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Structuring Contract Provisions for Risks Arising from Automated Driving Systems

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I. Introduction

The automotive landscape dictating the relationship between OEMs, Tier 1 suppliers and sub-suppliers is changing due to the entrance of new market participants within the automotive supply chain. The new market participants are focused on opportunities for the sale of automated driving systems (ADS-Systems),[1] components for automated driving systems (ADS-Components), and services such as ride-sharing offered to consumers to utilize vehicles with automated driving systems (ADS-Services). The changing landscape creates confusion within the supply chain as traditional market participants evolve time-tested supply terms to allocate new risks introduced by the new market participants.

First, traditional Tier-1 and sub-suppliers are being asked to provide OEMs with final ADS-Components to support ADS-Systems in pursuit of new market opportunities. But, neither the lead time to complete component testing and validation, nor the small batch production runs match the normal production and schedule expectations of traditional Tier-1 and sub-suppliers.

Second, non-traditional suppliers lacking experience with automotive component testing have entered into the automotive supply chain. The non-traditional suppliers include manufactures of computer chips, as well as manufacturers of radar,[2] LIDAR, [3] vision systems, and related ADS-Components. The traditional Tier-1 and sub-suppliers are being asked to integrate components from non-traditional suppliers.

Third, for decades multistage manufacturers, intermediate manufacturers, and Alterers[4] (ADS-System Integrators) have turned OEM vehicles into ambulances, police cars, and delivery trucks (aka upfitting) in accordance with clear long-standing Federal Motor Vehicle Safety Standards (FMVSS) as promulgated by National Highway Traffic Safety Administration (NHTSA).[5] As to automated vehicles, NHTSA has published voluntary guidance through *Automated Driving Systems 2.0: A Vision for Safety and Automated Vehicles 3.0: Preparing for the Future of Transportation 3.0* providing industry the flexibility to choose how to address a given safety design rather than promulgate FMVSS.[6] So now these ADS-System Integrators are tasked with integrating ADS-Systems and ADS-Components for which no FMVSS exist.

Finally, OEMs are partnering with new market participants specializing in ADS-Services (ADS-Service Providers) focused on ADS-Service sales rather than vehicle sales. The ADS-Service Providers need to own fleets of automated vehicles to support the provision of ADS-Services to customers. However, to the ADS-Service Providers, the automated vehicles serve only as a conduit to provide ADS-Services, similar to how the cell phone serves as a conduit to sell telecommunication services.

This article provides an overview of key contractual provisions and risk allocation between OEMs, Tier 1 suppliers, sub-suppliers, and non-traditional suppliers when providing ADS-Systems, ADS-Components, and ADS-Services. But first, prior to analyzing risk allocation amongst supply chain participants, an overview of the theories of liability and defect types provide the necessary context to appreciate the risk allocation amongst supply chain participants.

II. Traditional Theories of Automotive Liability and Defect Types

The theories of automotive products liability include negligence, strict liability in tort, and breach of warranty, and regardless of theory of liability, plaintiff must prove the following: defect, injury, and causal relationship between defect and injury.

A. Liability Claims

Product liability claims based upon negligence theories center on the following failures to: properly label the vehicle, warn of dangers associated with the vehicle's use, give proper instructions, design adequately, manufacture adequately, inspect adequately, and test adequately.[7]

As to strict liability in tort, Section 402A of Restatement (Second) of Torts[8] provides for special liability of a seller of products in cases of physical harm resulting to a user or consumer. Precisely, one who sells any product in a defective condition unreasonably dangerous to the user or consumer, or to her property, may be subject to liability for physical harm caused to the user or consumer, or to her property.

For breach of warranty, claims arise from the following: defects in workmanship or materials, and breach of an express warranty or implied warranty, with the latter including claims under UCC Section 2-314 implied warranty of merchantability[9] and UCC Section 2-315 implied warranty of fitness for a particular purpose.[10]

B. Defect Types

Traditionally, product liability may extend to the product designer, manufacturer, component part manufacturer, distributor, or retailer that sells the product or provides a service utilizing the product. So product liability may arise for design, manufacturing, or marketing defects:

- A design defect (i) is common to each product of the same design, and (ii) exists before the product is even manufactured, though usually unknown to the manufacturer at the time of manufacture.[11]
- A manufacturing defect exists when a vehicle fails to conform to the design or specifications.[12] The manufacturing defect results from the manufacturing process and is unique to the individual product or group of products manufactured.
- A marketing defect (or failure to instruct or warn) is based on the product's foreseeable uses and misuses, reflecting a plaintiff's assertion that the manufacturer failed to forewarn the user of potential harms or defects.[13] The duty to warn of defects extends to all persons whom the manufacturer should expect to use the vehicle and to those endangered by a reasonably foreseeable use of the vehicle. The warning must notify the user of possible consequences of the use or foreseeable use or misuse of the vehicle. Additionally, as ADS-Services evolve to be provided direct to consumer, the warnings for foreseeable uses and misuses must also evolve to describe potential harm arising from the ADS-Services.

OEMs and traditional suppliers must give careful consideration to assess the impact of defect risks for ADS-Systems and ADS-Components introduced by new market participants, while ADS-Service Providers must assess and develop warnings for foreseeable risks arising from the use of ADS-Services.

III. OEMs and Traditional Suppliers within the Supply Chain

OEMs and traditional suppliers have time-honored component testing and validation protocols designed to support new product development. However, OEMs are new to ADS-Systems, and ADS-Components are new to the marketplace. So ADS-Systems and ADS-Components may lack the same full and complete testing and validation, including physical testing, design verification, and manufacturing validation prior to the OEM requesting traditional suppliers to manufacture the ADS-Components or subsystems, and ADS-Systems and ADS-Components may require wholly different types of virtual simulation testing prior to validation.

Further, ADS-Systems and ADS-Components are being delivered in small batch production runs with limited volume to amortize the costs of traditional component testing and validation, which exacerbates the lack of completed component testing and validation protocols. Therefore, risk allocation between an OEM and traditional supplier requires structuring contract provisions to focus on breach of warranty, as well as design and manufacturing defects.

To focus on warranty, the traditional supplier may narrowly state the express warranty focusing on manufacturing an ADS-Component that matches the provided or agreed upon design specifications, as opposed to providing a broad implied warranty of merchantability or fitness for a particular purpose not supported by the completed component testing and validation protocols. The traditional supplier may narrowly state the express warranty to confirm with the fully developed OEM specifications. The traditional supplier should avoid providing the OEM an implied warranty of merchantability or fitness for a particular purpose for ADS-Components which have not been through the fulsome rigors of component testing and validation due to the condensed production schedule.

To focus on design and manufacturing defects, the OEM and traditional supplier must document the design responsibility. By moving forward with clear design specifications and design responsibility parameters, the OEM and traditional supplier can focus on achieving the design specifications within the manufacturing process. Pointedly, the traditional supplier may not be in a position to evaluate and accept the risk of integrating the ADS-Component. If the traditional supplier accepts certain design risk, then the traditional supplier should take steps to ensure the schedule allots sufficient time within the supply agreement to perform component testing and validation of the ADS-Components within the ADS-System.

IV. Non-Traditional ADS-System and ADS-Component Suppliers within the Supply Chain

Non-traditional suppliers lacking experience with automotive component testing have entered the automotive supply chain. The non-traditional suppliers include manufactures of computer chips, as well as manufacturers of radar, LIDAR, vision systems, and related ADS-Components. The traditional Tier-1 and sub-suppliers are being asked to integrate components from non-traditional suppliers. To allocate risks from ADS-Components sourced to non-traditional suppliers, the traditional Tier-1 and sub-suppliers may structure contract provisions so that the OEM directly buys ADS-Components from the non-traditional supplier, or the OEM designates a non-traditional supplier to supply the ADS-Components to the Tier 1 and sub-suppliers.

These direct-buy sourcing strategies allow the OEM to take the lead in setting the warranty scope and design specifications with the non-traditional supplier while continuing to utilize the traditional Tier-1 and sub-suppliers for their known component integration and assembly capabilities. The strategy allows the OEM to aggressively utilize cutting-edge technology while taking the active role to evaluate and set the risk parameters with the non-traditional supplier. The OEM is usually in the best position to set the risk parameters with the non-traditional supplier since the OEM is pursuing the use of the cutting-edge technology.

By using a direct-buy sourcing strategy, the risk allocation within the contract between the OEM and non-traditional supplier may focus on design defects and manufacturing defects for the ADS-Components. The direct-buy sourcing strategy serves to allocate the risk to the party intended by the OEM to receive the risk, *i.e.* the OEM chose the non-traditional supplier to manufacture the ADS-Component and the OEM chose the Tier-1 and sub-suppliers to perform the assembly and integration of the ADS-Components, so the OEM should proactively take the steps to structure the contracts to best allocate the risks directly to the most responsible party.

