TOOL&DIE Authority

Exclusive technical information and timely news by industry experts for tool and die professionals provided by *MetalForming* magazine.

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Contents

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PMA Services, Inc.
6363 Oak Tree Blvd.
Independence, Ohio 44131-2500
Phone: 216-901-8800
Fax: 216-901-9669

In and Around the Trade

Here's How We Got Here. Spread the Message! Part 1

By Joe Brown

Joe Brown

"Guns, planes, ships and many other things have to be built in the factories and the arsenals of America. They have to be produced by workers and managers and engineers with the aid of machines, which in turn have to be built by hundreds of thousands of workers throughout the land. In this great work there has been splendid cooperation between the government and industry and labor. And I am very thankful…American industrial genius, unmatched throughout all the world in the solution of production problems, has been called upon to bring its resources and its talents into action. I want to make it clear that it is the purpose of the nation to build now with all possible speed every machine, every arsenal and every factory that we need to manufacture our defense material. We have the men, the skill, the wealth and, above all, the will. No pessimistic policy about the future of America shall delay the immediate expansion of those industries essential to defense. We need them…We must be the great arsenal of democracy."

FDR's words, not mine, from his historic Fireside Chat, December 29, 1940.

Make no mistake about

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Danny's Dish—Your Entrée to the World of Sheetmetal

Troubleshooting Sheetmetal Problems

(or, Meticulously Mending Metal with Mettle)

By Danny Schaeffler

Danny Schaeffler

Most stamping problems can be traced back to some characteristic of the process or material that is out of whack compared to what was used in the past. The list of usual suspects includes the sheetmetal, die, lubricant and press. Of course, there are dozens of other possibilities, but let's start by going after the low-hanging fruit.

It's easy to check the sheetmetal—along with the material delivery should come a report detailing the composition of the alloy and its mechanical properties such as yield and tensile strength, elongation and n-value. Or, metalformers can send material samples to a local laboratory for testing, for just a few hundred bucks. Too much to spend? Maybe not, considering the cost of scrap, the other profitable jobs your press could be used for, and all of the better ways your press operators, technicians and engineers could be spending their time.

Test results in hand, you can compare them to the historical values received, as well as the allowable range specified. Of course, this can be a challenge if you don't have the historical information; periodic testing of incoming material helps metalformers develop a baseline.

You can probably skip the composition check. Quite likely, this is on the tags of every shipment, and will be the same for all coils with the same heat number. A heat is a single batch of molten steel (about 300 to 400 tons at the high end), and the elements in the liquid steel are uniformly distributed throughout. The steel mill takes a chemical analysis from the liquid steel and typically applies the results to all coils produced from that heat. It then continuously casts the molten steel into a slab as thick as 10 in. and about 20 ft. long and as wide as 72 in. Width does not change significantly during processing, so the coil you receive results from rolling the thickness down, which extends the coil length.

It is entirely possible, and even expected, that the 10 to 20 coils produced from the same heat will have different mechanical-property test results, even if the mill used the same recipe for all processing. This is because strength, elongation and other mechanical properties are output variables—there is no "strength-o-meter" on the side of the mill. Key input variables include incoming composition, processing-temperature profiles and the degree of thickness reduction at numerous rolling stations. Each of these parameters has a tolerance of acceptable and achievable values, which results in normal and inherent variability in the alloy produced.

Of course, you want the properties tested to reflect the portion of the coil you receive. Although great strides have been made in edge-to-edge and tip-to-tail uniformity, variations in thickness and mechanical properties in a coil still occur. When a mill generates certified steel properties, it usually is from the central portion across the width at one end of the coil—this area is easier to access and the

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Professor Pete's *"Lessons from the Press Shop"*

Surface Coatings for Draw Steels—You May Not Need Them

By Peter Ulintz

The stamping and forming industry invests a substantial amount of money on specialized surface coatings for tool and die components. The primary objective of these coatings is to protect tool surfaces against abrasive, adhesive and corrosive wear. A surface coating's high hardness and low coefficient of friction help tools run longer in production.

