

UNIFORM INSPECTION & COMMUNICATION STANDARDS 2010 - 2011

Electrical Systems

ELECTRICAL SYSTEMS

These materials are confidential and are not to be disclosed to, or utilized by, any individual or entity other than participants of the Motorist Assurance Program (MAP).

The Automotive Maintenance and Repair Association (AMRA) and MAP do not warrant these materials or guarantee their accuracy, and AMRA and MAP assume no liability for errors.

MAP STANDARDS OF SERVICE

MAP developed standards of service for shops to follow in working with customers. Written from the point of view of customers, and for the use of maintenance and repair shops, the standards expand on the ideas and promises established in MAP's Pledge to Customer

I. Our recommendations are based upon the following definitions.

System Failure - Parts/system indicated are out of manufacturers' specifications, have failed or are unable to perform their normal function as intended or designed by the manufacturers. Service/replacement is required.

Preventive/Scheduled Maintenance - Parts/system are scheduled for service/ replacement per industry standards or are near the end of their useful life and repair/ replacement is recommended in advance of parts/system failure. Service/replacement is suggested.

Improved System Performance - Parts/ system indicated are recommended for repair/ replacement to enhance/improve the vehicle's ability to perform as intended or designed by the manufacturer, or as requested by the customer. Service/replacement is suggested.

II. Training/Criteria Our personnel have acquired auto repair expertise through formal education or work experience. Where appropriate, personnel are moving toward certification (e.g. vehicle manufacturer, ASE, etc.) for the services performed. Continuing education will be supported by all MAP participants.

III. Appropriate Company Approved Inspection

We will perform an appropriate inspection based on MAP Uniform Inspection & Communication Standards.

IV. Written Estimates

Written estimates based on our inspection, in compliance with state and local regulations, will include parts (dollar amount), labor (dollar amount), and the total estimate.

V. Work Authorization

No work will be performed without the customer's prior approval.

VI. Limited Warranty

A minimum limited warranty will be offered of 90 days or 4,000 miles, whichever comes first, covering parts and labor.

VII. Returned Parts

All customers will be entitled to the return of old parts, or if they choose, they may examine the parts prior to leaving the store. Where failed parts are required to be returned to the manufacturer in order to

honor the warranty, the customer will be allowed to examine the parts.

VIII. Classification of Parts

Replaced parts will be identified as new, remanufactured, rebuilt or used. MAP participants will inform the customer and indicate on the estimate and invoice whether a part is new, remanufactured, rebuilt or used.

THE MAP PROCESS - OVERVIEW

Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program comes from retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We produce materials that give motorists the information and encouragement to take greater responsibility for their vehicles-through proper, manufacturer / recommended maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt (1) a Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require that an inspection of the vehicle's (problem) system be made and the results communicated to the customer according to industry standards. Given that the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, Electrical Systems, and Drive Train and Transmissions. Further, revisions to all of these inspection communication standards are continually re-published. Participating shops utilize these Uniform Inspection & Communication Standards as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association, and the program adjusted as needed.

We welcome you to join us as we continue our outreach... with your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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THE MAP PROCESS - OVERVIEW OF SERVICE REQUIREMENTS AND SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-train, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience or the vehicle manufacturer's recommended service interval and must be documented. However, any suggestions must be documented and must be based on substantial and informed experience or the vehicle manufacturer's recommended service interval. NOTE: Vehicle manufacturer service intervals are often categorized as either Normal or Severe. Frequently, motorists are unaware that their driving patterns and habits meet the criteria for following Severe Service schedules. Severe Service is generally defined as, but not limited to one or more of the following conditions: Driving in stop-and-go traffic; frequent short trips; high-speed driving; extreme temperatures; towing or hauling.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

- **Example:** An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.
- **Example:** A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

- **Example:** An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.
- **Example:** The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement	Reasons to Suggest Repair or Replacement
A. Part no longer performs intended purpose B. Part does not meet a design specification (regardless of performance) C. Part is missing	1. Part is close to the end of its useful life B - Part does not meet a design specification (regardless of performance) (just above discard specifications, or weak; failure likely to occur soon, etc.) 2. To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.) 3. To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM) 4. Technician's recommendation based on substantial and informed experience 5. To comply with maintenance recommended by AMRA / MAP

Reasons to Require Repair or Replacement**NOTE:**

When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement**NOTE:**

Suggested services are *always* optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

BATTERY, STARTING & CHARGING SYSTEM CHECKSHEET



BATTERY, STARTING & CHARGING SYSTEM CHECKSHEET

Date: _____
Name: _____
Address: _____
City: _____ State: _____ Zip Code: _____
Year: _____ Make: _____ Model: _____
Mileage: _____ License: _____ VIN: _____ Eng Code: _____

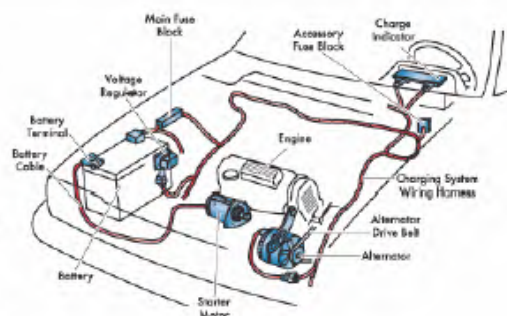
Customer Interview:

Reason Code Explanation**Code Reason****Remind**

- A Part No Longer Performs Intended Purpose
- B Part Does Not Meet A Design Specification (Regardless Of Performance)
- C Part Is Missing

Suggested/Optional

- 1 Part Is Close To The End Of Its Useful Life
- 2 To Address A Customer Need, Convenience Or Request
- 3 To Comply With Maintenance Recommended By The Vehicle's Original Equipment Manufacturer
- 4 Technician's Recommendation Based On Substantial And Informed Experience
- 5 To Comply With Maintenance Recommended By AMRA/MAP



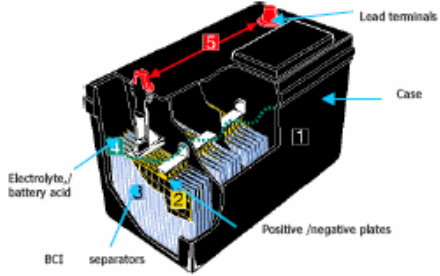
Your vehicle has been inspected following the Uniform Inspection and Communication Standards developed by the Motorist Assurance Program. MAP produces materials that give motorists the information and encouragement to take greater responsibility for their vehicles—through proper maintenance. We encourage participating service and repair shops to adopt the MAP Pledge of Assurance to their Customers and the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction. For more information visit: www.motorist.org

DISCLAIMER: This document may be used as a guide when performing vehicle inspection. This form is not to be used as an estimate form and may not comply with Local or State Laws. The Motorist Assurance Program is not responsible for the performance and accuracy of the motor vehicle inspection performed using this document.

Fig.1: Battery, Starting & Charging System Checksheet (1 Of 2)

BATTERY, STARTING & CHARGING SYSTEM CHECKSHEET

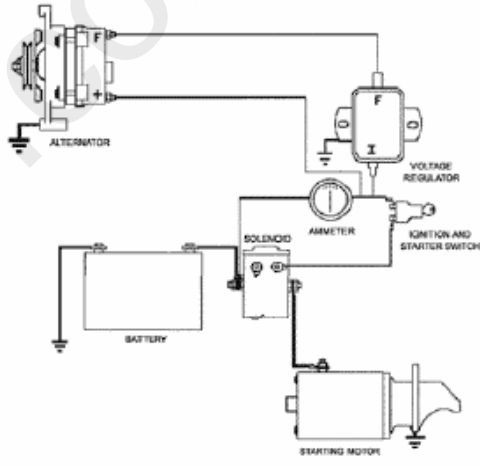
Battery				
	OK	S	R	Condition
Battery				
Fluid Level				
Case				
Posts				
Voltage				
CCA				Minimum OE Spec _____ Actual _____
Battery Box				
Battery Hold Down				
Battery Bolts				
Heat Shield				



