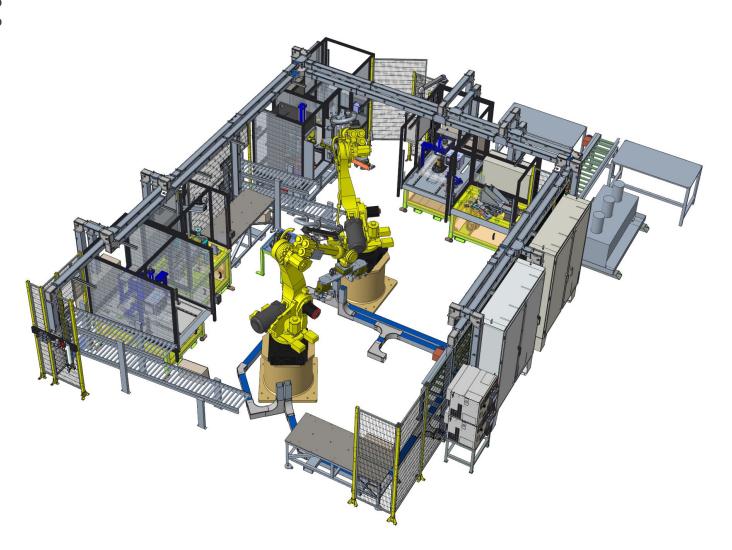


## +Vantage Case Study: Turnkey Inspection & Testing Cells

Transmission Housing Inspection, Testing & Assembly Cell





#### • Parts:

· Transmission Housing

#### Customer Problem:

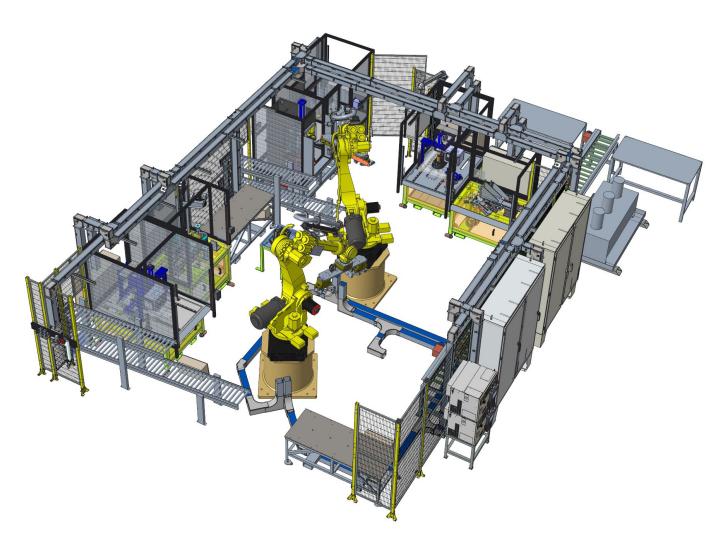
- The assembly, testing, and gaging process was too labor intensive
- Critical end of line machining processes require reliable and repeatable verifications
- System capable of running both case's & cover's all in one manufacturing system

#### • The project:

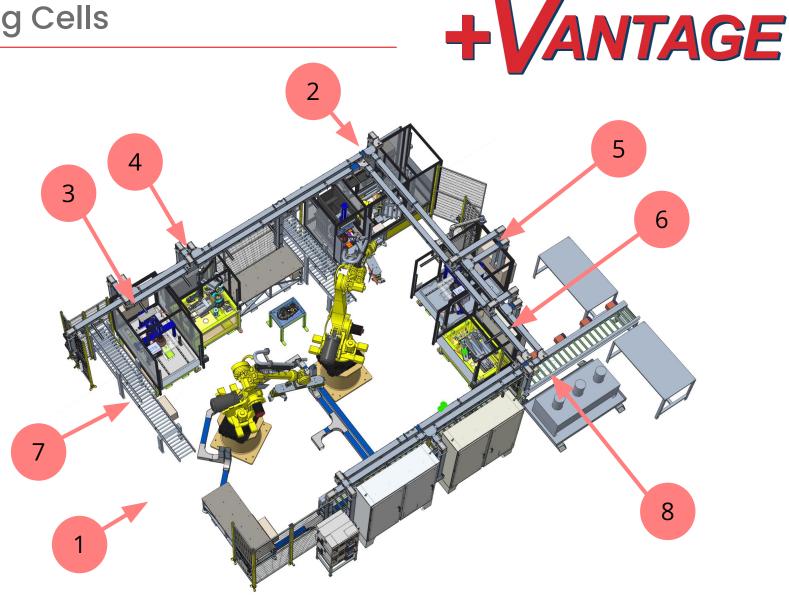
• This system consists of two robots managing part handling for automation. Various End of line operations are performed in this cell such as leak test, bushing press, contact probe gaging, vision inspection and part stamping for classification.

