Service Bulletin

Mazda Motor of America, Inc.
7755 Irvine Center Drive
Irvine, California 92718
Telephone (714) 727-1990

mazda

Category	Applicable Model/s	Subject	Bulletin No.	002/95
G	All Models	MAINTENANCE FREE BATTERY DIAGNOSTIC AND CHARGING PROCEDURE	Issued	4/5/95
			Revised	

DESCRIPTION

The following information describes the correct inspection and servicing procedures for original equipment Mazda batteries. This bulletin replaces the previously released bulletin Cat. G, No. 003/93

NOTE: Diagnostic procedures used for lead-acid batteries provide false readings and contribute to unnecessary replacement if used on maintenance free batteries.

The instructions in this bulletin apply to wholesale delivery vehicles, vehicles in dealer inventory and retailed vehicles. The instructions include:

1. Inspection Procedures
2. Battery Charging Information
3. Battery Diagnostic Procedure (Flow Chart)
4. Charging System Diagnostic Procedures (Equipment Requirements)
5. Cold Cranking Amperage (CCA) Specifications
6. Warranty Information
7. Battery Maintenance Record
8. Battery Check Sheet

Both the *"Battery Check Sheet"* and the *"Battery Maintenance Record"* are available in pad form from HELM Inc..

1. INSPECTION

A) At Wholesale Delivery

- Measure the voltage with a digital voltmeter. If the voltage is 12.4 V or more, the battery is normal. If the battery is less than 12.4V, refer to the table on page 2 for "boost" and "quick" charging specifications.

Or

- Test the battery with a load or electronic tester (i.e. VAT 40 or MIDTRONICS PowerSensor Plus). Refer to the table on page 3 or 4 (depending on test equipment) for minimum voltage specifications.
- If the battery is not within the minimum specification, contact your DCSM for authorization prior to replacing the battery. See the Warranty Information on page 7.

NOTE: Do not install the "ROOM" fuse until retail delivery. Following this procedure will minimize the amount of dark current drawn from the battery. Dark current is current drawn by various electronic circuits which are constantly "ON". Examples of these circuits are engine and transmission CPUs, alarm systems and radio memories.

B) Vehicles In Dealer Inventory

- All batteries require periodic maintenance and, if necessary, supplemental charging to maintain battery performance.
- Measure the amount of battery voltage once a month. If the voltage is less than 12.4V, perform a "quick" or "boost" charge according to the instructions on page 2 and complete the Battery Maintenance Record.

NOTE: Run the vehicle's engine 20-30 minutes once per week (with A/C "ON", if equipped). Running the engine will charge the battery and circulate the A/C refrigerant oil to maintain seals. If possible, periodically relocate the vehicle to keep brake rotor surfaces free of rust.

C) Just Prior To Retail Delivery

- Measure the battery voltage with a digital voltmeter or use the MIDTRONICS PowerSensor Plus tester in the "C" position for a voltage check or the"D" position to provide battery CCA rating. If the voltage is 12.4 V or more, the battery is normal and the vehicle may be delivered.

NOTE: MIDTRONICS PowerSensor Plus requires only 10.2V to accurately test battery condition.

- If the voltage is less than 12.4V, refer to the table on page 2 for "boost" and "quick' charging specifications prior to delivery.

NOTE: If the battery power level is significantly low, driving the vehicle **will not** sufficiently restore battery charge. Install the "ROOM" fuse **just prior** to vehicle delivery.

