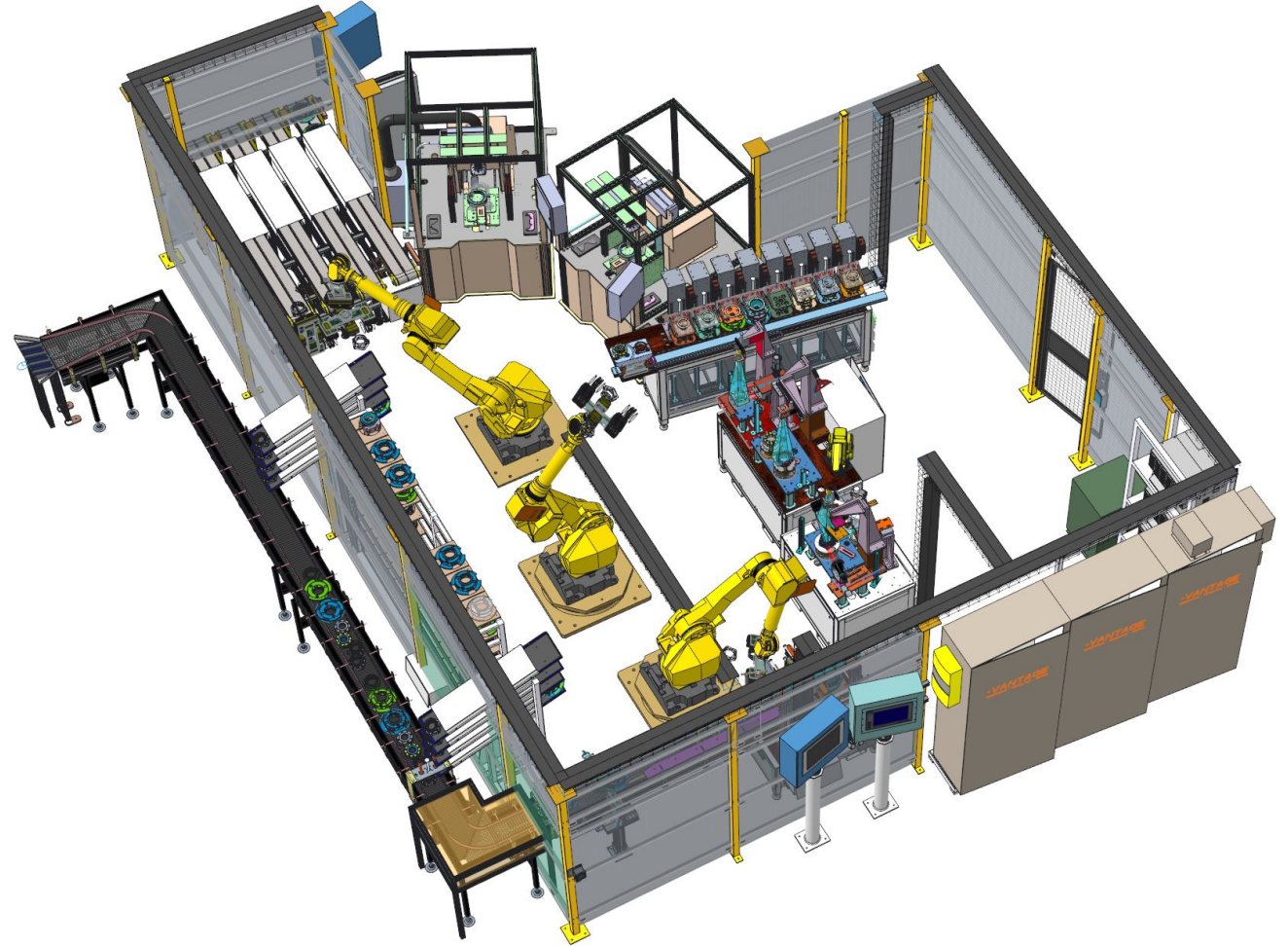


## +Vantage Case Study: Turnkey Inspection & Testing Cells

Carrier End of Line Measurement and  
Testing Cell



# Turnkey Inspection & Testing Cells



- Parts:

- Gas and Diesel Carriers

- Customer Problem:

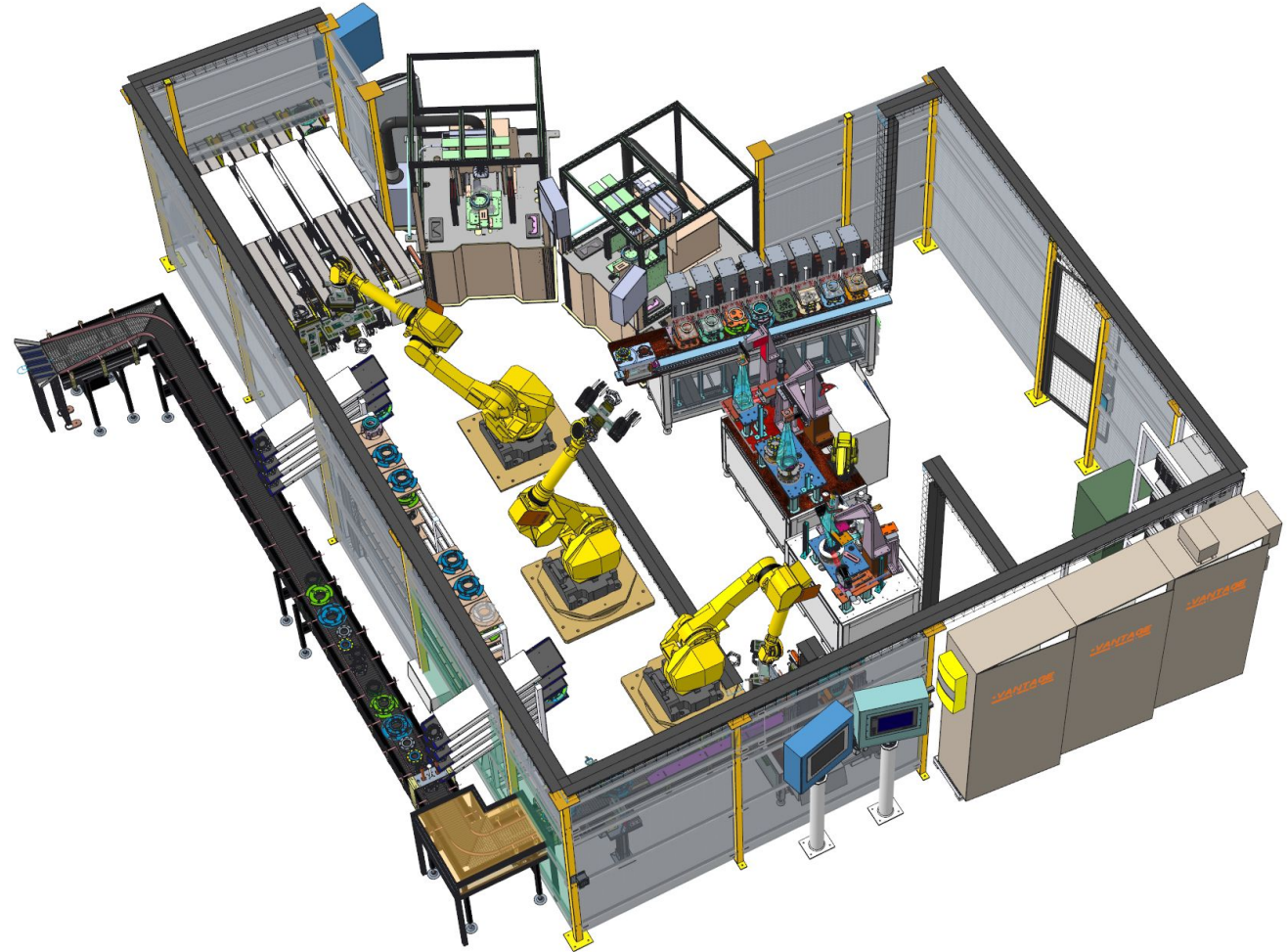
- The inspection process was too labor intensive and defective parts were getting through the existing process
- Multistage machining process requires multi-step EOL inspection
- The manufactured components required a method of data acquisition & part traceability

- The project:

- This system consists of (3) robots performing part handling across the cell. Parts enter cell via incoming gravity roller conveyor. Part is transferred to various stations where multiple inspections are performed. Part is then laser marked for traceability and is transferred to outgoing powered belt conveyors.

- Process:

- Incoming Gravity Roller Conveyor
- Robotic Part Handling
- Part Orientation Control
- Eddy Current Inspection
- Resonance Inspection
- Air Gage Inspection
- Part Laser Marking
- Outgoing / Reject part sorting
- Automatic Mastering