#### Process:

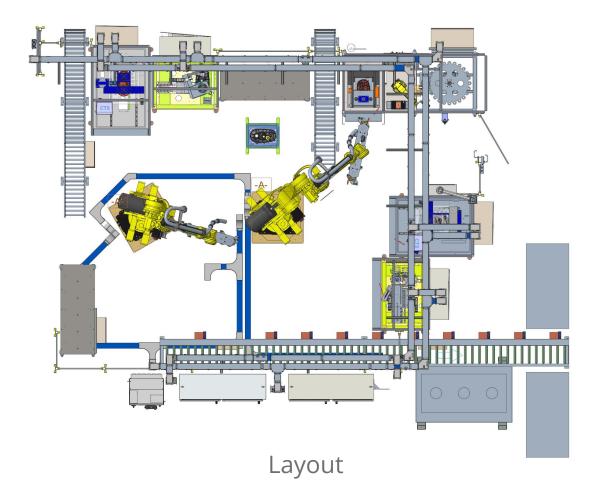
- 1. Incoming Powered Zoned Conveyor
- 2. Robotic Integration & EOAT
- 3. Hydraulic Busing Presses
- **4.** Leak Test Systems
- 5. Contact Probe Inspection Systems
- **6.** Vision Inspections Systems
- 7. Part Stamping
- 8. Cell full integrated, debugged, and assembled

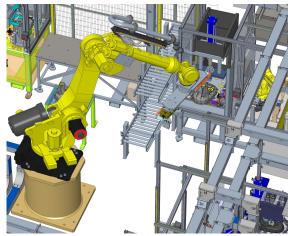


- Overview:
  - 1. Incoming Station
    - Customer Provided Powered Conveyor
  - 2. Bushing Press Station
    - Automatic Bushing Press
    - · Robotic Material Handling
  - 3. Front Leak Test Station
    - Part Dependent Leak Test Station
    - · Part Impact Marking
  - 4. Front Inspection Station
    - Part Dependent Leak Test Station
    - Part Impact Marker
  - 5. Rear Leak Test Station
    - Part Dependent Leak Test Station
    - · Part Impact Marking
  - **6.** Rear Inspection Station
    - Part Dependent Leak Test Station
    - Part Impact Marker
  - **7.** Reject Conveyors
    - Gravity Roller Conveyors
  - 8. Outgoing Conveyor
    - Roller Power Conveyor

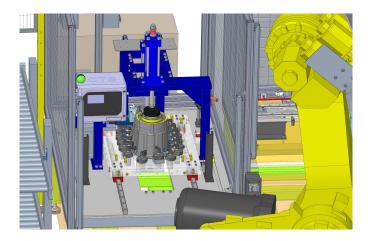








Robotics Material Handling



Automated Leak Testing and Bushing Press













## **Core Product Overview**



#### Inspection



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

#### **Engineering & Service**



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

#### **Automation &**



Fully automatic systems to streamline your manufacturing process and increase production

#### **Assembly Systems**



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

**Automation Made Seamless** 

#### **Systems**



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

#### **Industrial**



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

## Global Customer Reach



1,500

250

12

MACHINES BUILT

YEARS COMBINED EXPERIENCE

SYSTEMS INSTALLED IN +12 DIFFERENT COUNTRIES





USA (HQ)

