



Pinpointing sources of quality lapses

by Patrick Ponticel

Assembly plants are easy targets for criticism, but not always the right ones.

Source: Hyundai

"Where a body is welded has everything to do with quality," said Bob Brincheck, Director of the North America Automotive Business Unit for Dassault Systèmes.

When a piece of interior trim comes loose or something else goes awoul in a new car, the owner has every right to gripe about the automaker that delivered the faulty product. And he or she usually does.

But the owner may not be the only victim in such a case.

Sometimes, the perturbed owner will deride the automaker in general terms as an incompetent entity, indicting the entire organization by muttering something like "Acme Motors stinks." Sometimes, though, an owner will stew over his predicament and cook up more pointed an-

tipathy, verbally lashing out at the incompetent and unseen assembly line worker who "can't even put a piece of trim on right," let alone master more complex assembly tasks. The assembly line worker is an easy target of attack, the car owner's underlying presumption being that he or she could have done a better job than the inept autoworker affixing the trim part.

And maybe the owner could have done a better job. But the more pertinent debate is whether the assembly line worker on the receiving end of a customer scolding is really the guilty party.

Reading between the lines of the recent **J.D. Power and Associates Initial Quality Study**, one might assume that about half of all problems reported by owners of new 2006 models within three months of their purchase (which is the population that the company surveys for its study) owe to sloppy workmanship on the plant floor. That is because in the study released June 7, problems encountered by new-vehicle owners are categorized as either design-related or production-related, and the split is roughly 50-50.

Design-related problems are those such as a knob that is hard to reach or a control the operation of which is difficult to learn. Production-related problems,

Power says, are defects and malfunctions such as a piece of trim coming loose.

As assembly line workers know, however, the sordid story of a piece of trim coming loose could just as likely have begun at the company's engineering department several years before launch as it could have at the plant floor trim station two weeks before launch. And it sometimes does.

New to its annual study, J.D. Power for the 2006 edition categorized vehicle quality problems according to whether they were production-related or design-related. Of the major brands' average 124 PP100, 64 qualified as production-related and 52 as design-related, with only 10 of the 37 brands registering more design than production-related problems.

Ranking the plants

And as it typically does, J.D. Power ranked assembly plants according to the quality (as judged by respondents of the J.D. Power survey) of the vehicles they produce. However, the company added a new twist this year, considering only production-related problems for its plant rankings. Coming out on top among all plants across the globe that assemble product for sale the United States was **Toyota's Iwate facility in Japan**, where

Initial Quality, Problems by Type, Top 10 Nameplates

Nameplate	Production	Design
Porsche	49	35
Lexus	42	45
Hyundai	53	41
Toyota	52	47
Jaguar	59	44
Honda	57	46
Cadillac	54	57
Infiniti	57	52
GMC	70	43
Acura	63	51
Industry average	64	52

Source: J.D. Power and Associates 2006 Initial Quality Study

NOT JUST ANOTHER PRETTY FACE.



We go the extra mile on service. We are all about quick quotes, quick spec information, quick delivery on orders, quick delivery on parts, and we are quick to call you back. > Buy them, install them and forget them. They're backed by our reputation for excellence and safety. Call 800.331.2889 or get complete specs at www.JDNeuhaus.com.

The Force To Lift Your Business™



J.D. NEUHAUS L.P.

www.jdneuhaus.com

410.472.0500 > 800.331.2889 > email: info@jdneuhaus.com

Premium air hoists from 275 lb. to 250 ton capacity. 100% duty cycle. Immediate quick-ship delivery.



Vehicle Segment Leaders

No. of segment winners	Company	Vehicles
5	General Motors	Chevrolet HHR, Corvette ¹ , Silverado 2500/3500, Saturn Vue
4	Toyota	Toyota 4Runner, Tacoma, Lexus IS, RX 350/400 h
3	Honda	Honda Civic, Odyssey, Ridgeline
3	BMW	BMW 7 Series, Mini Cooper, Mini Cooper Convertible

Source: Strategic Vision
¹Won two segments

the **Lexus** ES is built. U.S. buyers and lessees of that model reported only 32 production-related PP100. The top-ranked plant in North America was **General Motors'** Oshawa #2 plant in Ontario, Canada. Buyers of vehicles produced at that plant (the **Buick** LaCrosse and **Pontiac** Grand Prix) reported only 43 PP100.

