



LME:009C

LOCOMOTIVE ENGINEERING DEPTT.

PURCHASE SPECIFICATION

LME/ PUR/ 195  
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SHEET 1 OF 6

# SPECIFICATION

OF

# LEAD ACID BATTERY

FOR

350HP/700HP(TPP)DIESEL ELECTRIC LOCOMOTIVE

**Note-This Specification Supersedes Earlier Specification No.-LE/DESL/116**

Enclosures : Nil

Rev	Date	Prepared	Rev	Date	Prepared	Rev	Date	Prepared
		Approved			Approved			Approved
Rev	Date	Prepared	Rev	Date	Prepared	Rev	Date	Prepared
		Approved			Approved			Approved

*Sushil Kumar*  
30/07/05

Prepared by :

*SV*

Checked by :

*SVelma*  
30.7.5

Approved by :

Distribution : Loco Prodn. (001)    Loco PPC (002)    Loco QC (003)    Tech. (004)    CQX (005)



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## 1. GENERAL

1.1. This specification covers the manufacture and supply of lead acid battery to be used on 350hp and 700hp(TPP) diesel electric locomotive for cranking of the diesel engine through starter motor and supply the auxiliary load during running of the diesel engine. One set of battery shall consist of 3 battery of 8Volts.

## 2. Clause wise Clause Commentary

The supplier shall provide a valid and fully compliant proposal for the equivalent as detailed in the technical specification. The supplier shall submit a detailed clause-by-clause commentary on all the clauses of the technical spec. Where the tenderer is not able to comply fully with certain clauses and proposes an alternative design, the deviations shall be consolidated and listed separately. An offer without a clause by Clause Commentary and consolidated list of deviations as stated above is liable to be treated as unresponsive and be rejected.

**The suppliers are required to put one of the following comments against each clause-**

- (I). "We comply" - Further substantiation/alternative offer may be furnished here  
(II). "We do not comply" - Further substantiation/alternative offer must be furnished here

Clause by Clause Commentary shall be furnished in the following format: -

Clause No.	"We Comply"/ "We do not Comply"/	Remarks/ Alternative Offer

## 3. Service Condition

### 3.1. Ambient Temperature

0° C to 70° C with maximum relative humidity of 100% (Saturation). The locomotive will be working in altitude up to maximum of 1000 meters above sea level.

Prepared By *Jushil Kumar*  
30/07/15

Checked By *SV*

Approved By *S Velma*



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### 3.2. Shocks and Vibrations

During normal working of the locomotive the equipment will be subjected to vibration and buffing shocks as indicated below:

Vertical acceleration	-	1.0g	Maximum
Lateral Acceleration	-	0.5g	Maximum
Longitudinal Acceleration	-	3.0g	Maximum

### 4. Compliance with National Standards

The lead acid battery shall comply with IS 5154-latest revision.

### 5. Dimension and Tolerances

Manufacturer should specify dimensional tolerance for the Lead Acid Battery to be supplied against this spec.

### 6. Deviation

Any deviation from the standard laid down with a view to improve the performance, utility, efficiency and reliability may be given due consideration provided full particulars and justifications there of are furnished along with the offer.

### 7. Technical Documents and Drawing to be furnished by the supplier as part of the contract

7.1. Following documents shall be supplied along with the offer: -

7.1.1. Size of the Battery

7.1.2. Discharge curve of the battery

7.1.3. Clause wise clause comments on the purchase spec.

7.1.4. Inspection and Test Plan shall be submitted to BHEL for approval and testing to be done as per duly approved test Plan.

7.1.5. Instruction manual of the battery covering charging procedure for the first charging and routine charging. Details for both constant voltage charging as well as constant current charging.

7.2. Test certificate (Type and Routine) duly signed by BHEL Representative shall be submitted along with the Lead Acid Battery.

Prepared By *Sushil Kumar*  
30/07/05

Checked By *SV*

Approved By *S. K. Sharma*



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### 8. Drawings/Documents

The supplier should submit the following drawing /documents after award of contract: -

- I) General arrangement Drawings showing OGA of the battery along with the details showing the lifting arrangement.
- II) Data sheets for the Battery.
- III) Three copies of the manual shall be supplied with each set of battery after award of the contract

### 9. Commissioning

Commissioning shall be in the scope of BHEL, however if any assistance is required during commissioning supplier shall depute their representative free of cost.

### 10. Guarantee

The supplier shall guarantee all the equipments as a whole against any manufacturing, material and workmanship for a period of 30 months from date of dispatch or 24 months from date of commissioning whichever is earlier. In case any damage or defect noticed during this period due to defective material or workmanship, the damaged cell shall be replaced free of cost by supplier.

### 11. Submission of Tender Quotation

All tender documents and quotation shall be submitted in duplicate.

