基于物联网技术的智能制造创新平台

罗克韦尔自动化中国有限公司

6-13

Rockwell Automation

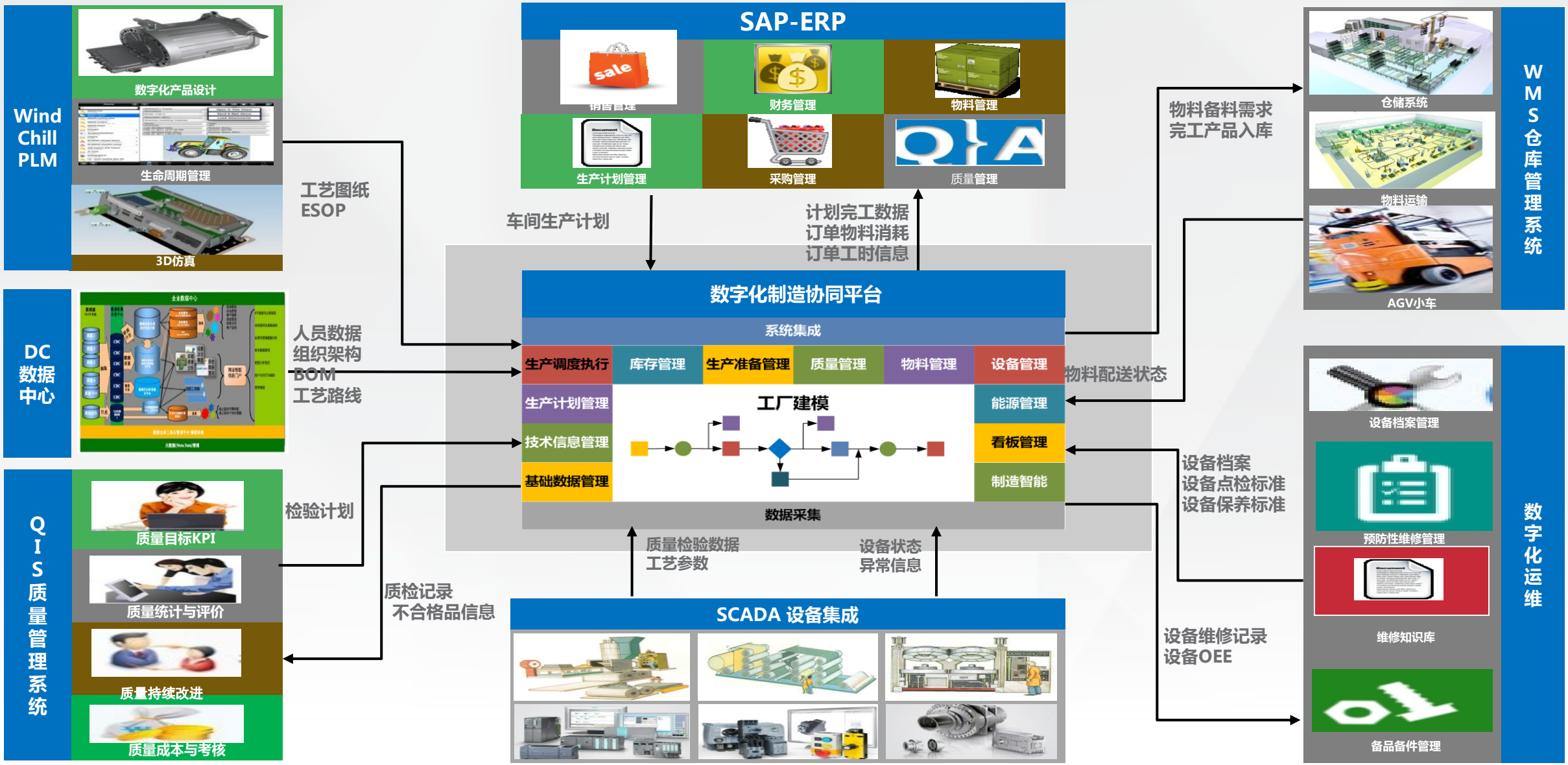
Agenda

1 智能制造系统的建设现状和短板问题

2 物联网与智能制造的融合- 罗克韦尔创新平台

案例演示

某公司智能制造整体规划



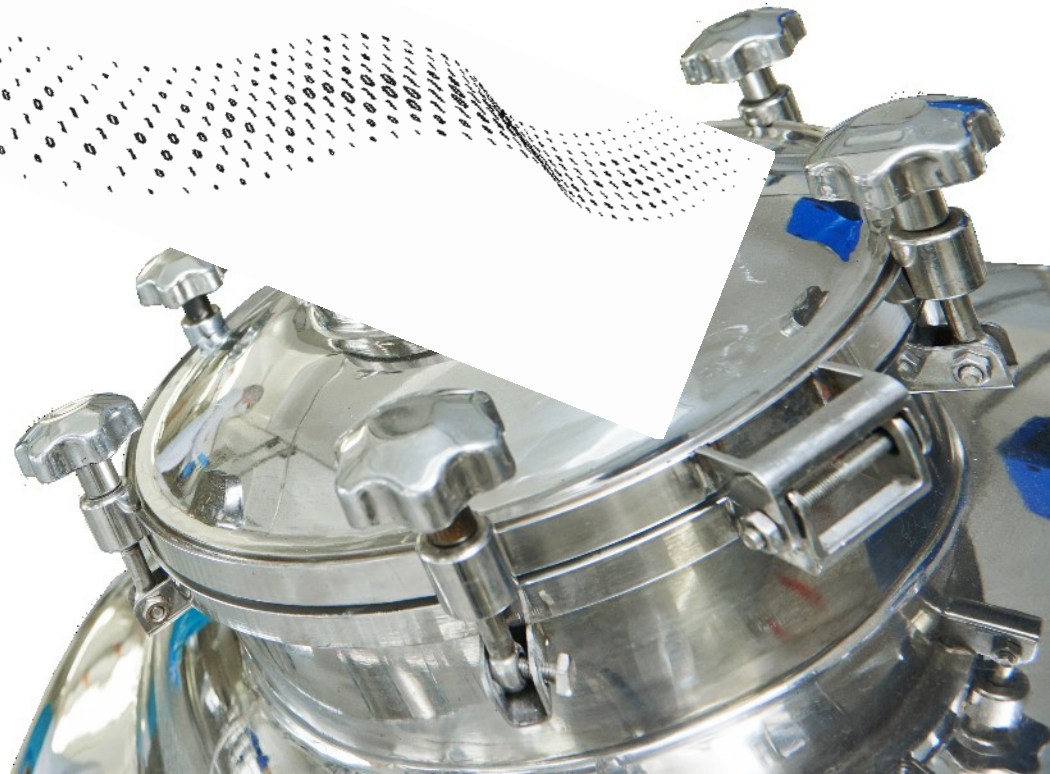
MES/MOM 实施的几个短板问题

1. 本厂-车间的MES试点应用为主，本单位的制造能力加强，但是对供应链的改善有限

2. 对于集团性的企业， 为满足不同产品制造特点而选用的“异构”的智能制造系统，形成了集团内部相互独立的MES 系统

3. MES 业务系统以流程为导向，以数据记录和采集为主，对各系统用户（操作工，管理人员）的决策支持能力有限

4. Happy Patch （异常管理流程能力有限）



