

STEERING AND SUSPENSION DAMAGE EXPLAINED

Steering and suspension components have changed drastically over the last 10 years. With the advancement in so-called smart suspension systems and steering assist systems, damage assessors and technicians have had a difficult time in diagnosing the damage sustained. In many cases, damage goes undiscovered until the vehicle goes in for a wheel alignment, or technicians change parts until the vehicle will take a wheel alignment. Another issue is that many OEMs are now requiring that if there is damage to a suspension component, many of the components in that area be changed. Likewise, damage to the tie rod end requires the rack and pinion assembly to be changed per the OEMs. The above issues not only show the importance of pre-measuring and diagnosing steering and suspension components, but also address the importance of checking with the OEM repair manuals for what is required after a collision event.

Diagnosing Suspension and Steering Damage

It is important to understand what type of collision event the vehicle was involved in and what occurred in the event. For example, a vehicle traveling at 15mph on snow and ice that slides into a curb and causes scraping of the rim and bending of the outer tie rod is completely different than a vehicle traveling at 30mph and impacting a deep pothole that bends the rim and the outer tie rod. Many of the OEMs are utilizing aluminum to make the suspension components. During collision events, the applied impact forces can cause the aluminum components to bend and deform - not only at the point of impact, but many times damage can occur to the suspension components in the opposite area of the impact as well. Damage is frequently not visible to the naked eye, and requires



mechanical or electronic measurements to ensure there is no sustained damage. It is imperative that damage assessors and technicians never assume that damage is or is not present; they must measure and *prove* it. They must also check with the OEM information on procedures after a collision event and position statements on suspension and steering component damage and repair.

Measuring suspension components can be done comparatively and mechanically with tram gauges and tape measures. If components are found to be misaligned, then we recommend electronic measurements be taken with three-dimensional structural repair measurement equipment from manufacturers

such as Car-O-Liner, Spanesi or similar. If wheel alignment equipment is available, then we recommend a four-wheel alignment check be performed. Either of the electronic systems will determine the extent of damage, if any. This will ensure that the technician and/or damage assessor knows what needs to be replaced - or *not* replaced.

Many vehicles have multiple electronic assist components and electronic controls that must be initialized and reset after component replacement. Many vehicles also come with an automatic cruise control system that works with the steering system, and most vehicles also have a backup camera that works with the steering angle

and/or yaw-rate sensors. These systems must also be checked during the analysis process.

Many OEMs have serviceable tie rod ends, but these replacement parts are only for normal wear and tear and not for collision damage replacement. In this case, if the tie rod is damaged in a collision event, the OEM would require the replacement of the rack and pinion steering assembly. Additionally, if the rim and tie rod are damaged, many times all the suspension components on that side may require replacement. Generally, when a tie rod sustains damage, the rim also sustains some damage. Rim assemblies need to be evaluated for the extent of damage sustained. Most OEMs only allow sanding and buffing of the rim, while others allow refinishing of the rim. Most of the OEMs have positions statements that state "no bending, reshaping, adding material, removing material, welding or heating of the rim." This is why refurbishing a wheel assembly is really not a good idea. The extent of damage sustained is often unknown due to the fact that the main issue is micro cracking that may be present and undetectable without Magnafluxing or X-Raying the rim — procedures that are not typically cost-effective.

As we have said before, today's damage assessors need to become *para-engineers* due to the changing complexity of today's vehicle designs and components. This industry needs to raise the bar on education and training. The general driving public is relying on us to ensure their vehicles are repaired safely and will perform in the manner in which they were designed to. Too often, we inspect vehicles for post-repair inspections or during accident reconstruction and discover incorrect repair procedures attempted where those procedures were a contributing factor in the subsequent collision event. Many times, we find that suspension components failed in those investigations. Failure of steering and suspension components that were damaged and left undetected during the repairs can have disastrous results, and all the liability rests solely on the repair facility. Always follow the OEM repair procedures and protocols. Making a business decision to appease a third party can expose you to a huge financial loss, if you were negligent.

