

Eliminate First Piece Inspection

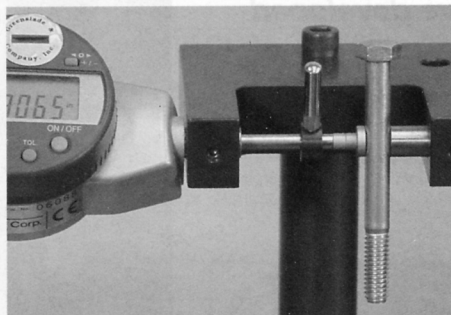
by P. Brian Csikos

Would you believe that you can actually remove the Quality Department from first piece inspection and at the same time improve quality? It is true and can save the company thousands of dollars when implemented correctly.

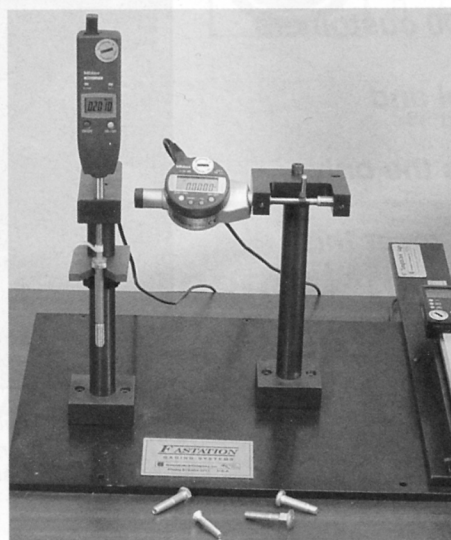
In many companies, Quality performs first piece inspection and approves the set-up prior to production runs. This has been carried over from the years before Total Quality Management practices were implemented. Quality would double-check the set-up and ensure parts were correct and that blueprint requirements were being met. Not only was this considered good insurance, but it was "Quality's" job to ensure quality, not necessarily production.

Unfortunately this paradigm has not changed for many companies, or they have not fully adopted current practices. The quality department is usually considered overhead and has non-value added task. These tasks usually come under scrutiny by management and First Piece Inspection falls into this category.

If you think about it, we pay good money to set-up personnel to make parts to print specifications. They know how to read prints and use measuring instruments. They are trained to make set-up changes as needed to get the required dimensions. We expect them to do it right the first time. With this in mind, you have to ask yourself the question, "Why do we have another person and



1. Body Diameter



2. FASTATION

department check to make sure the parts are correct?"

The answer usually revolves around two areas. Either the set-up personnel aren't doing their job correctly, or we

haven't spent the time training on blueprints and instruments. In any case, by having Quality inspect we are taking at least some responsibility off of production which actually decreases the level of Quality. They know that someone else will be double checking their work and will rush or even stop short of perfect quality. The process is one where they try to get Quality to approve versus making it correct because their name is going on it. Many times this not only creates risk but requires the set-up person to go back and make adjustments, scrap product, and re-inspect which all deteriorates efficiencies.

With all this being said, let's look at ways to create a better system for all involved. Some of this will take a leap of faith from management. We have to trust that our employees not only want to do it right but that they actually will. We also have to provide them with the education and tools to do the job.

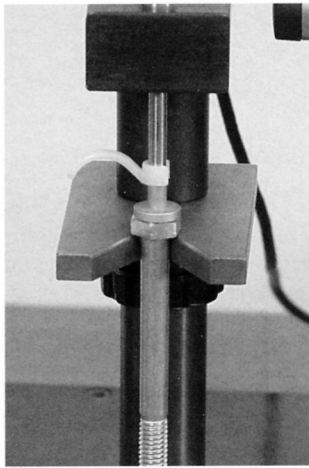
Like with any decision making, we need good data to support the action plan. In this case, we'll want to track the percentage and number of first piece approvals and rejections. Usually, you'll find the approval rate in the high 90s. Anything over 99% means you are getting close to eliminating first piece inspection. Anything less than 99% probably means you have some work left.