There are far too many instances where surface coatings are unnecessarily applied to die components, resulting from errors made in die engineering or die construction. In these instances, tool coatings may appear to increase tool life and productivity but actually add unnecessary costs to die construction and die maintenance. In many instances the metalformer actually may not need the coatings at all.

Adding a tool-surface coating often is the first line of defense against galling in a draw corner. The situation is exacerbated when someone suggests that the company should revise its die-design standards to require higher-grade tool steels and a surface coating on all dies of similar design or on those that produce similar parts. If you have extra money to handle these added requirements or are willing to accept the first solution that works, then you are excused from class until next month. But, if you prefer to do things methodically to minimize tooling and production costs, then read on.

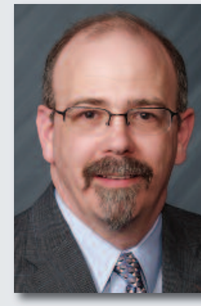
The arrival of CNC machining and 3D modeling has reduced the amount of time required to design, machine and assemble die components. One technique that has quickened this process is the ability to cut clearance into the punch or die cavity by offsetting the cutter path by maximum material thickness. This works until a drawn corner is encountered.

Lesson 1: Ensure that all corner sections vulnerable to galling have proper punch-to-die clearance for the magnitude of material thickening occurring in that portion of the die.

The corners in box-shaped geometries form in a manner similar to cup drawing. The corners are compressive on the material moving toward the die radius and tensile on the material that has been drawn over the radius. As a result, thickening occurs in both the vertical wall and the flange remaining on the blankholder around the draw corners. This phenomenon often is overlooked during die construction or, worse yet, it may not even be known to occur.

To reduce the likelihood of galling in draw corners, additional punch-to-die clearance must be machined in the vertical wall. This may sound simple but it generally requires the use of analytical tools such as metalforming simulations. An operator simply cannot measure a stamping out of the die to determine how much it has thickened. Most likely, the material has been thinned substantially due to a tight corner clearance. The proper execution of metalforming simulations, however, will provide very accurate thickness plots. The metalformer then can use the data to determine the location and the correct amount of punch-to-die clearance needed for a given stamping process.

Lesson 2: Polish all corner die sections as though a surface coating will be applied. Much of the performance improvements attributed to surface coatings may actually be the result of the preparation process. Because surface coatings can be very expensive, close attention is paid to the heattreatment process and die-polishing quality. Often, this level of attention greatly exceeds that given to noncoated die sections. Proper tool-steel selection and heattreatment are required to ensure adequate surface hardness to resist abrasive wear. High-quality die polishing, in the direction of material flow, helps reduce friction and adhesive wear (galling).



Peter Ulintz

Lesson 3: Address adhesive-wear problems directly; do not coat over them. If problems persist, adhesive wear also can be reduced by increasing the toughness of the tooling material and reducing friction between the tooling material and the workpiece. This usually requires the proper selection and application of lubricants, tool steel and heattreatment. These factors must be properly evaluated and corrected before applying tooling surface treatments. Otherwise, the expensive surface coating may do nothing more than cover up an underlying, and perhaps less expensive, die problem.

Homework Assignment: Before applying a surface coating to your next problematic tool, verify that you have the appropriate punch-to-die clearance for the amount of material thickening that is occurring. Properly heattreat and polish the die components as though a surface coating will be applied. Then return the prepared die section to service without a surface coating and document the results. You may be surprised.

Class dismissed! **TDA**

Pete has worked in the metal-stamping industry for more than 30 years. His background includes tool and die making, tool engineering, engineering management, advance process planning and product development. Pete also is a monthly columnist for PMA's MetalForming *magazine's Tooling By Design column. He oversees the website, Tooling by Design.* ***www.toolingbydesign.com***

Troubleshooting Sheetmetal Problems…continued

full-weight coil can be shipped. When a metalformer encounters steel-related problems, it may be the result of in-coil variability, where a specific lift does not reflect the properties obtained at the coil ends.

