

INSTRUCTION AND OPERATING MANUAL



CAP CHECK I Overhead Line Type



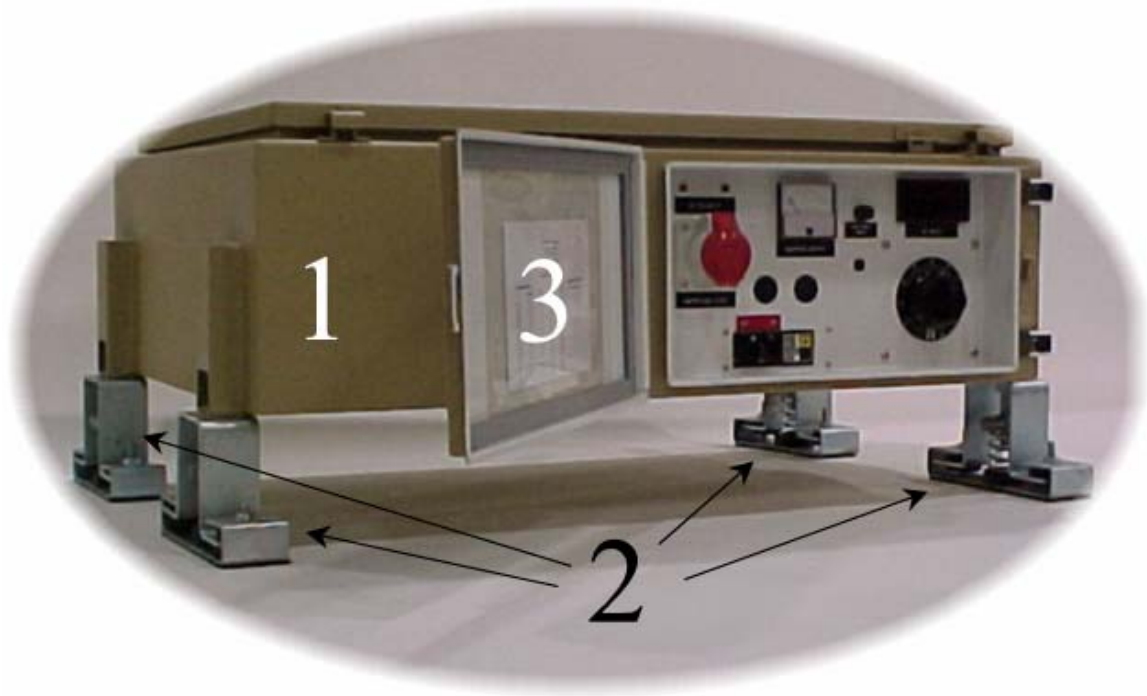
HD ELECTRIC COMPANY

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COMPONENT IDENTIFICATION

CAP CHECK I – Overhead Line Type
MODEL CC-1000

ENCLOSURE



1. Metal Enclosure for Inverter and Controls
2. Shock Mounting Supports
3. PASS/FAIL LIMIT RATING CHART

COMPONENT IDENTIFICATION

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PANEL & ENERGIZING CORD

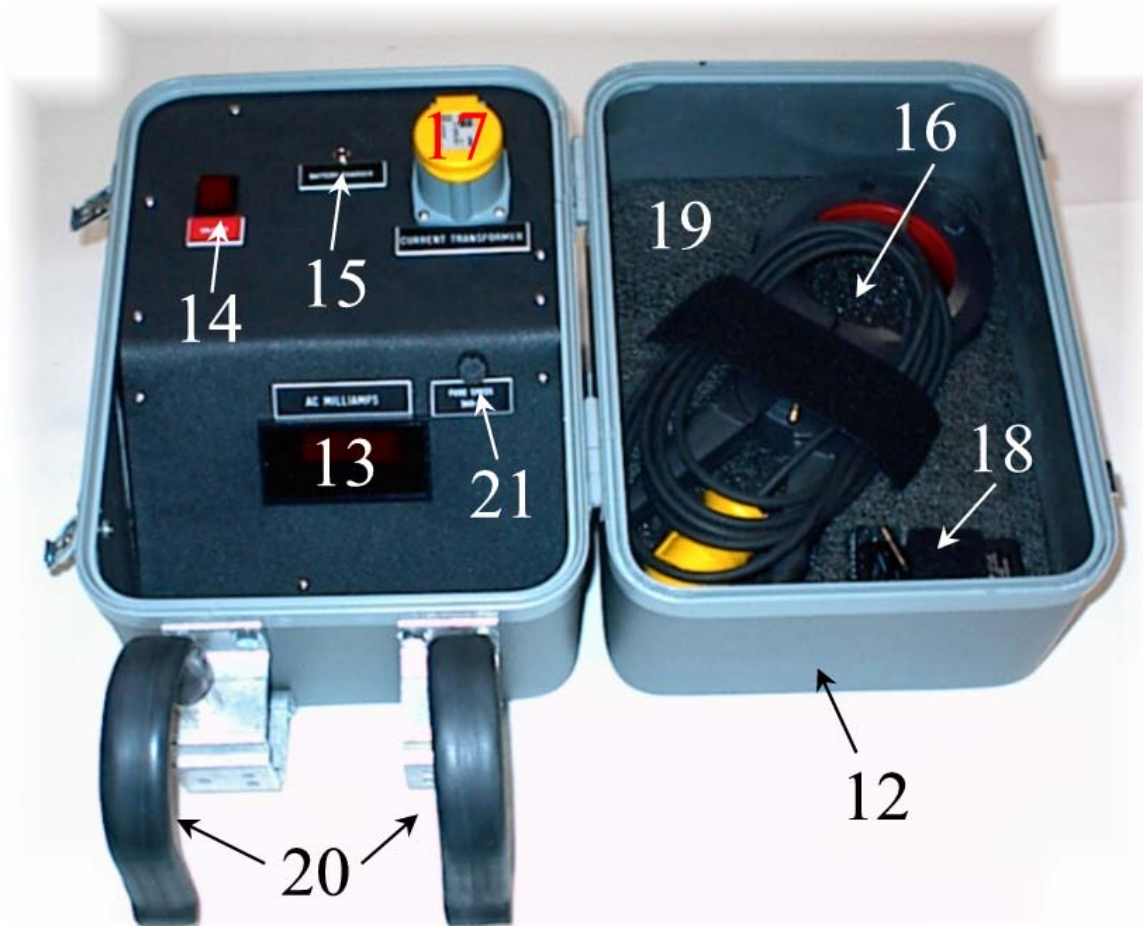


4. AC Volts Digital Meter
5. ON/OFF Input Breaker (40 Amp 12 Volt)
6. Variable Transformer
7. Energizing Cord Connector
8. Inverter Output Current Meter
9. DC Polarity Lights
10. AC Volts Digital Meter Fuse
11. Energizing Cord

COMPONENT IDENTIFICATION

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PROBE/AMMETER CASE



- 12. Probe/Ammeter Case
- 13. AC Milliamps Digital Meter
- 14. ON/OFF Breaker
- 15. Battery Charger Connection
- 16. Current Probe
- 17. Current Probe Connection
- 18. Battery Charger
- 19. Current Probe Storage Area
- 20. Bucket Mounting Hooks
- 21. Fuse

CAUTION

CAUTION Make certain capacitors are shorted and de-energized COMPLETELY prior to testing. ALWAYS be certain capacitor bank to be tested is out of service. Allow at least 5 minutes for capacitors to fully discharge.

CAUTION Make certain leads NEVER cross phases or drape across bushings, live transformers, etc. Cordage must remain free and clear of all objects, including human body, AT ALL TIMES.

CAUTION Make certain maximum capacitor KVAR and voltage does not exceed Cap Check I testing limits. Maximum KVAR for Cap Check I can be noted on the Test Rating Charts.

