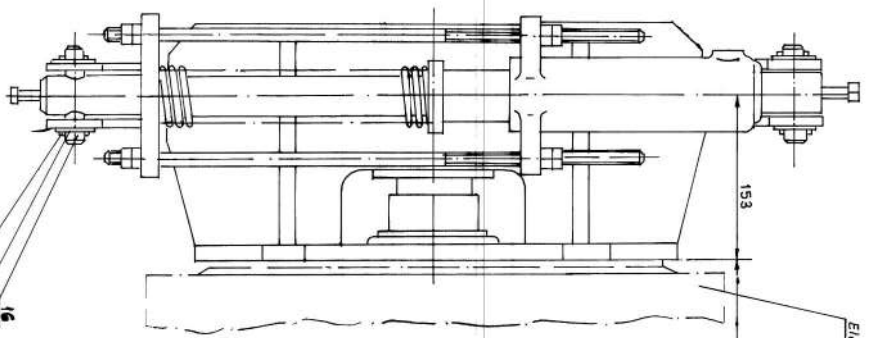
A

21	2	Check valve	Steel	0.34	
22	2	Washer φ25	Steel	0.6	
23	2	Pin φ25	Steel	8.0	
24	2	Washer φ25	Steel	0.6	

10-1-1378

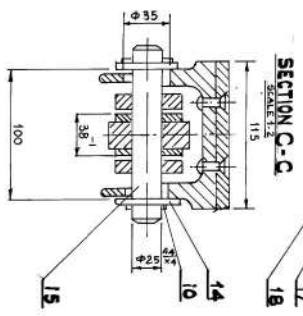
10-1-1378

VIEW - E

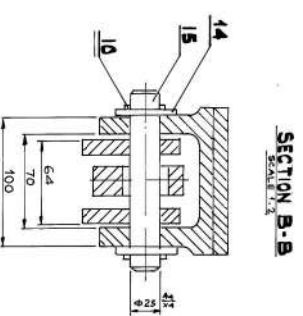


Electric Motor

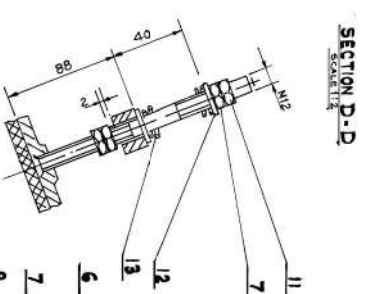
These bolts are the bolts of Motor



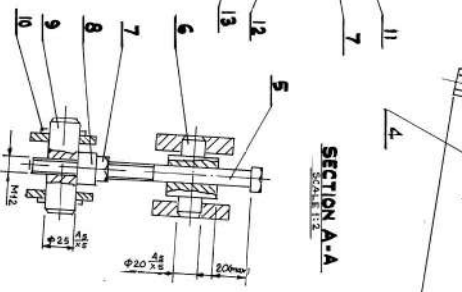
SECTION C-C  
SCALE: 1:2



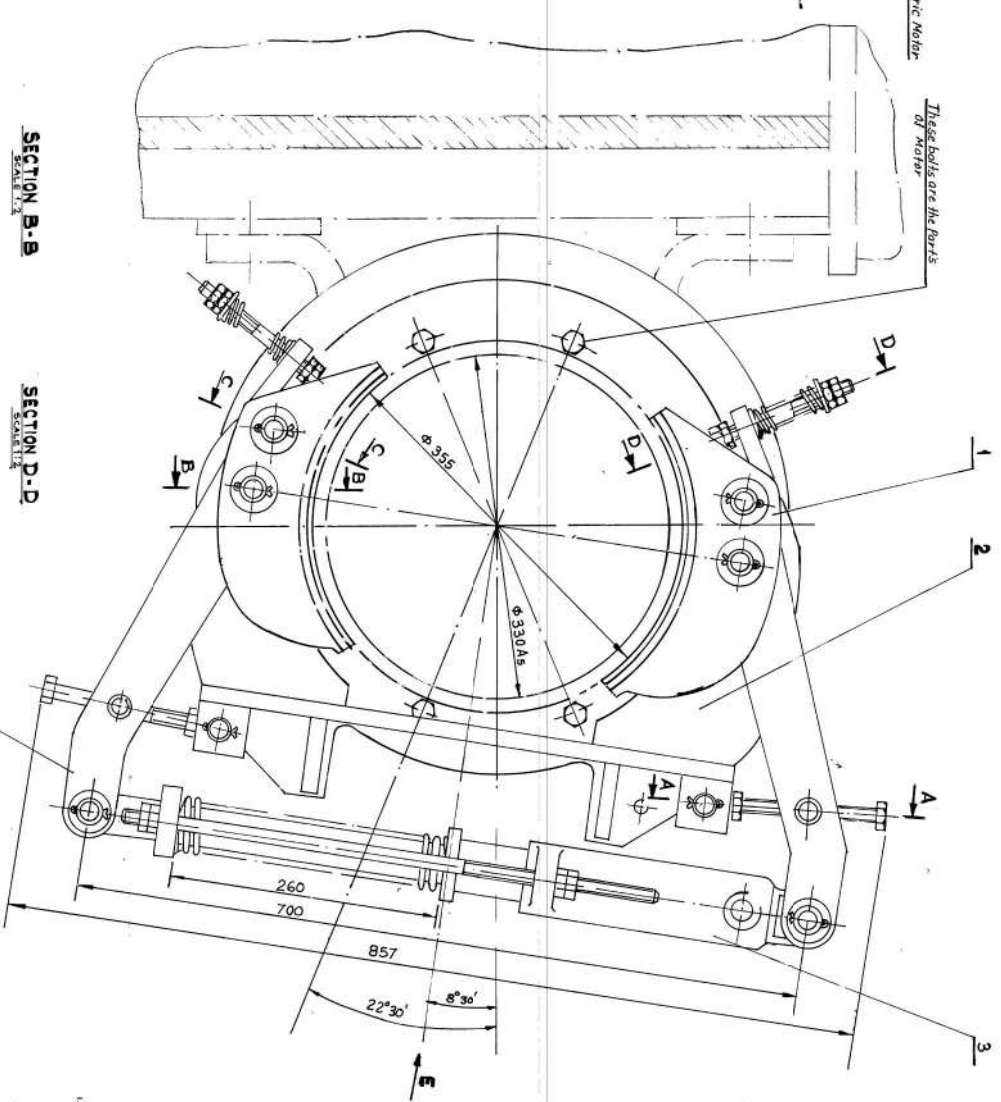
SECTION B-B  
SCALE: 1:2



SECTION D-D  
SCALE: 1:2



SECTION A-A  
SCALE: 1:2



**TECHNICAL CHARACTERISTICS**

Braking Torque --- 150 kg.m  
 Working Force of spring --- 200 Kg.  
 Working Pressure in hydraulic cylinder --- 16 kg/cm<sup>2</sup>  
 Stroke of Piston --- 44-112 mm

- TECHNICAL INSTRUCTIONS**
1. All hinge and bolt connections should be lubricated with suitable lubricant.
  2. All Parts of the hinge connection must easily turn by hand
  3. Before the cylinder is installed on the brake adjustable bolts and studs should be adjusted so that with the lever released the clearance between the brake pulley and shoe should be uniform and within 2.8 to 3.2 mm.
  4. For brake mounting, use bolts M16x40 of the motor.

**Special Note:-**

1. Profile activation of the brake to be tested at vendor site
2. Surface finish of piston should be V
3. Sprague finish of piston should be V
4. Groove lining should be of Federal A quality and of minimum thickness 6mm. Test at strength test system. Specific gravity 1.85 g/cm<sup>3</sup>
5. Cylinder should be subjected to hydraulic test at 24 kg/cm<sup>2</sup> with oil filled in it. While doing this, it should be ensured that there is no leakage of oil through the collar of cylinder

