

Service Bulletin

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| Category G | Applicable Model/s All Models | Subject MAINTENANCE FREE BATTERY DIAGNOSTIC AND CHARGING PROCEDURE | Bulletin No. 001/97 Issued 04/08/97 Revised 06/19/97 |
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NOTE: The information in this bulletin has changed. Replace the original bulletin with this revised copy.

APPLICABLE MODELS

All Models

DESCRIPTION

The information in this bulletin describes:

- Conditions that may lead to battery failure
- Correct servicing and inspection procedures
- Samples of current inspection sheets and maintenance records
- Requirements for Warranty submission

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Attachments: Sample of battery Maintenance Records and Battery Check Sheet

CONSUMER NOTICE: The information and instructions in this bulletin are intended for use by skilled technicians. Mazda technicians utilize the proper tools / equipment and take training to correctly and safely maintain Mazda vehicles. These instructions should not be performed by "do-it-yourselfers." Customers should not assume this bulletin applies to their vehicle or that their vehicle will develop the described concern. To determine if the information applies, customers should contact their nearest authorized Mazda dealership.

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1. CONDITIONS LEADING TO BATTERY PROBLEMS

If a customer complains of poor battery performance (i.e. slow start, no start) perform the following quick check prior to detailed diagnostics or part replacement.

| Item | Check |
|------------------------------------|---|
| Condition Prior To Battery Problem | Door Open, Lights Left On, Radio On Etc. |
| Vehicle Condition | Add-On Accessories Installed Properly (Alarms, Cellular Phones, Stereo Amp. Etc.) |
| Battery Condition | Correct Fluid Level. Check Indicator "Eye" (If Equipped) And Note Color |
| Cable Condition | Must Be Free Of Corrosion, Terminals Tight |
| Vehicle Wiring Grounds | Check By Voltage Drop Measures |
| Alternator | Check Alternator Output (Between 13.5 And 15.5 Volts) |
| Alternator Drive Belt | Must Be Set To Correct Tension And In Good Condition |

A preliminary check of these items will, in most cases, reveal the problem without time consuming detailed diagnostics.

NOTE: As a result of the product testing on returned parts, 60% of the returned alternators and 20% of the returned batteries are classified NTF (No Trouble Found).

2. BATTERY MAINTENANCE RESPONSIBILITY

Mazda Motor of America has instituted a comprehensive battery maintenance program at port facilities to maintain peak battery performance until delivery to the dealer. After wholesale delivery, it is the dealer's responsibility to maintain the condition of the batteries in new Mazda vehicles while in inventory and at the time of new car delivery.

Batteries must be periodically recharged to maintain a measured 12.4 volts or better. Loss of battery voltage is dependent on ambient temperature, demo use and time in inventory.

Mazda recommends voltage checks at one month intervals and just prior to retail delivery. The maintenance and inspection process will vary based on dealer inventory and environmental factors that affect battery life (i.e. extreme temperatures).

3. BATTERY MAINTENANCE RECORD

Mazda has installed a "Battery Check Tag" on the mirror of all vehicles (except B-Series and Miata) starting June 1, 1996. The tag will document the maintenance efforts of the port personnel and subsequent maintenance at the dealership.

A sample of the "Battery Check Tag" is attached to this bulletin. **Do not remove this tag from the mirror until retail delivery.**

The dealership is responsible for entering the vehicle's battery voltage onto the tag on the following occasions:

- Wholesale Delivery
- Planned Dealer Inventory Maintenance
- Retail Delivery

NOTE: Entries must be identified by the dealership employee number for quality tracking purposes. After retail delivery, the tag must be kept with the vehicle's service file.

If a battery claim is made on the vehicle while in inventory, a copy of the "Battery Check Tag" must be attached to the repair order.

