Digital transformation for SMB factories

Speaker:
Ryan Kuhlenbeck, CEO

Agenda

10/25/2023

Topics

1. SMB Factories are a Massive part of US manufacturing
2. What digital transformation looks like
3. Examples of what digital transformation can provide
4. Example of one factory's journey so far

SMB Factories are Massive

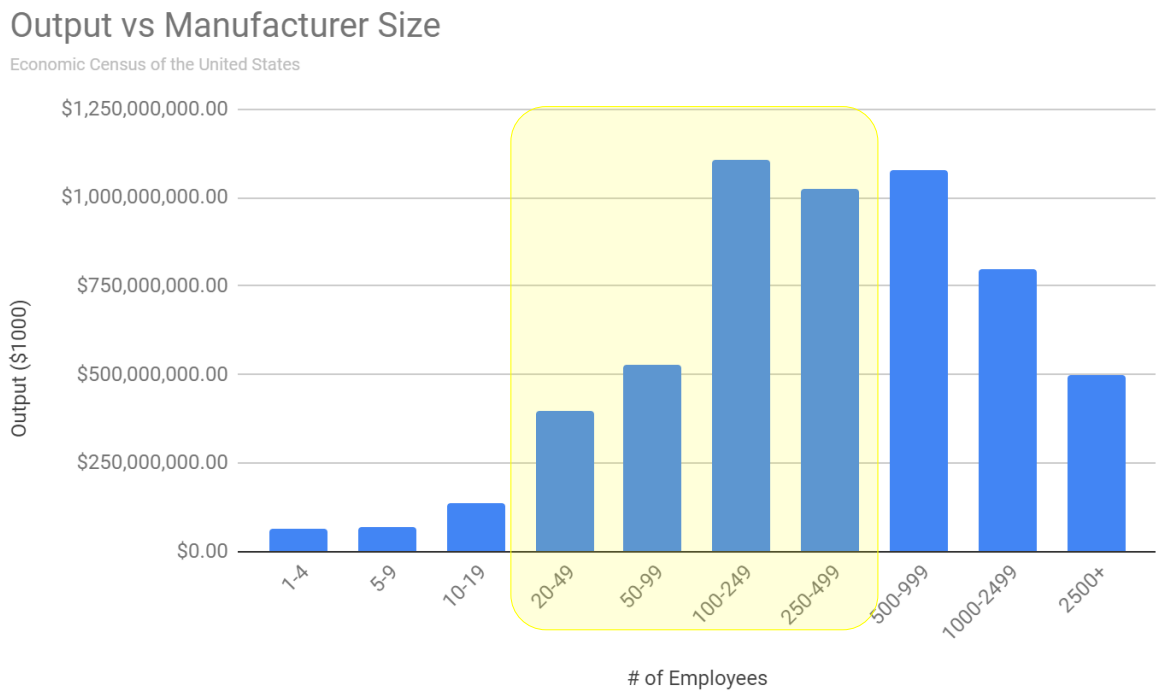
Why small & midsize factories are so important

Small & Midsize factories are the largest manufacturing segment

Enterprise: 500+ employees per site, with multiple locations.
Sophisticated tech stacks with products customized to fit their requirements.

SMB: 20-499 employees per site. If multi-factory, likely less than 5 sites.
Handful of technologies integrated around accounting/inventory (ERP) & shop floor (MES)

