

INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY

[A Division of NATRIP Implementation Society (NATIS), Govt. of India]

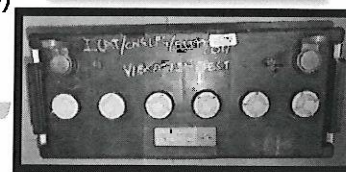
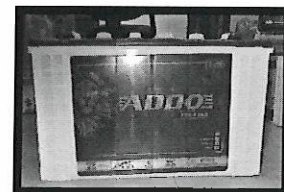
Non-Transferable

TEST REPORT






C T O B M 5313

Date: 05.10.2017

- 1.0 NAME AND ADDRESS OF THE: M/s. EASTMAN AUTO & POWER LIMITED**
CUSTOMER Khasra No. 315/252/1-4 Nalagarh Pinjore Highway
Nalagarh District Solan (H.P.) 174101, India
- 2.0 NAME AND ADDRESS OF THE: Same as Sr. No. 1.0**
MANUFACTURER
- 3.0 CUSTOMER LETTER REF: IOCS No. CCTNEAPLMHEEG53399 Dated 19-Jul-2017**
- 4.0 DESCRIPTION OF DEVICE UNDER TEST (DUT):**
DUT Name : Battery Module, 12 V
Battery Type : Lead Acid Battery
Battery Capacity(Ah) : 90 Ah (Ah in 5 hrs)
Id/Model No. : AD 1206ER
Quantity : 06 Nos.(ICAT/CNG-LPG/53399/01-06)
Trade Name : ADDO
Drawing No. : EAP-ER-40-0251






- 5.0 OBJECTIVE OF THE TEST:**
To validate the Safety Requirements of Traction Batteries as per AIS: 048 amended up to date
- 6.0 TEST RESULTS:**
Please refer the Test requirements and Results in **Annexure-I** of this report.
- 7.0 CONCLUSION:**
The battery specified in **Sr. No. 4.0** of this test report met all the test requirements when tested as per AIS: 048 amended up to date.

Prepared By	Checked By		Approved By	 Page 1 of 7 + Dwg (01) [53399]
				
UDIT KAUL Asst. Manager	MADHUSUDAN JOSHI Dy. General Manager		PAMELA TIKKU Sr. General Manager	

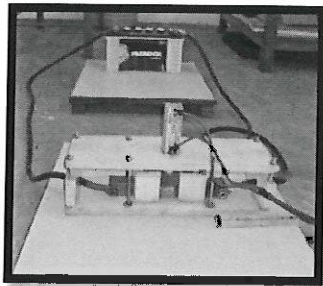
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10. The appropriate local court at Gurgaon shall have the jurisdiction in respect of any dispute, claim or liability arising out of this report.


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Annexure – I




1.0 TEST REQUIREMENTS AND RESULTS:

Cl. No.	Test	Test Requirements	Observations/Results
2.1 Electrical Tests			
2.1.1	Short Circuit test (Test ID:ICAT/CNG-LPG/53399/01)	 <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature.</p> <p>Apply a hard short in less than one second to the battery module with a conductor specified in the standard.</p> <p>Test Duration: 10 minutes, or until another condition occurs which prevents completion of test (i.e. component melting, etc.)</p> <p>Lab temperature: Not exceeding 30°C</p> <p>Acceptance Criteria:</p> <p>After 2 hours of observation:</p> <p>At the end of the test, there shall be no:</p> <ol style="list-style-type: none"> Physical damage to the casing or mechanical parts. Melting of components. Fire or explosion. <p>It is acceptable for the battery to become dry at the end of the test.</p>	<p>Ambient temperature : 29°C</p> <p>Conductor of $\leq 5\text{m}\Omega$ was used and short was applied for 10 minutes.</p> <p>No physical damage, explosion or melting observed.</p> <p>Satisfactory.</p>


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2.1.2	Over Charge test (Test ID: ICAT/ CNG-LPG/53399/02)	 <p> Battery Condition: Fully charged (100% SOC), contained at ambient temperature at $27 \pm 5^\circ\text{C}$. Duration: 10 hours The battery is to be overcharged at a constant charging current of 0.1 (C_{10}). </p> <p> Acceptance Criteria: At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts. b) Melting of components. c) Fire or explosion. </p>	<p>Battery was charged with 10 A for 10 hours.</p> <p>No physical damage, melting or explosion observed.</p> <p>Satisfactory.</p>
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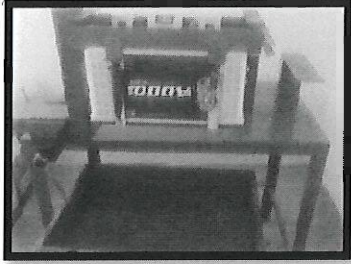