A steel mill may set up certain orders (typically hot-rolled steel) to require just one tensile test for every heat. It then applies the results from this one test to every coil from that heat. While this may not accurately reflect the mechanical properties of all 300+ tons, it may sufficiently characterize the coils—at least as far as the mill is concerned. If your shipping records show the exact same properties for numerous coils, you might question where and how the results were generated.

More challenging to troubleshooting is when a mill or service center performs subsequent coil-processing operations after certified steel properties are generated. Consider, for example, an order that requires a tensile test, but the internal mill QC report indicates that a particular coil has shape problems. Tension-leveling the coil may correct the shape, but also could increase the material's strength and decrease its formability—elongation and n-value. In some cases, however, the mill already has performed the order-required tensile testing, and may not repeat the test.

To avoid confusion, be sure to obtain a coupon of the troublesome coil and have it tested—it may be the best $100 you've spent in a long time.

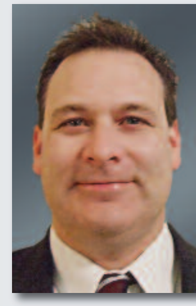
Bon Appétit! **TDA**

Danny Schaeffler is the president of Engineering Quality Solutions, an independent resource for product applications assistance to materials and manufacturing companies. EQS focuses on helping companies make more cost-effective use of the sheetmetal specified for each application. Projects have included tooling buyoff assistance, field formability analyses (FLD and strain analysis), and defect identification and root cause analysis. Danny oversees the blog, The Future is Forming. ***www.EQSgroup.com***

Quinn's Efficient Die Making Tips

Job Tracking and Quoting Systems—A Deeper Look

By Bob Quinn



Bob Quinn

Last month we talked about job tracking and measuring job times with tracking systems. Shops use these systems to measure the length of time needed to complete details, and to track the progress of a job and its related costs. They then can compare these results to how the job was quoted. Last month I discussed reasons why companies shy away from such systems, one being that job tracking adds time to the job, and it can be difficult to convince all of the employees to cooperate and to accurately maintain the job-tracking system.

However, the benefits of such a system include the ability to verify the effects of efficiency-improvement projects, and the ability to more accurately schedule jobs. In addition, without such a tracking system, it becomes almost impossible to keep jobs on schedule and on time. Proof of this is easily attained by asking three different employees the question: "How long before those five details are complete?" I have asked this question in my shop, and it's not uncommon to get answers as varied as "one day" and "two weeks." The truth, however, is best attained through an accurate job-scheduling and tracking system, and even that, at times, can be considered only an estimate.

Accuracy Results Match the Effort Exerted

Once a shop has implemented a job-tracking and scheduling system, it should seek ways to improve the system. Then, as the system improves the shop will experience more accurate estimates, proportional to the amount of effort put into improving the system. It is a fact: There is no off-the-shelf tracking system that can accurately quote, project or estimate costs, or develop schedules to match your shop without some level of tweaking. Benchmark quoting programs can predict the average cost for an American-built tool. And some will even attempt to put a target "offshore" price on tooling. But neither the quoting system nor the tracking/scheduling system will be accurate unless the shop provides it with data from its real-world applications, tuning the system to its unique circumstances. All parties involved must understand this process, realizing that it is not simple. The companies providing job-tracking and quoting systems do not always reveal all of the facts regarding how the systems work together, and what it takes to make them jive.

A common thread between a quoting system and tracking/scheduling system should be the categories of labor and machine time used in your shop. Every operation you track should have a matching line item in the quoting system. The main categories, and those most commonly referred to, are design, machining and tryout. My opinion: Having only these three categories makes it impossible to detect changes or improvements in your system. If one area improves and another degrades, overall machining time might stay the same, effectively hiding the problem and giving no support or credit to the person or area that improved.