### 12. Technical Specification

#### 12.1. Scope of Supply

The scope of supply under this purchase specification Shall be as given below:-

- (A). 3 X 8Volt Lead Acid Battery in dry and uncharged condition - 1 Set
- (B). Inter Unit Connectors – 2 Nos.
- (C). Lugs for Connecting Cables – 2 Nos

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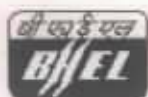
*Sushil Kumar*  
30/07/05

Checked By

*SV*

Approved By

*S Velma*



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## 12.2. Construction

One set of battery shall consist of 3 X 8Volts batteries with the following details

a).	Battery Voltage	24Volts
b).	No of cells	12
c).	Voltage of each battery unit	8 Volts
d).	No. of battery unit	3 nos.
e).	Initial Cranking Current	800Amps.
f).	Control Equipment current	30 Amps.
g).	Dimension of each 8 Volts battery unit (in mm)	440(L) X 180(W) X 400(H)
h).	Dimensional tolerance	±5 mm
i).	Ampere Hour Capacity	180AH at 5Hour rate at 30°C.
j).	Container	Each 8 V battery shall be housed in the hard Monoblock rubber container to IS 1146.
k).	Inter unit connector	Two nos. inter unit connectors shall be provided to connect the batteries when they are placed adjacent to each other As shown in the Figure 1 on page no.6.
l).	End Connection	Suitable lugs to be provided on the two ends for connection of the cables to the battery. The cables to be connected to the battery shall be 50mm <sup>2</sup> and cable is not in the scope of the supply of the battery manufacturer.

## 12.3. Marking

Each battery shall have the following detailed marking:

- Manufacturer's brand name
- Date of manufacture
- Type no. of the battery
- Serial no.
- Specific gravity
- Maximum and minimum water level marking

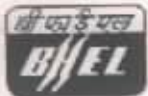
Prepared By Euski Kulkarni  
30/07/05

Checked By

SV

Approved By

S Verma



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**12.4. Tests**

12.4.1. The battery shall satisfy all the test and performance requirement of IS5154-Latest Revision.

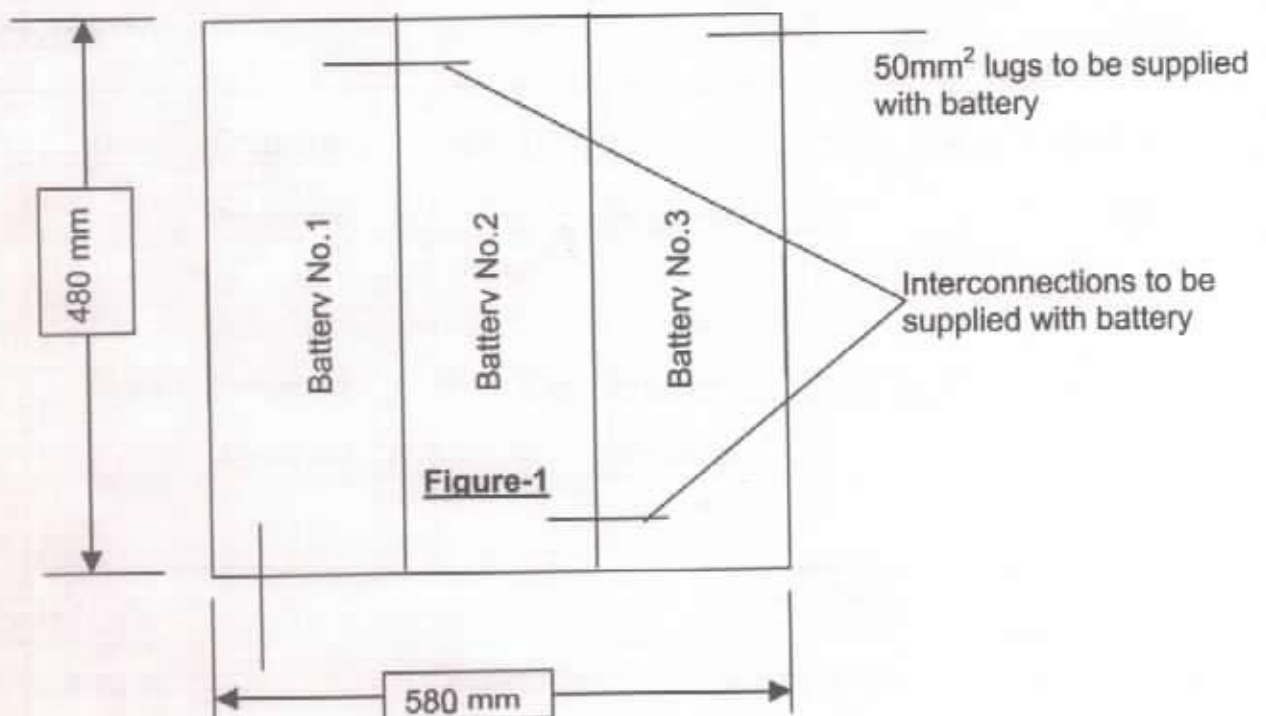
**12.5. Inspection**

12.5.1. The battery shall be subjected to inspection by BHEL or it's authorized representative at supplier works either it is covered separately in Purchase order or not.

12.6. Supplier should give minimum 15 Days notice for inspection of the battery.

**12.7. General Plan Layout of the Battery**

General plan Layout of the Battery shall be as follows



Prepared By Dushil Kumar  
30/07/05

Checked By SV

Approved By S.Velma