

Technical Pre-Qualification Requirement for

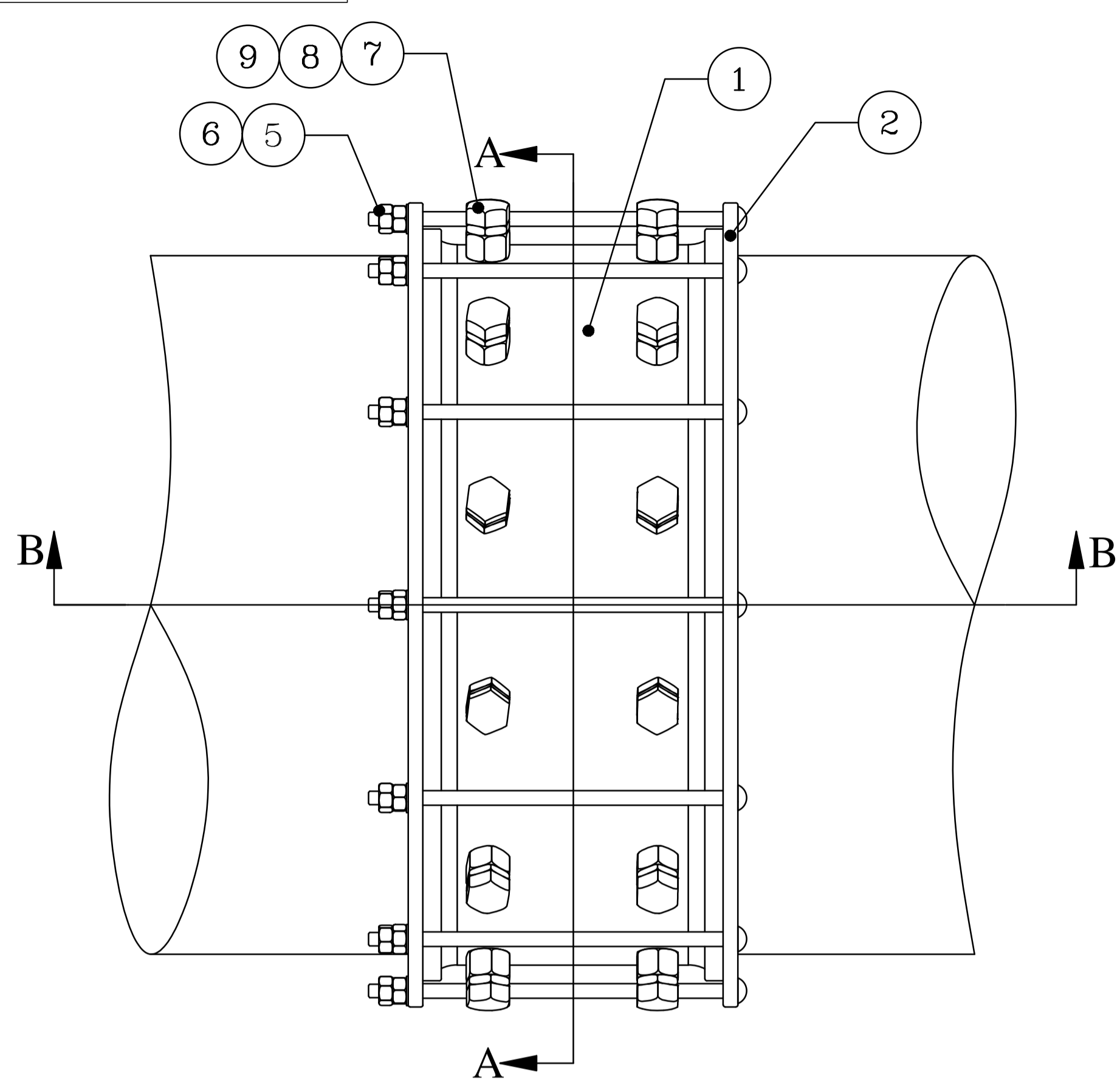
28” SLEEVE COUPLING

1. The vendor shall be an established Sleeve coupling manufacturer having adequate design, engineering, manufacturing, inspection and testing facilities. The sleeve coupling should be of mechanical type and for connecting coal pipes. Vendor shall furnish technical backup documents for the proof of above requirements.
2. The offered sleeve coupling shall be of sizes as per enquiry and from the existing regular manufacturing range of the supplier. Vendor shall provide the manufacturing catalogue or general reference list for the offered coupling along with offer.
3. The supplier shall have experience of having supplied Sleeve coupling of 28” inch or higher and for applications of similar severity as specified in the enquiry. Supplier shall submit documents in proof of the same.
4. Proven track record is required. As a proof for this pre-qualifying requirement point, vendor should submit:
Minimum ONE end user certificate for the satisfactory operational performance of their supplied sleeve coupling with accessories meeting or exceeding the specification requirements. (OR)
Minimum TWO purchase orders meeting or exceeding the requirements as per the enquiry specification
5. In case of order placement, the vendor shall have the responsibility for the following and same to be confirmed point wise.
 - i) Vendor should have the component replacement responsibility in case of defect / failure.
 - ii) Experts from vendor’s side shall assist in commissioning activities at site, if required.
 - iii) Vendor should ensure the product performance during erection & commissioning.

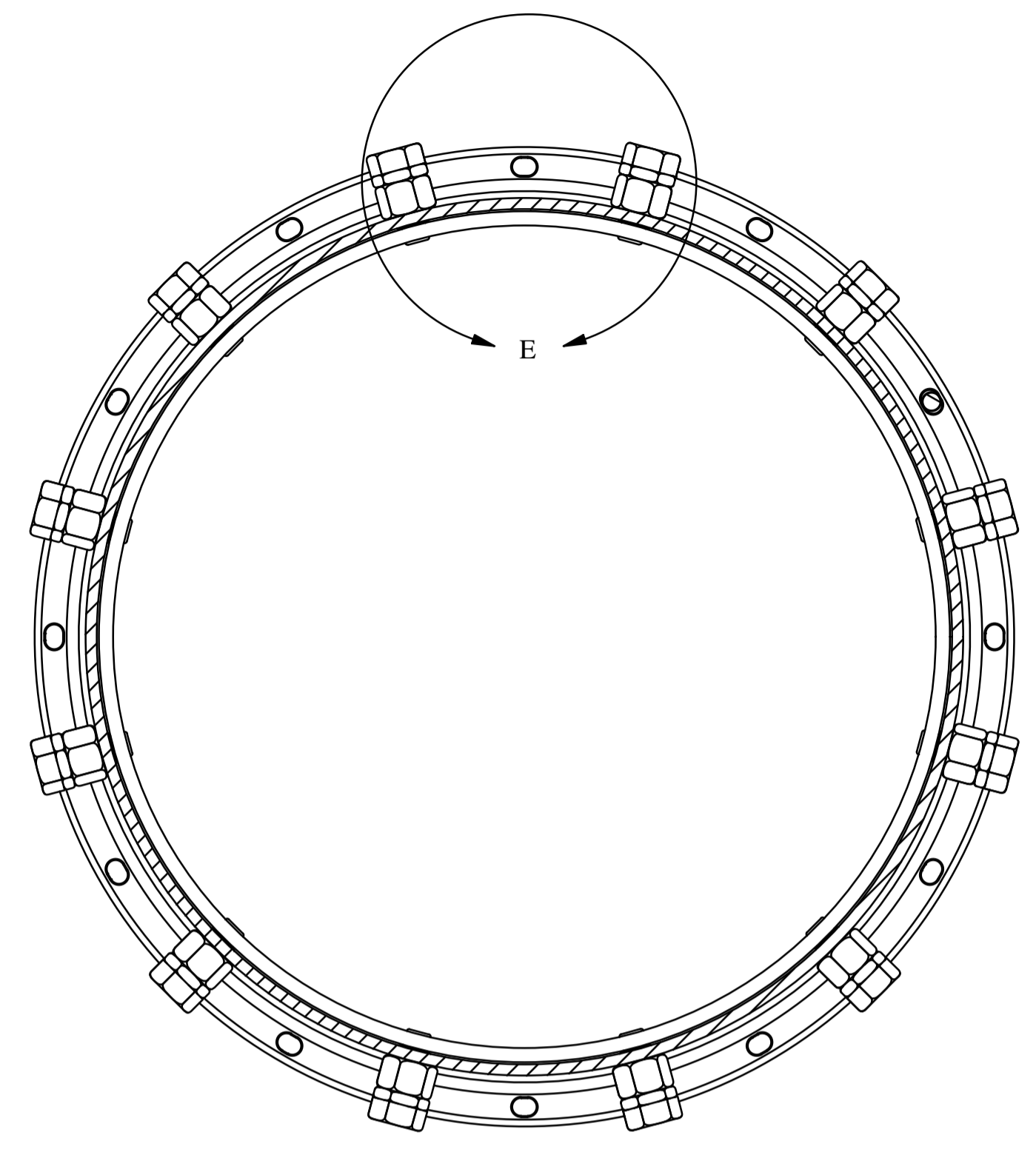
6. DOCUMENT SUBMISSION CHECKLIST FOR THE VENDOR TO MEET PQR

| Clause | Documents acceptable | Check list |
|--------|---|--------------------------|
| 1 | i) ISO or Other third Party certification about the engineering, manufacturing, testing and servicing facilities in the name of supplier/OEM as applicable. The certificate shall be specific for the product quoted by the vendor. (OR) ii) List of manufacturing, testing and servicing facilities available (like machinery/equipment) in the letterhead of supplier/OEM as applicable. | <input type="checkbox"/> |
| 2 | Supply reference list with details of PO, PO date, customer name, application severity/type in the form of a table | <input type="checkbox"/> |
| 3 | Product Catalogue in the name of supplier/OEM as applicable | <input type="checkbox"/> |
| 4 | Min. one end user certificate (or) Two POs in the name of supplier/OEM as applicable | <input type="checkbox"/> |
| 5 | Signed copy of this technical PQR document | <input type="checkbox"/> |