制造业发展的趋势-协同制造信息管理平台

协同研发

协同制造

协同服务

整车厂

供应商

供应商

分厂

分厂

- 供应商生产计划下发与调整
- 生产进度跟踪
- 追溯
- 交期跟踪
- 库存跟踪
- 质量测试结果

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制造业发展的趋势-集团化智能制造平台

设计与工艺标准

制造能力与绩效评估

质量标准

集团

分厂

分厂

分厂

分厂

- 集团制造能力评估
- 生产计划下发与调整
- 设计与工艺标准下发
- 质量标准下发
- 交期跟踪
- 在制品库存跟踪
- 制造绩效评估（OEE等）

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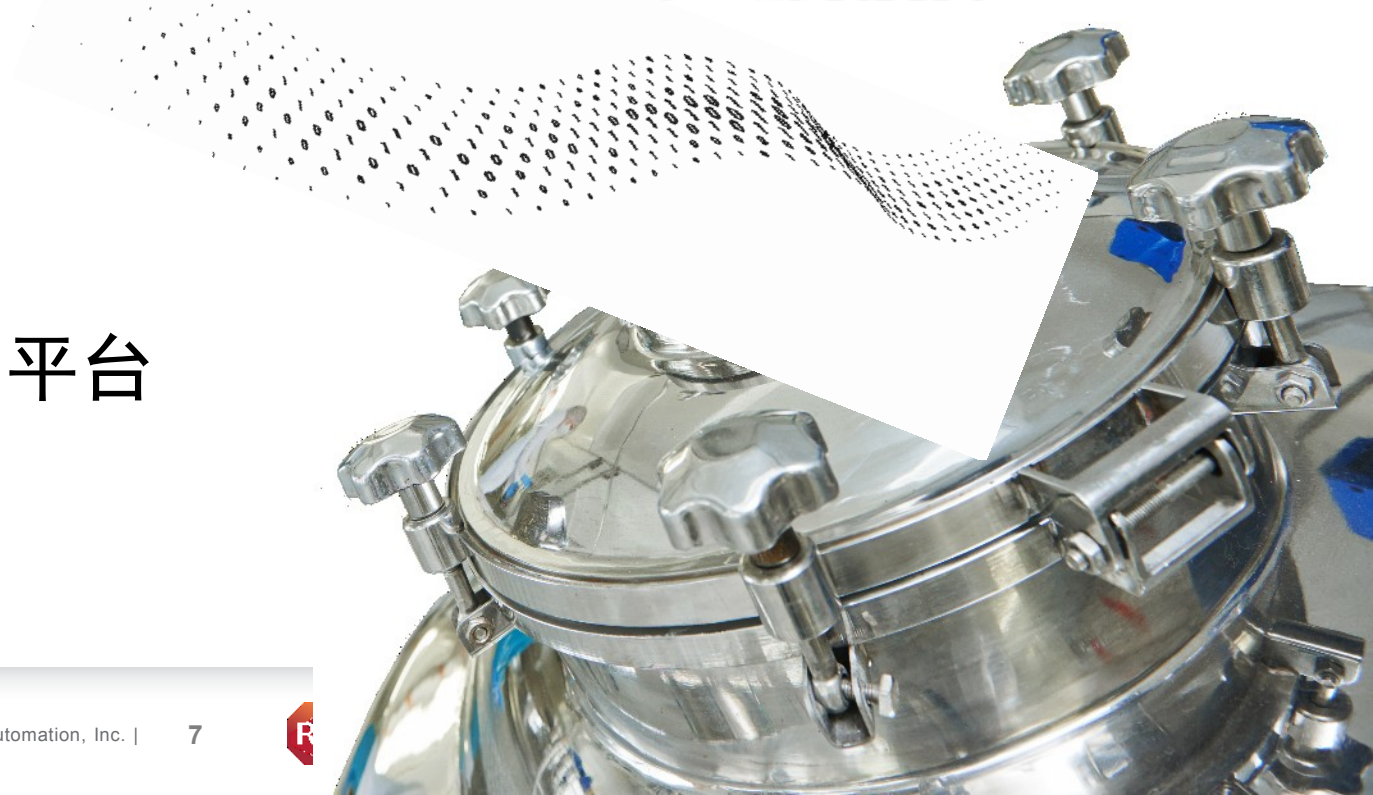
企业智能制造制造系统的未来