I also have seen categories on tooling cost-breakdown sheets provided by OEMs that include items such as model buildup and other services that you may not even be using. Unfortunately, there is no one correct set of categories, as every shop tends to have a slightly different specialty and these areas of expertise tend to drive the categories selected. In our shop, for instance, we do not own a jig grinder. Instead, we use a wire-EDM machine to cut dowel holes. Therefore, we do not include anything related to jig grinding in our list of processes to be tracked. Here is what we track (See table at left).

Operation	Labor/Machine
Design	Labor time
Detail/processing	Labor time
Manual milling, i.e. working on Bridgeport	Labor time
Offline setup Fadal milling (all 2D work)	Labor time
Online setup Fadal milling (all 2D work)	Labor time
Fadal milling (all 2D work)	Machine time
Offline setup contour milling (all 3D work)	Labor time
Online setup contour milling (all 3D work)	Labor time
Contour milling (all 3D work)	Machine time
Heattreat preparation	Labor time
Offline setup wet grinding	Labor time
Online setup wet grinding	Labor time
Wet grinding	Machine time
Offline setup EDM	Labor time
Online setup EDM	Labor time
EDM	Machine time
Offline setup hard milling	Labor time
Online setup hard milling	Labor time
Hard milling	Machine time
Offline setup die shoe/stripper/parallel machining	Labor time
Online setup die shoe/stripper/parallel machining	Labor time
Die shoe/stripper/parallel machining	Machine time
Benching details	Labor time
Assembly	Labor time
Tryout	Labor time
Designer tryout time	Labor time
Shelf setup/receiving materials and purchased items	Labor time
Road trips	Labor time
Perishable ordering	Labor time

For any of the categories that involve the use of a CNC machine, we break setup times into online setup and offline setup—both considered manual labor. And, when the machines run, we consider that machine time. So, nowhere on our time-ticket system will you see "Contour milling" available for an operator to log time toward. Instead, he might log time toward programming the contour work, which would fall under the category "Offline setup contour milling." Likewise, we have time tickets for each machining center and EDM machine; even our wet grinder gets a time ticket.

We define online setup as when the operator running the machine physically interacts with the machine. An example would be setting up a part in a die shoe on a

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Making Sense of Error Proofing

Part Measurement on the Fly, Part 3

By Drew Stevens


Drew Stevens

Of all the deliverables customers expect from their vendors, consistent quality usually tops the list. It doesn't matter how many parts a supplier produces or how quickly they're delivered if the parts don't meet quality specifications or fit correctly into an assembly. Sending out-of-spec parts to a customer can undermine supplier confidence, and costs for additional quality-related tasks, such as providing a third-party sorter at the customer's facility, can add up quickly.

The Difference in Sensors

In the last few articles, I've discussed measuring key features of a part during production and, last month, I described how to apply sensors to determine whether or not a right-angle bend falls within tolerance while the press is running in continuous mode. In that example, we used a standard 8-mm inductive proximity sensor with a digital output. Now let's consider the same quality check using an analog-output proximity sensor. An analog sensor sends a different output than does a standard inductive proximity sensor. Output either will be voltage (0 to 10 V) or current (4 to 20 mA), depending on the sensor. The closer the target gets to the sensor, the higher the output value (Fig. 1).