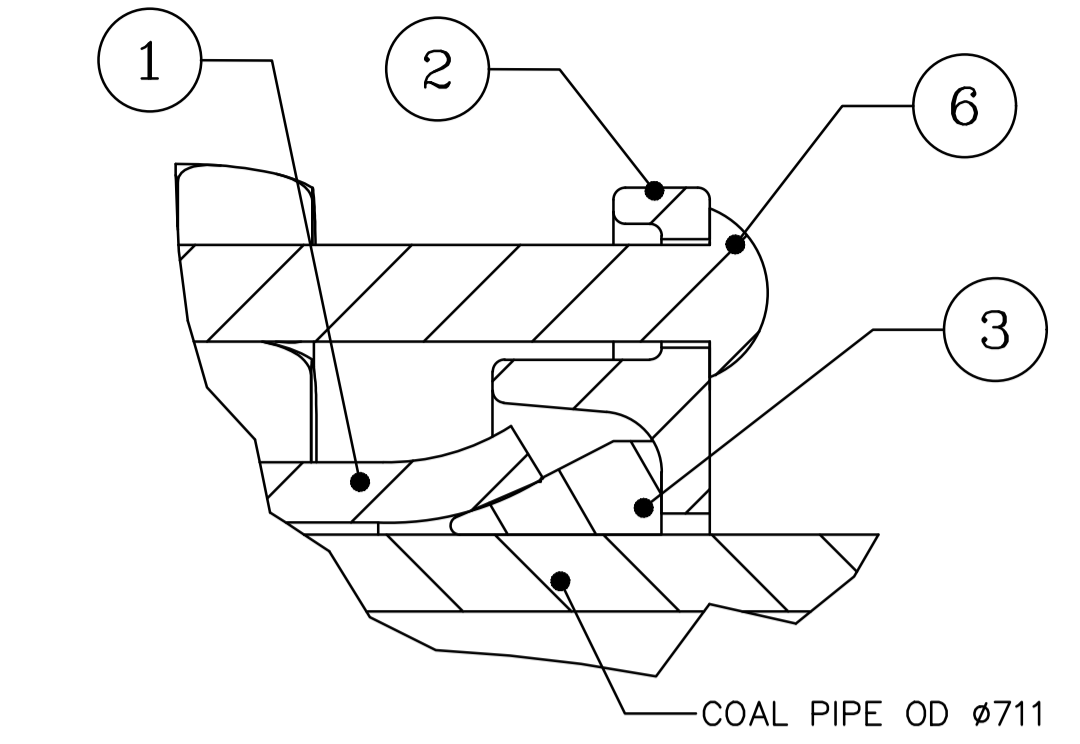
Vendor signature and seal with Date



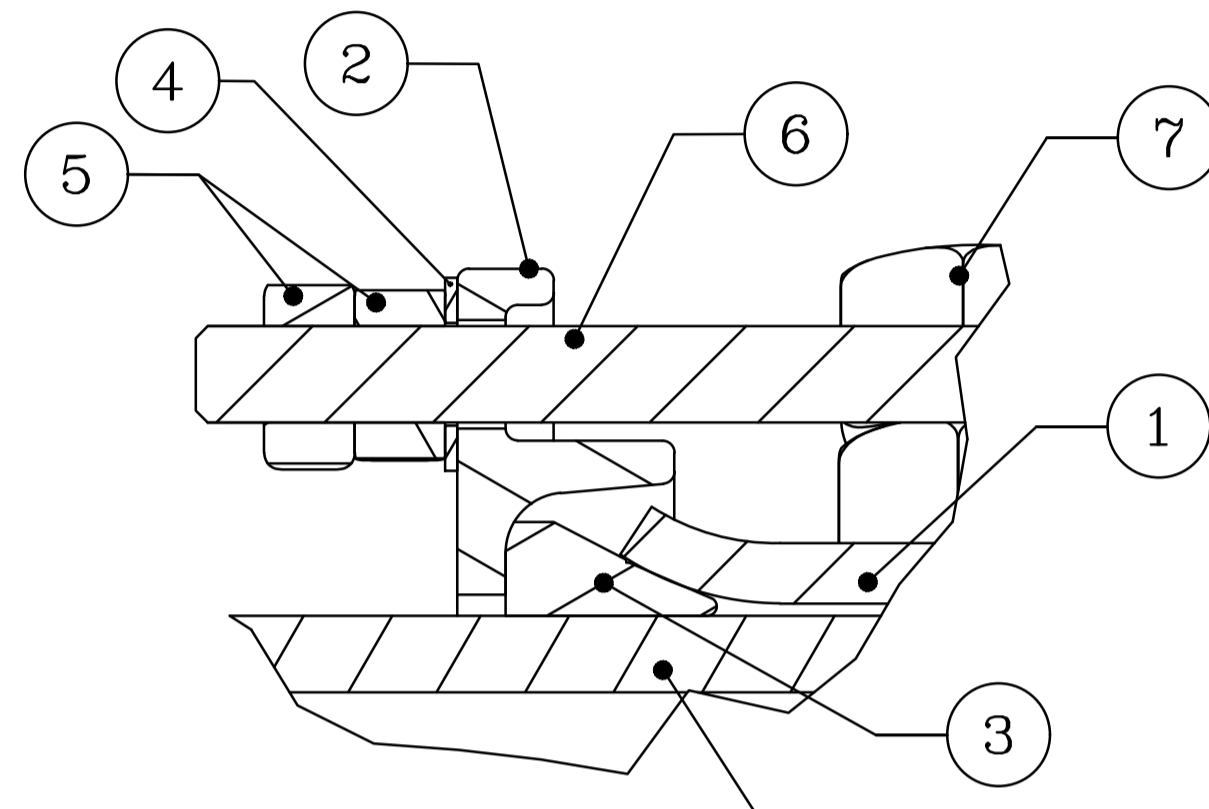
FINAL ASSEMBLY



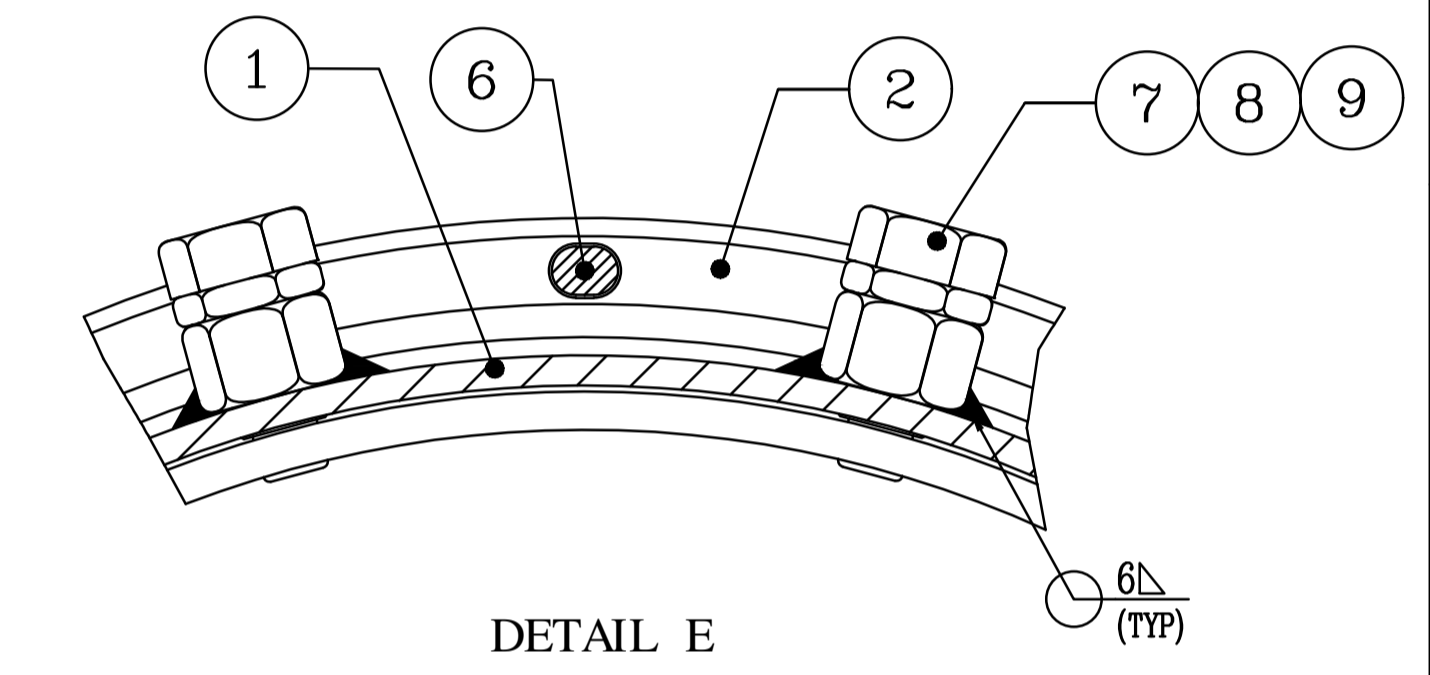
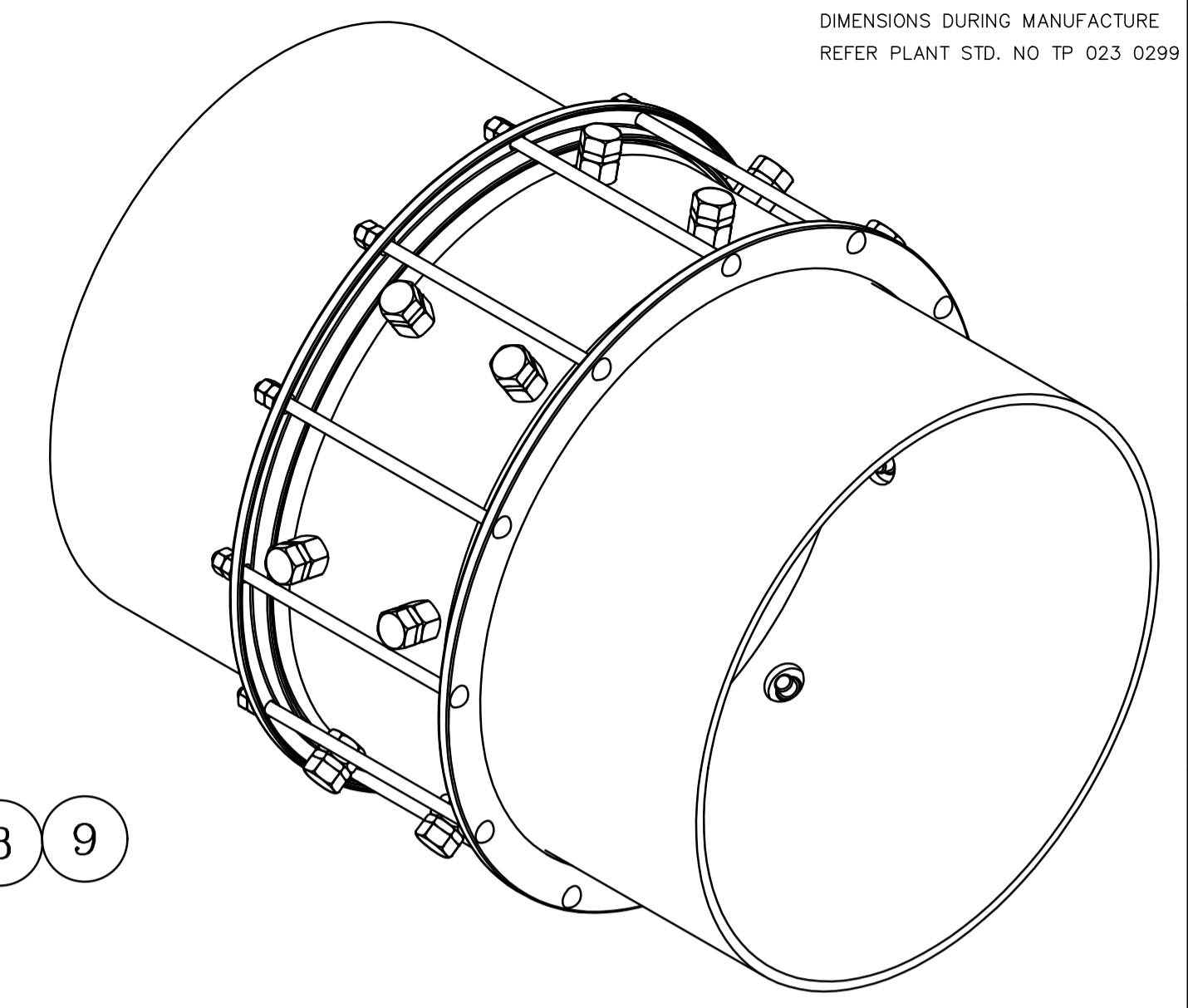
SECTION A-A



