

*** EXHAUST SYSTEM UNIFORM INSPECTION GUIDELINES ***

Article Text

1991 Volkswagen Vanagon
For Volkswagen Technical Site
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Saturday, March 18, 2000 08:48PM

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 to their customers.

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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 recommended service interval.

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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.

A - PART NO LONGER PERFORMS INTENDED PURPOSE

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UAAA;

3	Reasons to Require Repair	3	Reasons to Suggest Repair	3
3	or Replacement	3	or Replacement	3

AAA-

3	A - Part no longer performs	3	1 - Part is close to the end of	3
3	intended purpose	3	its useful life (just above	3
3		3	discard specifications, or	3
3		3	weak; failure likely to	3
3		3	occur soon, etc.)	3

AAU

B - PART DOES NOT MEET DESIGN SPEC., REGARDLESS OF PERFORMANCE

UAAA;

3	Reasons to Require Repair	3	Reasons to Suggest Repair	3
3	or Replacement	3	or Replacement	3

AAA-

3	B - Part does not meet a design	3	2 - To address a customer need,	3
3	specification (regardless	3	convenience, or request (to	3
3	of performance)	3	stiffen ride, enhance	3
3		3	performance, eliminate noise	3
3		3	etc.)	3

AAU

C - PART IS MISSING

UAAA;

3	Reasons to Require Repair	3	Reasons to Suggest Repair	3
3	or Replacement	3	or Replacement	3

AAA-

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

AAU

EXHAUST

**SERVICE PROCEDURES REQUIRED & 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.

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.

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

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part of converter broken      3      3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Obvious overheating          3      3 Further inspection required.
                              3      3 See note (2) below.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Outlet pipes cracked          3      B  3 Require repair or replacement.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Pieces of catalyst material   3      A,1 3 Suggest replacement.
found downstream             3      3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Plugged                      3      A  3 Require replacement. See note (3)
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Testing has determined that   3      A  3 Require repair or replacement.
existing converter has been    3      3
lead-poisoned, contaminated  3      3
or failed testing             3      3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
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.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
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EXHAUST & TAIL PIPES

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

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EXHAUST & TAIL PIPES
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Condition                    3 Code 3 Procedure
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Bracket broken               3      A  3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Pipe bent out of position    3      B  3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA Require repair or replacement.
Pipe broken                  3      A  3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Pipe cracked                 3      B  3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Pipe leaking                 3      A  3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Pipe missing                 3      C  3 Require replacement.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Pipe plugged                 3      A  3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Pipe weak due to corrosion,  3      A,1 3 Suggest replacement.
but no leaks present         3      3
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Weld(s) broken ³ A ³ Require repair or replacement.

EXHAUST CONNECTIONS

EXHAUST CONNECTIONS

Condition	3	Code	3	Procedure
Attaching hardware incorrect	3	B	3	Require replacement of hardware.
Corroded, affecting structural integrity	3	A,1	3	Suggest replacement.
Incorrect type (i.e. flange, ball & socket etc.)	3	B	3	Require replacement.
Leaking	3	A	3	Require repair.
Loose	3	A	3	Require repair.

HANGERS

HANGERS

Condition	Code	Procedure
Broken	A	Require replacement.
Corroded, affecting structural integrity	A,1	Suggest replacement.
Incorrect type	B	Require replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.
Out of position	B	Require repair or replacement.
Rubber deteriorated	A,1	Suggest replacement.

HEAT RISERS

HEAT RISERS

Condition	Code	Procedure

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Broken	3	A	3	Require replacement of affected parts.
AAAAAA				
Diaphragm inoperative	3	A	3	Further inspection required.
	3		3	See note (1) below.
AAAAAA				
Leaking	3	A	3	Require repair or replacement.
AAAAAA				
Rattles	3	B,2	3	Suggest replacement of affected parts.
	3		3	
AAAAAA				
Seized	3	A	3	Require replacement of affected parts.
	3		3	
AAAAAA				
Spring(s) broken	3	B	3	Require replacement of spring(s).
AAAAAA				
Spring(s) inoperative	3	A	3	Require replacement of spring(s).
AAAAAA				

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.