Joe Ivers, Executive Director of Quality and Customer Satisfaction Research for J.D. Power, acknowledged that those 43 production-related PP100 cannot necessarily be blamed on the assembly plant. "Usually, it's not clear whether a problem is the result of engineering or manufacturing," he said. "It's pretty much impossible to infer" from the survey responses.

But the categorization of problems does help pinpoint the origin of problems to some degree, noted Ivers: While a noisy sunroof problem can be the result of either an assembly line worker's careless

Vehicles produced at General Motors' Oshawa #2 plant near Toronto had fewer production-related problems than those produced at any other plant in North America, according to J.D. Power and Associates.



installation of the weather-stripping or an engineer's improper calculation of sunroof opening geometry, an instrument panel control dial that is difficult to reach clearly is not a production problem.

Categorization is important to give their automaker clients and the general public an accurate perspective on each brand, Ivers said. He noted that although **BMW** had a poor overall PP100 score of 142 (putting it 27th out of 36 brands), it was not because its vehicles are not well put together. It had only 52 production-related PP100, tied for third best in the industry. Where **BMW** got hammered was in the complexity of its vehicles' controls and displays for various high-tech fea-

tures. The brand finished ahead of only **Land Rover** in design-related problems.

"New vehicles today are often packed with new technologies that, unfortunately, can be complicated and frustrating for the average consumer when their integration is not well executed," Ivers said. "In the eyes of consumers, design flaws can have as much of an impact on their perceptions of quality as can a defect. Yet many manufacturers have tended to address quality solely on the plant floor without considering design factors."

Such a plant-floor focus on quality can be dangerous, according to Ivers, who said he has heard more than one quality director joke that "there is no design problem that cannot, with enough effort and creativity, be made worse in the plant." And the tendency will remain for automakers "to assign production-related issues to production and design issues to design" and leave it at that, Ivers added.

Certain problems that J.D. Power categorizes as production-related problems "are, we know, functions of lack of a robust design to begin with," said Bob Ottolini, GM Executive Director of Product Development, Quality.

Jamie Hresko, Vice President of Quality for GM North America, said "less than robust" design accounts for more than half of all production-related problems.

Design issues that impact wind noise are among those that pose particular challenges for manufacturing, according to Hresko. "They make the build a little

Automakers have much to absorb in recent quality, satisfaction studies

With a significant change in the way it characterizes problems, the recent **J.D. Power and Associates** Initial Quality Study is providing automakers with lots of material to chew on. On top of that, automakers will be busy reviewing another recent report that looks at quality: **Strategic Vision's** Total Quality Study. Both studies are based on surveys of individuals who recently purchased a new vehicle.

"We try to be No. 1 in all of them," Jamie Hresko, Vice President of Quality for **General Motors** North America, said of those and various other studies. "Our objective is to understand from a customer perspective what the dislikes are, and we try to address them through process changes, plant adjustments—whatever the solution calls for. And we try to implement those solutions as fast as we can. But we know we've got a lot of work to do."

Hyundai, which did particularly well in the J.D. Power study in terms of overall vehicle quality, also examines these and other studies for possible improvements in quality and other areas. John Kalson, Production Engineer at Hyundai Motor Manufacturing America, said there is a strong correlation between the various study results and its internal metrics, the main one of which is warranty.

GM, Hyundai, and other automakers work with third-party consulting/rating outfits long before their rankings come out so they can concentrate on issues that the rankings will address in terms.

WE'RE INNOVATING IN SEVEN CORE DIMENSIONS. SAFETY FIRST.



Most people see the world in 3-D; we see it in 7-D — seven core dimensions, that is, where we can offer automakers products and technologies influential to drivers, such as our Safety technology. Studies show that consumers are willing to pay more for safety content such as anti-whiplash systems and advanced tire pressure monitoring. Using our expertise in seating, electrical distribution systems, electronics and other interior products, Lear is answering the growing demand for safety features with products like **ProTec™ PLuS** and **IntelliTire™**. Our Safety technology is just one of the ways we advance relentlessly.

