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- Thank you, Jay (Baron)
- Good Morning everyone!
- I appreciate this opportunity to discuss world class manufacturing with you and the exceptional speakers on this panel.
- This is a perfect time for our discussion because today our industry's exploring many exciting new opportunities to leverage the manufacturing organization's role as an influencer of corporate transformation.
- These opportunities are often determined by how intelligently we create a perfect choreography between people and technology, and how completely we embrace ideas such as lean manufacturing and flexibility.
- The outcome of this transformation process is our ability to provide consistently better value for customers and shareholders, through improving cost, quality and speed.
- And, along the way, maybe even re-inventing our discipline itself and, in so doing, re-writing the business model for our companies and industry.
- Tom LaSorda will have more to say on the larger dimension of that topic when he speaks here on Wednesday.
- Today, I want to bring you up-to-date on a tangible example of where and how this is occurring at the Chrysler Group: DaimlerChrysler's Global Engine Manufacturing Alliance-or GEMA for short—and the collaborative development of our World Engine program, with US-based plants soon to come on-line in Dundee, Michigan.
- GEMA is a leading edge manufacturing partnership between DaimlerChrysler, Mitsubishi and Hyundai, employing the most modern technologies and techniques to manufacture what we expect will be a paradigm-changing powertrain component, World Engine.
- There's been much written about the health of the partnership between the three companies...let me clarify at the outset...that while the investment-related aspects of the partnerships have, indeed, changed, joint projects like World Engine have not been affected.
- In fact, our World Engine plants in Dundee as I mentioned, are set to come on-line this year, represent a lot of hard work by our people and our partners.
- We're all very excited.
- As a manufacturing executive who's put in some time in this industry, there's very little that really surprises me anymore...at least very little that I'd admit to first thing on a Monday morning.
- With all the complexity required to bring a program like World Engine to fruition, the most important skill required is an ability to manage crosscultural communication.

- I call this “the higher power,” a gift from the proverbial gods. Because no matter how smart you are, if you don’t get this right you’re either toast or tempura, depending on which side of the world you’re on.
- So, while I know you’re hungry for details about the program, I couldn’t sleep tonight if I didn’t take just a little time to possibly save at least one career.
- Please listen because the career I save may be yours!
- Have you ever heard someone say you should never let technology know you’re in a hurry? Well, there’s an international business version of that: never assume everyone’s on your schedule
- As an international project manager, here’s a typical way your day can begin. You’re in your office. Gung-ho and ready to go...when your secretary comes in with the following news:

Auburn Hills is out for breakfast, Stuttgart’s on a coffee break, and Tokyo and Seoul are out for dinner. Would you like me to try your mother?

- As this cartoon suggests, if you’re not totally aware of time and custom, you’ll lose a lot of productive time, and you’ll eventually begin to feel quite lonely. The good news, of course, is that mom’s always there for you.
- Make sure that when you’re ready to work everyone else is, too. It may help to get a couple of clocks, a good diary and enough communications adgetry to transform you, literally, into a hot spot for low-level radiation.
- Of course, sleep may be something you’ll want to begin to lose interest in. Meetings can occur virtually at any time. It’s tough at first, but you’ll get used to it.
- Notwithstanding my recent experiences with radioactivity, and because of my concern for you, I spent some time on the Internet to pull together this brief list of Top Five International Faux Pas: call it Coventry’s Top Five...
- Always remember-particularly if you’re an American—what’s common practice in one part of the world may be absolutely taboo in another.
- With that in mind, the good news is that here’s a pretty decent top ten list. Let’s take a look at a few you may be unfamiliar with...
 - 1. Making assumptions
 - “Where can I get a good cup of ‘American’ coffee?”
 - 2. Neglecting to develop relationships
 - “Just sign the contract, I’m in a hurry!”
 - 3. Comparing the place you are visiting to your home
 - “Oh, Mt. Fuji is OK, but it doesn’t hold a candle to Traverse City”
 - 4. Wearing improper attire.
 - I’m still trying to explain casual day at CTC to my Korean and Japanese colleagues.
- Now the bad news, of course, is that the problem with these top five lists is that there’re usually more than five ways to die in any situation.
- In international situations, I can assure you, there’re many more than five.
- Unfortunately, five’s all I have time for.