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4. SERVICING EQUIPMENT REQUIREMENTS

In order to accurately and quickly check the condition of maintenance-free batteries, you should have available a digital volt meter capable of reading to 0.01V and a battery tester utilizing load cells (VAT 40, or equivalent) or electronic testing (Midtronics Power Sensor Plus).

- VAT 40 testers require the battery to be charged to 12V or higher.
- Midtronics testers require 10.2V or higher to test and provides an indicator lamp confirming that the battery is OK to test. See Service Bulletin ST, 003/95 for Midtronics purchase information.

5. CHARGING AND LOAD TESTING INFORMATION

The chart below gives specific charging amps, times and load test amps for 1993 - 97 vehicles.

Refer to the applicable workshop manual for other model year vehicles and additional troubleshooting information.

FACTORY INSTALLED BATTERIES

| Model | Battery | Max. Charge Current (AMP) | Charge Time (Min.) | Load Test (AMP) |
|------------------|------------|---------------------------|--------------------|-----------------|
| Protege / 323 | 55D23L | 30 | 30 | 180 |
| 626 / MX-6 | GROUP58R | 30 | 30 | 174 |
| 929 | 55D23L | 30 | 30 | 180 |
| | 80D26L | 35 | 30 | 195 |
| Millenia | 75D26L | 35 | 30 | 195 |
| | 80D26L | | | |
| MX-3 | 50D20L | 25 | 30 | 150 |
| | 55D23L | 30 | 30 | 180 |
| | 65D23L | 30 | 30 | 165 |
| MX-5 Miata | S46A24L | 20 | 30 | 105 |
| RX-7 | 55D23L | 30 | 30 | 180 |
| | 65D23L | 30 | 30 | 165 |
| | 75D26L | 35 | 30 | 195 |
| MPV | 50D20L | 25 | 30 | 150 |
| | 80D26L | 35 | 30 | 195 |
| B-Series | 50D20L | 25 | 30 | 150 |
| | 75D26L | 35 | 30 | 195 |
| | 80D26L | 35 | 30 | 195 |
| 1994-97 B-Series | BX-58C | 35 | 20 | 270 |
| | BXT-65-650 | 35 | 20 | 325 |
| Navajo | BXT-65-650 | 35 | 20 | 325 |

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6. BATTERY DIAGNOSTIC PROCEDURES (USING LOAD TESTER VAT-40 or equivalent on Lead-Acid Batteries)

1. Start engine and confirm that the alternator warning light is not illuminated.

NOTE: If the warning light is illuminated, the self-diagnostic function is operating. Check the alternator and related harness. Refer to the instructions in section G of the workshop manual.

2. Check the alternator belt tension and condition.
3. Turn the vehicle headlights "ON." Check the engine belt and alternator bearing for unusual noise by raising and lowering the engine RPM.
4. Turn the ignition and all accessories "OFF."
5. Connect the load tester.
6. Apply the load tester referring to the table on page 3 and the flow charts on page 5 or 7 (depending on the test equipment. The final voltage must be above the minimum value shown in the table. Record the voltage on the "Battery Check Sheet."
 - If the voltage is more than the minimum, measure the open circuit voltage. Charge the battery is less than 12.4V.
 - If the voltage is less than the minimum, "quick" or "boost" charge the battery for 30 minutes.

CAUTION: DO NOT "quick" or "boost" charge MX-5 Miata batteries. These batteries are gel type and must not be charged at more than 20 amps.

- Perform a load test again. If the battery is still below the minimum, replace the battery and proceed to step 8.