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

London, ON Canada tel: +1 226 234 1515 Mexico

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

14/F Suncome Cimic Tower 800 Shangcheng Rd Pudong New Distric Shanghai. 200120

tel: +86 137 7103 2628

## 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



| ID  | Task Name    |  | Duration | Start       | Finish     | Predecessors | % 2<br>Complete | 1   Mar'21   Apr'21   May'21   Jun'21   Jul'21   Aug<br>7   14   21   28   7   14   21   28   4   11   18   25   2   9   16   23   30   6   13   20   27   4   11   18   25   1 |
|---|--------------|--|----------|-------------|------------|--------------|-----------------|---|
| 1   | Camcor 2     | 00752 - Base Shaft Assembly System   | 116 days | Fri 2/19/21 | Fri 7/30/2 |              | 18%             | ¥   |
| 2   |              |  |          |             |            |              |                 |   |
| 3   | Open J       | lob  | 3 days   | Fri 2/19/21 | Tue 2/23/2 |              | 100%            | <u></u>   |
| 4   |              | eive PO  | 1 day    |             | Fri 2/19/2 |              | 100%            |   |
| 5   |              | al kick off meeting  |          | Mon 2/22/21 | Tue 2/23/2 |              | 100%            | <u> </u>  |
| 6   | Assi         | gn a Job Number to the Project in QuickBooks   | 2 days   | Mon 2/22/21 | Tue 2/23/2 |              | 100%            |   |
| 7   | Sen          | d PO Acknowledgment  | 2 days   | Mon 2/22/21 | Tue 2/23/2 | 4            | 100%            |   |
| 8   |              |  |          |             |            |              |                 |   |
| 9   |              | nical Engineering  |          | Wed 2/24/21 |            |              | 62%             | •   |
| 10  | Proj         | ect in Engineering Cue   | 3 days   | Wed 2/24/21 | Fri 2/26/2 | 15           | 100%            |   |
| 11  | Crea         | ate Approval Drawings and submit to Customer   | 21 days  | Mon 3/1/21  | Mon 3/29/2 | 10           | 100%            | Eng   |
| 12  | follo        | ign approved by Customer - Design updates by Danilo<br>wing feedback and discussions with Camcor ** Critical Path<br>no*** | 7 days   | Tue 3/30/21 | Wed 4/7/2  | 11           | 0%              | Eng_App   |
| 13  |              | plete mechanical design  | 5 days   | Thu 4/8/21  | Wed 4/14/2 | 12           | 0%              |   |
| 14  |              | ase commercial items and build details   | 3 days   | Thu 4/15/21 | Mon 4/19/2 | 13           | 0%              |   |
| 15  |              |  | /-       |             |            |              | -               | T   T   T   T   T   T   T   T   T   T   |
| 16  | Flectrie     | cal/Pneumatic Engineering  | 42 days  | Thu 4/15/21 | Fri 6/11/2 |              | 0%              |   |
| +VANTAGE on Nem Deck Rev 1 9-18-2017  |              | ical design and submit for Approval  | 15 days  | Thu 4/15/21 | Wed 5/5/2  | 13           | 0%              | Elec  |
|   |              | ved Customer approval for Electrical/Pneumatic design  | 3 days   | Thu 5/6/21  | Mon 5/10/2 | 17           | 0%              |   |
|   |              | utility information with Camcor  | 0 days   | Mon 5/10/21 | Mon 5/10/2 | 18           | 0%              | <b>₹</b> 5/10   |
|   |              | se electrical build  |          | Tue 5/11/21 | Fri 5/14/2 | 19           | 0%              |   |
|   |              | amming   |          | Mon 5/17/21 | Fri 6/11/2 |              | 0%              | Prog  |
| ss if appl  |              |  |          |             |            |              |                 |   |
| ss if appi  | icable)      | sembly   | 73 days  | Tue 4/20/21 | Thu 7/29/2 |              | 0%              |   |
|   |              | facturing  | 35 days  | Tue 4/20/21 | Mon 6/7/2  | 14           | 0%              | Mnfq  |
| n Eston) (3/18 Shawn<br>Shawn sent some older<br>owsome around 126 N.<br>Iculated 12.5 Kn. Big<br>rent data. Danilo said<br>age and the Vantage |              | ve Electrical/Pneumatic items  | 5 days   | Mon 5/31/21 | Fri 6/4/2  | 20FS+10 days | 0%              |   |
|   |              | ve parts from Customer for Setup and Runoff  | 0 days   | Tue 6/1/21  | Tue 6/1/2  | 24FS-5 days  | 0%              | <b>→</b> 6/1  |
|   |              | ve press from Customer   | 0 days   | Tue 6/1/21  | Tue 6/1/2  | 24FS-5 days  | 0%              | 6/1   |
|   |              | nbly   | 19 days  | Tue 6/8/21  | Fri 7/2/2  | 24           | 0%              | Ass'y   |
|   |              | ate programming and debug  | 19 days  | Mon 7/5/21  | Thu 7/29/2 | 28           | 0%              | ,De   |
| they are n  | ot machining |  |          |             |            |              |                 |   |
| Eston. Shawn to see if<br>e retainers we can send   |              | at Vantage   | 1 day    | Fri 7/30/21 | Fri 7/30/2 |              | 0%              |   |
|   |              | Off  | 1 day    | Fri 7/30/21 | Fri 7/30/2 | 29           | 0%              | TRI TRI   |
|   |              | mer Acceptance   | 1 day    | Fri 7/30/21 | Fri 7/30/2 | 29           | 0%              | ·   |
|   |              | ackage/Ship  | 2 days   |             | Tue 8/3/2  |              | 0%              |   |
| wondering if in process<br>part are held within<br>all will be +/- 0.01 mm<br>1 mm. They are done in  |              | n  | 1 day    | Mon 8/2/21  | Mon 8/2/2  |              | 0%              | <u> </u>  |
|   |              |  | 1 day    | Mon 8/2/21  | Mon 8/2/2  |              | 0%              | Tie   |
|   |              | /21)   | 1 day    | Tue 8/3/21  | Tue 8/3/2  | 137          | 0%              |   |

