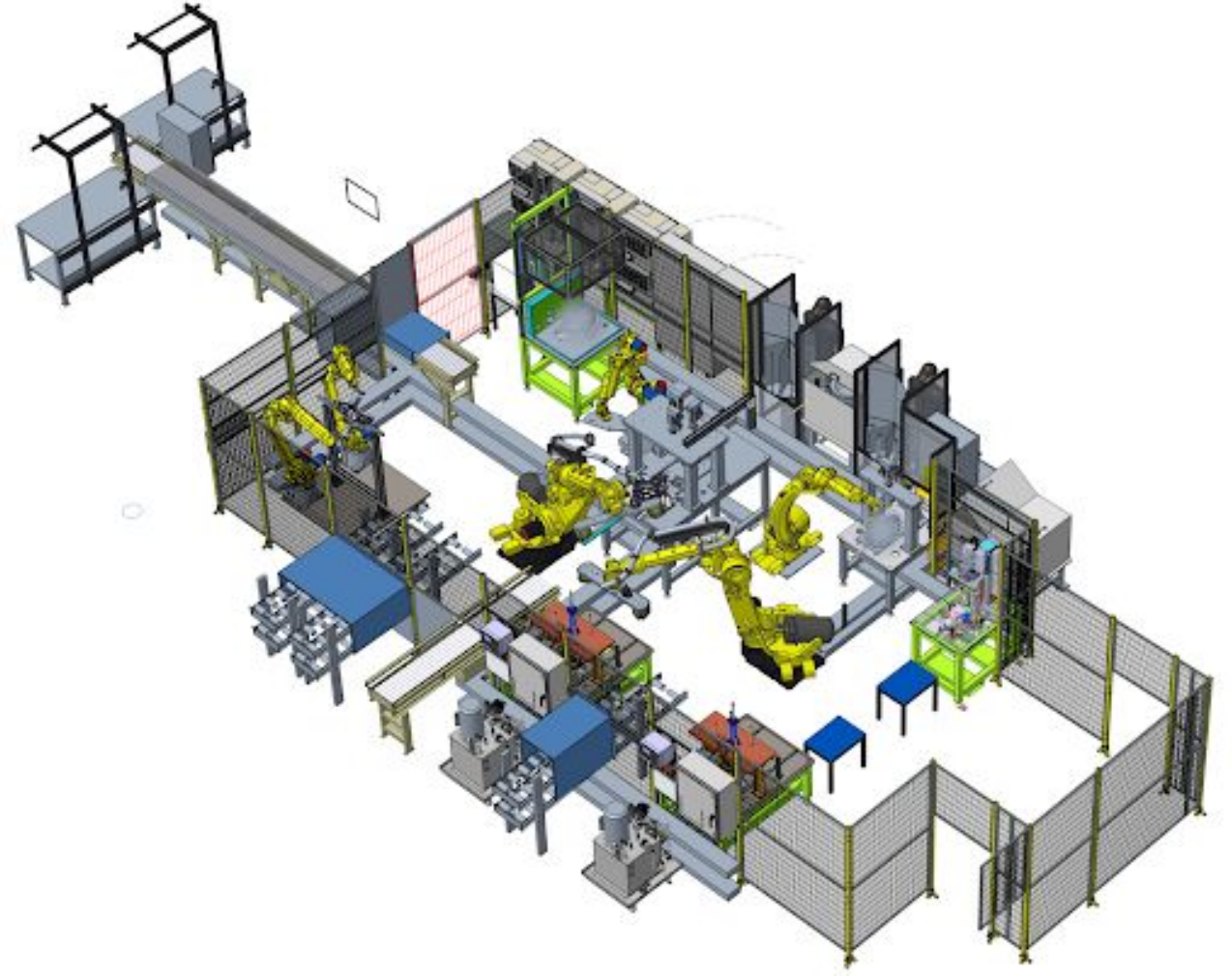


+Vantage Case Study: Turnkey Inspection & Testing Cells

eAxle Gear Box Final Inspection, Testing,
Assembly and Laser Marking Cell



Turnkey Inspection & Testing Cells



- Parts:

- eAxle Gear Box

- Customer Problem:

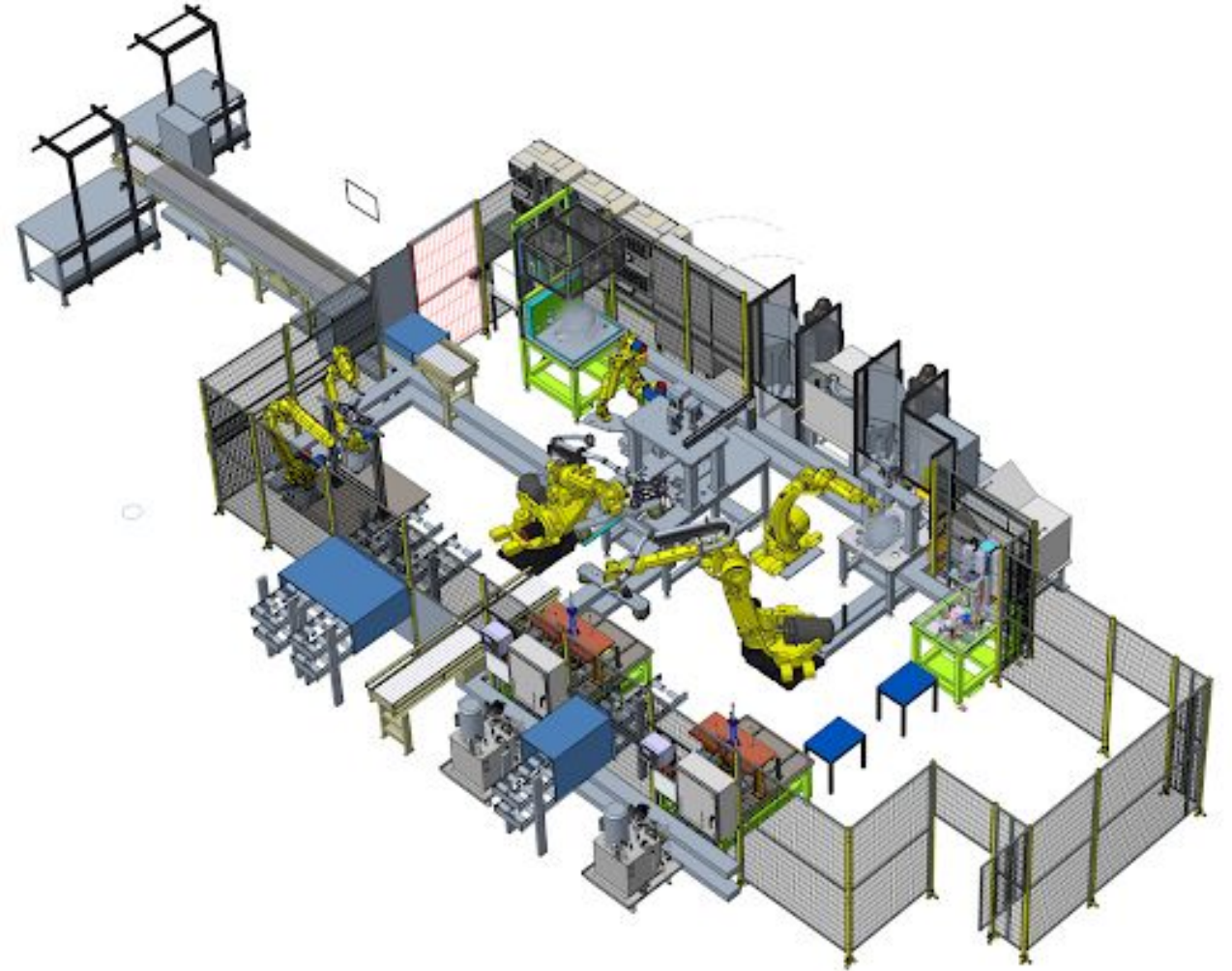
- Critical end of line machining processes require reliable and repeatable verifications
- Parts required 100% measurement & leak test for all parts in the production volume.
- The manufactured components required a method of data acquisition & part traceability

