SPECIFICATION
FOR MANUFACTURING AND SUPPLY OF BRAKE CYLINDER (8" x 8") FOR 3-PHASE (WAG-9HC/WAP-7) ELECTRIC LOCOMOTIVES"

SPECIFICATION NO.: CLW/MS/3/BRAKE CYLINDER DRAFT
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SPECIFICATION FOR MANUFACTURING AND SUPPLY OF BRAKE CYLINDER (8" x 8") FOR 3-PHASE (WAG-9HC/WAP-7) ELECTRIC LOCOMOTIVES:-

1.0 INTRODUCTION:

The specification involves the conditions governing successful manufacturing, testing and supply of Brake Cylinder, to be used on bogies for 3-Phase (WAG-9HC/WAP-7) Electric locomotives manufactured at Indian Railways/PUs.

(a) "Tenderer" means the firm/company submitting the offer for development manufacture and supply of materials against this specification.

(b) "Contractor or Successful tenderer" means the firm or company on whom the order for development, manufacture and supply of materials against this specification has been placed.

2.0 BRIEF DESCRIPTION:

Every WAG-9HC/WAP-7 locomotive fitted with 08 nos. of Brake Cylinders per locomotive. The main components of Brake Cylinder consist of several components including casting component, spring, rubber component & hardware. The Brake Cylinder is a component fitted on the bogie frame used in 3-Phase (WAG-9HC/WAP-7) Electric Locomotives in Indian Railways. The item is to be manufactured as per relevant CLW drawings, specification & STR.

3.0 EVALUATION/QUALIFICATION CRITERIA:

The tenderer must acquaint themselves adequately with the existing systems in order to offer a technically competent and suitable product.

i) Firm should be an NABCB ISO-9001 certified company.

ii) All the components shall be manufactured / procured as per the material specification given in the drawings & specification.

iii) Rubber items shall be procured from RDSO approved sources only. However, the manufacturers shall be fully be responsible for satisfactory performance of the rubber items. The rubber items shall be smooth, free from pin holes, blisters, porosities and other visual flaws.

iv) The tenderer interested in development of Brake Cylinder to CLW Drawing No. 01/03/19/56 Alt-12, should have facilities as per STR No. CLW/2023/ELDO/M/STR/0182, Rev "0" issued on March'23. The casting shall be sound & sharp without defect or blemishes of any kind and to the requirement of the drawing & specification.

v) The vendors shall indicate their casting source in the format enclosed as Annexure-'A'.

vi) Vendors to ensure that quality of bought out hardware items as per relevant drawing & specification.

vii) All the components shall be manufactured/procured as per the material specification indicated against each components in the drawing.

4.0 EQUIPMENT (M & P AND T&P) REQUIRED:

The firm should have Machinery & Plant and Measuring & Testing Equipments as per STR No. CLW/2023/ELDO/M/STR/0182, dated: 30.03.2023 and to upgrade the T&P as per requirement of para 6 of this specification.

5. TESTING

5.1 Leakage Test for Brake Cylinder complete:

5.1.1 The brake cylinder shall be mounted on the fixture to limit the piston stroke to 107-117 mm. Adjust the piston stroke to 107-117 mm and apply 10 kg/cm² air pressure and observe the leakage is not exceeded 0.1 kg/cm² in 10 minutes.

5.1.2 The below-mentioned pressure may be checked for Brake Cylinder and no leakage should be observed.

	BC pressure (Kg/cm²)	Piston Stroke to be maintained at
Initial	0.4	39 -42 mm
intermediate	2	60-63 mm
Full service	2.5	65-68 mm
Emergency	3.5	65-68 mm

5.2 Testing of Brake Cylinder Body for leakage

Before assembly, put dummy plate on the dome side and put the brake cylinder for hydraulic pressure 10 kg/cm² for 5 minutes and there should be no leakage.

6.0 INSPECTION:

6.1 The Inspecting authority shall make audit checks of the manufacturing procedure "Internal Quality Assurance System" to ensure that the brake cylinder offered for inspection is manufactured strictly as per "Internal Quality Assurance System" and the manufacturer has carried out all the tests/inspection during manufacturing stage to ensure that brake cylinder offered are strictly to the drawing & specification. During such audit checks the Inspecting Authority shall also see from the records of Internal Quality Assurance that the Raw Material used for the manufacture of brake cylinder is as per specification laid down.

6.2 The Inspecting Authority shall conduct the following checks from a lot of not more than 100 Nos.

6.2.1 Brake cylinders picked up at random shall be checked for dimensions with respect to CLW drawings & as per IS: 2500, Part-II. Necessary gauges/templates if required shall be made available by the manufacturer with valid calibration details.

6.2.2 Brake cylinders picked up at random shall be subjected to tests as given at para 5.1 and 5.2 of this specification as per IS: 2500, Part-II.