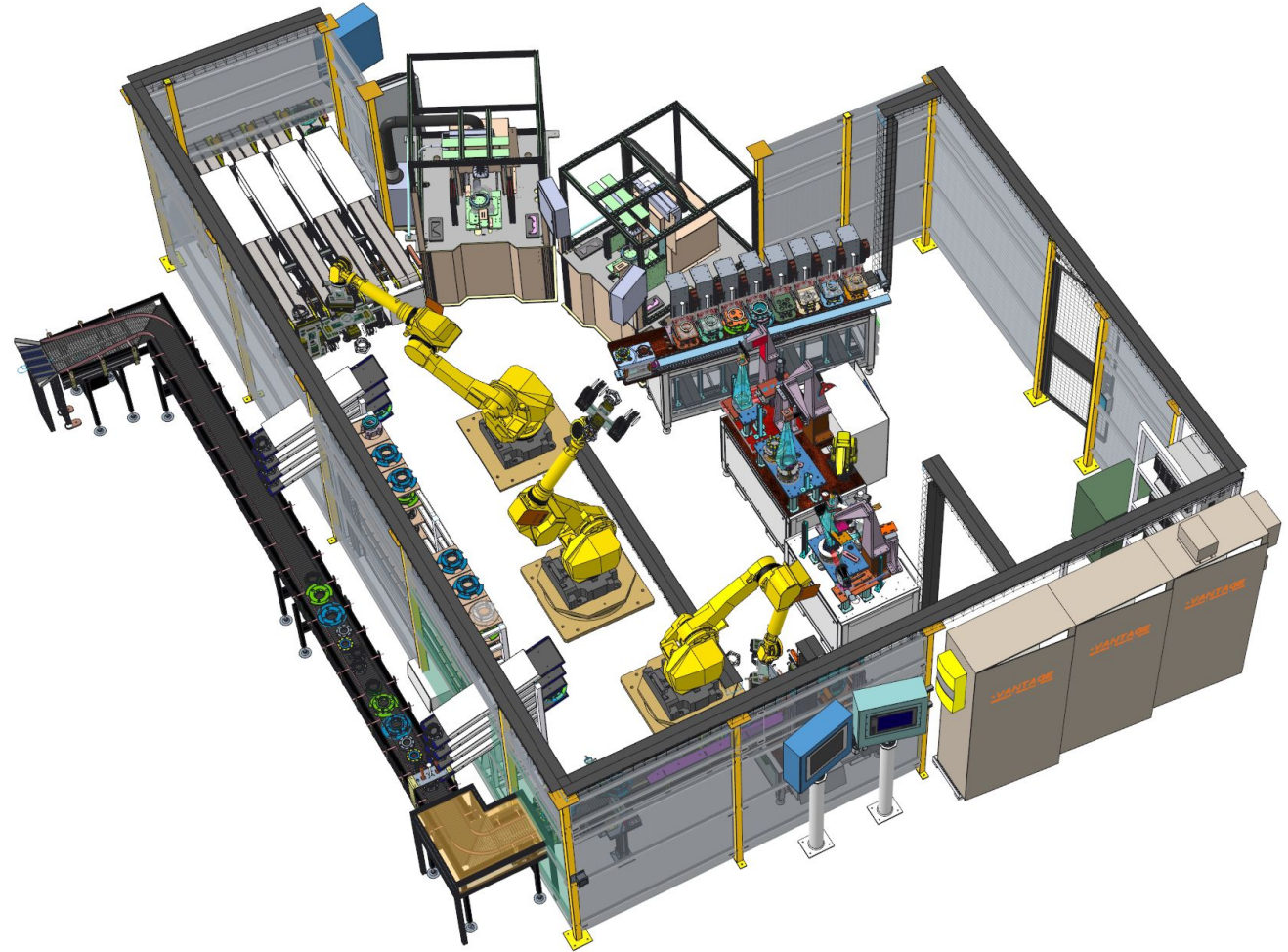


# Turnkey Inspection & Testing Cells



- Components:

- Custom Incoming Gravity Roller Conveyor
- Outgoing Powered Belt Conveyors
- Custom Gravity Roller Reject Conveyors
- Fanuc Robotics
- Custom EOATs with Schunk Pneumatic Grippers
- Cognex Vision Inspection
- IBG Eddy Current Inspection
- Resonant Inspection System
- Schunk Linear Servo Belt Drive
- 8 Station Air Gage System
- Keyence Laser Markers
- Safety interlocks
- RTGC Controls
- Allen Bradley Controls and HMI