- The project:

- This system consists of 6 robots maintaining all EOL processes and inspections. Processes include plug press, leak test, contact probe inspections (including diameter, position, flatness, distance and profile measurements) and a camera vision inspection. Parts are then packed out of cell accordingly in a seamless inline fashion.

- Process:

1. Incoming Powered Conveyors
2. Robotic Integration & EOAT
3. Servo Bushing Presses
4. Leak Test System
5. Contact Probe Inspection Systems
6. Vision Inspections Systems
7. Part Stamping
8. Cell full integrated, debugged, and assembled

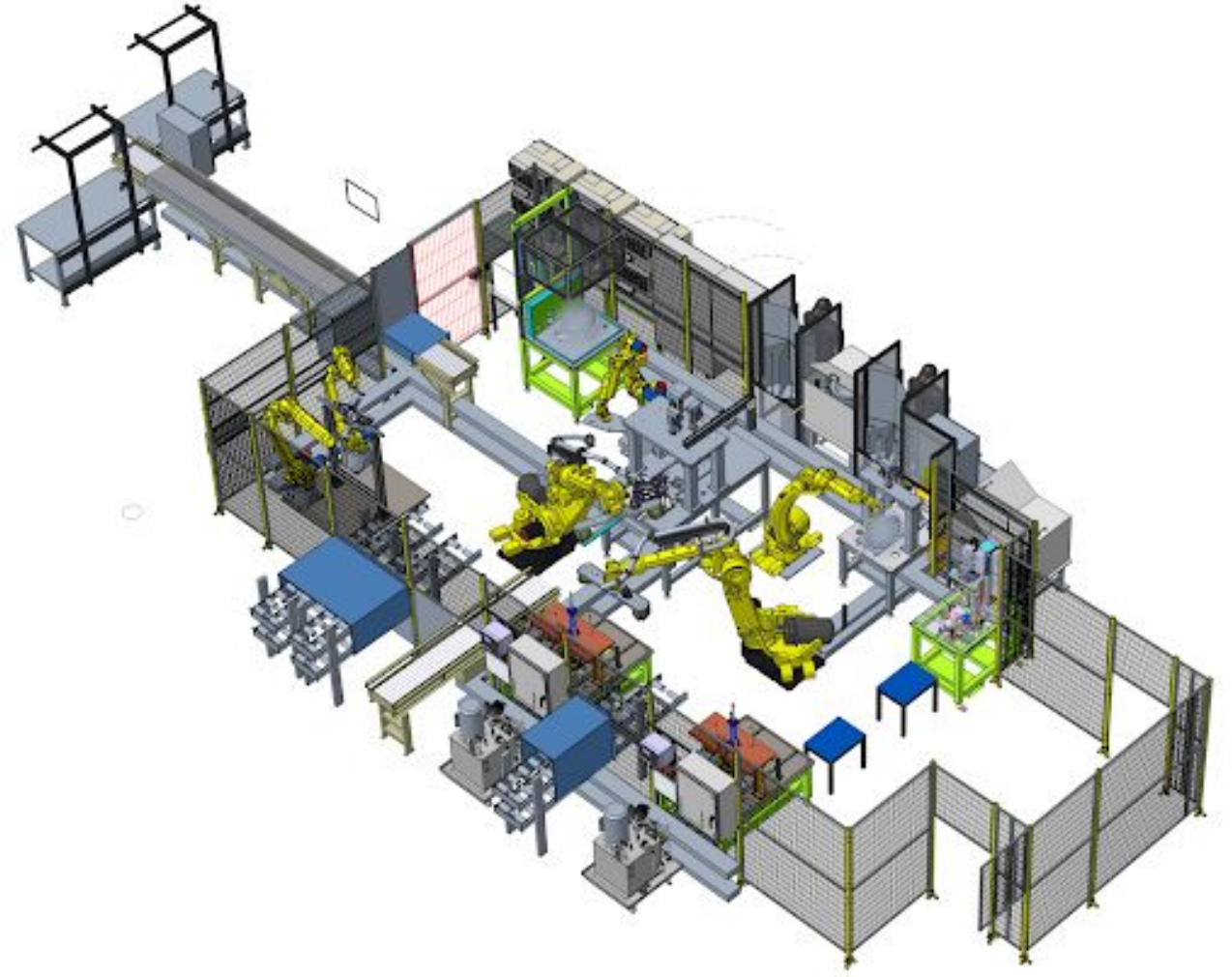


Turnkey Inspection & Testing Cells



- Components:

