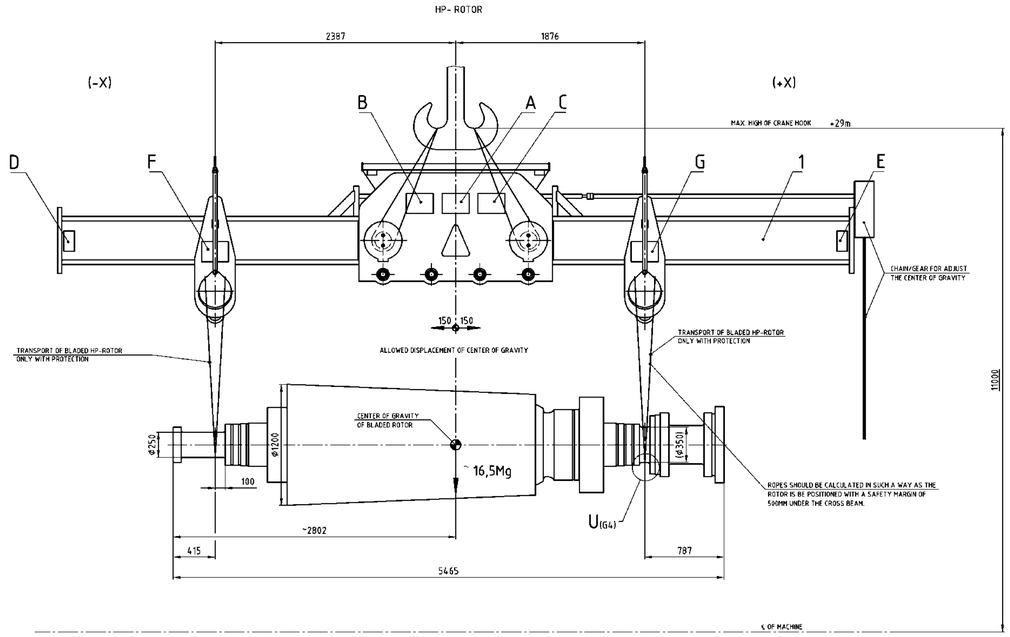
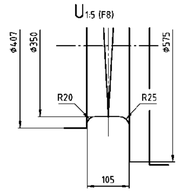
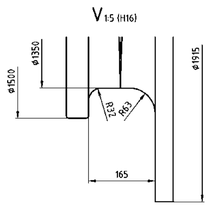
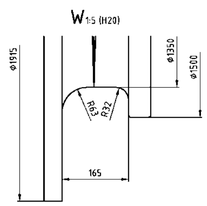
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm) | FORM DG 46 (B)

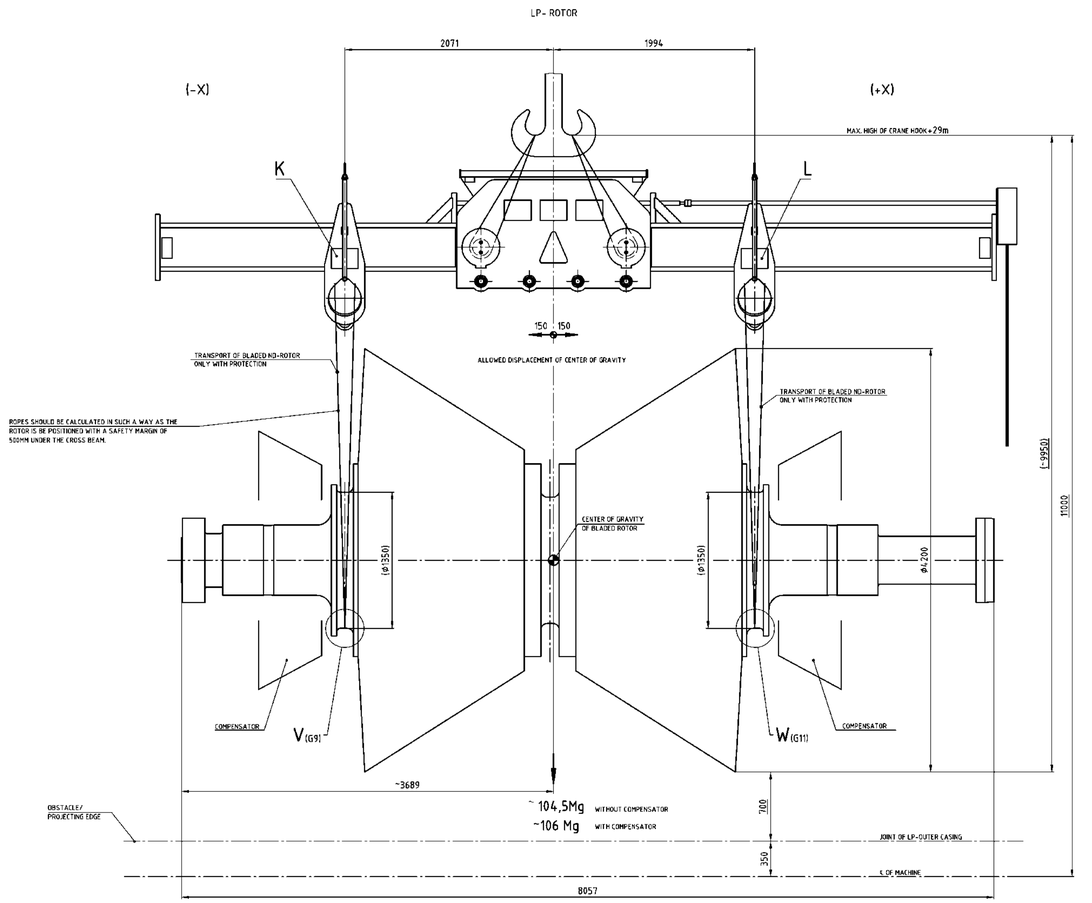
DRAWING No. 0-12090-48000











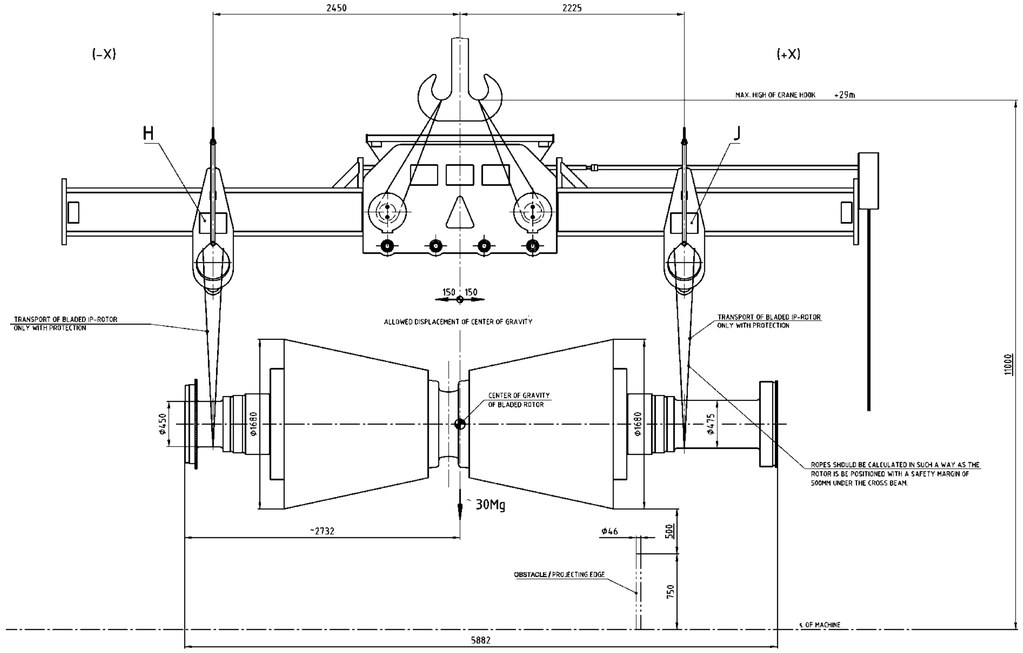


PLATE No	TEXT
A	NAME PLATE OF MANUFACTURER ACC. TO THE ORDERING DATA AND ACC. TO TLV OF THE ORDER(TLV 7050)
B	ALLOWED DISPLACEMENT OF CENTER OF GRAVITY ±150mm
C	WEIGHT : xxxMg
D	(-X)
E	(+X)
F	HP-SHAFT
G	HP-SHAFT
H	IP-SHAFT
J	IP-SHAFT
K	LP-SHAFT
L	LP-SHAFT
M	LP UPPER PART
N	CROSS-OVER PIPE
O	CROSS-OVER PIPE

WEIGHTS INCL. TOLERANCE ADDITION

ATTENTION!
- ALIGNMENT AND ADJUSTMENT FOR CROSS BEAM ACCORDING TO OPERATION INSTRUCTION OF MANUFACTURER
- ROPES MARKED TO PREVENT INTERCHANGING
- TRANSPORTATION OF ROTORS ONLY WITH PROTECTION
- THE CROSS-BEAM IS DESIGNED WITH WORK PLATFORMS ON BOTH SIDES

NOTE!
- The Scope of supply Includes Lifting Beam, Lifting Slings for Crane Hook (between crane hook & lifting beam), Lifting Slings for HP Shaft, IP Shaft & LP Shaft, Lifting Adapters with Load Shackle & Lifting Slings for Cross Over Pipe, Turn Buckles & Braces(with locking bolt) for Casing Upper Part, Leather Sheet Protection, Stands for lifting beam etc.
- Perimeter & Length of the Slings are critical and according to Dimension given in drawing.Lifting Slings for Left & Right of the same module may or may not be same.Party to take note of this.
- Location of Lifting Points for HP/IP/LP Shafts,COP & Casing Upper Part shown in drawing of 01209065000 are very Critical. Party to take note of this and must adhere.
- All other technical requirements shall be as per TLV7050

SUPPLIER:- GSK STAHL-UND MASCHINENBAU GMBH OR EQUIVALENT

NOTE:- ALL OTHER TECHNICAL REQUIREMENTS SHALL BE AS PER TLV7050

MAT. CODE W90312090137

GRADE OF UNTOL.DIM		TTX	TTX	SDI-
M/CG.-C/M/F AA0230208				
WELDING-A/B/C/D / AA0621101				
GAS CUTTING-T3/AA0621101				

REV	DATE	ALTERED	CHECKED

TYPE OF PRODUCT	STEAM TURBINE 660 MW
OR NAME OF CUSTOMER/PROJECT	BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR
DEPT STE	SCALE 1:20
CODE 4011	WEIGHT (KG)
TITLE : LIFTING BEAM	REF. TO ASSY. DRG.
CARD CODE	DRAWING NO. 0-12090-48000
SHEET No. 1	No. OF SHEETS 3

	NAME	SIGN	DATE
DRN	RITESH	SDI-	08-02-2016
CHD	ALOK	SDI-	09-02-2016
APPD	D.K.RAY	SDI-	10-02-2016

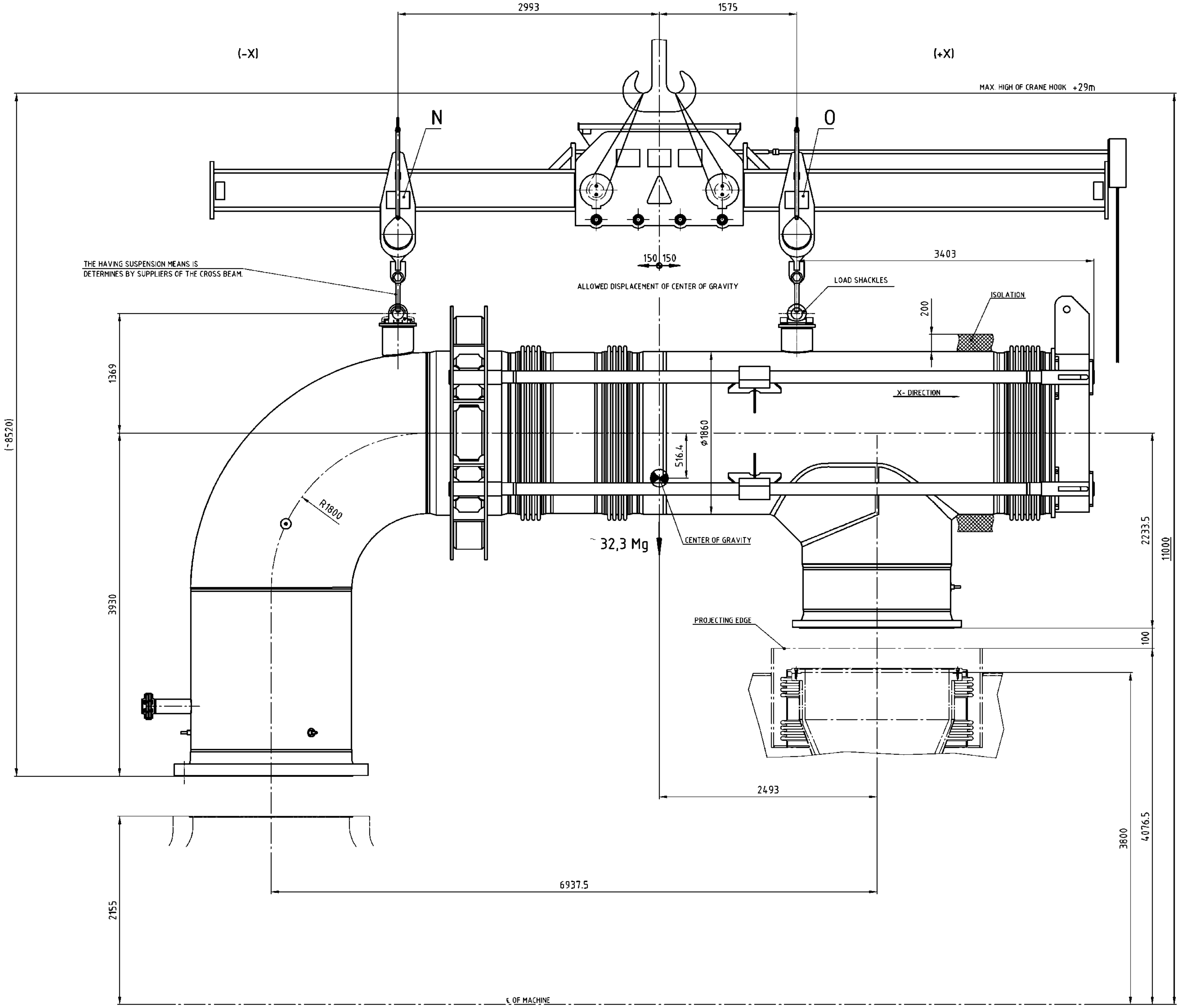
ITEM No. | NO. OF ITEMS

A3 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM DG 46 (B)