1. 供应链的互联互通
2. 在传统的ISA 95标准上，增加集团制造管控的功能层
3. 以人为本，数据赋能
4. 基于业务创新的敏捷开发平台



工厂制造制造系统的未来 – FTPC INNOVATION SUITE

当前

InnovationSuite powered by PTC

ISA-95

L4/L5	Business Systems (ERP, SCM, PLM) Governance & planning
L3	Production Execution (MES / MOM)
L2	Process Monitoring (HMI-SCADA)
L1	Process Sensing, Manipulating (PLC)

MES | 物联网

- 行动支持
- 协同
- 分析与预测
- 模型与展示
- 数据集成

工厂/集团管理层 | 维修人员 | 质量人员 | 操作工

- 连接
- 实时
- 基于角色
- 预测
- 移动应用 & 增强现实
- 应用创新开发平台

物流 | 供应商 | 环境 | IOT 网关

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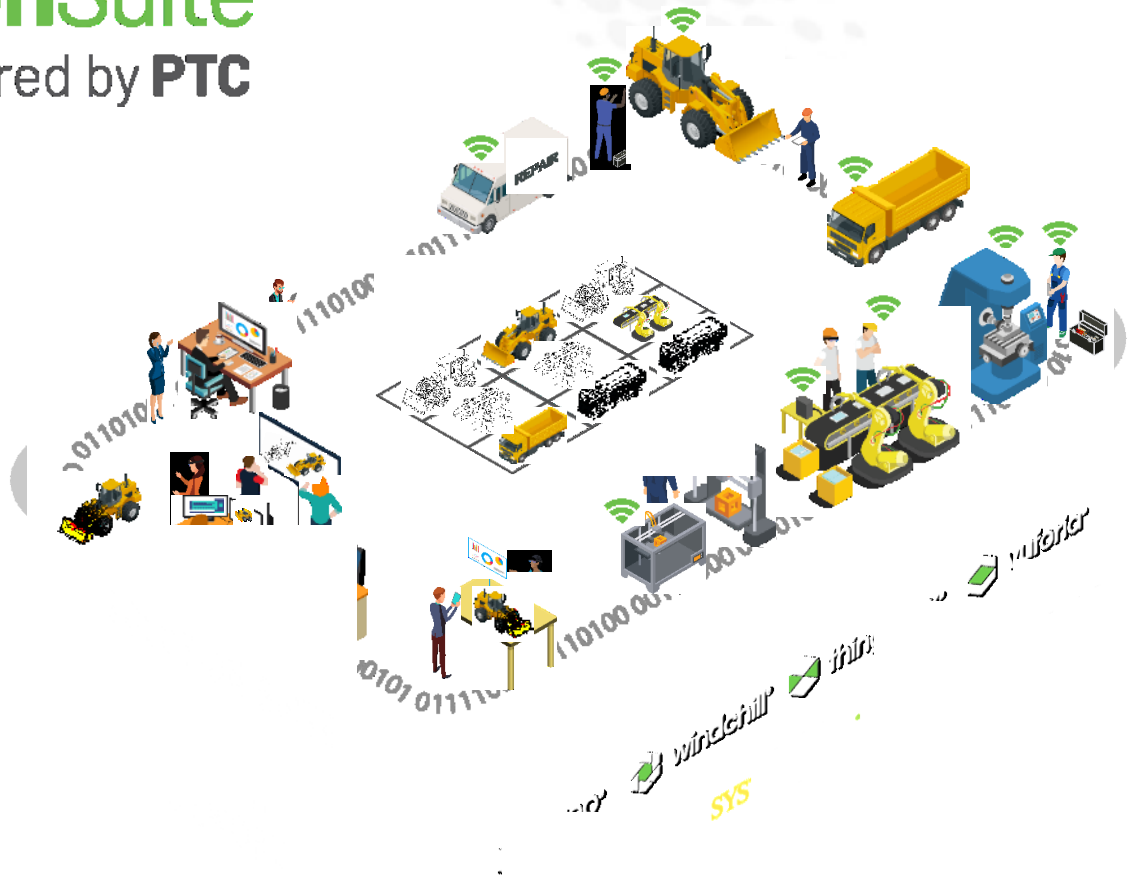
InnovationSuite
powered by PTC