V. Alterers and ADS-System Integrators

ADS-Service Providers are requesting ADS-System Integrators to include or "upfit" vehicles with ADS-Systems at differing stages of the manufacturing process. These ADS-System Integrators must comply with FMVSS certification standards and requirements.[14] Traditionally, additional systems may be integrated with vehicles as part of (i) multistage manufacturing of incomplete vehicles, (ii) intermediate manufacturing upon vehicles manufactured in two or more stages, or (iii) alteration of a complete and certified vehicle.[15] The integration of ADS-Systems requires the ADS-System Integrators to understand and assume certain legal responsibility and certification related duties under the Vehicle Safety Act depending upon the role of the ADS-System Integrators in the manufacturing process.[16]

An incomplete vehicle is the first completed stage of a vehicle that will be built in two or more stages, and minimally an incomplete vehicle must include a chassis, power train, as well as steering, suspension and braking systems.[17] The key details of an Incomplete Vehicle Document (IVD) for an incomplete vehicle include the following:

- List of the vehicle types into which the incomplete vehicle may be appropriately manufactured, *g.* truck, multi-purpose vehicle (MPV), bus, trailer; and
- Provide one (1) of the following three (3) types of statements regarding each applicable FMVSS for each potential vehicle type:
  - the vehicle when completed will conform to the standard if no alterations are made in identified components;
  - the specific conditions of final manufacture under which the incomplete vehicle manufacturer specifies that the completed vehicle will conform to the standard; or
  - the conformity with the standard cannot be determined based upon the components supplied on the incomplete vehicle.[18]

Under the regulations, the incomplete vehicle manufacturer is responsible for IVD accuracy. The intermediate and final stage manufacturers may rely upon the incomplete vehicle manufacturer's IVD statements as part of the basis to issue a future good faith certification of the vehicle.[19]

An incomplete vehicle manufacturer assumes legal responsibility for certification-related duties and liabilities under the Vehicle Safety Act with respect to (i) the components and systems the incomplete vehicle manufacturer installs or supplies for installation on the incomplete vehicle, unless such components are changed by a subsequent manufacturer, (ii) the vehicle as further manufactured or completed by an intermediate or final-stage manufacturer, to the extent that the vehicle is completed in accordance with the IVD, and (iii) the accuracy of the information contained in the IVD.[20]

Similarly, an intermediate manufacturer assumes responsibility for certification-related duties and liabilities under the Vehicle Safety Act with respect to (i) the components and systems the intermediate manufacturer installs or supplies for installation on the incomplete vehicle, unless changed by a subsequent manufacturer, (ii) the vehicle as further manufactured or completed by an intermediate or final-stage manufacturer, to the extent that the vehicle is completed in accordance with the addendum to the IVD furnished by the intermediate vehicle manufacturer, (iii) the work done by the intermediate manufacturer on the incomplete vehicle that was not performed in accordance with the IVD or an addendum of a prior intermediate manufacturer, and (iv) the accuracy of the information in any addendum to the IVD furnished by the intermediate vehicle manufacturer.[21]

Finally, an altered vehicle is a completed vehicle previously certified compliant with all applicable FMVSS that has been altered other than by the addition, removal, or substitution of attachable components. The Alterer has the duty to determine continued conformity with applicable FMVSS affected by the alteration to the certified vehicle.[22]

So to allocate FMVSS compliance risk within contract provisions, OEMs and traditional suppliers should determine if the ADS-System Integrator is serving as an intermediate manufacturer, a final stage manufacturer, or an Alterer in order to confirm the responsible party for required certifications and assumed liabilities.

VI. OEMs and ADS-Services

In certain cases, OEMs are now partnering with ADS-Service Providers to equip automated vehicles with the ADS-Service Providers' technology. Currently, the ADS-Service Providers contemplate providing ADS-Services through fleets of automated vehicles by integrating the ADS-Systems with complete vehicles, so the ADS-Service Providers will need capable vehicles to support ADS-Services. Consequently, the ADS-Service Providers are developing proprietary ADS-Systems to install on base vehicles and further the service fleet business models. These evolving consumer business models may eventually be based on user sharing and co-ownership uncommon to the historic market place which focuses solely on individual use and ownership.