SUPPLIER:- GSK STAHL-UND MASCHINENBAU GMBH OR EQUIVALENT

MAT. CODE W90312090137

~~GMO No.~~/ C.B.O.M 0-12090-48000	STATUS OF DRG U	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE 660 MW
GRADE OF UNTOL.DIM		
M/CG.-C/M/F AA0230208		
WELDING-A/B/C/D / AA0621104		
GAS CUTTING-T3'AA0621101		

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	RITESH	SD/-	08-02-2016
CHD	ALOK	SD/-	09-02-2016
APPD	D.K.RAY	SD/-	10-02-2016

DEPT STE | CODE 4011 | SCALE N.T.S. | WEIGHT (KG) | REF. TO ASSY. DRG. | ITEM No. | NO. OF ITEMS —

TITLE : LIFTING BEAM

CARD CODE | DRAWING NO. 0-12090-48000

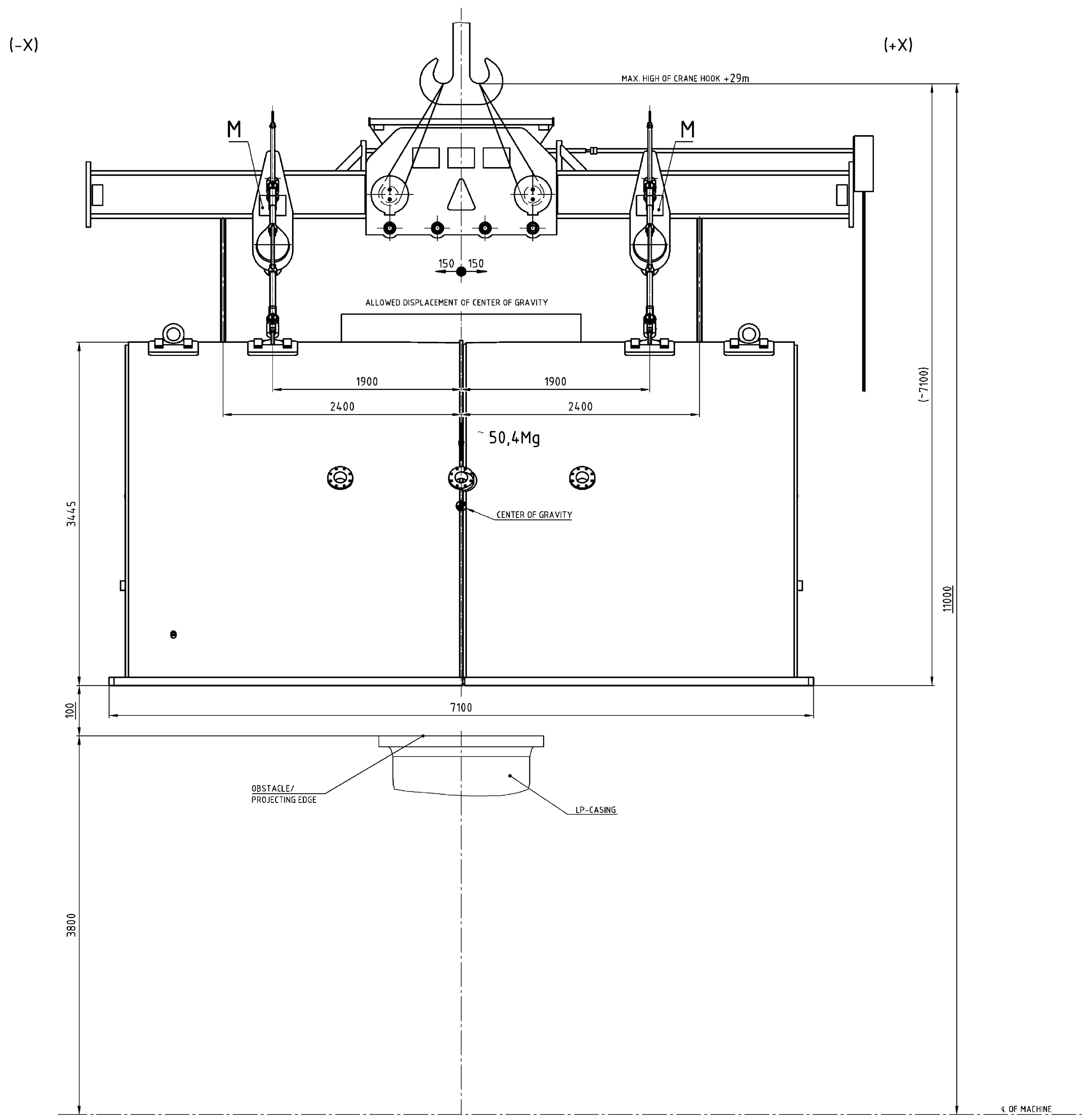
SHEET No. 2 | No. OF SHEETS 3

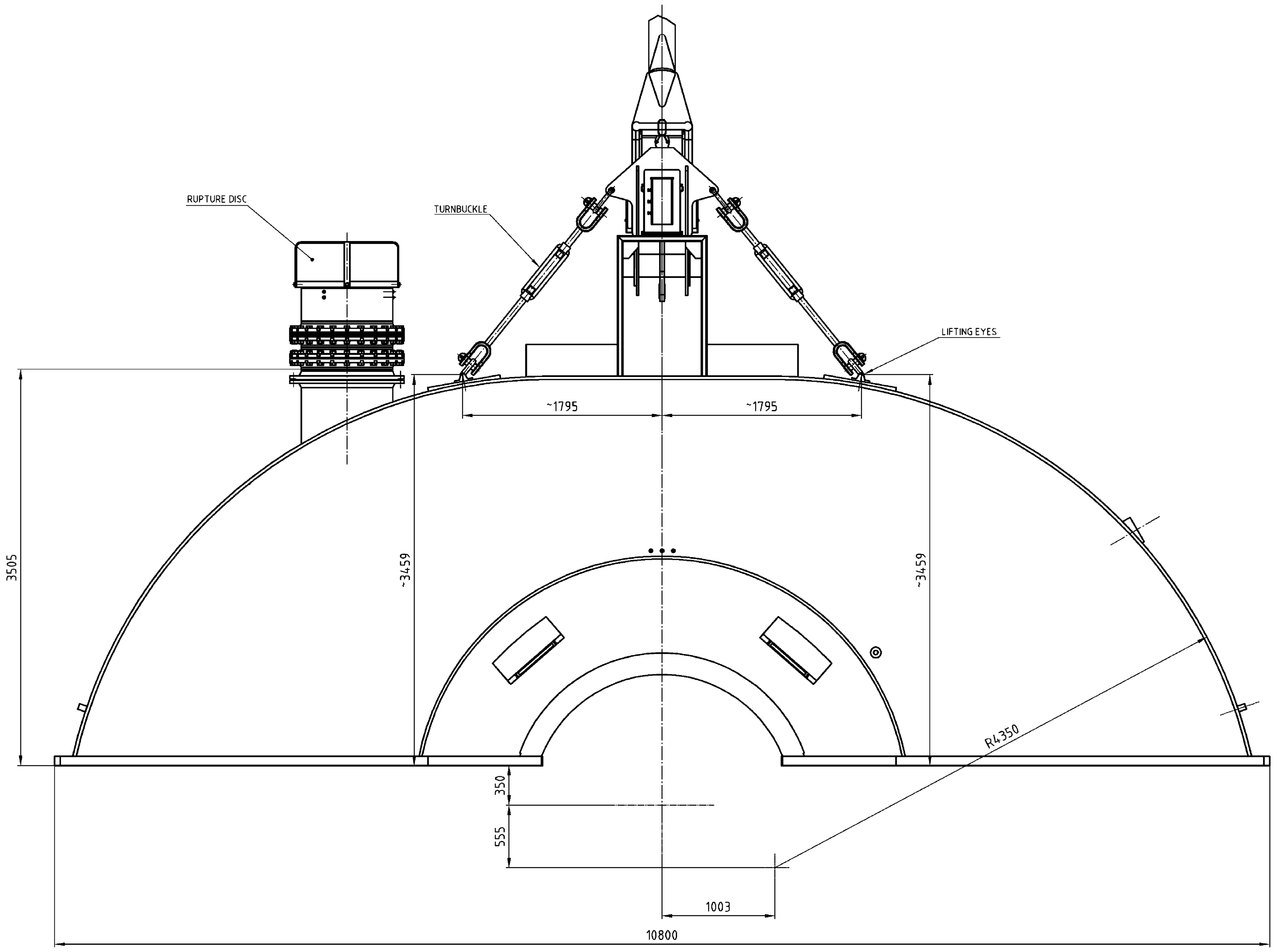
A0 SIZE

FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm) | FORM DG 46 (B)

DRAWING No. 0-12090-48000

LP UPPER PART





TECHNICAL REQUIREMENT:-

IDENTIFICATION ACCORDING TO HW 0400397.

SUPPLIER:- GSK STAHL-UND MASCHINENBAU GMBH OR EQUIVALENT.

MAT. CODE W90312090137

GMS No./ C.B.O.M	0 12090 48000	STATUS OF DRG: U
GRADE OF UNTOL.DIM		
M/CG.-C/M/F AA0230208		
WELDING-A/B/C/D AA0621104		
GAS CUTTING-'T3'AA0621101		

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	STEAM TURBINE 600 MW		
BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR	NAME	SIGN	DATE
DRN	RITESH	sd/-	08.02.2016
CHD	ALOK	sd/-	09.02.2016
APPD	D.K.RAY	sd/-	10.02.2016

DEPT	CODE	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.
PED	4011	1:25	-	

TITLE: LIFTING BEAM

CARD CODE — DRAWING NO. 0-12090-48000

SHEET No. 3 | No. OF SHEETS 3

A0 SIZE

1.0 SCOPE

This document covers the board guide lines on design and manufacture of welded lifting beam. Vendor to supply one lifting beam assembly consists of beam of box structure or other suitable structure, including following items for lifting purpose.

1) Lifting slings for crane hook (i.e. between EOT crane hook & lifting beam).
2) Lifting slings for bladed HP, IP & LP shaft.
3) Lifting adaptors with load shackle for Cross Over Pipe (COP).
4) Turn buckle & braces (with locking bolt) for casing upper part (LP Outer Casing).
5) Leather sheet protection for shafts.
6) Stands for lifting beam etc.

Note:-

a) Parameter & length of the slings are critical and according to dimension given in the drawing, lifting slings for left and right of the same module may or may not be same.

b) Location of lifting points for bladed HP/LP/IP shafts, COP & casing upper part shown in drawing 01209048000 are very critical and must be adhered while designing lifting beam and other associated components like slings, load shackles, turn buckles, braces etc.

c) Vertical distance from crane maximum height to bottom most portion of the component (i.e. HP, IP & LP shaft, LP outer casing & COP) to be lifted is furnished in drawing 01209048000 and must be adhered while designing lifting beam and other associated components like slings, load shackles etc.

d) Apart from above scope of supply, party to include other components in the scope of supply if necessary, to lift the following components.
   1) Bladed HP Shaft
   2) Bladed IP Shaft
   3) Bladed LP Shaft
   4) LP Outer casing
   5) Cross Over Pipe

2.0 PURPOSE

The lifting beam is required for lifting and transportation of fully bladed rotors and assembled outer casing (upper half) of LP turbine and COP or at site during assembly, erection and maintenance. Only one lifting beam has been foreseen for lifting of these components (bladed HP, IP and LP rotors, LP outer casing and COP).

3.0 WORKING LOAD LIMIT

Lifting beam shall be designed for WLL of 110 tons. All other lifting component as per scope of supply shall be designed for loads given in drawing 01209048000.

4.0 Vendor is fully responsible for making lifting beam functional at site. In case lifting beam dispatched to site in disassembled condition, vendor shall be responsible for assembly of lifting beam at site.

5.0 APPLICABLE CODE

The design, manufacture and testing of the Lifting Beam shall comply with the various requirements of the following standards.

DIN 15018 parts I, II & III DIN 15003

IS:5, IS: 800, IS:807, IS:808, IS:1964, IS:2062, IS:2074, IS:2365, IS:2932, IS:3177, IS:3658, IS:3815, IS:3938, IS: 5749, IS5749, IS:8791, IS:11732

This is not a complete list and cross-referred standard have not been listed.

Important: Lifting beam shall meet all statutory safety requirements like Factories Act 1948 an UP Factories Rules 1950 etc. Vendor shall submit certificates of Proof Load Testing Hooks/Bollards, Slings/Links used in place of slings and assembled Lifting Beam from competent authority as specified in Factories Act 1948.

For European vendor's following list of standards shall be applicable.

EN 13155, DIN 18800-1,-2,-3 & -7, ISO 5817, BGR 500, DIN 15018-1, DIN 15018-2, ISO 3834-3, ISO 15609-1, ISO 15614-1, EN 287-1, EN 1418, EN 10204, ISO 8501-1, ISO 12944-4, ISO/IEC 17025, EN 473, EN 1677, ISO 2768, ISO 13920.

Important: Lifting beam shall meet all statutory safety requirements as per VBG 9a.

6.0 DESIGN REQUIREMENTS

The detail mechanical designs will be worked out by the supplier. The design shall conform to the specified over all dimensions as well as specified requirements listed in the technical delivery condition.

6.1 Lifting bollards / hooks shall be arranged symmetrically about the center of gravity of the lifting beam, with the loading arrangement to be in the extreme end position. Each lifting bollard/hook shall have at least 60% loads rating of lifting beam. If separate lifting bollard / hooks are foreseen for assembled LP casing (top half) & COP then each of these shall have at least 30% load rating of lifting beam.

6.2 In accordance with the drawing the equipment shall be vertical and longitudinal adjustable. In case of dimensional value not defined for vertical adjustment, the following applies to the equipment:
For each load equipment, the adjustment range is ±15 mm.

6.3 Adjustable load equipment has to be designed for less friction and single operation with transportation load.

6.4 The solid links/ D-Shackle if used in place of slings for suspending Lifting Beam from EOT shall be suitable for Ram Horn Hook (as per IS 5749) of EOt of the following capacity.

Lifting Beam of 110 tons – Solid link suitable for EOT 250 Tones.

6.5 The overall height of the beam shall be kept as low as possible.

6.6 The adjustable threads of device shall be secured against being unscrewed to extreme position. The number of load bearing threads shall be designed for maximum load case, required factor of safety and an impact factor of 1.25.

Horizontal displacement of center of mass has to consider up to ±150 mm.

6.7 All enclosed spaces in the lifting beam shall be providing with drainage holes of adequate size.

6.8 The mechanical design of the lifting bollards, which are designed for attachments for two endless slings, must be such that the slings can be easily detached. Suitable pulleys/other arrangement shall be provided to keep the slings secured in positions.

6.9 Structural design shall be suitable for a maximum apex angle 120° at the main hook.

6.10 The lifting device shall be designed to withstand most severe combination of different witch may occur simultaneously during the working. The acceptable stresses in various members shall in accordance with DIN 15018.