企业运营智能

解决方案提供从顶层到车间的实时制造绩效管理，降低制造成本，提高制造网络的灵活性和敏捷性

设备智能诊断与优化

解决方案支持对设备能力、性能和健康状态进行实时监控、诊断、预测，避免计划外停机，最大限度地提高资产利用率

对员工进行数据赋能

解决方案赋予工人智能化的工作指导，和流程指引，以提高生产效率和质量，避免安全和合规风险

可伸缩MES方案

解决方案提供了模块化的MES方案，使得实施变得简单，快捷，以降低库存成本，提高质量和加快上市时间

企业运营智能-演示

- Acme Tractor Corporation
  - Eastern Europe
    - Minsk
    - Plock
  - Scandinavia
    - Copenhagen
    - Tampere
  - United States
    - Cincinnati
    - Milwaukee
    - San Antonio
    - Tacoma
  - Western Europe
    - Antwerp
    - Lyon
    - Perugia

Cincinnati

COMPARISON DASHBOARD | PLANTS PERFORMANCE CHART | NEWS

Bridgette Jackson
Plant Manager

CONTACT
(610) 453-3274
bjackson@acmetractor.com

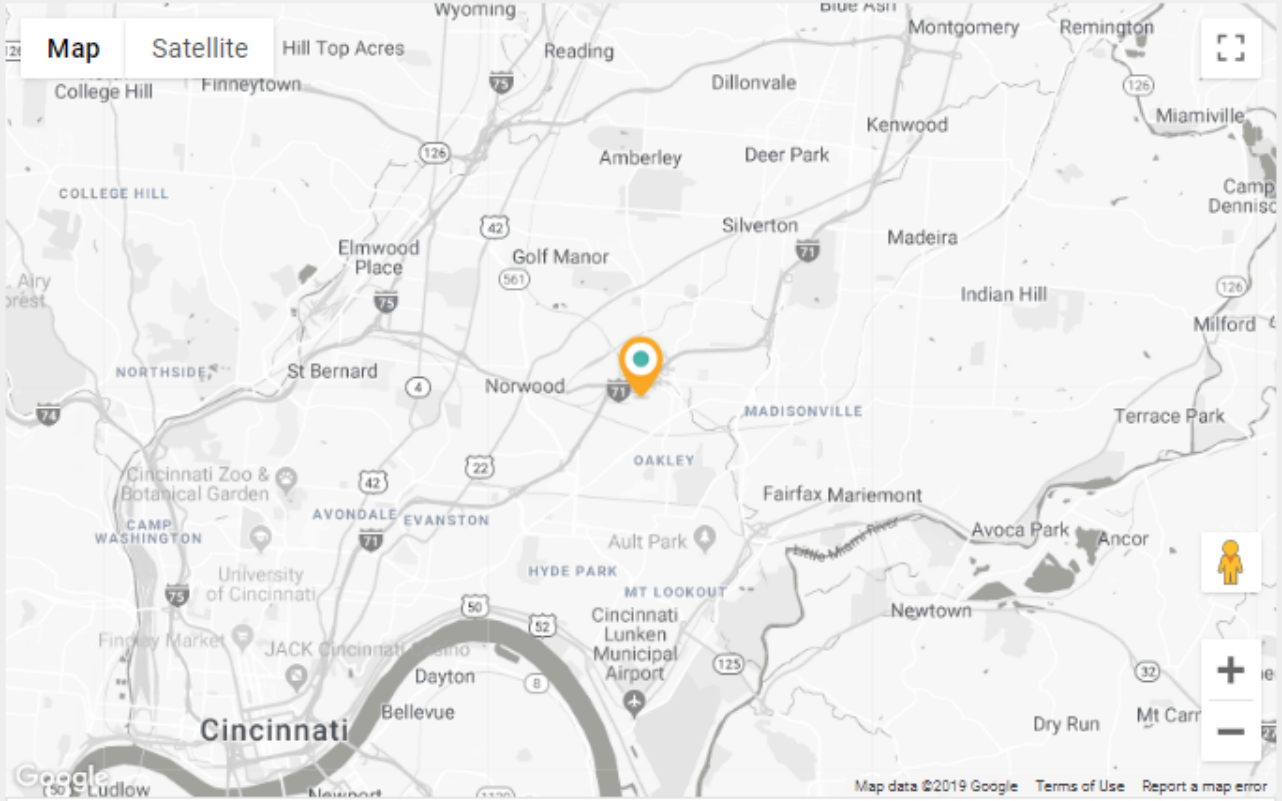
Send a Message

Production Schedule | Plant Details

CURRENT
WEATHER

53.4°F

clear sky

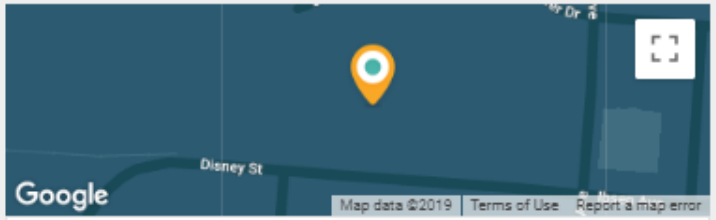


Plant Address
24 Griffey Blvd, Cincinnati, Ohio

Production	Scrap	True Efficiency	OEE	First Pass Yield
34 ↘	6 ↘	78 ↘	55 ↗	95 ↘

Plant: Cincinnati

Change Plant

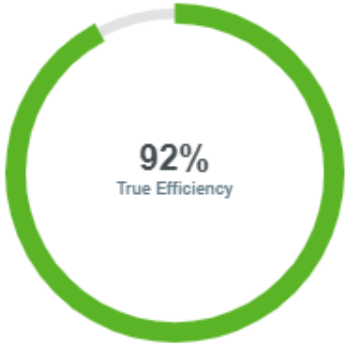


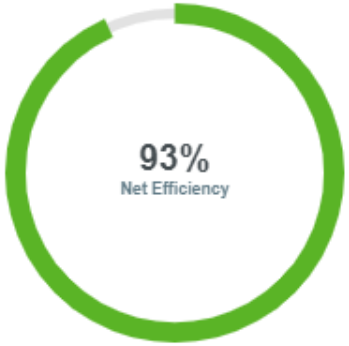
Plant Manager
Bridgette Jackson
(610) 453-3274
bjackson@acmetractor.com

Send a Message

Plant Address
24 Griffey Blvd, Cincinnati, Ohio

View by Area: Final Assembly | Clear



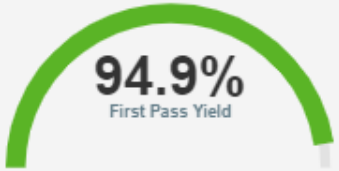


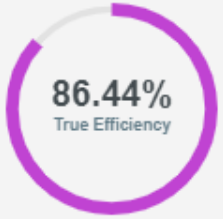
Spotlight Line: Transmission Assembly Line | Pause | Next