- Bastian Powered Roller Conveyors
- Custom Gravity Roller Conveyors
- Fanuc Robotics
- Custom EOATs with Schunk Pneumatic Gripper
- Sic Safety Light Curtains
- Corton Servo Press
- CTS Leak Test System
- Cognex Vision Inspection
- Keyence Laser Marker
- Solartron LVDT Probes
- Columbia Tool Impact Marker
- Safety interlocks
- Allen Bradley Controls Structure

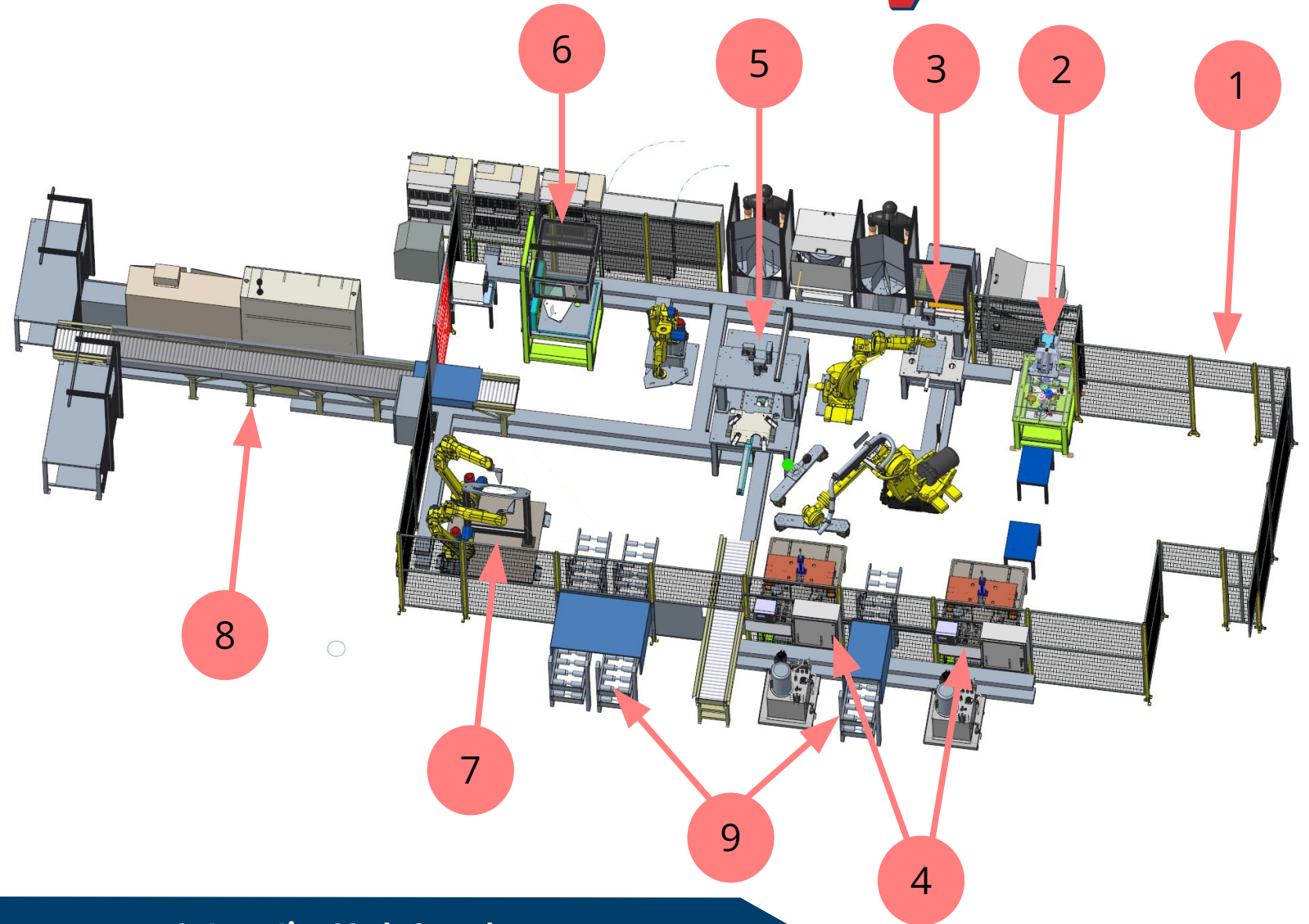


Turnkey Inspection & Testing Cells

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• Overview:

1. Incoming Station
 - Customer Provided Powered Conveyor
2. Contact Probe Gage Station
 - Inspections include:
 - Surface Flatness and Profile
 - Diameter Size and Position
 - Perpendicularity/Parallelism
3. Automatic Torque and Press Station
 - Seal Press Assembly
 - Plug Torque Assembly
4. Leak Test Stations
 - Part Dependent Leak Tests
 - Part Marking
5. Automatic Assembly and Torque Station
 - Dowel Assembly Press
 - Bushing Assembly Press
6. Laser Marker Station
 - Laser Mark Grading
7. Vision Inspection
 - Inspections Include:
 - Assembly Verification
 - Holes and Threads Presence
 - Flatness and Small Surface Defects
8. Outgoing Conveyor
 - Powered Roller Conveyor
9. Reject Conveyors
 - Gravity Roller Conveyors