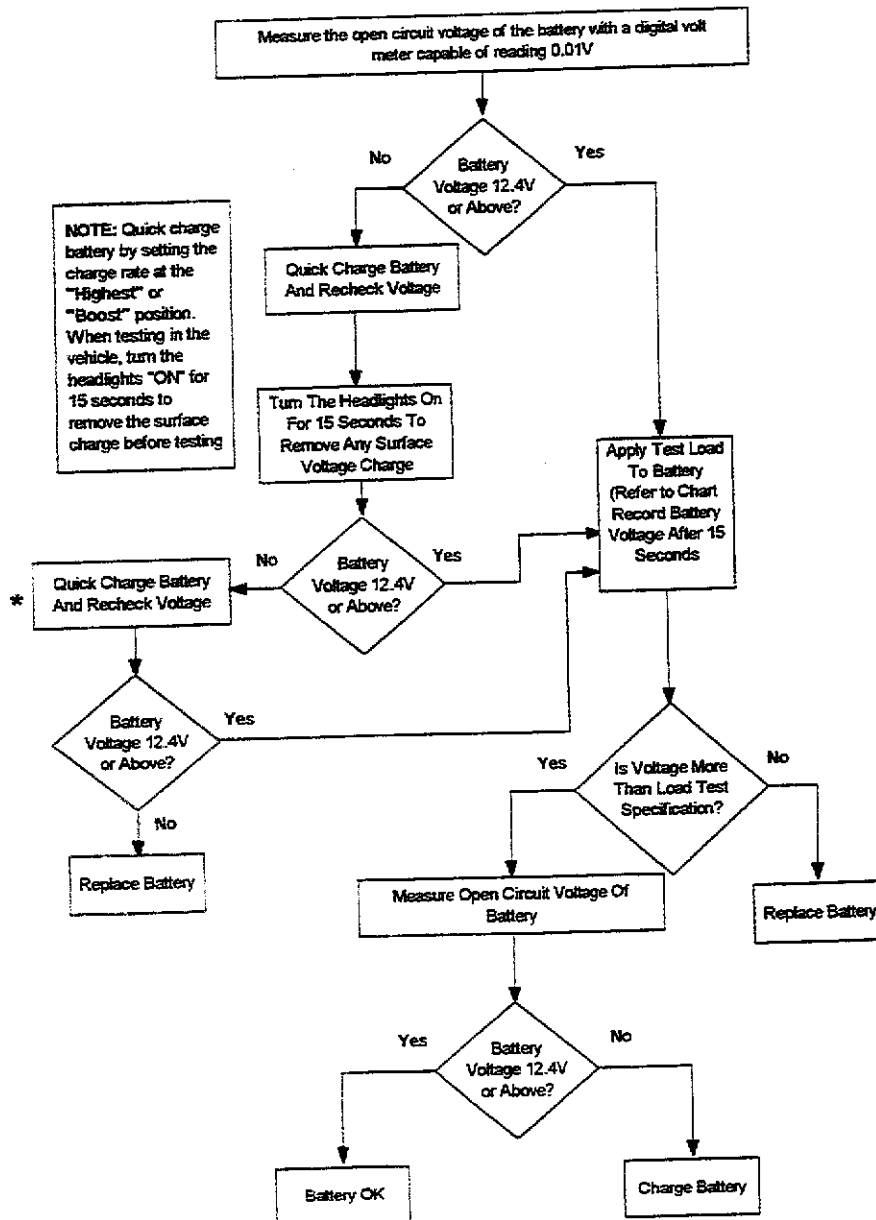
7. Start the vehicle and raise the RPM to 2500.
8. Connect the battery load tester and apply a load equal to the alternator rating.
 - If the voltage is 13.5V to 15.0V the alternator and battery are functioning correctly.
 - If the voltage is more than 15.0V replace the alternator.
 - If the voltage is 13.5V or under, check for resistance between the battery and terminals "B" and "S." Inspect the harness for damage. Repair as necessary. Retest the alternator. If the voltage is still less than 13.5V

CAUTION: Diagnostic procedures for lead-acid battery performance are different for those used for maintenance-free batteries (lithium hybrid batteries). Incorrect diagnostics will result in false readings and unnecessary battery replacement if the wrong procedure is followed.