We hope this article has helped the industry to better understand today's complex steering and suspension components and why you must follow the OEM procedures. Feel free to contact us if you have questions. **H&D**

Larry Montanez, CDA is co-owner of P&L Consultants with Peter Pratti Jr. P&L Consultants works with collision repair shops on estimating, production and proper repair procedures. P&L conducts repair workshops on MIG & resistance welding, measuring for estimating and advanced estimating skills. P&L also conducts investigations for insurers and repair shops for improper repairs, collision reparability and estimating issues. P&L can be reached by contacting Larry at (718) 891-4018 (office), (917) 860-3588 (cell), (718) 646-2733 (fax) or via email at info@PnLEstimology.com. The P&L website is www.PnLEstimology.com.

Jeff Lange, PE is president of Lange Technical Services, Ltd. of Deer Park, NY. Jeff is a Licensed New York State Professional Engineer who specializes in investigating vehicle and component failures.

Lange Technical Services, Ltd. is an investigative engineering firm performing forensic vehicle examinations and analysis for accident reconstruction, products liability and insurance issues. Jeff can be reached at (631) 667-6128 or by email at Jeff.Lange@LangeTech.net. The Lange Technical Services, Ltd. website is www.LangeTech.net.

Executive Director's Thoughts

Larry and Jeff continually bring up issues and topics that have a common theme: Researching today's vehicle prior to a repair is a must. Knowing how to do the repair right – in advance – is the only way to have confidence in the finished product for the customer. We cannot ever forget that customers trust technicians with their families' safety. - *Jordan Hendler*



P&L CONSULTANTS™
For All Collision Repair & Material Damage Insurance Training Needs
Consulting, Estimating, Investigations & Hands-On Training.

ESTIMOMOLOGY™



P&L Consultants has over 50 years of collision and insurance damage analysis experience. As defined by P&L, Estimomology™ is the study and understanding of the estimating process.

To be a true Estimologist™, one must understand:

- Vehicle Construction Processes;
- Vehicle Absorption of Collision Damage;
- Vehicle Collision Repair Processes;
- P-Page Logic; and
- Negotiating for Profit and Fairness.

P&L (creators of the EME 54™ Theory) has developed a comprehensive estimating workshop that will help you limit supplements, increase profits and improve repairer-insurer relations...or as we call it, "Find the Sweet Spot.™"

After attending the P&L Workshop and through the practice of our methods, you will be able to analyze collision-damaged vehicles more accurately and efficiently - while at the same time reducing supplements. Our 10-Step Process of Scoping™, Forgotten Items in Each Area™, P-Page Explanation, Hands-on Writing and Mechanical and Electronic 3-dimensional process will ensure an accurate estimate every time.

Available P&L Workshops:

Pre-Production & Damage Estimating (PDE01) \$549.00

This is an 8-hour comprehensive workshop that teaches you proper damage analysis report writing. You will be writing with real damaged vehicles. Students receive Laminates of the P&L Customer Info Worksheet® and the P&L 18 SOP Steps™.

Advanced Estimating & Negotiating* (AEN02) \$499.00 *You must first attend and complete P&L PDE01

This 8-hour comprehensive workshop picks up where PDE01 leaves off. You will be writing with damaged vehicles using the P-Pages and then negotiating procedures in a role-playing scenario. You will use all of your knowledge and skills to negotiate what needs to be done to repair the vehicle. Students receive a P&L Negotiating Laminate, P&L Word Track Laminate and a more in-depth look at measuring for structural damage.

STRSW & GMAW/MIG (RMW01) \$200.00

This 8-hour workshop is all hands on. We will cover STRSW & GMAW machine set-up, test welds, panel preparation, sanding and grinding, shunting, joint configurations and weld bonding procedures.

P&L'S MISSION

Our training programs will assist the collision and insurance industries to work together during all stages of a physical damage claim in a spirit of fairness, intelligence, cooperation and accuracy. This helps to ultimately serve both parties' mutual customer - the vehicle owner - with fast, safe, pre-loss condition repairs that are fiscally reasonable and industry-accepted.

P&L Consultants also offers in house consulting on the following:
Damage Analysis & Estimating Databases, Estimate Review for Missed Items,
Workflow Analysis and Hands-On Collision Repair Mentoring.

Interested in hosting a P&L Consultant Workshop or in-house counseling? Please contact us for details. We will come to you!



Phone: 718.891.4018

Cell: 917.860.3588

E-mail: larrygoju@aol.com

www.PnLEstimology.com