Wire, Cables, Fuse Block				
	OK	S	R	Condition
Cables				
Positive				
Negative				
Ground Straps				
Cable Ends				
Wiring				
Fuse Blocks				
Fuses / Circuit Breakers				
Indicator Lights / Gauges				
Battery Cooling Fan				
Terminals / Connectors				

Alternator / Generator				
	OK	S	R	Condition
Alternator				
Volts				Spec _____ Actual _____
Voltage Regulator				
Pulleys				
Belt				
Tensioner				
Brackets				

Starter Motor				
	OK	S	R	Condition
Starter				
Cranking Amperage or Voltage				Spec _____ Actual _____
Starter Drive				
Solenoid				
Cables				



Generic Starting & Charging System

OK	Suggested 1, 2, 3, 4, 5	Required A, B, C
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Fig. 2: Battery, Starting & Charging System Checksheet (2 Of 2)

ELECTRICAL SYSTEMS

ACTUATOR MOTORS (ELECTRIC)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Missing	C	Require replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

ACTUATOR MOTORS (VACUUM)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement

Condition	Code	Procedure
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking (vacuum)	A	Require repair or replacement
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage
Linkage binding, affecting performance	A	Require repair or replacement of linkage
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement

AIR BAGS

NOTE: For all air bag components and conditions, refer to vehicle manufacturer's specifications for diagnosis and parts replacement.

ALTERNATORS AND GENERATORS

NOTE: If components have been added that increase vehicle electrical load requirement (for example, sound systems, air conditioning, alarm systems, etc.), charging system output must meet the increased demand.

Condition	Code	Procedure
Alternator output meets OEM specification but is insufficient for add on electrical load	2	Suggest upgrade of alternator or removal of excess electrical load
Alternator's rated output is below OEM specification	B	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware non-functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Diode inoperative	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Inoperative includes intermittent operation.		
Housing broken, affecting performance	A	Require repair or replacement
Housing broken, not affecting performance	A	No service suggested or required
Housing cracked, affecting performance	A	Require repair or replacement
Housing cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Noisy	2	Suggest repair or replacement
Pulley incorrect	B	Require replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Terminal resistance (voltage drop) out of specification	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Voltage drop out of specification	A	Require repair or replacement

AMPLIFIERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Malfunctioning	A	Require repair or replacement
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Missing	C	Require replacement
Sound quality poor	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

ANTENNAS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent, affecting performance	2	Suggest repair or replacement
Binding	2	Suggest repair or replacement
Broken	A	Require replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation or out of specification.		
Insulation damaged, conductors exposed	A	Require repair or replacement
Insulation damaged, conductors not exposed	1	Suggest replacement
Missing	C	Require replacement
Motor runs continuously	A	Require or replacement
Power antenna noisy	2	Suggest repair or replacement
Sticking	2	Suggest repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		

Condition	Code	Procedure
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

BATTERIES

NOTE: Proper operation of any electrical system or component can be affected by battery condition. The battery(ies) must meet or exceed minimum specification for vehicle as equipped and test to that specific battery's CCA.

Definition of Terms

Battery Performance Testing - Testing that determines whether or not a battery meets both vehicle OEM and battery manufacturer's specifications.

Cold Cranking Amp (CCA) Rating - The number of amperes a new, fully charged battery at 0Â° F (-17.8Â° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

Cranking Amps (CA) - The number of amperes a new, fully charged battery, typically at 32Â° F (0Â° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12volt battery).

OEM Cranking Amps - The minimum CCA required by the original vehicle manufacturer for a specific vehicle.

Condition	Code	Procedure
Battery frozen	Å	Further inspection required
NOTE: Do not attempt to charge a frozen battery. Allow battery to warm thoroughly and then performance-test. If battery fails performance test, require replacement.		
Battery tests near the ""end of its useful life"" utilizing a tester or on-board monitor able to accurately determine this condition	1	Suggest Replacement
Case leaking	A	Require replacement
Casing swollen	A	Further inspection required
NOTE: No service suggested or required unless the battery fails performance test, in which case, require replacement.		
Circuit open internally	A	Require replacement
Electrolyte contamination	A	Further inspection required
NOTE: No service suggested or required unless the battery fails performance test, in which case, require replacement.		
Electrolyte discoloration	A	Further inspection required

Condition	Code	Procedure
NOTE: No service suggested or required unless the battery fails performance test, in which case, require replacement.		
Fails to accept and hold charge	A	Require replacement
NOTE: This phrase refers to a battery that fails to either accept and/or retain a charge using appropriate times listed in the Battery Charging Guide of the BCI Service Manual, battery charger operating manual, or battery manufacturer's specifications.		
Fluid level low	B	Further inspection required
NOTE: Determine cause of low fluid level. Refill to proper level(s) with water (distilled water preferred). Recharge battery and performance-test.		
NOTE: If battery does not meet specifications, require replacement.		
NOTE: If battery is sealed type (non-removable filler caps), require replacement.		
Out of performance specification for battery	B	Require replacement
NOTE: The battery may meet vehicle's OEM specifications for that vehicle but test below the minimum specifications defined by the battery manufacturer.		
Out of specification for application	B	Require replacement
NOTE: The battery may meet battery manufacturer's specifications but test below the minimum specification defined by the vehicle's OEM for that vehicle.		
Post (top or side) burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Post (top or side) burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Post (top or side) corroded, affecting performance	A	Require repair
Post (top or side) corroded, not affecting performance	2	Suggest repair
Post (top or side) loose	A	Require replacement
Post (top or side) melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Post (top or side) melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		

Condition	Code	Procedure
Specific gravity low	B	Further inspection required
NOTE: Recharge and test to manufacturer's specifications. If battery fails performance test, require replacement.		
State of charge low	A	Further inspection required
NOTE: Recharge and test to manufacturer's specifications. If battery fails performance test, require replacement.		
Top dirty	2	Suggest cleaning battery
Top wet	A	Require cleaning battery Further inspection required
NOTE: Check fluid level and adjust to manufacturer's specification. Suggest checking charging system for proper operation.		
Vent cap loose	A	Require repair or replacement of vent cap
Vent cap missing	C	Require replacement of vent cap

BATTERY CABLES, WIRES AND CONNECTORS

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Insulation damaged, conductors exposed	A	Require repair or replacement
NOTE: Exposed conductor at replacement (aftermarket) terminal end does not require repair or replacement.		
Insulation damaged, conductors not exposed	1	Suggest replacement
Open	A	Require repair or replacement
Protective shield (conduit) melted	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Protective shield (conduit) missing	C	Suggest repair or replacement
Resistance (voltage drop) out of specification	A	Require repair or replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement

Condition	Code	Procedure
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Voltage drop out of specification	A	Require repair or replacement

BATTERY CABLES

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Insulation damaged, conductors exposed	A	Require repair or replacement
NOTE: Exposed conductor at replacement (aftermarket) terminal end does not require repair or replacement.		
Insulation damaged, conductors not exposed	1	Suggest replacement
Open	A	Require repair or replacement
Protective shield (conduit) melted	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Protective shield (conduit) missing	C	Suggest repair or replacement
Resistance (voltage drop) out of specification	A	Require repair or replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

Condition	Code	Procedure
Voltage drop out of specification	A	Require repair or replacement

BATTERY TRAYS AND HOLD DOWN HARDWARE

Condition	Code	Procedure
Battery improperly secured	2	Suggest repair
Bent, affecting performance	A	Require repair or replacement
Bent, not affecting performance	Â	No service suggested or required
Broken, affecting performance	A	Require repair or replacement
Broken, not affecting performance	Â	No service suggested or required
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Missing	C	Require replacement
Threads damaged	A	Require repair or replacement
Water drain clogged	A	Require repair

BATTERY WIRES

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Insulation damaged, conductors exposed	A	Require repair or replacement
NOTE: Exposed conductor at replacement (aftermarket) terminal end does not require repair or replacement.		
Insulation damaged, conductors not exposed	1	Suggest replacement
Open	A	Require repair or replacement
Protective shield (conduit) melted	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Protective shield (conduit) missing	C	Suggest repair or replacement
Resistance (voltage drop) out of specification	A	Require repair or replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Voltage drop out of specification	A	Require repair or replacement

BELTS

Condition	Code	Procedure
Alignment incorrect	B	Further inspection required
NOTE: Determine cause of incorrect alignment and require repair.		
Cracked	1	Suggest replacement
Frayed	1	Suggest replacement
Missing	C	Require replacement
Noisy	2	Further inspection required
NOTE: Determine cause of noise and suggest repair.		
Plies separated	A	Require replacement
Tension out of specification	B	Require adjustment or replacement
Worn beyond adjustment range	B	Require replacement
Worn so it contacts bottom of pulley	A	Require replacement

BULB SOCKETS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken	A	Require repair or replacement
Bulb seized in socket	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of socket.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of socket.		
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		

Condition	Code	Procedure
Connector missing	C	Require replacement
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Leaking	B	Require repair or replacement
Melted	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

BULBS, SEALED BEAMS AND LEDS

NOTE: Does not include soldered-in components.

