

MOTOR AGE
TRAINING

TST

"Climate Control Service & Diagnostics"

Presented by Motor Age & TST

Sponsored by

The logo for AutoZone, featuring a stylized orange and red graphic on the left and the word "AutoZone" in a bold, italicized red font with a registered trademark symbol on the right.

What To Expect From This Webinar

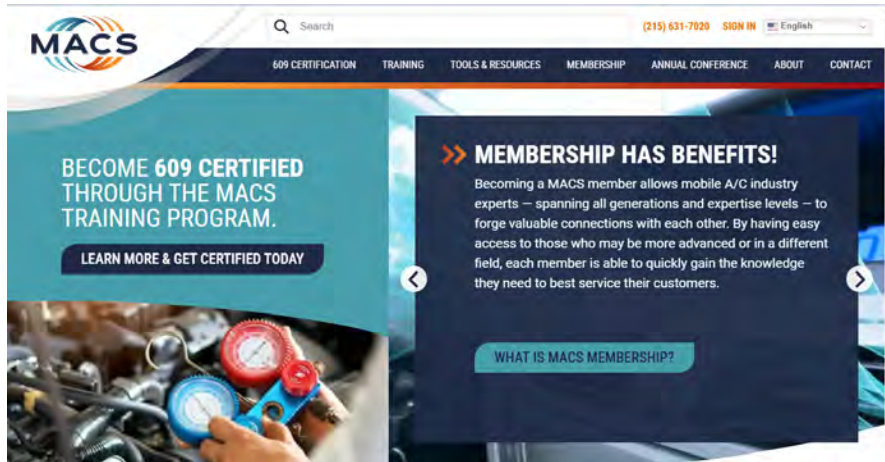
We will deliver a comprehensive, technician-focused approach to properly checking, servicing, and diagnosing today's HVAC systems. Whether you're dealing with performance complaints, airflow issues, or refrigerant concerns, this session gives you the procedures and testing strategies needed to get the job done right.

What This Webinar Covers

- **Visual Inspection Techniques -**
- **System Performance Testing -**
- **Temperature Testing & Cabin Air Evaluation -**
- **Refrigerant Sealant Detection -**
- **Refrigerant Identification -**
- **Leak Testing Methods -**
- **CO2 Testing -**
- **Evacuation & Service Procedures -**
- *And more - Including best practices, safety considerations, and real-world diagnostic tips.*
- **The Recording Will Be Available at [Motor Age Training Account](#) & [TSTseminars.org](#)** 3



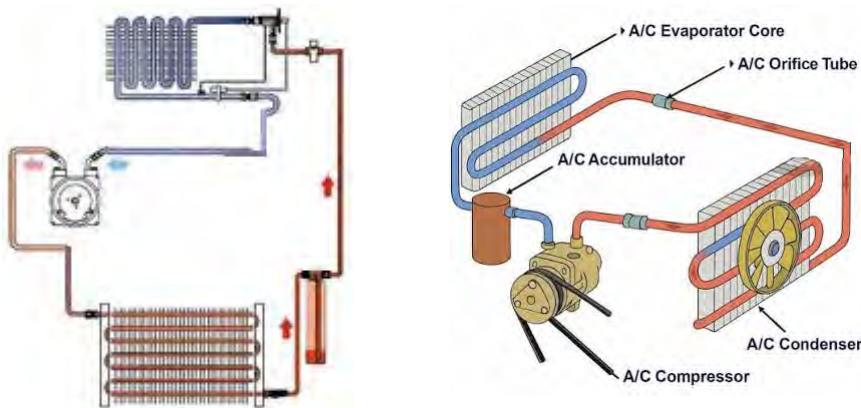
Mobil Air Climate Systems Association aka MACS



- **Started on January 1, 2018 you were required to present a copy of your 609 AC Certification card to you auto parts store. This is mandatory if you purchase more than 2 pounds. Why is that?**

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A/C Systems Review



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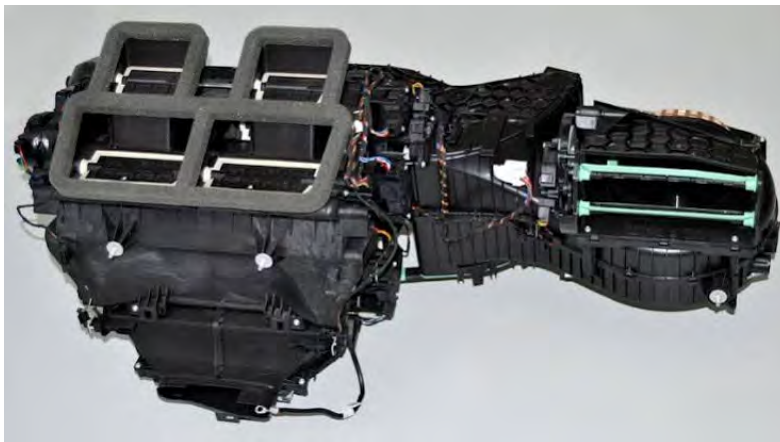
Latent Heat