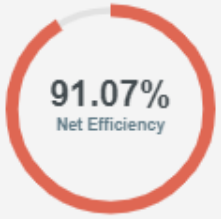
Current Shift: Shift 1

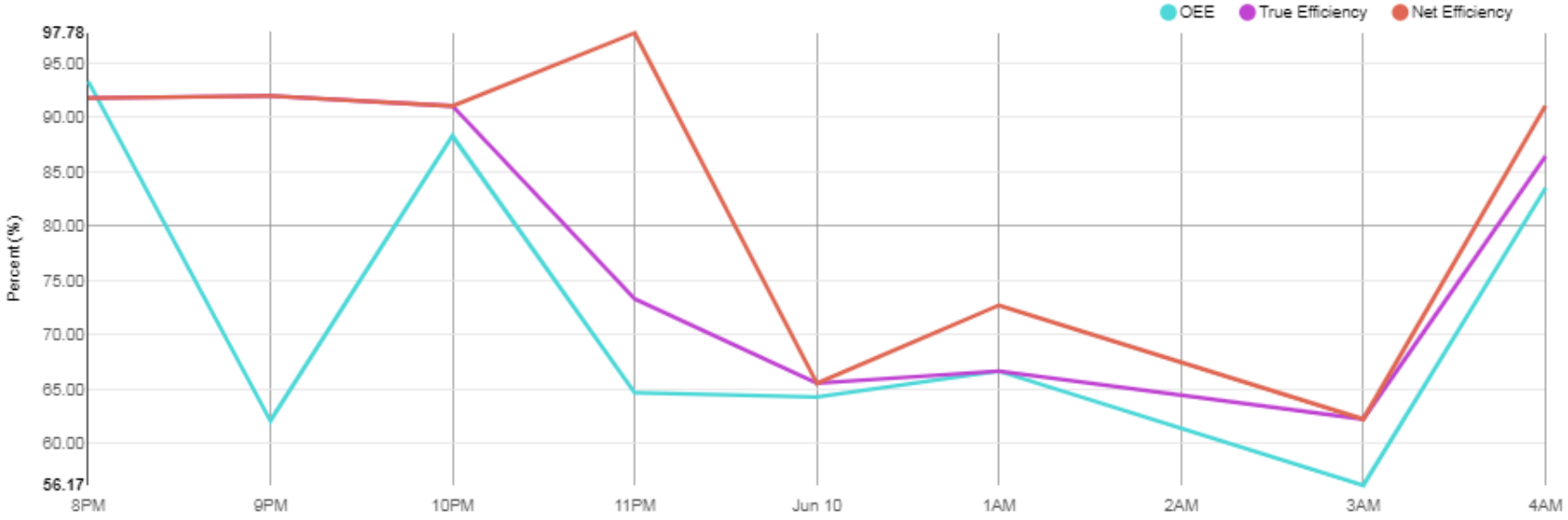
Shift progress 398min

Uptime 370min









ACME tractor manufacturing

HOME | PLANTS | LINE | SCHEDULE | MAINTENANCE | QUALITY

Welcome, DemoUser

Final Assembly Line 1

Current Order: 80 HP Engine Assembly

Scheduled End: 2019-02-20 03:27

Current Reason: Between Orders

Produced PO

NaN%
First Pass Yield
0 250
0 Prod | 0 Rework

Produced Shift

93.8%
First Pass Yield
0 80
75 Prod | 5 Rework

410min
out of 480min

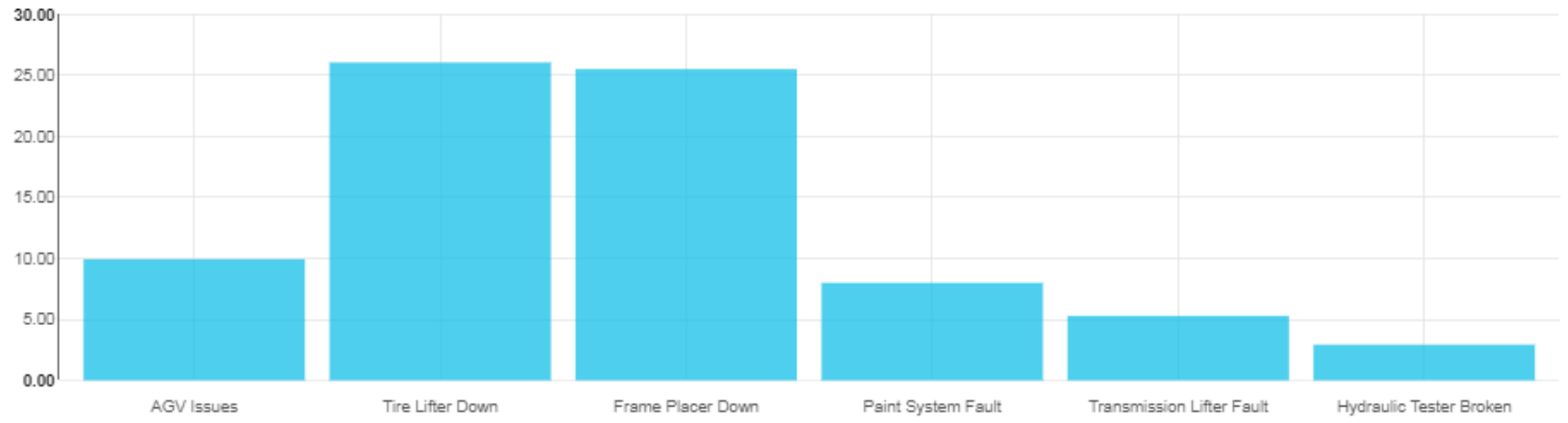