6.11 The lifting device shall be designed for hoisting class H1 of DIN 15018. Risk class "Average" shall be used for corrosion.

6.12 Complete lifting beam and its components shall be designed in line with standards / codes referred in clause 5.0. Manufacturing drawings for all the parts and sub-assemblies shall be worked in accordance with technical requirements specified. Strength calculations for all the load carrying members shall be worked out and submitted in form of a document for approval along with drawings for approval as per clause 7.0

7.0 PRE-APPROVAL DOCUMENTS

Five copies of the pre-approval documents shall be submitted for the approval. These documents shall include:

- Overall General Arrangement Drawing (OGA) and Assembly drawings with part list.
- Strength calculations.
- Quality plans.
- Welding procedure specifications and Procedure qualification record duly approved by third party. e.g. Lloyds etc.
- Functional description
- Additionally bought out components such as load equipments, chain links, hitching ropes etc. have to be specified in the part list as follows:
  - **A.** Supplier
  - **B.** Type
  - **C.** Maximum load capacity

Approval of the pre-approval documents by the purchaser will in no way absolve the supplier and his subcontractor of their responsibility of sound design and manufacture of record rated load conditions Commencement of manufacture shall start after the approval of pre-approval documents by the purchaser will be made the once documents are submitted for approval. This information may be forwarded to customer and authorized inspection agency within the scope of the order.

8.0 FUNCTIONAL DESIGN

8.1 Functional Design Calculation & Mechanical Design

The following codes, standards and guidelines shall be applied for functional design calculations and mechanicals design as far as applicable.

- This plant standard
- DIN 15018-1,-2/EN 13155 and further cross-referred DIN.
- Material as per IS:2062, IS:1964, for structural steel IS:808 rolled steel beam, Channel and angle section etc. Grades, size and IS Number of the steel section to be used shall be clearly indicated on the manufacturing drawings.
- Relevant National/International Standard on the subject.
- All statutory obligations like Factories Act 1948 and UP Factories Rules 1950/VBG 9a for accident prevention, applicable regulation at the time if design and manufacturing.

8.2 Testing and Inspection Requirements

8.2.1 The supplier shall carry out inspection as agreed to established and maintain quality to ensure the mechanical accuracy of components, compliance with drawings, identification and acceptability of all materials, parts and equipment

8.2.2 Quality plan for all major equipment/components/assemblies shall be submitted by supplier for approval as per the requirements of this specification in the BHEL format. Copies of all the test procedures acceptance norms and reference documents shall be furnished along with Quality Plans. In finalized QP, customer hold points shall be identified and communicated to supplier.

8.2.3 The purchaser shall be notified in writing for witnessing of tests and inspections identified as customer hold points (CHP) in the QP, three weeks in advance of the actual date of inspection/test. Quality Plan format shall be sent along with annexure-Q along with enquiry to supplier and approved QP shall form a part of purchase order.

8.2.4 The purchaser's representative shall be given full access to the shop in which which equipment is being manufactured or tested and all test record shall be made available to him. Final inspection shall be carried out by the Purchaser's representative before the dispatch of the equipment. Final routine and type test shall be carried out in the presence of the purchaser's representative. Purchaser's representative may be qualified as purchaser's representative or its customer's representative or any other inspection agency as appointed by purchaser/its customer.

8.2.5 Q.A. documents package including copies of records / certificates for all tests / inspection carried out as per the quality plan / technical specification / drawings / data sheets shall be sent to purchaser along with the dispatch of the equipment to site. Q.A. documentation shall be submitted to Purchaser for approval prior to dispatch of equipment's.

All the sub-vendors for agreed list of bought-out items including all raw materials / semi-finished / finished component / shall be subject to the approval of BHEL Customer.

8.2.6 Q.A. package shall include the following.

- Approved Welding Procedure Specification and Procedure Qualification Record.
- Welder's Qualification records.
- Rerecords of all N.D.T.
- Records of all tests / checks as per Quality Plan /drawing / specifications.
- Records of heat-treatment.
- Records of repairs. If any.

Records of deviations / concessions, if any and their approval purchaser / customer.

8.2.7 All tests / checks during various stages of manufacture shall be carried out as per agreed quality plan / drawings specification requirements and shall be binding on supplier. However in the event of any deficiency observed in any part of equipment, purchaser reserves the right to extend the scope of inspection / testing if found necessary.

8.2.8 Incase inspection / tests are performed by the supplier he shall demonstrate that he has qualified staff and necessary inspection / test equipment for the purpose.

8.2.9 Incase the supplier intends to delegate the inspection and testing to some other agency then prior approval form the purchaser shall be required.

8.2.10 All inspections / tests listed shall be scheduled during the course of manufacture in such a way that flaws are detected on first opportunity well in time and remedial measure can be taken without jeopardizing the delivery dates.

8.2.11 Each certification shall include material specification, grade of steel, manufacture's marking batch no., specimen no. etc.

8.2.12 The test / checked envisaged by the purchaser to be carried out (listed below) are minimum requirement and are in addition to tests / checks carried out by supplier as per their internal practice, however , tests and inspection requirements shall be finalized in detail at the time if quality plan finalization.

- Material test for chemical and mechanical properties of all items. All materials shall be properly identified and material test certificates shall have correlation with the material identification. In the absence of test certificates

/ their correlation with the material, check tests for chemicals and mechanical properties shall be carried out.

- Ultrasonic testing of hook before and after load testing shall be carried out as per IS:8791. Acceptance norms shall be as per IS:8791, Class-A
- 100% D.P.T. of lifting bollard / hook after proof load lest. Dye Penetration Test shall be carried out as per IS:3658 and acceptance norms shall be as per IS:11732, Level-1
- Proof load test of hook / bollard as per IS:5749/ IS:3841. A certificate issued by competent authority should be submitted.

100% RT/UT of all welds in tension zone of lifting beam and weld taking the load at both ends of lifting beam shall be carried out as per ASME section-V acceptance norms shall be as per ASME section VIII. All other welds shall be subjected to 10% RT/UT. All field corner welds and welds not tested by RT/UT shall be subjected to 100% MPI / D.P.T. examination (accessible areas only).

All welding procedure and welders shall be qualified as per ASME section IX. Qualification shall be witnessed by purchaser's representative / third party inspection agency.

8.3 Stage Inspection – Stage inspection / supervision shall take place during course of manufacturing. Any deviation from the test / inspection, envisaged in the quality plans shall require the consent of the Purchaser.

All tested and examination listed shall be binding for stage inspection.

The supplier shall be responsible for the execution and commissioning of the inspection / test listed in the test and examination plans.

8.4 A pre-dispatch inspection will be carried out for all material / component / equipment / assemblies at the end of all shop tests at the supplier's works to check for –

- Verification of completeness and acceptance of all previous tests, inspections & checks performed and satisfactory documentation of the same.
- Checks for workmanship appearance and cleanliness.
- Checks for identification, painting, preservation and packing.

8.5 Acceptance Testing: Each lifting beam shall be subjected to functional test as per loading specified. In particular the freedom of movement of moving parts, adherence to the

tolerance and also to the clearance necessary for proper functioning shall be demonstrated by the supplier.

8.5.1 Functional / load testing shall be carried out prior to dispatch unless otherwise agreed upon. This testing shall be done in presence of purchaser or his representative. Assembly and load testing shall be the sole responsibility of the supplier. Supplier has to do load testing at his works. A certificate of satisfactory performance should be signed by both parties in a suitable Performa. Supplier owns full responsibility to make it fully operative at site.

8.5.2 Incase slings are used in the lifting beam, then each slings leg shall be proof load tested to twice the permissible working load (maximum safe working load + dead weight of lifting beam) prior to use. Incase solid links etc are used in place of slings Proof Load testing shall be at 1.5 times (safe working lode + dead weight of lifting beam) a certificate issued by competent shall be furnished.

8.5.3 Proof load testing shall be carried out 1.5 times the safe working load for 30 minutes. After the proof lode test all items shall be checked dimensionally to detect any permanent set or other defect. After proof load test all weld seem shall be examined by 100% MPI / DPT (only one accessible area). A certificate issued by competent authority for Proof Load Testing shall be furnished.

8.5.4 Deflection test shall be carried out at safe working load. Deflection shall be noted after holding the load for 10 minutes (deflection should not exceed 1/900 of the span).

8.5.6 Identification marking:- The lifting beam shall be permanently labeled with beams own weight, permissible safe working load at the individual suspension point with the latter of sufficient size (approximately 100 mm).

A name plate will either be fixed or captive engraving made on Lifting Beam bearing to BHEL and manufacturer's name/identification marking, order number & year of manufacture. Beam size given length and width shall be put at a suitable location so that component can be unmistakable identified at a later date. Functional test stamping shall be affixed at the point along with the information specified above. A proper place preferably at the center of beam should be marked for putting BHEL emblem.

9.0 PRESERVATION / PAINTING

The part shall be properly conserved by applying suitable rust preventers for long storage in open humid environment. The Lifting Beam shall be given protective coating of one coat of red oxide zinc chromate primer (IS:2074) and four finishing coats of dark admiralty gray shade no. 632 (unless otherwise specified) (IS:5, IS:2932). Prior to application to prime the surface shall be suitably prepared for for painting. Final paint thickness shall not be less than 80 microns (unless otherwise specified). All bright finished parts to be given long lasting corrosion preventive coat. The moving parts shall be treated with long lasting lubricants. For lubrication required at future date, manufacture will furnish specification and supplier's address of the recommended lubricant, In case of any special working condition purchaser shall clearly specify the condition to supplier for giving proper anti-corrosion treatment.

Note:- Paint as per equivalent international standard may be accepted with prior permission from BHEL however preservation / painting should satisfy above clause 9.0.

10.0 PACKING DISPATCH INSTRUCTION

Supplier shall be informed about the delivery site in advance. Suitable dispatch instruction will also be given. Supplier should dent a copy of packing list and shipping documents well in advance. (at least a month) before actual shipment.

Another cop of actual packing list/drawing/shipping documents should send along with consignment properly packed in a polythene cover. The parts shall be packed so that adequate protection is accorded against conformation, mechanical damage and corrosion.

Unless otherwise specified, assembly and testing of the Lifting Beam and warrantee of its satisfactory performance at the place of delivery shall be responsibility of the supplier.

Assembly can be done at site with prior permission of the purchaser / the customer. However, full responsibility of assembly and testing lies with the supplier. Any assembly tools and commissioning spare required for this purpose shall be arranged by the supplier at his cost and risk. All statutory tests shall be carried out by supplier at his cost and risk.

1.0 SCOPE

This document covers the board guide lines on design and manufacture of welded lifting beam. Vendor to supply one lifting beam assembly consists of beam of box structure or other suitable structure, including following items for lifting purpose.

1) Lifting slings for crane hook (i.e. between EOT crane hook & lifting beam).
2) Lifting slings for bladed HP, IP & LP shaft.
3) Lifting adaptors with load shackle for Cross Over Pipe (COP).
4) Turn buckle & braces (with locking bolt) for casing upper part (LP Outer Casing).
5) Leather sheet protection for shafts.
6) Stands for lifting beam etc.

Note:-

a) Parameter & length of the slings are critical and according to dimension given in the drawing, lifting slings for left and right of the same module may or may not be same.

b) Location of lifting points for bladed HP/LP/IP shafts, COP & casing upper part shown in drawing 01209058000 are very critical and must be adhered while designing lifting beam and other associated components like slings, load shackles, turn buckles, braces etc.

c) Vertical distance from crane maximum height to bottom most portion of the component (i.e. HP, IP & LP shaft, LP outer casing & COP) to be lifted is furnished in drawing 01209058000 and must be adhered while designing lifting beam and other associated components like slings, load shackles etc.

d) Apart from above scope of supply, party to include other components in the scope of supply if necessary, to lift the following components.

   1) Bladed HP Shaft
   2) Bladed IP Shaft
   3) Bladed LP Shaft
   4) LP Outer casing
   5) Cross Over Pipe

2.0 PURPOSE

The lifting beam is required for lifting and transportation of fully bladed rotors and assembled outer casing (upper half) of LP turbine and COP or at site during assembly, erection and maintenance. Only one lifting beam has been foreseen for lifting of these components (bladed HP, IP and LP rotors, LP outer casing and COP).

3.0 WORKING LOAD LIMIT

Lifting beam shall be designed for WLL of 80 tons. All other lifting component as per scope of supply shall be designed for loads given in drawing 01209058000.

4.0 Vendor is fully responsible for making lifting beam functional at site. In case lifting beam dispatched to site in disassembled condition, vendor shall be responsible for assembly of lifting beam at site.

5.0 APPLICABLE CODE

The design, manufacture and testing of the Lifting Beam shall comply with the various requirements of the following standards.

DIN 15018 parts I, II & III DIN 15003

IS:5, IS: 800, IS:807, IS:808, IS:1964, IS:2062, IS:2074, IS:2365, IS:2932, IS:3177, IS:3658, IS:3815, IS:3938, IS: 5749, IS5749, IS:8791, IS:11732

This is not a complete list and cross-referred standard have not been listed.

Important: Lifting beam shall meet all statutory safety requirements like Factories Act 1948 an UP Factories Rules 1950 etc. Vendor shall submit certificates of Proof Load Testing Hooks/Bollards, Slings/Links used in place of slings and assembled Lifting Beam from competent authority as specified in Factories Act 1948.

For European vendor's following list of standards shall be applicable.

EN 13155, DIN 18800-1,-2,-3 & -7, ISO 5817, BGR 500, DIN 15018-1, DIN 15018-2, ISO 3834-3, ISO 15609-1, ISO 15614-1, EN 287-1, EN 1418, EN 10204, ISO 8501-1, ISO 12944-4, ISO/IEC 17025, EN 473, EN 1677, ISO 2768, ISO 13920.

Important: Lifting beam shall meet all statutory safety requirements as per VBG 9a.

6.0 DESIGN REQUIREMENTS

The detail mechanical designs will be worked out by the supplier. The design shall conform to the specified over all dimensions as well as specified requirements listed in the technical delivery condition.

6.1 Lifting bollards / hooks shall be arranged symmetrically about the center of gravity of the lifting beam, with the loading arrangement to be in the extreme end position. Each lifting bollard/hook shall have at least 60% loads rating of lifting beam. If separate lifting bollard / hooks are foreseen for assembled LP casing (top half) & COP then each of these shall have at least 30% load rating of lifting beam.

6.2 In accordance with the drawing the equipment shall be vertical and longitudinal adjustable. In case of dimensional value not defined for vertical adjustment, the following applies to the equipment:
For each load equipment, the adjustment range is ±15 mm.

6.3 Adjustable load equipment has to be designed for less friction and single operation with transportation load.

6.4 The solid links/ D-Shackle if used in place of slings for suspending Lifting Beam from EOT shall be suitable for Ram Horn Hook (as per IS 5749) of EOt of the following capacity.