Condition	Code	Procedure
Adjustment out of specification	B	Require repair or replacement
Application incorrect	B	Require replacement
NOTE: Application incorrect includes wrong bulb coating or color.		
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Base burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Base burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Base corroded, affecting performance	A	Require repair or replacement
Base corroded, not affecting performance	2	Suggest repair or replacement
Base leaking	A	Require repair or replacement
Base loose, affecting performance	B	Require repair or replacement
Base loose, not affecting performance	1	Suggest repair or replacement
Base melted	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		

Condition	Code	Procedure
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	Â	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Burned out	A	Require replacement
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Cracked	B	Require replacement
Intermittent	A	Require replacement
Lamp base melted	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Leaking	B	Require repair or replacement
Missing	C	Require replacement
Seized in socket	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

CD PLAYERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware

Condition	Code	Procedure
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Malfunctioning	A	Require repair or replacement
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Missing	C	Require replacement
Skips	A	Require repair or replacement
Sound quality poor	A	Require repair or replacement
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Speed incorrect	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

CIGARETTE LIGHTER ASSEMBLIES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Loose	B	Require repair or replacement
Missing	2	Suggest replacement
Sticking	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

CIRCUIT BREAKERS

Condition	Code	Procedure
Application incorrect	B	Require replacement
Blown	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Insulation damaged, conductors exposed	A	Require repair or replacement
Insulation damaged, conductors not exposed	1	Suggest replacement
Missing	C	Require replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

CLUTCH SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware

Condition	Code	Procedure
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn	1	Suggest replacement

CONNECTORS

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement

Condition	Code	Procedure
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Insulation damaged, conductors exposed	A	Require repair or replacement
Insulation damaged, conductors not exposed	1	Suggest repair or replacement
Open	A	Require repair or replacement
Protective shield (conduit) melted	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Resistance (voltage drop) out of specification	A	Require repair or replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Voltage drop out of specification	A	Require repair or replacement

CONTROL MODULES

Condition	Code	Procedure
Application incorrect	B	Require replacement
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware threads damaged	A	Require repair or replacement of hardware
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware
Code set (if applicable)	A	Further inspection required
NOTE: Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).		
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require repair

Condition	Code	Procedure
Contaminated	A	Require repair or replacement
NOTE: Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.		
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation. Some components may be serviceable; check for accepted cleaning procedure.		
Leaking	B	Require repair or replacement
Missing	C	Require replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead corroded	A	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

CRUISE CONTROL BRAKE SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn	1	Suggest replacement

CRUISE CONTROL CABLES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent	A	Require repair or replacement
Binding	A	Require repair or replacement
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	Â	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Broken	A	Require replacement
Cracked	B	Require repair or replacement
Disconnected	A	Require repair or replacement
Kinked	A	Require repair or replacement
Melted	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
NOTE: Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.		
Routed incorrectly	B	Suggest repair
Seized	A	Require repair or replacement

CRUISE CONTROL CLUTCH SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn	1	Suggest replacement

CRUISE CONTROL LINKAGES AND CABLES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent	A	Require repair or replacement
Binding	A	Require repair or replacement
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	Â	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Broken	A	Require replacement
Cracked	B	Require repair or replacement
Disconnected	A	Require repair or replacement
Kinked	A	Require repair or replacement
Melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
NOTE: Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.		
Routed incorrectly	B	Suggest repair
Seized	A	Require repair or replacement

CRUISE CONTROL RESERVOIRS

Condition	Code	Procedure

Condition	Code	Procedure
Leaking	A	Require repair or replacement
Melted	A	Require replacement
Missing	C	Require replacement
Oil-soaked (spongy)	1	Suggest replacement
Restricted	A	Require repair or replacement
Surface cracks (dry-rotted)	1	Suggest replacement

CRUISE CONTROL TUBES

Condition	Code	Procedure
Leaking	A	Require repair or replacement
Melted	A	Require replacement
Missing	C	Require replacement
Oil-soaked (spongy)	1	Suggest replacement
Restricted	A	Require repair or replacement
Surface cracks (dry-rotted)	1	Suggest replacement

CRUISE CONTROL VACUUM DUMP RELEASE VALVES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken	A	Require repair or replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking	B	Suggest replacement
Out of adjustment	B	Further inspection required
NOTE: Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.		

CRUISE CONTROL VACUUM HOSES, TUBES AND

Condition	Code	Procedure
Reservoirs	A	A
Leaking	A	Require repair or replacement
Melted	A	Require replacement
Missing	C	Require replacement
Oil-soaked (spongy)	1	Suggest replacement
Restricted	A	Require repair or replacement
Surface cracks (dry-rotted)	1	Suggest replacement

CRUISE CONTROL VEHICLE SPEED SENSORS

Condition	Code	Procedure
Air gap incorrect	B	Require adjustment to vehicle manufacturer's specifications

Condition	Code	Procedure
NOTE: If a sensor is not adjustable, further inspection is required to identify and correct cause.		
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken	A	Require replacement
Housing cracked	B	Require replacement
Internal resistance does not meet specifications	B	Require replacement
NOTE: Component failure may be caused by water intrusion into the wiring harness. Always check insulation for damage and wiring for excessive resistance.		
Lead routing incorrect	B	Require rerouting according to vehicle manufacturer's specifications
Loose	B	Require adjustment to vehicle manufacturer's specifications
NOTE: Some integral bearing assemblies with sensors may require replacement.		
Missing	C	Require replacement
Output signal incorrect	B	Require repair or replacement
NOTE: Component failure may be caused by water intrusion into the wiring harness. Always check insulation for damage and wiring for excessive resistance.		
Surface contaminated	2	Suggest cleaning; identify and correct source
Tip bent	B	Require replacement
Tip broken	B	Require replacement
Tip missing	B	Require replacement
Wire lead burned	A	Require replacement
Wire lead conductors exposed	B	Require replacement
Wire lead corroded	A	Require replacement
Wire lead open	A	Require replacement
Wire lead shorted	A	Require replacement

DEFOGGERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

DEFROSTERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

Condition	Code	Procedure
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

DELAYS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

DIMMERS

Condition	Code	Procedure
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Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

ELECTRIC HEATERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement

Condition	Code	Procedure
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

EQUALIZERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Malfunctioning	A	Require repair or replacement
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Missing	C	Require replacement
Sound quality poor	A	Require repair or replacement
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

FUSE BLOCKS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken, affecting performance	A	Require replacement
Broken, not affecting performance	Â	No service suggested or required
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of fuse box.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of fuse box.		
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Melted, affecting performance	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Melted, not affecting performance	2	Suggest replacement
NOTE: Determine cause and correct prior to replacement of part.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

FUSE BOXES AND BLOCKS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken, affecting performance	A	Require replacement
Broken, not affecting performance	A	No service suggested or required
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of fuse box.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of fuse box.		
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Melted, affecting performance	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Melted, not affecting performance	2	Suggest replacement
NOTE: Determine cause and correct prior to replacement of part.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS

Condition	Code	Procedure
Application incorrect	B	Require replacement
Blown	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Insulation damaged, conductors exposed	A	Require repair or replacement
Insulation damaged, conductors not exposed	1	Suggest replacement
Missing	C	Require replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement

FUSIBLE LINKS

Condition	Code	Procedure
Application incorrect	B	Require replacement
Blown	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Insulation damaged, conductors exposed	A	Require repair or replacement
Insulation damaged, conductors not exposed	1	Suggest replacement

Condition	Code	Procedure
Missing	C	Require replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement

GAUGES

NOTE: Includes odometers, speedometers, and tachometers (except cable-driven).

