

# **\* A/C-HEATER SYSTEM UNIFORM INSPECTION GUIDELINES \***

## **Article Text**

1996 Volkswagen Golf

For Volkswagen Technical Site

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Thursday, August 19, 1999 11:24PM

### **ARTICLE BEGINNING**

#### **GENERAL INFORMATION**

A/C-Heater System Motorist Assurance Program  
Standards For Automotive Repair

All Makes and Models

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

The Motorist Assurance Program was formed in 1992 by forty (40) companies who were concerned about the image of automotive service establishments. Today, MAP is an industry-wide association dedicated to strengthening consumer satisfaction with the automotive repair industry. MAP's participants represent the majority of the nation's multi-bay retail automotive outlets, their parts and equipment suppliers, independent repair shops, industry associations, car companies, manufacturers representatives, and the trade press. MAP is developing standards of service, uniform inspection procedures and other programs to assure consumers of the industry's professionalism and the commitment to excellence shared by MAP's sponsoring companies.

MAP's achievements to date include production and distribution (over 280,000) of the consumer brochure "How to Find Your Way Under the Hood and Around Your Car", development of a Pledge of Satisfaction to Consumers and Standards of Service and establishment of relationships with regulatory agencies.

As auto repair becomes an issue for federal and state regulators, MAP is working to educate government leaders on the dynamics of automotive service and the self-monitoring efforts MAP has undertaken on the industry's behalf. MAP's sponsoring companies are becoming well-known to government representatives as exemplary businesses working to improve the industry. Media sources also look to MAP to provide information and advice to consumers and on working with automotive technicians and repair establishments.

In the next few months, MAP plans to assist member repair facilities in implementing the MAP Pledge to Customers, establishing an alternate dispute resolution system to help resolve customer complaints within the industry, and developing a shop accreditation program to encourage policies in concert with the MAP Standards of Service and Inspection Guidelines.

MAP has united the aftermarket behind its consumer-oriented goals and has established itself both within and outside of the industry. We welcome you to join us as MAP continues its outreach. With your support, both the automotive repair industry and your customers will reap the benefits. Please contact MAP at:

808 17th Street, NW  
Suite 200  
Washington, D. C. 20006  
202 466 7050

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### **MAP UNIFORM INSPECTION GENERAL GUIDELINES**

#### **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.

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

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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. The following reasons may be used for required and suggested services:

### Reasons to Require Repair or Replacement:

- \* component no longer performs intended purpose
- \* component does not meet a design specification (regardless of performance)
- \* component is missing.

### Reasons to Suggest Repair or Replacement

- \* component is close to the end of its useful life (just above discard specifications or weak; failure likely to occur soon, etc.)
- \* address a customer need, convenience or request (stiffen ride, enhance performance, eliminate noise, etc.)
- \* comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
- \* technician's recommendation based on substantial and informed experience.

## HEATING, VENTILATION & AIR CONDITIONING GUIDELINES

\* PLEASE READ THIS FIRST \*

NOTE: When servicing R-12 Systems it is suggested to use "O" rings, seals and hose materials which are also compatible with R-134a in case the vehicle requires retrofitting later in its life.

## COMPRESSOR & CLUTCH ASSEMBLY

### COMPRESSOR

AA			
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Noisy	3 Further inspection	3 Check/service oil level and
	3 required.	3 state of charge following
	3	3 manufacturer's recommended
	3	3 service procedures. If the
	3	3 compressor is still noisy,
	3	3 suggest repair or
	3	3 replacement. Compressor may
	3	3 be near the end of its
	3	3 useful life.

Damaged housing	3 Suggest repair or	3 If damage affects proper
	3 replacement.	3 operation of system require
	3	3 replacement.

Leaks	3 Require repair or	3
	3 replacement.	3

Missing or	3 Require repair or	3
damaged mounting	3 replacement.	3
brackets/hardware	3	3

**CLUTCH ASSEMBLY**

Condition	3	Procedure	3	Note
-----------	---	-----------	---	------

Inoperative/slips	3 Further inspection	3 Check air gap, belt
	3 required.	3 tension, system pressure,
	3	3 electrical system. Require
	3	3 repair or replacement
	3	3 according to manufacturer's
	3	3 specifications.

Noisy	3 Suggest repair or	3
	3 replacement.	3

Seized bearing	3 Require replacement	3
	3 of bearing.	3

Burnt coil	3 Require replacement	3
	3 of coil.	3

Damaged connector	3 Require repair or	3
	3 replacement.	3

Damaged hub	3 Require repair or	3
	3 replacement of hub.	3

Will not disengage	3 Further inspection	3 Check air gap & electrical
	3 required.	3 system. Suggest repair or
	3	3 replacement.