Lifting Beam of 80 Tones – Solid link suitable for EOT 250 Tones.

6.5 The overall height of the beam shall be kept as low as possible.

6.6 The adjustable threads of device shall be secured against being unscrewed to extreme position. The number of load bearing threads shall be designed for maximum load case, required factor of safety and an impact factor of 1.25.

Horizontal displacement of center of mass has to consider up to ±150 mm.

6.7 All enclosed spaces in the lifting beam shall be providing with drainage holes of adequate size.

6.8 The mechanical design of the lifting bollards, which are designed for attachments for two endless slings, must be such that the slings can be easily detached. Suitable pulleys/other arrangement shall be provided to keep the slings secured in positions.

6.9 Structural design shall be suitable for a maximum apex angle 120° at the main hook.

6.10 The lifting device shall be designed to withstand most severe combination of different witch may occur simultaneously during the working. The acceptable stresses in various members shall in accordance with DIN 15018.

6.11 The lifting device shall be designed for hoisting class H1 of DIN 15018. Risk class "Average" shall be used for corrosion.

6.12 Complete lifting beam and its components shall be designed in line with standards / codes referred in clause 5.0. Manufacturing drawings for all the parts and sub-assemblies shall be worked in accordance with technical requirements specified. Strength calculations for all the load carrying members shall be worked out and submitted in form of a document for approval along with drawings for approval as per clause 7.0

7.0 PRE-APPROVAL DOCUMENTS

Five copies of the pre-approval documents shall be submitted for the approval. These documents shall include:

- Overall General Arrangement Drawing (OGA) and Assembly drawings with part list.
- Strength calculations.
- Quality plans.
- Welding procedure specifications and Procedure qualification record duly approved by third party. e.g. Lloyds etc.
- Functional description
- Additionally bought out components such as load equipments, chain links, hitching ropes etc. have to be specified in the part list as follows:
  - A. Supplier
  - B. Type
  - C. Maximum load capacity

Approval of the pre-approval documents by the purchaser will in no way absolve the supplier and his subcontractor of their responsibility of sound design and manufacture of record rated load conditions Commencement of manufacture shall start after the approval of pre-approval documents by the purchaser will be made the once documents are submitted for approval. This information may be forwarded to customer and authorized inspection agency within the scope of the order.

8.0 FUNCTIONAL DESIGN

8.1 Functional Design Calculation & Mechanical Design

The following codes, standards and guidelines shall be applied for functional design calculations and mechanicals design as far as applicable.

- This plant standard
- DIN 15018-1,-2/EN 13155 and further cross-referred DIN.
- Material as per IS:2062, IS:1964, for structural steel IS:808 rolled steel beam, Channel and angle section etc. Grades, size and IS Number of the steel section to be used shall be clearly indicated on the manufacturing drawings.
- Relevant National/International Standard on the subject.
- All statutory obligations like Factories Act 1948 and UP Factories Rules 1950/VBG 9a for accident prevention, applicable regulation at the time if design and manufacturing.

8.2 Testing and Inspection Requirements

8.2.1 The supplier shall carry out inspection as agreed to established and maintain quality to ensure the mechanical accuracy of components, compliance with drawings, identification and acceptability of all materials, parts and equipment

8.2.2 Quality plan for all major equipment/components/assemblies shall be submitted by supplier for approval as per the requirements of this specification in the BHEL format. Copies of all the test procedures acceptance norms and reference documents shall be furnished along with Quality Plans. In finalized QP, customer hold points shall be identified and communicated to supplier.

8.2.3 The purchaser shall be notified in writing for witnessing of tests and inspections identified as customer hold points (CHP) in the QP, three weeks in advance of the actual date of inspection/test. Quality Plan format shall be sent along with annexure-Q along with enquiry to supplier and approved QP shall form a part of purchase order.

8.2.4 The purchaser's representative shall be given full access to the shop in which which equipment is being manufactured or tested and all test record shall be made available to him. Final inspection shall be carried out by the Purchaser's representative before the dispatch of the equipment. Final routine and type test shall be carried out in the presence of the purchaser's representative. Purchaser's representative may be qualified as purchaser's representative or its customer's representative or any other inspection agency as appointed by purchaser/its customer.

8.2.5 Q.A. documents package including copies of records / certificates for all tests / inspection carried out as per the quality plan / technical specification / drawings / data sheets shall be sent to purchaser along with the dispatch of the equipment to site. Q.A. documentation shall be submitted to Purchaser for approval prior to dispatch of equipment's.

All the sub-vendors for agreed list of bought-out items including all raw materials / semi-finished / finished component / shall be subject to the approval of BHEL Customer.

8.2.6 Q.A. package shall include the following.

- Approved Welding Procedure Specification and Procedure Qualification Record.
- Welder's Qualification records.
- Rerecords of all N.D.T.
- Records of all tests / checks as per Quality Plan /drawing / specifications.
- Records of heat-treatment.
- Records of repairs. If any.

Records of deviations / concessions, if any and their approval purchaser / customer.

8.2.7 All tests / checks during various stages of manufacture shall be carried out as per agreed quality plan / drawings specification requirements and shall be binding on supplier. However in the event of any deficiency observed in any part of equipment, purchaser reserves the right to extend the scope of inspection / testing if found necessary.

8.2.8 Incase inspection / tests are performed by the supplier he shall demonstrate that he has qualified staff and necessary inspection / test equipment for the purpose.

8.2.9 Incase the supplier intends to delegate the inspection and testing to some other agency then prior approval form the purchaser shall be required.

8.2.10 All inspections / tests listed shall be scheduled during the course of manufacture in such a way that flaws are detected on first opportunity well in time and remedial measure can be taken without jeopardizing the delivery dates.

8.2.11 Each certification shall include material specification, grade of steel, manufacture's marking batch no., specimen no. etc.

8.2.12 The test / checked envisaged by the purchaser to be carried out (listed below) are minimum requirement and are in addition to tests / checks carried out by supplier as per their internal practice, however , tests and inspection requirements shall be finalized in detail at the time if quality plan finalization.

- Material test for chemical and mechanical properties of all items. All materials shall be properly identified and material test certificates shall have correlation with the material identification. In the absence of test certificates

/ their correlation with the material, check tests for chemicals and mechanical properties shall be carried out.

- Ultrasonic testing of hook before and after load testing shall be carried out as per IS:8791. Acceptance norms shall be as per IS:8791, Class-A
- 100% D.P.T. of lifting bollard / hook after proof load lest. Dye Penetration Test shall be carried out as per IS:3658 and acceptance norms shall be as per IS:11732, Level-1
- Proof load test of hook / bollard as per IS:5749/ IS:3841. A certificate issued by competent authority should be submitted.

100% RT/UT of all welds in tension zone of lifting beam and weld taking the load at both ends of lifting beam shall be carried out as per ASME section-V acceptance norms shall be as per ASME section VIII. All other welds shall be subjected to 10% RT/UT. All field corner welds and welds not tested by RT/UT shall be subjected to 100% MPI / D.P.T. examination (accessible areas only).

All welding procedure and welders shall be qualified as per ASME section IX. Qualification shall be witnessed by purchaser's representative / third party inspection agency.

8.3 Stage Inspection – Stage inspection / supervision shall take place during course of manufacturing. Any deviation from the test / inspection, envisaged in the quality plans shall require the consent of the Purchaser.

All tested and examination listed shall be binding for stage inspection.

The supplier shall be responsible for the execution and commissioning of the inspection / test listed in the test and examination plans.

8.4 A pre-dispatch inspection will be carried out for all material / component / equipment / assemblies at the end of all shop tests at the supplier's works to check for –

- Verification of completeness and acceptance of all previous tests, inspections & checks performed and satisfactory documentation of the same.
- Checks for workmanship appearance and cleanliness.
- Checks for identification, painting, preservation and packing.

8.5 Acceptance Testing: Each lifting beam shall be subjected to functional test as per loading specified. In particular the freedom of movement of moving parts, adherence to the

tolerance and also to the clearance necessary for proper functioning shall be demonstrated by the supplier.

8.5.1 Functional / load testing shall be carried out prior to dispatch unless otherwise agreed upon. This testing shall be done in presence of purchaser or his representative. Assembly and load testing shall be the sole responsibility of the supplier. Supplier has to do load testing at his works. A certificate of satisfactory performance should be signed by both parties in a suitable Performa. Supplier owns full responsibility to make it fully operative at site.

8.5.2 Incase slings are used in the lifting beam, then each slings leg shall be proof load tested to twice the permissible working load (maximum safe working load + dead weight of lifting beam) prior to use. Incase solid links etc are used in place of slings Proof Load testing shall be at 1.5 times (safe working lode + dead weight of lifting beam) a certificate issued by competent shall be furnished.

8.5.3 Proof load testing shall be carried out 1.5 times the safe working load for 30 minutes. After the proof lode test all items shall be checked dimensionally to detect any permanent set or other defect. After proof load test all weld seem shall be examined by 100% MPI / DPT (only one accessible area). A certificate issued by competent authority for Proof Load Testing shall be furnished.

8.5.4 Deflection test shall be carried out at safe working load. Deflection shall be noted after holding the load for 10 minutes (deflection should not exceed 1/900 of the span).

8.5.6 Identification marking:- The lifting beam shall be permanently labeled with beams own weight, permissible safe working load at the individual suspension point with the latter of sufficient size (approximately 100 mm).

A name plate will either be fixed or captive engraving made on Lifting Beam bearing to BHEL and manufacturer's name/identification marking, order number & year of manufacture. Beam size given length and width shall be put at a suitable location so that component can be unmistakable identified at a later date. Functional test stamping shall be affixed at the point along with the information specified above. A proper place preferably at the center of beam should be marked for putting BHEL emblem.

9.0 PRESERVATION / PAINTING

The part shall be properly conserved by applying suitable rust preventers for long storage in open humid environment. The Lifting Beam shall be given protective coating of one coat of red oxide zinc chromate primer (IS:2074) and four finishing coats of dark admiralty gray shade no. 632 (unless otherwise specified) (IS:5, IS:2932). Prior to application to prime the surface shall be suitably prepared for for painting. Final paint thickness shall not be less than 80 microns (unless otherwise specified). All bright finished parts to be given long lasting corrosion preventive coat. The moving parts shall be treated with long lasting lubricants. For lubrication required at future date, manufacture will furnish specification and supplier's address of the recommended lubricant, In case of any special working condition purchaser shall clearly specify the condition to supplier for giving proper anti-corrosion treatment.

Note:- Paint as per equivalent international standard may be accepted with prior permission from BHEL however preservation / painting should satisfy above clause 9.0.

10.0 PACKING DISPATCH INSTRUCTION

Supplier shall be informed about the delivery site in advance. Suitable dispatch instruction will also be given. Supplier should dent a copy of packing list and shipping documents well in advance. (at least a month) before actual shipment.

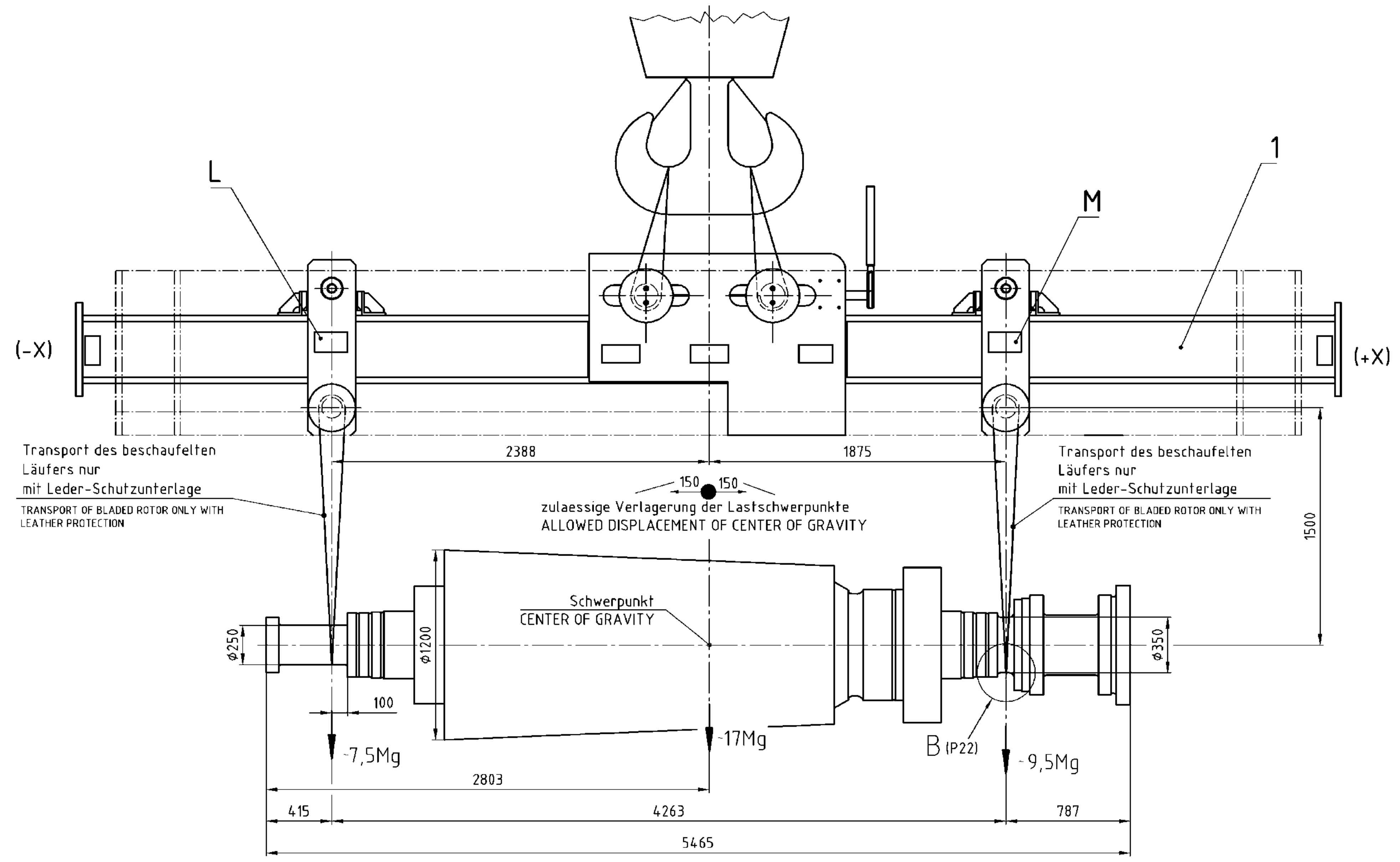
Another cop of actual packing list/drawing/shipping documents should send along with consignment properly packed in a polythene cover. The parts shall be packed so that adequate protection is accorded against conformation, mechanical damage and corrosion.