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Leaking	B	Require replacement
Lens broken	A	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Lens cloudy	2	Suggest repair or replacement
NOTE: If lens is available as a separate part, suggest replacement of lens only.		
Lens missing	C	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.		
Mechanical head noisy	2	Suggest repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		

Condition	Code	Procedure
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

GENERATORS

NOTE: If components have been added that increase vehicle electrical load requirement (for example, sound systems, air conditioning, alarm systems, etc.), charging system output must meet the increased demand.

Condition	Code	Procedure
Alternator output meets OEM specification but is insufficient for add on electrical load	2	Suggest upgrade of alternator or removal of excess electrical load
Alternator's rated output is below OEM specification	B	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware non-functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Diode inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Housing broken, affecting performance	A	Require repair or replacement
Housing broken, not affecting performance	A	No service suggested or required
Housing cracked, affecting performance	A	Require repair or replacement
Housing cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Noisy	2	Suggest repair or replacement
Pulley incorrect	B	Require replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		

Condition	Code	Procedure
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Terminal resistance (voltage drop) out of specification	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Voltage drop out of specification	A	Require repair or replacement

GROUND CABLES AND STRAPS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Insulation damaged, exposing conductors	2	Suggest replacement
Loose	A	Require repair
Missing	C	Require replacement
Open	A	Require repair or replacement
Resistance high	A	Require repair or replacement
Terminal resistance (voltage drop) is out of specification	B	Require repair or replacement
Voltage drop out of specification	B	Require repair or replacement

GROUND STRAPS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Insulation damaged, exposing conductors	2	Suggest replacement
Loose	A	Require repair
Missing	C	Require replacement
Open	A	Require repair or replacement
Resistance high	A	Require repair or replacement
Terminal resistance (voltage drop) is out of specification	B	Require repair or replacement
Voltage drop out of specification	B	Require repair or replacement

HEADLIGHT ADJUSTERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent, preventing adjustment	A	Require repair or replacement
Broken	A	Require repair or replacement
Indicator broken	A	Require replacement
Indicator missing	C	Require replacement
Missing	C	Require replacement of adjusters
Seized	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

HORNS AND SIRENS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware

Condition	Code	Procedure
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Missing	C	Require replacement
Out of adjustment	B	Require adjustment
Sound quality poor	A	Require repair or replacement. Further inspection required
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

IGNITION SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement

Condition	Code	Procedure
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn	1	Suggest replacement

INDICATOR LIGHTS

Condition	Code	Procedure
Does not come on during bulb check	Ā	Further inspection required
NOTE: See service manual for further information.		
Fails to function properly during test mode	Ā	Further inspection required
NOTE: See service manual for further information.		
On constantly	Ā	Further inspection required
NOTE: See service manual for further information.		
On intermittently	Ā	Further inspection required
NOTE: See service manual for further information.		

KEYLESS ENTRY KEYPADS AND TRANSMITTERS

Condition	Code	Procedure

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Malfunctioning	A	Require repair or replacement
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

KEYLESS ENTRY TRANSMITTERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Malfunctioning	A	Require repair or replacement
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Terminal broken	A	Require repair or replacement

Condition	Code	Procedure
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

LEDS

NOTE: Does not include soldered-in components.

Condition	Code	Procedure
Adjustment out of specification	B	Require repair or replacement
Application incorrect	B	Require replacement
NOTE: Application incorrect includes wrong bulb coating or color.		
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Base burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Base burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Base corroded, affecting performance	A	Require repair or replacement
Base corroded, not affecting performance	2	Suggest repair or replacement
Base leaking	A	Require repair or replacement
Base loose, affecting performance	B	Require repair or replacement
Base loose, not affecting performance	1	Suggest repair or replacement
Base melted	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	Â	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Burned out	A	Require replacement
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement
Cracked	B	Require replacement
Intermittent	A	Require replacement
Lamp base melted	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Leaking	A	Require repair or replacement
Missing	C	Require replacement
Seized in socket	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

LENSES

Condition	Code	Procedure
Adjustment out of specification	B	Require repair
Application incorrect	A	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken, affecting performance	A	Require replacement
Broken, not affecting performance	A	No service suggested or required

Condition	Code	Procedure
Cracked	B	Require replacement
Discolored	A	Require replacement
Leaking	B	Require repair or replacement
Melted, affecting performance	A	Require replacement
Melted, not affecting performance	2	Suggest replacement
Missing	C	Require replacement

MICROPHONES

Condition	Code	Procedure
Application incorrect	A	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Membrane torn	A	Require replacement
Missing	C	Require replacement
Polarity reversed	A	Require repair
Sound quality poor	A	Require repair or replacement. Further inspection required
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

MIRRORS (ELECTROCHROMATIC AND HEATED)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware

Condition	Code	Procedure
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Cracked	B	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Missing	C	Require replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

MOTORS

Condition	Code	Procedure
Amperage draw out of specification	A	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bracket bent	A	Require repair or replacement
Bracket broken	A	Require repair or replacement
Bracket cracked	A	Require repair or replacement
Bracket holes elongated, affecting performance	A	Require repair or replacement
Bracket holes elongated, not affecting performance	A	No service suggested or required
Bracket missing	C	Require replacement
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Drive mechanism damaged, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Further inspection required to determine cause.		
Drive mechanism damaged, not affecting performance	2	Suggest repair or replacement
NOTE: Further inspection required to determine cause.		
Fails to disengage	A	Require repair or replacement
Housing broken, affecting performance	A	Suggest repair or replacement
Housing broken, not affecting performance	Â	No service suggested or required
Housing cracked, affecting performance	A	Require repair or replacement
Housing cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	Â	No service suggested or required
Linkage binding, affecting performance	A	Require repair or replacement of linkage
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Further inspection required
NOTE: Follow OEM recommended adjustment procedures. Repair or replace if out of specification.		
Resistance out of specification	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement

Condition	Code	Procedure
Wire lead shorted	A	Require repair or replacement

NEUTRAL SAFETY SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn	1	Suggest replacement

ODOMETERS, SPEEDOMETERS AND TACHOMETERS (CABLE DRIVEN)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Drive cable broken	A	Require replacement
Drive cable noisy	2	Suggest repair or replacement
Inoperative	A	Further inspection required
NOTE: Inoperative includes intermittent operation, out of OEM specification, or out of range.		
Leaking	B	Require replacement
Lens broken	A	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Lens cloudy	2	Suggest repair or replacement
NOTE: If lens is available as a separate part, suggest replacement of lens only.		
Lens missing	C	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Noisy	2	Suggest repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

ODOMETERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement

Condition	Code	Procedure
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Leaking	B	Require replacement
Lens broken	A	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Lens cloudy	2	Suggest repair or replacement
NOTE: If lens is available as a separate part, suggest replacement of lens only.		
Lens missing	C	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.		
Mechanical head noisy	2	Suggest repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

POWER DISTRIBUTION CENTER

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken, affecting performance	A	Require replacement
Broken, not affecting performance	Â	No service suggested or required
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of fuse box.		
Burned, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of fuse box.		
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Melted, affecting performance	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Melted, not affecting performance	2	Suggest replacement
NOTE: Determine cause and correct prior to replacement of part.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

PULLEYS

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement
Application incorrect	B	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent, affecting performance	A	Require replacement
Cracked	B	Require replacement
Loose	B	Require repair or replacement
Missing	C	Require replacement
Pulley damaged, affecting belt life	A	Require replacement

RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware

Condition	Code	Procedure
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Malfunctioning	A	Require repair or replacement
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Missing	C	Require replacement
Sound quality poor	A	Require repair or replacement
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

RELAY BOXES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken, affecting performance	A	Require replacement
Broken, not affecting performance	A	No service suggested or required
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of relay box.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of relay box.		
Connector (Weatherpack type) leaking	A	Require repair or replacement

Condition	Code	Procedure
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Cover missing	C	Require replacement of cover
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Melted, affecting performance	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Melted, not affecting performance	2	Suggest replacement
NOTE: Determine cause and correct prior to replacement of part.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

RELAYS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Housing broken	A	Require replacement
Housing cracked	2	Suggest replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Missing	C	Require replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement

Condition	Code	Procedure
Terminal loose, not affecting performance	1	Suggest repair or replacement

SEALED BEAMS

NOTE: Does not include soldered-in components.