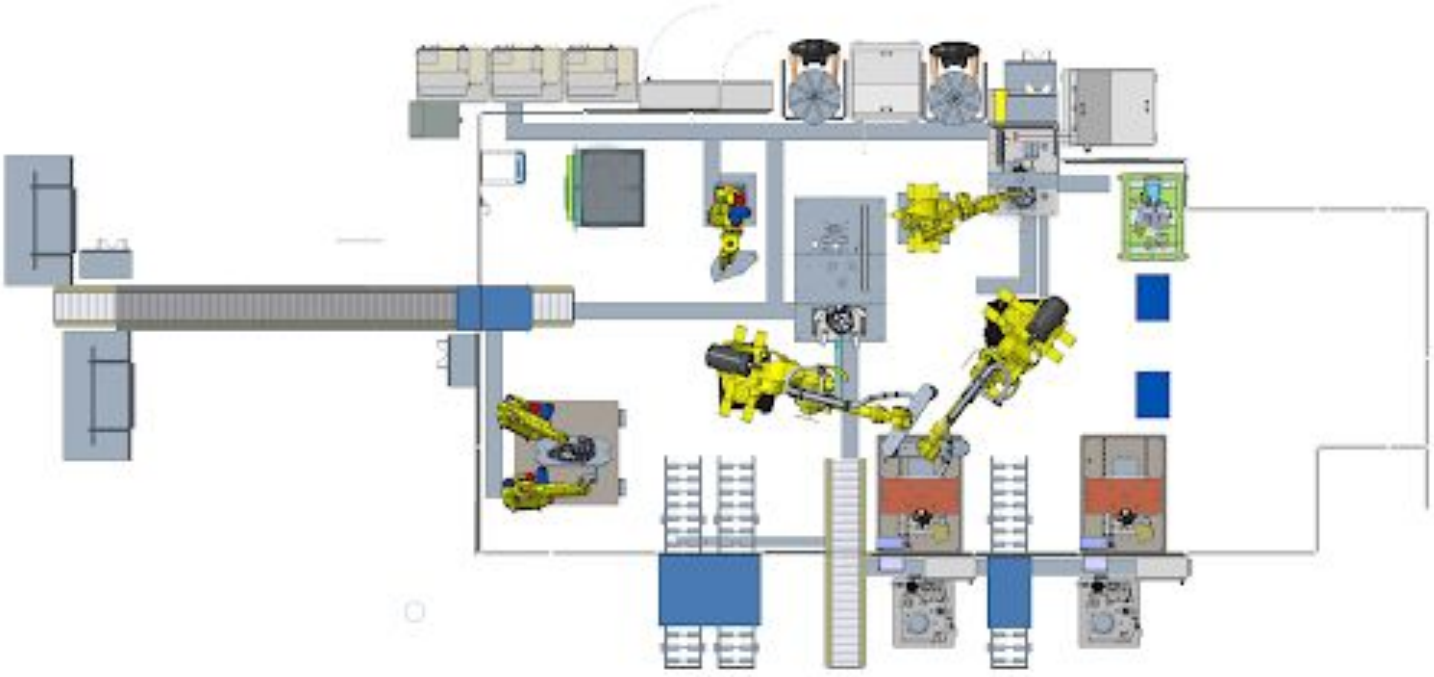


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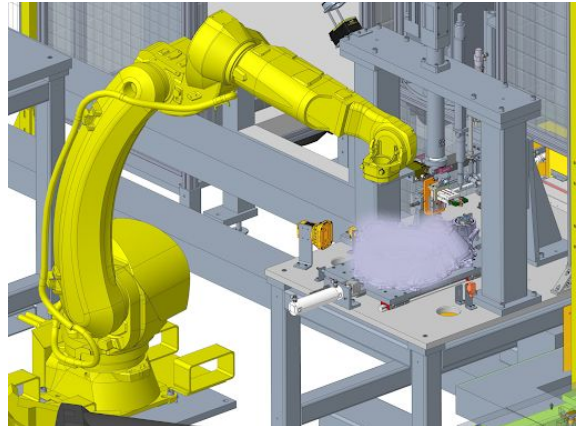
+V

