

BATTERY ANALYZER

CONTENTS

Notice

1. Graphic Instructions
2. How To Operate
 - 3-1. Battery Test
 - 3-2. Alternator Test
 - 3-3. Crank Motor Test
3. Battery Spec Charts

1. Notice

- This machine is for 12V & 24V Lead-Acid vehicle battery.
- Please don't store the machine in high temp. or humidity place. It'll damage the machine.
- The working voltage range is 9V~35V DC.
- Please operate after turn on the headlight 3~5 minutes to clean the surface voltage when the battery was just full recharged.
- .
- The bad connect cable between 2 12V battery (24V system) will cause the wrong result. Please check individual battery to ensure.

2. Graphic Instructions



1. Monitor Zone: Show Functions & Information
2. Function Zone: Input Data & Select Functions



1. Select: Press Up/Down/Left/Right to input data or select function.
2. Enter: Confirm the selected function or data.
3. Exit: Abort the function or clear the data.

3. How to Operate.

3.1 Battery Test----12/24V

Select Item ▲▼
Battery
Alternator
Cranking

Select Test Item--Battery

Select Input ▲▼
CCA IEC
EN JIS#
DIN Unknown

Select Battery Type

Select Rating ▲▼
SET 520 CCA ◀▶
Press Enter to Start

Enter Battery Rating

Analyzing Wait



Waiting for Result

RESULTS	Good
12.46V	406 CCA
Int.R	6.72mΩ
LIFE	50 %

RESULTS	Good
25.86V	406 CCA
Int.R.	13.44mΩ
LIFE	50 %

Result

Battery Voltage 12.46V
 Charged 100% 13.2V
 90% 12.9V
 75% 12.45V

CCA Value 406CCA
 The computed CCA value
 In 24V system testing, CCA is the half of the sum
 of two batteries.

Internal Resist 6.72mΩ
 (Int.R) It will between 2-15mΩ
 Greater CCA with minor resist
 In 24V system testing, Internal Resist will the sum
 of two batteries.

LIFE The computed life of battery,
 suggest to change if under 45%

3.2 Alternator Test----12V

Select Item ▲▼
Battery
Alternator
Cranking

Select Test Item—Alternator

Start the Engine

Then press Enter

Start the engine then press Enter to test

3000RPM 13.96V
Max 14.07 V < 15.0 V
Min 13.55 V > 13.3 V
Press Enter Continue

**Pump to 3000 RPM for 3-5 Seconds,
Max Volt must under 15.0V, Min V must above 13.3V
(When turn off all loads)**

Load is all opened
Then press Enter

**Turn on the headlight & A/C(Max),
Then press Enter to start**

2000RPM 13.89V

Max13.96 V > 13.5V

Min 13.76V > 12.5V

**Pump to 2000 RPM for 3-5 Seconds,
Max Volt must above 13.5V, Min V must above 12.5V
(When turn on all loads)**

3.3 Alternator Test----24V

Select Item ▲▼

Battery

Alternator

Cranking

Select Test Item—Alternator

Start the Engine

Then press Enter

Start the engine then press Enter to test

1000RPM 27.96V

Max 38.57 V < 30.0 V

Min 26.55 V > 26.6 V

Press Enter Continue

**Pump to 1000 RPM for 2-5 Seconds,
Max Volt must under 30.0V, Min V must above 26.6V
(When turn off all loads)**

Load is all opened
Then press Enter

**Turn on the headlight & A/C(Max),
Then press Enter to start**

1500RPM 28.89V
Max28.96 V > 27.0V
Min 27.76V > 25.0V

**Pump to 1500 RPM for 2-5 Seconds,
Max Volt must above 27.0V, Min V must above 25.0V
(When full loading)**

3.4 Crank Motor Test----12V

Select Item ▲▼
Battery
Alternator
Cranking

Select Test Item—Cranking

Start the motor		
Normal	V	12.6 V
Crank	V	10.3 V
Crank	V	> 9.2 V

The voltage should be above 9.2V when cranking.

Please test the battery before testing the alternator and crank motor. The bad battery will affect the result of alternator and crank motor testing.