Condition	Code	Procedure
Adjustment out of specification	B	Require repair or replacement
Application incorrect	B	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Base burned, affecting performance	A	Require repair or replacement

NOTE:

Determine cause and correct prior to repair or replacement of part.

Base burned, not affecting performance	2	Suggest repair or replacement
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NOTE:

Determine cause and correct prior to repair or replacement of part.

Base corroded, affecting performance	A	Require repair or replacement
Base corroded, not affecting performance	2	Suggest repair or replacement
Base leaking	A	Require repair or replacement
Base loose, affecting performance	B	Require repair or replacement
Base loose, not affecting performance	1	Suggest repair or replacement
Base melted	A	Require replacement

NOTE:

Determine cause and correct prior to replacement of part.

Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	A	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	A	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Burned out	A	Require replacement
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement

NOTE:

Determine cause and correct prior to repair or replacement of part.

Connector missing	C	Require replacement
Corroded, affecting performance	A	Require repair or replacement
Corroded, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
Cracked	B	Require replacement
Intermittent	A	Require replacement
Lamp base melted	A	Require replacement
NOTE: Determine cause and correct prior to replacement of part.		
Leaking	B	Require repair or replacement
Missing	C	Require replacement
Seized in socket	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

SEAT HEATERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

SECURITY ALARM SENSORS

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware threads damaged	A	Require repair or replacement of hardware
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement. Further inspection required
NOTE: Inoperative includes intermittent operation.		
Missing	C	Require replacement
Resistance out of specification	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead corroded	A	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

SIRENS

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Missing	C	Require replacement
Out of adjustment	B	Require adjustment
Sound quality poor	A	Require repair or replacement. Further inspection required
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

SOLENOIDS

NOTE: For starter solenoids that are integral to the starter assembly, see Starters. For starter relays, see Relays.

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage

Condition	Code	Procedure
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

SPEAKERS AND MICROPHONES

Condition	Code	Procedure
Application incorrect	A	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Membrane torn	A	Require replacement
Missing	C	Require replacement
Polarity reversed	A	Require repair
Sound quality poor	A	Require repair or replacement. Further inspection required
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

SPEEDOMETER AND TACHOMETER LINKAGES AND CABLES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent	A	Require repair or replacement
Binding	A	Require repair or replacement
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	Â	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Broken	A	Require replacement
Cracked	B	Require repair or replacement
Disconnected	A	Require repair or replacement
Kinked	A	Require repair or replacement
Melted	A	Require repair or replacement

NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Routed incorrectly	B	Suggest repair
Seized	A	Require repair or replacement

SPEEDOMETER CABLES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent	A	Require repair or replacement
Binding	A	Require repair or replacement

Condition	Code	Procedure
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	A	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	A	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Broken	A	Require replacement
Cracked	B	Require repair or replacement
Disconnected	A	Require repair or replacement
Kinked	A	Require repair or replacement
Melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Routed incorrectly	B	Suggest repair
Seized	A	Require repair or replacement

SPEEDOMETERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Leaking	B	Require replacement
Lens broken	A	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Lens cloudy	2	Suggest repair or replacement
NOTE: If lens is available as a separate part, suggest replacement of lens only.		
Lens missing	C	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		

Condition	Code	Procedure
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.		
Mechanical head noisy	2	Suggest repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

STARTERS

NOTE: To prevent misdiagnosis, care should be taken to eliminate the possibilities of mechanical problems or high resistance in power and/or ground circuits.

Condition	Code	Procedure
Amperage draw does not meet OEM specifications	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
NOTE: Inspect block or bell housing mounting surface.		
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	Â	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket holes elongated, affecting performance	A	Require repair or replacement
Bracket holes elongated, not affecting performance	Â	No service suggested or required
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Drive gear damaged, affecting performance	A	Require repair or replacement
NOTE: Further inspection required to determine cause. Require inspection of ring gear.		
Drive gear damaged, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
NOTE: Further inspection required to determine cause. Require inspection of ring gear and service as needed.		
Fails to disengage	A	Require repair or replacement
Housing broken, affecting performance	A	Require repair or replacement
Housing broken, not affecting performance	A	No service suggested or required
Housing cracked, affecting performance	A	Require repair or replacement
Housing cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Noisy	2	Suggest repair or replacement
Shimmed incorrectly	B	Require repair
Starter shaft bushing missing	C	Require replacement
NOTE: Bushing may be in bell housing.		
Starter shaft bushing worn, affecting performance	A	Require replacement
Starter shaft bushing worn, not affecting performance	1	Suggest replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

SUB-WOOFER VOLUME CONTROL

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Malfunctioning	A	Require repair or replacement
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Missing	C	Require replacement

Condition	Code	Procedure
Sound quality poor	A	Require repair or replacement
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement

SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn	1	Suggest replacement

TACHOMETER CABLES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent	A	Require repair or replacement
Binding	A	Require repair or replacement
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	Â	No service suggested or required
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Broken	A	Require replacement
Cracked	B	Require repair or replacement
Disconnected	A	Require repair or replacement
Kinked	A	Require repair or replacement
Melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Routed incorrectly	B	Suggest repair
Seized	A	Require repair or replacement

TACHOMETERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Leaking	B	Require replacement
Lens broken	A	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Lens cloudy	2	Suggest repair or replacement
NOTE: If lens is available as a separate part, suggest replacement of lens only.		
Lens missing	C	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.		
Mechanical head noisy	2	Suggest repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement

TAPE PLAYERS AND CD PLAYERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement

Condition	Code	Procedure
Malfunctioning	A	Require repair or replacement
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Missing	C	Require replacement
Skips	A	Require repair or replacement
Sound quality poor	A	Require repair or replacement
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Speed incorrect	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

TENSIONERS

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bearings worn	1	Suggest replacement
Belt tension incorrect	B	Require adjustment or repair
Cracked	B	Suggest replacement
Missing	C	Require replacement
Noisy	2	Suggest replacement
Pulley damaged, affecting belt life	A	Require replacement
Seized	A	Require repair or replacement

TIMERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware

Condition	Code	Procedure
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

TRANSCEIVERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Malfunctioning	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.		
Missing	C	Require replacement
Sound quality poor	A	Require repair or replacement
NOTE: Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead burned	A	Require repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

TRANSDUCERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Drive mechanism damaged, affecting performance	A	Require repair or replacement
NOTE: Further inspection required to determine cause.		
Drive mechanism damaged, not affecting performance	2	Suggest repair or replacement
NOTE: Further inspection required to determine cause.		
Inoperative	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Inoperative includes intermittent operation or out of specification.		
Leaking (vacuum/fluid/air)	A	Require replacement
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	A	No service suggested or required
Linkage binding, affecting performance	A	Require repair or replacement of linkage
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Out of adjustment	B	Further inspection required
NOTE: Follow OEM recommended adjustment procedures. Repair or replace if out of specification.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

VACUUM ACCUMULATORS (RESERVOIRS)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Leaking	A	Require repair or replacement

VOLTAGE REGULATORS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement

Condition	Code	Procedure
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

WASHER FLUID LEVEL SENDERS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Leaking	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead corroded	A	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

WASHER PUMPS

Condition	Code	Procedure

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Leaking externally	A	Require repair or replacement
Leaking internally	A	Require repair or replacement
Noisy	2	Suggest repair or replacement
Resistance out of specification	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead corroded	A	Require repair or replacement
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

WIPER ARMS AND BLADES

NOTE: Windshield coatings or waxes can cause blades to not function as intended. Clean surface before making final judgment about blade replacement.

