



HOTSEAT

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How one morning car ride turned into an ethical dilemma over Jeep, and why heat-treating equipment suppliers are unclear as to what the future may hold.

IT WAS EARLY OCTOBER while I was listening to the Paul W. Smith morning radio show on WJR when I couldn't believe what I heard. During an interview at the Paris Auto Show, Fiat CEO Sergio Marchionne made what appeared to be an off-the-cuff announcement that the Jeep Wrangler would have to be relocated from the Jeep assembly plant in Toledo, Ohio. The reason he gave was due to the likely decision to change the existing steel body-on-frame design to an aluminum-unibody system. This got my attention because not long after Fiat acquired Chrysler Marchionne said that Jeep would always be built in Toledo. Not surprisingly, the local union immediately started to circle the wagons and fight the potential withdrawal.

I believe Jeep is one of the most—if not the most—recognized automobile brands in the world. Jeep, a phonetic pronunciation for GP (General Purpose), started off as a concept vehicle for the Army in 1940 by the American Bantam Car Company. Eventually, Ford and Toledo-based Willys-Overland competed for higher production with Willys winning the bid by meeting the weight specification.

Per the Heritage Region Jeep Alliance, in 1950, Willys obtained a United States Trademark Registration for Jeep. Since then, ownership of the Jeep trademark, which is also registered internationally, has passed from Willys-Overland to Kaiser to American Motors Corporation, to Chrysler Corporation and now Fiat S.p.A.

Since 1950, Toledo has been the primary source for the CJ, Wrangler and Cherokee models.

I would love to own a Jeep Wrangler, but the problem is gas mileage. The basic V6, six-speed manual Wrangler will get about 17 MPG in the city and 21 on the highway on a good day. The problem is weight. For a relatively small car, it weighs approximately 3,900 pounds. Another problem arises from it staying true to its heritage as an off-road vehicle, even though I believe most owners never leave the pavement. The drivetrain is designed for high-torque applications. Maybe that's why Jeep has never been blessed with four-cylinder turbo or turbo diesel engines like other passenger cars have been, which is peculiar in my opinion. There must be many others like me who would own a Jeep if it had a more fuel-efficient drivetrain that could easily reach 26 MPG city and 33 on the highway.

Weight is the biggest barrier to fuel economy, and reducing a vehicle's chassis weight brings along other weight-saving opportunities, such as lighter brakes,


smaller engines and transmissions, and lighter gearing for transfer cases.

Jeep's problem, like some small cars, is a direct result of the 2025 CAFE standards. It seems the standards associate a car's footprint to its weight and the number of units sold. Being just 12 ft. 8.8 in. (152.8 in.) long and 6 ft. 1.7 in. (73.7 in.) wide, by the projected standards, its density should not be anywhere near its existing mass.

Transmission gears and shafts, engine crank and camshafts, and suspension components receive most of the critical heat-treating processes along with bearings in both the engine and transmission. Now, suitable grades of aluminum must be heat-treated to satisfy strength requirements of structural parts and forming needs of body panels. However, there are unforeseen developments that will affect all of the automotive manufacturing processes including heat-treating as OEM's strive to meet the 2025 CAFE standards. Small cars like Jeep may feel the effects more than most.

Several areas of interest are gaining traction as they relate to the CAFE standards and how cars and trucks will be built. Firstly, oil and gas fracking has the potential of reducing fuel costs much more than anyone expected. Second, electric vehicles and hybrids are not selling at the targeted 20 percent projected by 2025 as hoped but will likely be less than 10 percent. Next, adhesives are making significant gains as the bonding process of choice as aluminum becomes more attractive for body and structural materials. Automated spot welding in use now with steel unibody chassis is much more difficult with aluminum due to its stable oxide. Adhesives also weigh less than screws or rivets and provide a continuous bond, better sound deadening, and tighter sealing, and are more suitable for joining dissimilar metals. Lastly, internal engine development is realizing much greater fuel efficiency than was previously anticipated. All of this information is now causing decision makers to possibly revisit the 2025 CAFE standards, and no one knows how or if any changes are forthcoming.

Auto makers can only sell what consumers want to purchase and what the government mandates. The horizon is anything but clear as to what 2025 will bring. As for heat-treating equipment suppliers, our crystal ball is as cloudy as anyone's.

Not long after submitting a draft of this column, I learned Jeep engineers are rethinking the unibody body concept and, perhaps, will keep the body-on-frame design, a decision perhaps as an early concession to Toledo. If this is true, and since the frame is a substantial structure, replacing the steel frame with aluminum invites a totally new and a more expansive heat-treating process to duplicate the strength of steel. 

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