AAAAAA

HEAT SHIELDS

HEAT SHIELDS

Condition	3	Code	3	Procedure
AAAAAA				
Bent	3	B	3	Require repair or replacement.
AAAAAA				
Broken	3	A	3	Require replacement.
AAAAAA				
Corroded, affecting structural integrity	3	A,1	3	Suggest replacement.
	3		3	
AAAAAA				
Loose	3	A	3	Require repair.
AAAAAA				
Missing	3	C	3	Require replacement.
AAAAAA				

MANIFOLDS: CAST & TUBE TYPE

MANIFOLDS: CAST & TUBE TYPE

Condition	3	Code	3	Procedure
AAAAAA				
Air injection tube in manifold broken	3	A	3	Require repair of injection tube or replacement of manifold.
	3		3	
AAAAAA				
Air injection tube in	3	A,1	3	Suggest replacement of injection

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manifold corroded,	3	3	tube or manifold.
affecting structural	3	3	
integrity	3	3	

[illegible]

Air injection tube in manifold leaking	3	A	3	Require repair of injection tube or replacement of manifold.
--	---	---	---	--

[illegible]

Air injection tube in	3	A	3	Require repair.
manifold loose	3		3	

[illegible]

Air injection tube in manifold restricted	3	A	3	Require replacement of injection tube or manifold.
---	---	---	---	--

[illegible]

Air injection tube in	3	A	3	Require repair of injection tube
manifold threads damaged	3		3	manifold.

[illegible]

Air injection tube in manifold threads stripped	3	A	3	Require replacement of injection tube or manifold.
---	---	---	---	--

```
(threads missing)          3          3
```

Bolt(s) broken 3 A 3 Require replacement.

[illegible]

Bolt(s) loose	3	A	3	Require tightening or replacement
	3		3	of bolts.

[illegible]

Bolt(s) missing 3 C 3 Require replacement.

[illegible]

Gasket leaking	3	A	3	Require tightening or replacement
	3		3	of gasket.

[illegible]

Heat stove bent	3	B	3	Require repair or replacement
	3		3	of stove. See note (1) below.

[illegible]

Heat stove broken	3	A	3	Require replacement of stove.
	3		3	See note (1) below.

[illegible]

Heat stove corroded,	3	A,1	3	Suggest replacement of stove.
affecting structural	3		3	See note (1) below.

integrity	3	3
-----------	---	---

[illegible]

Heat stove missing	3	C	3	Require replacement of stove.
	3		3	See note (1) below.

[illegible]

Manifold broken **3** A **3** Require repair or replacement.

[illegible]

Manifold cracked 3 B 3 Require repair or replacement.

[illegible]

Manifold warped 3 A 3 Require replacement.

[illegible]

Stud(s) broken	3	A	3	Require replacement of stud.
----------------	---	---	---	------------------------------

[illegible]

Stud(s) missing	3	C	3	Require replacement of stud.
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Stud(s) threads damaged      3 A 3 Require repair/replacement of stud
Stud(s) threads stripped      3 A 3 Require replacement of stud.
(threads missing)             3 3
NOTE: (1) Stove may not be available separately; this may require
replacement of manifold.

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MUFFLERS & RESONATORS

MUFFLERS & RESONATORS

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Condition                      3 Code 3 Procedure
Body shell distorted, affecting 3 A 3
performance or structural integrity 3 3
Corrosion hole                  3 A 3 Require replacement.
Missing                          3 C 3
Mounting bracket(s) broken      3 A 3
Mounting bracket(s) cracked     3 B 3 Require repair or
Nipple cracked                  3 A 3 replacement.
Nipple loose                     3 B 3 Require replacement.
Outer wrap peeling (exhaust not leaking) 3 A,1 3 Suggest replacement.
Plugged                          3 A 3
Puncture (other than a drain hole) 3 A 3
Rattling or knocking noise from muffler 3 B 3 Require replacement.
Seam(s) open (exhaust leaking) 3 A 3
Sound quality unsatisfactory    3 B,2 3 Suggest replacement
to address customer
need and/or request.
Split (exhaust leaking)         3 A 3 Require replacement.
Weak due to corrosion, but no leaks 3 A,1 3 Suggest replacement.
present                          3 3

```

END OF ARTICLE