Strategy Based Diagnostics in Collision Repair

Strategy Based Diagnostics is an automotive best practice routine that was initially published by G.M after studying and observing successful technicians in the field who consistently meet or exceed productivity standards with the lowest levels of “re-checks” or “comebacks.” Since GM published this best practice, Strategy Based Diagnostics has been adopted by most in the automotive repair field. With the current wave of innovative technologies being applied to new vehicle models, this process is finding its way into collision repair as a necessity. The complexities and procedures associated with the requirement to return a vehicle to pre-loss condition can be mind boggling. We have modified some steps to this process that makes it more applicable to collision damaged vehicles in addition to the assessment of obvious visual physical damage.

The goal of Strategy Based Diagnosis is to provide guidance when creating a plan of action for each specific diagnostic situation. By following a similar plan for each diagnostic situation, maximum efficiency will be achieved when diagnosing and repairing vehicles.

The first step of the diagnostic process should always be: Understand and Verify the Customer's/Technician’s Concern. For collision damaged vehicles there are the additional challenges that the customer may not be aware of a problem.

1. Understand and Verify the Areas of Concern. The first part of this step is to obtain as much information as possible from the customer and from the vehicle itself. In order to verify the concern, the technician should be familiar with the normal operation of the system and refer to the owner or service manual for any information that is needed.
2. Perform a Vehicle Diagnostic System Check. This will verify the proper operation of the vehicle’s embedded systems. This will also lead the technician in an organized diagnostic approach to building a good repair blueprint.
3. Preliminary Checks: Conduct a thorough visual inspection. Review the history of the vehicle. Detect unusual sounds or odors. Record the diagnostic trouble code (DTC) information.

    - When does/did the condition occur?
    - Is/was there physical damage contributing to the condition?
    - How long does the condition last?
    - How often does the condition occur?
    - Are there aftermarket accessories on the vehicle?

4. Check for related Bulletins, Recalls and Preliminary Information (PI).
5. Previous steps may not be possible until physical condition of vehicle is repaired to a point that it can be operated normally.
6. Review the following diagnostic categories:

6.1. Current DTC: Follow the designated DTC diagnostic in order to make an effective repair. Refer to Diagnostic Trouble Code (DTC) List for the vehicle.

6.2. Symptom - No DTC: Select the appropriate symptom diagnostic. Follow the diagnostic steps or suggestions in order to complete the repair.

6.3. No published diagnostics: Analyze the concern. Develop a plan for the diagnostics. The service manual schematics will display system power, ground, input, and output circuits. You can also identify splices and other areas where multiple circuits are tied together. Look at component locations to see if components, connectors or harnesses may be exposed to extreme temperature, moisture, or corrosives such as road salt, battery acid, oil or other fluids. Utilize the system description and operation and system circuit description.

6.4. Intermittent/History DTC: An intermittent condition is one that does not occur continuously, may be difficult to duplicate, and will only occur when certain conditions are met. Generally, an intermittent is caused by faulty electrical connections and wiring, malfunctioning components, electromagnetic interference (EMI), driving conditions, or aftermarket equipment. The following approaches and tools may prove to be beneficial in locating and repairing an intermittent condition or a History DTC.

6.4.1. Combining the technician’s knowledge and skill with the available service information.

6.4.2. Evaluate the symptoms and conditions described by the customer or observed by the technician.

6.4.3. Follow the procedures in Testing for Intermittent Conditions and Poor Connections.

6.4.4. Use the available scan tool, digital multi-meter, or data logger with data capturing capabilities.

7. Isolate the root cause then repair and verify the correction. Verifying that the DTC or symptom has been corrected may involve road testing the vehicle and additional scanning.

8. Re-examine the Concern: If a technician cannot successfully find or isolate the concern, a re-evaluation is necessary.

5. Vehicle Operating as Designed: This condition exists when the vehicle is found to operate normally. The condition described by the customer or technician may be normal. If possible compare with another like vehicle that is operating normally under the same conditions described by the customer or observed by the technician. Document your findings and the operation of the system.

9. The final step of the diagnostic process should always be: Repair Verification.

This process is very straight forward however each step is not always easily achieved. Damaged vehicles can induce faults in areas not normally encountered by routine maintenance or component failures. This means the technician's thorough understanding of what was damaged and repaired from a collision is critical in chasing down a fault. Additionally access to high level vehicle scan routines is a must to too look in the right areas.

Collision shops that currently have skilled electrical/electronic diagnostic technicians on staff are those who already recognize the need of getting involved with the electrical/electronic repairs needed on today's complex vehicles. If your shop is currently subletting this work or towing vehicles to dealers after collision repairs for electronic diagnosis and repair, I highly recommend you select a candidate for training to at least an intermediate level with a diagnostic support system.

Check out the I-Car courses offered under the path of "Electrical/Mechanical Technicians"

- DAM13e Basic Electronics Damage Analysis
- ELE01 Electrical Circuits and DVOM Usage (6 Credit Hours)
- ELE02 Diagnosis, Testing, and Repair of Common Electrical Loads (6 Credit Hours)
- LSC04e Automotive Lighting (1 Credit Hours)

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COLLISION DIAGNOSTIC SERVICES

Remote diagnostics to help you put cars back where they belong.