

*** EXHAUST SYSTEM UNIFORM INSPECTION GUIDELINES ***

Article Text

1996 Volkswagen Golf

For Volkswagen Technical Site

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Thursday, August 19, 1999 11:43PM

ARTICLE BEGINNING

GENERAL INFORMATION

Exhaust Systems

All Makes & Models

Updated: September, 1996

MAP UNIFORM INSPECTION GENERAL GUIDELINES

OVERVIEW OF MOTORIST ASSURANCE PROGRAM

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 retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

The Motorist Assurance Program was established as an industry-wide effort to address concerns raised by regulators, the media and consumers questioning our ethics and methods of doing business. The automotive repair industry had been bombarded by months of negative stories in the media and scrutiny from state and federal regulators who focused on how the need for repairs is determined. MAP was formed as an industry response to this issue.

Our 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 responsibility for their vehicles - through proper, manufacturer-recommended, maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt a Pledge to their Customers and the Motorist Assurance Program developed Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service which demonstrates 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 according to industry guidelines. After learning that neither the car manufacturers nor any other source had complete guidelines, leading industry organizations, along with other industry participants banded together to address this challenging task. During the past two and a half years, they successfully developed industry inspection guidelines for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical systems. Guidelines for Drive Train and Transmission are currently being promulgated. Revisions to the inspection guidelines for Exhaust, Brakes/ABS and Steering and Suspension Systems, which were issued two years ago, are now being published for implementation beginning spring 1997. Participating shops utilize these Uniform Inspection Guidelines as part of the inspection process and for communicating their findings

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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 concerned with auto repair and/or consumer protection are conducted. Feedback from these representatives are brought back to members, and the program adjusted as needed.

To assure auto repair customers recourse if they were not satisfied with a repair transaction, the Motorist Assurance Program offers arbitration through MAP/BBB-CARE in cooperation with the Council of Better Business Bureaus and individual participating Bureaus. MAP "piloted" in Indianapolis and Pittsburgh during spring, 1996 - and publicized "roll-outs" in New Jersey, Detroit (MI), Chicago (IL) and Richmond (VA) were conducted. To put some "teeth" in the program, and accreditation requirement for shops was initiated. The requirements are stringent and a self-policing method has been incorporated which includes the "mystery shopping" of outlets. In addition, a committee of service providers had been working diligently developing standards for newspaper, television and Internet advertising.

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.hunter.com/map.htm or contact us at:

808 17th Street, NW Suite 200

Washington, D. C. 20006

Ph. (202) 466-7050 Fax (202) 223-9569

OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, ABS, steering and suspension, wheel alignment, tires and wheels, driveline, engine performance and maintenance and heating, ventilation and air conditioning services be offered and performed under the guidelines 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 needs expressed by the customer.

This section lists the various parts and conditions that indicate required or suggested service or part replacement. Although this list is extensive, it is not inclusive. In addition to this list, a technician may make a suggestion. This suggestion must be based on substantial and informed experience or the vehicle manufacturer's

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recommended service interval.

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 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 to address a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may only be 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 customer declines to authorize a service or repair indicated in the MAP Uniform Inspection Guidelines as "required," a MAP shop may refuse service on that system, if proceeding with the work could create or continue an unsafe or unsatisfactory condition.

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

PART REPLACEMENT CODE IDENTIFICATION

NOTE: Refer to the following tables for definitions of the codes listed in the condition/procedure tables for the specific components that may need to be replaced.

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Reasons to Require Repair or Replacement		Reasons to Suggest Repair or Replacement	
A - Part no longer performs intended purpose		1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)	

Reasons to Require Repair or Replacement		Reasons to Suggest Repair or Replacement	
B - Part does not meet a design specification (regardless of performance)		2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise etc.)	

Reasons to Require Repair or Replacement			Reasons to Suggest Repair or Replacement		
C - Part is missing	3		3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)	3	
	3		4 - Technician's recommendation based on substantial and informed experience	3	

Some exhaust systems are of a welded design. It is not required that the entire system be replaced. Determine the need to

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replace individual components based on conditions of component.

CATALYTIC CONVERTERS

CAUTION: Before working on an exhaust system, review EPA 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. Advise customer of cause(s).