ITEM NO	DESCRIPTION	QTY	UNIT	REMARKS
1	1040 18 204 Shoe Assy	2	9.10	18.20
2	1040 18 205 Brake Housing	1	15.00	51.00
3	1040 18 219 Cylinder Assy	1	14.00	14.00
4	1040 18 223 Lever	4	2.00	8.00
5	1040 18 224 Bolt M12x170	1	16.13	32.6
6	1040 18 225 Cross Member	1	1.00	1.00
7	Hex Nut M12-5 Pcs	6	0.17	1.02
8	1040 18 228 Pin 25x82	2	0.04	0.08
9	1040 18 227 Pin 5x40	1	12.00	12.00
10	Hex Lock Nut M12-5 Pcs	4	0.18	0.72
11	Hex Lock Nut M12-5 Pcs	4	0.18	0.72
12	Punched Washer 14	2	0.02	0.04
13	1040 18 228 Spring	1	0.05	0.05
14	Punched Washer 20	8	0.03	0.24
15	1040 18 229 Pin 25x194	4	0.20	0.80
16	1040 18 230 Pin 20x85	2	0.20	0.40
17	Punched Washer 22	4	0.07	0.28
18	Split Pin 4x36	4	0.08	0.32

**FOR TRAVEL MECHANISM**

SCALE: 1:2.5

WT. IN KG - 96

**HMB**

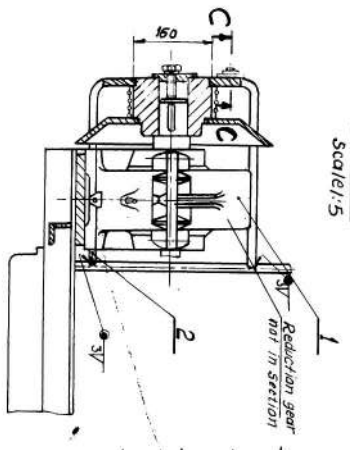
July 86

10-1-1111

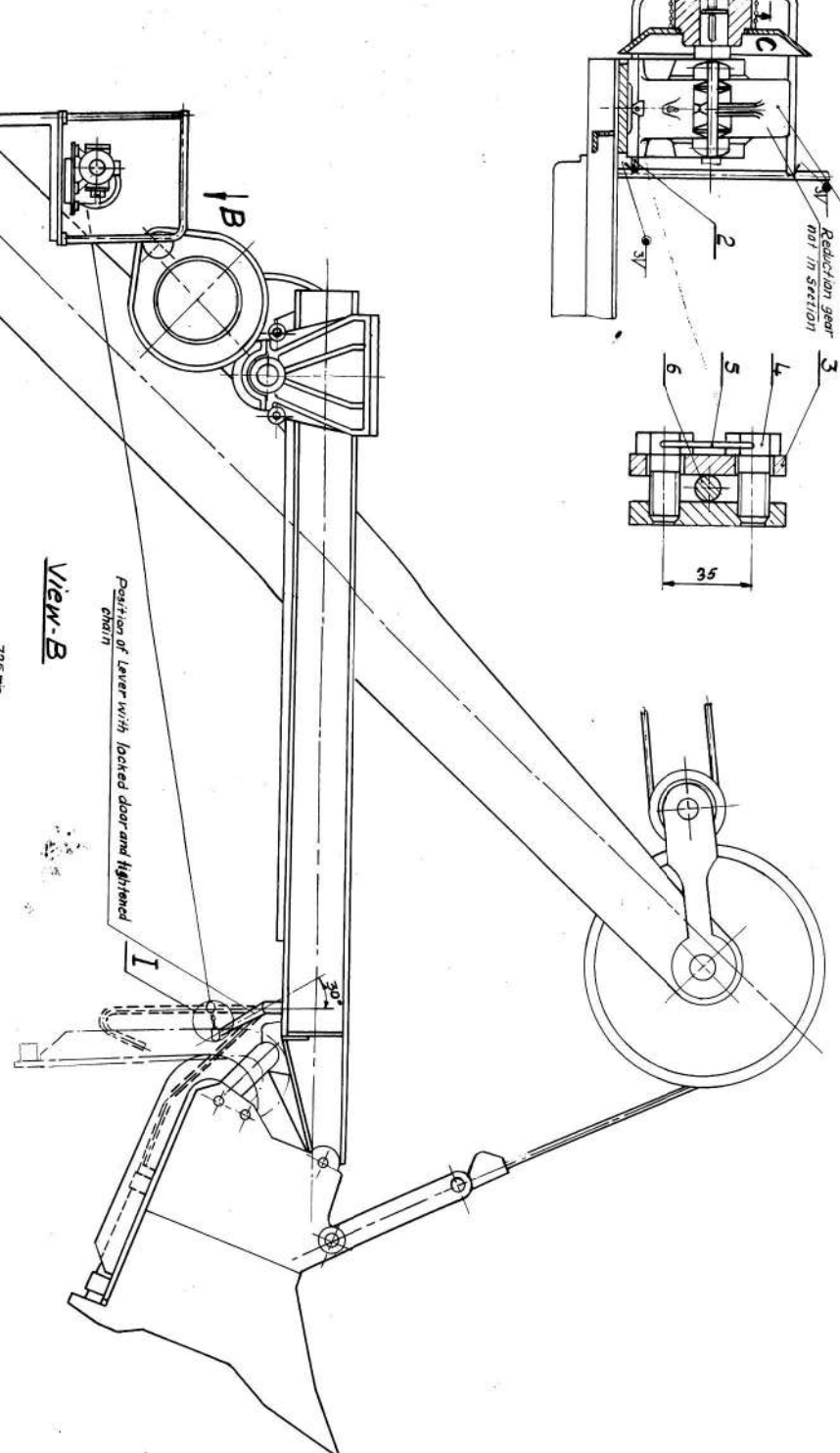
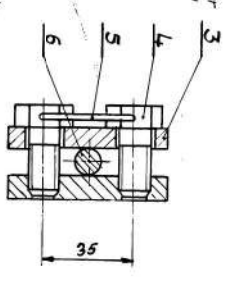
NO	REV	REVISION	APPROVED	DATE
1	1	INITIAL REV. SHEET		