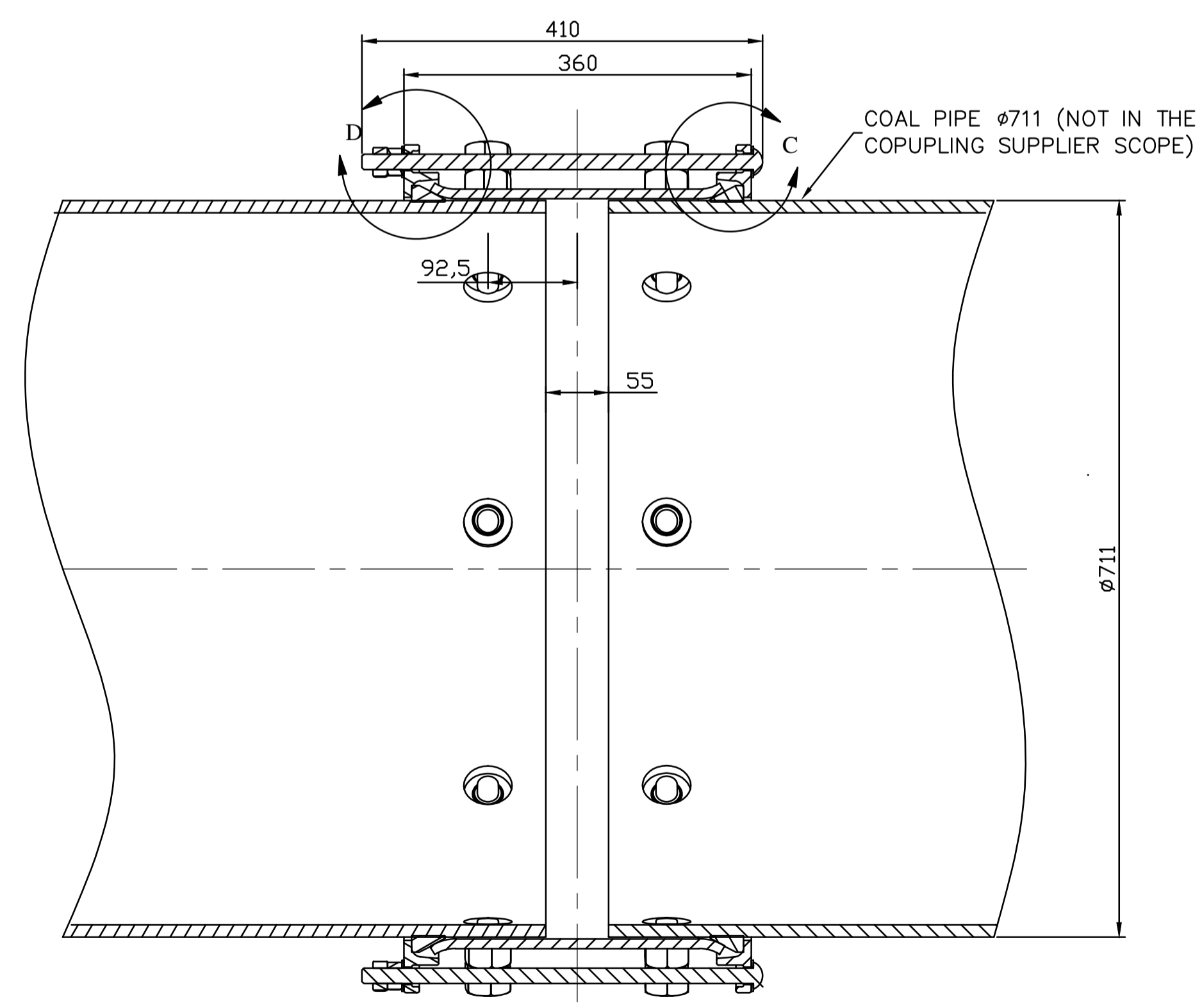
DETAIL C



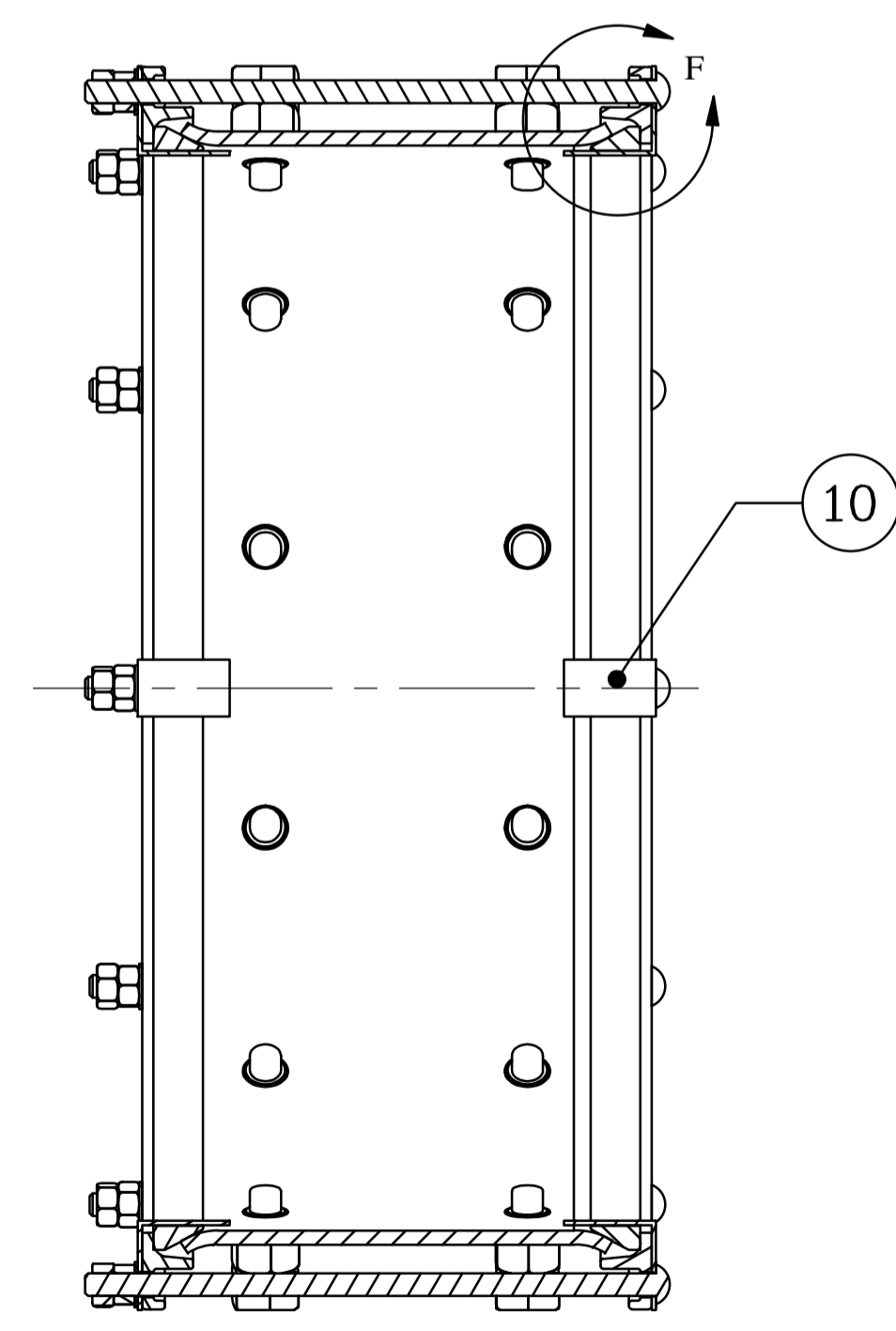
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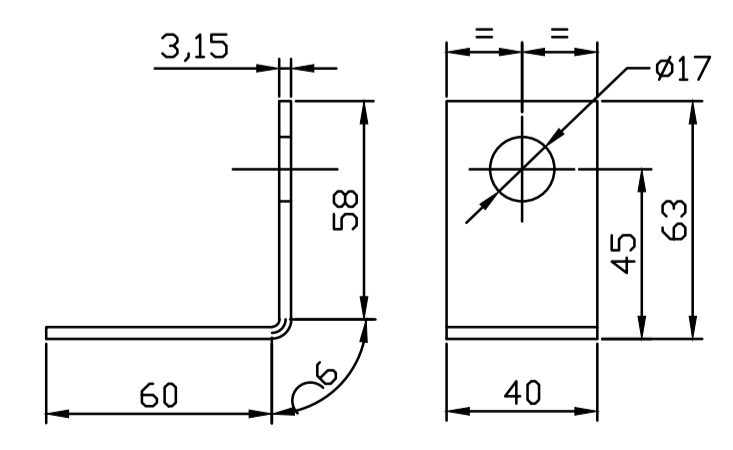
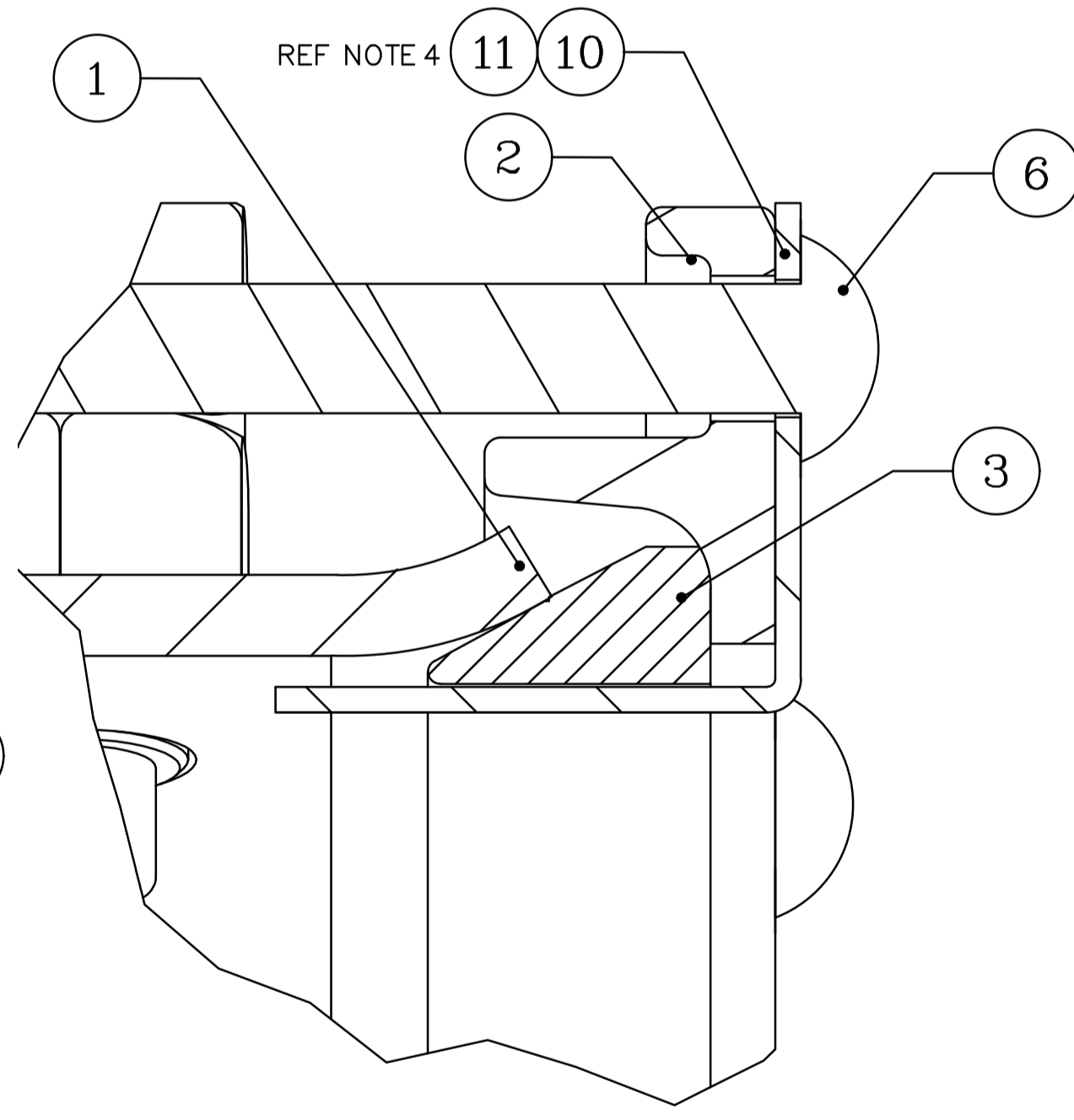
DETAIL E