We should test the crank motor particularly when the voltage is under 9.2V, but the result of battery testing is good.

Please change a good battery then start this test if the battery marked as REPLACE in the battery testing.

3.5 Crank Motor Test----24V

Select Item ▲▼
Battery
Alternator
Cranking

Select Test Item—Cranking

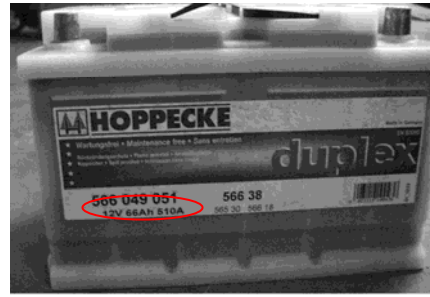
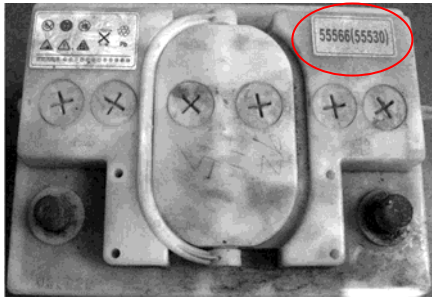
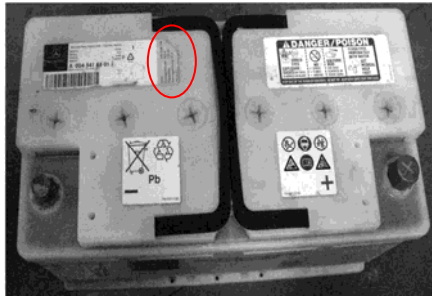
Start the motor		
Normal	V	25.90 V
Crank	V	17.81 V
Crank	V	> 16.0 V

The voltage should be above 16.0V when cranking.
Please test the battery before testing the alternator and crank motor. The bad battery will affect the result of alternator and crank motor testing.

We should test the crank motor particularly when the voltage is under 9.2V, but the result of battery testing is good.

Please change a good battery then start this test if the battery marked as REPLACE in the battery testing.

Where The Battery Model Number Is.



Traditional test method (1/2 CCA Load Test)

A deep discharge test simulating the demands imposed on a battery. Test the ability to deliver a starter motor's cranking current requirements while maintaining a terminal post voltage above a minimum standard.

Apply a load equal to 1/2 the CCA rating for 15 seconds and measure the voltage drop. Compare the voltage to a voltage chart.

The battery state -of-charge must be 75% (12.4 v) to perform a 1/2 CCA test. If the battery is below 75% state-of-charge, it must be charged before testing.

New Measurement Techniques: Ohmic Measurement

Resistance Measurements(DC method)

Impedance Measurements(AC method)

Conductance Measurements(AC method)

Resistance Measurement

Resistance measurements can be performed by applying a load across the cell/unit and measuring the step change in voltage and current. The Ohmic value is calculated by dividing the change in voltage by the change in current.

Impedance Measurements

Impedance measurements can be performed by passing a current of known frequency and amplitude through the battery and measuring the resultant ac voltage drop across each cell/unit. The ac voltage measurement is taken between the positive and negative terminals of individual cells or the smallest group of cells possible. Compute the resultant impedance by Ohm's law.

Conductance measurements(Our Test Method)

Conductance measurements can be performed by applying a voltage of known frequency and amplitude across a cell/unit and observing the ac current that flows in response to it. The conductance is the ratio of the ac current component that is in-phase with the ac voltage, to the amplitude of the ac voltage producing it.