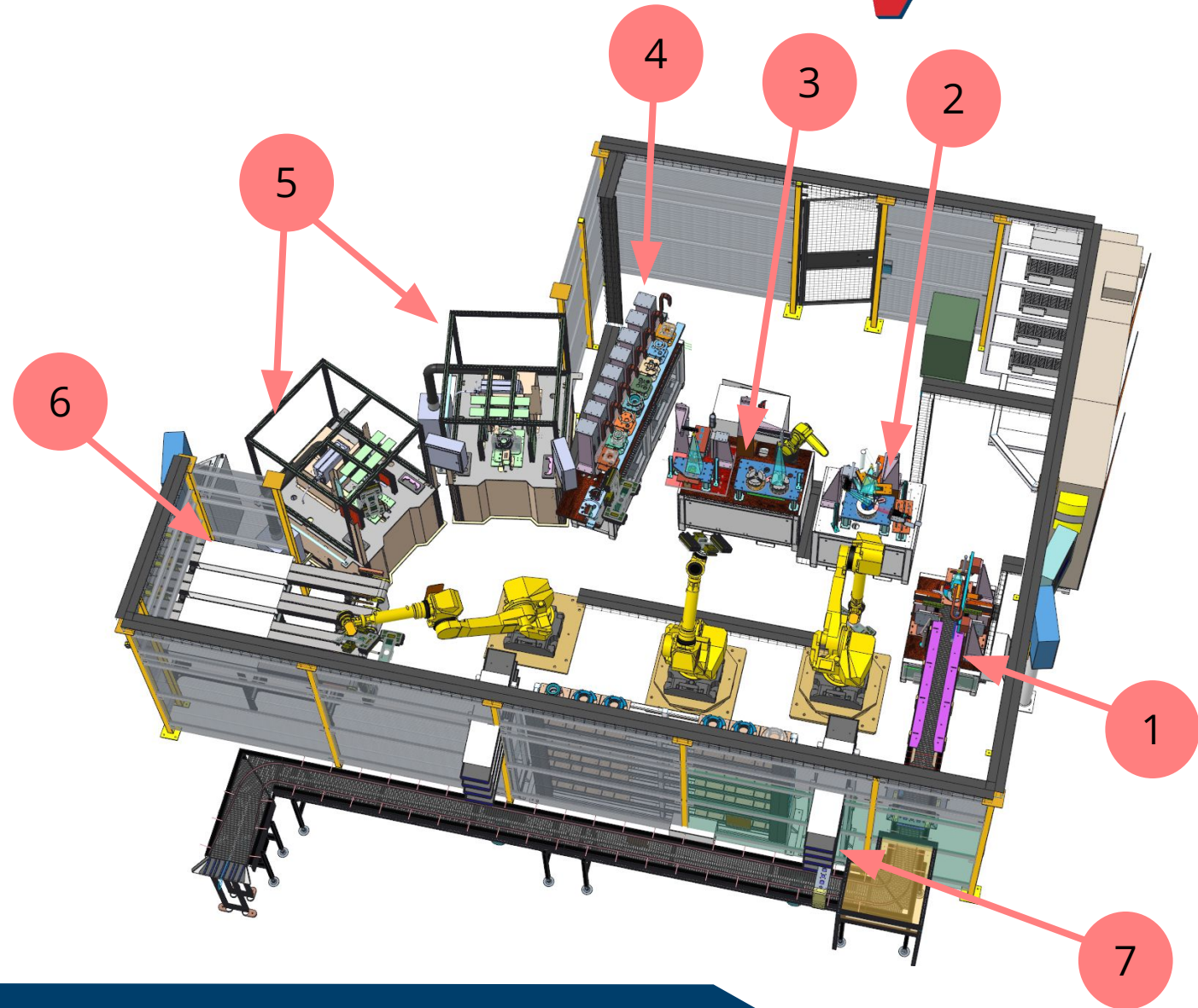


# Turnkey Inspection & Testing Cells

# +VANTAGE

## • Overview:

1. Incoming Conveyor
  - Roller Conveyor
  - Part Metering
  - Part Orientation Control
2. Vision Inspection Station
  - Inspections Include
    - Hole Position
    - Media Presence
    - Window Heights
3. Eddy and Resonator Station
  - Eddy Current Inspections
    - Inner Flange Crack Depth
    - Outer Flange Crack Depth
  - Resonance Inspection
    - Ping for Braze Condition
4. Air Gage Station
  - Diameter Size Inspection
5. Laser Marking Stations
  - Automatic Laser Marking
6. Exit Conveyors
  - Powered Belt Conveyors
7. Reject Conveyors
  - Gravity Roller Conveyors