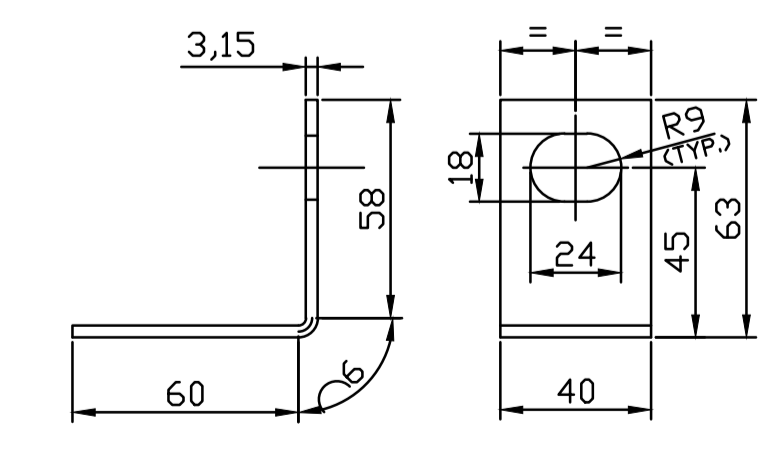
SECTION B-B



ASSEMBLY SECTIONAL VIEW (COUPLING ASSLY WHILE DISPATCHING)



ITEM NO 10



ITEM NO 11

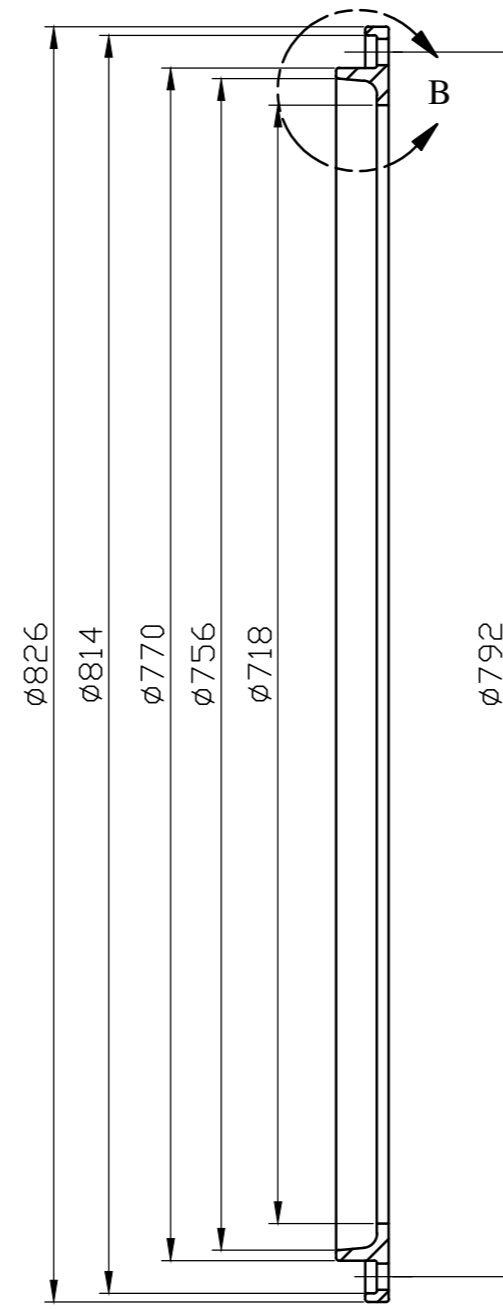
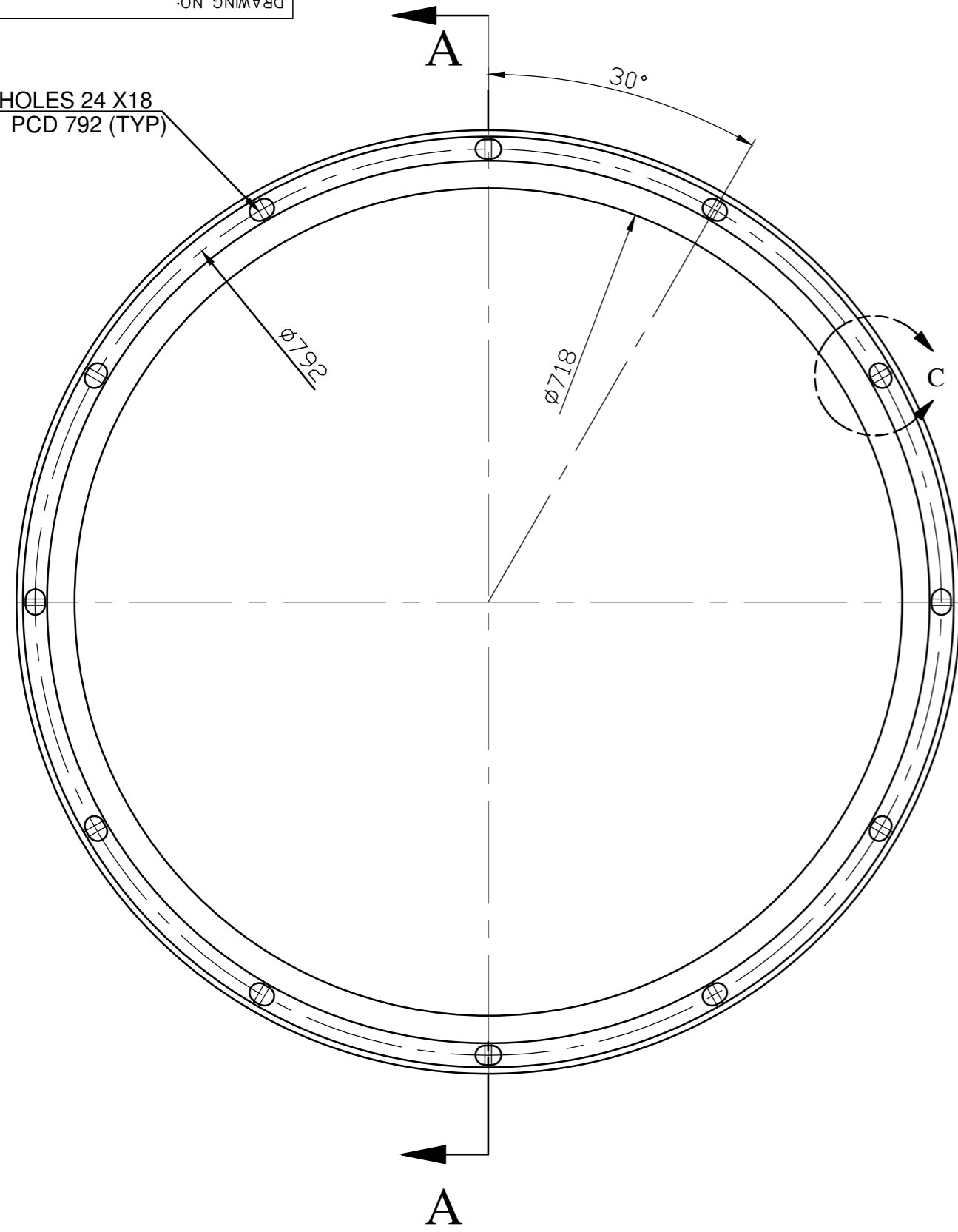
NOTES:

1. ALL DIMENSIONS ARE IN MM
2. COATING AS PER APPLICABLE PAINTING SCHEDULE
3. COUPLING DESIGN IS IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION REQUIREMENTS FOR 50 PSIG DESIGN PRESSURE
4. ITEM NO 10 & 11 TO BE PAINTED YELLOW. & TO BE PLACED BOTHSIDE 60° APART. THIS IS TO PREVENT SLIPPING OF GASKET OUT OF THE ASSEMBLY. ITEM NO 10 & 11 TO BE REMOVED WHILE ERECTION.