Signature _____ Signature _____ Index # 002722

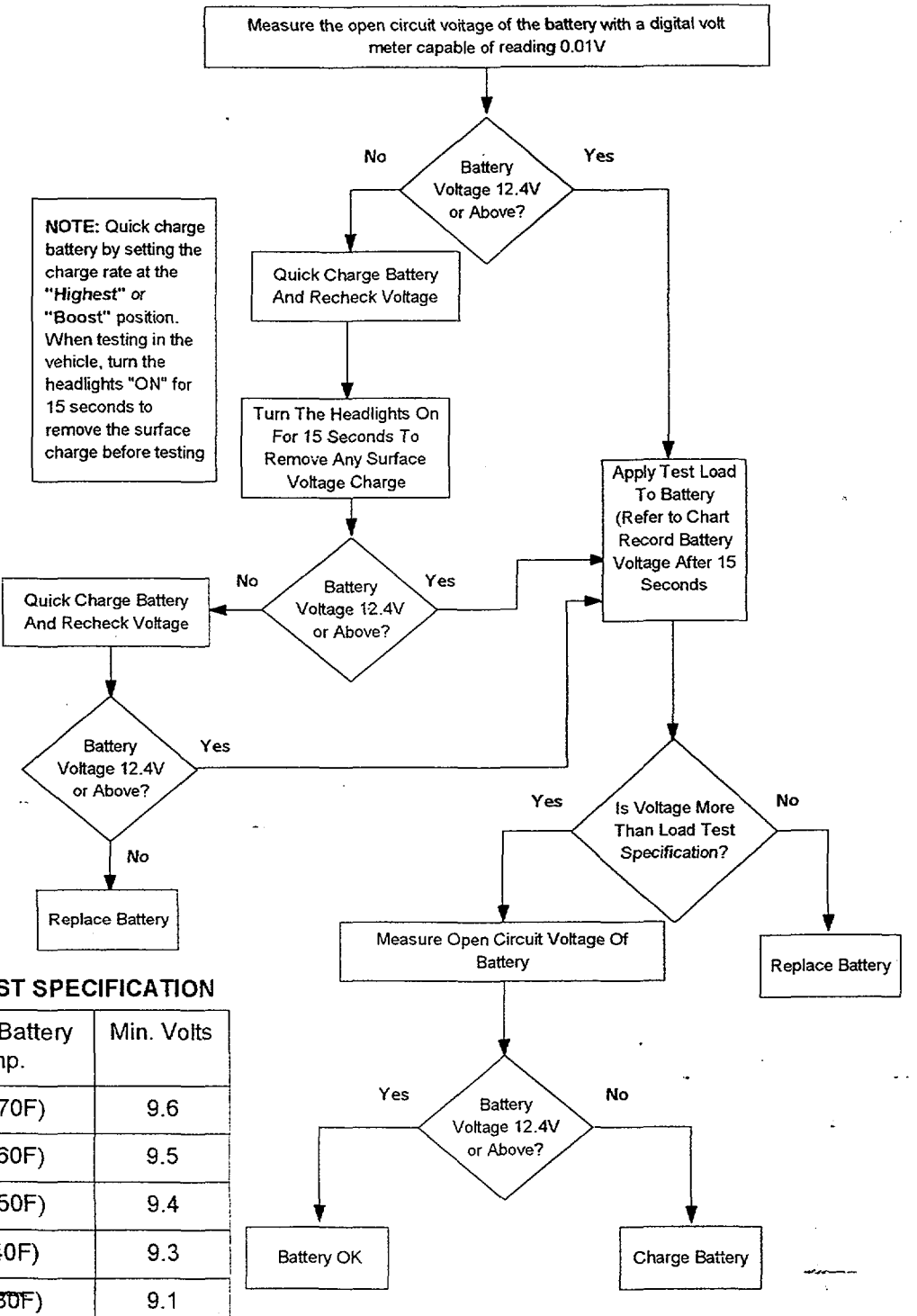
2. CHARGING INFORMATION

The chart below gives specific charging amps, times and load test amps for 1993 -'95 vehicles. Refer to the applicable workshop manual for other model year vehicles and additional troubleshooting information.

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 80D26L	30 35	30 30	180 195
Millenia	75D26L 80D26L	35	30	195
MX-3	50D20L 55D23L 65D23L	25 30 30	30 30 30	150 180 165
MX-5	S46A24L	20	30	105
RX-7	55D23L 65D23L 75D26L	30 30 35	30 30 30	180 165 195
MPV	50D20L 80D26L	25 35	30 30	150 195
B-Series	50D20R 75D26R 80D26R	25 35 35	30 30 30	150 195 195
94-95 B-Series	BX-58C BXT-65-650	35 35	20 20	270 325
Navajo	BXT-65-650	35	20	325

3. BATTERY DIAGNOSTIC PROCEDURES (Load Test Using VAT-40 or Equivalent)

Diagnostic procedures used for testing lead-acid batteries provide false readings leading to unnecessary replacement if used on maintenance-free batteries. Follow the table below when diagnosing systems with maintenance-free batteries.