The Benefit of Our Test Method

Conductance correlates directly to battery capacity

Passive test method is safe & repeatable

Never discharges the battery

Can Test discharged batteries

Provides a unique indication of battery

Provides a unique indication of state of charge

JIS Battery Model Convert Chart

Battery Model		CCA			Battery Model		CCA		
JIS(No)	JIS(Old)		MF	CM	JIS(No)	JIS(Old)		MF	CMF
26A17R		200			55B24R	NT80-S6	430	420	500
26A17L		200			55B24L	NT80-S6	430	420	500
26A19R	12N24-4	200	220	264	55D26R	N50Z	350	440	525
26A19L	12N24-3	200	220	264	55D26L	N50ZL	350	440	525
28A19R	NT50-N24	250			60D23R		520		
28A19L	NT50-N24	250			60D23L		520		
32A19R	NX60-N2	270	295		65D23R		420	540	580
32A19L	NX60-N2	270	295		65D23L		420	540	580
26B17R		200			65D26R	NS70	415	520	625
26B17L		200			65D26L	NS70L	415	520	625
28B17R		245			65D31R	N70	390	520	630
28B17L		245			65D31L	N70L	390	520	630
28B19R	NS40S	245			70D23R	35-60	490	540	580
28B19L	NS40LS	245			70D23L	25-60	490	540	580
32B20R	NS40	270			75D23R		500	520	580
32B20L	NS40L	270			75D23L		500	520	580
32C24R	N40	240	325	400	75D26R	F100-5	490		
32C24L	N40L	240	325	400	75D26L	F100-5L	490		
34B17R		280			75D31R	N70Z	450	540	735
34B17L		280			75D31L	N70ZL	450	540	735
34B19R	NS40ZA	270	325	400	80D23R		580		
34B19L	NS40ZAL	270	325	400	80D23L		580		
36B20R	NS40Z	275	300	360	85B60K				500
36B20L	NS40ZL	275	300	360	85BR60				500
36B20R	NS40ZS	275	300	360	95D31R	NX120-7	620	660	850
36B20L	NS40ZLS	275	300	360	95D31L	NX120-7	620	660	850
38B20R	NX60-N2	330	340	410	95E41R	N100	515	640	770
38B20R	NT60-N24	330	340	410	95E41L	N100L	515	640	770

Battery Model		CCA			Battery Model		CCA		
JIS(No)	JIS(Old)		MF	CM	JIS(No)	JIS(Old)		MF	CMF
38B20L	NX60-24L	330	340	410	105E41	N100Z	580	720	880
38B20L	NX60-24L	330	340	410	105E41L	N100ZL	580	720	880
40B20L		330			105F51R	N100Z	580		
40B20R		330			105F51L	N100ZL	580		
42B20R		330			115E41R	NS120	650	800	960
42B20L		330			115E41L	NS120L	650	800	960
42B20R		330			115F51R	N120	650	800	960
42B20L		330			115F51L	N120L	650	800	960
46B24R	NS60	325	360	420	130E41	NX200-1	800		
46B24L	NS60L	325	360	420	130E41L	NX200-1	800		
46B24R	NS60S	325	360	420	130F51R			800	
46B24L	NS60LS	325	360	420	130F51L			800	
46B26R		360			145F51R	NS150	780	920	
46B26L		360			145F51L	NS150L	780	920	
46B26R		360			145G51	N150	780	900	1100
34B19R	NS40ZA	270	32	400	80D26R	NX110-5	580	580	630
34B19L	NS40ZA	270	32	400	80D26L	NX110-5	580	580	630
46B26L		360			145G51	N150L	780	900	1100
48D26R	N50	280	360	420	150F51R	NT200-12	640		
48D26L	N50L	280	360	420	150F51L	NT200-12	640		
50D20R		310	380	480	165G51	NS200	935	980	
50D20L		310	380	480	165G51	NS200L	935	980	
50D23R	85BR60K	500			170F51R	NX250-1	104		
50D23L	85B60K	500			170F51L	NX250-1	104		
50B24R	NT80-S6	390			180G51	NT250-15	109		
50B24L	NT80-S6L	390			180G51	NT250-15	109		
50D26R	50D20R		370		195G51	NX300-5	114		
50D26L	50D20L		370		195G51	NX300-5	114		
55D23R		355	480	500	190H52	N200	925	1100	1300
55D23L		355	480	500	190H52	N200L	925	1100	1300
55B24R	NX100-S6	435	420	500	245H52	NX400-2	153	1250	
55B24L	NX100-S6	435	420	500	245H52	NX400-2	153	1250	
55B24L	NX100-S6	435	420	500	245H52	NX400-2	153	1250	