Automation Made Seamless

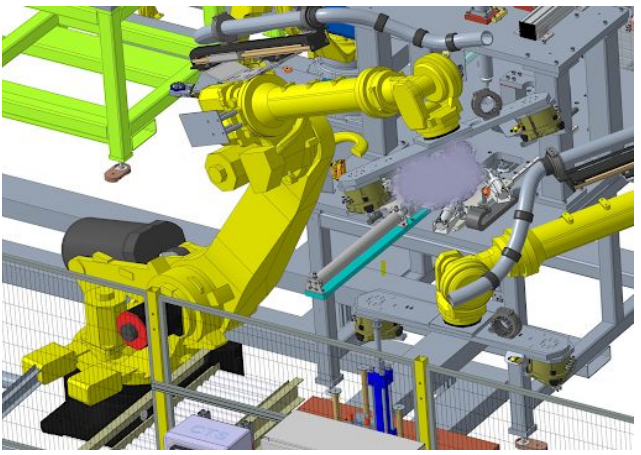
Turnkey Inspection & Testing Cells

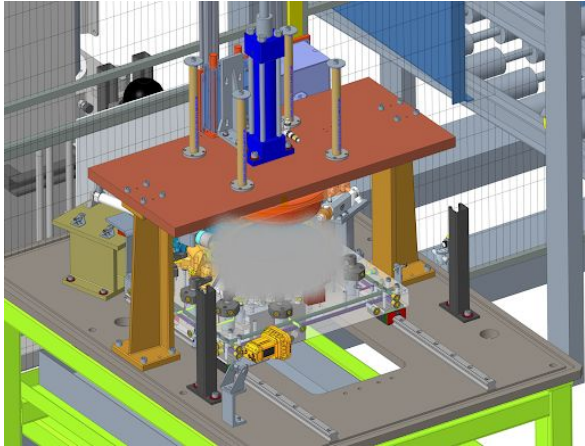
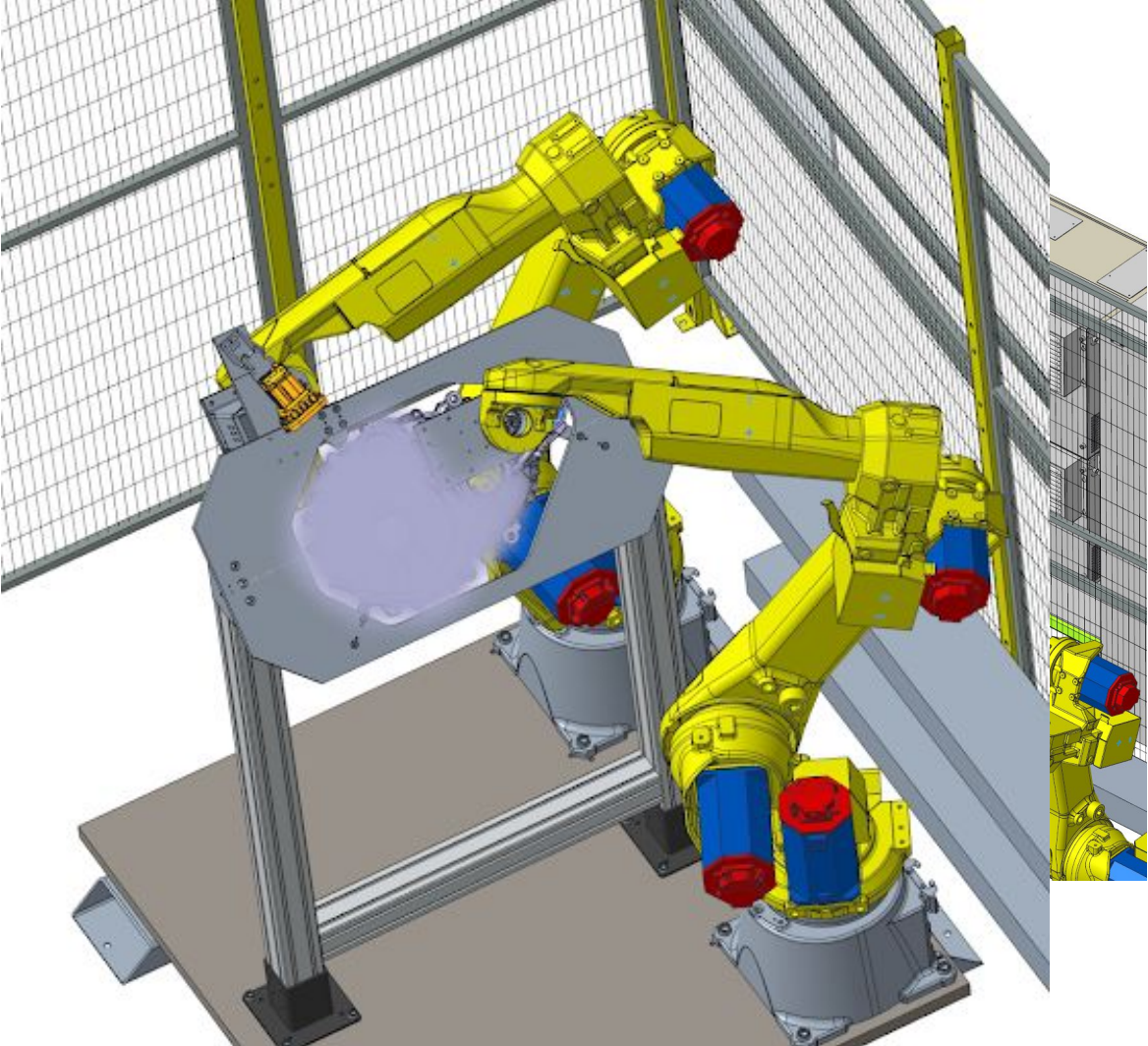