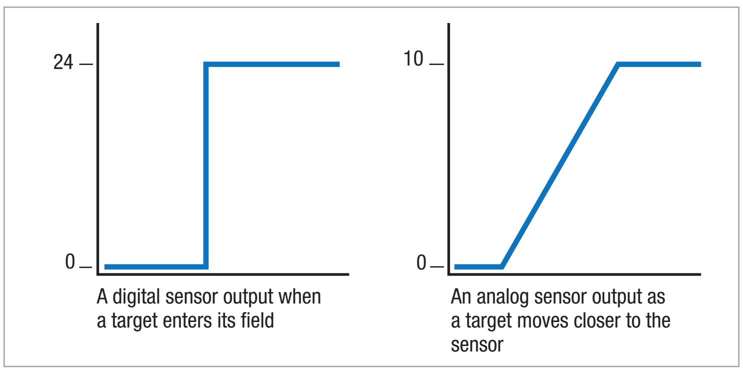

Fig. 1

Placement and Protection

Analog proximity sensors look very similar to their digital counterparts, and it can be hard to tell them apart without documentation or testing. Location of the analog sensor will be the same as with the digital—at the point farthest from the bend line, where it is still maintenance friendly. The sensor also should be located so that the form, at both ends of the bend tolerance, will fall within the sensor's assured operating distance—the guaranteed distance that the target can locate from the sensor and still function accurately. This value is available in the sensor documentation.

Protection is, again, very important. Analog sensors can be expensive, so destroying one during maintenance is counterproductive. Any cabling or wires coming off the sensor also must be protected from the elements in the press as well as from damage during die maintenance. Keep in mind that if it can be seen, it can be cut, sliced, sheared or broken.

Measuring the Form

Using a digital sensor to error-proof a feature is easy enough—if the feature falls within the sensing range, it's within the print tolerance. Using an analog signal is a bit different. The idea is to determine how far the form deviates from a perfect right-angle bend, and if that deviation is acceptable. Because analog sensors provide an output range, the sensor should be positioned so that when the form is at its mean dimension, the output falls at the center of the range.

In our example, we'll assume use of an analog proximity sensor with an output of 0-10 V. When the form is exactly at a 90-deg. angle, the operator stationed at the press controller should see a reading from the sensor of 5 V. When the form is out of tolerance in either direction, the output changes accordingly: If the form is shallow, the voltage will be lower; and, if the form is overbent, voltage will be higher.

The key advantage to using this type of sensor in this application is that it's easier to measure a bilateral tolerance with only one sensor. Remember, in our example with the digital sensor, in order to measure over- and under-bend conditions, two opposed sensors were required, which takes up a lot more room in the tool (Fig. 2).

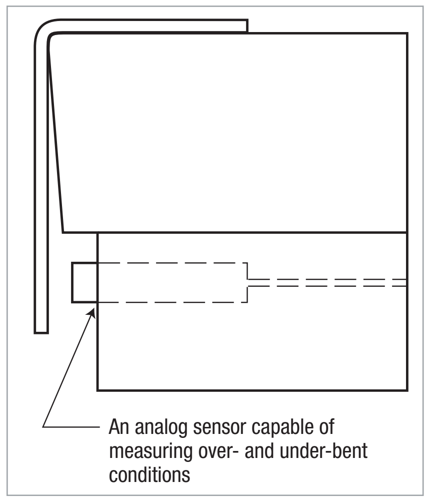

Fig. 2

The Press Controller

Connecting to the sensor to the press controller is relatively simple. If the controller has analog inputs, the sensor need only be connected to the controller, either directly or through a junction box, which I highly recommend to protect all of the wiring. Programming the controller also should prove relatively simple. With analog inputs available, there should be parameters under the controller's die-protection settings that the operator can adjust according to the features being measured.

Here is where a test shield comes in handy. For die setup, provide the operator with a perfectly formed part and also with a sample part that has a bend angle just inside the prescribed tolerance. Using these sample parts will make it much easier for the operator to set the parameters in the controller. If the controller uses numeric values for the input, the operator places the under-bent test shield into the die, notes the measurement and programs the controller accordingly, then repeats this for the over-bent part. The controller now will accept any measurement as representing a good part when it falls within those parameters.

If the controller uses a signature, or real-time representation of the input, you'll have to cycle the press a few times with a known good form to teach the controller what a good part looks like. Then, when the form starts to deviate, the signature of the sensor's signal will change accordingly. Trial and error may be needed to precisely define a part that is out of tolerance when using this type of controller.