**View-A**  
Scale: 1/5

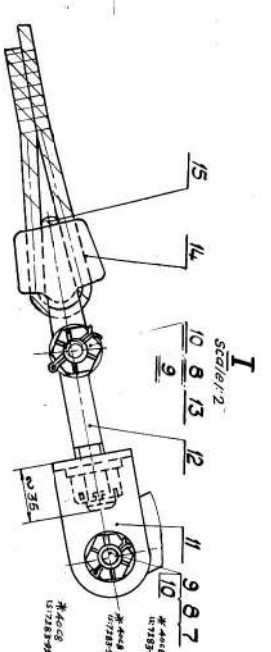
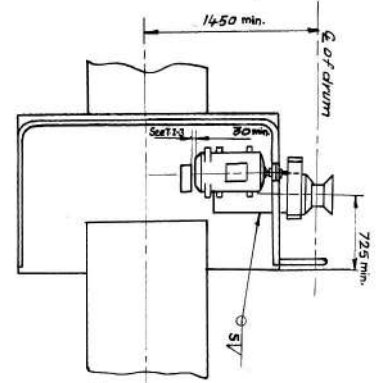


**Section C-C**  
Scale: 1/1



Position of lever with latched door and tightened chain

**View-B**



Scale: 1/2

- Technical Instructions**
1. For welding use electrodes with coating E-31744 copper (S-614, Spec. ref. is: 614-T). End of the Rope (item no. 6) is to be secured to the drum by means of plate (item no. 2) and bolts (item no. 3). The other end should be fixed to the fork (item no. 10) by means of wedge (item no. 15).
  2. While installing the winch on the service platform, at least a gap of 30mm. between the end of motor and air shaft should be maintained.
  3. Rope guide (item no. 2) is to be welded to the railing of service platform after installing of the mechanism.
  4. Holes for split pins (item no. 10) in bolts (item nos. 4, 12) are to be drilled during assembly.