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Condition	Procedure	Note
Leaking	Require repair or replacement.	
Internal restriction	Require replacement.	
Air flow obstruction	Further inspection required.	If fins cannot be cleaned or straightened, require replacement.
Damaged connections or fittings	Require replacement.	

Condition	3	Procedure	3	Note
Leaking	3	Require replacement.	3	
Restricted	3	Require replacement.	3	
Desiccant bag deterioration	3	Require replacement.	3	
Moisture in system	3	Require replacement.	3	
System has been exposed to air	3	Suggest replacement.	3	
Missing, damaged mounting hardware or brackets	3	Require repair or replacement of hardware or brackets	3	

Condition	Procedure
Blistered hose	<sup>3</sup> Suggest repair or replacement.

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AA			
Damaged		<sup>3</sup>	Require repair or replacement.
AA			
Routed incorrectly		<sup>3</sup>	Suggest re-routing.
AA			
Leaking		<sup>3</sup>	Require repair or replacement.
AA			
Restricted		<sup>3</sup>	Require repair or replacement.
AA			
Outer covering is cracked to the extent inner fabric of hose is visible		<sup>3</sup>	Require repair or replacement.
AA			
Crimped		<sup>3</sup>	Require repair or replacement.
AA			
Missing/damaged mounting hardware or brackets		<sup>3</sup>	Require repair or replacement of hardware or brackets.
AA			

**EVAPORATOR FILTER (IF APPLICABLE)**

EVAPORATOR FILTER (IF APPLICABLE)			
AA			
Condition	<sup>3</sup>	Procedure	<sup>3</sup> Note
AA			
Air flow obstruction	<sup>3</sup>	Further inspection required.	<sup>3</sup> If filter cannot be cleaned, require replacement.
AA			
Missing	<sup>3</sup>	Require replacement.	<sup>3</sup>
AA			

**EXPANSION VALVE/ORIFICE TUBE**

EXPANSION VALVE/ORIFICE TUBE			
AA			
Condition	<sup>3</sup>	Procedure	<sup>3</sup> Note
AA			
Leaking	<sup>3</sup>	Require replacement.	<sup>3</sup>
AA			
Restricted	<sup>3</sup>	Require repair or replacement.	<sup>3</sup>
AA			
Filter screen torn	<sup>3</sup>	Require replacement.	<sup>3</sup>
AA			
Inoperative expansion valve	<sup>3</sup>	Further inspection required.	<sup>3</sup> Inspect capillary tube and ensure proper positioning.
AA			
	<sup>3</sup>		<sup>3</sup> Re-check system performance. If still inoperative require replacement of expansion valve.
AA			

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**PRESSURE CONTROL VALVES**

**NOTE:** Includes Evaporator Pressure Regulator (EPR), Pilot Operated Absolute (POA), Suction Throttling Valve (STV), Valves In Receiver (VIR).

**PRESSURE CONTROL VALVES**

AA		
Condition	<sup>3</sup>	Procedure
AA		
Leaking	<sup>3</sup>	Require repair or replacement.
AA		
Restriction	<sup>3</sup>	Require repair or replacement.
AA		
Stuck open or closed	<sup>3</sup>	Require repair or replacement.
AA		
Damaged connections or fittings	<sup>3</sup>	Require repair or replacement.
AA		

**SERVICE PORTS**

**SERVICE PORTS**

AA		
Condition	<sup>3</sup>	Procedure
AA		
Leaking	<sup>3</sup>	Require repair or replacement.
AA		
Sticking valve core	<sup>3</sup>	Require repair or replacement
AA		
Missing valve cap	<sup>3</sup>	Require replacement of valve cap.
AA		
Damaged threads	<sup>3</sup>	Require repair or replacement.
AA		

**DRIVE BELTS**

**DRIVE BELTS**

AA			
Condition	<sup>3</sup>	Procedure	<sup>3</sup> Note
AA			
Missing	<sup>3</sup>	Require replacement.	<sup>3</sup>
AA			
Improper tension	<sup>3</sup>	Require adjustment.	<sup>3</sup>
AA			
Improper alignment	<sup>3</sup>	Further inspection	<sup>3</sup> Check alignment of pulleys
	<sup>3</sup>	required.	<sup>3</sup> and proper belt
	<sup>3</sup>		<sup>3</sup> installation. Suggest
	<sup>3</sup>		<sup>3</sup> repair or replacement.
AA			
Damaged	<sup>3</sup>	Require replacement.	<sup>3</sup> Damaged conditions may
	<sup>3</sup>		<sup>3</sup> include but are not