Let's assume we've done the analysis and you find the quality approval or pass

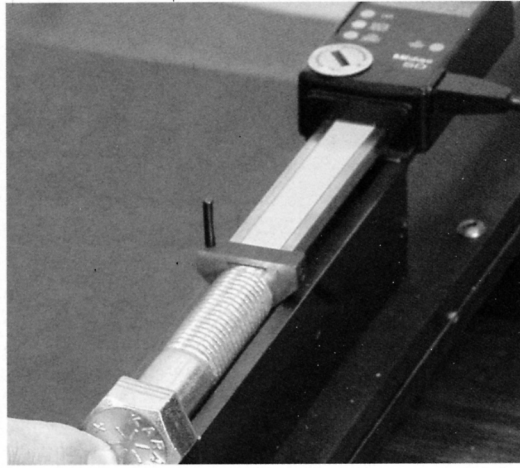


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3. Head Height



4. Length Gage

percentage to be 97%. We then review the 3% rejections and tally these to determine the number of people and instruments involved. This will tell us one of three things and which action to take. You may find that it is a few people that need trained, certain instruments or characteristics, or an overall blitz.

Once armed with this data you can start a training program. The level of training, time, etc. will be based on what the data shows. Also, it is important to include the inspectors and ensure measurements are being taken in a consistent manner. Some of the rejections may be a result of measuring differently. A thorough gage, repeatability and reproducibility (R&R) study is a good way to test employees and monitor measurement capabilities. It is also a good method of testing employees before and after training.

You may find that the present measurement technique has too much variation. Hand gages may have to be eliminated and replaced with an electronic device. Several solid based electronic measuring devices are available to the fastener industry (see photos 1-4 courtesy of Greenslade and Company).

Be aware that some employees may not have the touch to reliably use hand gages. Don't get frustrated, but rather create a system to accommodate these employees. It may be necessary to remove the authority for some individuals to approve set-ups at least until they

prove they are capable.

It is important to chart and display the first piece approval percentage where it will be viewed by production. Include a goal line on the chart so everyone has something to shoot for. This will make them aware it is being watched and will actually prompt improvement. It is also important to just monitor progress and ensure it is improving.

Be cautious regarding inspectors who will protect their jobs. When they realize first piece inspection may be eliminated, they may attempt to report defects that aren't necessarily accurate. There are a couple ways to deal with this up front. First try to find other duties that will take the place of the time spent for first piece inspection. This could be auditing, customer corrective actions, or even final inspection. The other option is to keep the plan confidential until the time comes to change duties.

As we begin training and implementation, it is important to create a system where the operator, set-up person, and/or lead person are fully responsible for product quality. This should be relayed to them verbally and in written form. The system should also make production workers accountable for first piece rejections. Establish a plan to have operators sign-off on the set-up and cell leaders or supervisors double-check and sign-off.

When a first piece set-up is found to be out of specification, an investigation should occur. Once you discover the

employees involved, it's smart to train and discuss the reject with them. Document this on a form that explains the problem, person(s) responsible, and corrective actions performed. Have them sign it and explain how important this is.

This will be discipline but should be in a very mild form. You may want to call the form "special contact" or "special training." Let the employee know that this will be kept in their file and that you do not expect this to happen again.

Once the approval percentage exceeds 99%, you can begin to think about elimination. The exact number will depend on your comfort level based on many factors (customer base, type of fastener, etc.). Look at the reject data carefully and think about the retribution if these went out the door to customer sites.

My experience has shown that most first piece rejects are for very minor discrepancies that will not affect fit or function. For example, if a length or head height is out by .0005, this should not cause problems in assembly. Also, some of these may be caught in final inspection. Look at the data and calculate an estimate on what these rejects could cost. Likewise, compare this number to the cost of the present first piece inspection by quality. This will help you focus on the big picture and make a solid decision.

With the present economy and lean initiatives, many Quality Departments do not have the resources they once had. This elimination may allow the use of individuals in pro-active and/or value added duties. Again, this needs to be figured into the big picture as you are making a decision toward elimination of Quality inspection.

The new gages, training, and emphasis on responsibility for those doing the work will improve quality and reduce cost. It will take some work, but you may find it worth the effort. ■