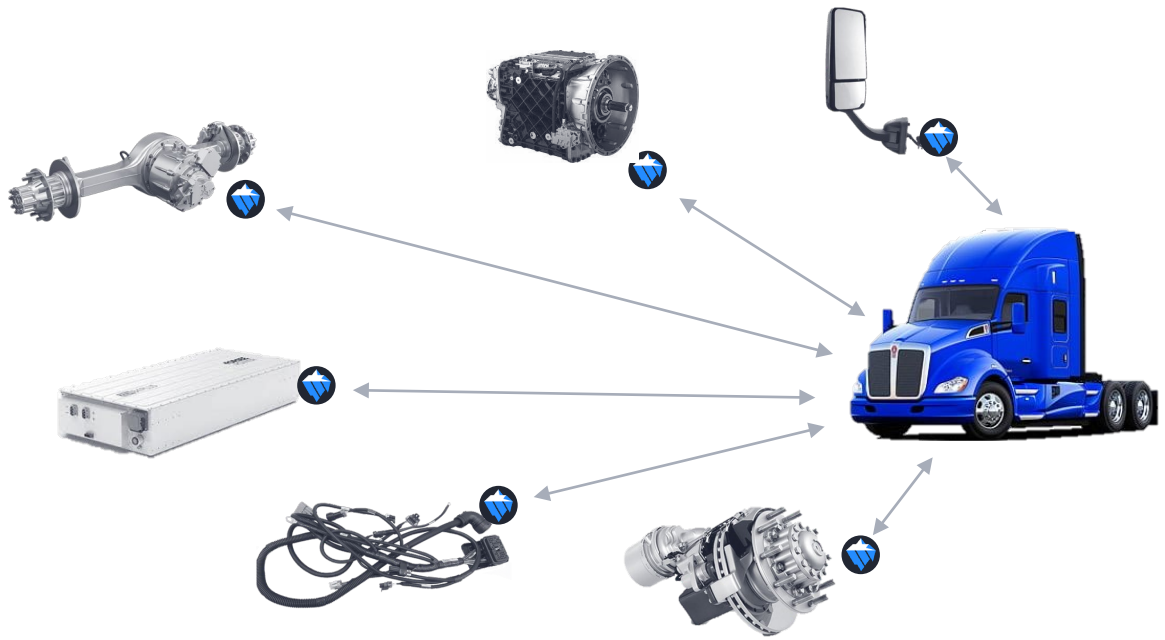
Tiny: <20 employees. One location.
QuickBooks or ERP-lite with spot solutions (based on their business needs).



Enterprise: (500+)	2,750 sites $2.4 Trillion annually 42% of revenue
SMB: (20-499)	**84,000 sites** **$3.1 Trillion annually** **54% of revenue**
Tiny: (1-19)	210,000 sites $0.3 Trillion annually 4% of revenue

SMB Factories make up the majority of the supply chain

The majority of suppliers are SMB, forming the backbone of the largest industries in the world.



A single semi-truck requires 1000's of suppliers with 10,000's of sub-suppliers

What does digital transformation look like for SMB factories?

Hint: its not the portrayal often found in the media…

What does digital transformation look like for mid-sized factories?

"Digital Transformation" often suggests robotics, AI/ML, etc.

This what actual Digital Transformation looks like. Assisting, not disturbing.

The purpose is to solve today's "death by a thousand cuts"

The vast majority of factories **do not** suffer from one or two large issues. They are held back by dozens of small issues that add up to 30%+ in lost output

People

"Hiring, training & retaining employees is a constant challenge"

Equipment

"We lost hours in repair because we didn't torque a fastener correctly"

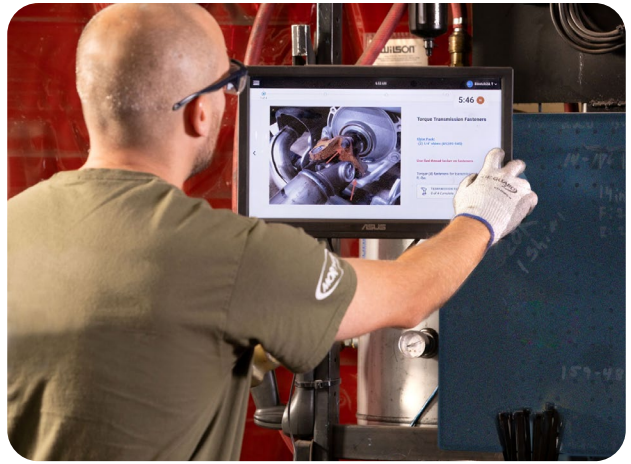
Data

"I don't know how productive my factory workers truly are"

What *should* it look like for SMBs?

Leverage solutions created across hundreds of factories, allowing each team to **continuously improve** their factory each and every day.

People



Interactive work environment with training & production integrated seamlessly together

Equipment

Fully integrated tools & machines setup in minutes by anyone in the factory.

Data

Realtime throughput & worker productivity data to KNOW exactly how operations are performing

Examples of Solutions

What problems can be solved and how much does it cost to solve them?

Training Burden

Company: DC Fast Chargers, Tennessee

Issue: New factory creation. Hundreds of new employees
30-60min TAKT time processes
~3-week process supervising new employees

Solution: Uniform digital interface for all instructions
Layered content for both training & production

Yield: 200 stations rolled out in 5 months by 3 people
140 connected TQ tools & test equipment
$84k per year in software cost (all in)
Training time reduced to less than 1 day