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Attaching socket stripped	A	Require replacement
Bent	A	Require repair or replacement
Loose	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement

Condition	Code	Procedure
Size incorrect	2	Suggest replacement
Tension insufficient	B	Require repair or replacement
Torn	A	Require replacement
Worn, affecting performance	A	Require replacement
Worn, not affecting performance	1	Suggest replacement

WIPER BLADES

NOTE: Windshield coatings or waxes can cause blades to not function as intended. Clean surface before making final judgment about blade replacement.

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Attaching socket stripped	A	Require replacement
Bent	A	Require repair or replacement
Loose	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Size incorrect	2	Suggest replacement
Tension insufficient	B	Require repair or replacement
Torn	A	Require replacement
Worn, affecting performance	A	Require replacement
Worn, not affecting performance	1	Suggest replacement

WIPER HOSES AND NOZZLES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Blocked	A	Require repair or replacement
Leaking	A	Require repair or replacement
Missing	C	Require replacement
Oil-soaked (spongy)	1	Suggest replacement
Spray pattern incorrect	2	Suggest repair or replacement
Surface cracks (dry-rotted)	1	Suggest replacement

WIPER LINKAGES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Attaching stud stripped	A	Require replacement
Bent	A	Require repair or replacement
Inoperative	A	Require replacement

Condition	Code	Procedure
NOTE: Inoperative includes intermittent operation.		
Loose	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Tension insufficient	B	Require repair or replacement
Worn, affecting performance	A	Require replacement
Worn, not affecting performance	1	Suggest replacement

WIPER NOZZLES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Blocked	A	Require repair or replacement
Leaking	A	Require repair or replacement
Missing	C	Require replacement
Oil-soaked (spongy)	1	Suggest replacement
Spray pattern incorrect	2	Suggest repair or replacement
Surface cracks (dry-rotted)	1	Suggest replacement

WIPER PUMP RESERVOIRS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Cap missing	C	Require replacement
Leaking	A	Require repair or replacement
Missing	C	Require replacement

WIRING HARNESSES AND CONNECTORS

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Insulation damaged, conductors exposed	A	Require repair or replacement

Condition	Code	Procedure
Insulation damaged, conductors not exposed	1	Suggest repair or replacement
Open	A	Require repair or replacement
Protective shield (conduit) melted	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Resistance (voltage drop) out of specification	A	Require repair or replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Voltage drop out of specification	A	Require repair or replacement

REASON CODE EXPLANATION

Code	Reason
Required	
A	Part No Longer Performs Intended Purpose
B	Part Does Not Meet A Design Specification (Regardless Of Performance)
C	Part Is Missing
Suggested/Optional	
1	Part Is Close To The End Of Its Useful Life
2	To Address A Customer Need, Convenience Or Request
3	To Comply With Maintenance Recommended By The Vehicle's Original Equipment Manufacturer
4	Technician's Recommendation Based On Substantial And Informed Experience
5	To Comply With Maintenance Recommended By AMRA/MAP

AUTOMOTIVE TERMINOLOGY & DEFINITIONS

ACTUATOR

a control device that delivers mechanical action in response to a vacuum or electrical signal; anything that the engine control computer uses to do something, such as trigger fuel injection or fire a spark plug. Most actuators on a computercontrolled engine system are activated by grounding their circuits rather than by actively powering them, since that protects the computer from short circuits.

AEMD (AUTOMOTIVE ELECTRIC DRIVE MOTOR)

a U.S. Department of Energy program to develop low-cost traction drive motors for automotive applications.

AIR BAGS

air bags are fabric bags that are filled quickly with a gas to provide supplemental protection for vehicle passengers during some collisions. Side-impact air bags are becoming increasingly

available. Air bags are most effective in protecting vehicle occupants who are properly belted.

ALTERNATING CURRENT (A C)

electrical current that flows in one direction, from positive to negative, and then reverses direction, from negative to positive.

ALTERNATOR

a belt driven device that provides electrical current for the vehicle's charging system.

AMMETER

an instrument for measuring the strength of electrical current flow in a circuit in terms of amperes.

AMPERAGE

the amount of electrical current flowing in a circuit.

AMPERE (AMP)

a unit for measuring the strength (rate of flow) of an electrical current.

AMPLIFIER

a device with electron tubes or semiconductors used to increase the voltage or current of a signal.

AMPLIFY

to enlarge or strengthen original characteristics. Usually used in reference to electronics.

ANION

negative ion. Alkali, molten carbonate, and solid oxide fuel cells are "anion-mobile" cells - anions migrate through the electrolyte toward the anode.

ANODE

one of two electrodes in a fuel cell or battery. The anode, the negative post of the fuel cell, conducts the electrons that are freed from the hydrogen molecules so that they can be used in an external circuit. It has channels etched into it that disperse the hydrogen gas equally over the surface of the catalyst.

ARCING

the ability of electrical energy to jump across an air gap.

ARMATURE

a laminated, soft iron core wrapped by wire that converts electrical energy to mechanical energy.

BATTERY ACID

the sulfuric acid solution used as the electrolyte in a battery.

BATTERY CELL

the part of a battery made from two dissimilar metals and an acid solution. A cell stores chemical energy to be used later as electrical energy.

BATTERY SAVER

the battery saver system is an effective way to prevent complete battery discharge when the engine is shut down. Based on the preset time-limit, the system automatically disconnects the battery load when the battery is not being charged. Depressing the reset push button will enable the battery to

be reconnected for additional periods of time. Critical systems can be set up to have battery power maintained.

BATTERY

a device that produces electricity through, electrochemical action.

BENDIX DRIVE

the starter drive gear that is attached to the starter motor armature and engages the gear teeth on the flywheel.

BRUSH

a bar of conductive material that rides on the commutator of a generator or motor.

CAPACITOR

a device, made up of two or more conducting plates, separated by an insulator, used to store an electric surge or charge of current.

CATHODE

one of two electrodes in a fuel cell or battery. The cathode, the positive post of the fuel cell, has channels etched into it that distribute the oxygen to the surface of the catalyst. It also conducts the electrons back from the external circuit to the catalyst, where they can recombine with the hydrogen ions and oxygen to form water.

CATION

positive ion. Phosphoric acid and proton exchange membrane (PEM) fuel cells are "cation-mobile" cells - the cation migrates through the electrolyte toward the cathode.

CHARGING SYSTEM

the system that supplies electrical power for vehicle operation and recharges the battery.

CIRCUIT BREAKER

a device used in an electrical circuit to interrupt current flow in the event of an overload or short.

CIRCUIT

a path through which electricity flows before returning to its source.

COLD CRANKING AMPS

the amount of cranking amperes that a battery can deliver in 30 seconds at 0°F (-18°C).

COMMUTATOR

a slotted ring located at the end of the armature of a generator or motor. The commutator provides the electrical connection between the armature and brushes.

CONDUCTIVITY

transmission of electricity by metallic substances. Metals have high electrical conductivity, and with few exceptions, their conductivity decreases with increasing temperature.

CONDUCTOR

a material that provides a path for the flow of electrical current or heat.

CONTINUITY

the condition that exists in a working electrical circuit. A circuit that is unbroken, not open.

CORRODE

gradual loss from a metal surface from chemical action.

CORROSION

deteriorative loss of a metal as a result of environmental reactions.

CORROSIVITY

the characteristic of a material that enables it to dissolve metals and other materials or burn the skin.

DELAYED ACCESSORY POWER

delayed accessory power continues electric power temporarily to certain convenience features after vehicle power has been turned off. For example, the feature allows the customer to close a window without reinserting the key. Delayed accessories include radio and power windows, power moon roof and message center.