By contrast to OEMs, the ADS-Service Providers' business focus is with ADS-Service sales rather than traditional vehicle sales, creating confusion within the supply chain. So for ADS-Service Providers and their OEM partners, the parties must allocate potential claims for design and manufacturing defects, while giving heightened scrutiny to marketing defects for the products and services being provided directly to the consumer. This heightened scrutiny may require additional coordination between the OEM and ADS-Service Provider to forewarn the consumer of potential harms arising from vehicle behaviors the consumer may not understand, when such behaviors are dictated by the static preprogrammed software instructions providing the ADS-Service experience for which the consumer has no experiential basis to reasonably foresee the vehicle behavior.

The following is a potential risk allocation when structuring contract provisions between OEMs, Alterers, and ADS-Service Providers: OEMs responsible for design and manufacture of the base vehicle without the ADS-System; ADS-Service Providers responsible for design and manufacture of the proprietary ADS-System; and, the Alterer responsible for the installation of the ADS-System on the base vehicle. In addition, ADS-Service fleets will require vigilant maintenance, so claims for repair or service failures may arise based on aftermarket parts installed by repair or service providers or as a result of a defect in the repair or service to integrate the aftermarket parts with the original parts. Generally, the risks regarding the repair or service of an ADS-System may best be allocated to the ADS-Service Provider and their direct repair and service contractors.

Finally, liability allocation and mitigation steps between the OEMs, Alterers, and ADS-Service Providers may further include (i) naming third-party beneficiaries to certain warranties, (ii) requiring indemnification of third-party claims pertaining to ADS-Components and ADS-Systems within OEM supply chain agreements, (iii) naming certain parties as additional insureds under insurance policies within the OEM supply chain agreements, and (iv) identifying the scope and proof requirements for recall claims and allocation of recall costs.

VII. Conclusion

The movement to incorporate ADS Systems within vehicles requires that automotive market participants allocate traditional risks for warranty and liability in new contexts. To allocate these traditional risks in new contexts, the OEMs, traditional supplier base, and new market entrants should focus on thoughtfully applying traditional warranty and liability principals within the new environment of ADS-Components, ADS-Systems, and ADS-Service Providers.

[1] See https://en.wikipedia.org/wiki/Automated_driving_system. An automated driving system is a complex combination of various components that can be defined as systems where perception, decision making, and operation of the vehicle are performed by electronics and machinery instead of a human driver, and as introduction of automation into road traffic.

[2] See https://en.wikipedia.org/wiki/Radar. Radar is an object-detection system that uses radio waves to determine the range, angle, or velocity of objects.

[3] See https://en.wikipedia.org/wiki/Lidar. LIDAR is a surveying method that measures distance to a target by illuminating the target with pulsed laser light and measuring the reflected pulses with a sensorand LIDAR.

[4] An Alterer means a person or company that alters a certified vehicle by addition, substitution, or removal of components (other than readily attachable components) before the first purchase of the vehicle other than for resale, see Definitions, 49 CFR 567.7(3).

[5] See *Federal Motor Vehicle Safety Standards*, 49 CFR 571.

[6] See https://www.transportation.gov/av/2.0 USDOT Automated Vehicles 2.0 Activities (September 12, 2017), and https://www.transportation.gov/av/3 (October 4, 2018).

[7] See Restatement Torts, 3d, Products Liability § 2 (1998).

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[8] See Restatement Torts, 2d, § 402A (1965).

[9] UCC § 2-314, Implied Warranty: Merchantability; Usage of Trade.

[10] UCC § 2-315, Implied Warranty: Fitness for Particular Purpose.

[11] See Restatement Torts, 3d, Products Liability § 2 (1998).

[12] *Id.*

[13] *Id.*

[14] See Certification, 49 CFR 567.

[15] See Definitions, 49 CFR 567.7(3).

[16] See The Vehicle Safety Act, 49 USC Chapter 301.

[17] See Definitions, 49 CFR 567.7(3).

[18] *Id.* at 568.4(b)(6) and (b)(7)(i)-(iii).

[19] See Requirements for manufacturers of vehicles manufactured in two or more stages, 49 CFR 567.5(d).

[20] *Id.* at 567.5(b).

[21] *Id.* at 567.5(c)(i)-(iv).

[22] See Requirements for persons who alter certified vehicles, 49 CFR 567.7.