



ATP FOR ENGINE BRAKE VALVE

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ACCEPTANCE TEST PLAN ENGINE BRAKE VALVE



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Amendment Record

Amendment No.	Date	Para / Section No.	Remarks

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1.0 SCOPE:

This document is applicable for the manufacture of parts, assembly and testing (both performance and endurance) of the Engine Brake Valve. This document is to be followed by the manufacturer, QC and customer.

2.0 FUNCTION:


Engine Brake Valve consists of an Air Cylinder mounted on a bracket and a butterfly valve. The air cylinder actuates the Butterfly valve.

The unit is used to restrict Engine exhaust, generating back pressure and thus the power of the engine is absorbed during the exhaust braking.

3.0 TECHNICAL SPECIFICATIONS:

Sl.No	Parameter	Specification
3.1	Working medium of Cylinder	Air
3.2	Normal Working Pressure	8 bar
3.3	Maximum permissible pressure	10 bar
3.4	Normal Thermal range of operation	+ 50°C to + 80°C
3.5	Extreme Thermal range of operation	- 40° C to + 100°C
3.6	Air cylinder Bore diameter	40 mm
3.7	Air cylinder Stroke	40 mm
3.8	Air Pressure to operate the butterfly valve	≤4 bar
3.9	Air pressure to fully close the butterfly valve	5.2 bar max.
3.10	Exhaust Gas temperature	450°C Maximum
3.11	Installation dimension	As per assembly drawing
3.12	Overall dimension	As per assembly drawing
3.13	Weight	As per assembly drawing

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4.0 GENERAL REQUIREMENT:

The supplier shall dismantle the given Imported Sample and carry out Material analysis and arrive at an equivalent Material, specify the same in the drawing prepared. The supplier shall prepare the part drawings / Assembly drawing and submit the same to BEML.

Air cylinder will be supplied by BEML to the supplier as free issue material (Air cylinder is not there in supplier scope) but it has to be mounted on the Engine Brake valve and testing to be carried out by the supplier.

The supplier shall test all the raw materials as per relevant drawing and specification for both Mechanical, Chemical properties prior to machining/assembly. The raw materials that are meeting the drawing/specification requirements are only to be used. The test reports for the raw materials shall be submitted to BEML-QA by the supplier during delivery of the item.

Detailed inspection of the components for dimensions, surface finish etc (as per drawing/specification) shall be carried out by the QC personnel of supplier and records are to be maintained. The parts shall be made available to the BEML-QA agency for verification.


The supplier shall carry out the Functional checks of ENGINE BRAKE VALVE prior to submission to the BEML-QA. The supplier shall offer the Test Reports and the dimensional check sheets to the BEML-QA agency.

During the manufacturing stages (part manufacture, assembly, testing), items that are meeting the specification requirements shall only be considered for acceptance test.

5.0 TEST SCHEDULE:

S. No	Test parameter	Test (ref)	Sampling	Supplier	BEML	CQA (BEML)
1	Visual Inspection	6.1	100%	P	W	R
2	Dimensional checks of components.	6.2	100%	P	W *	R
3	Chemical, Mechanical etc.,	6.3	One sample for each batch	P	R	R

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4	Completeness of assembly	6.4	100%	P	R	R
5	Leak test	6.5	100%	P	R	R
6	Performance Test for 100 Cycles	6.6	100%	P	R	R
7	Endurance Test for 50,000 Cycles	6.6	One number from pilot batch	P	W	W
8	Fitment and Functional Test on applicable vehicle	6.7	One number from pilot batch	W	P	W

P: - Perform, W: - Witness, R: - Review, * on sampling basis

5.1 ACCEPTANCE CRITERIA:

As per the manufacturing drawings and specification.

6.0 TEST PROCEDURE:

6.1 Visual Inspection: The objective of this check is to ensure all the parts, sub assemblies, assembly are free from physical/mechanical defects like blow holes, cracks etc.

6.2 Dimensional checks: All components used in Engine Brake are to be checked for dimensional parameters & technical conditions with appropriate instruments and recorded in the check sheets before assembly.

6.3 Chemical, Mechanical Tests: The test shall be conducted on samples or the actual components for their Chemical, Mechanical, (as applicable), hardness, etc., properties and values are compared as per the Std/Drawing requirement before taking up for next processing.

6.4 Completeness of Assembly: The Engine Brake assembly is checked for fitment of all the items as specified in the BOM. The Supplier shall prepare the detailed assembly procedure and adhere to the same.

The Name plate shall have the Vendor Code, SI.No, Month / Year of Manufacturing. The same to be riveted at the proper location as specified in the drawing.

6.5 Leak test: At 8 bar pressure, the maximum permissible leakage in the air cylinder is 10cm³/min (At standard atmospheric condition)

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6.6 Performance Test: The unit is subjected to Performance Test at ambient conditions with 8 bar pressure to the Air cylinder as detailed below.

Parameter	Specifications
Air Pressure	8 bar
Frequency	30 cycles /minute
Total cycle	100 cycles

At the end of the Performance test, the unit shall function smoothly.

6.7 Endurance test:

The unit is subjected to endurance test with 8 bar pressure to Air cylinder as given below:

Parameter	Specification
Pressure	8 bar
Frequency	30 cycles /minute
Total cycle	50,000 cycles

At the end of endurance test, the unit shall function smoothly and when leak test is carried out as per SI No: 6.5, the leakage shall not exceed 1500cm³/min (At standard atmospheric conditions) . The unit shall also meet the requirements of performance as per SL No: 3.8 and 3.9

7.0 ENVIRONMENTAL TESTS:

7.1 Low Temperature test:

The unit is kept in a chamber at a temperature of - 40°C for 16 hours. After this test, the unit shall pass leak test as per clause number 6.5 and meet the performance requirements as per SI No: 3.8 and 3.9 when tested at room temperature.

7.2 High Temperature test:

The unit is kept in a chamber at a temperature of +100°C for 24 hours. After this test, the unit shall pass leak test as per clause number 6.5 and meet the performance requirements as per SI No: 3.8 and 3.9 when tested at room temperature.

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7.3 Salt spray test:

The unit is subjected to the salt spray test (NSS) for a period of 96 hours as per ISO 9227.

No red corrosion allowed on the external surface of the structural parts

7.4 Vibration Test

The unit shall be subjected to a Vibration test of 50,000 cycles at a Frequency of 50 Hz and +/- 8 'g' acceleration. After this test, the unit shall pass as per clause number 6.5 and meet the performance requirements as per SI No: 3.8 and 3.9

8.0 REFERENCE DOCUMENTS:

- BEML Drawing No: 130 0 7530 0 21 4

9.0 RECORDS:

- Material test reports
- Dimensional inspection reports
- Performance test report
- Calibration certificates related to the instruments used
- Endurance test data.

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