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Advanced High Strength Steels (AHSS)

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by Tim Hoke

In today's heavily regulated and highly competitive marketplace, automobile manufacturers share many common concerns: greater vehicle safety, improved fuel economy and lower manufacturing costs, among others. One approach to help resolve these issues has been to develop structural materials that are lightweight, while still offering strength and flexibility.

Applying innovative materials

Among recent technological advances, Advanced High Strength Steels or AHSS have quickly been adopted by the automobile industry. These steels are known for their increased strength, lightweight composition, improved performance under impact and energy transfer when exposed to a collision. There are two primary types of AHSS, "Dual Phase" (DP) and "Transformation Induced Plasticity" (TRIP). Although the two steel types differ in the material composition, each features increased tensile strength and formability than in traditional steel products.

There are several other variations of AHSS in use today, and they all rely on the same principles. Each manufacturer determines which formulation is used, based on specific engineering requirements.

What does AHSS mean to the collision industry?

While these steel types are relatively new, several automobile manufacturers have begun using up to 40% of AHSS in new vehicles. A primary challenge facing the collision repair industry is to identify correct repair policies and procedures for AHSS components:

- Can it be straightened?
- Can it be heated and reformed?
- Can it be sectioned?
- Is special welding equipment or procedures necessary for proper repairs?

Some AHSS reinforced panels are not repairable at all and must be replaced. To maintain efficiency and profitability, these components should be identified up front. Failure to follow accurate repair procedures may result in unnecessary comebacks and a new area of liability concern.

Insurance concerns

Another issue is how well informed insurance adjusters are in AHSS repair procedures. New materials could significantly impact the estimating process.

In some instances, you may be required to partially disassemble the vehicle to determine an accurate estimate. Who pays for the labor invested if the insurance company subsequently totals the car? Who is liable if the insurance company instructs you to perform repairs you know to be improper?

Information is key

In some cases, traditional repair practices may not be applicable to vehicles with AHSS. Technicians require factory-correct information, and may require special training to effectively work with the materials.

There is only one remedy for dealing with any new technology – accurate information. Conventional repair methods may leave the vehicle vulnerable to catastrophic damage if it is involved in an accident after leaving the repair facility. Improper repairs can alter the crush zone and expose passengers to increased risk. This scenario also places the repair shop in jeopardy unless repairs meet manufacturers' original specifications.

Summary

The importance of having access to factory specs and techniques is paramount when repairing vehicles utilizing structural components of AHSS. Many manufacturers offer specific repair information, but tracking down this information can be difficult. Third-party information sources offer a single source for vehicles of all makes and models.

One thing is certain, collision technicians must become proficient in working with AHSS and other new materials, as their prevalence in vehicles increases. The need for this knowledge is immediate! A shop's profitability and reputation rely on staying current with innovative technologies. And those innovations are coming at an ever-increasing rate.