- Refrigerant changes from a liquid to a vapor and back to a liquid again as it circulates through the A/C system. The refrigerant changes of state absorbs and releases more heat energy than it would if it were always a vapor or always a liquid.
- The amount of energy transferred during a change of state is greater than the actual change in temperature of the liquid or vapor.
- R12 is -21.7°F Boiling Point
- R134a -15.1°F Boiling Point
- R1234yf -22°F Boiling point



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Air Distribution



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Check Duct Air Flow With An Anemometer

The blower motor airspeed at its highest setting should measure about 13 - 16 mph (1000 - 1450 CFM).

Anything less than 10 mph (approx. 900 CFM) airspeed should be considered severely restricted.



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Control Panels & Air Distribution

- **The control unit is a mechanical / vacuum or electrically operated unit that allows the driver to regulate temperature intensity, select the air distribution mode, or change the blower motor speed.**
- Typically, there are only 3 basic types of units. They are either mechanical / vacuum, a combination of mechanical / vacuum and electrical function or (digital) automatic temperature control.



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Refrigerant Identification Procedure

- **Step 1. SAFETY is everything! ALWAYS use goggles (clear or yellow) to protect your eyes. Use the yellow goggles to view dye.**
- **Step 2. Make sure to check for A/C Sealant in EVERY SYSTEM.**
- **Step 3. Is to check Refrigerant purity.**



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Refrigerant Identification Procedure

- **Sealant Issues caused by just a few of these products that can be purchased online or in many stores.**



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Refrigerant Identification Procedure

- Sealant Issues



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Save Your Machine & Your Refrigerant Supply

AirSept
Dual Automatic
Recycle Guard
Sealant Remover



AirSept
AC Charge Guard
Keeps PAG Oil Out
Of Hybrid / Electric
Compressors



Use A Separate Oil Injector For Hybrid & Electric Vehicles



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MACS A/C System Engine Pre - Heat Procedure

Engine Pre-Heat for Refrigerant Removal Procedure The following procedure will aid in refrigerant removal when the work area is cool and J2210 and J1732 recovery equipment is being used. In general, if the work area is warmer than 90° F (32° C) this procedure is not required. Recovery equipment certified to J2788, J2810, J2843, J2851, J3030 do not require this pre-warming procedure.

REMOVAL PROCEDURE:

1. A/C System Controls Compressor clutch off Turn clutch off or remove electrical connection Set panel system controls Outside air (not max) High fan speed Airflow panel outlets ATC Systems: Set temperature mid range Check to make sure system is on outside air, drawing air from vehicle cowl air inlet area



MACS A/C System Engine Pre - Heat Procedure

REMOVAL PROCEDURE:

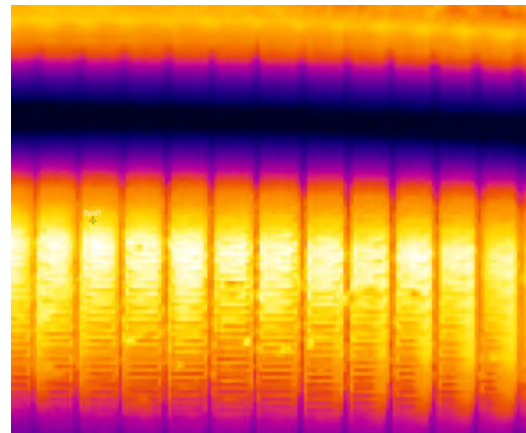
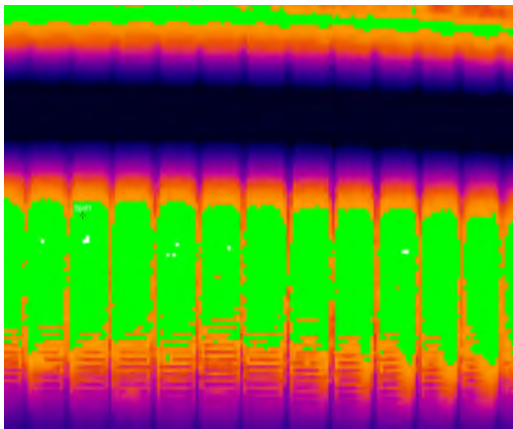
2. Vehicle hood open to allow warm engine air to enter cowl inlet to A/C system Operate engine idle condition Neutral (park) with parking brake applied Depending upon engine compartment temperature:

Run engine to warm up A/C system components for 15 minutes After idling engine for 15 minutes (hot condition) Stop engine and then turn ignition to on position allowing operation of: A/C fan high; system on Outside air When applicable – Operation of electric engine cooling fan to circulate air in engine compartment. Do not change any control or conditions listed in steps 1 and 2 above Start refrigerant recovery process.

When refrigerant recovery is completed, including the required 5 minute recheck for system pressure (system refrigerant out gassing), shut vehicle and equipment off.



A/C Condenser Compressor Off (Left) Compressor On (Right)



An approximate 40 - 50 - degree temperature drop across the condenser is normal on many vehicles.

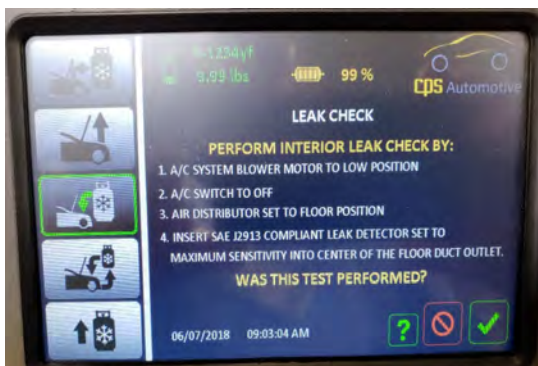
R1234yf Leak Detector



A R1234yf Leak Detector J2913, must be able to Detect a 0.1 oz or 3 gram leak per year set to its highest sensitive settings.

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R1234yf Leak Detector



R1234yf Leak Detector J2913 directions on a CPS A/C machine. Perform this test for at least 5 minutes. This is a very important step since there is a safety and legal issue associated with this leak inspection. Remember that R1234yf is FLAMMABLE !

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For More Information Go To

ALLDATA Repair

2014 Chevy Truck Equinox AWD L4.2.8L

AC Blows Warm or Poor Performance

#P152099H: AC Blows Warm or Poor Performance - (Aug 20, 2024)

Subject: AC Blows Warm or Poor Performance

Brand	Model	Model Year	Year	Engine	Transmission
GM	Truck	2014	2014	4.2L	4AT

Equipment Statement
Total P152099H is covered by warranty. Please contact P152099H.

The following diagnosis might be helpful if the vehicle exhibits the symptom(s) described in this P1:

Condition / Concern
Customer may complain that they AC does warm or they have poor AC performance.

Recommendation / Instructions
When technical assistance is required via online service, the following information will be helpful in assisting with diagnosing the service:

Please use the following information available:

- *AC High and low pressures from external A/C gauges
- High side service history from SDS
- AC compressor duty cycle
- Refrigerant service valve connection in HVAC area of equipment
- Outside temperature
- Humidity
- Spit temperature

If the unit is equipped with an Automatic HVAC system, go into the HVAC data from the scan tool and get the following readings:

- *Evaporator temperature sensor reading (if equipped)
- *Cabin temperature sensor reading
- *Outside temperature sensor reading

ALLDATA INFORMATION

- AC/Climate Reference
- Application and ID Components
- Diagnosis and Operation Components
- Diagrams
- Component Video
- Diagnostic Tools
- Shop and Equipment and Instructions
- Locking Components
- Price and Finance Link
- Service and Repair Procedures
- Service Procedures
- Technical Service Bulletins
- Technical Safety Information
- Specifications
- Fluid Types and Capacities
- Technical Service Bulletins
- AT Technical Service Bulletins
- AT Technical Service Bulletins
- By Component
- Customer Interest Bulletins
- Service Information Bulletins
- Repair and Campaigns
- Wagon Tools
- Software Update Bulletins
- Technical Service Bulletins
- Testing and Inspection
- Component Tests and General Diagnostics
- Work Instructions and Diagnostic Procedures
- Programming and Refueling
- Scan Tool Features and Procedures
- System Related Diagnostic Procedures
- Tools and Equipment
- Manual - Mechanical Repair

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A/C System Diagnostic App - ManTooth



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On To The Vehicle

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Thank you to our partner!



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