- So...as my attorney instructed me to say, good luck, go global, and maybe get a more comprehensive list!
 - Okay...fun's over. Let's get to work...
- Generally, these are the areas I'll cover with you today:
 - What is GEMA?
 - What is the World Engine?
 - What benefits are derived by the Chrysler Group and DaimlerChrysler?
 - And what lessons are we learning and applying?
- GEMA is a unique program comprised of three very different partners working together to develop a world class product efficiently. So much of this program is at the leading edge of lean, flexible manufacturing...that the program serves an incubator of new ideas and techniques for each of the partners.
- It's a Joint Venture company formed to manufacture an engine family with world class technology, performance and efficiency, while minimizing investment.
- World Engine will have a worldwide manufacturing footprint with factories in:
 - Asan, South Korea
 - Hwasung, South Korea
 - Two plants in Dundee, Michigan
 - And in Shiga, Japan
- In short- it truly is a World Engine, with features that can be appreciated in markets around the globe.
- World Engine is a family of 4-cylinder gasoline engines, co-developed by Hyundai, Mitsubishi and DaimlerChrysler, containing many state-of-the-art features, designed to rival the best 4-cylinder engines in the world.
- Some of the features include:
 - High pressure die cast aluminum cylinder block
 - Variable Valve Timing
 - Select fit piston, bearings and tappets
 - And torque and horsepower ratings that rival many of today's small V6 engines.
- GEMA is different because it enables us to target new sources of value, to mitigate risk and to optimize operational excellence.
- So, how does GEMA Target Value?
 - We extract the benefits of volume bundling on almost 2 million units per year.
 - (In a few minutes I'll walk you through specifically where these savings are.)
 - We utilize an efficient investment strategy: We didn't buy a block line, we bought three block lines, utilizing the best engineering inputs from MMC, HMC and DCX.

- We also for the first time bought standard machining centers, which significantly reduce capital investment requirements and program lead times.
- By agreeing to standardization and communization of component designs, we leverage the strengths of the partnership.
 - For example, we pursue open-book pricing, shared sourcing and volume bundling.
- The team is working toward a “commodity” mentality for engine manufacturing similar to what we now see in the computer business – aligned with great partners to generate breakthrough improvement.
- This strategy contrasts what we’re doing with our HEMI engine, where the engine is becoming a brand in itself.
- People buy cars, not engines...unless your name is HEMI.
- So, how does GEMA help us mitigate risk?
- You can imagine the complexity of managing change with three companies, three languages and five plants. So we have developed a formal change process among the three partners.
 - The process introduces “speed bumps” into the design change process by requiring each company to approve changes before implementation.
 - This helps ensure:
 - Commonality among partners is maintained.
 - Eliminates any unilateral action that could reduce volume of the other two partners.
 - We’re using only proven technology.
 - This is a perfect example of practical innovation. From a manufacturing perspective, we are not inventing anything. We are innovatively applying proven technology.
 - With respect to reliability, three companies are testing variants of the final products.
 - There are three design teams reviewing product testing and performance, resulting in a more robust design based on data-driven decisions.
 - The running rule among the three teams is that the best data wins.
 - As a result, we will be launching a product with more customer equivalent miles than any engine previously launched by any of the three partners.
- So, how do we optimize operational excellence?
- We do this by placing total focus on the manufacture and assembly of engines.

- In fact, this focused factory has only three machining lines and an assembly line.
- Critical components, such as cam shafts and connecting rods are purchased “finished machine.”
- Everything that is not core to building the engine will be contracted to service-provider specialists in the fields of:
 - Chemical Management
 - Tool Management
 - Janitorial Services
 - Material handling...and many more...
- This is a highly automated factory.
- Automation and precision technology are designed into the system for quality and efficiency, such as...
 - Automatic bearing selection
 - Error-proofed piston selection
 - Automatic torque verification
 - Automated cylinder head assembly, capable of “lights out” operation.
- How does a team of about 550 employees improve the manufacturing organizations of HMC, MMC and DaimlerChrysler?
- By deviating from the industry playbook and focusing on efficiency and empowering teams:
- Some of the enablers we’ll be using are:
 - 3/2/120 work schedule
 - Highly skilled employees
 - No first-line supervision
 - Rotating crews
 - Manufacturing flexibility
 - And, partnering with specialists for non-core activities.
- So, obviously, this is not business as usual, nor is it your father’s factory.
- Flexible machining centers are the basis to the GEMA business model allowing for a BATCH SIZE OF ONE.
 - Parts recognition and automatic changeover allow for different products to flow down the line seamlessly.
- Sophisticated machinery and gauging equipment create a final product with higher precision, resulting in enhanced performance, and durability that greatly exceeds each partner’s previous standards.
- The flexible GEMA process allows for throughput even with a machine downtime. This creates opportunities for:
 - Preventive maintenance during operations.