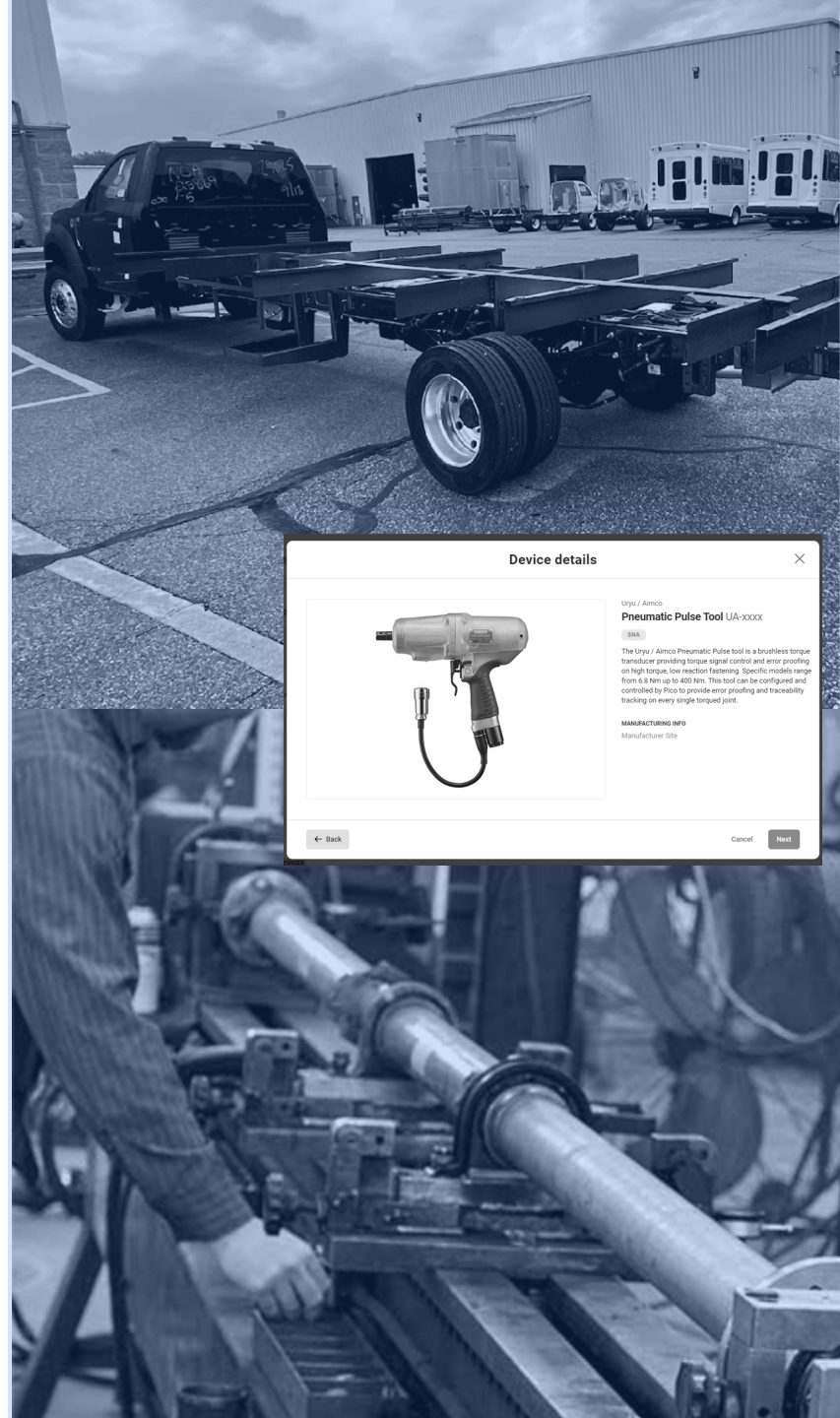
Critical Fasteners

Company: RV Supplier, Indiana

Issue: Critical joint field failure risk requires smart tool solution & integration into processes

Solution: Specialized transducerized high TQ pulse tool (Uryu) with integration for configuration & data recording

Yield: ~ 1 week to setup the infrastructure (air + power)
tool integration from Pico's library
$25k for the tool & controller + $800/mo in software
2400+ error free chassis and counting