Many aging press controllers lack analog inputs, and may be costly to upgrade. It's still possible to use an analog sensor in this situation, with the benefit again being that only one sensor is needed to perform the entire quality check, as opposed to using two digital sensors. Many sensor manufacturers also sell analog controllers with digital outputs. These devices accept analog sensors and allow the user to create setpoints from the analog signal. When a setpoint is reached, the controller sends a PNP

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Job Tracking and Quoting Systems—A Deeper Look…continued

CNC mill, or checking part flatness while the part sits in the EDM machine. One could argue that this time should be charged against the machining time, but the machine is not actually running during this process. It also should be noted that any online setup activity actually prevents the machine from running. So, a common goal would be to conduct as much offline setup time as possible, and minimize or eliminate online setup time. An example of offline setup: changing cutter inserts. If changing the inserts on the cutter were to prevent the mill from running, I would categorize that as online setup.

What Else to Track?

These categories relate primarily to the design and build of progressive dies, and it would not be a stretch to say that other things in the organization could be tracked as well. Sales costs, quotes and order processing can be very expensive to an organization. And, because they do not directly relate to the cost of a tool, they are generally not charged against that tool. For example, if you were to spend 1 hr. quoting every part with a close ratio of five percent, then it would be easy to see that every job built should include 5 hr. of labor toward quoting. This is not common practice, but perhaps it should be.

While the list of categories above likely will not be an exact fit to your company, hopefully you'll find it helpful in guiding you as you look to implement an integrated quoting, time tracking and scheduling system. **TDA**

Bob Quinn has been a tool and die shop owner for 15 years. He is an inventor, programmer, designer, and tool and die maker. The focus of his efforts over the years has been to develop and implement advanced methods and technologies to improve die-build efficiencies. In short, a lean tool-build specialist. Bob Quinn is president of die designer and builder RCM Inc. *www.rcmtool.com*

Part Measurement on the Fly, Part 3…continued

or NPN signal to the main press controller that indicates when a measurement falls inside or outside of acceptable parameters, depending on the manufacturer. Some of these devices even feature digital displays that show numeric values for each measurement, making it easy to track SPC data over time. The press controller then can be programmed to expect an input within certain angles of the stroke, just like with any other digital sensor.

Remember: When programming the controller, set the angles to expect the input after the forming work is finished, but while the part is still held by the stripper or pressure pad.

Next month we'll examine error-proofing in value-added stamping operations. **TDA**

Drew Stevens has been providing sensor-based error-proofing solutions to manufacturers for nearly 10 years. He also is a Journeyman Diemaker and author of the book "Die Protection for Lean Manufacturing.*" In his role as a die-protection specialist, he develops specialized sensor-based die-protection training and application assistance to metalforming companies.*

Here's How We Got Here. Spread the Message! Part 1…continued

it. I do not support protectionism. Actually, I despise the whole premise of it. However, the U.S. tool and die industry is at the proverbial end of the road, having blown by the crossroads some time ago. A once-prosperous sector of the economy that thrived on the American values of hard work, cooperation and innovation has been abused, bullied and taken advantage of. With companies on the brink of disaster, we all want to know: How did it get this bad? What went wrong? Fifteen years ago everything was fine.

I must preface the remainder of this article with a plea: Please take this information to educate the masses, specifically those who do not understand the tool and die, mold and stamping industries. Let's face it, the majority of the public doesn't know what we know or see what we see.

Before any significant and sweeping changes can be made, the rest of the country must be informed—your neighbors, aunts, uncles, pharmacist, children, doctors, professors, etc. Anyone who can cast a ballot can become an invaluable soldier in this battle, especially if they're unaware of the situation we face and how they're impacted when a tool and die company closes its doors.

Before contacting any state representative or politician, be sure to do some digging and find out how many tooling companies reside in your city or district and how many people they employ—these workers represent votes in a coming election.

How Did We Get Here?

"For a good time, call 1-800-AMERICA," is scribbled across bathroom stalls across the world. How could you do this to me?