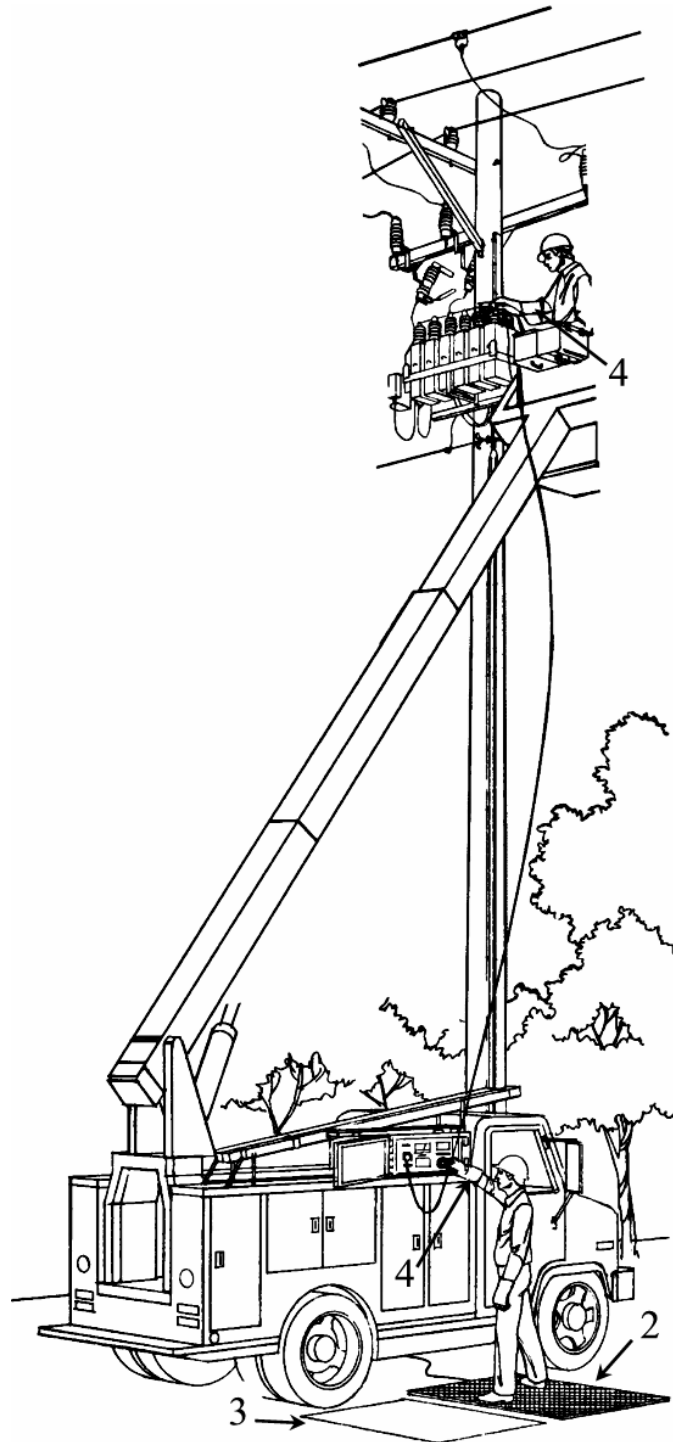
CAUTION Make certain Cap Check I voltage (Variac) is set to zero (0) prior to turning instrument on and energizing capacitors.

CAUTION Always turn Variac to zero after testing capacitor and before turning Cap Check I off. This action will discharge the capacitor.

NOTE: Familiarize yourself with the Cap Check I instrument panel layout as diagrammed on the previous pages, prior to conducting your first test.

**SUGGESTED SAFETY RULES ASSOCIATED WITH CAPACITOR CHECKER
WHEN TRUCK BOOM IS NEAR HIGH VOLTAGE LINES**

1. Ground the vehicle to a driven ground.
2. Inverter operator must stand on a permanent or portable metal platform mechanically connected to the truck.
3. If it becomes necessary to step off the platform, he must step on an insulated rubber blanket first, then onto ground.
4. Wear rubber gloves.
5. Grounding cable removed after temporarily grounding the capacitor.



ADDITIONAL SAFETY NOTES

Please note that your Company may have additional safety rules and procedures, which should be employed while using this equipment. You must check to make certain that all safety considerations are properly addressed when using this equipment. These are recommended safety rules contained in this booklet and are to be used as guidelines in establishing and integrating your own safe procedures.

CHECKER PROCEDURE

SAFETY NOTE: SEE SAFETY STEPS ON PRIOR PAGES

OPERATING NOTE: This Capacitor Checker places a low AC voltage to the capacitors being checked. Each set of capacitors will be checked by phase, using three separate connections (A – B – C phase).