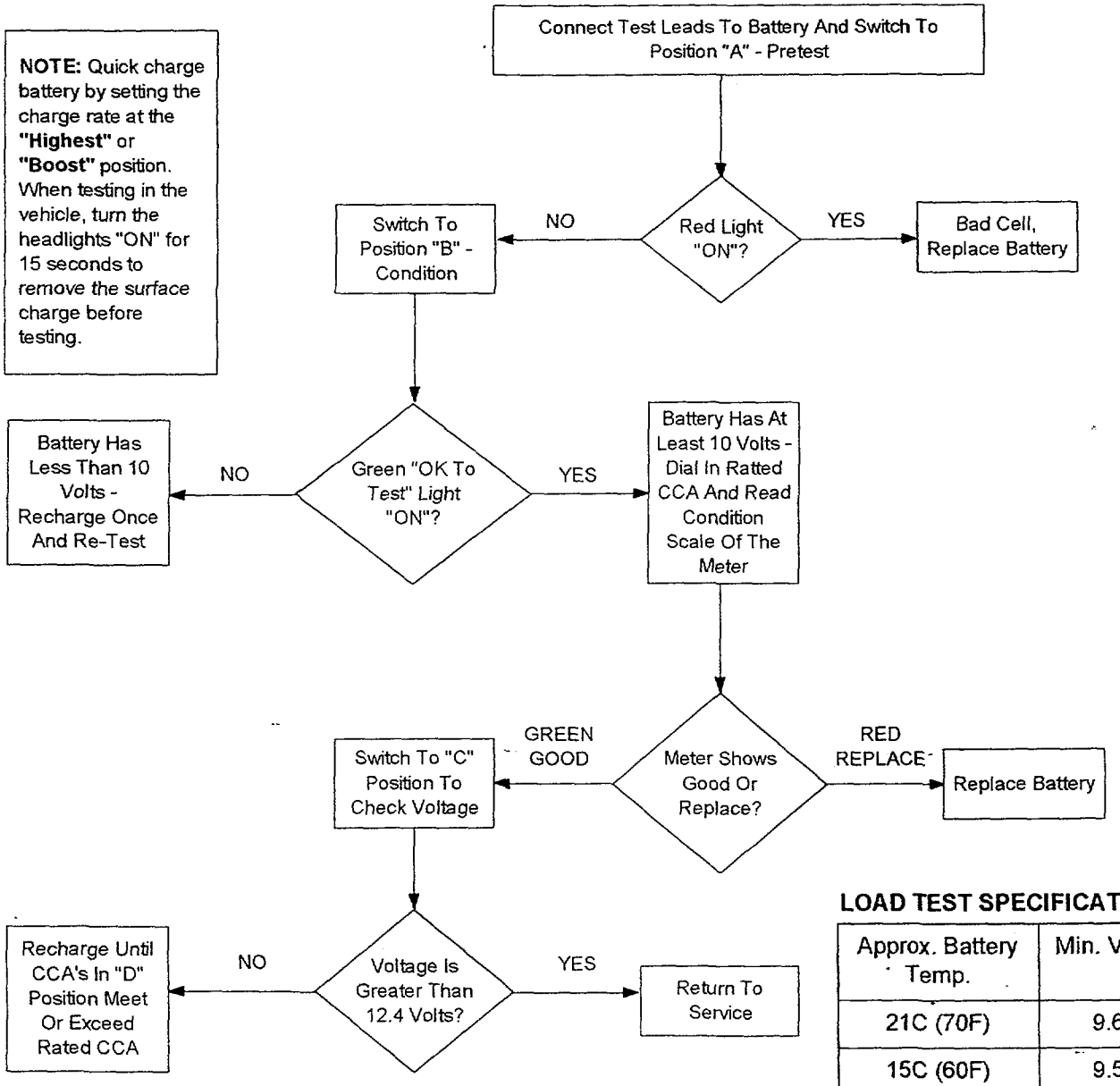
LOAD TEST SPECIFICATION

Approx. Battery Temp.	Min. Volts
21C (70F)	9.6
15C (60F)	9.5
10C (50F)	9.4
4C (40F)	9.3
-1C (30F)	9.1
-7C (20F)	8.9
-12C (10F)	8.7
-18C (0F)	8.5

See Page 4 of 7 for Midtronics PowerSensor Plus Instructions

3. BATTERY DIAGNOSTIC PROCEDURES (Using *Midtronics PowerSensor Plus*)

Diagnostic procedures used for testing lead-acid batteries provide false readings leading to unnecessary replacement if used on maintenance-free batteries. Follow the table below when diagnosing systems with maintenance-free batteries.



This flow chart is not available in pad form. Dealers are requested to make copies at the dealership.
This chart will be provided in pad form at the next printing.