America, I love you dearly. But I'm tired of you cheating on me time and time again. And now you're giving out your phone number? You allow your foreign partners to levy heavy tariffs on American imports while you have become a red-light district of the manufacturing industry. Consider this: While Korea restricts the import of American automobiles with an eight percent tariff, we levy a paltry two percent tariff on Korean imports. This is in addition to several nontariff barriers (NTBs) used to restrict U.S. access to foreign markets. Again, in Korea it's been said that government officials have threatened to audit any citizen that purchases an American-made car. This is only one of several NTBs that, if deployed in the United States, would cause irate citizens, with their torches and pitchforks, to light up the streets to the White House and state capitols everywhere.

Outsourcing—or, the loss of jobs to low-cost countries (LCC) quickly becomes the answer given to the question: How did we get here? But the real answer also includes rising costs for raw materials and healthcare, as well as currency manipulation, among other reasons. Basically, it all comes down to a lack of accountability to ensure a level playing field for manufacturers all over the world. LCCs have become breeding grounds for artificially inexpensive tool and die shops. If you truly believe it's because of cheap labor, you have been misguided and misinformed.

Should we demand that foreign governments stop subsidizing their countries' tool and die shops, or that they set tariffs that match those of the United States? Really, all that matters is that the playing field be leveled with consistent trade standards. Meanwhile, our corporate culture cannibalizes itself, with the tooling industry, basted with a growing list of restricting government regulations, the daily special on the menu of ignorance.

Salt on the Wound

Lately, in an unprecedented maneuver, the big guys (OEMs and Tier Ones) have started telling the little guys (tool and die shops) that they won't pay them for goods that already had been delivered for 90 days, instead of the typical 60. Consider this analogy: What if your gas company

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Here's How We Got Here. Spread the Message! Part 1…continued

wanted you to pay immediately for all of the gas it projects you will use in the next three or six months, or perhaps two years? That's the reality of the automotive supply chain today, as purchasers expect the companies with the least wiggle room—tool and die shops—to bear their costs.

Cash flow is the oxygen for any company. Yet, while the OEMs and Tier One suppliers—mostly by their sheer size and their access to capital markets—can more readily handle the major ups and downs of this industry, guess who struggles to stay afloat during the cyclical merry-go-round known as the North American auto industry? The tool and die companies. So now, not only are tool and die shops not receiving progress payments on U.S automobile launches, they're also being forced to carry all of the risk and act as the manufacturer and financer.

No other factor has injured the tool and die industry more than pressure from automotive manufacturers and Tier One companies to lower the cost of tooling. It's become a mantra; a required way of doing business.

Lopez' Legacy Lives On

I was finishing high school in 1996 when the supplier-bashing price-slashing extraordinaire Jose Ignacio Lopez was exiled from the automotive landscape. And yet the result of his destructive ways remain visible everywhere I look. Like a tornado, Lopez arrived in Detroit in 1991 and obsessively demanded, pushed, threatened, intimidated and insulted suppliers into continuous cost cuts. This practice severely handicapped the ability of many of these companies to innovate. He became the darling of myopic executives who failed to realize that the cost savings being reported were only being baked in somewhere else. Think of a water balloon and what happens when you squeeze it. While the squeezed end changes shape, doesn't the water just transfer to another part of the balloon?

Consider too the fixation on the Production Part Approval Process (PPAP). The American domestics wouldn't listen when Dr. Deming offered his free advice decades ago, while Japan's automakers welcomed him with open arms. As technical as some of the verbiage and quality-control measurements sound, it basically boils down to simplicity and common sense. When the Asian manufacturers made their move on market share, we finally perked up and kicked it into overdrive—overreaction—with a slew of cost-cutting moves. But you can't call this benchmarking, because the Asian automakers reduced their costs through a series of mutually understood and incremental long-term partnerships with their suppliers. Through time, this collaboration and the trusting relationships they have developed have reduced costs in a rational manner. Reacting to this, U.S companies focused on reducing costs without understanding the steps taken by their Japanese counterparts. Traitors such as Lopez pounded their fists on boardroom tables mandating major cost reductions from suppliers, immediately and without cooperation. That's not what Deming suggested, and not what Honda or Toyota did. This scenario ultimately led to a rapid decline in working capital, which set off a nasty domino chain of events including multiple liens, rising legal costs and an immediate crimp on access to credit—both commercial and trade credit.