CATALYTIC CONVERTERS

Condition			3	Code	3	Procedure
Air injection tube broken						
Air injection tube burnt			3	A	3	
Air injection tube damaged						
Air injection tube leaking			3	A	3	
Air injection tube loose						
Air injection tube			3	A	3	Require repair or replacement of
restricted			3		3	injection tube or replacement of
Air injection tube threads						
damaged			3	B	3	catalytic converter.
Air injection tube threads						
stripped (threads missing)			3	A	3	
Body cracked						
Converter empty			3	B	3	
Converter fill plug missing			3	A	3	Require repair or replacement.
Converter missing						
Exhaust gases leaking			3	C	3	Require replacement.
Flanges leaking						
Inlet pipes cracked			3	A	3	Require repair or replacement.
Internal rattle (except			3	A	3	Require repair or replacement of
pellet-type)			3		3	flanges.
Inlet pipes cracked						
Internal rattle (except			3	B	3	Require repair or replacement.
pellet-type)			3	B, 2	3	Further inspection required.
			3		3	See note (1) below.

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Mounting brackets that are ³ A ³ Require repair or replacement.
part of converter broken ³ ³
~~~~~  
Obvious overheating           <sup>3</sup>         <sup>3</sup> Further inspection required.  
                                     <sup>3</sup>         <sup>3</sup> See note (2) below.  
~~~~~  
Outlet pipes cracked ³ B ³ Require repair or replacement.
~~~~~  
Pieces of catalyst material     <sup>3</sup>   A, 1   <sup>3</sup> Suggest replacement.  
found downstream             <sup>3</sup>         <sup>3</sup>  
~~~~~  
Plugged ³ A ³ Require replacement. See note (3)
~~~~~  
Testing has determined that   <sup>3</sup>   A     <sup>3</sup> Require repair or replacement.  
existing converter has been<sup>3</sup>         <sup>3</sup>  
lead-poisoned, contaminated<sup>3</sup>         <sup>3</sup>  
or failed testing               <sup>3</sup>         <sup>3</sup>  
~~~~~

NOTE: (1) If the converter is breaking up, suggest converter
 replacement. If an object has fallen into the converter,
 remove the object.
 (2) Further diagnosis is required to determine the cause of
 the overheating. Replacement of the converter may not be
 necessary.
 (3) Determine cause and correct to ensure that new converter
 will not become plugged.
~~~~~

**EXHAUST & TAIL PIPES**

NOTE:     For pipes with resonators, also refer to the section on  
          Mufflers and Resonators.

**EXHAUST & TAIL PIPES**