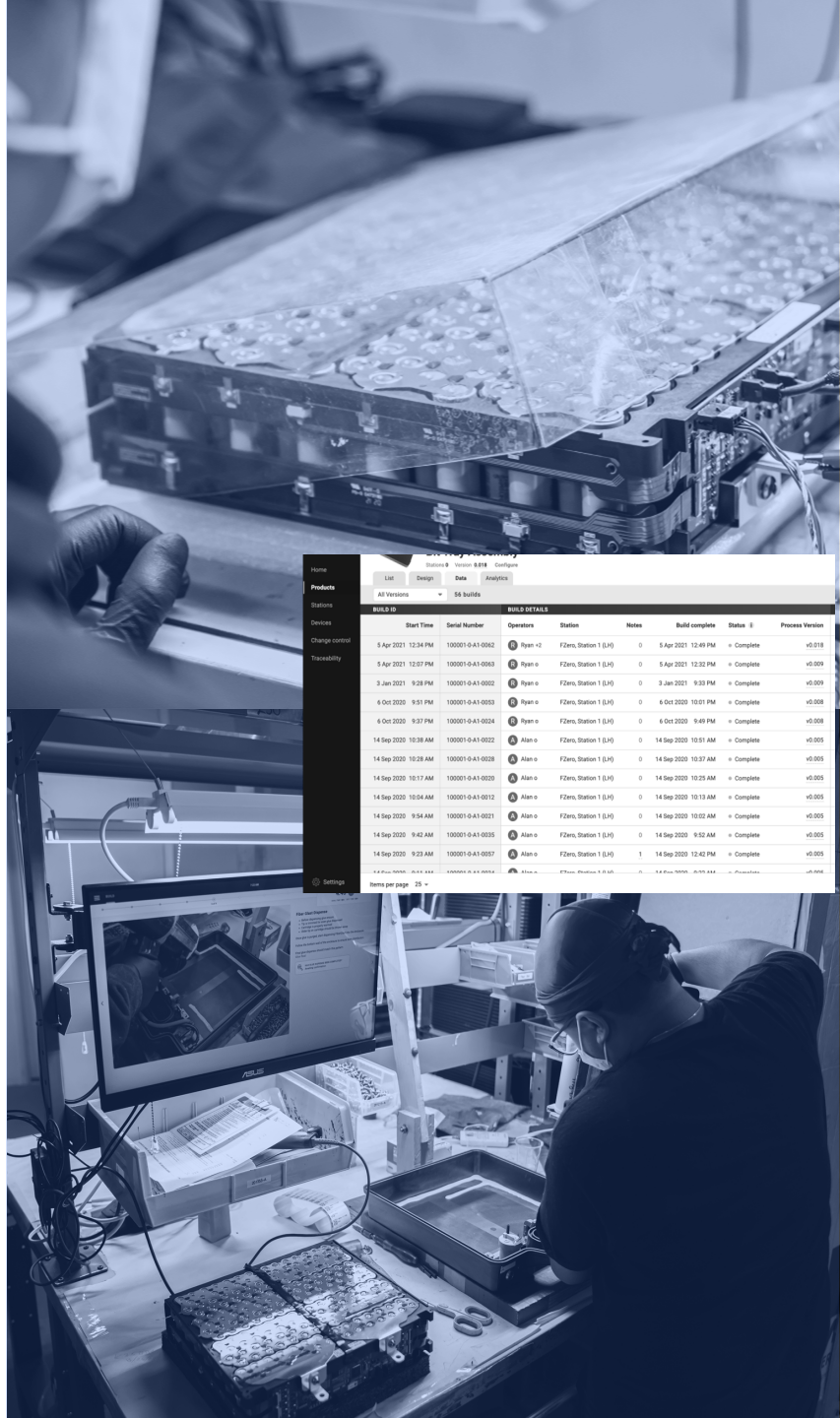
Li Ion low volume production

Company: Li Ion battery pack supplier, California

Issue: Building battery packs requires error proofing and full traceability on ALL processes

Solution: Shop floor operating system with tool & machine integration + worker guidance, within a 50 person company budget

Yield: 20 stations integrated in 3 months by 1 engineer
$54k per year in software cost
15000+ products shipped with full traceability



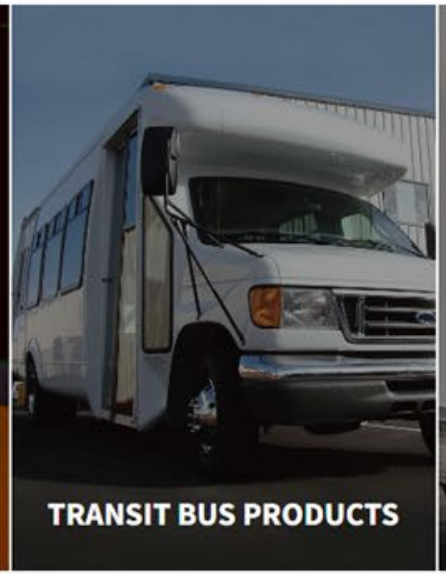
Factory Example

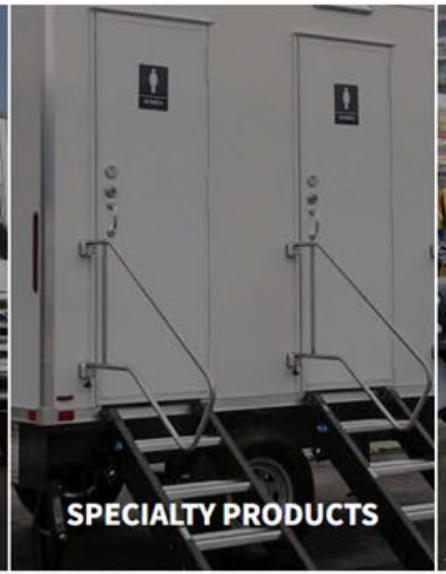
What path does a digital transformation often follow?