Layout

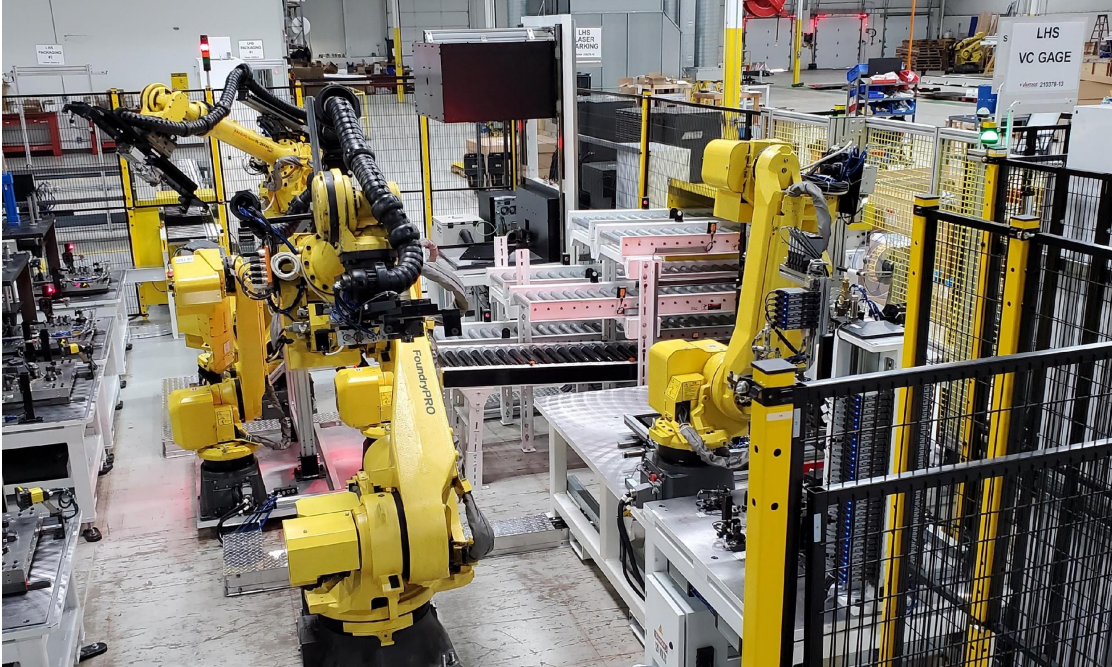


Robotics Material Handling



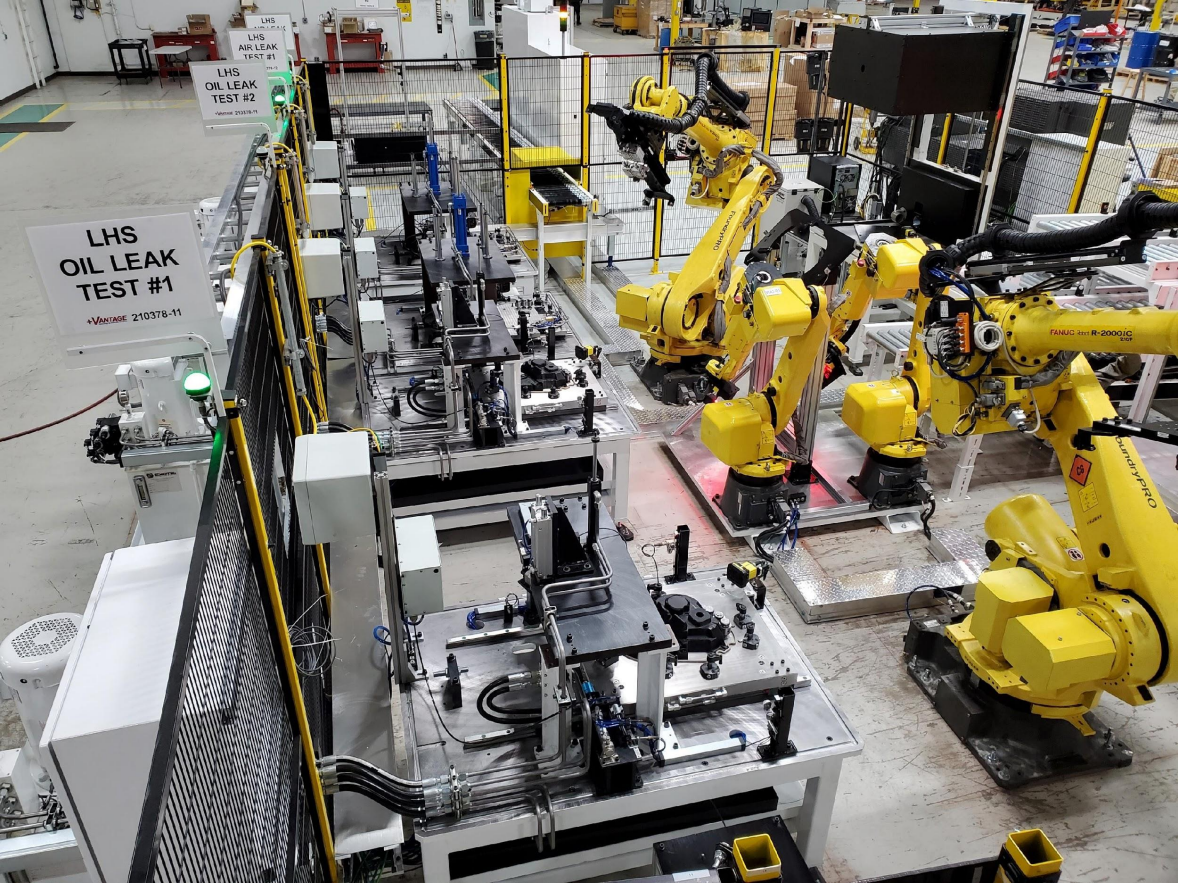
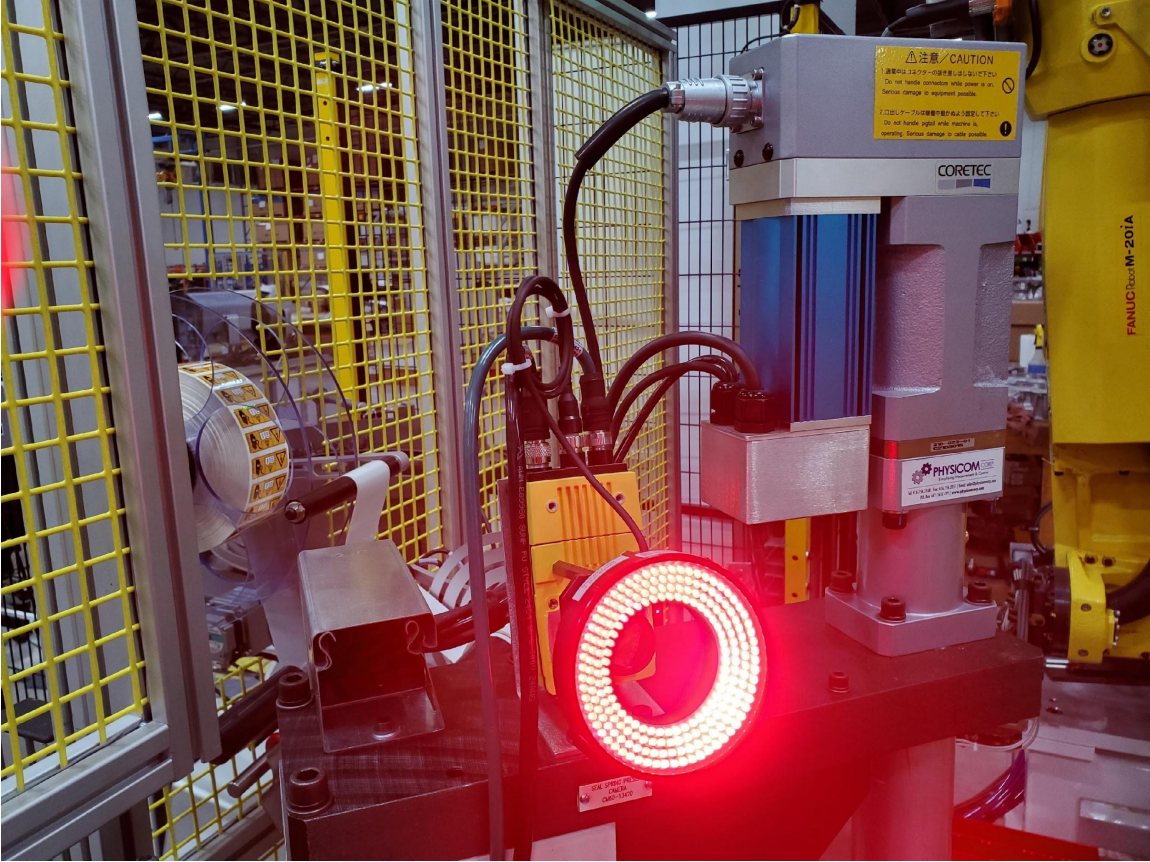