LOAD TEST SPECIFICATION

Approx. Battery Temp.	Min. Volts
21C (70F)	9.6
15C (60F)	9.5
10C (50F)	9.4
4C (40F)	9.3
-1C (30F)	9.1
-7C (20F)	8.9
-12C (10F)	8.7
-18C (0F)	8.5

4. CHARGING SYSTEM DIAGNOSTIC PROCEDURE (Equipment Procedures)

1. Check the following:
   - Connectors
   - Grounds
   - Alternator Condition
   - Fuses

(USING VAT-40 OR EQUIVALENT)

2. Start engine and confirm that 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 applicable workshop manual.
3. Check the alternator belt tension and condition.
4. Turn the vehicle headlights "ON". Check engine belt and alternator bearing for unusual noise by raising and lowering the engine RPM.
5. Turn ignition and all accessories "OFF".
6. Connect a load tester.
7. Apply the load test referring to the table and flow chart on page 3 or 4 (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 if less than 12.4V.
   - If the voltage is less than the minimum, "quick" or "boost" charge the battery for 30 minutes. Perform a load test again. If the battery is still below the minimum, replace the battery and proceed to step 8.
8. Start the vehicle and raise the RPM to 2500.
9. 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 14.1V 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 14.1V, replace the alternator.

(USING MIDTRONICS PowerSensor Plus TESTER)

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 pre-charging. If low voltage is still found, 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 indicates that the battery has at least 10.2V and can therefore be tested without pre-charging. This position indicates battery cold cranking amperage (CCA). This position requires that the CCA rating be set on the MIDTRONICS PowerSensor Plus Tester dial. Refer to the attached chart to determine CCA. The MIDTRONICS PowerSensor Plus tester then determines actual CCA by measuring the actual condition of the battery voltage and plate condition.

   Position "C" measures the alternator output when the engine is started and also indicates "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 capacity is determined (ex. Indicated CCA of 400 for a battery with a 600 rating = 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.

See page 6 for the appropriate ratings.

Number: 002/95	Date Issued: 4/5/95	Revised:

5. BATTERY COLD CRANKING AMPERAGE (CCA) RATINGS

NOTE: CCA Rating Numbers (stamped on battery covers) are required for use with **MIDTRONICS** PowerSenser Plus Battery Tester.

WET BATTERY APPLICATION GUIDE

Model / Year	Factory Battery (JIS) Number	Group Size**	OEM Battery CCA	Replacement Battery CCA	Replacement Battery Part Number
323 / PROTEGE					
1982-86	50D20L	GR24	280	460	0000 80 024R WB
1986 - 91	50D20L	GR26R	320	525	0000 80 026R WB
1988 - 95*	55D23L	GR35	360	525	0000 80 035R WB
626 / MX-6					
1980-92	50D20L	GR26R	410	525	0000 80 026R WB
1983-91*	55D23L	GR35	360	525	0000 80 035R WB
1992-95	582, 540	GR58R	582	582	0000 80 058R WB
MILLENIA					
1995	75D26L, 490	GR24	490	675	0000 80 124F WB
929					
1988-95	50D20L	GR26R	310	525	0000 80 026R WB
1988-91*	80D26L, 582	GR24	585	675	0000 80 124R WB
MPV					
1989-95	50D20L, 306	GR26R	310	525	0000 80 026R WB
1989-95 (Cold Pack)	80D26L, 582	GR58R	585	675	0000 80 124F WB
RX-7					
1986-88	50D20L, 306	GR26R	310	460	0000 80 0024 WB
1989-93	55D23L, 356	GR35	360	525	0000 80 0035 WB
1986-93	65D23L, 420	GR35	420	460	0000 80 0024 WB
1992-95	75D26L	GR24	415	500	0000 80 224F WB
1992-95		24F	490	675	0000 80 124F WB
MX-3					
1992-93 (I-4)	50D23L	GR26R	310	525	0000 80 026R WB
1992-95 (V6)	55D23L	GR35	360	525	0000 80 035R WB
1992-95 (ALL)		GR24F	415	500	0000 80 224F WB
B-SERIES					
1986-91	50D20L	GR26R	320	525	0000 80 026R WB
1986-95 (Cold Pack)	75D26L	GR24	390	500	0000 80 224F WB
1988		GR26R	390	500	0000 80 224F WB
1995	582, 540	GR58R	540	540	0000 80 58HD WB
1995*		GR65R	650	875	0000 80 0065 WB
NAVAJO					
1991-94	650	GR65R	650	875	0000 80 0065 WB

NOTE:

* Indicates optional batteries to those listed just above.