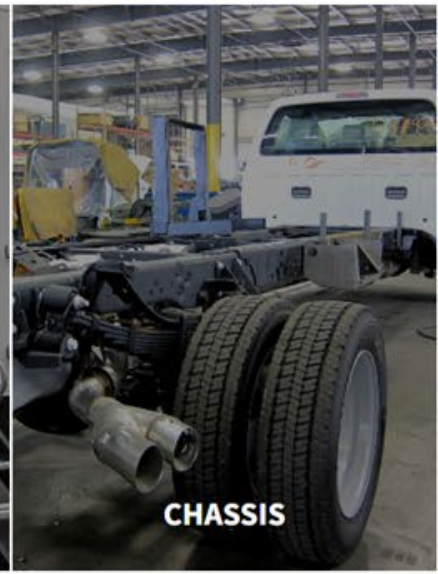
ABOVE. BEYOND. ALWAYS.

At MORryde, we have a passion for solving problems. Whether we're fabricating custom solutions, modifying a commercial chassis or engineering innovative products, we answer to a wide range of markets and provide solutions for variety of needs.

At MORryde, it's simply about doing MORE for our customers, and it doesn't stop at the sale. We stand behind our products, believing in quality first, service always. No matter the issue, we'll be the first to respond and the last to be satisfied.



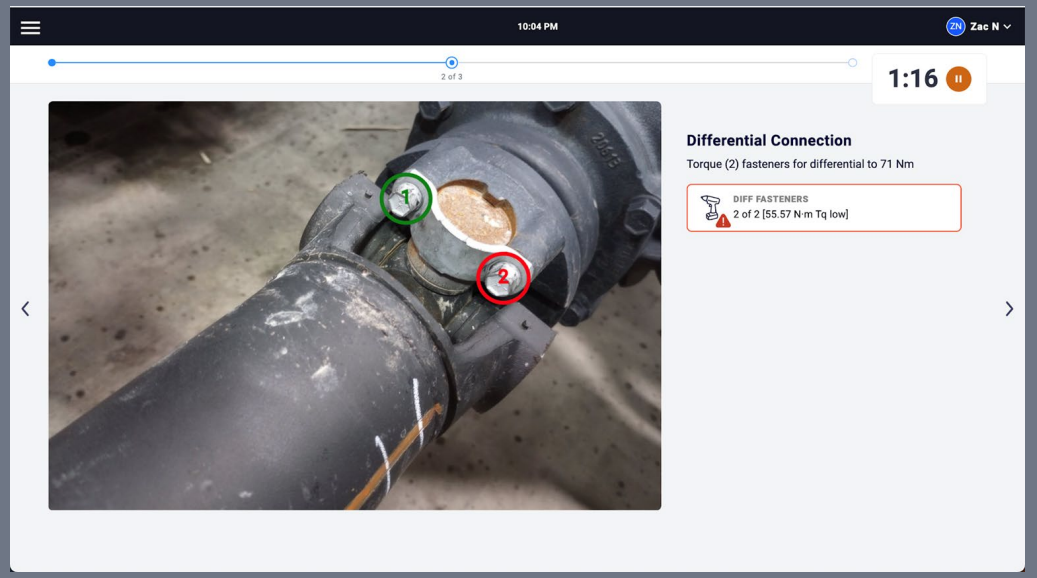




Connected tools

- Need 100% certainty that every fastener is torqued to specification.
  - Varied fastener count: 6-12
  - 2-4 locations on the drive shaft
  - Several different classes of chassis and manufacturers.
- Need full integration to ensure the chassis does not advance to the next process – ideally an effortless interface for the operator.