Use "Flow Chart" on Page 5

6.1 BATTERY DIAGNOSTIC PROCEDURES (Using Load Tester VAT-40 or Equivalent on Maintenance-Free Batteries)

Diagnostic procedures used for testing lead-acid batteries provide false reading leading to unnecessary replacement if used on maintenance-free batteries. The information below is provided for diagnosing maintenance-free batteries.



***CAUTION : DO NOT BOOST OR QUICK CHARGE MX-5 MIATA "GEL TYPE" BATTERIES.**

6.2 BATTERY DIAGNOSTIC PROCEDURES (Using Midtronics PowerSensor Plus Tester on Lead-Acid Batteries)

1. Connect the Midtronics PowerSensor Plus tester, if low voltage is found (less than 10.2V) charge the battery for two (2) hours and recheck. If the voltage is greater than 10.2V, test battery condition without precharging. If low voltage is still found after a two (2) hour charge, replace the battery according to the information in the warranty section of this bulletin.
2. If the tester indicates that the battery is not at fault, refer to the appropriate workshop manual or BETM (Body Electrical Troubleshooting Manual) for troubleshooting and repair information.

The following are additional Midtronics PowerSensor Plus tester features:

Position "A" will test for an open circuit (bad cell or broken internal circuit). This is indicated by a "Red" LED light. If an open circuit is indicated, replace the battery using the criteria described in the warranty section of this bulletin.

Position "B" a "green" LED indicated that the battery has at least 10.2V and can therefore be tested without pre-charging. This position requires that the CCA rating (for the specific battery type under test) be set on the Midtronics PowerSensor Plus Tester dial. Refer to the attached chart (on page 3 of 9) to determine actual CCA. The Midtronics PowerSensor Plus Tester then determines actual CCA by measuring the condition of the battery voltage and plate condition.

Position "C" measures the alternator output when the engine is running and also indicated "Open Circuit Voltage".