DIGITAL SIGNAL PROCESSING AUDIO SYSTEM

a Digital Signal Processing (DSP) system modifies audio signals digitally to achieve better control of sound quality. DSP can be used for standard functions such as volume, balance, fade and tone control, as well as AM and FM stereo decoding. It also allows advanced audio processing such as concert hall emulation, sound shaping and adaptive noise reduction filtering.

DIGITAL VOLT/OHMMETER (DVOM)

an instrument that measures volts, ohms and amps and displays the results numerically.

DIGITAL

a voltage signal that uses on and off pulses.

DISCHARGE

the flow of current from a battery; to remove the refrigerant from an air conditioning system.

DIVERSITY ANTENNA

a diversity antenna system uses two antennas mounted at different locations on the vehicle and automatically chooses one that provides the better FM radio signal.

DUTY CYCLE

a signal that varies the ratio of on time to off time, resulting in a square wave that can range between zero and 100 percent or may be high or low, and off may be high or low; in a process, the ratio of on time to total cycle time; in fuel injectors, the percentage of on-time to total cycle time; in solenoids, the percentage of on-time to total cycle time.

ELECTRICITY

electric current used as a power source. Electricity can be generated from a variety of feedstocks, including oil, coal, nuclear, hydro, natural gas, wind, and solar. In electric vehicles, onboard rechargeable batteries power electric motors.

ELECTROCHEMISTRY

science that deals with the relation of electricity to chemical changes and with the interconversion of chemical and electrical energy.

ELECTRODE

electrical terminal that conducts an electric current into or out of a fuel cell.

ELECTRODE

a terminal that conducts an electric current into or away from the conducting part of a circuit, such as the terminal of a battery; firing terminals found in a spark plug.

ELECTROLYSIS

chemical and electrical decomposition process that can damage metals such as brass, copper and aluminum in the cooling system; the decomposition of an electrolyte by the action of an electric current passing through it.

ELECTROLYTE

chemical compound that conducts electricity from one electrode to the other inside a fuel cell.

ELECTROLYTE

a material whose atoms become ionized (electrically charged) in solution. In automobiles, the battery electrolyte is a mixture of sulfuric acid and water.

ELECTROMAGNET

an iron core surrounded by a coil of wire that temporarily becomes a magnet when an electric current flows through the wire.

ELECTROMAGNETIC INDUCTION

moving a wire through a magnetic field to create current flow in the wire.

ELECTROMECHANICAL

refers to a device that incorporates both electrical and mechanical principles together in its operation.

ELECTRONIC

pertaining to the control of systems or devices by the use of small electrical signals and various semiconductor devices and circuits.

EMITTER

in a transistor, the region or layer of semiconductor material from which electrons are injected into the base region.

ENERGY

the capacity for doing work and overcoming resistance.

FIELD COIL

a wire coil on an alternator rotor or starter motor frame; a field coil produces a magnetic field when energized.

FLUX DENSITY

the degree of concentration of the magnetic lines of force that emanate from a magnetic sensor; when the tooth of a reluctor aligns with the sensor tip, the magnetic lines of force are squeezed together, which increases flux density.

FLYWHEEL

a mechanical battery that stores kinetic energy. A flywheel is essentially a spinning wheel with a motor. Flywheels can be more responsive than chemical batteries, and they are less susceptible to

the effects of weather.

FREQUENCY

the number of cycles of a periodic waveform typically measured in one second intervals or hertz (cycles per second).

FUSE

a metal circuit protection device that melts when there is a circuit overload or short.

FUSIBLE LINK

a smaller gauge wire that is included in an electrical circuit to provide circuit protection. The smaller gauge wire will melt when the circuit is overloaded.

GENERATOR

a device that converts mechanical energy into electrical energy; SAE J1930 nomenclature for an alternator; a generating device that uses diode rectifiers to convert ac to dc.

GROUND CIRCUIT

that part of the circuit that is connected electrically to the negative terminal of the battery. Every electric circuit has a power and ground side. Most computer actuations consist of completing the ground side of an actuator's circuit; this protects the computer from short circuits. Resistance in a ground circuit will reduce the current through it and cause deterioration in the function of the circuit.

GROUND

a connecting body whose electrical potential is zero to which an electrical circuit can be connected.

HALL EFFECT

when current flows through a thin wafer of semiconductor material, and a magnetic field crosses it at a right angle, a voltage known as a Hall effect voltage will be generated at the edge of the material. Interrupting the magnetic field turns off the voltage. This is the principle used by Hall effect sensors.

HEAT SINK

part of a system designed to be at a lower temperature than its surroundings, used to dissipate heat from that system; device to dissipate heat and protect parts.

HIGH INTENSITY DISCHARGE HEADLAMPS

high intensity discharge (HID) headlamps provide a brighter, whiter light for increased forward visibility. They produce about 2 times as much light as conventional halogen bulbs and have a distinct appearance. Also, they are more durable than filament bulbs and require 37 percent less power to operate.

HIGH TENSION

that part of a system that operates under or carries high voltage; in an ignition system, voltages in the secondary circuit of the system as opposed to the low, primary circuit voltage.

HYDROMETER

an instrument used to measure the specific gravity of a solution.

IMPEDANCE

the total resistance of an electrical device measured in ohms.

INDUCTION

the process by which an electric or magnetic effect is produced in an electrical conductor or magnetic body, when it is exposed to variation of a field of force. Induction is the principle used in an ignition coil to increase voltage.

INSULATED CIRCUIT.

a circuit that includes all of the high-current cables and connections from the battery to the starter motor.

INSULATOR

a non-conductive material used to insulate wires in an electrical circuit.

INTEGRATED CIRCUIT

an electrical circuit containing many interconnected amplifying devices and circuit elements formed on a single body or chip of semiconductor material; diodes, transistors and other electronic components mounted on semiconductor material and able to perform numerous functions.

ION CHROMATOGRAPHY

a form of liquid chromatography that uses ion-exchange resins to separate atomic or molecular ions based on their interaction with the resin.

ION

atom that carries a positive or negative charge because of the loss or gain of an electron.

KEEP-ALIVE MEMORY

a series of vehicle battery-powered memory locations in the microcomputer that store information on input failure, identified in normal operations for use in diagnostic routines; adapts some calibration parameters to compensate for changes in the vehicle system.

LIGHT EMITTING DIODE (LED)

a digital electronic display device which can be used as a simple signal light or arranged to show letters and/or numbers.

LIQUID CRYSTAL DIODE (LCD)

a digital electronic display device made of a special glass and liquid, which requires a separate light source.

MAGNET

any substance that attracts iron or an iron, steel or any ferrous metal alloy.

MAGNETIC FIELD

the areas surrounding the poles of a magnet which are affected by its forces of attraction or repulsion; the region of space in which there is a measurable magnetic force.

MAGNETIC GAUGES

electrical analog gauges that use magnetic forces to move the needle left or right.

MAGNETIC PULSE GENERATOR

a sensor used to monitor the position of any point on a rotating part such as a crankshaft or input shaft.

MEMORY PROFILE SYSTEM

the Memory Profile System offers different drivers the ability to set into memory their preferred positions for several comfort and convenience features. A driver is identified by a unique key fob or entry code, and the vehicle systems automatically adjust to his or her settings. Depending on the vehicle, some of the following features can be included in the memory profile: Seat position Steering wheel position (tilt/telescope) Mirror positions Safety belt "D" ring height Pedal positions Radio stations Power steering assist level Ride firmness

MEMORY

part of a computer that stores or holds programs and other data.

MERCURY SWITCH

a type of switch that uses the flow of liquid metal, Mercury, to complete the electrical circuit. Mercury switches are frequently used to control trunk and underhood lights.

MICROPROCESSOR

the portion of a microcomputer that receives sensor input and handles calculations.

MODULE

an electronic control unit.

MOTOR

a machine that converts electrical energy into mechanical energy.

MOTOR

in an HEV, an electric traction motor converts electrical energy from the energy storage unit to mechanical energy that drives the wheels of the vehicle. Unlike a traditional vehicle, where the engine must "ramp up" before full torque can be provided, an electric motor provides full torque at low speeds. This characteristic gives the vehicle excellent "off the line" acceleration.