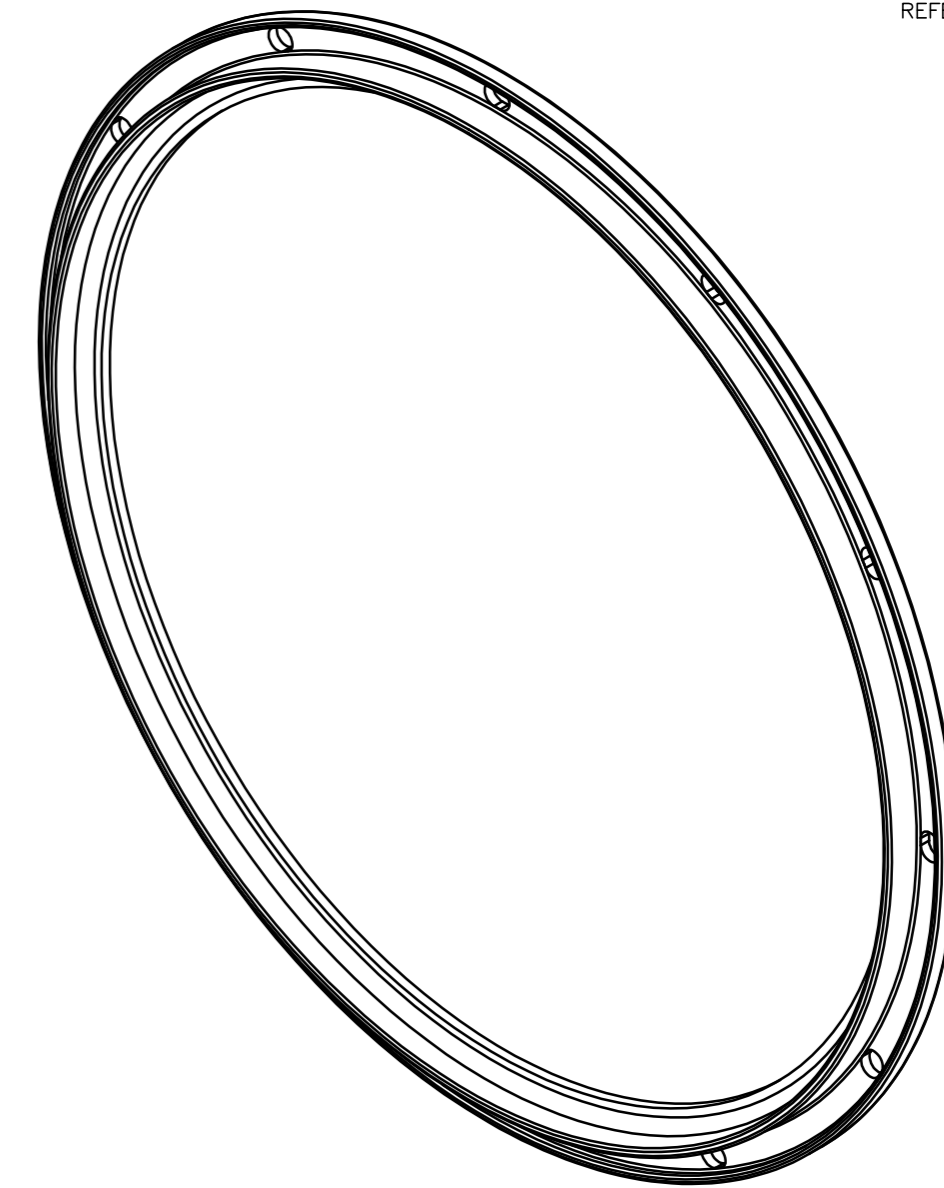
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|----------------|-------------|------------------|-----|----------------|----------------|------------------------------|------|----|----------------------|----|------|
| | 11 | SH3.15X40X124 | | | | IS 2062 | NO | | 0.117 6 | | |
| | 10 | SH3.15X40X124 | | | | IS 2062 | NO | | 0.118 6 | | |
| | 09 | SCREW M30 | S | 4-47-200-01987 | | | NO | | 0.575 24 | | |
| | 08 | LOCK NUT M30 | S | | | IS1364 | NO | | 0.076 24 | | |
| | 07 | NUT M30 | S | | | IS 1364 | NO | | 0.228 24 | | |
| | 06 | SNAP HD BOLT M16 | S | 4-47-200-01986 | | | NO | | 0.665 12 | | |
| | 05 | NUT M16 | S | | | IS 1364 | NO | | 0.055 24 | | |
| | 04 | WASHER M16 | S | | | IS 1364 | NO | | 0.009 12 | | |
| | 03 | GASKET | S | 4-47-200-02041 | | SILICON | NO | | 1.113 2 | | |
| | 02 | FOLLOWER RING | S | 2-47-200-01884 | | ASTM A536 Gr.65 4512 | NO | | 13.478 2 | | |
| | 01 | MIDDLE RING | S | 3-47-200-01820 | | 15-011-098 IS 2062Fe410WA | NO | | 52.574 1 | | |

| | | | | | | | |
|--|----------------------------|--|----------------------------|---|-----------------------|---|--|
| CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way without the prior written consent of the company. | | TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014 | | DRN: RAVI SHANKAR PRASAD CHD: GANGADHAR MOHS APPD: SARAVANA KUMAR G | | NAME: RAVI SHANKAR PRASAD SIGNATURE: [Signature] DATE: 22.03.2017 | |
| DEPT: FS | ALL DIMENSIONS ARE IN MM | PROJECTION: [Symbol] | SCALE: NTS | WEIGHT (Kg): 113.670 | REF TO ASSY / OLD DWG | | |
| CODE: 129 | TITLE: SLEEVE COUPLING 28" | | DRAWING NO: 1-47-200-02254 | | REV: 00 | | |

12 HOLES 24 X 18 ON PCD 792 (TYP)

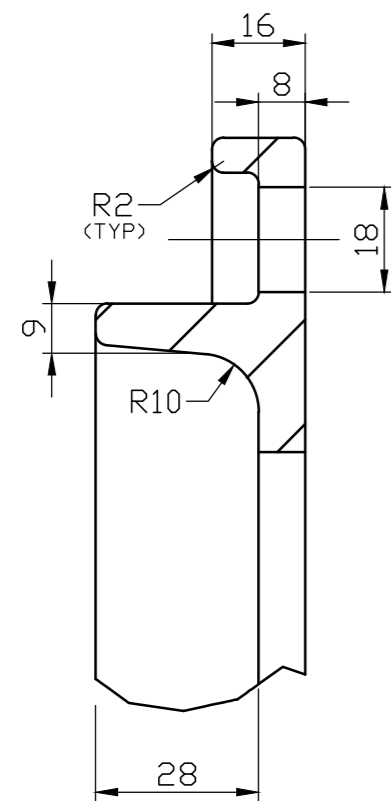


SECTION A-A

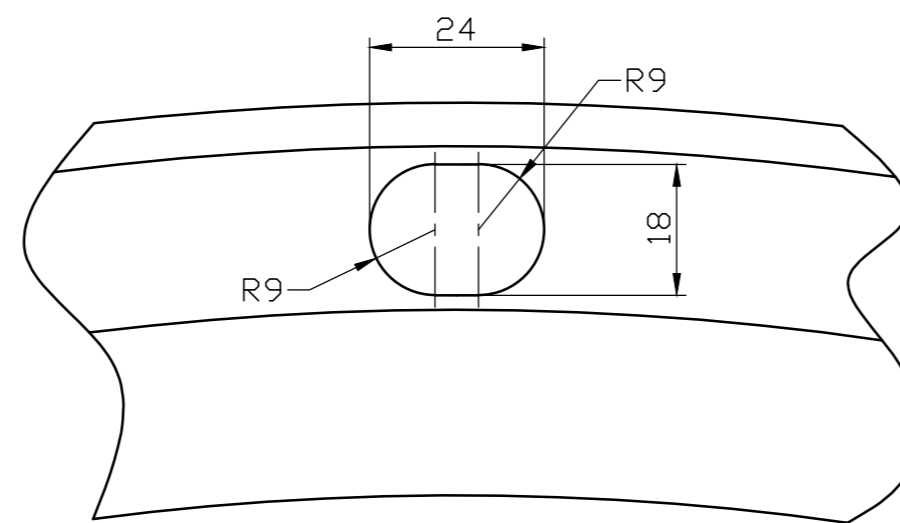


NOTE:

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. TOLERANCE FOR LINEAR DIMENSION ± 1
3. TOLERANCE FOR ANGULAR DIMENSION $\pm 1^\circ$



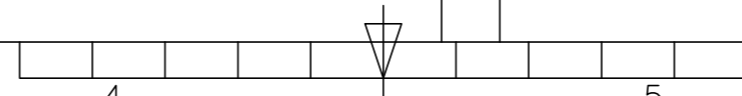
DETAIL B



DETAIL C

| | | | | | | | | | | |
|----------------|--|---------------|-----|----------------|------------------------|----------------|-------|----------|-------------|------|
| VARIANT NUMBER | | FOLLOWER RING | | | | | | | 13.478 | |
| ITEM NUMBER | | | | | ASTM A 536 Gr.65-45-12 | | | | | |
| | | DESCRIPTION | STD | DRAWING NUMBER | ITEM NO | MATERIAL CODE | A/C/P | UNIT | UNIT WEIGHT | CS |
| | | | | | VAR NO | MATERIAL SPECN | DI | QUANTITY | | ZONE |

| | | | | | | | | | | | |
|--|---|-----------------------------------|--------------------------|------------|---|-------------|-----------------------|--------------|---------------------|-----------|------------|
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| | DEPT | FS | ALL DIMENSIONS ARE IN MM | PROJECTION | SCALE | WEIGHT (Kg) | REF TO ASSY / OLD DWG | DRN | RAVI SHANKAR PRASAD | SIGNATURE | DATE |
| | CODE | 129 | | | NTS | 13.478 | | CHD | GANGADHAR MCHS | -sd- | 22.03.2017 |
| | TITLE | SLEEVE COUPLING FOLLOWER RING 28" | | | | | | DRAWING NO : | 2-47-200-01884 00 | | |
| REV | 01 | DATE | ALTERED : | | | | | APPD | SARAVANA KUMAR G | -sd- | 22.03.2017 |
| ZONE | | | CHD & APPD : | | | | | | | | |

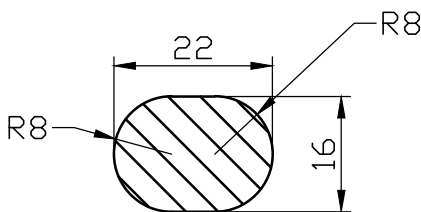


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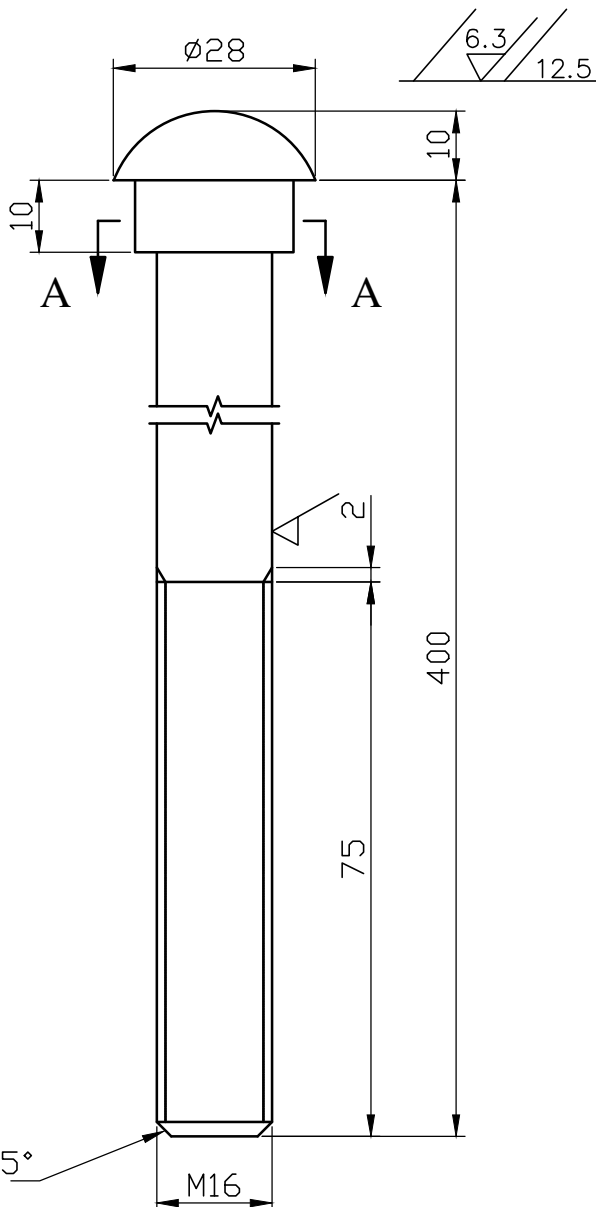
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|-----|----------|---------------------------|
| REV | DATE | ALTERED : BIMAL CHOWDHURY |
| 01 | 31.07.14 | CHD & APPD :MCH GANGADHAR |