2.2 Mechanical Tests




2.2.1	Vibration test (Test ID: ICAT/ CNG-LPG/53399/03)	 <p> Battery Condition: Fully charged (100% SOC), contained at ambient temperature, firmly held on the vibration table in vehicle mounting position. Axis: Vertical and Horizontal axis, with battery positioned in longitudinal direction. Acceleration: 3 g (sinusoidal vibration) Frequency: 30-150 Hz Sweep rate: 1 octave per minute Duration: 2 hours in each axis Immediately after the test, discharge the battery at room temperature not exceeding 30°C, at the rate of $I = 0.2 \times \text{Battery capacity}(C_5)$ </p> <p> Acceptance Criteria: During test, there shall be no electrolyte loss. The deterioration of battery rated capacity during discharging shall not be more than 10%. At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts b) Fire or explosion </p>	<p>No electrolyte loss observed during test.</p> <p>Immediately after the test, battery was discharged at 18 A And deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p>Satisfactory.</p>
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2.2.2	<p>Shock test (Test ID: ICAT/CNG-LPG/53399/04)</p>	  <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature not exceeding 30°C, firmly held on the vibration table in vehicle mounting position. Axis: Vertical and Horizontal axis, with battery positioned in longitudinal direction. Acceleration: 30 g (half-sine wave) No. of shocks: 10 in each axis Duration: 15 ms of each shock Immediately after the test, discharge the battery at room temperature, at the rate of $I = 0.2 \times \text{Battery capacity}(C_5)$ Acceptance Criteria: The deterioration of battery rated capacity during discharging shall not be more than 10%. At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts b) Fire or explosion.</p>	<p>Immediately after the test, battery was discharged at 18A and deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p>Satisfactory.</p>
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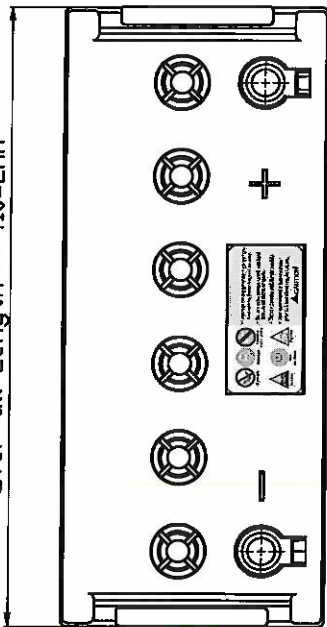
2.2.3	Roll-Over Test (Battery Module) (Test ID: ICAT/CNG-LPG/53399/05)	 <p>Rotate the battery module one complete revolution in one direction, for one minute in a continuous, slow-roll fashion, and observe leakage, if any.</p> <p>Then rotate the battery module in 90° increments in same direction for one full revolution. Hold the battery module for one hour at each position.</p> <p>Acceptance Criteria: The volume of electrolyte spilled in each position shall not be more than 25 ml per module.</p>	<p>Spillage observed was less than 25ml in each position.</p> <p>Satisfactory.</p>
2.2.4	Penetration Test (Test ID: ICAT/CNG-LPG/53399/06)	 <p>The battery module shall be penetrated with a mild steel (conductive) pointed rod, which will be electrically insulated from the test fixture.</p> <p>Rate of penetration: 8 cm/s.</p> <p>Diameter of Rod: 20mm</p> <p>Orientation of penetration: perpendicular to the electrode plates.</p> <p>Minimum Depth of penetration: Through three cells or 100 mm</p> <p>The battery should be observed, with the rod remaining in place, for a minimum of one hour after the test.</p> <p>Acceptance Criteria: At the end of the test, there shall be no: a) Melting of components. b) Fire or explosion.</p>	<p>After penetration, up to a depth through three cells with a pointed mild steel rod of diameter 20mm, electrically insulated from the test fixture, no explosion, no fire and no melting observed.</p> <p>Satisfactory.</p>

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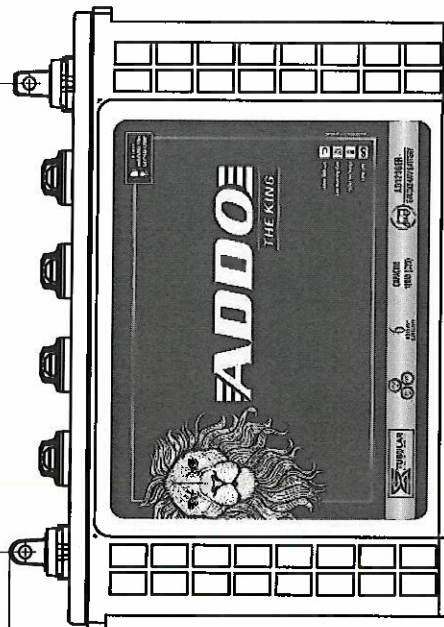
Test report no:- CT0BM5313 Dated:- 05.10.2017

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Over all Length = $410 \pm 2\text{mm}$

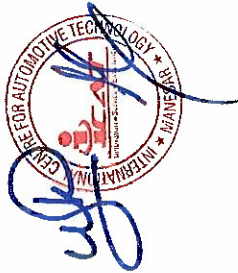
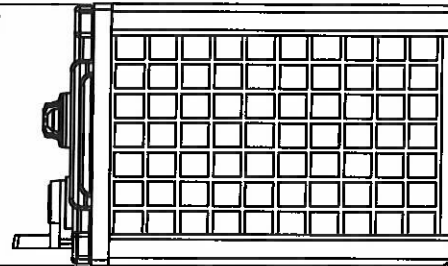


310



Over all Height = $283 \pm 2\text{mm}$

Over all width = $172 \pm 2\text{mm}$



Note :-
Battery Should be Free from dent, scratches, dust etc

REV.	DATE	DESCRIPTION					INITIALS
Material :-		2016	NAME	SIGN	DATE		Eastman Auto & Power Ltd. Nalagarh - HP - India
—		DRN	Mukesh		01/06/2017		
		CHD	R.K		01/06/2017		
Finish :-		APPD.	MDS		01/06/2017	FINISH BATTERY (AD1206ER)	Drg.No. :- EAP-ER-40-0251
Smooth		SCALE :-		NOT TO SCALE			
Drg.Uni. :-		Unless Otherwise Specified					
MM		Tolerance ± 0.2					
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