Shift Progress

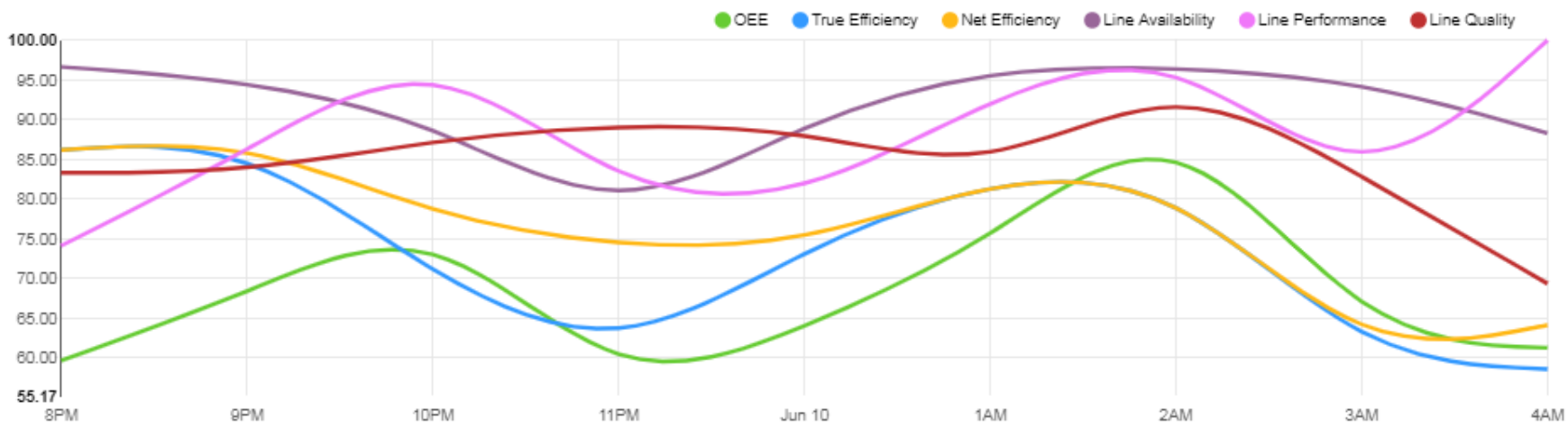
- 327min Uptime
- 58min Equipment DT
- 20min Quality DT
- 0min Other time
- 5min Changeover

60.27% OEE	58.62% True Efficiency	64.15% Net Efficiency
88.33% Availability	98.33% Performance	69.39% Quality

Charts | Prod | BOM | Cons | SPC | Inventory | Utilization | Workspace

Downtime By Duration | Downtime By Occurrence | Rework Reasons | Scrap Reasons





- Acme Tractor Corporation
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  - Western Europe
    - Antwerp
    - Lyon
    - Perugia