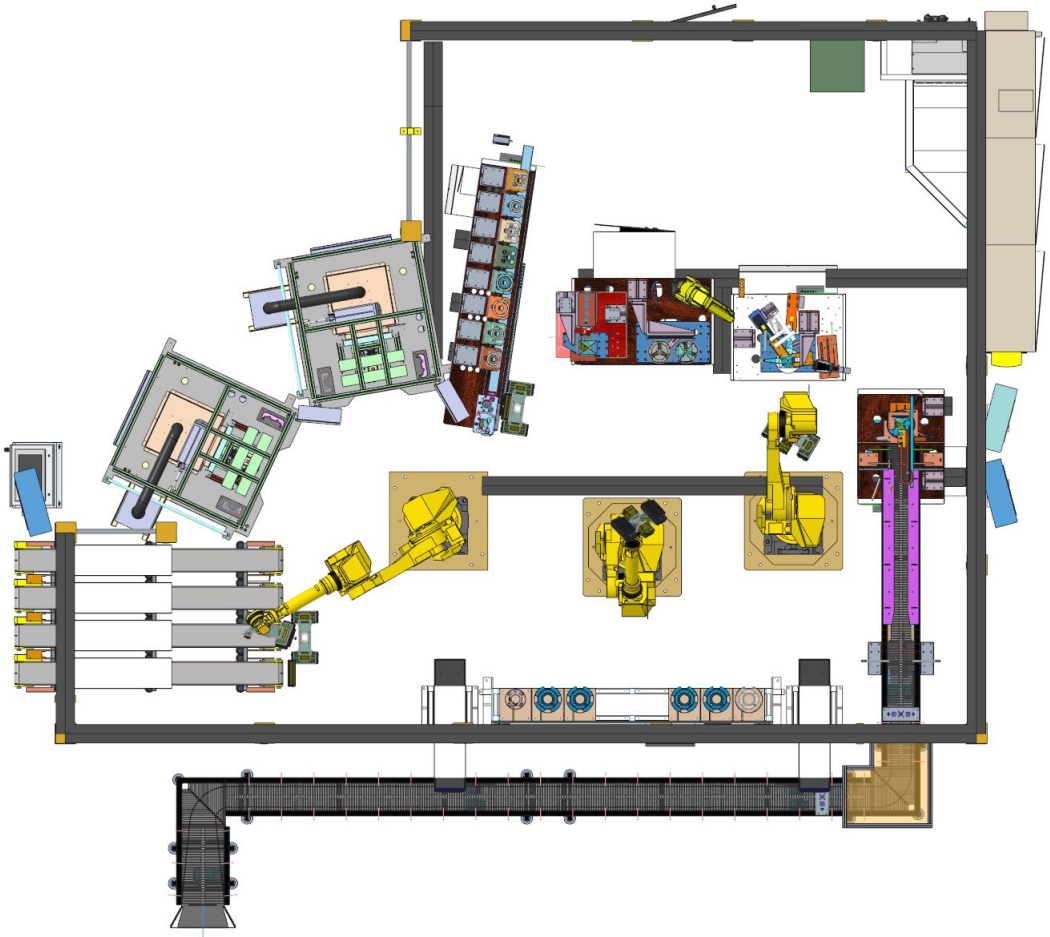
4

+V

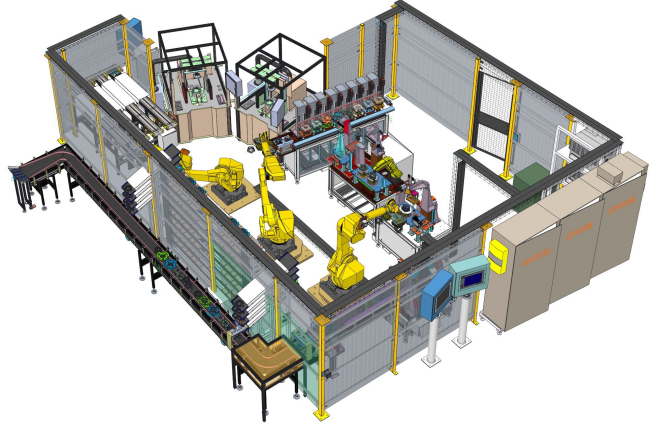
Automation Made Seamless



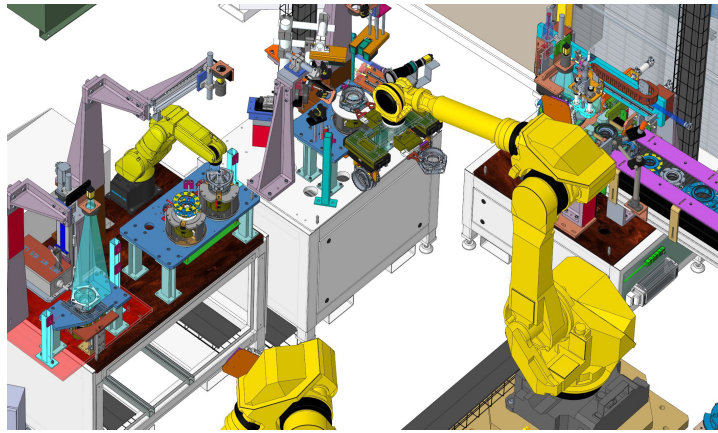
# Turnkey Inspection & Testing Cells



Layout



Automated Inspection and Laser Marking System

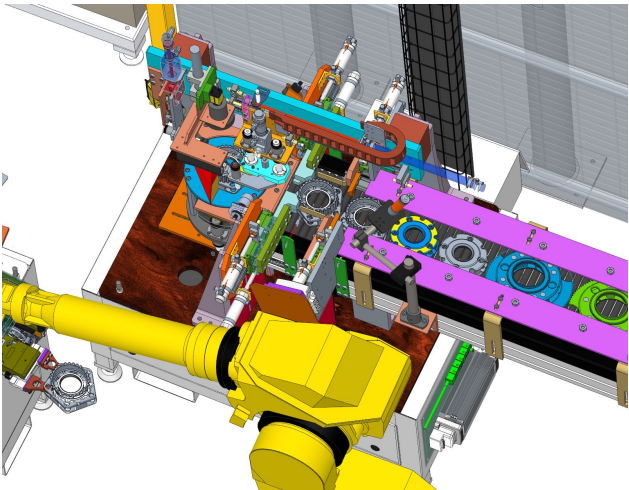


Fanuc Robotics Material Handling

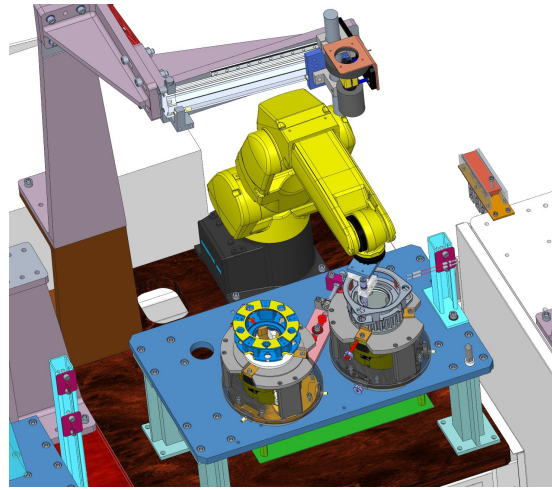


Automation Made Seamless

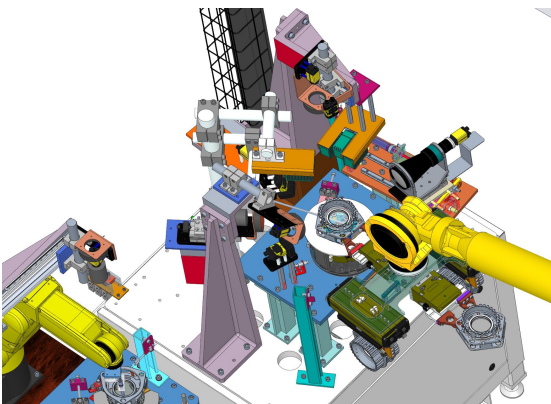
# Turnkey Inspection & Testing Cells



Incoming Part Orientation Control