** The "GROUP" size refers to the battery external dimensions and **not** the CCA rating. Batteries can have the same group size and different CCA ratings.

 • For information on batteries for older and/or diesel model vehicles, see Accessory Bulletin XG-4.

Number: 002/95	Date Issued: 4/5/95	Revised:

6. WARRANTY INFORMATION

Charging System Diagnosis

Symptom Code:	Complete Actual Code
Damage Code:	Complete Actual Code
Part Number Main Cause:	Complete Actual Part Number
Operation Number:	G0501ACX
Labor Hours:	0.5Hrs (Vehicles other than 929)
	0.6Hrs (929 Vehicles)

NOTE: The above operation number is used for **Battery Inspection, Charging and Testing. This includes:**

- Battery Load Test
- Battery Replenishment
- Charging and Capacity Test
- Charging Test
- Dark Current Test

NOTE: If a charging problem still exists after battery charging and/or replacement, follow the charging diagnostic procedures covered under operation number G0001*DX to identify the problem. Basic diagnostic operations require separate punch/flag time. Hours shown on the SRT microfiche are the maximum allowable times.

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

- **Wholesale Delivery Inspection**

Charging/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. **This operation will require completion of the Battery Check Sheet.**

Replacement requires DCSM authorization. Additionally, **the Battery Check Sheet must be completed** and attached to the repair order. If the check sheet is not attached to the repair order, the claim will be denied.

- **Vehicles In Dealer Inventory**

Maintenance of vehicles in dealer inventory is the responsibility of the dealer and is not covered under vehicle warranty. If a battery problem results from defects in material/workmanship, battery replacement is covered under vehicle warranty with DCSM authorization. Maintain the battery according to the schedules and procedures listed on page 1 of this bulletin. **Complete the Battery Maintenance Record** and attach a copy of the completed record to the repair order. If a copy is not attached to the repair order, the claim will be denied.

- **After Retail Delivery (First Ninety (90) Days After Retail Delivery)**

Charging/testing is not covered under vehicle warranty unless accompanied by a related repair (i.e. alternator failure). **This operation will require completion of the Battery Check Sheet.**

Replacement is covered with DCSM authorization only if the battery has been properly maintained while in inventory. **A copy of the Battery Maintenance Record** and **Battery Check Sheet** must be completed and attached to the repair order. If copies are not attached to the repair order, the claim will be denied.

After Retail Delivery (After Ninety (90) Days From Retail Delivery)

Charging/testing is not covered under the vehicle warranty unless accompanied by a related repair (i.e. alternator failure). This operation will require completion of the Battery Check Sheet.

Replacement is covered under normal warranty if the battery is judged defective after charging and diagnosing the battery according to the procedure in this bulletin.

The Battery Check Sheet must be completed and attached to the repair order. If copies are not attached to the repair order, the claim will be denied.

BATTERY CHECK SHEET

NOTE: Attach this Check Sheet to the reverse side of the Repair Order.

1. Was the customer's complaint verified? ____ Yes ____ No
2. Battery Inspection Results

Information	Reading
Instrument Used For Test	
Battery Voltage (Open Terminal)	
Battery Voltage (Load Test)	

3. Authorization Number _____ *(If battery was replaced prior to retail sale or within 90 days of retail sale)*

See Reverse Side For Battery Diagnostic Flow Chart

9999 95 037G 95

BATTERY MAINTENANCE RECORD

VIN: _____

Inspection			Charging and Load Test if the battery voltage measures less than 12.4V		Signature
Date	Voltage	Removal of *ROOM* Fuse	After Charging	Load Test	

- Battery voltage should be checked according to the Service Bulletin Cat. G, No. 002/95.
- Removal of the ROOM fuse should be confirmed. Check the column ("Removal of ROOM Fuse") during inspection.
- Date, voltage and signature must be filled out on inspection.
- The record should be retained at the dealer when the vehicle is retailed.

NOTE:
- If the battery voltage measures less than 12.4V, driving the vehicle will not sufficiently charge the battery. Do not release a vehicle with a battery that is below full charge.
- Install the ROOM fuse just prior to vehicle delivery.
- Removing the ROOM fuse reduces the amount of "dark-current" voltage that is drained from the battery.

See Reverse Side For Battery Diagnostic Flow Chart