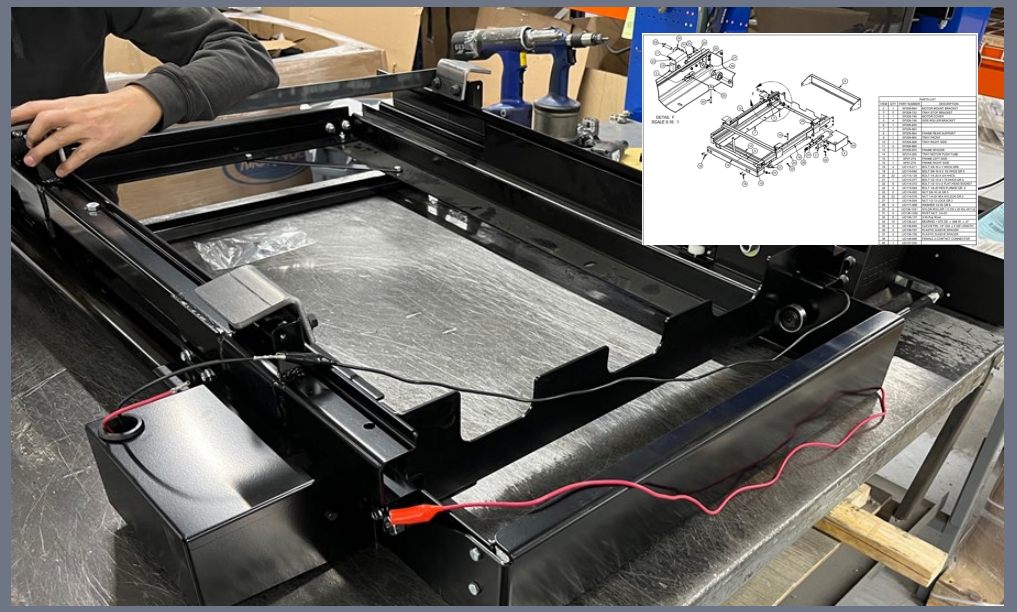
Every chassis since the installation of Pico MES has been installed error-free! **2,400 chassis and counting!**

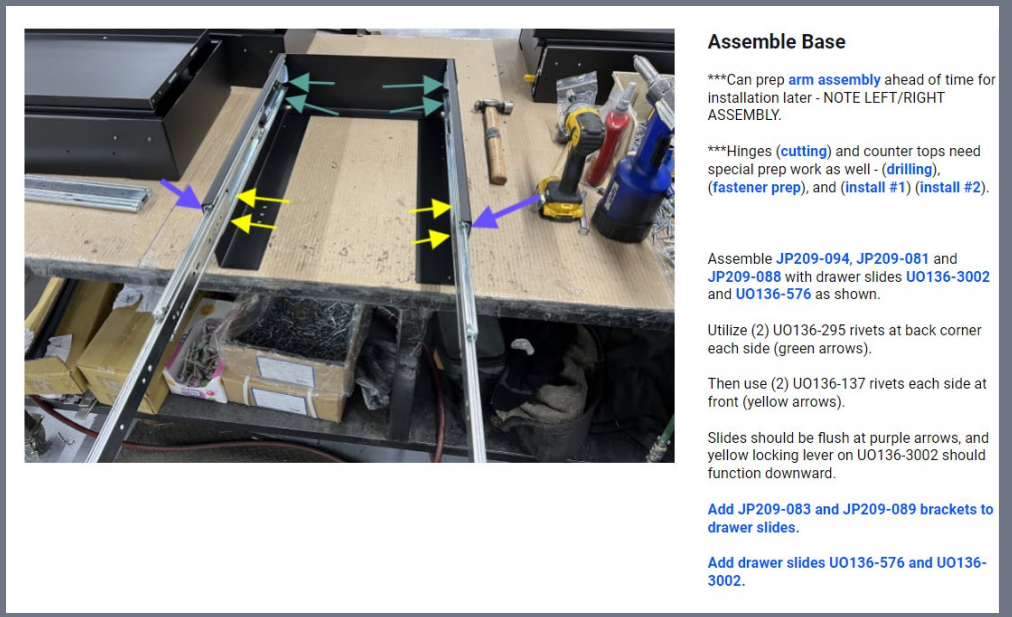


Operator experience

- Allowed us to document production floor knowledge, lessons learned from customer issues, and put it in a reference location that will be accessed and displayed with every build.
- Saves on set up time, training time, and gives us data to know where to focus efforts for efficiency improvements, training needs, and management efforts

Over 500 processes and 20 daily operators. 100% integration with ERP.

