

AmSafe Seatbelt Airbag

First-Responder Reference Guide



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E509944, Rev C



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The illustrations, charts, and graphics shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, AmSafe, Inc. assumes no responsibility or liability (to include intellectual property liability) for actual use based on the examples shown in this publication.

This manual describes some important differences between a standard restraint and airbag restraint that should be taken into consideration when applying products such as those described in this publication.

Throughout this publication, reference is made to other training materials. When applying procedures, you must consult all references listed regarding more detailed safety information as it applies to specific circumstances.

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General Information

- **IMPORTANT NOTE:** The AmSafe Airbag System is NOT connected to aircraft power and will NOT be disabled by disconnecting the aircraft battery.
- It is a restraint system with an airbag inserted in the restraint webbing.
- It is designed to deploy in a significant crash event to provide torso and head protection for aircraft crew and passengers.
- The crash pulse required to deploy the system is a function of acceleration and impact energy. A severe longitudinal deceleration sustained over a period of 40-50 ms is a typical condition for the sensor to activate the airbag system.
- The AmSafe Seatbelt Airbag 2- point lap belt and 3-point restraint systems have the airbag attached to the lap belt portion, under a protective cover.
- The AmSafe Seatbelt Airbag 4- and 5 -point restraint systems have the airbag attached to the shoulder strap portion of the restraint under a protective cover.

The AmSafe Seatbelt Airbag system is a FAA approved & certified product and is installed on a variety of general aviation aircraft and multiple foreign and domestic commercial aviation aircraft.

- See Appendix A for installed applications and configuration information.

System Components

- Electronic Module Assembly (EMA) – Sensing system & power supply.
- Inflator Assemblies – The ROI Inert gas storage cylinder contains 6250 psi compressed helium to inflate the airbag during a crash event. When the gas is released into the Seatbelt Airbag Assembly (SAA) via the inflator hose, the gas will be released at ambient temperature. The Inflator-in-the-Webbing System may use the ASH 2.2, hybrid type inflator with stored gas (70%Ar /20%NO /10%He) at 5400psig, or the ACH 2.1 hybrid inflator with a stored gas mixture (20% AR/80%He) at 7400 psig.
- Seatbelt Airbag Assembly (SAA) – Aircraft restraint system with airbag attached to the webbing to provide enhanced occupant protection during an aircraft crash event.
- Interface Cable Assembly – Cable which connects the EMA, inflator and SAA.

The AmSafe Seatbelt Airbag system is designed to not impede egress. After deployment in a crash event, the airbag will deflate in less than 10 seconds.

The AmSafe Seatbelt Airbag is distinguishable from a standard seatbelt restraint by the material covering the airbag.



AmSafe Seatbelt Airbag 3- , 4- and 5-Point Restraints

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Updated System Component Options

AmSafe has recently added another version of the seatbelt airbag system for 4- and 5-point airbag restraints. This new version of inflator allows us to install the inflator assembly directly into the webbing on the restraint to simplify installation and gas hose routing issues that sometimes affect the standard system installation. The same basic criteria for precautionary concerns and disabling the system will apply; however, the system will look different than other applications when installed. The following pictures represent a sample of the inflator-in-the-webbing application:



AmSafe Airbag Inflator-in-the-Webbing Samples

As shown above, the inflator assembly can be located inside a Velcro cover and the cable assembly (used to disconnect the system) will remain the same as the other installations. Although the inflator assembly is located inside a cover, the airbag will deploy the same. When approaching an airplane accident you will be able to identify the airbag restraint either because it deployed or by the padded leather-look of the restraint assembly regardless if the inflator was installed in the webbing or in the seat.

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Incident Scenarios

If you need immediate incident support, contact Tom Barth (602) 628-0322, Jim Crupi (602) 628-0349 or Hotline (602) 850-2787

Scenario 1: Aircraft crash event occurs which causes the AmSafe Seatbelt Airbag to deploy.

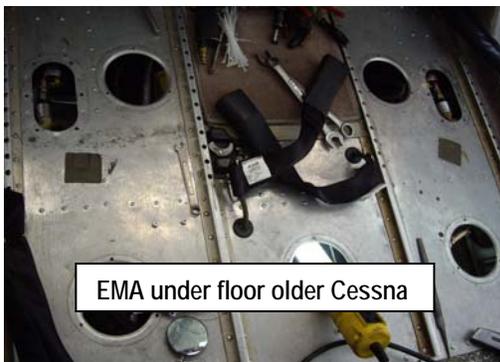
When the AmSafe Seatbelt Airbag is deployed in an aircraft crash event, the system is rendered inert because the helium-filled inflator assembly has expended its contents.