~~~~~  
Condition ³ Code ³ Procedure
~~~~~  
Bracket broken                 <sup>3</sup>   A     <sup>3</sup>  
~~~~~  
Pipe bent out of position ³ B ³
~~~~~ Require repair or replacement.  
Pipe broken                    <sup>3</sup>   A     <sup>3</sup>  
~~~~~  
Pipe cracked ³ B ³
~~~~~  
Pipe leaking                   <sup>3</sup>   A     <sup>3</sup>  
~~~~~  
Pipe missing ³ C ³ Require replacement.
~~~~~  
Pipe plugged                   <sup>3</sup>   A     <sup>3</sup>  
~~~~~  
Pipe weak due to corrosion, ³ A, 1 ³ Suggest replacement.
~~~~~

|                    |  |  |             |                  |
|--------------------|--|--|-------------|------------------|
| <b>Condi ti on</b> |  |  | <b>Code</b> | <b>Procedure</b> |
|--------------------|--|--|-------------|------------------|

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|                                                                                                                                                                                                                     |                                |                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------|
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |
| Broken                                                                                                                                                                                                              | <sup>3</sup> A <sup>3</sup>    | Require replacement of affected parts. |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |
| Diaphragm inoperative                                                                                                                                                                                               | <sup>3</sup> A <sup>3</sup>    | Further inspection required.           |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |
| Leaking                                                                                                                                                                                                             | <sup>3</sup> A <sup>3</sup>    | Require repair or replacement.         |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |
| Rattles                                                                                                                                                                                                             | <sup>3</sup> B, 2 <sup>3</sup> | Suggest replacement of affected parts. |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |
| Seized                                                                                                                                                                                                              | <sup>3</sup> A <sup>3</sup>    | Require replacement of affected parts. |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |
| Spring(s) broken                                                                                                                                                                                                    | <sup>3</sup> B <sup>3</sup>    | Require replacement of spring(s).      |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |
| Spring(s) inoperative                                                                                                                                                                                               | <sup>3</sup> A <sup>3</sup>    | Require replacement of spring(s).      |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |
| NOTE: (1) If the inoperative diaphragm is separate from the heat riser, then require replacement of the inoperative diaphragm. If the inoperative diaphragm is part of the heat riser, then replace the heat riser. |                                |                                        |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                                                                                                            |                                |                                        |

**HEAT SHIELDS**

**HEAT SHIELDS**

|                                                                          |                                |                                |
|--------------------------------------------------------------------------|--------------------------------|--------------------------------|
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                |
| Condition                                                                | <sup>3</sup> Code <sup>3</sup> | Procedure                      |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                |
| Bent                                                                     | <sup>3</sup> B <sup>3</sup>    | Require repair or replacement. |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                |
| Broken                                                                   | <sup>3</sup> A <sup>3</sup>    | Require replacement.           |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                |
| Corroded, affecting structural integrity                                 | <sup>3</sup> A, 1 <sup>3</sup> | Suggest replacement.           |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                |
| Loose                                                                    | <sup>3</sup> A <sup>3</sup>    | Require repair.                |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                |
| Missing                                                                  | <sup>3</sup> C <sup>3</sup>    | Require replacement.           |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                |

**MANIFOLDS: CAST & TUBE TYPE**

**MANIFOLDS: CAST & TUBE TYPE**

|                                                                          |                                |                                                              |
|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------|
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                                              |
| Condition                                                                | <sup>3</sup> Code <sup>3</sup> | Procedure                                                    |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                                              |
| Air injection tube in manifold broken                                    | <sup>3</sup> A <sup>3</sup>    | Require repair of injection tube or replacement of manifold. |
| AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |                                |                                                              |



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|                                                                         |   |      |   |                                                              |
|-------------------------------------------------------------------------|---|------|---|--------------------------------------------------------------|
| Air injection tube in manifold corroded, affecting structural integrity | 3 | A, 1 | 3 | Suggest replacement of injection tube or manifold.           |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Air injection tube in manifold leaking                                  | 3 | A    | 3 | Require repair of injection tube or replacement of manifold. |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Air injection tube in manifold loose                                    | 3 | A    | 3 | Require repair.                                              |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Air injection tube in manifold restricted                               | 3 | A    | 3 | Require replacement of injection tube or manifold.           |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Air injection tube in manifold threads damaged                          | 3 | A    | 3 | Require repair of injection tube manifold.                   |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Air injection tube in manifold threads stripped (threads missing)       | 3 | A    | 3 | Require replacement of injection tube or manifold.           |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Bolt(s) broken                                                          | 3 | A    | 3 | Require replacement.                                         |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Bolt(s) loose                                                           | 3 | A    | 3 | Require tightening or replacement of bolts.                  |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Bolt(s) missing                                                         | 3 | C    | 3 | Require replacement.                                         |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Gasket leaking                                                          | 3 | A    | 3 | Require tightening or replacement of gasket.                 |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Heat stove bent                                                         | 3 | B    | 3 | Require repair or replacement of stove. See note (1) below.  |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Heat stove broken                                                       | 3 | A    | 3 | Require replacement of stove. See note (1) below.            |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Heat stove corroded, affecting structural integrity                     | 3 | A, 1 | 3 | Suggest replacement of stove. See note (1) below.            |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Heat stove missing                                                      | 3 | C    | 3 | Require replacement of stove. See note (1) below.            |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Manifold broken                                                         | 3 | A    | 3 | Require repair or replacement.                               |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Manifold cracked                                                        | 3 | B    | 3 | Require repair or replacement.                               |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Manifold warped                                                         | 3 | A    | 3 | Require replacement.                                         |
| AAAAA                                                                   | 3 |      | 3 |                                                              |
| Stud(s) broken                                                          | 3 | A    | 3 | Require replacement of stud.                                 |
| AAAAA                                                                   | 3 |      | 3 |                                                              |

| Condition                                                           | Code | Procedure                                                    |
|---------------------------------------------------------------------|------|--------------------------------------------------------------|
| Body shell distorted, affecting performance or structural integrity | A    |                                                              |
| Corrosion hole                                                      | A    | Require replacement                                          |
| Missing                                                             | C    |                                                              |
| Mounting bracket(s) broken                                          | A    |                                                              |
| Mounting bracket(s) cracked                                         | B    | Require repair or replacement.                               |
| Nipple cracked                                                      | A    |                                                              |
| Nipple loose                                                        | B    | Require replacement.                                         |
| Outer wrap peeling (exhaust not leaking)                            | A, 1 | Suggest replacement.                                         |
| Plugged                                                             | A    |                                                              |
| Puncture (other than a drain hole)                                  | A    | Require replacement.                                         |
| Rattling or knocking noise from muffler                             | B    |                                                              |
| Seam(s) open (exhaust leaking)                                      | A    |                                                              |
| Sound quality unsatisfactory                                        | B, 2 | Suggest replacement to address customer need and/or request. |
| Split (exhaust leaking)                                             | A    | Require replacement.                                         |
| Weak due to corrosion, but no leaks present                         | A, 1 | Suggest replacement.                                         |

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