INITIAL SET-UP

1. Place Probe/Ammeter case in hanging position on Aerial Bucket and turn "ON".
2. Verify Capacitor Bank is OUT OF SERVICE and ISOLATED from ALL sources. If in service, open, isolate and wait full five (5) minutes for capacitor(s) to discharge and temporarily ground.
3. Verify Capacitor Can size, voltage rating (System and Bank Voltage), and total KVAR per phase.

NOTE: Check duty cycle and operating limits table to make certain you will not exceed operating limitation of components.

Remove from circuit any bulged, leaking or flashed bushing capacitors.

4. Plug Energizing Cord into its connector located in the control panel of the cabinet.
5. Make certain 12-volt DC source and hook-up is correct.

NOTE: DC Polarity Lights are located in upper left-hand corner of control panel. Make certain GREEN LIGHT is "ON" prior to energizing Inverter.

6. Wire brush capacitor terminal at point of Inverter Lead connection and attach Inverter Leads on Capacitor Bushing of the phase to be checked as follows:

IMPORTANT: Red Alligator Clip to phase and Black to neutral.

The neutral may be common to all cans in that phase which provides a proper connection point.

TO TEST TOTAL BANK CURRENT (PER PHASE)

7. Place Clamp-Probe on the Phase Lead.
8. With the Variable Transformer at zero, or lowest setting, (fully counter clockwise), close the Input Breaker (40 amp).
9. Note capacitor can size and voltage, select the proper Inverter test voltage and begin to apply test voltage slowly.

CAUTION: If upon applying the test voltage, bank current increases rapidly and output voltage does not, a capacitor or capacitors are completely shorted.
DO NOT EXCEED 2 AC AMPS ON THE INVERTER OUTPUT METER.

Search for shorted cans by moving Current Probe from bushing to bushing. The shorted capacitor(s) will have a very high reading compared to the good cans, which will provide little or no reading at this low applied voltage.

If the Output Breaker trips, zero the Variable Transformer and re-set the Output Breaker and the unit will be operable.

INDIVIDUAL CAN TESTING

10. If bank has no completely shorted capacitors, the bank current will be under 2 AC amps on the INVERTER OUTPUT CURRENT METER.
11. Upon energizing bank to specified voltage place the Current Probe on the phase bushing of each capacitor. Verify with Current Probe that each capacitor is within range on the charts. **REPLACE CANS NOT IN ACCEPTABLE RANGE.** Check capacitors with low readings for corroded terminals. Corrosion can inhibit proper voltage being applied.
12. After completion of check on each phase, turn the Variable Transformer to lowest setting and trip 40-amp breaker.

NOTE: Zeroing the Variable Transformer essentially grounds the capacitors connected to the Test Leads.

13. Values ABOVE the accepted range on Current Meter indicate one or more packs shorted.

Those with values LOWER than acceptable range on Current Meter indicate an open pack(s). Check those cans for corroded terminals.

When check is complete, return the Variable Transformer to zero. Open Input Breaker to conserve battery charge.

14. Remove Inverter Leads, turn off Current Probe Meter, and remove Probe from bank.
15. Restore all equipment in truck and make sure all access parts are snapped closed and locked. Water will damage the unit.
16. After testing for lengthy periods of time the battery for the Probe/Ammeter will have to be charged. Make certain you maintain this charge at all times. Do not charge overnight. Overcharging will damage the battery life. For a fully discharged battery charge time required will be between 16 – 24 hours. Never exceed 24 hours. On a full charge unit will operate for at least 10 hours.

NOTE: Dimming of LED indicates low battery.

