

Air Bag systems estimates, diagnostics and repairs.

If, When, and why to replace an airbag module or other components during a collision repair

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1. The Initial inspection

When a vehicle is presented to the collision shop for repairs, or an estimate, a close visual inspection and function check is critical for determining the depth of the potential airbag portion of the estimate. Besides assessing the physical visual elements of sheet metal and other obvious damage, an electrical damage assessment is also needed. The vehicle's control module network can give a wealth of information regarding non-obvious damage. For example, even if an obvious deployment has occurred (all those deflated bags hanging out), the person assessing the damage needs to turn the key on (KOEO) and inspect the air bag light and make sure it bulb checks. If there is an obvious deployment you know to expect the airbag light to remain on. But this does not tell you the complete story about why the air bag light is on. If any other deployment device had been triggered that is not obvious (front and rear seat belts and head rests for example) the light will remain on. Only a scan with an OEM level scan tool can answer these questions.

Even without an obvious deployment this airbag light check needs to be done. As mentioned above, if any other deployment device had been triggered that is not obvious (front and rear seat belts and head rests for example) the light will remain on. Additionally, the presence of an air bag warning light does not mean a deployment was triggered. There are all types of airbag malfunctions that can happen with no collision event at all and a system fault could have been present long before a collision occurred.

Lastly, and more importantly, if the air bag light is off, there could still be trouble codes indicating previously stored intermittent faults that you need to be aware of. I have seen cases where the air bag light itself had failed leading to a false assumption that the associated systems were OK when actually they were not.

The only way to know for sure is to scan with an OEM level scan tool and evaluate the scan results with a thorough understanding of the system. If this evaluation is skipped, you will probably find your shop scrambling for additional replacement parts or suffering from programming difficulties on scheduled delivery day. This will probably cause you to miss the delivery due date, additional supplement claims, additional parts procurement or the additional repairs and rental expenses may need to be absorbed by the shop.

2. Inspection Scan Time

The vehicle scan at this point is going to tell you which deployment devices have been triggered, which if any impact sensors have tripped, (this is where you prevent missing those pre-tensioners, headrest deployments and damaged impact sensors that are not obvious!) and if the crash detection /deployment command codes are permanently latched in the module (latched codes). Some manufacturer's airbag module are more likely to latch than others and sometimes crash detection codes will also latch in the passenger presence module, meaning 2 modules may need replacement and programming/coding. If you don't scan you won't know. So the first step of the scan is to obtain and record all diagnostic trouble codes for an estimate of all deployed devices that will need replacement, obtain and record any freeze frame/failure records,(Maybe that light was on before the accident?) then command a code clear routine. If crash detection and deployment command codes clear, this means module replacement will not be necessary averting the need to perform programming or coding after repairs are done. If the latched codes return then the module needs replacement and you can include the programming and/or coding expense into the estimate along with the cost of the

module(s) and labor. At this point it is time to take advantage of the scan tool, and obtain the modules electronic coding and/or programming file part numbers. On some models these are needed to integrate replacement modules into the vehicle's network. I have seen too many times a collision airbag system repair has resulted in the arbitrary replacement of an air bag module where the original module has been discarded. This leaves the vehicle delivery in jeopardy because the coding values or programming level, present in the discarded modules for the vehicle are not known. This is a problem that can always be avoided if the proper steps are taken at the beginning.

3. Time to review service information and document findings

If you are using a service, subletting this work to another shop, or have a mobile specialist come out, you should expect this documentation to be done for you. The result is a list of codes, deployments and necessity of additional inspections, programming or calibrations needed after all parts are replaced. If you are scanning and doing this yourself you will need access to service information for the vehicle you are working to obtain code descriptions and additional required replacements or inspection of certain parts related to deployment types. For instance, some manufactures require the replacement of impact sensors and/or module for ANY type of deployment, while other manufactures require component inspections and replacements depending on the inspection results. An example is a clock spring or spiral cable with a driver's front airbag deployment. Some manufactures require this to be replaced for any deployment and others require an inspection of the part and to replace only if damaged or a burn mark is evident. I know it is hard to provide this when an insurance company is asking for an accurate estimate now, but you have to resist the urge to rush. Strive for accuracy instead. This, in the long run will improve cycle time and help keep severity in check by not replacing components or modules arbitrarily.

4. Get the repair authorization and start fixing the car, but don't discard the replaced airbag module just yet!

You can get into some trouble and cause delays on some cars if you put that module in and button up access to it too soon. It depends on the manufacturer, year, make and model of the vehicle. Service information or technical assistance services can guide you on which vehicles to watch for on this. (This is less likely to happen if steps 1-3 are followed).

Some replacement modules will not program or initialize if there is an existing hard fault within the airbag system. To make matters worse, modules with missing programming cannot tell you what the fault is. If programming and/or coding cannot be achieved it may be necessary to re-install the old module and re-scan or inspect every possibility manually for a fault.

5. Completion and calibration scan

So now you have all the repairs done, all deployed devices replaced and the car looks good. The airbag light may be on or not. You must now perform a scan to clear all history codes, program or code the replaced modules, and perform necessary calibrations. If steps 1-4 have been followed you will already know what you need and how much time and expense to allow for necessary procedures. When using remote service with ASTech in your shop the vehicle needs to be assigned to a remote assistant at or near the vehicle who can monitor ASTech messages and perform key cycles, apply weights, monitor battery support, and perform inspections if hard faults are detected during scan. During this completion and calibration session if any codes return after key cycle (Hard Faults) or road test (Intermittent/conditional faults) these must be diagnosed and corrected. Things like unseated connector assurance pins, pinched wires or damaged shorting bars can be hard to spot, but scan data and trouble codes can lead you right to it. We find a lot of missed components in this step when a shop forgoes an accurate inspection with a scan.

6. Quality Control and road test.

Now all the lights are out, all codes clear and you receive documentation stating the vehicle is in pre-loss condition regarding what can be seen in the vehicles control module network. What's left is:

- Complete vehicle road test with systems function checks before delivery to customer
- Verify no malfunction lamps/messages return and all accessories function properly
- If warning lamps or malfunctions return immediately re-scan and/or address faults.

See the last line? This pertains to some codes and/or faults that are conditional and dependent on a road-test to self-check and pass. Intermittent issues can also pop up here. I am sure you would much rather address a fault uncovered in a road test than to have a customer bring their car back and tell you about it!

Thanks for reading and better results eliminating cycle time killers!

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