6.2.3 Two piston packing per every contract shall be tested for conformity with UIC code 831-R.

6.3 In case the samples picked up fail in any of the tests/checks indicated in para 6.2.1 to 6.2.3 the reasons for such failure shall be identified. The Inspecting Authority shall verify the reasons by conducting audit check on "Internal Quality Assurance System". If it is found that such failures are due to non-implementation of "Internal Quality Assurance System" the entire lot of brake cylinders shall be rejected. In case the failures.

6.4 Prototype Inspection:

6.4.1 Prototype inspection of Brake Cylinder shall be carried out as specified in the relevant purchase order (PO) at the vendor's premises. Following exercise shall be done prior to manufacturing prototype sample.

6.4.1.1 Firm shall submit test reports of raw materials showing the mill source, heat no., chemical analysis and mechanical properties of the material proposed for manufacturing prototype sample.

6.4.1.2 Sample/ Test bar shall be sealed at firm's premises for testing of raw material before start of manufacturing. Manufacturing shall be start only after raw material clearance by Inspecting Authority.

6.4.1.3 Manufacturing of bulk quantity shall be started only after approval of prototype. Firm shall also submit its internal dimensional and Laboratory report (NABL approved) to the Inspecting Authority including report of items outsourced during prototype inspection.

07: Inspection at firm's premises shall cover the following tests & values to be recorded:

	Inspection/Tests	Type Test	Routine Test
(i)	Dimension as per Drg. No. 01/3/19/56 Alt.12	100% of the offered quantity	Routine test as per IS: 2500 general instruction levels

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			Part II (Supplier should check themselves 100%)
(ii)	Chemical & Physical tests as per IS 210 FG 260	-Do-	-Do-
(iii)	Hardness test as per IS 210 FG 260	-Do-	-Do-
(iv)	0.1% Proof Stress as per IS 210 FG 260	-Do-	-Do-
(v)	Cleanliness of the Steel as per Drg. No. 01/3/19/56 Alt.12	100% of the offered quantity as per Drg no.	Routine test as per IS: 2500 general instruction levels Part II (Supplier should check themselves 100%)
(vi)	Ultrasonography Test	-Do-	-Do-
(vii)	DPT	-Do-	-Do-
(viii)	Leakage Test for Brake Cylinder complete as per para 5.1 of this specification	-Do-	-Do-
(ix)	Testing of Brake Cylinder Body for leakage as per para 5.2 of this specification	-Do-	-Do-

8. WTC: Work test certificate (WTC) of above tests shall be submitted by the firm.

9. QUALITY CONTROL PROCESS:

Dimensions and tolerances: - All dimensions/tolerances shall be as per details given in the relevant drawings. Detailed dimensional control charts shall be prepared indicating individual dimensions with tolerances for stage inspections based on the drawings during manufacturing of Brake Cylinder in which measurements of critical dimensions shall be recorded and kept for evaluation and verification by the Inspecting Agency. All un-tolerance dimensions shall be maintained in accordance with E.A.I.2400. If not indicated in the relevant drawings. Gauges, fixtures, templates with proper and accurate measuring instruments (currently calibrated) shall be used to ensure correctness of the measured dimensions.

10. QUALITY ASSURANCE SYSTEM:

The Vendors shall have NABCB accredited ISO-9001 series Quality Management System certification with existing validity.

11. IDENTIFICATION MARKS:

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Each Assembly/subassembly/Individual component shall have clear readable marking on its body. The marking shall be as following:

a) Manufacturer's name or trademark if any.
b) Month and year of manufacture.
c) Part No./Drg. No./Type No./ Running Serial No.
d) Batch No. if any.
e) Important technical data, such as rating, if any.

12. PAINTING:

The exterior of the brake cylinder shall be painted with one coat of anti-corrosive primer & finish coat of Stone Grey RAL 7030. Painting to be done as per specification mentioned in drawing.

13. GUARANTEE/WARRANTY:

The manufacturer/supplier shall guarantee for all the items as per IRS conditions of contract (latest revision).

14. PACKING & TRANSPORTATION:

14.1 The manufacturer shall ensure that all external ports of brake cylinders are suitably covered with protection caps to prevent ingress of foreign matter during handling and storage.

14.2 The manufacturer shall also ensure that brake cylinders in assembled condition are adequately packed before dispatch to prevent damage in handling and storage.

14.3 Material is to be supplied in proper wooden packing and it shall be ensured that packing should be waterproof to ensure delivery without any transit damage. Suitable plastic caps should be provided in mounting holes & in flange holes.

15. REFERENCES:

i) Drawing. No. 01/3/19/56 Alt.12
ii) STR No. CLW/2023/ELDO/M/STR/0182, Rev "0"
iii) IS 2500 (latest revision)
iv) IS 210 FG 260 (latest revision)

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Annexure-A

Past experience in the field of Casting & Machining (copy of relevant document to be attached)

SN	Year	Client's name & address	Item (s)	Weight of single piece (MT)	Numbers of pieces supplied	Total executed order value (Rs)	Remarks

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