

**ABC123**

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2000 Chevrolet Camaro

## **ARTICLE BEGINNING**

### GENERAL INFORMATION

Exhaust Systems January 2000 Motorist Assurance Program  
Standards For Automotive Repair

All Makes and Models

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## **INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)**

### **OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)**

Automotive industry professionals and interested readers:  
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP 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 an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for

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the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) 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 governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing technique has been incorporated which includes the "mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

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](http://www.motorist.org) or contact us at:

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### **OVERVIEW OF SERVICE REQUIREMENTS AND SUGGESTIONS**

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, 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

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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 the 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.

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 presenting suggested repairs to the customer, you must

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present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

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

- A - Part no longer performs intended purpose
- B - Part does not meet a design specification (regardless of performance)
- C - Part is missing

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

- 1 - Part is close to the end of its useful life (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

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.

**EXHAUST**

**SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER  
VEHICLE OPERATION**

WARNING: Federal EPA rules prohibit altering an exhaust system in any way that defeats the emission reduction components of a vehicle. Be sure to review and adhere to EPA policy on removing and replacing catalytic converters. Where state or local laws are stricter, they take precedence over these guidelines.

NOTE: Some exhaust systems are of a welded design. It is not required that the entire system be replaced. Determine the need to replace individual components based on conditions of component.

**CATALYTIC CONVERTERS**

CAUTION: Before working on an exhaust system, review EPA

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regulations on removing and replacing catalytic converters.

NOTE: Any time a converter has failed, further diagnosis is required to determine the reason(s) for converter failure.

**CATALYTIC CONVERTER INSPECTION**

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Condition	Code	Procedure
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Air injection tube broken .....	A ...	Require repair or replacement of injection tube or replacement of catalytic converter.
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Air injection tube burnt .....	A ...	Require repair or replacement of injection tube or replacement of catalytic converter.
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Air injection tube leaking .....	A ...	Require repair or replacement of injection tube or replacement of catalytic converter.
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Air injection tube loose .....	A ...	Require repair or replacement of injection tube or replacement of catalytic converter.
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Air injection tube restricted .....	A ...	Require repair or replacement of injection tube or replacement of catalytic converter.
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Air injection tube threads damaged .....	A ...	Require repair or replacement of injection tube or replacement of catalytic converter.
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Air injection tube threads stripped (threads missing) .....	A ...	Require repair or replacement of injection tube or replacement of catalytic converter.
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Body cracked .....	B ..	Require repair or replacement.
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Converter empty .....	A ..	Require repair or replacement.
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Converter fill plug missing .....	C ..	Require repair or replacement.
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Converter missing .....	C .....	Require replacement.
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Exhaust gases leaking ...	A ..	Require repair or replacement.
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Flanges leaking .....	A ...	Require repair or replacement of flanges.
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Inlet pipes cracked .....	B ..	Require repair or replacement.
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Internal rattle (except pellet-type) .....	2 .....	(1) Further inspection required.
Mounting brackets that are part of converter broken .....	A ..	Require repair or replacement.
Obvious overheating .....	..	(2) Require testing of converter.
Outlet pipes cracked .....	B ..	Require repair or replacement.
Pieces of catalyst material found downstream .....	1 .....	Suggest replacement.
Plugged .....	A .....	(3) Require replacement.
Testing has determined that existing converter has been lead-poisoned, contaminated, or failed testing .....	A ..	Require repair or replacement.

- (1) - If the converter is breaking up, suggest converter replacement. If an object has fallen into the converter, remove the object.
- (2) - Overheating is caused by something other than the converter. Further diagnosis is required to determine the cause of the overheating.
- (3) - Determine cause and correct to ensure that new converter will not become plugged.

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**EXHAUST AND TAIL PIPES**

NOTE: For pipes with resonators, also see MUFFLERS AND RESONATORS.

**EXHAUST AND TAIL PIPE INSPECTION**

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Condition	Code	Procedure
Bracket broken .....	A ..	Require repair or replacement.
Pipe bent out of position .....	B ..	Require repair or replacement.
Pipe broken .....	A ..	Require repair or replacement.
Pipe cracked .....	B ..	Require repair or replacement.
Pipe leaking .....	A .....	Require replacement.
Pipe missing .....	C .....	Require replacement.
Pipe plugged .....	A .....	Require replacement.
Pipe weak due to corrosion, but no leaks present .....	1 .....	Suggest replacement.
Weld broken .....	A ..	Require repair or replacement.

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**EXHAUST CONNECTIONS**

**EXHAUST CONNECTION INSPECTION**

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Condi ti on	Code	Procedure
AA		
Attachi ng hardware i ncorrect .....	B .....	Requi re repl acement of hardware.
Cl amp broken .....	A .....	Requi re repl acement.
Cl amp loose .....	A ..	Requi re repai r or repl acement.
Cl amp mi ssi ng .....	C .....	Requi re repl acement.
Corroded, affecti ng structural i ntegrity ...	1 .....	Suggest repl acement.
I ncorrect type (i .e. fl ange, ball & socket etc.) .....	B .....	Requi re repl acement.
Leaki ng .....	A .....	Requi re repai r.
Loose .....	A .....	Requi re repai r.
AA		