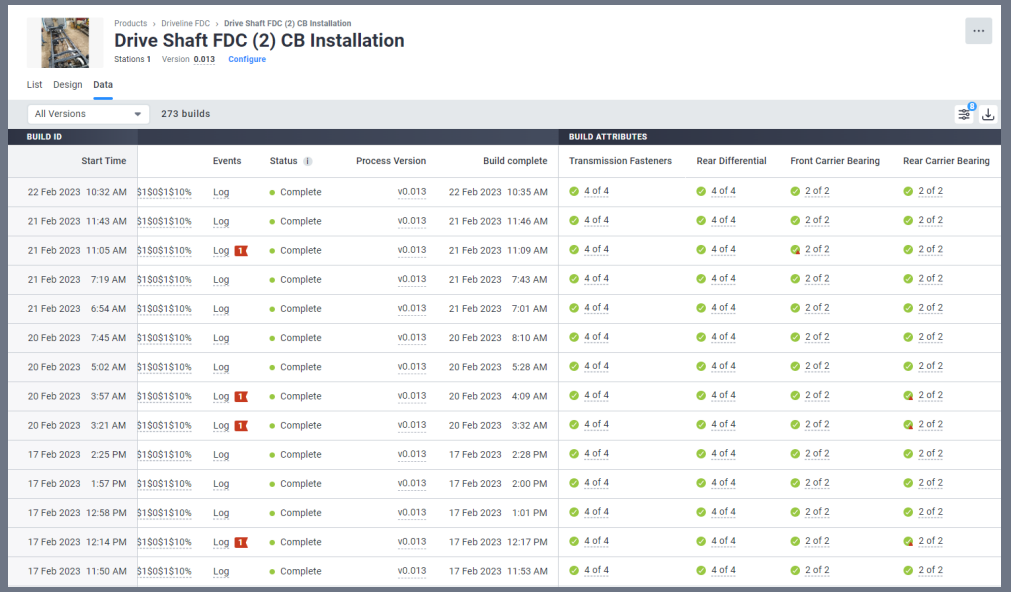




Full Traceability

- limits risk exposure while enabling high-volume scaling
- Easily enables tooling application from any vendor to apply the best tool for the job, while still giving the operators a single seamless interface all integrated with our ERP system.
- Nothing advances without properly torqued fasteners – full backwards traceability.

New product launch with full build data record enabled final design validation & elimination of field issue risk