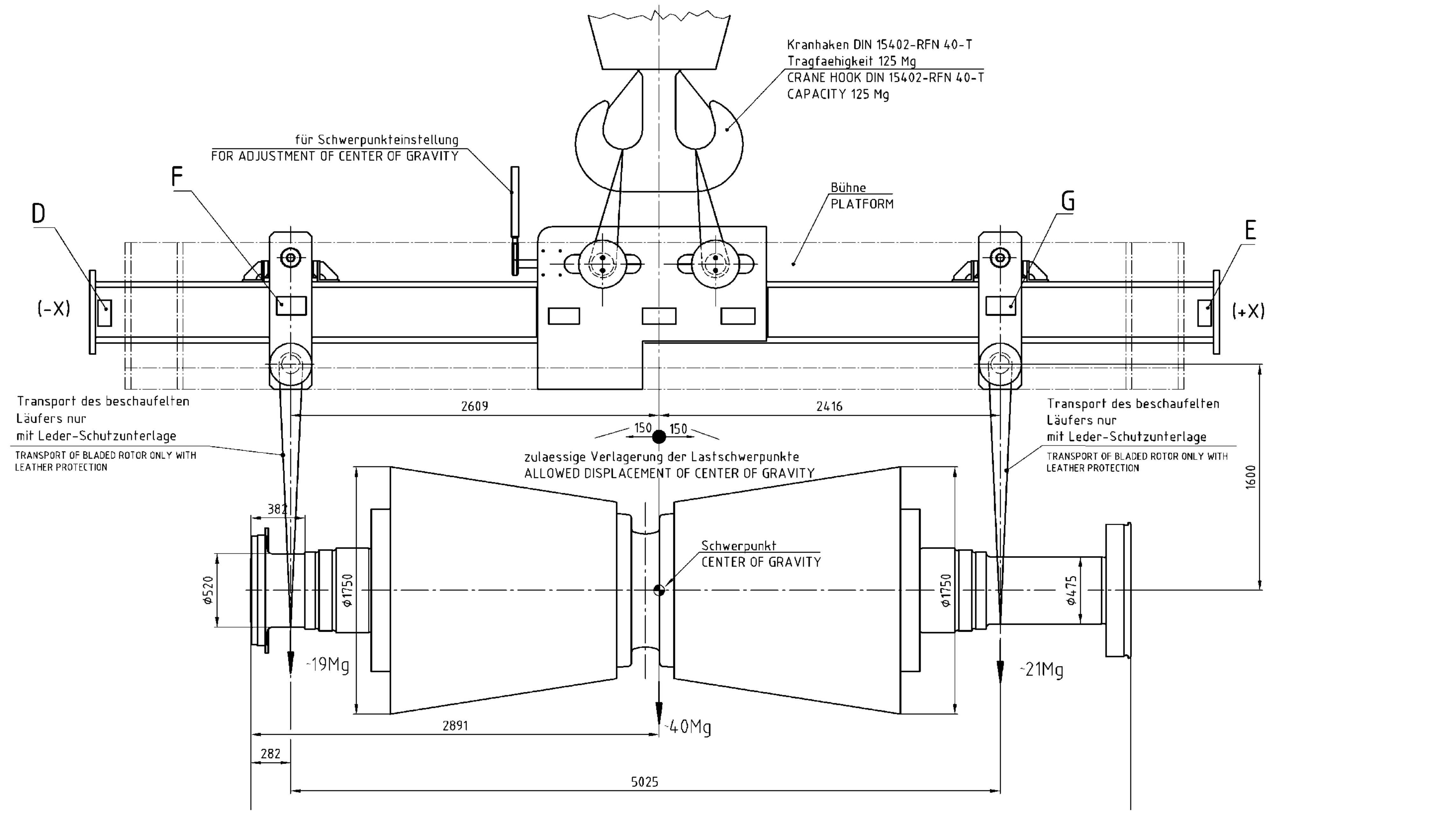
Unless otherwise specified, assembly and testing of the Lifting Beam and warrantee of its satisfactory performance at the place of delivery shall be responsibility of the supplier.

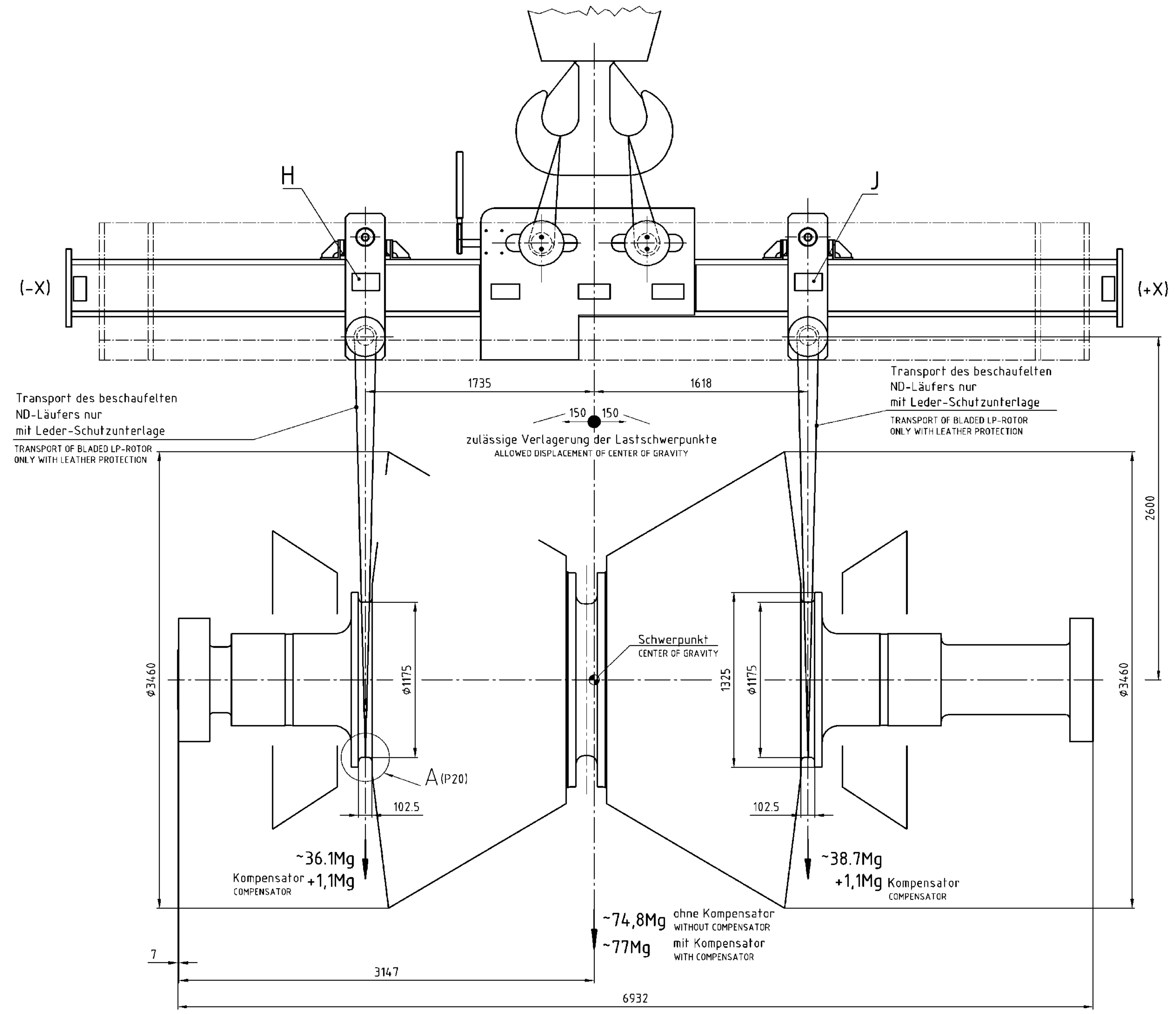
Assembly can be done at site with prior permission of the purchaser / the customer. However, full responsibility of assembly and testing lies with the supplier. Any assembly tools and commissioning spare required for this purpose shall be arranged by the supplier at his cost and risk. All statutory tests shall be carried out by supplier at his cost and risk.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm) FORM DG 46 (B)

0-12090-58000







Schild Nr. PLATE No	Text TEXT
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B	zul. Verlagerung des Lastschwerpunktes ALLOWED DISPLACEMENT OF CENTER OF GRAVITY ±150mm
C	Eigengewicht WEIGHT : xxxMg
D	(-X)
E	(+X)
F	MD-Welle IP-SHAFT 19,0 Mg
G	MD-Welle IP-SHAFT 21,0 Mg
H	ND-Welle LP-SHAFT 36,1 Mg
J	ND-Welle LP-SHAFT 38,7 Mg
K	ND-Oberteil LP UPPER PART 13,6 Mg
L	HD-Welle HP-SHAFT 7,5 Mg
M	HD-Welle HP-SHAFT 9,5 Mg

Die dargestellte Traverse ist nur ein Beispiel und nicht verbindlich für die Ausführung
THE ILLUSTRATED CROSS OVER BEAM IS FOR EXAMPLE ONLY AND NOT BINDING FOR EXECUTION

Alle Gewichte inkl. Sicherheitszuschlag
WEGHTS INCL. SAFETY ADDITION

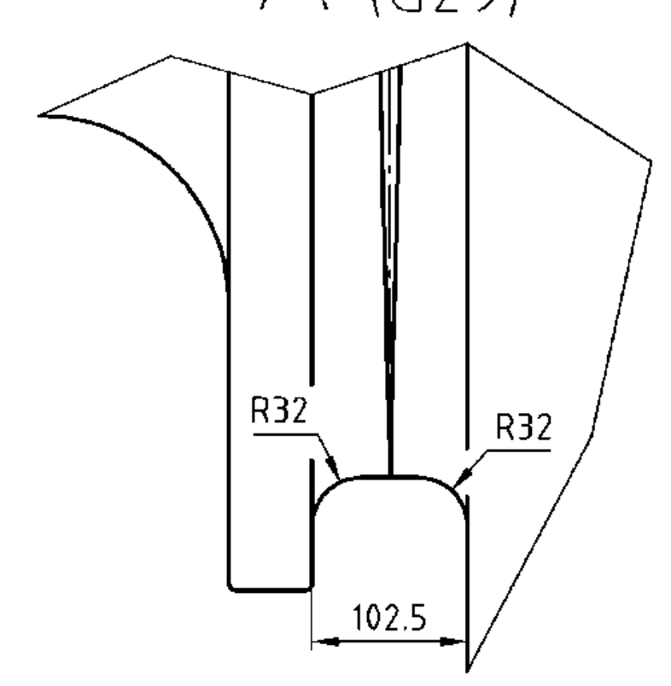
Achtung!
-Anordnung und Einstellung der Traverse nach Montagevorschrift des Herstellers
- Seile gegen Vertauschen gekennzeichnet
- Transport der Wellen nur mit Leder-Schutzunterlage
- Die Traverse ist beidseitig mit einer durchgehenden Arbeitsbuehne auszufuehren

ATTENTION!
-ALIGNMENT AND ADJUSTMENT FOR CROSS BEAM ACCORDING TO OPERATION INSTRUCTION OF MANUFACTURER
- ROPES MARKED TO PREVENT INTERCHANGING
- TRANSPORTATION OF ROTORS ONLY WITH LEATHER PROTECTION
- THE CROSS-BEAM IS DESIGNED WITH WORK PLATFORMS ON BOTH SIDES

Hinweis!
Anschlagseite zum Kranhaken, zu den Bauteilen und Spannschlösser gehoeren
zum Lieferumfang der Traverse
Bedienungsanleitung in deutsch
NOTE!
THE SCOPE OF SUPPLY OF LIFTING DEVICE INCLUDES
LIFTING SLINGS FOR CRANE HOOK, MODULES AND TURNBUCKLES
OPERATION INSTRUCTION IN ENGLISH

NOTE:- ALL TECHNICAL REQUIREMENTS SHALL BE AS PER TDC-F-01209058000-00

A (G29)



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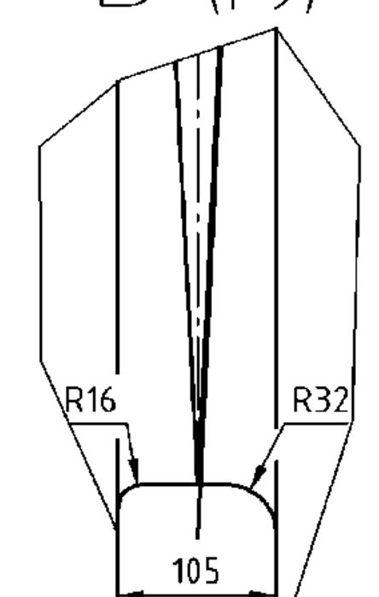


W90312090102

GMS No./ C.B.O.M 0 12090 58000 — STATUS OF DRG U

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

GRADE OF UNTOL.DIM
M/CG.-C/M/F AA0230208
WELDING-A/B/C/D / AA0621104
GAS CUTTING-'T3'AA0621101

BHARAT HEAVY ELECTRICALS LTD.
RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	MONIKA SINGH	SD/-	10.12.2012
CHD	PRADEEP KUMAR	SD/-	10.12.2012
APPD	D.K.RAY	SD/-	12.12.2012