Production Line Final Assembly Line 1 Create Order

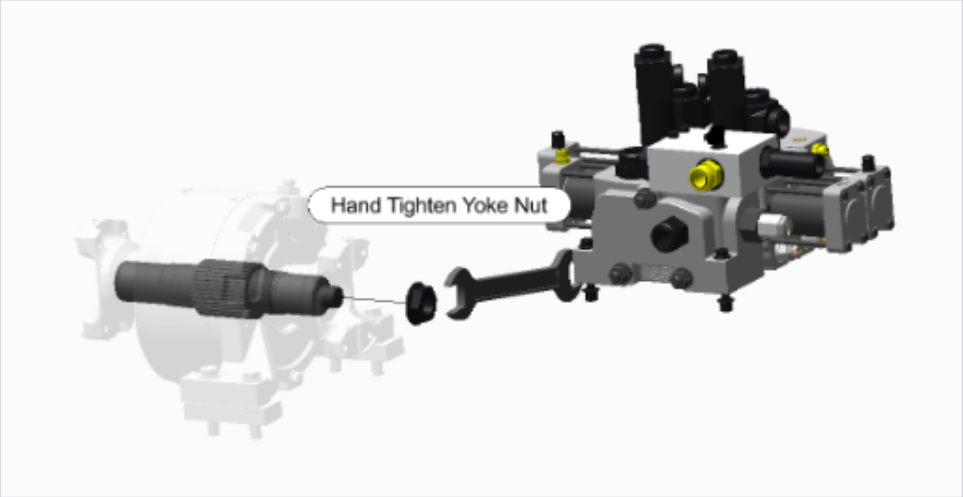
Production Status

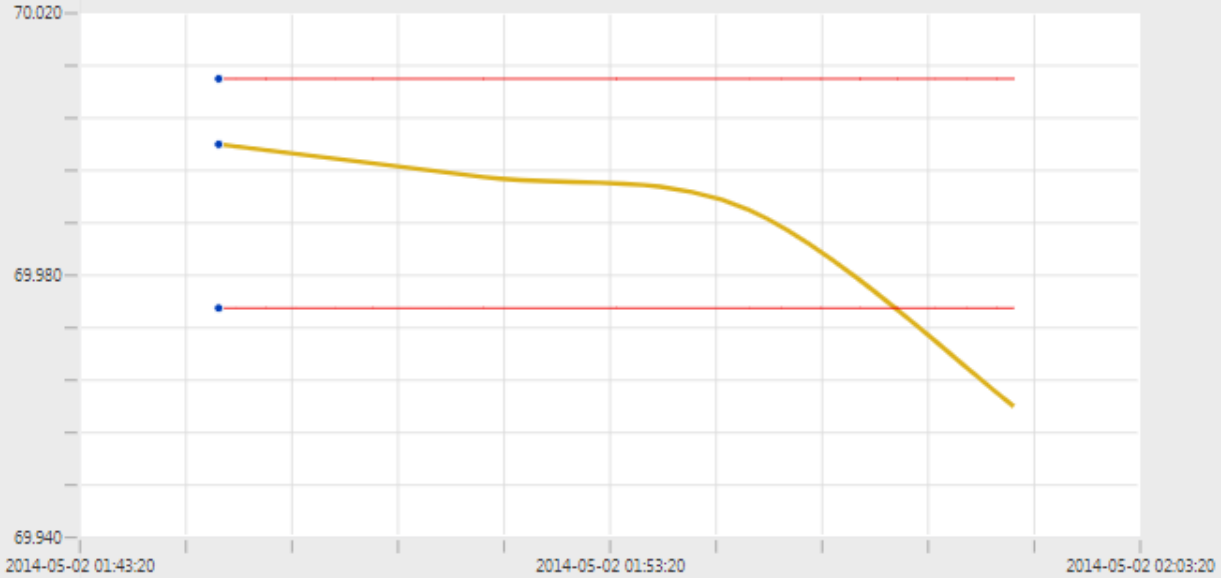
Export

Scheduled Plant	Production Order	Material Description	Required Qty	Status	Inventory Low	Priority	Due Date	Good Qty	Rework Qty	Scheduled Start Date	Scheduled End Date
AcmeTractor.Cincinnati	TR-0001	Light Duty Tractor	200.00	Running	No	1.00	2014-05-08 12:00:00	188.00	12.00	2014-05-05 12:00:00	2014-05-07 12:00:00
AcmeTractor.Cincinnati	TR-0003	Medium Duty Tractor	240.00	Hold	No	3.00	2014-05-12 12:00:00	227.00	13.00	2014-05-09 12:00:00	2014-05-11 12:00:00
AcmeTractor.Cincinnati	TR-0005	Light Duty Tractor	200.00	Running	No	5.00	2014-05-16 12:00:00	0.00	0.00	2014-05-13 12:00:00	2014-05-15 12:00:00
AcmeTractor.Cincinnati	TR-0007	Medium Duty Tractor	240.00	Running	No	7.00	2014-05-20 12:00:00	105.00	5.00	2014-05-17 12:00:00	2014-05-19 12:00:00
AcmeTractor.Cincinnati	TR-0009	Light Duty Tractor	200.00	Running	No	9.00	2014-05-24 12:00:00	0.00	0.00	2014-05-21 12:00:00	2014-05-23 12:00:00
AcmeTractor.Cincinnati	TR-0101	Light Duty Tractor	250.00	Hold	No	1.00	2019-03-26 00:58:00	0.00	0.00	2019-03-26 00:58:00	2019-03-26 00:58:00