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	<sup>3</sup>	<sup>3</sup> limited to: teeth missing,
	<sup>3</sup>	<sup>3</sup> chunking or excessive
	<sup>3</sup>	<sup>3</sup> cracking, missing rib,
	<sup>3</sup>	<sup>3</sup> broken or cut, ply
	<sup>3</sup>	<sup>3</sup> separation.
AA		
Noisy	<sup>3</sup> Suggest replacement.	<sup>3</sup>
AA		
Worn	<sup>3</sup> Suggest replacement.	<sup>3</sup> Worn conditions may
	<sup>3</sup>	<sup>3</sup> include: belt worn
	<sup>3</sup>	<sup>3</sup> narrower than original
	<sup>3</sup>	<sup>3</sup> width, bottom and side-
	<sup>3</sup>	<sup>3</sup> wall cracks, protruding
	<sup>3</sup>	<sup>3</sup> edge cords.
AA		

**DRIVE PULLEYS**

DRIVE PULLEYS		
AA		
Condition	<sup>3</sup>	Procedure
AA		
Damaged	<sup>3</sup> Require replacement.	
AA		
Improper alignment	<sup>3</sup> Require repair.	
AA		
Missing, damaged mounting hardware	<sup>3</sup> Require repair or replacement of	
	<sup>3</sup> bracket of hardware or bracket.	
AA		

**TENSIONERS**

TENSIONERS		
AA		
Condition	<sup>3</sup>	Procedure
AA		
Missing	<sup>3</sup> Require replacement.	
AA		
Noisy	<sup>3</sup> Suggest replacement.	
AA		
Damaged	<sup>3</sup> Suggest replacement.	
AA		
Improper adjustment	<sup>3</sup> Require adjustment or repair.	
AA		

**CONDENSER**

CONDENSER		
AA		
Condition	<sup>3</sup> Procedure	<sup>3</sup> Note
AA		
Leaking	<sup>3</sup> Require repair or	<sup>3</sup>

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<sup>3</sup> replacement. <sup>3</sup>

AA

Damaged connections <sup>3</sup> Require replacement. <sup>3</sup>  
or fittings <sup>3</sup> <sup>3</sup>

AA

Internal restriction <sup>3</sup> Require replacement. <sup>3</sup>

Air flow obstruction <sup>3</sup> Further inspection <sup>3</sup> If fins cannot be cleaned  
<sup>3</sup> required. <sup>3</sup> or straightened, require  
<sup>3</sup> <sup>3</sup> replacement.

AA

Missing/damaged <sup>3</sup> Require repair or <sup>3</sup>  
mounting hardware/ <sup>3</sup> replacement of <sup>3</sup>  
brackets <sup>3</sup> hardware or <sup>3</sup>  
<sup>3</sup> brackets. <sup>3</sup>

AA

**"O" RINGS/GASKETS/SEALS/SPRING LOCKS**

**"O" RINGS/GASKETS/SEALS/SPRING LOCKS**

AA

Condition <sup>3</sup> Procedure

AA

Leaking <sup>3</sup> Require repair or replacement.

AA

**IN-LINE FILTER**

**IN-LINE FILTER**

AA

Condition <sup>3</sup> Procedure

AA

Leaking <sup>3</sup> Require repair or replacement.

AA

Restricted <sup>3</sup> Require replacement.

AA

Damaged connections or fittings <sup>3</sup> Require repair or replacement.

AA

**REFRIGERANT OIL**

**REFRIGERANT OIL**

AA

Condition <sup>3</sup> Procedure <sup>3</sup> Note

AA

Overcharge/ <sup>3</sup> Require service to <sup>3</sup>  
undercharge <sup>3</sup> manufacturer's <sup>3</sup>  
<sup>3</sup> specifications. <sup>3</sup>

AA

Contaminated <sup>3</sup> Suggest replacement. <sup>3</sup> Particulate material  
<sup>3</sup> <sup>3</sup> (contaminants) may indicate a  
<sup>3</sup> <sup>3</sup> need for additional service.  
<sup>3</sup> <sup>3</sup> Determine cause of contamination

[illegible]

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**ELECTRICAL/VACUUM ACTUATORS (MOTORS)**

**ELECTRICAL/VACUUM ACTUATORS (MOTORS)**

AA		
Condition	3	Procedure
AA		
Leaking vacuum	3	Require replacement.
AA		
Inoperative	3	Require replacement
AA		
Damaged	3	Suggest replacement.
AA		
Missing	3	Require replacement.
AA		
Missing, damaged mounting hardware	3	Require repair of mounting
AA		
	3	hardware or bracket.
AA		
Corroded, loose terminals	3	Require repair or replacement.
AA		