OHM

a unit of electrical resistance of a circuit in which an electromotive force of one volt maintains a current of one ampere, named after German physicist Georg Ohm.

OHMMETER

an instrument that measures electrical resistance in ohms.

OHM'S LAW

a basic law of electricity expressing the relationship between current, resistance and voltage in any electrical circuit. Ohm's law states that the voltage in a circuit is equal to the current multiplied by the resistance.

PARALLEL CIRCUIT

a circuit with more than one path for the current to follow.

PARALLEL CONFIGURATION

a hybrid electric vehicle (HEV) with a parallel configuration has a direct mechanical connection between the power unit and the wheels, as in a conventional vehicle, but also has an electric motor that drives the wheels. For example, a parallel vehicle could use the power created from an internal combustion engine for highway driving and the power from the electric motor for accelerating.

PERIOD

in an electrical signal the period is the amount of time it takes for one cycle of an electrical signal to repeat itself; the number of periods that occur in one second is the frequency of the signal.

PHASE

any point or points of parallel movements or oscillations, in or out of synchronization; the rotational positions of the U-joints and yokes in a driveline.

PHOTOVOLTAIC PANEL

photovoltaic panels contain cells that convert sunlight into electricity. While solar-powered vehicles are not currently feasible for production, solar panels could be used to power vehicle components, such as a fan to exhaust hot interior air when the vehicle is parked in the sun or to recharge the vehicle battery. Photovoltaic panels can be integrated into the hood, roof, sunroof, deck lid or spoiler.

PICKUP COIL

a weak, permanent magnet-and-wire assembly which forms a position sensor.

PIEZOELECTRIC SENSOR

a sensor that generates voltage from physical shock or motion, a knock sensor.

POLARITY

the condition of being positive or negative relative to a reference point or object; the particular state (positive or negative) with reference to the two magnetic poles.

POTENTIOMETER

a device that changes voltage by varying its internal resistance.

PROGRAM

a set of instructions or procedures that a computer must follow when controlling a system.

PULSE WIDTH MODULATED

electronic control of a solenoid that rapidly cycles it on and off many times per second in order to achieve a specific output.

PULSE WIDTH

the length of time during which a circuit is energized.

RANDOM ACCESS MEMORY (RAM)

a type of memory used in a computer to store information temporarily.

READ-ONLY MEMORY (ROM)

a type of memory used in a computer to store information permanently, as opposed to the temporary storage provided by random-access memory (RAM).

RECTIFIER

a device that changes alternating current (AC) into direct current (DC).

RECTIFY

to change one type of voltage to another.

REFERENCE PULSE

a voltage signal generated by the crankshaft position sensor (or distributor, or camshaft position sensor - all equivalent components for this purpose). The voltage signal is sent to the computer as a fixed number of degrees BTDC for each cylinder, with the signal for cylinder No.1 distinguishable from the signal for the others.

REFERENCE VOLTAGE

the voltage supplied by the system computer to certain sensors. The sensors reduce the voltage by a specific amount, according to their function, and send the signal back to the computer. The computer then uses the reduced voltage signal to interpret the information sent.

RELAY

an electromagnetic switch that uses low amperage current to control a circuit with high amperage.

RELUCTOR

in an electronic ignition, the trigger wheel mounted on the distributor shaft that triggers the pickup coil, which in turn signals the control module to fire the coil.

REMOTE LIGHTING SYSTEM

the Remote Lighting System removes the sources of light from the lamp fixture. Instead, light for all fixtures is generated from a single "light battery". Light is transmitted to the various fixtures and accessories via fiber optics or light pipes. The advantages of remote lighting include reduced power consumption, greater durability and more flexibility in packaging and styling lamp fixtures.

RESISTANCE

the opposition offered by a substance or body to the passage of electric current through it.

RESISTOR

an electrical device installed in a circuit to lower voltage and current flow.

RHEOSTAT

a variable resistor used to control current flow in a circuit.

SATURATION

point at which current flowing through a coil or wire has built up the maximum magnetic field.

SEMICONDUCTOR

a material that is neither a good conductor of electricity nor a good insulator.

SENSOR

any mechanism by which the engine control computer can measure some variable on the engine, such as coolant temperature or engine speed. Each sensor works by sending the computer a signal of some sort, a coded electronic message that corresponds to some point on the range of the variable measured by that sensor.

SERIES CIRCUIT

a circuit that has only one path for current to follow.

SERIES CONFIGURATION

some hybrid electric vehicles (HEVs) use a series configuration, in which the heat engine or fuel cell together with a generator produce electricity for the battery pack and electric motor. Series HEVs have no mechanical connection between the hybrid power unit and the wheels; this means that all motive power is transferred from chemical energy to mechanical energy, to electrical energy, and back to mechanical energy to drive the wheels.

SERIES-PARALLEL CIRCUIT

a circuit that combines series and parallel circuits.

SHORT CIRCUIT

a condition that occurs in an electrical circuit when the current bypasses the intended load and takes a path with little or no resistance, such as another circuit or ground.

SHUNT

an alternate path through which electrical current or fluids may flow.

SOLENOID

a coil of wire that becomes an electromagnet when current flows through it. It then loses its magnetism when the current flow is turned off. The solenoid contains an iron plunger inside the wire coil that is spring loaded to one position. When the solenoid is energized, the plunger moves to the other position.

SOLID STATE

an electrical device with no moving parts.

SPECIFIC GRAVITY

the ratio of the weight or mass of the given volume of a substance to that of an equal volume of another substance, e.g. - water for liquids and solids; air or hydrogen for gases, are used as standards.

SPLICE

to join or unite by weaving, binding, soldering, cementing, etc., usually at the ends of two objects.

SQUARE WAVE/SINE WAVE

voltage fluctuations of different shapes in an electric circuit. The square wave goes immediately from one voltage to the other; the sine wave gradually changes, going through the intervening values. An electromagnetic pulse generator like a wheel speed sensor or a reluctor-type distributor pickup produces a sine wave. Hall Effect sensors, photoelectric switches, and other on-off signal generators produce square waves. For many purposes, square waves are easier for computers to work with, so on many vehicles there are electronic devices to modify sine waves into square waves.

STARTER

the electric motor that is used to start an engine.

STATOR

a device located between the impeller and turbine in a torque converter. It contains specifically angled blades around both sides of its circumference to redirect the flow of fluid coming off the turbine, which increases the force of the fluid driving the turbine, resulting in torque multiplication.

STEPPER MOTOR

an electric motor that can move to a specific position on its range of travel.

SWITCH

a device used to open, close or direct the current in an electrical circuit.

THERMISTOR

a temperature sensitive variable resistor in which the resistance decreases as its temperature increases.

TRANSDUCER

a device that changes a force into an electrical signal.

TRANSDUCER

device that converts variations in one energy form into corresponding variations in another, usually electrical.

TRANSISTOR

an electronic device produced by joining three sections of semiconductor materials. Used as a switching or amplifying device.

ULTRACAPACITOR

ultracapacitors are higher specific energy and power versions of electrolytic capacitors-devices that store energy as an electrostatic charge. They are electrochemical systems that store energy in a polarized liquid layer at the interface between an ionically conducting electrolyte and a conducting electrode. Energy storage capacity increases by increasing the surface area of the interface. Ultracapacitors are being developed as primary energy devices for power assist during acceleration and hill climbing, as well as recovery of braking energy.

VARIABLE RELUCTANCE SENSOR

a magnetic sensor that generates its own alternating current voltage based on the interference of a moving object across its tip.

VARIABLE RESISTOR

a resistor that can be adjusted so the amount of resistance produced in the circuit changes.

VOLT

unit of electromotive force. One volt of electromotive force applied steadily to a conductor of one-ohm resistance produces a current of one ampere.

VOLTAGE DROP

voltage lost by the passage of electrical current through resistance.

VOLTAGE REGULATOR

a device used to control the output of an alternator or generator.

VOLTMETER

an instrument used to measure voltage in a circuit.

WATT

a unit of measurement of electrical power. One volt multiplied by one amp equals one watt.

ZENER DIODE

a silicone diode that allows current to flow in the opposite direction, once an applied voltage reaches a certain level.