Eddy Current Inspection System



Multi Camera Vision Inspection



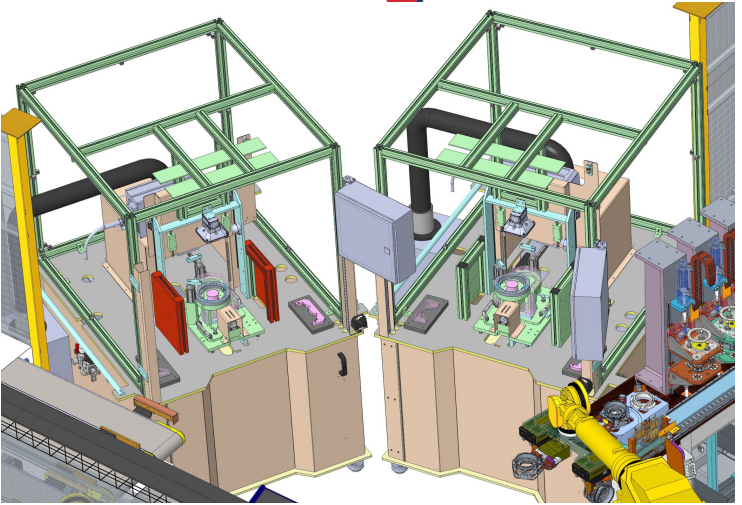
Resonant Inspection System



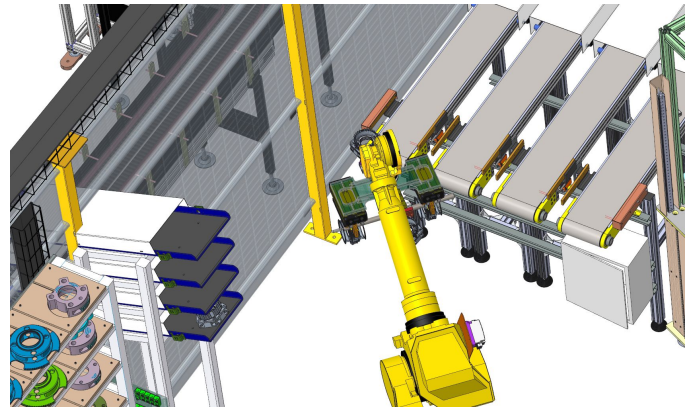
# Turnkey Inspection & Testing Cells



Multi Station Air Gage System with Servo Belt Drive



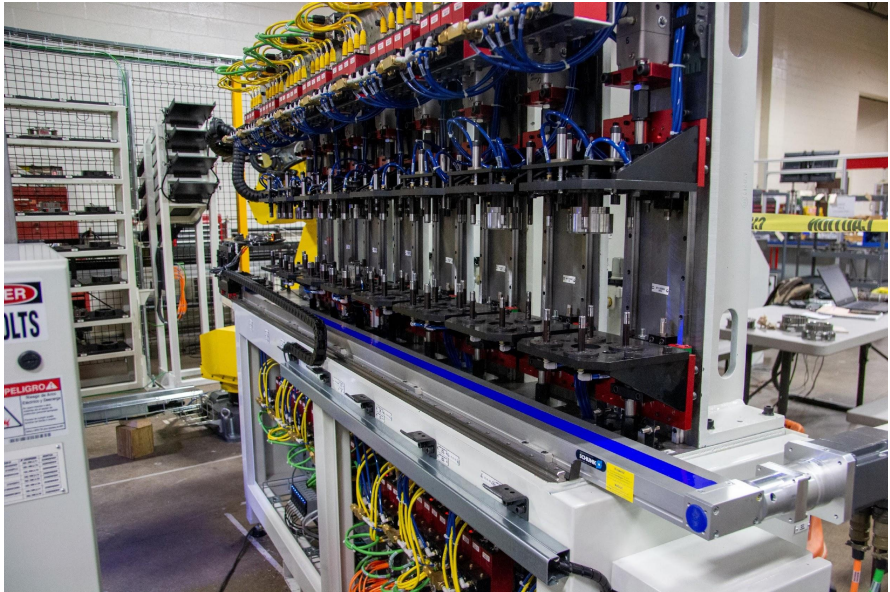
Laser Marking Stations



Automatic Part Sorting

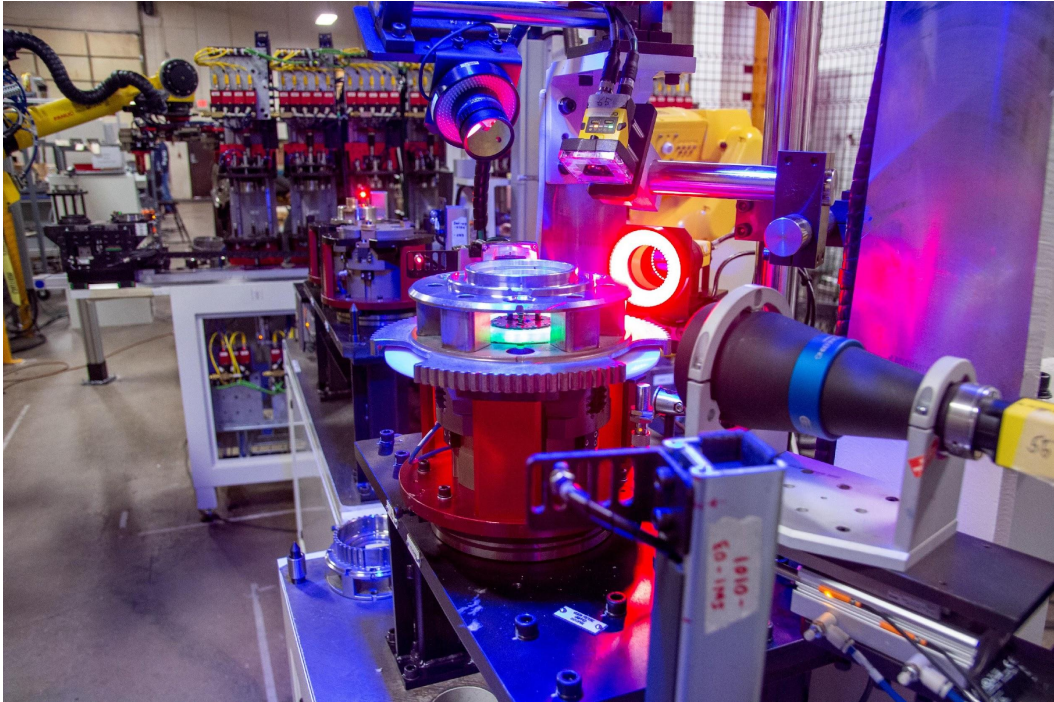
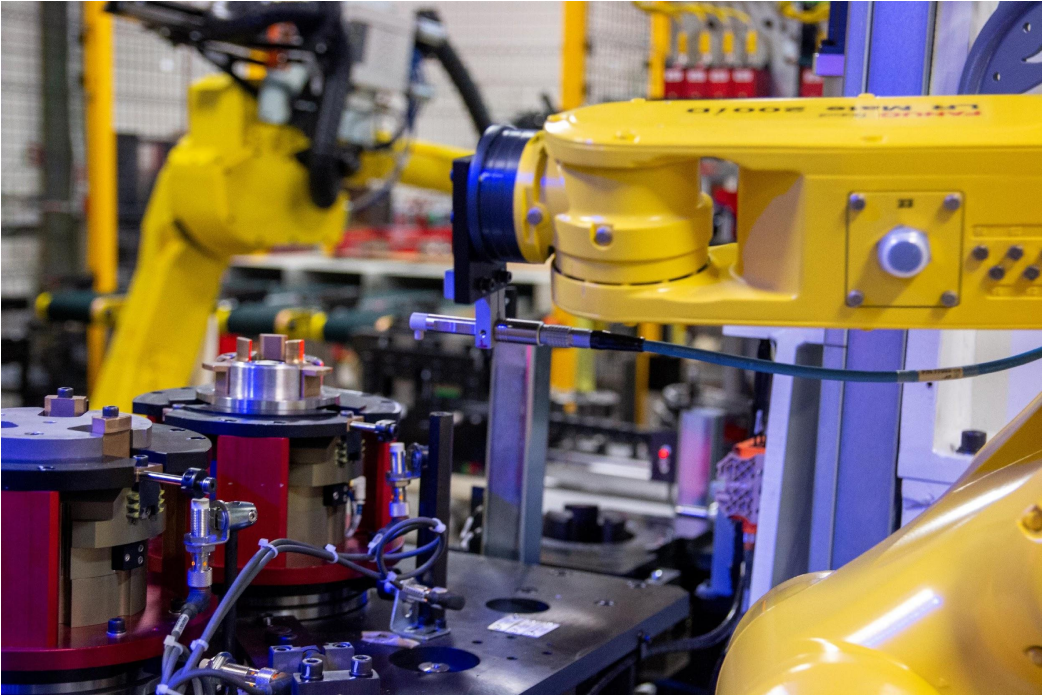