**LINKAGE**

**LINKAGE**

AA		
Condition	3	Procedure
AA		
Broken/damaged or binding	3	Require repair or replacement.
AA		
Missing or disconnected	3	Require repair or replacement.
AA		
Out of adjustment	3	Require adjustment.
AA		

**CABLES**

**CABLES**

AA		
Condition	3	Procedure
AA		
Binding	3	Suggest repair or replacement.
AA		
Out of adjustment	3	Require adjustment.
AA		
Broken or seized	3	Require replacement.
AA		
Disconnected	3	Require repair.
AA		

**VACUUM HOSES/TUBES**

**VACUUM HOSES/TUBES**

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AA		
Condi tion	3	Procedure
AA		
Missing	3	Require replacement.
AA		
Damaged	3	Suggest repair or replacement.
AA		
Leaking/restricted	3	Require repair or replacement.
AA		
Routed incorrectly	3	Suggest re-routing.
AA		

**EVAPORATOR DRAIN TUBE**

EVAPORATOR DRAIN TUBE		
AA		
Condi tion	3	Procedure
AA		
Disconnected	3	Require repair.
AA		
Missing	3	Require replacement.
AA		
Damaged/leaking	3	Require replacement.
AA		
Restricted	3	Require repair or replacement.
AA		

**CONTROLS**

FUNCTION SELECTORS		
AA		
Condi tion	3	Procedure
AA		
Inoperative	3	Require repair or replacement.
AA		
Malfunctioning	3	Suggest repair or replacement.
AA		
Damaged	3	Suggest replacement.
AA		
Missing	3	Require replacement.
AA		
Missing, damaged mounting hardware	3	Require repair of mounting hardware or bracket.
AA		
Corroded, loose terminals	3	Require repair or replacement.
AA		

BLOWER SWITCH		
AA		
Condi tion	3	Procedure
AA		
Inoperative	3	Require replacement.



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Malfunctioning	<sup>3</sup> Suggest replacement.
AA	
Damaged	<sup>3</sup> Suggest replacement.
AA	
Missing	<sup>3</sup> Require replacement.
AA	
Missing, damaged mounting hardware	<sup>3</sup> Require repair of mounting
	<sup>3</sup> hardware or bracket.
AA	
Corroded, loose terminals	<sup>3</sup> Require repair or replacement.
AA	

**SWITCHES**

NOTE: Includes, but not limited to: High Pressure Cut-Off,  
Low Pressure Cut-Off, Thermostatic Fan Control, Ambient,  
Pressure Cycling, etc.

**SWITCHES**

AA	
Condition	<sup>3</sup> Procedure
AA	
Inoperative/intermittent	<sup>3</sup> Require replacement.
AA	
Malfunctioning	<sup>3</sup> Suggest replacement.
AA	
Leaking	<sup>3</sup> Require repair or replacement.
AA	
Damaged	<sup>3</sup> Suggest replacement.
AA	
Missing	<sup>3</sup> Require replacement.
AA	
Missing, damaged mounting hardware	<sup>3</sup> Require repair of mounting
	<sup>3</sup> hardware or bracket.
AA	
Corroded, loose terminals	<sup>3</sup> Require repair or replacement.
AA	

**THERMISTOR/SENSORS**

NOTE: Includes, but not limited to: In-car Temperature, Ambient Air  
Temperature, Sun Load Sensor, etc.

**THERMISTOR/SENSORS**

AA	
Condition	<sup>3</sup> Procedure
AA	
Inoperative	<sup>3</sup> Require replacement.
AA	
Malfunctioning	<sup>3</sup> Suggest replacement.
AA	
Damaged	<sup>3</sup> Suggest replacement.

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Condi ti on			Procedure			Note		

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Damaged	<sup>3</sup> Suggest repair or <sup>3</sup> replacement.	<sup>3</sup>
AA		
Routed incorrectly	<sup>3</sup> Suggest rerouting of <sup>3</sup> of wiring.	<sup>3</sup>
AA		
Open fusible link	<sup>3</sup> Require replacement <sup>3</sup> of fusible link. <sup>3</sup> prior to replacement.	<sup>3</sup> Determine cause of <sup>3</sup> condition and repair
AA		
Shorted/open	<sup>3</sup> Require repair or <sup>3</sup> replacement.	<sup>3</sup>
AA		
Connector terminal bent, broken, corroded or loose	<sup>3</sup> Require repair or <sup>3</sup> replacement	<sup>3</sup>
AA		
Excessive resistance	<sup>3</sup> Require repair or <sup>3</sup> replacement	<sup>3</sup>
AA		
Poor ground	<sup>3</sup> Require repair.	<sup>3</sup>
AA		

### CONTROL MODULE

NOTE: Includes, but not limited to: BOM (Body), ECM (Electronic), PCM (Power), etc.