MOUNTING OF INVERTER CABINET

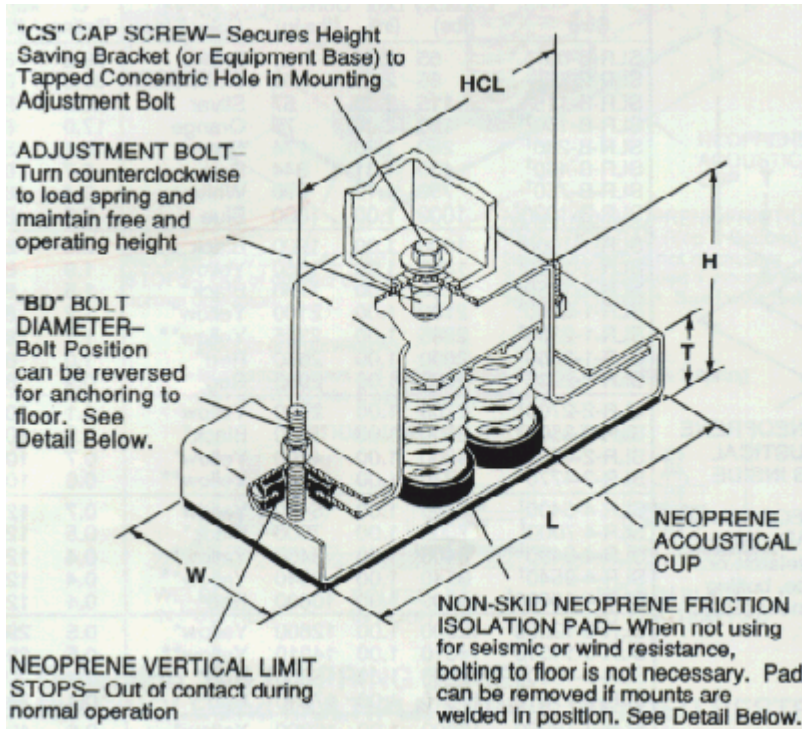
Provided with your unit are 4 Shock Mounts. Please note the illustrated technical sheet, which describes these Mounts.

We suggest that a Bolted-In –Position is the most ideal for it allows a certain amount of flexibility in moving the unit. If a permanent truck or trailer is selected the Welded-In-Position might be preferred.

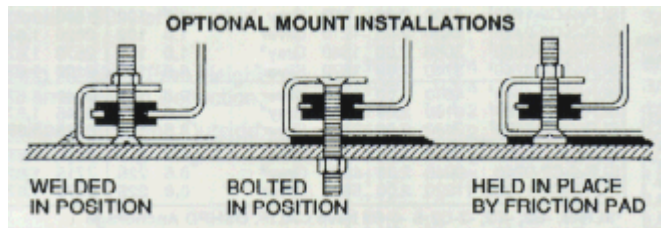
Note that these cabinets can be and have been, mounted on trucks or trailers. Select your ideal method.

Make certain to check the mounting hardware from time-to-time and make certain that it's tight and the enclosure is riding well.

Size	Rated Capacity (lbs)	Rated Defl (in)	Mount Constant (lbs/in)	Spring Color	Seismic G Rating	MEFA (ft sq)
SLR-A-125	125	1.33	94	Brown	6.4	27



SLR-A, -2A & -4A have Calif. OSHPD Anchorage Preapproval Number R-0195.
 All springs have additional travel to solid equal to 50% of the rated deflection.
 Solid Spring Height = Free Height minus 1.5 times Rated Deflection.
 Housing load ratings (expressed in max. G's and square feet of face area) are based on tests with bolted connections to steel top and bottom, SLR housings require uniform support under entire base plate. Tests were run with one bolt in top plate.
 MEFA - Maximum Allowable Equipment Face Area per Mount (ft sq) to determine safety of an installation in a 100 mph wind (30 psf.) divide the largest face area by the total number of mountings. Installation is safe if AREA No. of MOUNTS < MEFA.
 Example: Tower Face = 6' x 10' = 60 Square Feet. Weight = 4000 lbs
 Use: 4-SLR-2A-1020 MEFA = 33;
 Area/No. of Mounts = 60/4 = 15 < 33 Installation is safe in shear.
 When towers are tall and narrow, overturning moments should be checked as well.



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Cap-Check III
PASS/FAIL LIMIT RATING

Nameplate Data					Maximum Energized
V	KVAR	V test	I min	I max	Bank Load, KVAR
2200	15	50	138	186	150
2200	25	50	232	313	
2200	50	50	467	628	
2200	100	50	937	1260	
2200	150	50	1407	1891	
2400	15	50	115	157	200
2400	25	50	194	263	
2400	50	50	392	528	
2400	100	50	787	1058	
2400	150	50	1182	1588	
2400	200	50	1577	2118	
2400	15	120	284	375	50
2400	25	120	475	625	
2400	50	120	953	1250	
4000	50	50	139	188	550
4000	100	50	281	375	
4000	150	50	424	563	
4000	200	50	566	750	
4000	15	120	99	135	200
4000	25	120	168	225	
4000	50	120	338	450	
4000	100	120	680	900	
4160	50	50	129	173	600
4160	100	50	262	347	
4160	150	50	394	520	
4160	200	50	526	693	
4160	15	120	94	125	250
4160	25	120	156	208	
4160	50	120	315	416	
4160	100	120	632	832	
4800	50	50	96	130	800
4800	100	50	196	260	

