A. Testing without load

Visual inspection	for external leaks
Acid level	should reach to max., see figure 1
Acid density	should be identical in all cells, see figure 2, charge condition see table

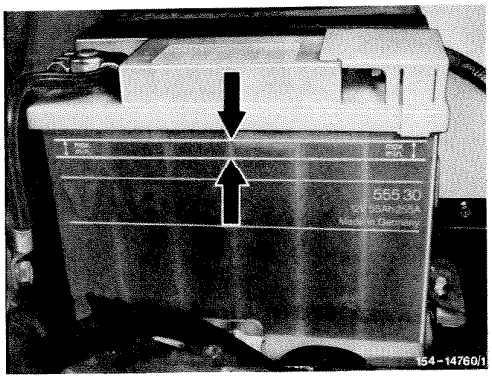
Charge condition

Charge condition with acid density in kg/dm³ and at 20 °C	charged	normal tropics	1.28 ± 0.01 1.28 ± 0.01	(okay)
	half charged	normal tropics	1.20 1.16	(recharging required)
	discharged	normal tropics	1.12 1.08	(recharge immediately)
Antifreeze protection	charged	normal tropics	–65 –40	
	half charged	normal tropics	–30 –13	
	discharged	normal tropics	–4 –1	

1. Checking fluid level

Should reach to the max. mark, visible on the battery from the outside.

Note: If the acid level is corrected, the battery must be recharged until start of gassing before measuring the acid density.



2. Testing the acid density

a)

– 1	2	3	4	5	6
1.28	1.28	1.28	1.28	1.16	1.28 +

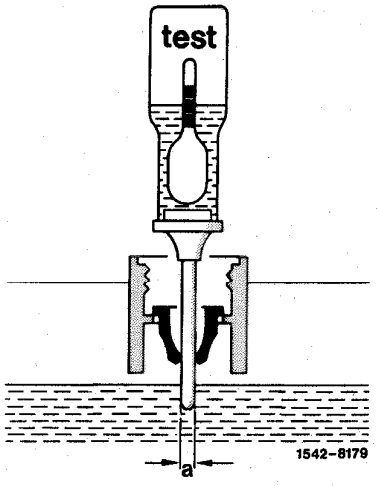
Short circuit in cell 5

b)

– 1	2	3	4	5	6
1.28	1.16	1.16	1.28	1.28	1.28 +

Leak in the cell wall between cells 2 and 3.

A conductive connection is created by the leaking cell wall and the connector which causes the cells to be discharged.



a = max. 9 mm

B. Testing under load

Carry out only if no faults were discovered during the test without load.

The minimum voltage should reach a constant value after 10 seconds. Minor deviations are of no consequence. If the voltage drops severely or if the voltage collapses, the battery is defective.

This test is only possible with a uniform acid density of the cells and an acid density of at leat 1.24 kg/dm³.

Capacity	Ah	44	55	62	66	88	90	92
Load current (approx. 3 times the capacity)	A	135	165	186	200	265	270	276
Minimum voltage after 10 s with acid density	V	9				10		
	kg/dm³	1.24	(1.19)[1]			1.28	(1.23)[1]	

[1]) Tropics

C. Charging

Batteries can only be charged with direct current. For charging, disconnect the battery from the electrical system of the vehicle and connect to a charger:

Positive pole (+) of the battery to the positive pole of the charger,
negative pole (–) of the battery to the negative pole of the charger.

The charge current (A) should be 10 % of the battery capacity, e.g. a charge current of 6.2 A for a 62 Ah battery.

Higher currents can be used for recharging until the start of gassing (2.4 V/cell).

Charge until the acid density and charge voltage no longer rise within the space of 2 hours. It must be observed that the value measured for the acid density changes by 0.01 for every 15 °C temperature differential. If for example an acid temperatura of 34 °C is measured, the respective acid density measured should be increased by 0.01 in order to obtain the value relative to 20 °C.

D. Battery treatment when taking the vehicle out of service

Requirement: Battery charge condition okay
Acid density at least 1.26 kg/dm^3
tropics 1.21 kg/dm^3

1. Disconnect negative battery terminal.

This will prevent discharge through open-circuit current users or the clock.

2. After 3 months, recharge battery. (Acid density 1.28 kg/dm^3).

Caution!
On no account leave the battery stand in discharged condition as the plates will become sulphatized. Sulphatized plates mean an initial damage of the battery and lead to premature failure.

Antifreeze protection at charge condition

		normal	tropics
charged		– 65	– 40
half charged	in °C	– 30	– 13
discharged		– 4	– 1