Camcor 200752 Timing Plan.mpp

| item | Operation                 | Item Description   | Key Contact for<br>Item | Actions  | Date Open | Target Close<br>date | Actual Close<br>Date | Comments (and note effectiveness if applicable)   |
|------|---------------------------|--|-------------------------|--|-----------|----------------------|----------------------|---|
| 5    | Press                     | max expected press force for retainer  | Shawn                   |  | 3/8/2021  | 3/12/2021            |                      | (X/10 Shawn working to get this info from Eston) (X/18 Shawn set some older sittle waiting for info - will fly again) (X/24 Shawn sent some older 2016 and X/10 data - loads are VEXF four - some around IZS N, difference - Shawn set ill flying to get current data. Danilo and Shawn could send sample parts to Varlage and the Varlage could send parts fly flowes. Per Shawn they are not machining parts row - would need to get parts from Eston. Shawn to see if the carry of the share of the Varlage could send parts to get the set of the Varlage could send parts for more. Per Shawn they are not machining parts row - would need to get parts from Eston. Shawn to see if the carry of Shaffle from Eston and some relativers we can send to Promesse). |
| 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 4 1 current blerance. Varitage is wondering if in process spec could be that all disameters on one part are held within higher telearces (per Borbly Large pursual with 6+ 4:0.01 mm and smaller inside pursuls can be 4:0.1 mm. They are done in different operations. Bobby indicating concern with shart 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<br>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            | 2040004              | (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/-   | Danilo/Todd             |  | 3/18/2021 | 3/31/2021            |                      | (3/24 request in in Proposal department - should have by next week)   |
| 13   | Feeding<br>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/<br>install info | Shawn requesting info re. shipping and utilities   | Shellie/Zach            | UKA Leaving Life Leaving of Costing? Special Voltage Section Size  Vendor Commer Geology Requirements Voltage Section Size | 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 Danillo 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)  |
|      |                           |  |                         |  |           |                      |                      |   |

Project: Camcor 200752 Assembly System



**Automation Made Seamless** 

#### **Proud Partners of:**



**Robotics** 













Vision Systems













Marking
Systems
DATALOGIC
THE VISION IS YOURS



**MECCO**°





**PLC** 



**SIEMENS** 





Torquing/Press ing

































































































## On-Site Service & Support

+VANTAGE

100% Dedication to Customer Service

Global Support On-Site Representatives

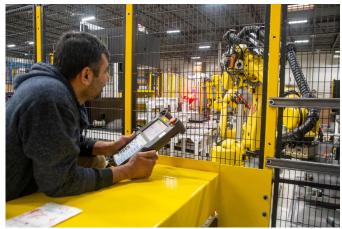
Quick Response Unit and Down Time Recovery

Remote Log In Service in a Moments Notice

24/7 Service Support

On-site Contracts Available

Highly Trained Staff of Engineers & Technicians







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### Mexico

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#### Canada

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# Thank You for Reading! Zero Defects

#### China

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**Automated Inspection** 

**Quality Assurance**