REV	DATE	ALTERED	CHECKED	
01	28.04.16	AFZAL	PRADEEP	DRAWING UPDATED AS PER C/A NO. STE-16-F0147

DEPT STE CODE 4011 — SCALE 1:25 — WEIGHT (KG) — REF. TO ASSY. DRG. — ITEM No. — NO. OF ITEMS —

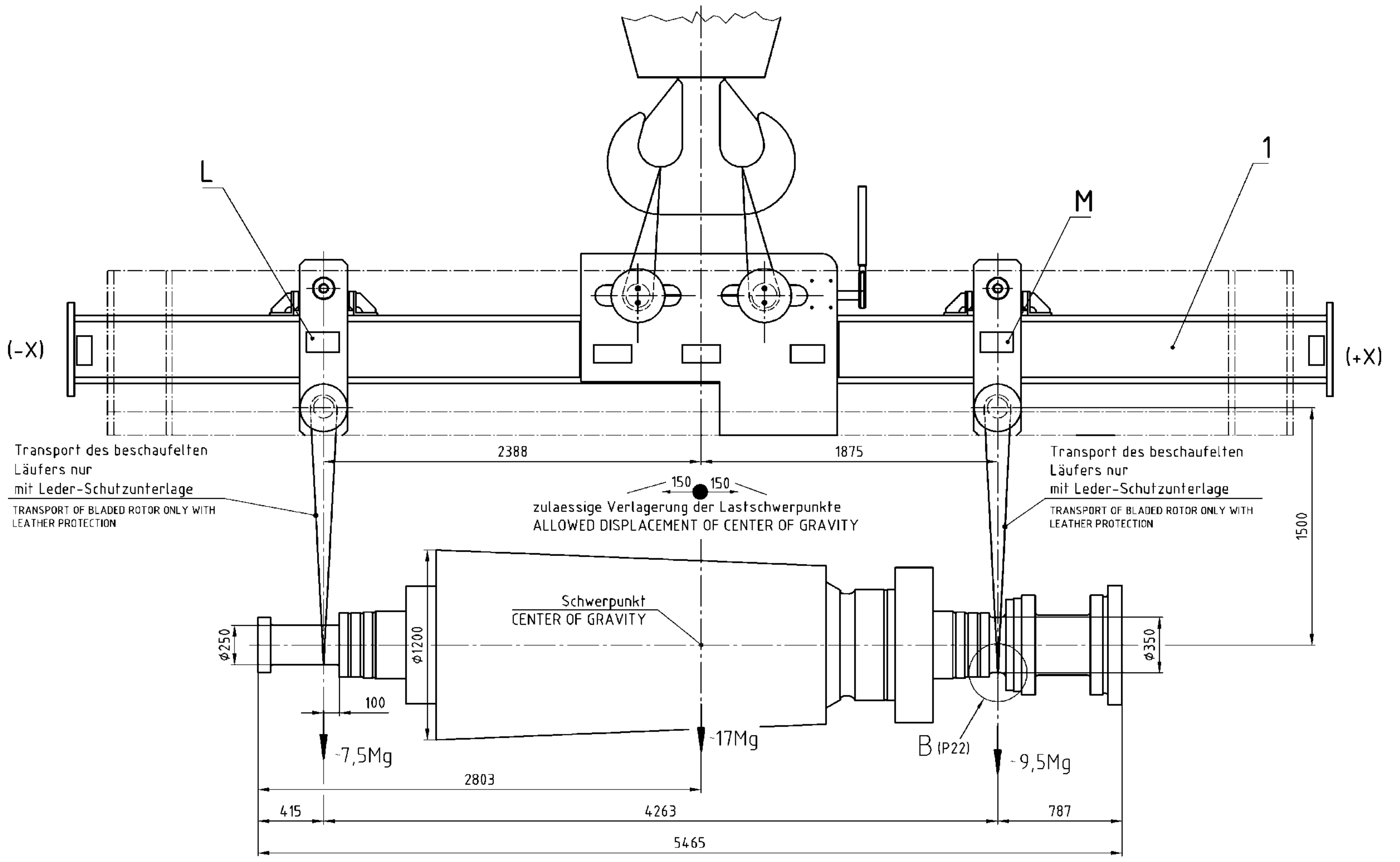
TITLE : LIFTING DEVICE CROSS BEAM SHEET 1

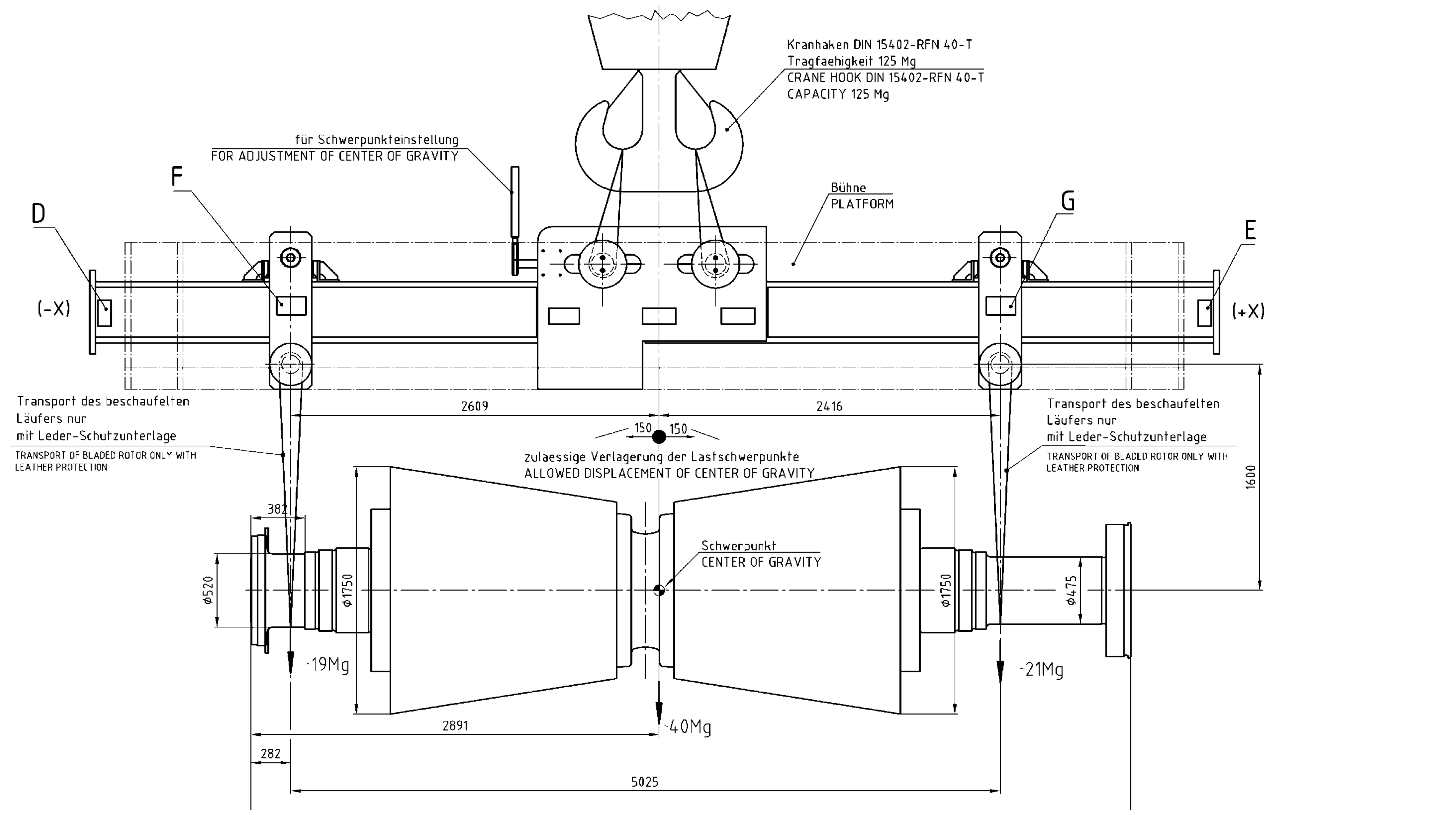
CARD CODE 7 — DRAWING NO. 0-12090-58000

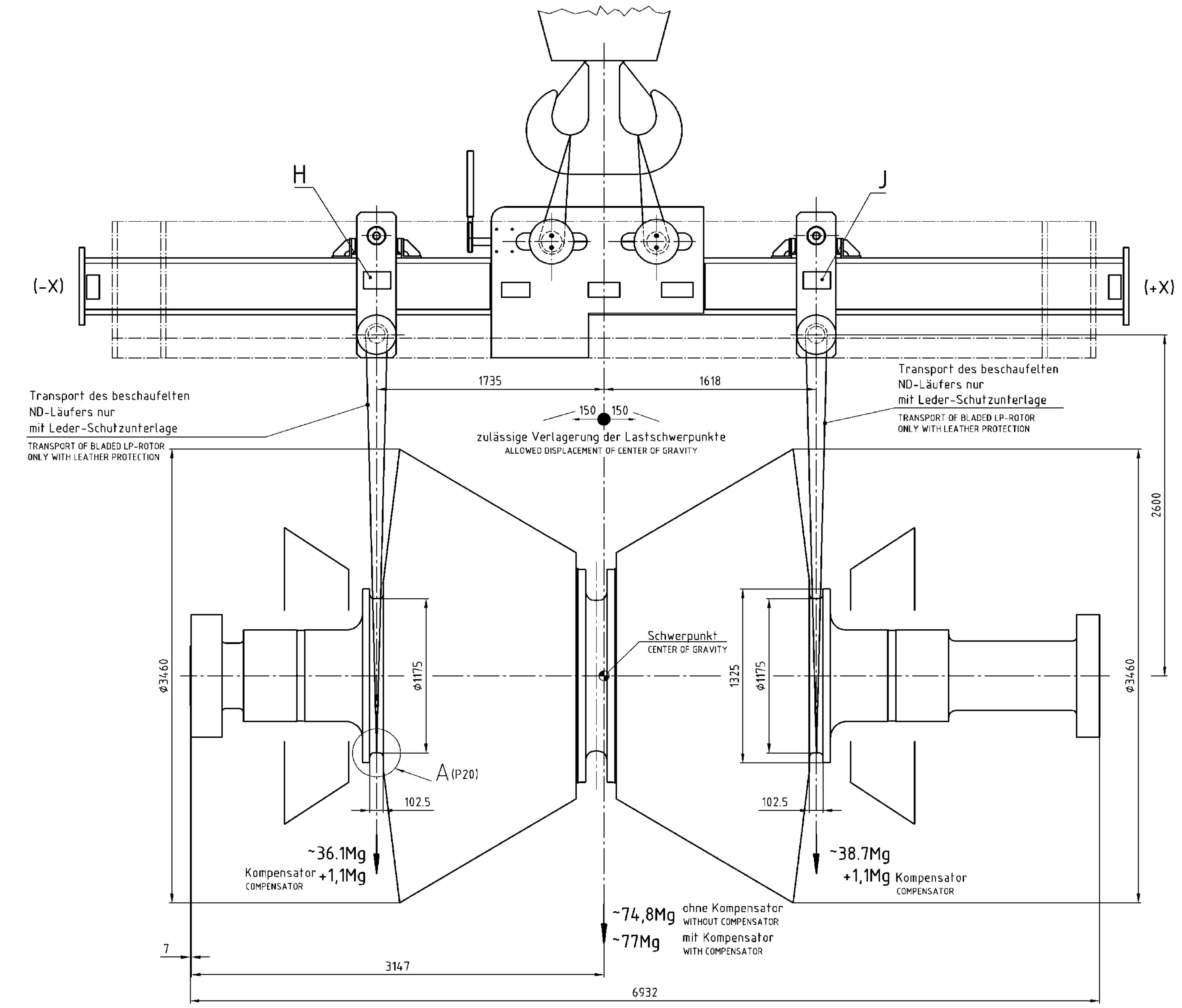
SHEET No. 1 No. OF SHEETS 3

A0 SIZE

0-12090-58000







Schild Nr. PLATE No	Text TEXT	
A	Typenschild des Herstellers nach VGB und Siemens PG Bestelldaten nach TLV 7050 NAME PLATE OF MANUFACTURER ACC. TO VGB AND SIEMENS PG ORDERING DATA ACC. TO TLV 7050	
B	zul. Verlagerung des Lastschwerpunktes ALLOWED DISPLACEMENT OF CENTER OF GRAVITY	±150mm
C	Eigengewicht WEIGHT	: xxxMg
D	(-X)	
E	(+X)	
F	MD-Welle IP-SHAFT	19,0 Mg
G	MD-Welle IP-SHAFT	21,0 Mg
H	ND-Welle LP-SHAFT	36,1 Mg
J	ND-Welle LP-SHAFT	38,7 Mg
K	ND-Oberteil LP UPPER PART	13,6 Mg
L	HD-Welle HP-SHAFT	7,5 Mg
M	HD-Welle HP-SHAFT	9,5 Mg

Die dargestellte Traverse ist nur ein Beispiel und nicht verbindlich für die Ausführung
THE ILLUSTRATED CROSS OVER BEAM IS FOR EXAMPLE ONLY AND NOT BINDING FOR EXECUTION

Alle Gewichte inkl. Sicherheitszuschlag
WEGHTS INCL. SAFETY ADDITION

Achtung!
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- Seile gegen Vertauschen gekennzeichnet
- Transport der Wellen nur mit Leder-Schutzunterlage
- Die Traverse ist beidseitig mit einer durchgehenden Arbeitsbuehne auszufuehren

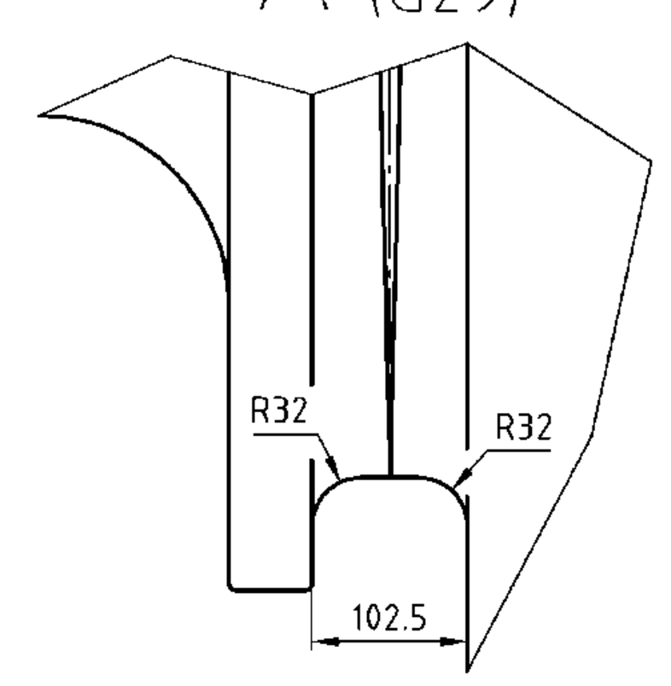
ATTENTION!
- ALIGNMENT AND ADJUSTMENT FOR CROSS BEAM ACCORDING TO OPERATION INSTRUCTION OF MANUFACTURER
- ROPES MARKED TO PREVENT INTERCHANGING
- TRANSPORTATION OF ROTORS ONLY WITH LEATHER PROTECTION
- THE CROSS-BEAM IS DESIGNED WITH WORK PLATFORMS ON BOTH SIDES

Hinweis!
Anschlagseite zum Kranhaken, zu den Bauteilen und Spannschlösser gehoeren zum Lieferumfang der Traverse
Bedienungsanleitung in deutsch

NOTE!
THE SCOPE OF SUPPLY OF LIFTING DEVICE INCLUDES LIFTING SLINGS FOR CRANE HOOK, MODULES AND TURNBUCKLES
OPERATION INSTRUCTION IN ENGLISH

NOTE:- ALL TECHNICAL REQUIREMENTS SHALL BE AS PER TDC-F-01209058000-00

A (G29)