4800	150	50	295	391	
4800	200	50	395	521	
4800	15	120	69	94	300
4800	25	120	116	156	
4800	50	120	236	313	
4800	100	120	474	625	
6640	15	300	92	122	250
6640	15	120	37	49	600
6640	25	120	61	82	
6640	50	120	122	163	
6640	100	120	245	327	
6640	150	120	367	490	
6640	200	120	490	653	
7200	15	300	76	104	50
7200	25	120	52	69	750
7200	50	120	104	139	
7200	100	120	208	278	
7200	150	120	313	417	
7200	200	120	417	556	
7200	300	120	625	833	
7300	100	120	203	270	750
7300	150	120	304	405	
7300	200	120	405	540	
7300	300	120	608	811	
7620	15	300	70	93	50
7620	25	300	116	155	
7620	50	120	93	124	800
7620	100	120	186	248	
7620	150	120	279	372	
7620	200	120	372	496	
7620	300	120	558	744	
7960	15	300	64	85	350
7960	25	300	107	142	
7960	50	120	85	114	900
7960	100	120	170	227	
7960	150	120	256	341	
7960	200	120	341	455	
8320	15	300	59	78	100
8320	25	300	98	130	

8320	50	120	78	104	1000
8320	100	120	156	208	
8320	150	120	234	312	
8320	200	120	312	416	
9960	200	50	91	121	3450
9960	300	50	136	181	
9960	100	120	109	145	1400
9960	150	120	163	218	
9960	200	120	218	290	
9960	300	120	327	435	
10300	100	120	102	136	1500
10300	150	120	153	204	
10300	200	120	204	271	
10800	200	120	185	247	1700
13200	25	480	62	83	150
13200	50	480	124	165	
13200	100	480	248	331	
13200	50	300	77	103	250
13200	100	300	155	207	
13200	150	120	93	124	2500
13200	200	120	124	165	
13280	50	300	77	102	250
13280	100	300	153	204	
13280	150	300	230	306	
13280	100	120	61	82	2550
13280	150	120	92	122	
13280	200	120	122	163	
13280	300	120	184	245	
13800	25	480	57	76	150
13800	50	480	113	151	
13800	50	300	71	95	250
13800	100	300	142	189	
13800	100	120	57	76	2750
13800	150	120	85	113	
13800	200	120	113	151	
14400	25	480	52	69	150
14400	50	480	104	139	
14400	100	480	208	278	

14400	50	300	65	87	300
14400	100	300	130	174	
14400	100	120	52	69	3000
14400	150	120	78	104	
14400	200	120	104	139	
14400	300	120	156	208	
15200	150	120	70	93	3350
16000	200	120	84	113	3700
17000	300	300	280	374	400
19920	200	120	54	73	5750
19920	300	120	82	109	
19920	50	480	54	73	350
19920	100	480	109	145	
19920	150	300	102	136	550
19920	200	300	136	181	
19920	300	300	204	272	
21600	150	300	87	116	650
21600	200	300	116	154	
21600	50	480	46	62	400
21600	100	480	93	123	
21600	150	480	139	185	
21600	200	480	185	247	
22130	100	480	88	118	400
22130	150	480	132	176	
22130	200	480	176	235	
22500	50	480	43	57	450
22500	100	480	85	114	
22500	150	480	128	171	
22500	200	480	171	228	
25000	100	480	69	92	550
25000	150	480	104	138	
25000	200	480	138	184	

Note: Maximum Energized Bank Load, KVAR refers to the capacitors which the Cap-Check III can energize as a group. The operating manual includes information on load calculations for series-parallel connected banks.

When more than one test voltage is listed for a can nameplate rating, select the highest value while considering the Cap-Check bank capacity rating.