EN & DIN Battery Model Convert Chart

Model	Same Model	DIN	EN	Model	Same Model	DIN	EN
52805	52815	180	240	56420	56322 88066	300	510
53517		175	300	56530	56618 56638	300	510
53520	53521 53522	150	240	56618	56619 56620	300	510
53625	53638 53836	175	300	56633	56647 56641	300	510
53646	53621 88038	175	300	56820	56821 56828	315	540
53653	53624 53890	175	300	57024	57029	315	540
54038	54039	175	300	57113	57539	400	680
54232		175	300	57114	56821 88074	400	680
54313	54324 54464	220	330	57218	57219	420	720
54317	54312 88146	210	360	57220	57217	420	720
54437	54466 54459L	210	360	57230		380	640
54459	54434 88046	210	360	57412	57413 57412L	400	680
54469	54449 54465	210	360	57512	57513 57531	350	570
54519	54533 54612	210	360	58515	58424	450	760
54523	54524	220	300	58521	58513	320	540
54537	54545 54801	190	300	58522	58514	320	540
54551	54580	220	300	58815	58821	395	640
54533	54577 54579	220	300	58820	58515 58527	395	640
54584	54578	220	300	58827		400	640
54590		210	330	58838	58833 88092	400	680
54827		240	360	59040	59017 59018	360	600
55040	88056	265	450	59218	59219	290	480
55041	55042	220	360	59226	59215	450	760
55044	55414 88056	265	450	59514		320	540
55046		300	510	59518	59519	395	640
55056		320	540	59615	59616	360	600
55057	54827 88156	320	540	60018	60019	250	410
55068	55069 55548	220	390	60026	58811	440	720
55218		255	420	60044	60038	500	760

Model	Same Model		DIN	EN	Model	Same Model		DIN	EN
55414	55415	55421	265	450	60527	60528		410	680
55422	55566	55040	265	450	61017	61018		400	680
55428	55423	55427	300	510	61023	62529		450	760
55457			265	450	61047	61048		450	760
55529			220	360	62034	62038 62045		420	680
55531	55545	55559L	255	420	63013			470	680
55559	55530	88056	255	420	63545	63549		420	680
55564	55552	55563	255	420	64020	64317 64318		325	550
55564	55565	55548	255	420	64028	64035		520	760
55570	55567	55565L	255	420	64036			460	760
56012			230	390	64317	64318 64323		540	900
56048	56068	56069	250	390	65513			540	900
56049	56069	56073	250	390	65514	65515		570	900
56077	56530		300	510	67043	67045		600	1000
56091	55811		360	540	68032	68034		600	1000
56111	55048		300	540	70029	70038 70027		630	1050
56218	56092		300	510	70036	68040 68021		570	950
56219	56216		300	510	71014	71015		700	1150
56220			280	510	72512			680	1150
56225	56323		300	510	73011			740	1200
56318	56312	56311	300	510					

Yuasa Battery Model Chart

Yuasa Model	CCA	Yuasa Model	CCA
GT50L-MF	356CCA	75A-72	630CCA
GTH55DL-MF	356CCA	78A-72	670CCA
GTH60DL-MF	325CCA	34-610MF	610CCA
GTH75DL-MF	520CCA	75-6MF	615CCA
GTH40S	275CCA	58-6MF	530CCA
GTH40L	276CCA	34-6MF	500CCA
GTH40	277CCA	24-500	500CCA
GTH60L	325CCA	34-710	710CCA
65-900	850CCA	41-580	580CCA
GTH75DR-MF	521CCA	58-530	530CCA
55D23R-MF	522CCA	65-730	730CCA
34-60	525CCA	75-660	660CCA
58-60	525CCA	78-710	710CCA
65-70	700CCA	GR40R-MF	700CCA
74-60	525CCA	GR40R-CMF	820CCA
75-72	500CCA	GR96R-MF	500CCA
35-580	580CCA	GR96R-CMF	580CCA

Easy way to know the CCA of your battery
(when you can't find the battery model)

Cube Capacity	Approx. CCA
1200 ~ 1600CC	350 CCA
1600 ~ 2000CC	500 CCA
2000 ~ 3000CC	650 CCA
3000CC+	750 CCA
M. Benz over 3000CC	760 EN