Yet one more reason we are where we are today: For 15 years there has been too much fragmentation across companies and, quite frankly, die shops were forced to change against their wishes. Don't confuse this with being inflexible and uncompromising. OEM and Tier One purchasing people were often—and still may be—compensated by how much they save in surface costs. Calling them myopic is a compliment. And, as the threats became more severe, suppliers in the tool and die industry have had little choice but to abide.

The Call for Progressive Payments

For our industry, this is an emergency as serious as war itself. We must apply ourselves to our tasks with the same resolution, the same sense of urgency, and the same spirit of patriotism and sacrifice as we would show were we at war. Because it's such a sensitive issue and will inevitably be discussed, could somebody please tell me how this country plans to tool up the next time war is upon us?

The OEMs' new take-it-or-leave-it financing strategy—refusing payments until PPAP—basically means that some tool and die shops may not receive payments for as long as two years. This can be after the start of vehicle production. So tell me again, why did the United States ever get rid of progress payments? They definitely didn't benchmark that practice from their Asian counterparts, as most foreign OEMs still use this innovation-inducing form of payment.

The Harbour-Felax Group, a Southfield, MI, consulting firm, recently released a study that sheds light on the differences in costs between the Detroit Three and the New Domestics. The study reveals that the New Domestics enjoy an eight percent advantage in costs compared to the Detroit Three. According to Harbour-Felax President Laurie Harbour-Felax: "After detailed data analysis and multiple supplier interviews, our conclusions highlight that the most significant gap that exists between the New Domestic OEMs and the Detroit Three speaks to their relationships with suppliers. The primary difference between their supply chains is in the area of payment terms for production tooling. In the supply networks of the New Domestics, we find that many suppliers receive progressive payments for production tooling."

What does that eight percent gap mean in real dollars? Consider that General Motors reportedly invests about $5 billion/yr. in tooling. An eight percent gap represents $400 million. Now include the other Detroit automakers and add up the cost disadvantage over several years, and the results are staggering. How can that be ignored?

Progressive payments, as defined in the study and generally understood throughout the die shops of Detroit and Grand Rapids, work thusly:

- 30 percent at tool kickoff;
- 30 percent at tool tryout;
- 30 percent at volume run; and
- 10 percent at PPAP.

Is it any coincidence that many U.S. tool and die shops have not operated profitably since the practice of progress payments disappeared? These companies are trying to fight on a global stage in one of the most competitive and critically important manufacturing sectors with both arms tied behind their backs, eyes blindfolded, shoelaces tied and fed a diet of bread and water. All the while, the United States allows competitors onto the playing field wearing brass knuckles and steel-toed boots, and having been injected with steroids.

I read recently a letter addressed to Congress by the editor of the *Detroit Free Press* during the Big Three's high-profile visits to Capitol Hill earlier this year. The letter relates to the condition of the U.S tooling industry, and suggests that if the industry is allowed to die, the responsible parties will have blood on their hands. An excerpt from the letter sticks with me:

"You don't want all this blood on your hands. No one could."

Next month, I'll discuss some steps that might help stem the destruction of this beloved American industry. **TDA**

Joe Brown has been working in the sales, marketing and public relations side of the tool, die and stamping industry since 2002. His background is primarily in marketing and business administration. Recently he has created a platform for those involved in the industry to share their hopes, ideas and concerns with a rapidly growing tool and die industry blog. He received his BA from Michigan State University and a MBA, from Wayne State University. Joe Brown oversees the website and blog, Will the Tool & Die Industry Ever Recover?

www.toolanddieing.com