DRAWING UPDATED

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD. NO TP 023 0299



SECTION A-A



| | | | | | | |
|----------------|-------------|-----|------------------|-------|------|----------|
| VARIANT NUMBER | ROD Ø | STD | ASTM A325 TYPE-B | A/C/P | UNIT | 0.665 |
| | DESCRIPTION | | MATERIAL SPECN | | | 1 |
| | | | | | | QUANTITY |

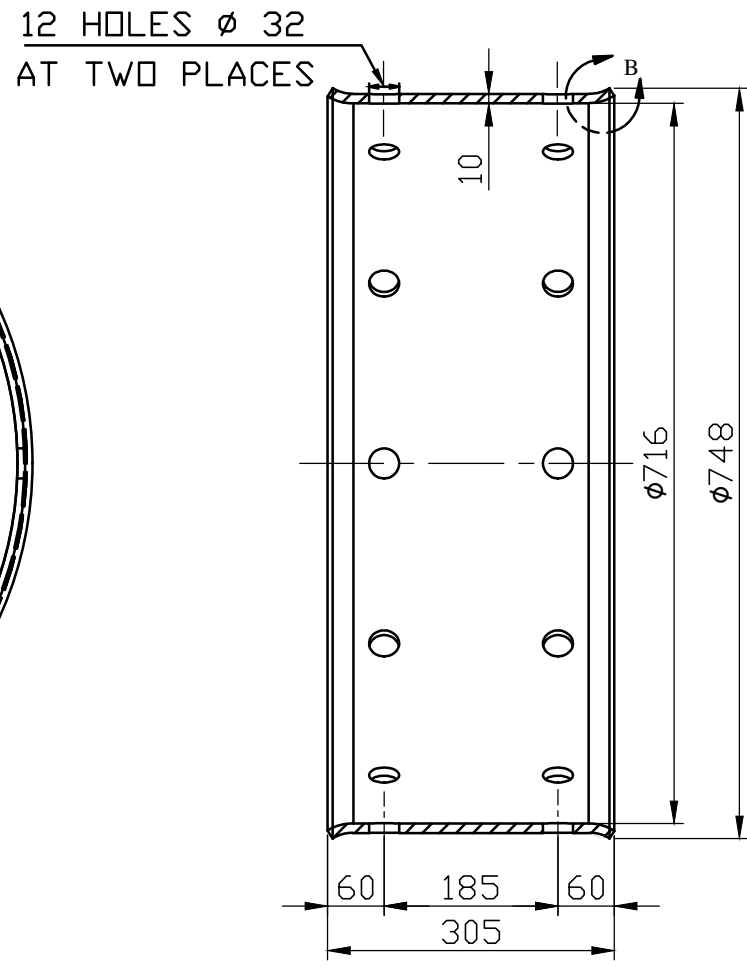
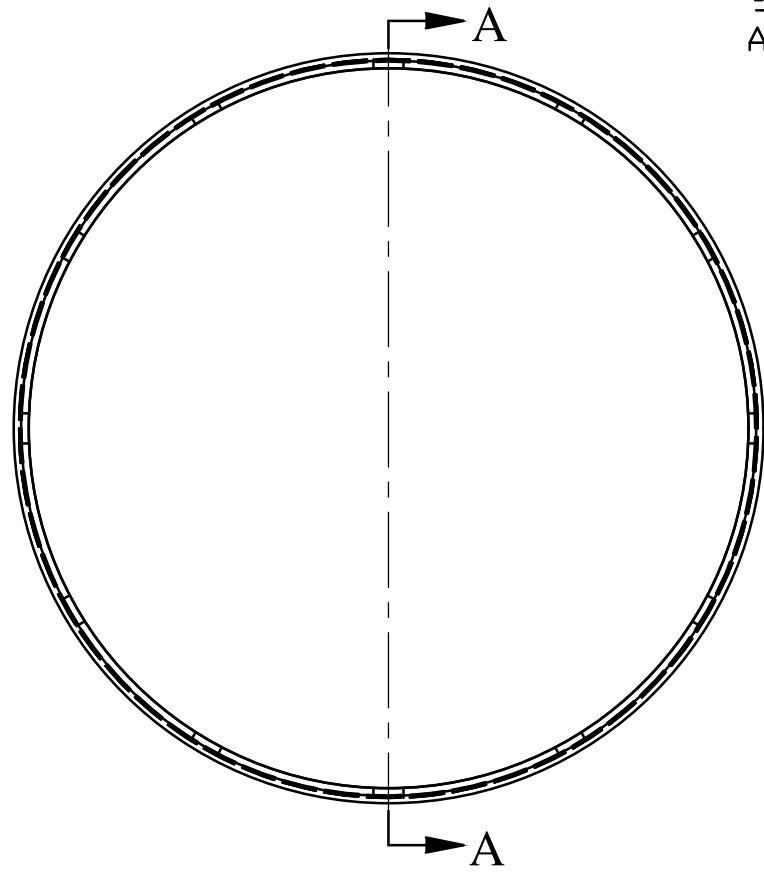


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UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

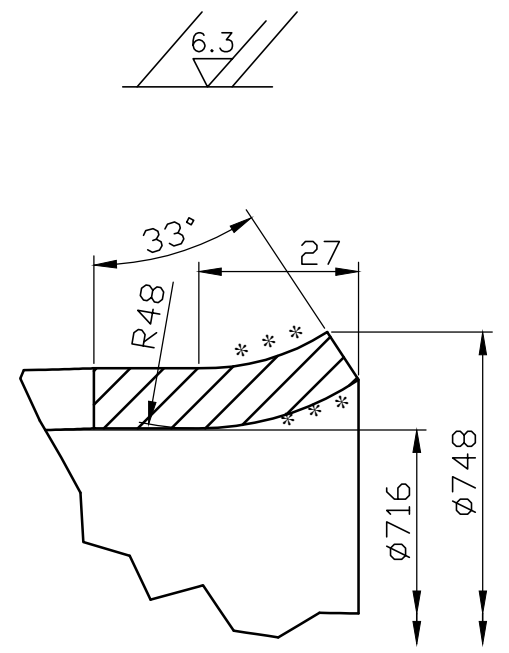
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|------|-----------------|-----------|----------|
| DRN | NAME | SIGNATURE | DATE |
| CHD | Bimal.Chowdhury | -sd- | 11.03.14 |
| APPD | Shankar Naik V | -sd- | 11.03.14 |
| | JVV Aruna kumar | -sd- | 11.03.14 |

| | | | | | | |
|------|-----|--------------------------|------------|-------|-------------|-----------------------|
| DEPT | FS | ALL DIMENSIONS ARE IN MM | PROJECTION | SCALE | WEIGHT (Kg) | REF TO ASSY / OLD DWG |
| CODE | 129 | | | 1:1 | 0.665 | |

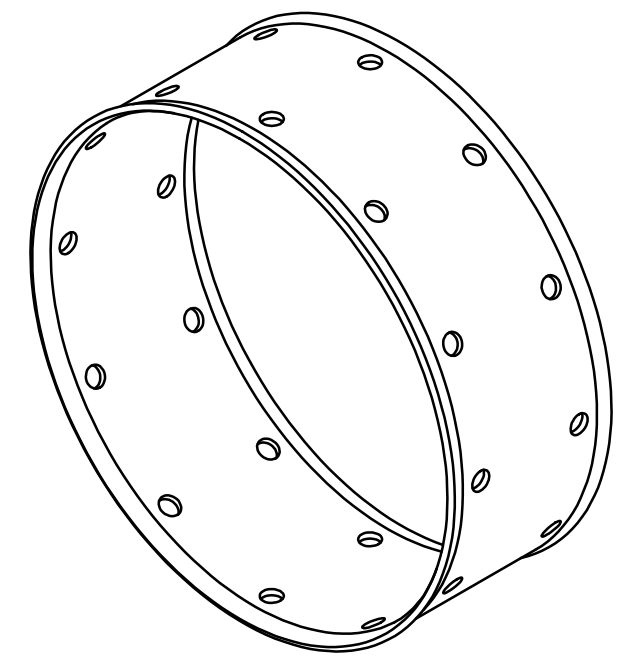
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|--------------|----------------|-----|
| TITLE | DRAWING NO : | REV |
| HEX BOLT M16 | 4-47-200-01986 | 01 |



SECTION A-A
SCALE 1 : 4



DETAIL B
SCALE 1 : 1



NOTE:

1. TOLERANCE FOR LINEAR DIMENSION ± 1 .
2. TOLERANCE FOR ANGULAR DIMENSION $\pm 1^\circ$.
3. THE ENDS ARE TO BE FLARED SMOOTH AT THE MARKED PLACE (***) IF THERE IS ANY WRINKLE OR FOLDINGS IT SHALL BE GROUND SMOOTH TO THE FLARED CURVATURE

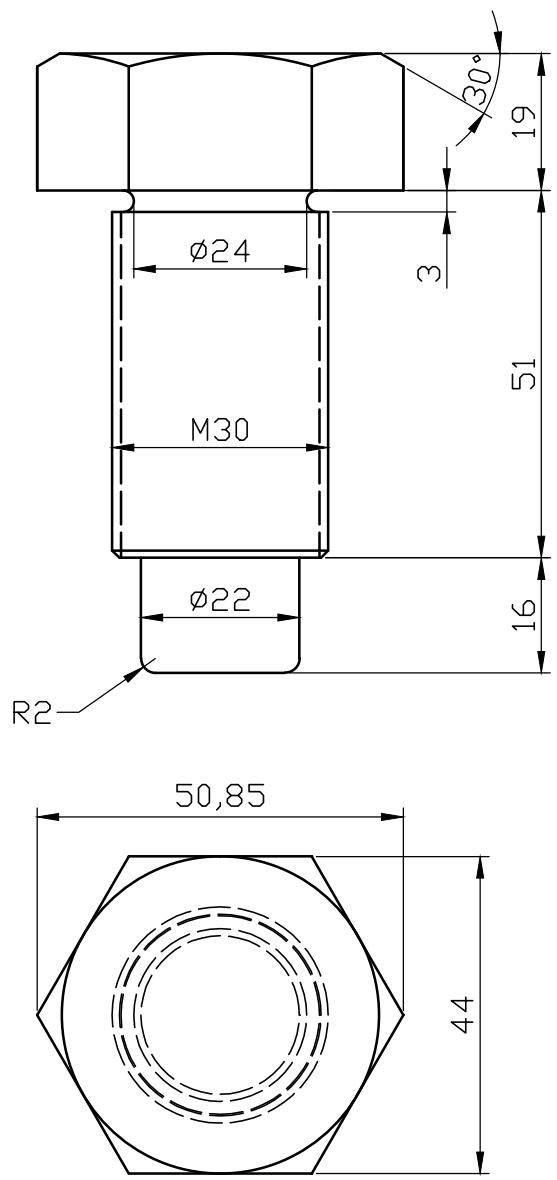
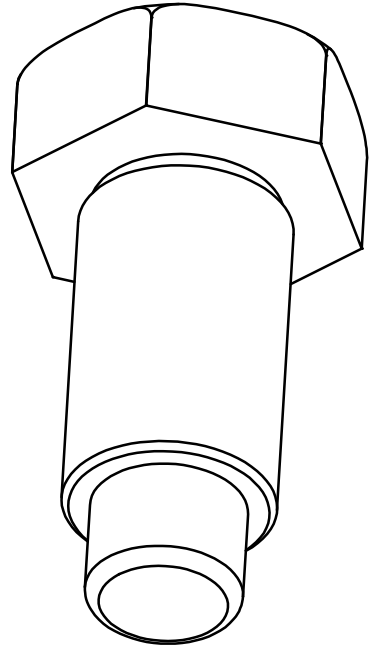
| | | | | | | | | |
|----------------|-------------|-------------|-----|----------------|---------------|----------------|------|-------------|
| VARIANT NUMBER | ITEM NUMBER | DESCRIPTION | STD | DRAWING NUMBER | 15-011-098 | A/C/P | UNIT | 52.574 |
| | | | | | IS 2062Fe10WA | | | 1 |
| | | | | | ITEM NO | MATERIAL CODE | DI | UNIT WEIGHT |
| | | | | | VAR NO | MATERIAL SPECN | | QUANTITY |