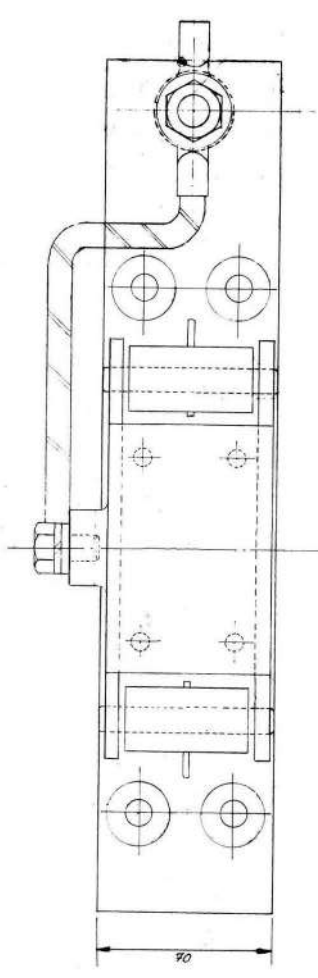
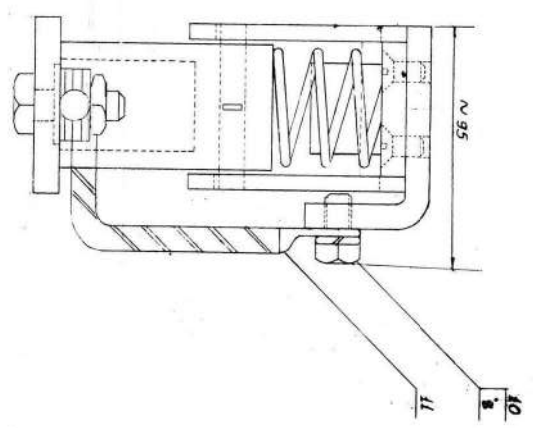
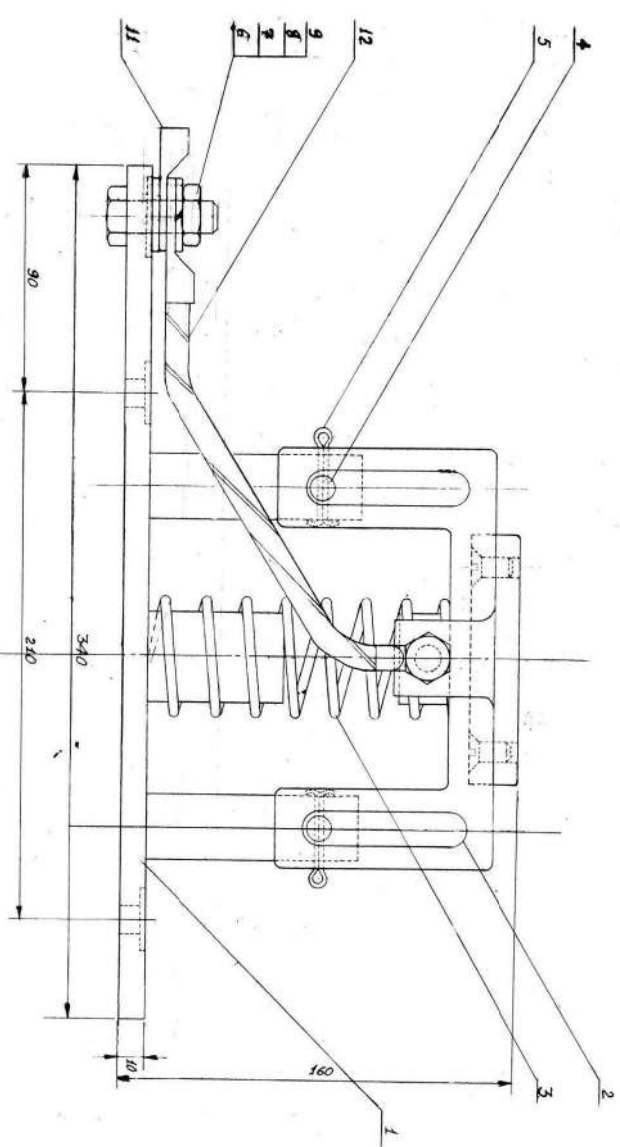
REPLACED  
Bureau...  
No. & D.