Products › Driveline FDC › Drive Shaft FDC (2) CB Installation

Drive Shaft FDC (2) CB Installation

Stations 1 Version 0.013 Configure

List Design Data

All Versions 273 builds

BUILD ID						BUILD ATTRIBUTES			
Start Time		Events	Status	Process Version	Build complete	Transmission Fasteners	Rear Differential	Front Carrier Bearing	Rear Carrier Bearing
22 Feb 2023 10:32 AM	$1$0$1$10%	Log	Complete	v0.013	22 Feb 2023 10:35 AM	4 of 4	4 of 4	2 of 2	2 of 2
21 Feb 2023 11:43 AM	$1$0$1$10%	Log	Complete	v0.013	21 Feb 2023 11:46 AM	4 of 4	4 of 4	2 of 2	2 of 2
21 Feb 2023 11:05 AM	$1$0$1$10%	Log 1	Complete	v0.013	21 Feb 2023 11:09 AM	4 of 4	4 of 4	2 of 2	2 of 2
21 Feb 2023 7:19 AM	$1$0$1$10%	Log	Complete	v0.013	21 Feb 2023 7:43 AM	4 of 4	4 of 4	2 of 2	2 of 2
21 Feb 2023 6:54 AM	$1$0$1$10%	Log	Complete	v0.013	21 Feb 2023 7:01 AM	4 of 4	4 of 4	2 of 2	2 of 2
20 Feb 2023 7:45 AM	$1$0$1$10%	Log	Complete	v0.013	20 Feb 2023 8:10 AM	4 of 4	4 of 4	2 of 2	2 of 2
20 Feb 2023 5:02 AM	$1$0$1$10%	Log	Complete	v0.013	20 Feb 2023 5:28 AM	4 of 4	4 of 4	2 of 2	2 of 2
20 Feb 2023 3:57 AM	$1$0$1$10%	Log 1	Complete	v0.013	20 Feb 2023 4:09 AM	4 of 4	4 of 4	2 of 2	2 of 2
20 Feb 2023 3:21 AM	$1$0$1$10%	Log 1	Complete	v0.013	20 Feb 2023 3:32 AM	4 of 4	4 of 4	2 of 2	2 of 2
17 Feb 2023 2:25 PM	$1$0$1$10%	Log	Complete	v0.013	17 Feb 2023 2:28 PM	4 of 4	4 of 4	2 of 2	2 of 2
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17 Feb 2023 12:58 PM	$1$0$1$10%	Log	Complete	v0.013	17 Feb 2023 1:01 PM	4 of 4	4 of 4	2 of 2	2 of 2
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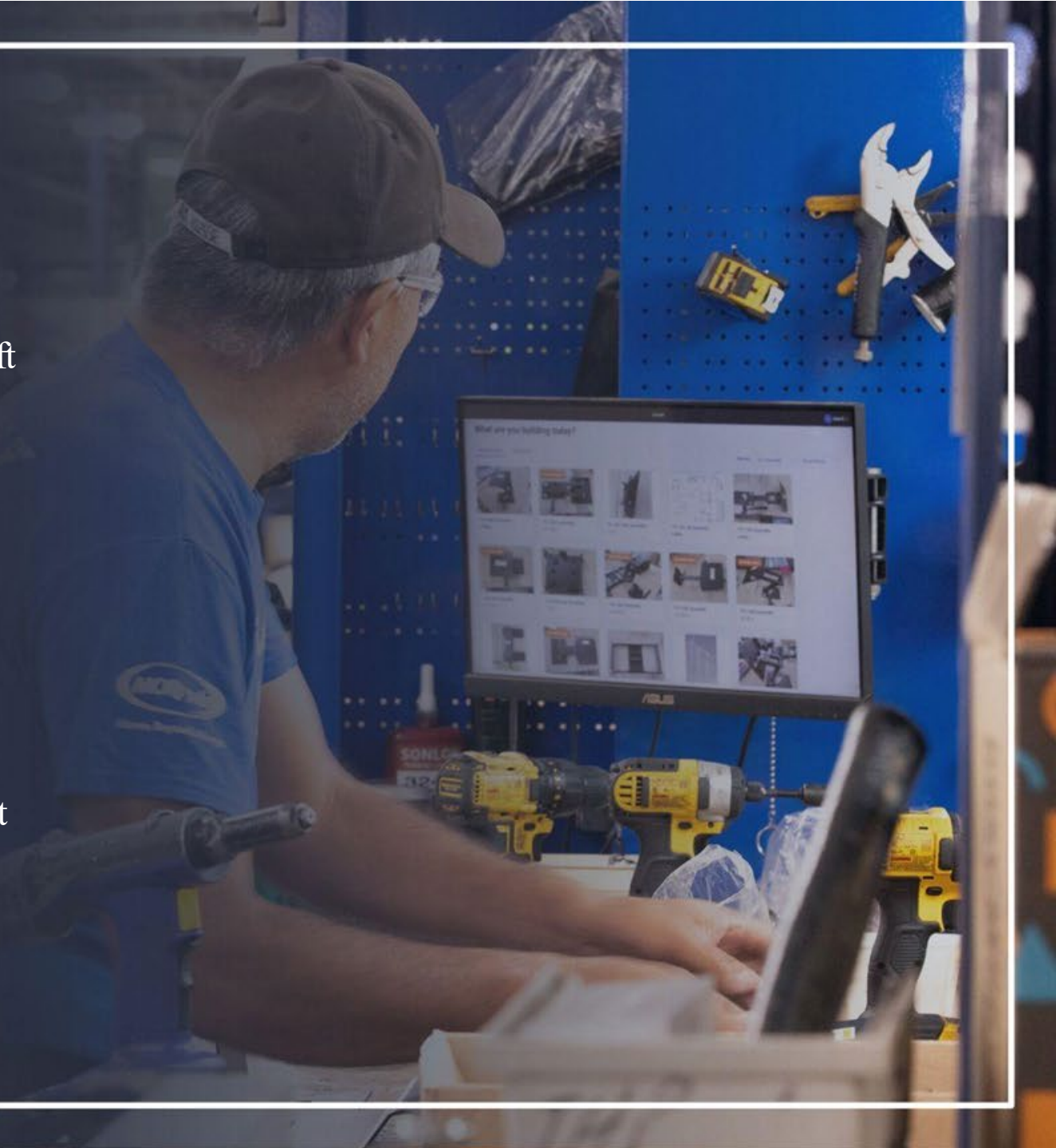
17 Feb 2023 11:50 AM	$1$0$1$10%	Log	Complete	v0.013	17 Feb 2023 11:53 AM	4 of 4	4 of 4	2 of 2	2 of 2

Results

- Over 2,400 chassis modified with zero drive shaft issues
- Easy identification of top 10% of assemblies with rate discrepancies
- Measurable 50% increase in production output.
- Full backwards traceability with all torque connected tooling for independent suspension axle assembly and chassis modification
- Fully integrated, versatile, quality solution at the ready in our toolbelt – essentially the silver bullet for whatever ugly monster we encounter.



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