| | | | | | | | |
|--|--|--------------------------|------------|---|-------------|-----------------------|--------|
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| | | | | Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014 | | DRN | NAME |
| DEPT FS | | ALL DIMENSIONS ARE IN MM | PROJECTION | SCALE | WEIGHT (Kg) | REF TO ASSY / OLD DWG | |
| CODE 129 | | | | | | NTS | 52.574 |
| TITLE | | | | DRAWING NO : | | REV | |
| MIDDLE RING 28" | | | | 3-47-200-01820 | | 00 | |



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| | | |
|-----|------|--------------|
| REV | DATE | ALTERED : |
| 01 | | CHD & APPD : |



| | | | | | | |
|----------------|-------|-----|------------------|-------|------|-------------|
| VARIANT NUMBER | ROD Ø | STD | MATERIAL CODE | A/C/P | UNIT | 0.575 |
| | | | | | | UNIT WEIGHT |
| DESCRIPTION | | | ASTM A325 TYPE-B | | | 1 |
| | | | | | | QUANTITY |



Bharat Heavy Electricals Ltd
 UNIT: HIGH PRESSURE BOILER PLANT
 TIRUCHIRAPALLI - 620014

| | | | |
|------|-----------------|-----------|----------|
| DRN | NAME | SIGNATURE | DATE |
| CHD | Bimal.Chowdhury | -sd- | 11.03.14 |
| APPD | Shankar Naik V | -sd- | 11.03.14 |
| | JVV Aruna kumar | -sd- | 11.03.14 |

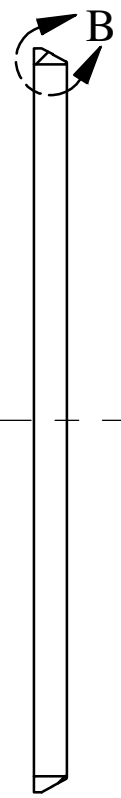
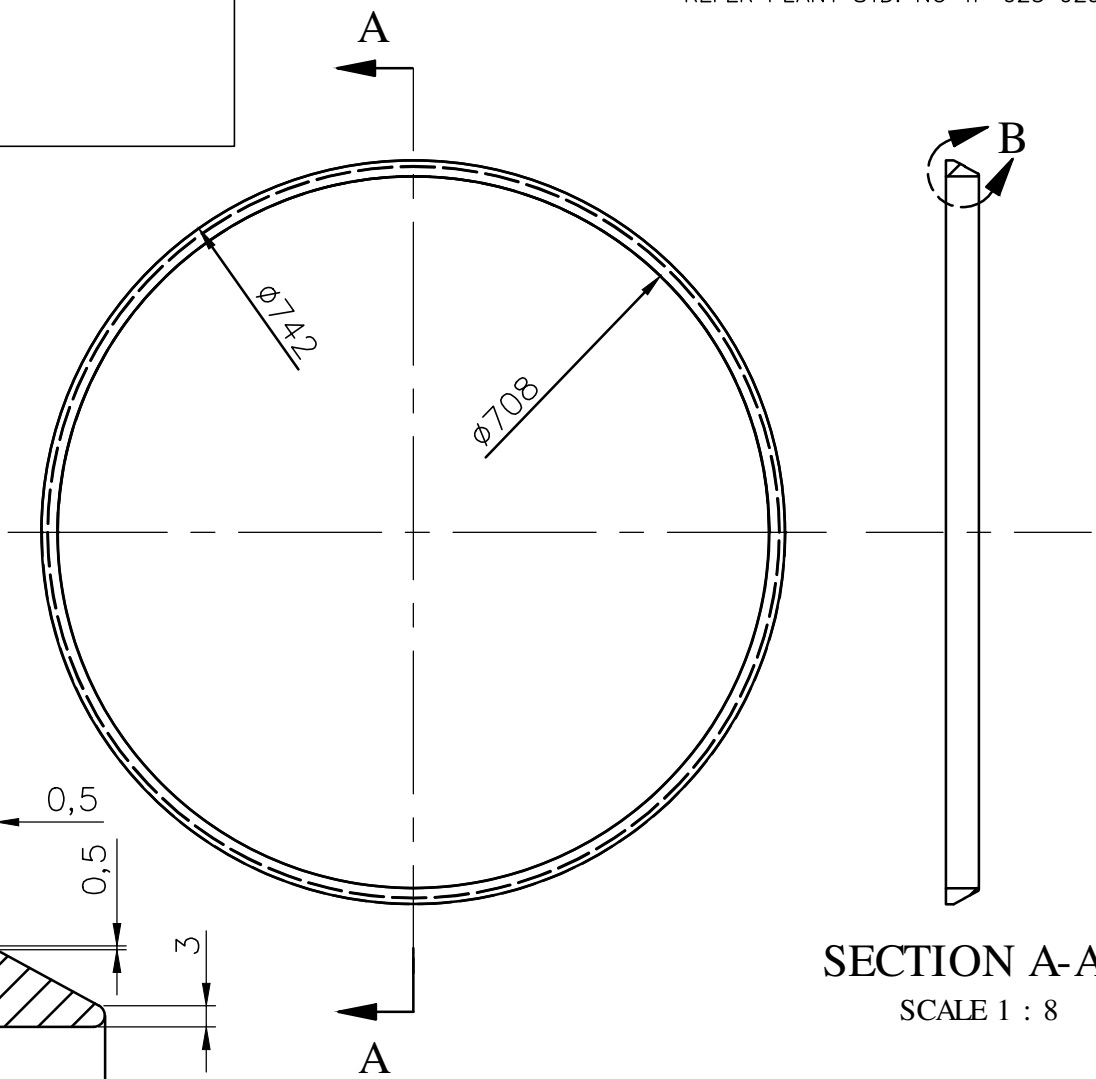
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| CODE | 129 | | | 1:1 | 0.575 | |

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|-----------|----------------|-----|
| TITLE | DRAWING NO : | REV |
| SCREW M30 | 4-47-200-01987 | 00 |

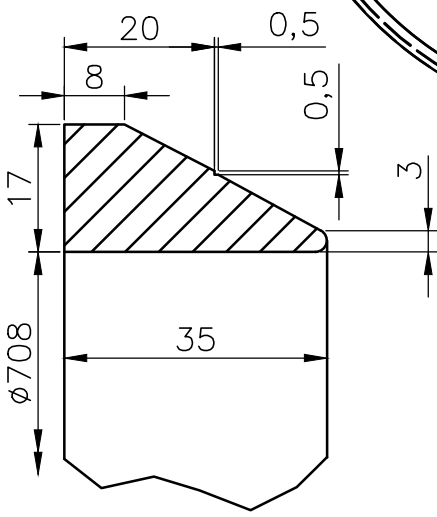
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| | | |
|-----|------|--------------|
| REV | DATE | ALTERED : |
| 01 | | CHD & APPD : |

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD. NO TP 023 0299






SECTION A-A
SCALE 1 : 8



DETAIL B
SCALE 1 : 1

| | | | | | |
|----------------|-----------------------|-----|----------------|-------|-------------|
| VARIANT NUMBER | GASKET: ID $\phi 708$ | STD | MATERIAL | NO | 1.130 |
| | | | | | 1 |
| DESCRIPTION | | | MATERIAL CODE | A/C/P | UNIT WEIGHT |
| | | | MATERIAL SPECN | | UNIT |

| | | | | | |
|--|---|---|---------------------|-------------|-----------------------|
|  355-056 | Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014 | DRN | NAME | SIGNATURE | DATE |
| | | CHD | RAVI SHANKAR PRASAD | -sd- | 22.03.2017 |
| | | APPD | GANGADHAR MCHS | -sd- | 22.03.2017 |
| | | APPD | SARAVANA KUMAR G | -sd- | 22.03.2017 |
| DEPT | ALL DIMENSIONS ARE IN MM | PROJECTION | SCALE | WEIGHT (Kg) | REF TO ASSY / OLD DWG |
| FS | |  | | 1.1302 | |
| CODE | 129 | | | | |
| TITLE | | | DRAWING NO : | | REV |
| SLEEVE COUPLING GASKET 28" | | | 4-47-200-02041 | | 00 |

| | | |
|--|---|--|
|  | BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS | DOC No: TDC:5:189 Rev: 03 Effective Date: 01/08/2015 Page: 1 of 6 |
| Product: Pipe Couplings with Gaskets for use in Fuel Systems | | |

Record of Revisions:

| Rev. No. | Clause No. | Details of revision | Remarks |
|----------|------------|---|---------|
| 02 | ---- | Totally revised | |
| 03 | ---- | Revised in entirety to indicate latest standards & requirements of suitable strapping arrangement for preventing slipping/missing of gaskets from the pipe coupling assemblies. | |

1. SCOPE:

This TDC details out the technical requirements for procurement of pipe couplings with gaskets used in fuel systems.

2. REFERENCE DOCUMENTS:

- a) Purchase specification and drawings
- b) AWWA Std.C-606 (latest revision)

3. GENERAL:

- 3.1. The pipe coupling are of mechanical type connecting coal lines with a positive grip which allows some degree of angular deflection .The couplings are of three types:
 - a) Shoulder/Groove type
 - b) Sleeve type
 - c) Slip on type
- 3.2. The coupling gasket should be manufactured as per BHEL drawing and purchase specification.
- 3.3. The manufacturer shall obtain approval from BHEL/QA for vendors for critical components like coupling housing, track bolts, follower ring and silicon gaskets, if procured from sub-vendors.
- 3.4. In case of any discrepancy in the requirements of this TDC & standards indicated/referred, requirements specified in this TDC shall prevail.