Item No.	Description	Material	Qty	Weight in kg	Remarks
1	Roller on 1000	Plate S1-475	1	0.10	
2	Roller on 1000	Plate S1-475	1	0.10	
3	Roller on 1000	Plate S1-475	1	0.10	
4	Roller on 1000	Plate S1-475	1	0.10	
5	Roller on 1000	Plate S1-475	1	0.10	
6	Roller on 1000	Plate S1-475	1	0.10	
7	Roller on 1000	Plate S1-475	1	0.10	
8	Roller on 1000	Plate S1-475	1	0.10	
9	Roller on 1000	Plate S1-475	1	0.10	
10	Roller on 1000	Plate S1-475	1	0.10	
11	Roller on 1000	Plate S1-475	1	0.10	
12	Roller on 1000	Plate S1-475	1	0.10	
13	Roller on 1000	Plate S1-475	1	0.10	
14	Roller on 1000	Plate S1-475	1	0.10	
15	Roller on 1000	Plate S1-475	1	0.10	

**Dipper Tip Mechanism**

Weight in kg - 167	1040 04 000
Drawn by	
Checked by	
Approved by	
Design No.	
Part No.	
Rev. No.	

Rev. No.	Revision	Signed	Date



**REVALIDATED**  
 M.F.  
 SINGAPORE

*Special Note: -  
 Current collector is to be manufactured  
 strictly as per drawing dimension*