- One piece flow.
 - Reduced risk of starving downstream operations.
- Transfer lines are “blocked” or “starved” as soon as any one station faults. Transfer line changeover cannot take place until one product exits the system.
- Now, let’s look at a key challenge we’ve overcome...communication of CAD data.
- We’ve overcome three different spoken languages. The languages that took some time to overcome were CATIA and PRO-E.
- We’re tackling that with another collaborative tool – Windchill Product Lifecycle Management software by Parametric Technology Corporation. This software links partners electronically and provides a method to manage common engineering documentation, engineering changes and provide data vaulting and management for all manufacturing information.
 - There’s one central repository for all information, which allows for change management control and tracking among partners.
 - It also provides manufacturing documentation change control, such as speeds and feeds, and direct access to the latest engineering information.
- Well, that’s the plant...let’s talk about the people.
- We have a new hiring strategy and are screening candidates for unique skills and talents. This process focuses on learning, teamwork and technical skills. The fallout rate is high, but the caliber of employees is impressive.
- The bottom-line result is a skilled workforce with a range of experience and global diversity, a team comprised of MMC, HMC, DCC and new GEMA employees all dedicated to redefining engine manufacturing.
- There are so many opportunities to learn. But we all know companies are in business to make money.
 - The results of our efforts can be seen on these charts.
 - Taking an existing DaimlerChrysler engine for reference, you can see how we added content while containing costs.
 - The international supply base provided cost savings opportunities never before explored by any one of the partners.
 - Although we’re a small part of the overall automotive landscape, we’re making a big impression on the village of Dundee, MI.
 - This project has helped create new housing, new businesses and improved infrastructure in a community of 3,000.
 - We love helping this town flourish.

- With 900,000 square feet of manufacturing floor space, 50,000 square feet of employee facilities and a 90,000 square foot shipping and receiving facility, we think we have what it takes to improve the performance level for all three partners.
- The progress and activity taking place are impressive.
- We look forward to the opportunities up ahead.

- Despite not having yet produced an engine on the manufacturing floor, there are many lessons already learned:
 - Utilizing the global supply base can provide significant opportunities.
 - Managing currency fluctuation is integral to a global program.
 - Procuring equipment and components worldwide requires that we manage foreign exchange risk.
 - We're learning that despite our aggressive timeline the currency markets these days move quicker.
- Multiple design and development teams make for a more robust product.
 - Teams at the working level have performed remarkable well.
 - Teams are challenging one another and the data driven decisions they reach make for a fantastic finished product.
 - Information sharing among partners improves everyone's performance, knowledge and ability to resolve issues quickly.

- We've learned that common suppliers can help facilitate problem resolution in machining and assembly operations.

- And we've also learned that we must perform, make or buy studies on all activities to ensure competitiveness in the global economy.
 - It's the only way to confirm what you think is core, is really core.

- I hope I've demonstrated that GEMA is a leading opportunity for DaimlerChrysler and partners.

- GEMA is an outstanding example of what teamwork and, as I said, that perfect choreography of people and technology can contribute to improved value for customers and shareholders. It is helping us to evolve to a more high performance business model.

- As a source of state-of-the-art process innovation, it's feeding the transformation of Chrysler Group: it's teaching us what's possible when your people are capable, motivated, equipped and empowered to achieve breakthrough performance.

- As a source of new, efficient engines, it'll benefit customers and communities around the world.
- In addition to applications by the three alliance partners, there are solid opportunities developing for sales with third-parties and in emerging parts of the world. World Engine, we expect, will be a big player in the mix of fuel-efficient powertrains around the world.