# Turnkey Inspection & Testing Cells





# Turnkey Inspection & Testing Cells

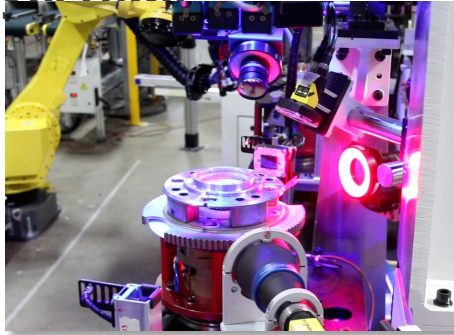




# Core Product Overview



## Inspection Systems



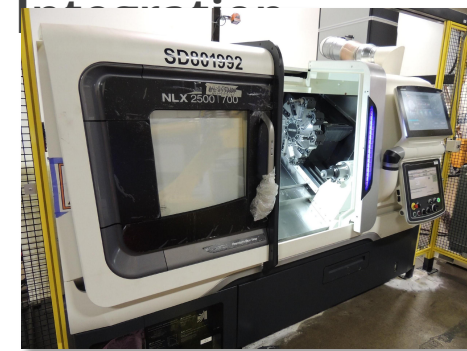
Vision, Laser, Pneumatic, Dynamic, Torque, as well as Classification and Identification

## 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



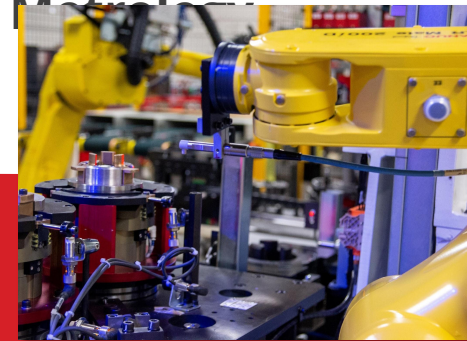
Let the +Vantage team's decades of experience solve your manufacturing challenges

## 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.

**Automation Made Seamless**



# 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

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## Company Size

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

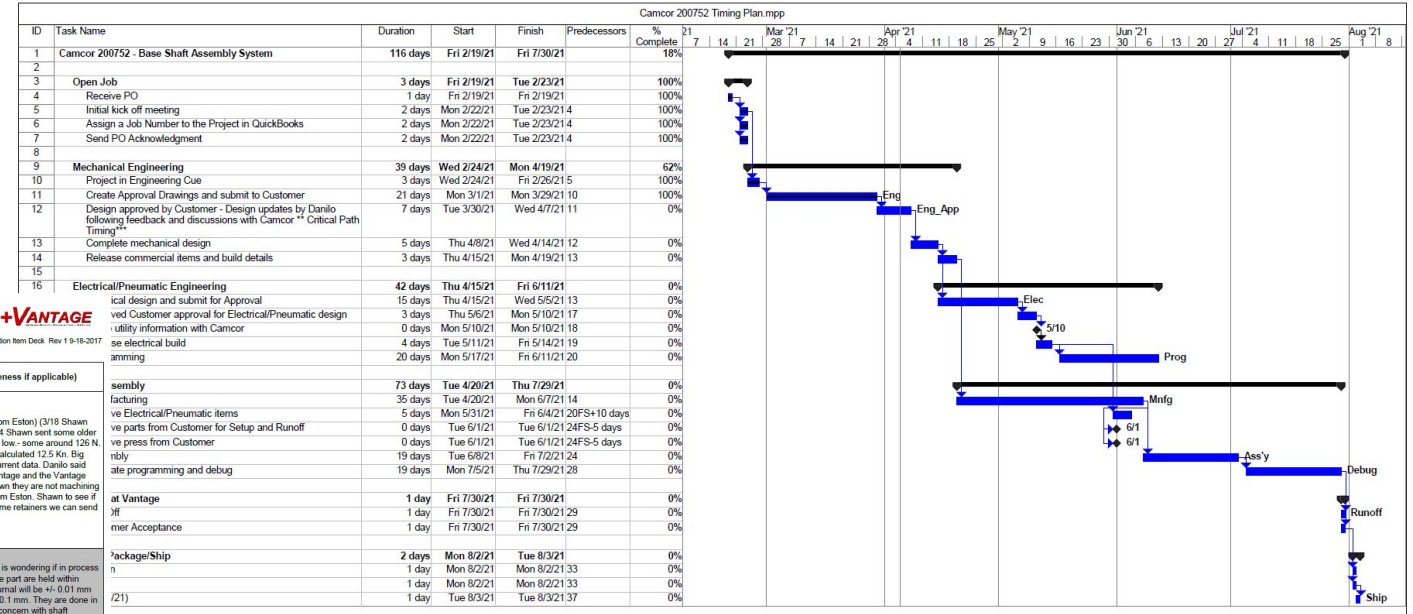
## Certifications

- 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)



