

# ALUMINIUM ROOF REPLACEMENT ON THE MITSUBISHI LANCER EVOLUTION & OUTLANDER

The use of dissimilar metals together in one area of the vehicle structure, and the attachment methods used with those materials, can affect damage analysis and repair versus replace decisions. Two models from Mitsubishi that require these considerations are the Lancer Evolution and Outlander.

The Lancer Evolution and Outlander are equipped with an aluminium roof, on models without a sunroof (see Figures 1 and 2). On models with a sunroof, the roof panel is made from steel. On vehicles with an aluminium roof, the roof panel is attached to steel roof rails and roof bows.

According to the 2008–2010 Lancer Evolution and 2007–2010 Outlander Body Repair Manuals, the aluminium roof panel is made from a type of aluminium containing magnesium, copper, and silicon. The manuals state that this type of aluminium has the equivalent strength of cold-rolled steel sheets.

## ROOF PANEL ATTACHMENT

The aluminium roof panel is rivet-bonded to the front, side, and rear roof rails, and bonded with adhesive alone to the inner sides of the front and rear roof rails and to the centre roof bow. Self-piercing rivets (SPRs) are used for the factory rivet-bonding attachment.

## ROOF PANEL REMOVAL

Following the removal of the SPRs, the roof panel is ready to be separated from the body at the bonded locations. To assist in the removal process, heat can be used in the bonded area of the damaged panel with a flameless heat source up to 204°C

(400°F). As the adhesive gets warmer, its strength and bond will weaken. Heating above 204°C (400°F) may weaken high-strength steels and aluminium. The lower centre roof bow on the Lancer Evolution, and the inner side roof rails on both the Lancer Evolution and the Outlander are high-strength steel parts.

## Installing a Replacement Roof Panel

Blind rivets and adhesives are used for the replacement roof panel attachment. The recommended rivet diameter is 4.8 mm.

The adhesive used for the rivet-bonding is different from that used for the attachment areas with just adhesive. The Lancer Evolution and Outlander body repair manuals state to use an epoxyayresin structural adhesive for the rivet-bonding



This 2008 Mitsubishi Lancer Evolution has a rivet-bonded aluminium roof panel.

attachment, specifically 3M AAD Part No. 8115 or equivalent. For the adhesive

bonding attachment, a urethane body sealer, specifically 3M AAD Part No. 08360 or equivalent is recommended.

The recommended adhesives are applied to the appropriate locations, noted in the repair manual. The adhesive maker's recommendations should be followed for part preparation.

For specific instructions, refer to the vehicle maker's technical information at <http://www.mitsubishitechinfo.com>. This is a subscription-based web site. Subscriptions are available for one day, seven days, 30 days, six months, or one year.

#### CONCLUSION

Estimators, auto physical damage appraisers and collision repair technicians must provide complete and accurate diagnosis and repairs to maintain the reliability of a vehicle structure. Damage



This 2008 Mitsubishi Outlander has a rivet-bonded aluminium roof panel.

analysis and repair versus replace decisions have become more challenging because of the increased use of dissimilar materials in vehicle construction, such as the rivet-bonded aluminium roof panel on some Mitsubishi Lancer Evolution and Outlander models.

This aluminium roof panel replacement procedure is just one example of this type of construction technology.

*Photos courtesy of Mitsubishi Motors North America, Inc.*

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