Sl. No.	Part No.	Description	Qty	Material	Remarks
1	11	Hex Nut M12x1.5	1	Steel	
2	12	Hex Washer 12	1	Steel	
3	1	Spring	1	Steel	
4	2	Pin dia. 4.5	1	Steel	
5	3	Collector Base	1	Steel	
6	4	Hex Nut M12x1.5	1	Steel	
7	5	Hex Washer 12	1	Steel	
8	6	Spring	1	Steel	
9	7	Pin dia. 4.5	1	Steel	
10	8	Hex Nut M12x1.5	1	Steel	
11	9	Hex Washer 12	1	Steel	
12	10	Spring	1	Steel	
13	11	Pin dia. 4.5	1	Steel	
14	12	Hex Nut M12x1.5	1	Steel	
15	13	Hex Washer 12	1	Steel	
16	14	Spring	1	Steel	
17	15	Pin dia. 4.5	1	Steel	
18	16	Hex Nut M12x1.5	1	Steel	
19	17	Hex Washer 12	1	Steel	
20	18	Spring	1	Steel	
21	19	Pin dia. 4.5	1	Steel	
22	20	Hex Nut M12x1.5	1	Steel	
23	21	Hex Washer 12	1	Steel	
24	22	Spring	1	Steel	
25	23	Pin dia. 4.5	1	Steel	
26	24	Hex Nut M12x1.5	1	Steel	
27	25	Hex Washer 12	1	Steel	
28	26	Spring	1	Steel	
29	27	Pin dia. 4.5	1	Steel	
30	28	Hex Nut M12x1.5	1	Steel	
31	29	Hex Washer 12	1	Steel	
32	30	Spring	1	Steel	
33	31	Pin dia. 4.5	1	Steel	
34	32	Hex Nut M12x1.5	1	Steel	
35	33	Hex Washer 12	1	Steel	
36	34	Spring	1	Steel	
37	35	Pin dia. 4.5	1	Steel	
38	36	Hex Nut M12x1.5	1	Steel	
39	37	Hex Washer 12	1	Steel	
40	38	Spring	1	Steel	
41	39	Pin dia. 4.5	1	Steel	
42	40	Hex Nut M12x1.5	1	Steel	
43	41	Hex Washer 12	1	Steel	
44	42	Spring	1	Steel	
45	43	Pin dia. 4.5	1	Steel	
46	44	Hex Nut M12x1.5	1	Steel	
47	45	Hex Washer 12	1	Steel	
48	46	Spring	1	Steel	
49	47	Pin dia. 4.5	1	Steel	
50	48	Hex Nut M12x1.5	1	Steel	
51	49	Hex Washer 12	1	Steel	
52	50	Spring	1	Steel	
53	51	Pin dia. 4.5	1	Steel	
54	52	Hex Nut M12x1.5	1	Steel	
55	53	Hex Washer 12	1	Steel	
56	54	Spring	1	Steel	
57	55	Pin dia. 4.5	1	Steel	
58	56	Hex Nut M12x1.5	1	Steel	
59	57	Hex Washer 12	1	Steel	
60	58	Spring	1	Steel	
61	59	Pin dia. 4.5	1	Steel	
62	60	Hex Nut M12x1.5	1	Steel	
63	61	Hex Washer 12	1	Steel	
64	62	Spring	1	Steel	
65	63	Pin dia. 4.5	1	Steel	
66	64	Hex Nut M12x1.5	1	Steel	
67	65	Hex Washer 12	1	Steel	
68	66	Spring	1	Steel	
69	67	Pin dia. 4.5	1	Steel	
70	68	Hex Nut M12x1.5	1	Steel	
71	69	Hex Washer 12	1	Steel	
72	70	Spring	1	Steel	
73	71	Pin dia. 4.5	1	Steel	
74	72	Hex Nut M12x1.5	1	Steel	
75	73	Hex Washer 12	1	Steel	
76	74	Spring	1	Steel	
77	75	Pin dia. 4.5	1	Steel	
78	76	Hex Nut M12x1.5	1	Steel	
79	77	Hex Washer 12	1	Steel	
80	78	Spring	1	Steel	
81	79	Pin dia. 4.5	1	Steel	
82	80	Hex Nut M12x1.5	1	Steel	
83	81	Hex Washer 12	1	Steel	
84	82	Spring	1	Steel	
85	83	Pin dia. 4.5	1	Steel	
86	84	Hex Nut M12x1.5	1	Steel	
87	85	Hex Washer 12	1	Steel	
88	86	Spring	1	Steel	
89	87	Pin dia. 4.5	1	Steel	
90	88	Hex Nut M12x1.5	1	Steel	
91	89	Hex Washer 12	1	Steel	
92	90	Spring	1	Steel	
93	91	Pin dia. 4.5	1	Steel	
94	92	Hex Nut M12x1.5	1	Steel	
95	93	Hex Washer 12	1	Steel	
96	94	Spring	1	Steel	
97	95	Pin dia. 4.5	1	Steel	
98	96	Hex Nut M12x1.5	1	Steel	
99	97	Hex Washer 12	1	Steel	
100	98	Spring	1	Steel	
101	99	Pin dia. 4.5	1	Steel	
102	100	Hex Nut M12x1.5	1	Steel	
103	101	Hex Washer 12	1	Steel	
104	102	Spring	1	Steel	
105	103	Pin dia. 4.5	1	Steel	
106	104	Hex Nut M12x1.5	1	Steel	
107	105	Hex Washer 12	1	Steel	
108	106	Spring	1	Steel	
109	107	Pin dia. 4.5	1	Steel	
110	108	Hex Nut M12x1.5	1	Steel	
111	109	Hex Washer 12	1	Steel	
112	110	Spring	1	Steel	