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# Proud Partners of:



## Robotics



## Vision Systems



## Marking Systems



## PLC



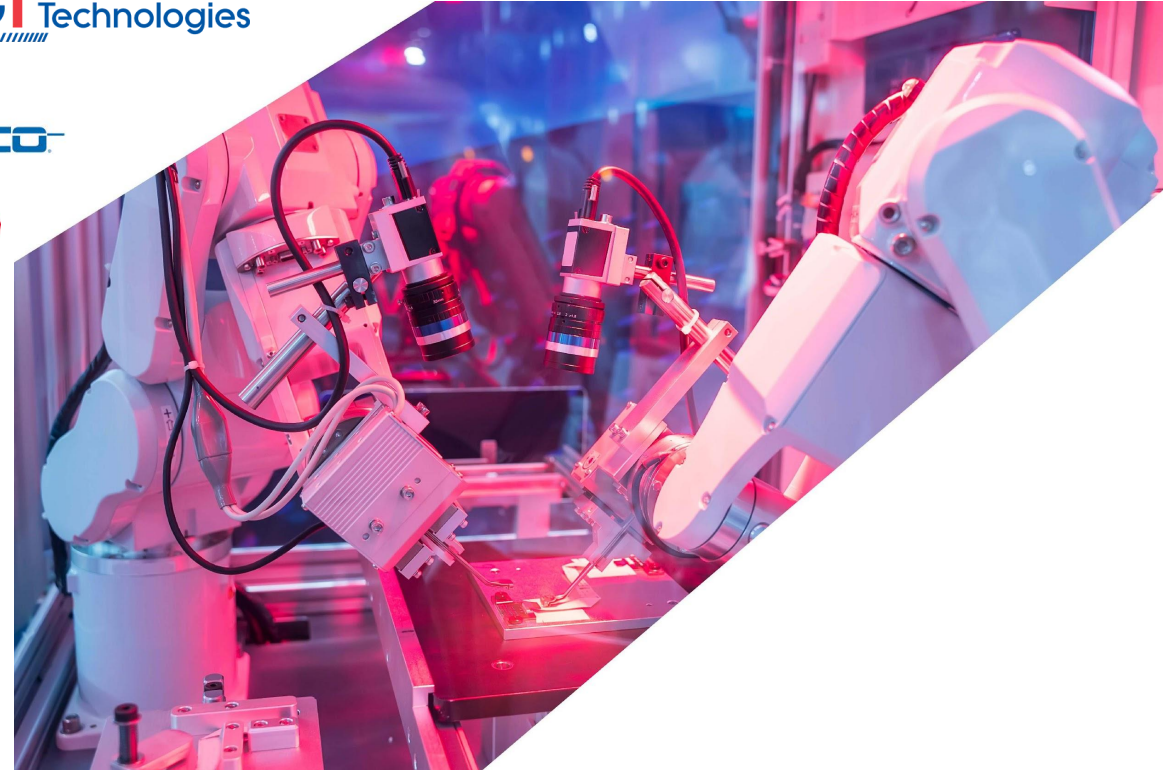
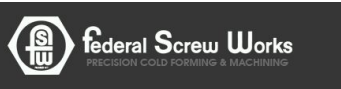
## Torquing/Pressing





# Our Featured Customers

# +VANTAGE



15

+V

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# On-Site Service & Support



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100% Dedication to Customer Service

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Global Support On-Site Representatives

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Quick Response Unit and Down Time Recovery

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Remote Log In Service in a Moments Notice

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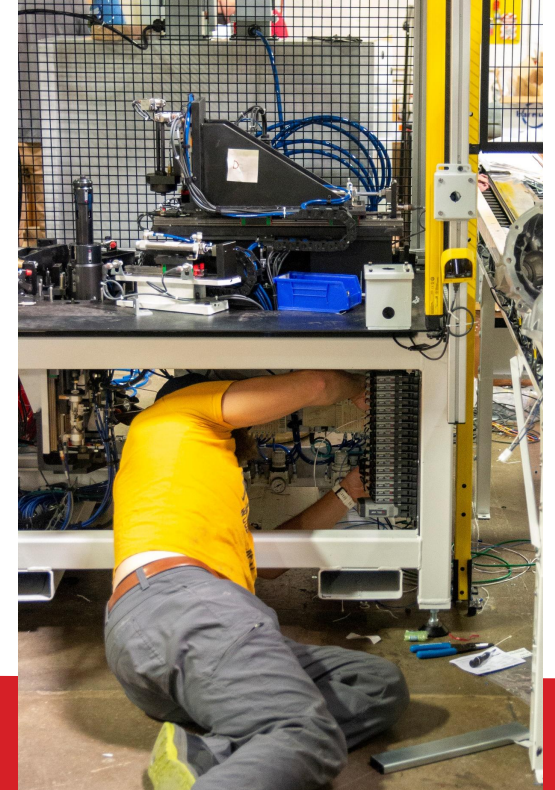
24/7 Service Support

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On-site Contracts Available

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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

**+VANTAGE**  
Metrology & Assembly Solutions

17

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