To see the Lear difference, go to lear.com.

aei.hotims.com/10519-263X



Best Plants in North and South America¹

Rank	Company	Plant, location	Production-related problems	Vehicles sold in N. and S. America
1	General Motors	Oshawa #2, Ontario, Canada	42	Buick LaCrosse, Pontiac Grand Prix
2*	Toyota	Georgetown, KY	47	Toyota Avalon, Camry, Solara Coupe/Convertible
2*	DaimlerChrysler	Windsor, Ontario, Canada	47	Chrysler Pacifica, Town & Country; Dodge Caravan, Grand Caravan

Source: J.D. Power and Associates 2006 Initial Quality Study

¹Based on vehicles sold in the United States

* Tie



Dassault Systèmes' simulation products help automakers optimize assembly.

more complex and force real manufacturing discipline with things like problem solving and variation control. There are a lot of detailed processes, and you can use them to work your way through some of the issues, but clearly design is a big part of the equation."

Hresko emphasized that once a problem area is identified, manufacturing works close with design to solve it.

It is not unusual "to see a design problem manifest itself in manufacturing," said John Kalson, Production Engineer at **Hyundai** Motor Manufacturing America in Montgomery, AL. The plant, where the Sonata and Santa Fe are built, finished 10th among 73 North and South American plants in the J.D. Power study. For vehicle quality, the Sonata ranked third in the hotly contested midsize car segment.

The plant's strong placing in the J.D. Power study was surprising in that production commenced less than 18 months ago with a work force with little experience in vehicle assembly, said Kalson.

All plants have problems, and the one in Montgomery is no exception, he added. "When you have hundreds of people putting parts on with screws and nuts and bolts, you're going to strip one, you're going to cross-thread once in a while. It's all about how you contain problems. It's about how quickly you can make a design change, a process change, a part change—whatever it might be to make the problem go away. That's what I think we did a real good job of doing in our first year of production."

Such quick reaction is possible when engineering and manufacturing work closely together—both during vehicle development and manufacturing. At Toyota, spokesman Dave Hanson said, "Designing a vehicle that is easy and simple to build is not a priority; it is a religion."

But it is not an exact science, which is why Toyota puts more emphasis on effectively and quickly managing problems rather than eliminating them. "In recent years," Hanson said, "we have experienced an increasing number of low-volume recalls. That is by design. Our system is set up to identify problems quickly, find a solution, and institute a countermeasure. There are always going to be mistakes, both engineering- and assembly-related. However, the goal is to minimize the number of vehicles that have the mistake. How quickly we react, and how well we handle the customer is the key."

Having the right systems in place to track problem trends and respond quickly is key.

GM, for example, uses what it calls a 24-hour Concern Detection Program (CDP) in which warranty and manufacturing data is examined daily. When a problem trend is uncovered, the goal is to resolve it within 24 hours.

CDP and other programs have helped GM improve quality dramatically. Over the past five years, the company has reduced warranty spending by 40%, according to Hresko. He said the improvement in warranty spending, which has a direct



Source: Hyundai

A dynamometer check is one of the final steps in vehicle production.

impact on the bottom line, corresponds with sharp improvements in various third-party quality studies such as J.D. Power's.

"Our goal is to take each individual survey and try to make adjustments whenever the consumer yells foul—and do it as fast as we possibly can," said Hresko.

Toleration

When it comes to production-related problems, tolerance stack-up is a regular culprit.

"Rarely, when going back to look at the origin of a problem, is it the case that [an engineer] made a simple mistake on a component," said Bob Brincheck, Director of the North America Automotive Business Unit for **Dassault Systèmes**. "Usually, it's because [the engineer] failed to realize how parts go together." That is especially so when working with curved surfaces that can multiply the negative effects of tolerance, a problem that can be avoided with use of CAE tools made by Dassault, he added.

In the hypothetical case of a small gap between the A-pillar trim and the Laying blame for quality lapses, "You may have to go to four or five places to figure out its origin," said Hyundai's Kalson, who declined to speak about any specific problems on Hyundai products. "You could be building your body wide at the top. With the standards we have today, if you are 2 or 3 mm off on a body build, you are far off. We're down to that much of an exact science. And that's not just for Hyundai; that's for all manufacturers." **aei**