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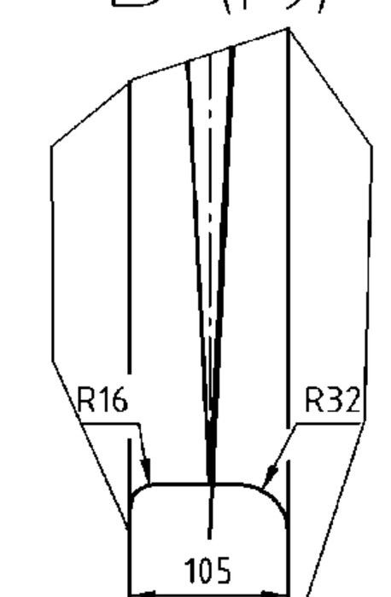
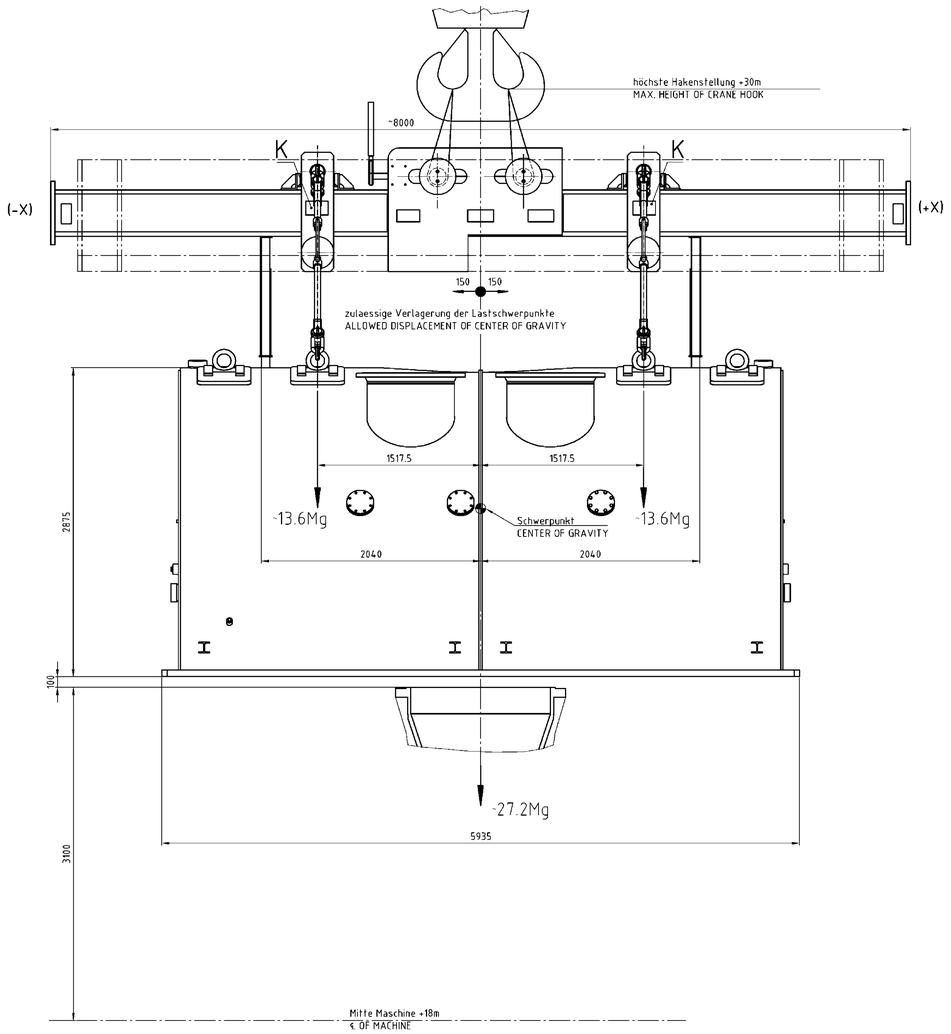


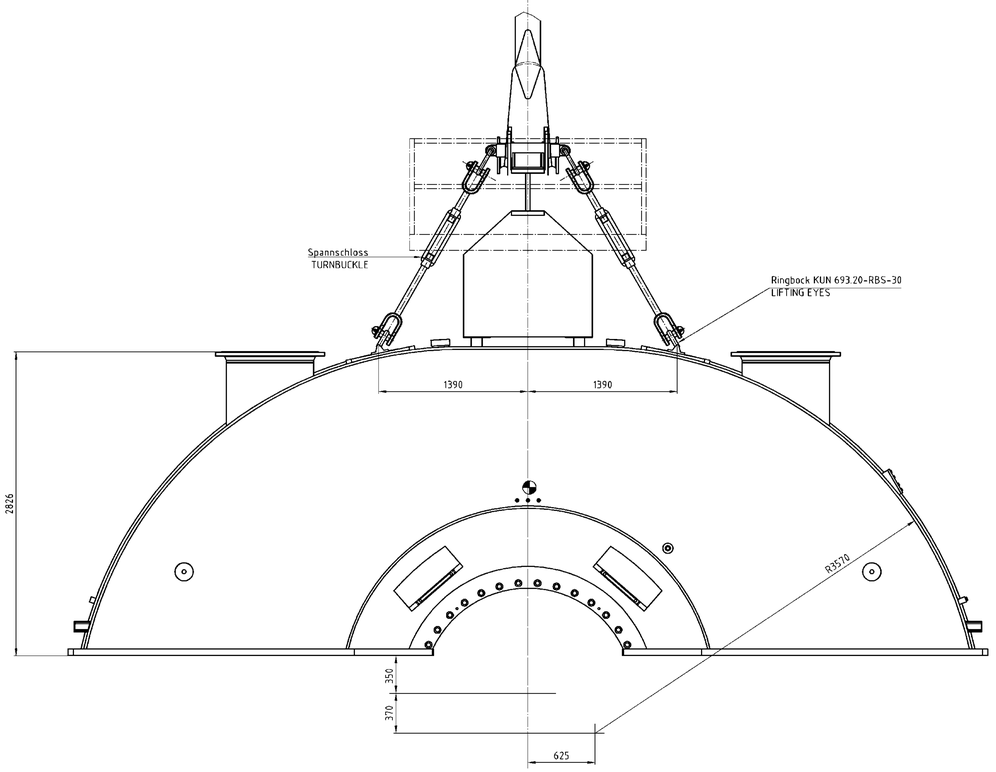
W90312090102

GMS No./ C.B.O.M	0 12090 58000
STATUS OF DRG	U
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	STEAM TURBINE
GRADE OF UNTOL.DIM	
M/CG.-C/M/F AA0230208	
WELDING-A/B/C/D / AA0621104	
GAS CUTTING-'T3'AA0621101	
BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR	
DRN	MONIKA SINGH SD/- 10.12.2012
CHD	PRADEEP KUMAR SD/- 10.12.2012
APPD	D.K.RAY SD/- 12.12.2012
NO. OF VAR	—
REV 01, DATE 28.04.16	ALTERED AFZAL, CHECKED PRADEEP — DRAWING UPDATED AS PER C/A NO. STE-16-F0147
DEPT	STE
CODE	4011
SCALE	1:25
WEIGHT (KG)	
REF. TO ASSY. DRG.	
ITEM No.	
NO. OF ITEMS	—
TITLE	LIFTING DEVICE CROSS BEAM SHEET 1
CARD CODE	7
DRAWING NO.	0-12090-58000
SHEET No.	1
No. OF SHEETS	3

A0 SIZE

DRAWING No. 0-12090-58000





W90312090102

GRADE OF UNTOL.DIM			
M/CG.-C/M/F AA0230208			
WELDING-A/B/C/D / AA0621104			
GAS CUTTING-'T3'AA0621101			

~~GMG No~~/ C.B.O.M	AGREED	NAME	SIGN	STATUS OF DWG DATE
0 12090 58000	DEPT			
	TTX	TTX	SD/-	

REV	DATE	ALTERED / CHECKED
01	28.04.15	ALTERED AFZAL / CHECKED PRADEEP

DRAWING UPDATED AS PER C/A NO. STS-16-F0147

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE	NO. OF VAR.
DRN	MONIKA SINGH	SD/-	10.12.2012	—
CHD	PRADEEP KUMAR	SD/-	10.12.2012	
APPD	D.K.RAY	SD/-	12.12.2012	

DEPT STE | CODE 4011 | SCALE 1:25 | WEIGHT (KG) | REF. TO ASSY. DRG. | ITEM No. | NO. OF ITEMS —

TITLE : LIFTING DEVICE CROSS BEAM SHEET 2

CARD CODE 7 | DRAWING NO. 0-12090-58000 22 23 24

SHEET No. 2 | No. OF SHEETS 3

AO SIZE

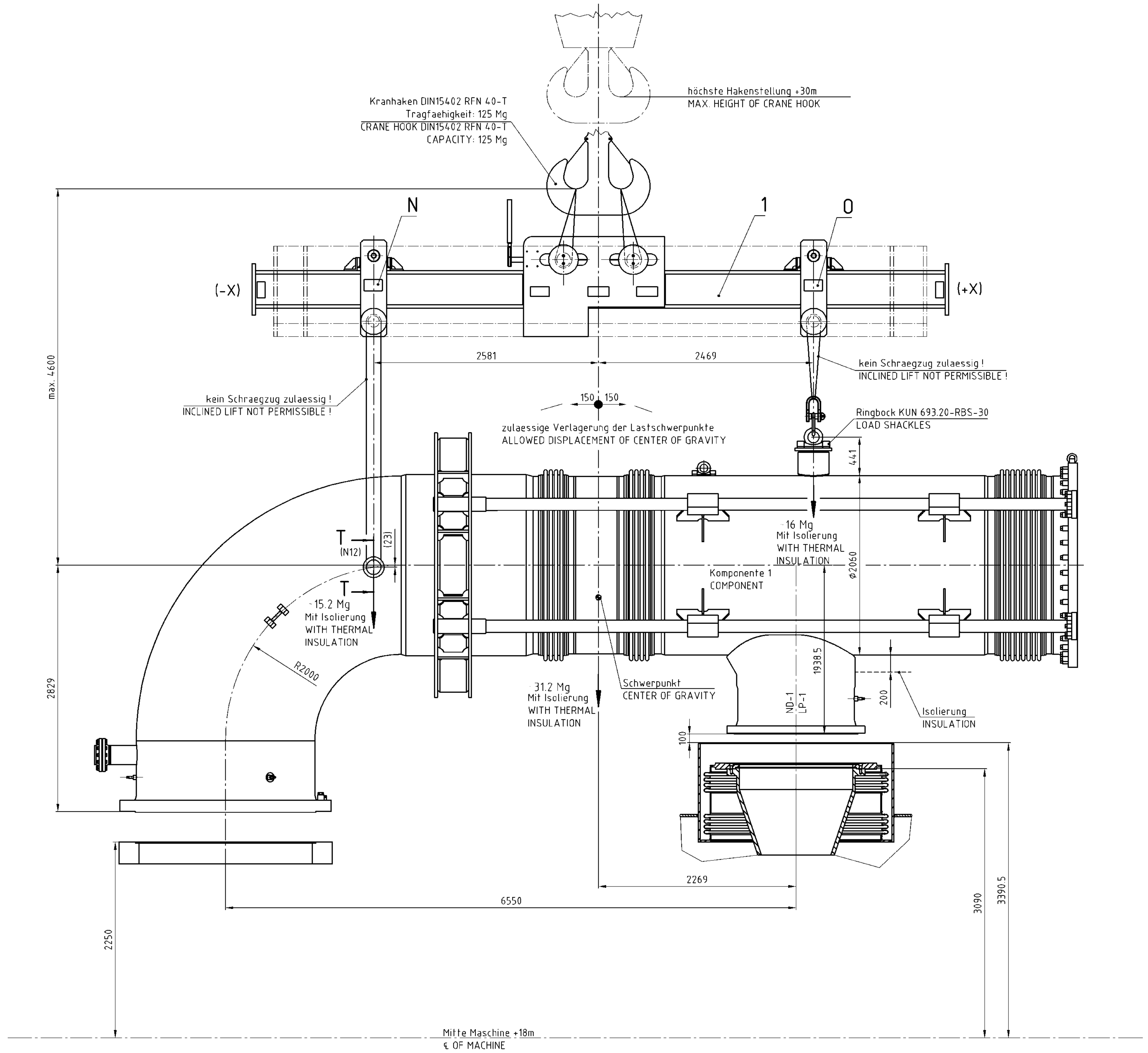
TIN NO. | SIGN & DATE | INVENTORY No.

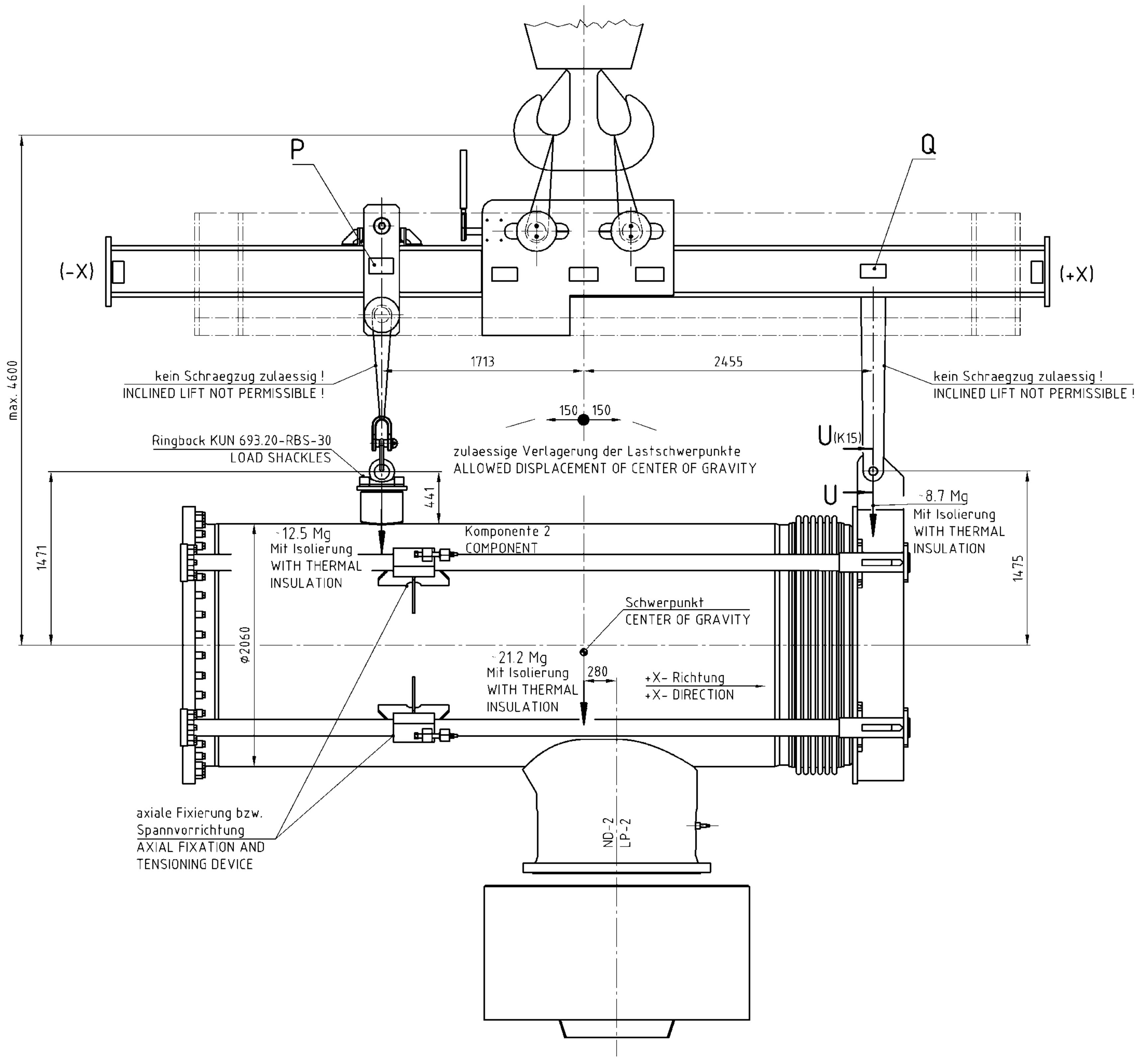
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