4. TECHNICAL REQUIREMENTS:

4.1. Applicable material specifications (latest revisions as on the date of PO) :

a) Shoulder/Groove type couplings:

Coupling Housing: ASTM A 536 Gr 65-45-12 or ASTM A47 Gr 32510
Track bolt: SA 105 or BS 970 080 M40 (EN8)
Nut: IS 1367 Part - 6 Cl 6

b) Sleeve type couplings:

Middle ring: IS-2062 E250 Gr-A or Gr B (refer BHEL drawing)
Follower ring: ASTM A 536 Gr 65-45-12
Bolt & Screw: ASTM A 325 Type 3 Class: B or IS 1367 Part-3 Property Class 10.9.
Nut: IS 1367 Part - 6 Cl 6

c) Slip on type couplings - Refer to latest revisions of Engineering Specification Nos: GF-295 for 18" (OD), GF-121 (for 20 3/4", GF-234 for 24 3/4" and GF-235 for 36 3/4".

Middle ring: AISI 410
Follower ring: ASTM A 27 Gr 70-36 or ASTM A 536 Gr 65-45-12
Bolts: ASTM A 325 Type 3 Class: B or IS 1367 Part-3 Property Class 10.9.
Nut: ASTM A 325 Type 3 Class: B or IS 1367 Part - 6 Cl 6

d) Gasket : Silicon rubber as per ASTM D2000, D412, D573, D2240, D865



Product: Pipe Couplings with Gaskets for use in Fuel Systems

- e) The manufacturer shall ensure that the casting supplier identifies the casting by punching or embossing the melt number on the material. All the relevant tests as per the material specification shall be carried out and the TC shall be provided. The foundry must send one test piece for each melt along with the castings to manufacturer.
- f) The manufacture shall identify the raw material (coupling body, follower ring, bolts & nuts) batch wise. Verify the TC for its compliance before accepting the material. Carry out the material check melt-wise for its properties. TC shall be from any government approved/NABL accredited laboratory and report shall be maintained.

4.2. MARKING AND IDENTIFICATION:

a) Shoulder/Groove type Coupling Body:

- i. The coupling body shall be given a running serial number. Match mark the segment of shoulder type coupling after machining and encircle the same by paint.
- ii. Dimensions shall be as per drawing and the profiles to be checked with template. Inspection report shall be maintained.
- iii. All castings shall be traceable to melt number, manufacturer and size of coupling.

b) Middle ring, Follower ring of sleeve/slip on type coupling

- i. Machined middle ring, follower ring shall be given a running serial number.
- ii. Conduct LPI for middle ring. No visible defects shall be acceptable and report shall be maintained. The middle ring flared portion is to be checked with template and the inside diameter is to be checked with template gauge and reported.
- iii. All castings shall be traceable to melt number, manufacturer and size of coupling.

4.3. WELDING REQUIREMENTS:

a) Welding Procedure (WPS & PQR) and Personnel/Operators (WPQ) qualifications shall be as per AWS D1.1 / ASME Sec IX.

b) All welds shall be tested by MPI as per ASTM E 709 with the following acceptance norms:

Indications which have any dimension >1.5 mm shall be considered relevant. A linear indication is one having a length > 3 times the width. A rounded indication is one of circular or elliptical shape with a length ≤ 3 times its width.

Acceptance criteria: All surfaces examined shall be free of:

- i. relevant linear indications;
- ii. relevant rounded indications > 5 mm;
- iii. four or more relevant rounded indications in a line separated by 1.5 mm or less, edge to edge.

5. SILICON GASKETS

5.1 If the coupling manufacturing manufactures gaskets, following are the requirements:

- a) Verify the raw material T.C.
- b) Visually check the coloring accelerator. It shall be free from foreign material.
- c) Silicon rubber compound shall be formed by mixing coloring accelerator in the mixing mill. Inspection report shall be maintained as mentioned below (fill actual values, after tests):

| SI No | Type of Check | Required | Actual |
|-------|---|------------------------|--------|
| 1 | Dimensions | As per Drawing | |
| 2 | Confirmation of material to Silicon | Conformity certificate | |
| 3 | Hardness on final Product Durometer (shore) A | 55 to 70 | |
| 4 | Specific gravity (Raw material) | 1.1 to 1.4 | |
| 5 | Stability of gasket dimensions | At 150°C for 3 hours | |



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The permissible variation from the original properties for silicon rubber of ASTM D2000 is as follows.

| | | |
|---------------------|---|---------------|
| Shore hardness | : | +10 max |
| Tensile strength | : | -25% to - 40% |
| Ultimate elongation | : | -30% to - 60% |

- d) Ensure that a calibrated thermometer /thermocouple is used to measure the temperature.
- e) Check all the dimensions and profile on one gasket from each production lot. Check the hardness of the gasket. The hardness shall be within 55 to 70 Durometer (shore) A.
- f) Serial number of gasket, manufacturer's code, batch no and date of manufacture shall be identified, marked/painted on the gaskets and inspection report shall be maintained.
- g) Gaskets shall be visually checked for freedom from discoloration, cracks, fissures and report to be submitted.
- h) Apply chalk power and properly pack with polythene cover.

5.2 If the silicon gaskets are bought out items for coupling manufacturer, following are the requirements:

- a) It shall be procured from BHEL approved vendors with TC and inspection report in format A, and comply with clause 5.1.(c)
- b) Check the size, profile and Durometer (Shore) A hardness on 10% of quantity as per drawing. The hardness shall be between 55 to 70 Durometer (Shore) A.
- c) **Type test for mechanical properties and heat resistance** at 175°C for 70 hours for each batch of silicon rubber gaskets as per ASTM D 865 (latest revision) **shall be done at least once in a year.**
- d) Gaskets shall be visually checked for freedom from discoloration, cracks, fissures and report to be submitted.

6. TRACK BOLTS:

6.1 If coupling manufacturer manufactures track bolts, following are the requirements:

- a) Procure the raw material with relevant TC. Identify the raw material batch-wise.
- b) For every batch, test the materials for its chemical & mechanical properties in a government recognized/NABL accredited laboratory.
- c) Check the dimensions as per drawing and maintain inspection report as given in format B.

6.2 If coupling manufacturer procures track bolts, following are the requirements:

- a) These shall be procured from BHEL approved sources with TC and inspection report as given in format C.
- b) Conduct hardness check on 10% of the quantity of bolts procured (Max. 5 nos per batch).
- c) Conduct material tests for its chemical & mechanical properties in a government recognized/NABL accredited laboratory once in every batch of bolts procured from every vendor.

6.3 Other Fasteners:

Procure the fasteners from reputed fastener manufacturers. Visually inspect on receipt and adequate evidence shall be obtained from the manufacturer to ensure the dimensions are maintained as per drawing, and it confirms to specification. Conduct Mechanical, Chemical tests at NABL approved lab and produce TC. All fasteners are to be identified with Manufacturers code and specification /Grade.

7. HYDRAULIC TESTING OF PIPE COUPLING

7.1. The coupling manufactured shall be hydraulic tested at a pressure of 300 psi for shoulder/groove type & sleeve type couplings and at 100 psi for slip on type coupling. The hydraulic testing shall be carried out both in horizontal and deflected position as detailed below.

- a) Test shall be conducted in the presence of BHEL Inspection/BHEL Authorized Inspection Agency (AIA).
- b) Before hydraulic test, it shall be ensured that the component is complete as per the drawing.
- c) Only calibrated pressure gauges shall be used for pressure measurement.



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- d) Suitable fixtures, as per AWWA C-606 (latest revision), shall be used for the Hydraulic testing. The fixture shall be inspected before the test to ensure water tightness. A non-return valve shall be provided at the water inlet to hold water at the rated pressure. The water used for hydraulic test shall be at ambient temperature, in case less than 21°C.
- e) The coupling and the gasket shall be assembled with the fixture. The assembly shall be filled with water, ensure that the air entrapped is driven off completely. Pressure shall be slowly increased to the required test pressure. The pressure shall be retained for 15 minutes. No leak is permitted. After the test, water shall be drained completely.
- f) The coupling in the fixture shall be given a deflection of 1.5 degree (max) for shoulder type coupling, 3 degree for slip on type coupling and 4 degree for sleeve type coupling. The hydraulic test shall be repeated as above.
- g) The coupling shall be removed from the fixture, dismantled and the gasket shall be visually examined for free from any damages.
- h) A hydraulic test report shall be prepared and duly countersigned by BHEL/QC or its Authorized Inspection Agency.

- 7.2. In case the test was already done by a vendor for a particular size and type of coupling, this need not be repeated by same vendor upto that size for that type of coupling as long as the raw materials for critical components are procured from BHEL approved sources and adequate controls as per Cl 4.2 are exercised during processing. However, test shall be carried out for higher sizes for which hydraulic test was not carried out earlier.
- 7.3. For all new vendors hydraulic test shall be done on one coupling of largest diameter of the size ordered (based on size required) to demonstrate his capability to comply with the specification. Based on this, hydro test in other size couplings need not be done.
- 7.4. If the vendor prefers to procure the raw material from new sources, the couplings need to be hydro tested and approval for this shall be obtained from BHEL before manufacturing. BHEL approval has to be obtained for the new source before bulk supply.

8. PAINTING, PRESERVATION AND PACKING

- 8.1. Thoroughly clean all the components. It shall be free from rust, grease, oil and other foreign materials.
- 8.2. All machined surfaces shall be applied with rust preventive oil.
- 8.3. One coat of red oxide (IS 2074) and one coat of red enamel paint shall be applied for shoulder type coupling.
- 8.4. One coat of red oxide (IS 2074) and one coat of blue enamel paint shall be applied for sleeve type.
- 8.5. One coat of red oxide (IS 2074) and one coat of smoke grey enamel paint shall be applied for slip on type.
- 8.6. Enamel paint shall be as per IS 2932.
- 8.7. If gasket is supplied along with coupling, it shall be wrapped with polythene tape (after applying French chalk) and then put on to coupling with identification of size, serial number of gasket, manufacturer's code and date of manufacture, etc. Suitable steel strapping arrangement is to be provided to prevent slipping of gaskets from the shoulder/groove type coupling assembly. The steel straps are to be provided minimum at 4 places (90 deg. apart) around the coupling. In case of sleeve or slip on type couplings, 4 angle shaped sheets to be provided at 90 deg. apart, which is to be fastened along with the coupling studs/bolts. Proper care shall be taken while attaching the steel straps (to prevent any damage to gaskets).
- 8.8. If gasket is supplied loose, it shall be placed in a polythene bag, after applying French chalk, with all required identification details like P.O., size, serial number of gasket, material code (if applicable), manufacturer's code and date of manufacture, etc.



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9. IDENTIFICATION & TRANSPORTATION

- 9.1. Manufacturer's identification mark/code number and coupling serial number, type of coupling shall be punched/stenciled on each coupling earmarked by border painting.
- 9.2. Each coupling shall be identified with PO/work order number and material code by metal tag.
- 9.3. Care shall be taken to avoid any damage during handling and transportation.

10. DOCUMENTATION

The manufacturer shall submit the following documents to M/s BHEL:

- a) Material TC for castings, track bolts and rubber compound.
- b) Lab test report of rubber compound for specific gravity, hardness and dimensional stability of gasket after heating at 150°C for three hours.
- c) Hydraulic test report (if applicable, as per Cl 7.2, 7.3 & 7.4).
- d) Certificate on shelf life for silicon gasket (for minimum period of two years).
- e) Visual inspection report(s) of gaskets.

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|---------------------------|-------------------|-----------------|----------------|-----------------------------|
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