Note: Some aircraft have multiple seat placements. Depending upon the particular crash event criteria, all airbags may not have deployed. Be sure to check all seat positions in the aircraft for AmSafe Seatbelt Airbag system placements.

Scenario 2: Aircraft crash event occurs where AmSafe Seatbelt Airbag does not deploy.

If an aircraft crash event occurs where the AmSafe Seatbelt Airbag is not deployed, be sure to use one of the steps below to reduce the risk of deploying the system:

- Disconnect the cable assembly from the Electronic Module Assembly (EMA). The EMA is typically installed under the seat and in some cases is attached to or secured below the floor of the seat. (shown below)



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Installation Examples:



- Disconnect the connector from the Inflator Assembly which is typically installed on, below, just behind the seat, or inside the Velcro flap on the web strap behind the occupant. Shown below.

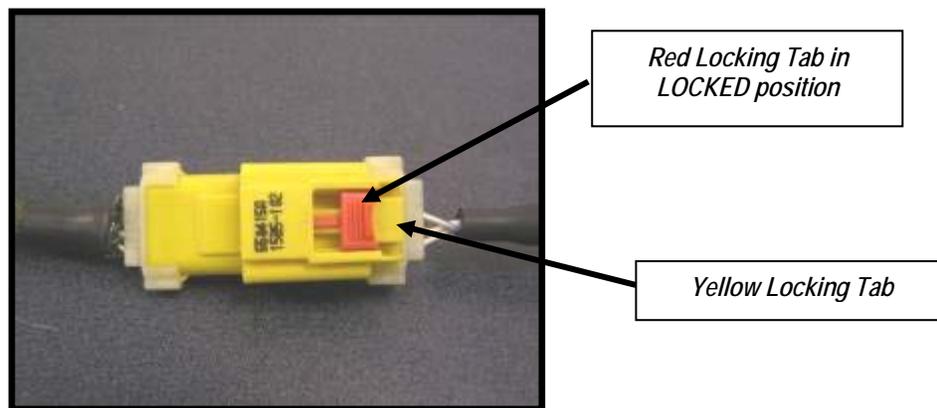


Squib Connector -
Squeeze connector sides to
release (ROI Inflator shown)
Squib connector is the same
for all inflator types.

NOTE:

Disabling the system can be accomplished by either locating the SAA connector within the Cable Interface or by simply cutting the connection.

- Locate the SAA connector (yellow) section of the Cable Interface Assy. and disconnect by sliding the red locking tab backwards to the unlocked position, depressing the yellow tab and then pull apart both connector halves.
- If access to either of these connectors is not possible due to deformation of the seat assembly or the fuselage, it is acceptable to cut the cable that connects to the inflator assembly or the EMA.
- If access to the connectors or cable assemblies is not feasible, another option is to cut the inflator hose as close to the bottom end of the restraint as possible to prevent deployment of a non-deployed airbag.



Red Locking Tab in
LOCKED position

Yellow Locking Tab

System Components:

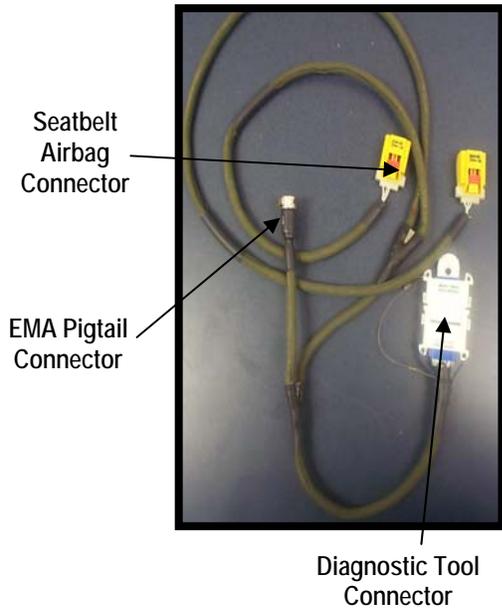
Inflator Assemblies



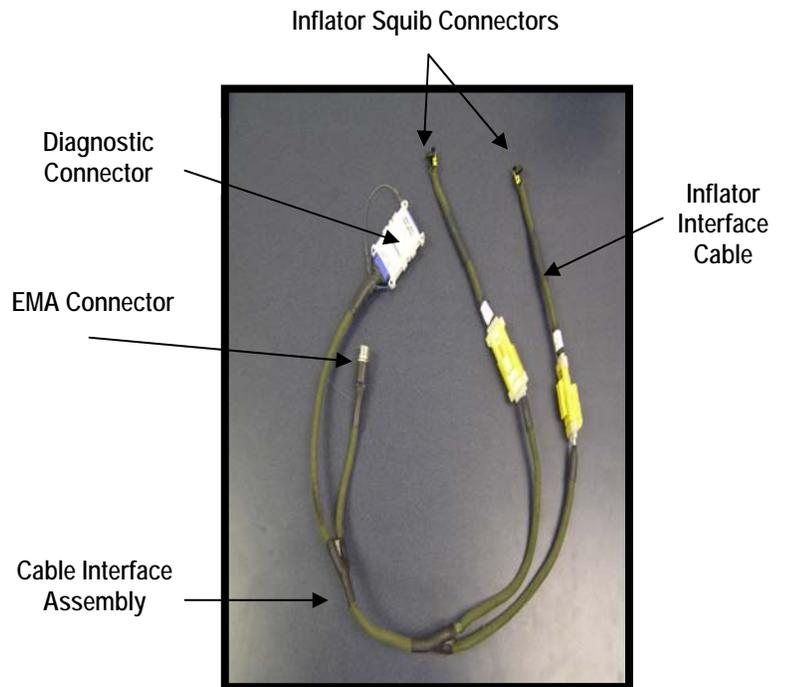
EMA Assembly



Cable Assemblies



Three-Point System Cabling



Four/Five-Point System Cabling

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First Responder Quick Check List for AmSafe Airbag System Safety Considerations

- 1. DISCONNECTING THE AIRCRAFT BATTERY WILL NOT DISABLE THE AMSAFE AIRBAG SYSTEM AS IT IS SELF-CONTAINED AND NOT CONNECTED TO AIRCRAFT POWER**
2. *Check to see if the aircraft is configured with the AmSafe Airbag System*
 - a) *The restraint system will have a padded bag attached on the lap belt or the shoulder harness*
 - b) *If the airbags have deployed it will be obvious, however, unoccupied seats may also have an active airbag system so take precautions to disable accordingly*
3. *Disable the airbag system using one of the following options:*
 - a) *Disconnect the yellow airbag connector by pressing the red locking tab and separating the connector pieces*
 - b) *Cut the cable assembly to the EMA or to the inflator, to deactivate the circuit*
 - c) *Cut the inflator hose as close to the bottom end of the restraint as possible to prevent deployment of a non-deployed airbag. If somehow the system were activated with the hose cut, the gas would be released away from the responder and the occupant (lasting approximately 5-10 ms, at high pressure between 6200-7400 psi).*
4. *Extraction Considerations:*
 - a) *If for some reason the airbags are not deployed, use extreme caution while cutting structure as the inflator assembly will still be a hazard and severe or fatal injury could occur if the inflator is cut or drilled*
 - b) *If a fire occurs after an aircraft crash event, the inflator will ignite in excessive heat:*
 - (1) *ACH inflator will auto ignite at approximately 130° C or 266° F and will release the stored gas to inert the system to reduce the risk of injury to emergency personnel*
 - (2) *ROI inflator will auto ignite at approximately 400° C or 750° F and will release the stored gas to inert the system to reduce the risk of injury to emergency personnel*

Note: *The AmSafe Seatbelt Airbag Inflator Assembly is a high pressure device (6250 psi – ROI compressed helium inflator or 7400 psi for the hybrid ASH inflator described above) and can create a fragmentation hazard if cut or punctured by hydraulic extraction tools. Please use caution when responding to an accident where the airbags have not deployed. Typical installation of the inflator assembly is under or around the seat. The inflator assembly is the same device used in automotive side-curtain airbag applications.*



Information requested by AmSafe to assist in accident investigation

- **Photos**
 - Deployed Airbag
 - Instrument Panel (or any other area of contact between the occupant and the aircraft interior)
 - Installed AmSafe Seatbelt Airbag equipment
- **Occupant Info**
 - Injuries, type & severity
 - Name
 - Seat position
 - Contact info
- **Crash Information**
 - Aircraft Type
 - Severity
 - Location
 - Witnesses
 - Time of accident
 - FAA on-site contacts
 - OEM on-site contacts
 - NTSB on-site contacts

AmSafe Contacts

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tbarth@amsafe.com

Airbag Support Hotline
(602) 850-2787

Note: For access to additional AmSafe Seatbelt Airbag system information, please visit www.amsafe.com and select the Customer/Partner Site link to register. Please be sure to specify "First Responder" in the NOTES section of the registration form to expedite access.

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