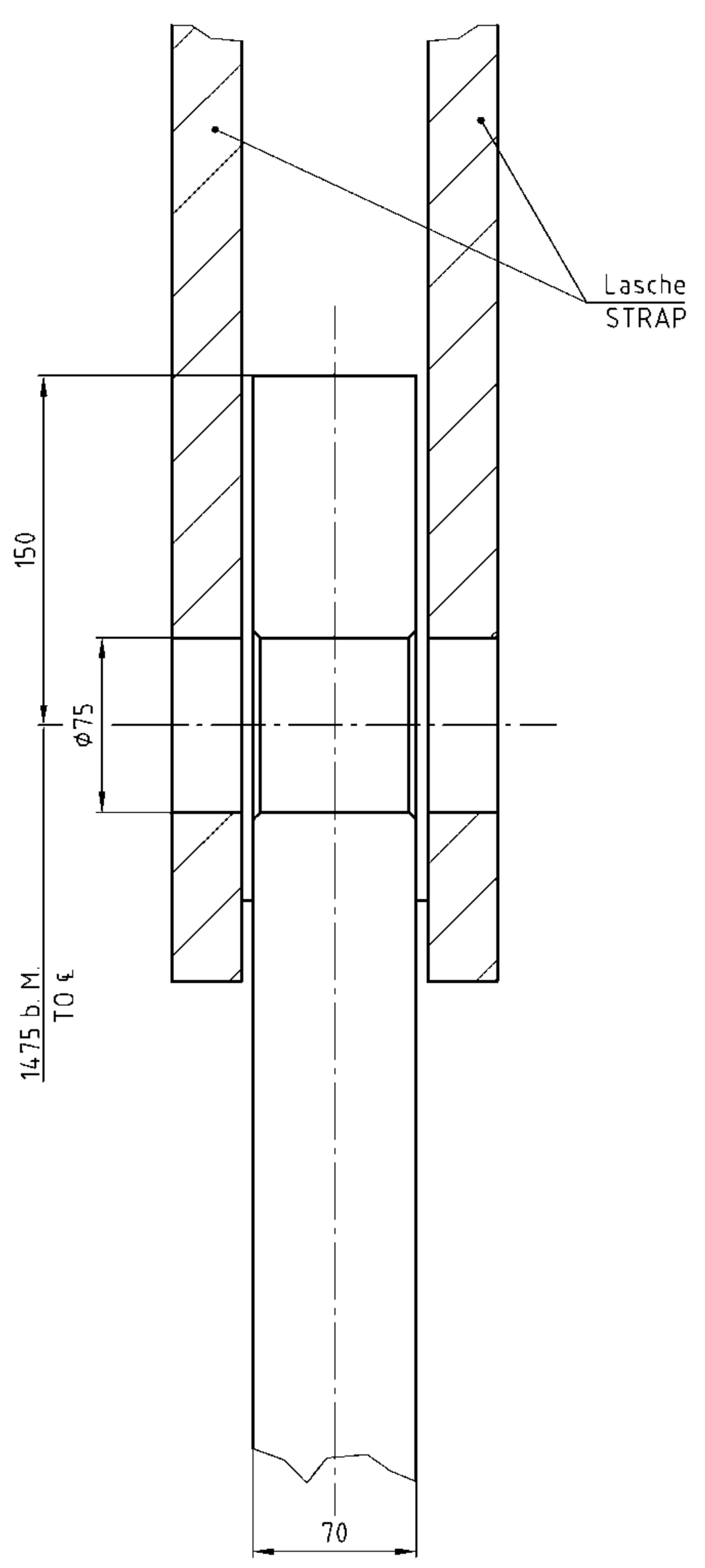
FORM DG 46 (B)

0-12090-58000





U-U (E20)
1:2,5



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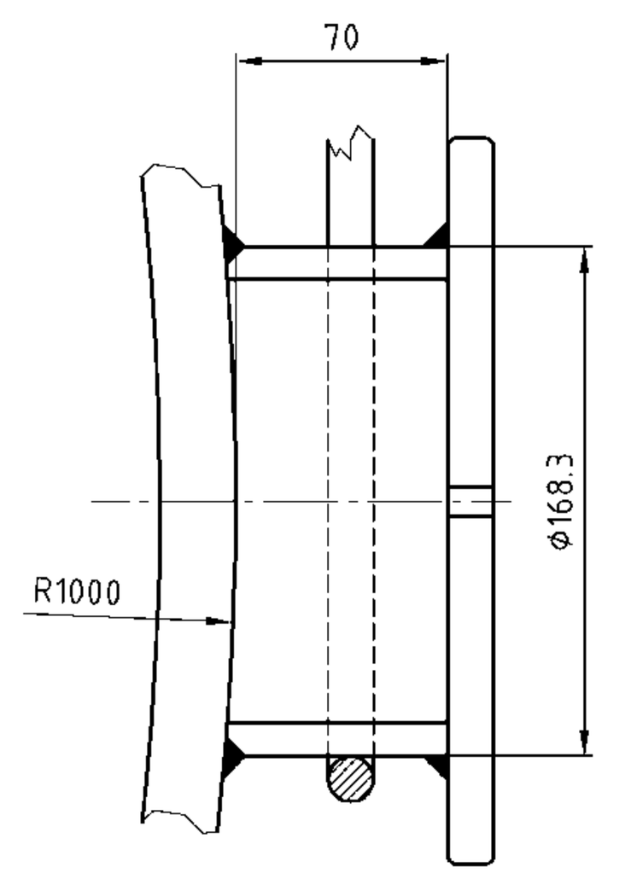
1:2,5



Schild Nr. PLATE No	Text TEXT		
N	Überströmltg. Komp.1 CROSS OVER PIPE	COMP.1	15.2 Mg
O	Überströmltg. Komp.1 CROSS OVER PIPE	COMP.1	16 Mg
P	Überströmltg. Komp.2 CROSS OVER PIPE	COMP.2	12.5 Mg
Q	Überströmltg. Komp.2 CROSS OVER PIPE	COMP.3	8.7 Mg

IDENTIFICATION ACCORDING TO HW04003977

W90312090102

GRADE OF UNTOL.DIM
M/CG.-C/M/F AA0230208
WELDING-A/B/C/D / AA0621104
GAS CUTTING-'T3'AA0621101

GMS No/ C.B.O.M 0 12090 58000

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	MONIKA SINGH	SD/-	10.12.2012
CHD	PRADEEP KUMAR	SD/-	10.12.2012
APPD	D.K.RAY	SD/-	12.12.2012

REV	DATE	ALTERED	CHECKED
01	28.04.16	AFZAL	PRADEEP

DRAWING UPDATED AS PER CIA NO. STC:16-F0147

DEPT STE; CODE 4011; SCALE 1:25; WEIGHT (KG) 351.00

TITLE: LIFTING DEVICE CROSS BEAM SHEET 3

DRAWING NO. 0-12090-58000

SHEET No. 3 No. OF SHEETS 3

A0 SIZE

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	LIFTING BEAM	QP NO.	QA_BI_QP_100		
				DATED	01/06/2013		
		DRG. NO.	AS PER PO				
		SPEC.	ST08007 REV 01				
		REV	00		Page 1 of 3		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
										M	B	N	
1	2	3	4	5	6	7	8	9	D	10			11
1.0	MATERIALS												
1.1	PLATES	CHEMICAL COMPOSITION	MAJOR	ANALYSIS	1/THICKNESS	APPD. DRAWING	STANDARD AS PER APPD. DRAWING	TC	√	P	V		
		MECHANICAL PROPERTIES	MAJOR	MECH	1/THICKNESS	APPD. DRAWING		TC	√	P	V		Note-1
1.2	FORGING (PULLEY, CROSS, HEAD, NUT, LINKS, SCREWS)	CHEMICAL COMPOSITION	MAJOR	ANALYSIS	1/HEAT	APPD. DRAWING		TC	√	P	V		
		HEAT TREATMENT	MAJOR	VERIFY	100%	STANDARD AS PER APPD. DRAWING	STANDARD AS PER APPD. DRAWING	TIME TEMP. CHART	√	P	V		
		MECHANICAL PROPERTIES	MAJOR	MECH	1/HEAT PER HT BATCH	APPD. DRAWING	STANDARD AS PER APPD. DRAWING	TC	√	P	V		
		INTERNAL DEFECT	MAJOR	UT	100%	IS:8791	IS:8791 CLASS-A	TC	√	P	V		
1.3	SLINGS	LOAD TEST	MAJOR	PROOF LOAD TEST	100%	ST 08007	IS2762 ST 08007	TC	√	P	V		TO BE WITNESSED BY COMP. PERSON
1.4	HOOKS	CHEMICAL COMPOSITION	MAJOR	ANALYSIS	1/HEAT	IS:3815/ 5749	AS PER SPECIFICATION	TC	√	P	V		TO BE WITNESSED BY COMP. PERSON
		MECHANICAL	MAJOR	MECH	1/HEAT PER HT BATCH	IS:3815/ 5749	AS PER SPECIFICATION	TC	√	P	V		
		DIMENSIONS	MAJOR	MEASURE	100%	APPD. DRAWING	APPD. DRAWING	I.R.	√	P	V		
		UT BEFORE LOAD TEST	MAJOR	UT	100%	IS:8791	IS:8791 CLASS-A	TC	√	P	V		
		LOAD TEST	MAJOR	LOAD TEST	100%	IS:3815/ 5749	IS:3815/ 5749	TC	√	P	V		
		UT AFTER LOAD TEST	MAJOR	UT	100%	IS:8791	IS:8791 CLASS-A	TC	√	P	V		
		DPT AFTER LOAD TEST	MAJOR	DPT	100%	IS: 3658	IS: 11732 LEVEL I	TC	√	P	V		

Sanjeev 27/02/16

संजीव कुमार भारद्वाज
Sanjeev Kumar Bhardwaj
अभियन्ता/Engineer
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बी. एच. ई. एल., हरिद्वार/BHEL Haridwar

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	LIFTING BEAM	QP NO.	QA_B1_QP_100		
				DATED	01/06/2013		
		DRG. NO.	AS PER PO				
		SPEC.	ST08007 REV 01				
		REV	00		Page 2 of 3		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
										M	B	N	
1	2	3	4	5	6	7	8	9	D	10			11
2.0	IN PROCESS INSPECTION												
2.1	FABRICATION	VERIFICATION OF WPS & PQR FOR WELDER QUALIFICATION	MAJOR	VERIFY	100%	ASME-IX	ASME-IX	Records	√	P	W*		*W IN CASE OF NEW WELDER
		EDGE PREPARATION & FIT UP	MAJOR	VISUAL	100%	AS PER DRG.	AS PER DRG.	I.R.	√	P	-		
		WELD QUALITY OF BUTT WELDS	MAJOR	RT	100% TENSION ZONE + WELDS TAKING LOAD AT BOTH ENDS	ASME-V ARTICLE-2	ASME-VIII DIV 1, UW-51	NDT Reports	√	P	V		
		WELD QUALITY OF BUTT WELDS	MAJOR	RT	100% ALL OTHER BUTT WELDS	ASME-V ARTICLE-2	ASME-VIII DIV 1, UW-52	NDT Reports	√	P	V		
		WELD QUALITY OF ALL WELDS	MAJOR	DPT	100%	ASME-V ARTICLE -6	ASME-VIII DIV 1, APPENDIX VIII	NDT Reports	√	P	V		
2.2	FABRICATED ITEMS	DIMENSIONS & VISUAL	MAJOR	MEASURE	100%	AS PER DRG.	APPD. DRAWING	I.R.	√	P	V		
3.0	FINAL INSPECTION												
3.1	ASSEMBLY	DIMENSIONS & VISUAL	MAJOR	MEASURE & VISUAL	100%	APPD. DRAWING	APPD. DRAWING	I.R.	√	P	W		
		FUNCTIONAL TEST	MAJOR	VISUAL	100%	APPD. DRAWING & BHEL SPEC.	SMOOTH OPERATION	I.R.	√	P	W		

		LEGEND:	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY संजीव कुमार भारद्वाज Sanjeev Kumar Bhardwaj अभियंता/Engineer गुणता आश्वासन/Quality Assurance बी. एच. ई. एल., हरिद्वार/BHEL, Haridwar

Sanjeev 27/02/16

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	LIFTING BEAM	QP NO.	QA_BI_QP_100	
				DATED	01/06/2013	
		DRG. NO.	AS PER PO			
		SPEC.	ST08007 REV 01			
		REV	00	Page 3 of 3		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	D	AGENCY M	AGENCY B	AGENCY N	REMARKS
1	2	3	4	5	6	7	8	9		10			11
		LOAD TEST AT 3 POSITIONS & DEFLECTION TEST	CRITICAL	SAFE WORKING LOAD TEST & PROOF LOAD TEST	100%	ST 08007	DEFLECTION AT SAFE WORKING LOAD SPAN/900 ST 08007	TC	√	P	W		Note-2
		SURFACE CRACK EXAM OF WELDS (ACCESSIBLE AREAS) & HOOK (IF APPLICABLE)	MAJOR	DPT	100%	ASME-V ARTICLE -6	ASME-VIII DIV 1, APPENDIX VIII	NDT Reports	√	P	W		
		IDENTIFICATION, PRESERVATION & PACKING	MAJOR	VISUAL	100%	BHEL SPEC. PO & QP	BHEL SPEC. PO & QP	I.R.	√	P	-		

NOTE-1: Testing of Plates shall be carried out only if correlation with manufactures test certificate is not available

NOTE-2: The Slings, links, Hooks wherever applicable & complete beam shall also be certified by competent authority as per the Factory Act before offering the Beam for load test to nominated Inspection agency.

		LEGEND:	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY

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