113	111	Pin dia. 4.5	1	Steel	
114	112	Hex Nut M12x1.5	1	Steel	
115	113	Hex Washer 12	1	Steel	
116	114	Spring	1	Steel	
117	115	Pin dia. 4.5	1	Steel	
118	116	Hex Nut M12x1.5	1	Steel	
119	117	Hex Washer 12	1	Steel	
120	118	Spring	1	Steel	
121	119	Pin dia. 4.5	1	Steel	
122	120	Hex Nut M12x1.5	1	Steel	
123	121	Hex Washer 12	1	Steel	
124	122	Spring	1	Steel	
125	123	Pin dia. 4.5	1	Steel	
126	124	Hex Nut M12x1.5	1	Steel	
127	125	Hex Washer 12	1	Steel	
128	126	Spring	1	Steel	
129	127	Pin dia. 4.5	1	Steel	
130	128	Hex Nut M12x1.5	1	Steel	
131	129	Hex Washer 12	1	Steel	
132	130	Spring	1	Steel	
133	131	Pin dia. 4.5	1	Steel	
134	132	Hex Nut M12x1.5	1	Steel	
135	133	Hex Washer 12	1	Steel	
136	134	Spring	1	Steel	
137	135	Pin dia. 4.5	1	Steel	
138	136	Hex Nut M12x1.5	1	Steel	
139	137	Hex Washer 12	1	Steel	
140	138	Spring	1	Steel	
141	139	Pin dia. 4.5	1	Steel	
142	140	Hex Nut M12x1.5	1	Steel	
143	141	Hex Washer 12	1	Steel	
144	142	Spring	1	Steel	
145	143	Pin dia. 4.5	1	Steel	
146	144	Hex Nut M12x1.5	1	Steel	
147	145	Hex Washer 12	1	Steel	
148	146	Spring	1	Steel	
149	147	Pin dia. 4.5	1	Steel	
150	148	Hex Nut M12x1.5	1	Steel	
151	149	Hex Washer 12	1	Steel	
152	150	Spring	1	Steel	
153	151	Pin dia. 4.5	1	Steel	
154	152	Hex Nut M12x1.5	1	Steel	
155	153	Hex Washer 12	1	Steel	
156	154	Spring	1	Steel	
157	155	Pin dia. 4.5	1	Steel	
158	156	Hex Nut M12x1.5	1	Steel	
159	157	Hex Washer 12	1	Steel	
160	158	Spring	1	Steel	
161	159	Pin dia. 4.5	1	Steel	
162	160	Hex Nut M12x1.5	1	Steel	
163	161	Hex Washer 12	1	Steel	
164	162	Spring	1	Steel	
165	163	Pin dia. 4.5	1	Steel	
166	164	Hex Nut M12x1.5	1	Steel	
167	165	Hex Washer 12	1	Steel	
168	166	Spring	1	Steel	
169	167	Pin dia. 4.5	1	Steel	
170	168	Hex Nut M12x1.5	1	Steel	
171	169	Hex Washer 12	1	Steel	
172	170	Spring	1	Steel	
173	171	Pin dia. 4.5	1	Steel	
174	172	Hex Nut M12x1.5	1	Steel	
175	173	Hex Washer 12	1	Steel	
176	174	Spring	1	Steel	
177	175	Pin dia. 4.5	1	Steel	
178	176	Hex Nut M12x1.5	1	Steel	
179	177	Hex Washer 12	1	Steel	
180	178	Spring	1	Steel	
181	179	Pin dia. 4.5	1	Steel	
182	180	Hex Nut M12x1.5	1	Steel	
183	181	Hex Washer 12	1	Steel	
184	182	Spring	1	Steel	
185	183	Pin dia. 4.5	1	Steel	
186	184	Hex Nut M12x1.5	1	Steel	
187	185	Hex Washer 12	1	Steel	
188	186	Spring	1	Steel	
189	187	Pin dia. 4.5	1	Steel	
190	188	Hex Nut M12x1.5	1	Steel	
191	189	Hex Washer 12	1	Steel	
192	190	Spring	1	Steel	
193	191	Pin dia. 4.5	1	Steel	
194	192	Hex Nut M12x1.5	1	Steel	
195	193	Hex Washer 12	1	Steel	
196	194	Spring	1	Steel	
197	195	Pin dia. 4.5	1	Steel	
198	196	Hex Nut M12x1.5	1	Steel	
199	197	Hex Washer 12	1	Steel	
200	198	Spring	1	Steel	
201	199	Pin dia. 4.5	1	Steel	
202	200	Hex Nut M12x1.5	1	Steel	
203	201	Hex Washer 12	1	Steel	
204	202	Spring	1	Steel	
205	203	Pin dia. 4.5	1	Steel	
206	204	Hex Nut M12x1.5	1	Steel	
207	205	Hex Washer 12	1	Steel	
208	206	Spring	1	Steel	
209	207	Pin dia. 4.5	1	Steel	
210	208	Hex Nut M12x1.5	1	Steel	
211	209	Hex Washer 12	1	Steel	
212	210	Spring	1	Steel	
213	211	Pin dia. 4.5	1	Steel	
214	212	Hex Nut M12x1.5	1	Steel	
215	213	Hex Washer 12	1	Steel	
216	214	Spring	1	Steel	
217	215	Pin dia. 4.5	1	Steel	
218	216	Hex Nut M12x1.5</			