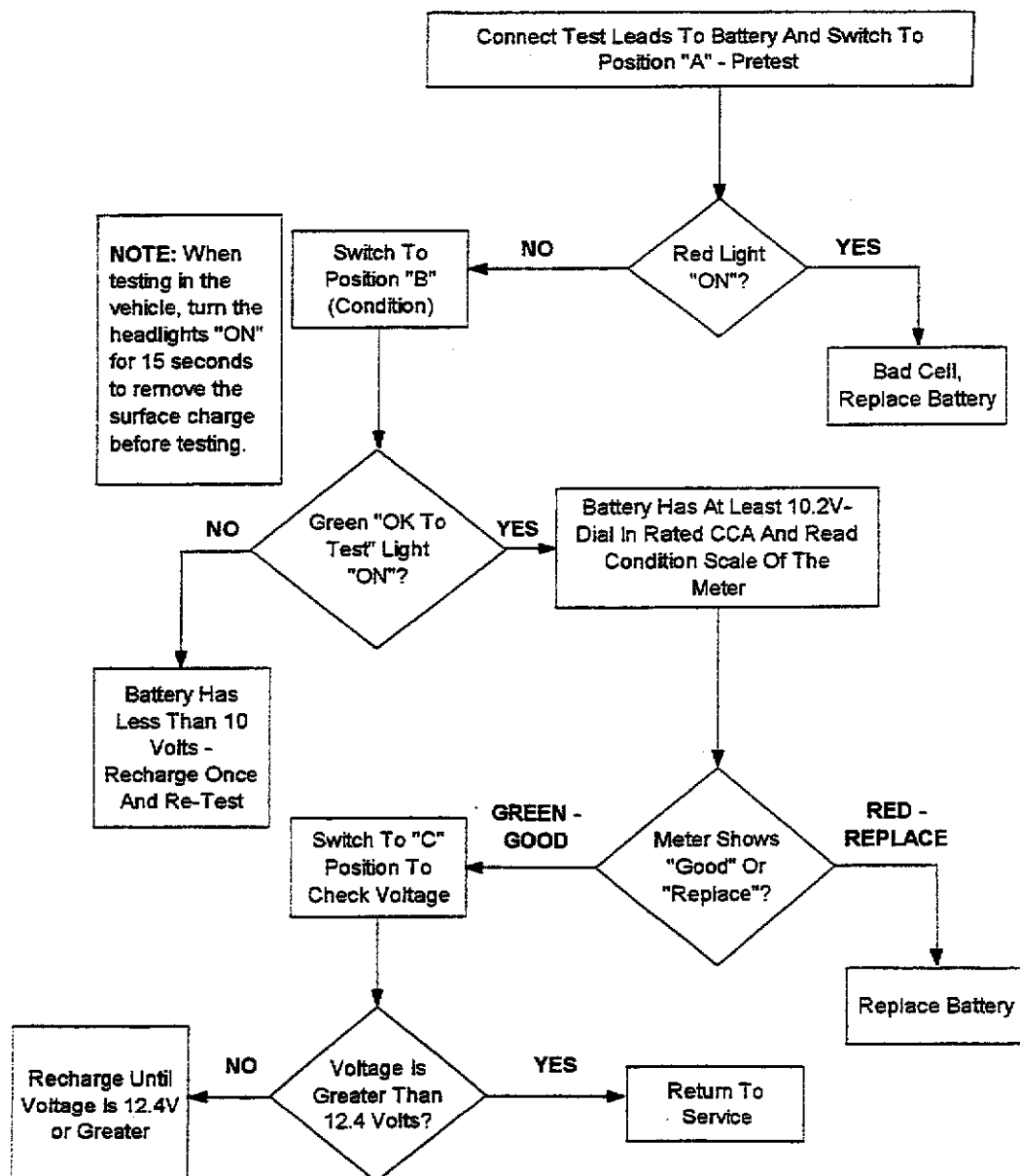
Position "D" Indicates actual CCA condition of the battery. By comparing the indicated reading to the battery's rated CCA, the battery condition is determined (ex. indicated CCA of 400 for a battery with a 600 rating indicated that the battery is 2/3 down on capacity). This decline will occur through normal aging and does not necessarily indicate that the battery requires replacement. It provides a general indication of the battery "health" for your customer.

IMPORTANT

Diagnostic procedures for lead-acid batteries performance are different than those used for maintenance-free batteries (lithium hybrid type). Incorrect diagnosis will result in false readings and unnecessary battery replacement if the wrong procedure is followed.

6.3 BATTERY DIAGNOSTIC PROCEDURES (Using Midtronics PowerSensor Plus Tester on Maintenance-Free Batteries)

Diagnostic procedures used for testing lead-acid batteries provide false readings leading to unnecessary replacement if used on maintenance-free batteries. The information below is provided for diagnosing maintenance-free batteries.



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7. PARTS INFORMATION (Mazda Finish Line Batteries)