### CONTROL MODULE

AA		
Condition	<sup>3</sup> Procedure	<sup>3</sup> Note
AA		
Inoperative	<sup>3</sup> Require replacement.	<sup>3</sup>
AA		
Malfunctioning	<sup>3</sup> Suggest replacement.	<sup>3</sup>
AA		
Code set	<sup>3</sup> Further inspection <sup>3</sup> required. <sup>3</sup> <sup>3</sup>	<sup>3</sup> Refer to manufacturer's <sup>3</sup> diagnostic trouble code <sup>3</sup> procedure and repair or <sup>3</sup> replace affected <sup>3</sup> component(s) as necessary.
AA		
Damaged/cracked housing	<sup>3</sup> Suggest replacement. <sup>3</sup> <sup>3</sup>	<sup>3</sup> If moisture enters the <sup>3</sup> module it can reduce life <sup>3</sup> expectancy or impair <sup>3</sup> function.
AA		
Damaged	<sup>3</sup> Suggest replacement.	<sup>3</sup>
Missing	<sup>3</sup> Require replacement.	<sup>3</sup>
Missing, damaged mounting hardware	<sup>3</sup> Require repair of <sup>3</sup> mounting hardware or <sup>3</sup> bracket.	<sup>3</sup>

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Corroded, loose terminals      3      Require repair or replacement.      3

**CONTROLLERS**

**NOTE:** Includes, but not limited to: IRCM, Coolant Fan Control Module (CFCM), AC Controller, Amplifier, Programmers, Control Heads, Power Modules, etc.

**CONTROLLERS**

Condition	3	Procedure	3	Note
Inoperative	3	Require replacement.	3	
Malfunctioning	3	Suggest replacement.	3	
Damaged/cracked housing	3	Suggest replacement.	3	If moisture enters the controller it can reduce life expectancy or impair function.
Damaged	3	Suggest replacement.	3	
Missing	3	Require replacement.	3	
Missing, damaged mounting hardware	3	Require repair of mounting hardware or bracket.	3	
Corroded, loose terminals	3	Require repair or replacement.	3	

**HEATER CORE**

**HEATER CORE**

Condition	3	Procedure	3	Note
Leaking	3	Require repair or replacement.	3	
Damaged fins, tubes, fittings	3	Suggest repair or replacement.	3	
Internal restrictions	3	Require repair or replacement	3	
Missing/by-passed	3	Suggest repair or	3	

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<sup>3</sup> replacement <sup>3</sup>

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Air flow <sup>3</sup> Further inspection <sup>3</sup> If fins cannot be cleaned  
obstruction <sup>3</sup> required. <sup>3</sup> or straightened, require  
<sup>3</sup> <sup>3</sup> replacement.

AA

**HEATER CONTROL VALVE**

**HEATER CONTROL VALVE**

AA

Condition <sup>3</sup> Procedure

AA

Coolant leak <sup>3</sup> Require replacement.

AA

Vacuum leak <sup>3</sup> Require replacement.

AA

Inoperative <sup>3</sup> Require replacement.

AA

Malfunctioning <sup>3</sup> Suggest replacement.

AA

Restricted <sup>3</sup> Suggest repair or replacement.

AA

**MIX/AIR CONTROL DOORS**

**MIX/AIR CONTROL DOORS**

AA

Condition <sup>3</sup> Procedure

AA

Broken/damaged/binding <sup>3</sup> Require repair or replacement.

AA

Disconnected <sup>3</sup> Require repair or replacement.

AA

**REQUEST FOR MAP MEMBERSHIP INFORMATION**

NOTE: To print membership information request form, print portion  
of article between dashed lines.

-----

**MAP**

**Request for Membership Information**

I want to be a part of the automotive maintenance and repair  
industry's move to improve the level of Customer satisfaction.

Please send me information on how I can become a member of MAP.

Name \_\_\_\_\_

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**Company/Organi zati on** \_\_\_\_\_

**Address** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Phone** \_\_\_\_\_ **FAX** \_\_\_\_\_

\*\*\*\*\*

**MAP**

**808 17th STREET, NW**

**Suite 200**

**Washington, D. C 20006**

**Phone 202 466 7050**

**Fax 202 223 9569**

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**END OF ARTICLE**