Turnkey Inspection & Testing Cells

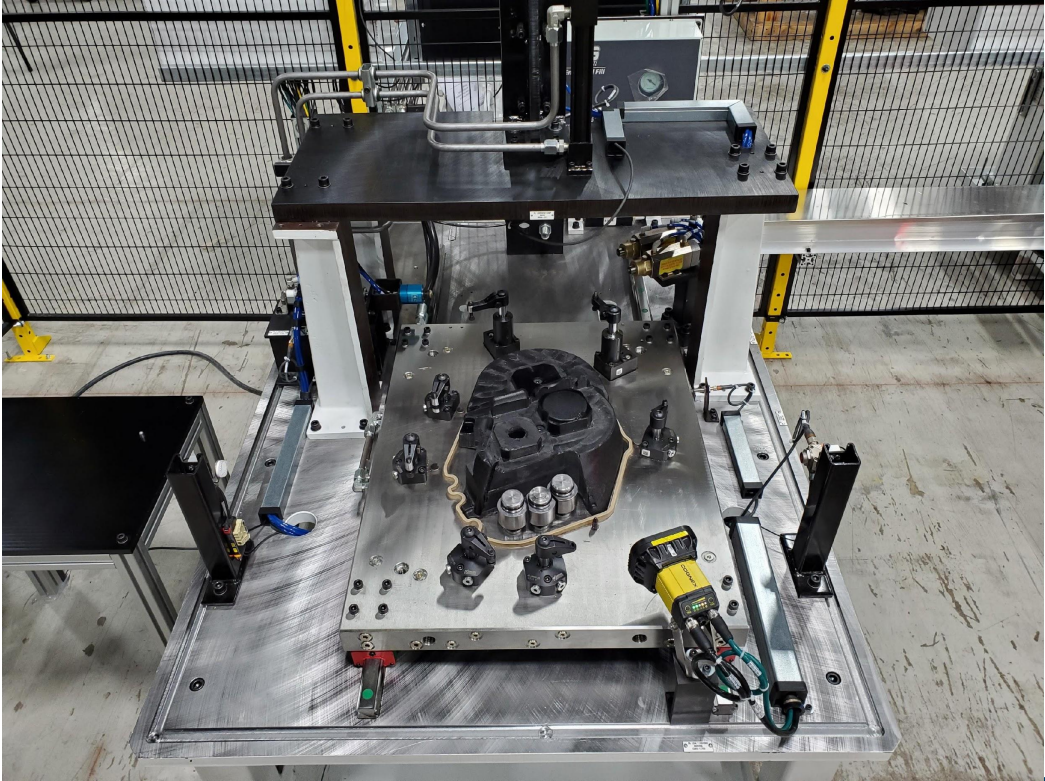


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Turnkey Inspection & Testing Cells



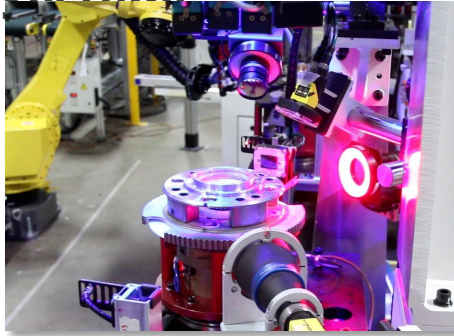
Turnkey Inspection & Testing Cells



Core Product Overview



Inspection Systems



Vision, Laser, Pneumatic, Dynamic, Torque, as well as Classification and Identification

Automation & Robotics



Fully automatic systems to streamline your manufacturing process and increase production

Systems



Custom design or upgrade/retrofit existing lines with the latest sensors and manufacturing technology

Engineering & Service



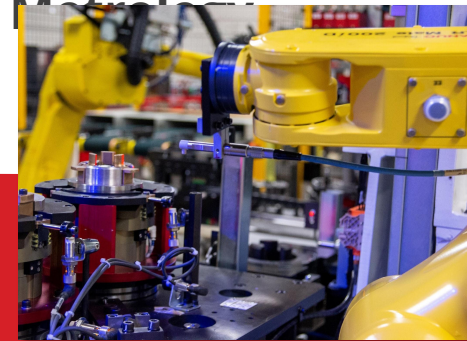
Let the +Vantage team's decades of experience solve your manufacturing challenges

Assembly Systems



Manual and semi-automatic multi-station assembly systems for pressing, torquing, & riveting

Industrial



Contact and non-contact gages for precision measurements. In-line and audit room.

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Global Customer Reach



1,500

MACHINES BUILT

250

YEARS COMBINED EXPERIENCE

12

SYSTEMS INSTALLED IN +12 DIFFERENT COUNTRIES



USA (HQ)

12651 Newburgh Rd
Livonia, MI 48150
tel: [+1 734 432 5055](tel:+17344325055)

Canada

London, ON Canada
tel: [+1 226 234 1515](tel:+12262341515)

Mexico

Micro Parque Finsa Eje 2 #470-2
Ramos Arizpe, Coah. 25210
tel: [+52 1 844 270 9389](tel:+5218442709389)

China

14/F Suncome Cimic Tower
800 Shangcheng Rd
Pudong New Distric Shanghai. 200120
tel: [+86 137 7103 2628](tel:+8613771032628)



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Company Overview



Company Size

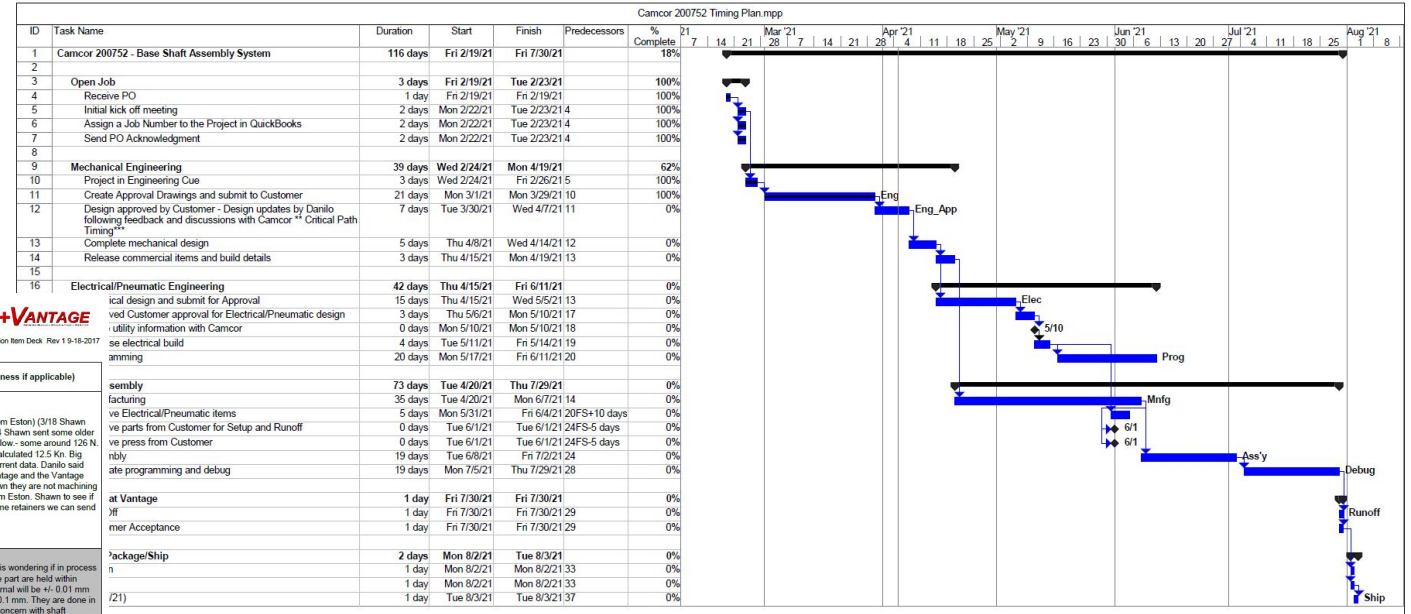
- 70 Employees Globally
- 100,000 sq. ft in Livonia
 - Additional office space globally