| Make | Year | Model | O.E.M. CCA | Part Number | CCA |
|---------------------|---------|-----------------------------------|------------|-----------------|-----|
| GLC | 1981-85 | FWD | 320 | 0000-80-026R-WB | 525 |
| | 1981-85 | Optinal For Above | 360 | 0000-80-0035-WB | 550 |
| | 1977-80 | RWD | 320 | 0000-80-0024-WB | 460 |
| MX-3 | 1992-95 | All 1.6L | 310 | 0000-80-026R-WB | 525 |
| | 1992-95 | Optional For Above | 360 | 0000-80-0035-WB | 550 |
| | 1992-95 | All V6 1.8L | 415 | 0000-80-024F-WB | 525 |
| 626/MX-6 | 1993-97 | All | 582 | 0000-80-058R-WB | 582 |
| | 1983-92 | All Except Diesel | 320 | 0000-80-026R-WB | 525 |
| | 1983-92 | Optional For Above | 360 | 0000-80-0035-WB | 550 |
| | 1984-85 | Diesel | 620 | 0000-80-124F-WB | 700 |
| | 1979-82 | All | 235 | 0000-80-0024-WB | 460 |
| RX-7 | 1993-95 | A/T | 490 | 0000-80-224F-WB | 625 |
| | 1993-95 | M/T | 420 | 0000-80-026R-WB | 525 |
| | 1984-92 | All | 320 | 0000-80-026R-WB | 525 |
| | 1979-83 | All | 370 | 0000-80-0024-WB | 460 |
| 323/Protege | 1988-97 | All | 310 | 0000-80-026R-WB | 525 |
| | 1988-97 | Optional For Above | 585 | 0000-80-0035-WB | 525 |
| 929 | 1988-95 | All w/o Cold Package | 320 | 0000-80-0035-WB | 550 |
| | 1988-95 | All w/ Cold Packages | 585 | 0000-80-124F-WB | 700 |
| Millenia | 1995-97 | All | 490 | 0000-80-124F-WB | 700 |
| B2000, B2200 | 1973-93 | All Except Diesel | 375 | 0000-80-0024-WB | 460 |
| | 1973-93 | Optional For Above | 375 | 0000-80-026R-WB | 525 |
| | 1982-84 | Diesel | 600 | 0000-80-0124-WB | 675 |
| B2300, B3000, B4000 | 1994-97 | B2300, B3000 Std. Cab | 540 | 0000-80-58HD-WB | 582 |
| | 1994-97 | B23090, B3000 Optional Cold Spec. | 650 | 0000-80-0065-WB | 875 |
| | 1994-97 | B4000 Cab Plus | 850 | 0000-80-0065-WB | 875 |
| B2600, B2600i | 1989-93 | All | 310 | 0000-80-0024-WB | 460 |
| | 1987-88 | All B2600 | 320 | 0000-80-026R-WB | 525 |
| | 1987-88 | Optional For Above | 390 | 0000-80-224F-WB | 525 |
| Navajo | 1991-94 | All | 650 | 0000-80-0065-WB | 875 |
| MPV | 1991-97 | All | 310 | 0000-80-026R-WB | 525 |
| | 1991-97 | Optional Cold Package | 585 | 0000-80-124F-WB | 700 |

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8. WARRANTABLE CHARGING AND/OR REPLACEMENT

The information below outlines when battery charging or replacement is covered under vehicle warranty.

- Charging / Testing

Charging or testing is not covered under vehicle warranty and is considered part of normal dealer processing responsibility. Boost charging is covered within 48 hours of vehicle delivery.

NOTE: This operation will require completion of the Battery Check Sheet.

- Wholesale Delivery Inspection

Battery replacement requires DCSM authorization. Additionally, the Battery Check Sheet and Battery Check Tag must be completed and attached to the repair order. **If the documents are not attached to the repair order, the claim is subject to debit.**

- After Retail Delivery

Replacement is covered under normal warranty if the battery is judged defective after charging and diagnosing the battery according to the procedures in this bulletin. The Battery Check Sheet must be completed and attached to the repair order. **If the documents are not attached to the repair order, the claim is subject to debit.**

9. WARRANTY CLAIM SUBMISSION

Dealers submitting warranty claims must retain copies of the Battery Check Tag and the Battery Check Sheet. The operation number listed below is used for Battery Inspection, Charging and Testing. This includes:

- Battery Load Test
- Battery Replacement
- Charging and Capacity Testing
- Charging Test
- Dark Current Test

10. WARRANTY INFORMATION (For testing, charging and replacement)

| | |
|-------------------------|------------------------------------|
| Symptom Code: | Complete Actual Code |
| Damage Code: | Complete Actual Code |
| Part Number Main Cause: | Complete Actual Part Number |
| Operation Number: | G0501ACX |
| Labor Hours: | 0.5 Hrs. (All vehicles except 929) |
| | 0.6 Hrs. (929) |