Inspection Details

Step 1 | **Step 2** | Step 3





Technician

Zach Williams
(216) 440-8548
zwilliams@acmetrucking.com

Current Part Inspection

70,000

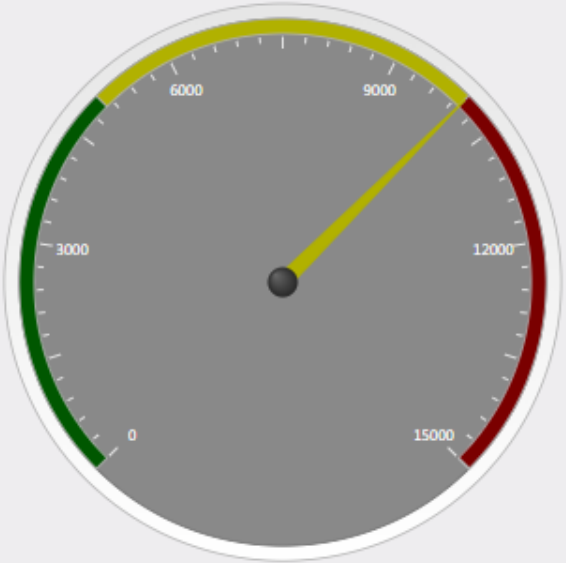
Current Lot

800

Part #

3321

Defects PPM



Inspection Log | Submit NCR | Blog | NCR Status

Date	Critical Dimension	Part #	Lot #	Model	Vehicle S/N
2014-05-02 01:45:57.000	**70.0000**	**3321**	**800**	**CX800g**	**CXG899563**
2014-05-02 01:50:57.000	69.9950	3321	800	CX800g	CXG899563
2014-05-02 01:55:57.000	69.9900	3321	800	CX800g	CXG899564
2014-05-02 02:00:57.000	69.9600	3321	800	CX800g	CXG899564

Lot Genealogy

Produced | Consumed

Material Medium Duty Tractor

Lot ID LOT-TR-0003

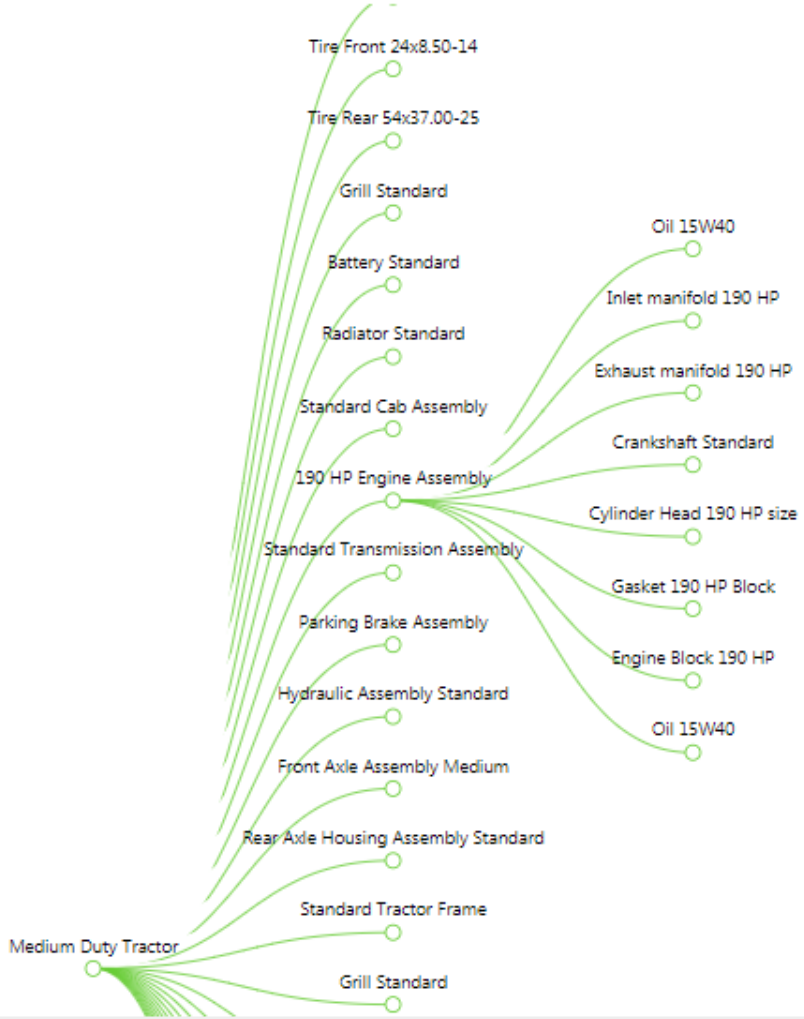
Retrieve Components

Lot ID:

Material ID:

Material Description:

Quantity:



DEMO-设备智能诊断与优化

Demo：对员工进行数据赋能

XY9H48
259D CAT
TWO SPEED
HAWTHORNE CAT
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罗克韦尔FTPC 创新平台

- 融合物联网技术，整合IT 和OT 的创新平台
- 支持私有云/本地部署/边缘计算
- 模块化实施，降低实施难度和成本
- 增强现实技术，将数据赋能给管理人员与员工
- 独一无二的创新智能制造信息化平台

Thank you!

www.rockwellautomation.com