**HANGERS**

**HANGER I NSPECTI ON**

Condi ti on	Code	Procedure
AA		
Broken .....	A .....	Requi re repl acement.
Corroded, affecti ng structural i ntegrity ...	1 .....	Suggest repl acement.
I ncorrect type .....	B .....	Requi re repl acement.
Loose .....	A ..	Requi re repai r or repl acement.
Mi ssi ng .....	C .....	Requi re repl acement.
Out of posi ti on .....	B ..	Requi re repai r or repl acement.
Rubber deteri orated .....	1 .....	Suggest repl acement.
AA		

**HEAT RISERS (MECHANICAL EFE DEVICES)**

**HEAT RI SER (MECHANI CAL EFE DEVI CE) I NSPECTI ON**

Condi ti on	Code	Procedure
AA		
Broken .....	A .....	Requi re repl acement of affected parts.
Di aaphragm i noperati ve ...	A .....	(1) Requi re repl acement.
Leaki ng .....	A ..	Requi re repai r or repl acement.
Noi sy .....	2 ...	Suggest repai r or repl acement of affected parts.
Sei zed .....	A ...	Requi re repai r or repl acement of affected parts.
Spri ng broken .....	B .....	Requi re repl acement of spri ng(s).
Spri ng i noperati ve .....	A .....	Requi re repl acement of spri ng(s).

(1) - If the i noperati ve di aaphragm i s separate from the heat

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riser, then require replacement of the inoperative diaphragm. If the inoperative diaphragm is part of the heat riser, then replace the heat riser.

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**HEAT SHIELDS**

HEAT SHIELD INSPECTION

AA

Condition	Code	Procedure
Bent .....	B ..	Require repair or replacement.
Broken .....	A .....	Require replacement.
Corroded, affecting structural integrity ...	1 .....	Suggest replacement.
Loose .....	A ..	Require repair or replacement.
Missing .....	C .....	Require replacement.

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**MANIFOLDS (CAST AND TUBE TYPE)**

MANIFOLD (CAST AND TUBE TYPE) INSPECTION

AA

Condition	Code	Procedure
Air injection tube in manifold broken .....	A ...	Require repair or replacement of injection tube or replacement of manifold.
Air injection tube in manifold corroded, affecting structural integrity .....	1 .....	Suggest replacement of injection tube or manifold.
Air injection tube in manifold leaking .....	A ...	Require repair or replacement of injection tube or replacement of manifold.
Air injection tube in manifold loose .....	A .....	Require repair.
Air injection tube in manifold restricted ....	A .....	Require replacement of injection tube or manifold.
Air injection tube in manifold threads damaged .....	A .....	Require repair of injection tube or manifold.
Air injection tube in manifold threads stripped (threads missing) .....	A .....	Require replacement of injection tube or manifold.
Bolt broken .....	A ...	Require replacement of bolts.
Bolt loose .....	A .....	Require tightening or replacement of bolts.



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Bol t mi ssi ng	.....	C	....	Requi re repl acement of bol ts.
Corroded, affecting sealability	.....	A	..	Requi re repair or repl acement.
Cyl i n d e r head threads stripped	.....	A	....	Requi re repair or repl acement of cyl i n d e r head.
Gasket leaking	.....	A	.....	Requi re tighteni ng or repl acement of gasket.
Heat stove bent	.....	B	.....	(1) Requi re repair or repl acement of stove.
Heat stove broken	.....	A	.....	(1) Requi re repl acement of stove.
Heat stove corroded, affecting structural integrity	.....	1	.....	(1) Suggest repl acement of stove.
Heat stove mi ssi ng	.....	C	.....	(1) Requi re repl acement of stove.
Mani fol d broken	.....	A	..	Requi re repair or repl acement.
Mani fol d cracked	.....	B	..	Requi re repair or repl acement.
Mani fol d warped	.....	A	..	Requi re repair or repl acement.
Out of speci fication	....	B	..	Requi re repair or repl acement.
Stud broken	.....	A	....	Requi re repl acement of stud.
Stud mi ssi ng	.....	C	....	Requi re repl acement of stud.
Stud threads damaged	....	A	....	Requi re repair or repl acement of stud.
Stud threads stripped (threads mi ssi ng)	.....	A	....	Requi re repl acement of stud.

(1) - Stove may not be avai lable separatel y; thi s may requi re repl acement of mani fol d.

AA

**MECHANICAL EFE DEVICES**

See HEAT RISERS (MECHANICAL EFE DEVICES).

**MUFFLERS AND RESONATORS**

**MUFFLER AND RESONATOR INSPECTION**

AA

Condi ti on	Code	Procedure
Body shell di storted, affecting performance or structural integrity	....	A ..... Requi re repl acement.
Corrosi on hole	.....	A ..... Requi re repl acement.
Mi ssi ng	.....	C ..... Requi re repl acement.
Mounti ng bracket broken	..	A .. Requi re repair or repl acement.
Mounti ng bracket cracked	.....	B .. Requi re repair or repl acement.
Ni ppl e cracked	.....	A .. Requi re repair or repl acement.
Ni ppl e loose	.....	B ..... Requi re repl acement.
Outer wrap peel i ng		

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(exhaust not leaking) ..	1	.....	Suggest replacement.
Plugged .....	A	.....	Require replacement.
Puncture (other than a drain hole) .....	A	.....	Require replacement.
Rattling or knocking noise from inside muffler ....	B	.....	Require replacement.
Seam open (exhaust leaking) .....	A	.....	Require replacement.
Sound quality unsatisfactory .....	2	..	Suggest replacement to address customer need and/or request.
Split (exhaust leaking) .	A	.....	Require replacement.
Weak due to corrosion, but no leaks present .....	1	.....	Suggest replacement.

AA

**END OF ARTICLE**