Certifications

- ISO 9001:2019
- Coherix System Integrator
- Fanuc Authorized Integrator
- Q-DAS ASCII Certification
- Schunk Official Partner
- Solartron Orbit 3 Integrator



Project Management



+Vantage - Action Item Deck

Project: Camcor 200752 Assembly System

Revised 3/24/21

Item	Operation	Item Description	Key Contact for Item	Actions	Date Open	Target Close date	Actual Close Date	Comments (and note effectiveness if applicable)
5	Press	max expected press force for retainer	Shawn		3/8/2021	3/12/2021		(3/10 Shawn working to get this info from Eston) (3/18 Shawn still waiting for info - will try again) (3/24 Shawn sent some older 2018 and 2019 data - loads are VERY low - some around 126 N) Danilo talked with Promess and they calculated 12.5 Kn. Big difference - Shawn still trying to get current data. Danilo said Shawn could send sample parts to Vantage and the Vantage could send parts to Promess. Per Shawn they are not machining parts now - would need to get parts from Eston. Shawn to see if he can get 5 shafts from Eston and some retainers we can send to Promess)
9	Eng	Shawn to look at in process tolerances for journals - Danilo is considering to use Vees to support journals during press.	Shawn		3/10/2021	3/12/2021	3/24/2021	(3/18 +/- .1 current tolerance. Vantage is wondering if in process spec could be that all diameters on one part are held within tighter tolerance) (Per Bobby Large journal will be +/- 0.01 mm and smaller inside journals can be +/- 0.1 mm. They are done in different operations. Bobby indicating concern with shaft bending. Critical item to get press force info - see item 5 so analysis of potential bending can be performed) (3/24 will close - see item 5 and 15)
11	Feeding system	Vantage using Feeding Concepts for feeding systems. Request deviation from Camcor spec that was sent 3/12. PO has been placed.	Shawn		3/18/2021	3/19/2021	3/24/2021	(3/18 Shawn will investigate. Vantage has developed this project with Feeding Concepts before specification was received.) (3/24 Deviation approved to use Feeding Concepts - commercial issue - Vantage did not have machine spec revision in quoting stage)
12		Bobby requesting to look at feasibility to check retainer height 0.3	Danilo/Todd		3/18/2021	3/31/2021		(3/24 request in in Proposal department - should have by next week)
13	Feeding system	1/2 cubic feet retainers and coffee can of balls	Shawn		3/18/2021	4/1/2021		(3/24 Shawn working with Eston to try and get parts)
14	Shipping/install info	Shawn requesting info re. shipping and utilities	Shelley/Zach		3/22/2021	7/23/2021		(See email sent 3/22/21 from Shawn. Utility information can be provided sooner after electrical design)
15	Eng	FEA Study for press operation	Danilo	Ref Item 5 and item 9				(3/24 Danilo did Preliminary FEA study on current design based on 20Kn and 12.5Kn. If 20Kn force applied, will deform shaft. 12.5Kn would not deform shaft. Is below max yield)



13

+V

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Proud Partners of:



Robotics



Vision Systems



Marking Systems



PLC

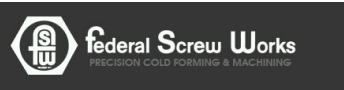


Torquing/Pressing



Our Featured Customers

+VANTAGE



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On-Site Service & Support



100% Dedication to Customer Service

Global Support On-Site Representatives

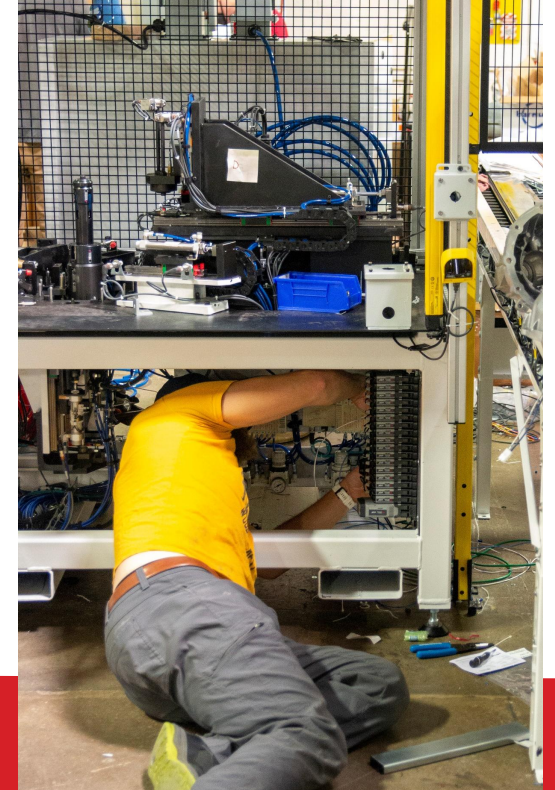
Quick Response Unit and Down Time Recovery

Remote Log In Service in a Moments Notice

24/7 Service Support

On-site Contracts Available

Highly Trained Staff of Engineers & Technicians



USA

12651 Newburgh Rd
Livonia, MI 48150
tel: +1 734 432 5055

Automated Inspection

Mexico

Micro Parque Finsa Eje 2 #470-2
Ramos Arizpe, Coah. 25210
tel: +52 1 844 270 9389

Quality Assurance

Canada

London, ON Canada
tel: +1 226 234 1515

Zero Defects

Thank You for Reading!

China

14/F Suncome Cimic Tower
800 Shangcheng Rd
Pudong New District Shanghai. 200120
tel: +86 137 7103 2628

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Metrology & Assembly Solutions

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