

Deploying a Common 3D MBE

within a

Multi-CAD, Multi-PLM, Multi-Source

Enterprise Environment

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Anark Corporation

GLOBAL PRODUCT DATA INTEROPERABILITY **S U M M I T** 2014



ELYSIUM

Parker

NORTHROP GRUMMAN

BOEING



Ride the 3D MBE Wave !!

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Anark Company Overview

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Leading provider of advanced visualization and PLM software and solutions to industry leaders since 2000.

Empowering 3D Model Based Enterprise revolution within Aerospace, Defense, Automotive, Energy, Industrial, Communications, and Furniture Sectors

Growing company, with world-wide network of technology, integration, and channel partners

Anark Corporation HQ in Boulder, Colorado



Our PLM Integration Partner:

Geometric LTD.



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- World's leading solutions provider with **exclusive focus on Product Realization** – the engineering to manufacturing domain
- Public listed company
- **Over 4500 people globally**
- Global delivery model with delivery centers in **US, Europe, China and India**
- Software Solutions portfolio including **DFMPro, CAMWorks, Glovius**
- Engineering services, embedded systems and technologies.

Global Presence



PLM Integration Partnerships



Cross Industry Customer Footprint

- 8 of the Global Fortune Top 10 **Automotive OEMs**
- 7 of the world's leading **Aerospace OEMs and suppliers**
- 5 of the world's leading **Machine tool players** in their respective segments
- 5 of the top 10 **Off-highway OEMs**

Terms we will use today...

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- **3D MBD/PMI – Model Based Definition** (aka. Product Manu Info)=
Engineering Product Definition inside native CAD which captures Design Intent (associative 3D GD&T, 3D +/- Tolerances) **without 2D Drawings**

- **3D MBE – Model Based Enterprise =**
Reuse of 3D MBD outside of CAD, combined with additional information from PLM, ERP, MES, CRM... (**The Complete Product Definition**) in Open 3D HTML or 3D PDF

- **3D TDP – Technical Data Package =**
DOD Release Document which defines The Complete Product Definition in 3D (in accordance with MIL-STD-31000 Rev A)

- **Data Sources for *The Complete Product Definition* –**
PLM= Assembly Configuration, some manufacturing data (Enovia, TC, Windchill)
ERP= More manufacturing data, Inventory, Work Processes...(Microsoft, SAP, Oracle)
MES= Real time manufacturing data (SAP, Epicore, Apriso, JobBOSS...)
CRM= Manages Customer and Supplier manufacturing data (Microsoft, Oracle, Salesforce)

Why the move to 3D Model Based Enterprise

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TOYOTA

50% Reduction Tooling design & fabrication

33% Reduction Overall assembly hours

30% Reduction Rework

BOEING®

50% Reduction Tooling design & fabrication

30% Reduction Overall assembly hours

50% Reduction Rework



30% Reduction

20% Reduction

50% Reduction

Engineering Overhead

Scrap and Rework

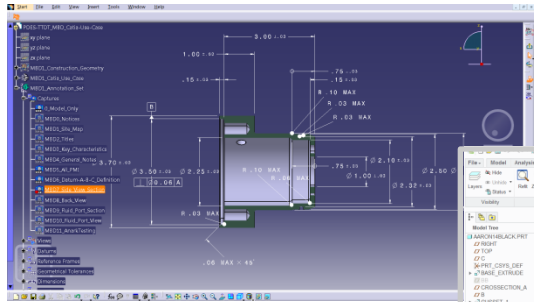
Supplier Response Time

Source :<http://model-based-enterprise.org/Starting-Model-Based-Enterprise/default.aspx>

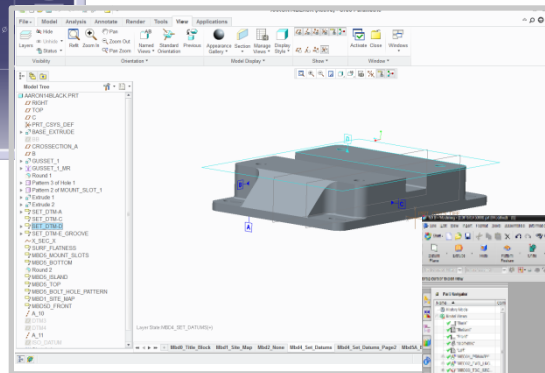
DOD Report: <http://model-based-enterprise.org/2012-assessment.aspx>

Many Enterprises use multiple Proprietary CAD Systems

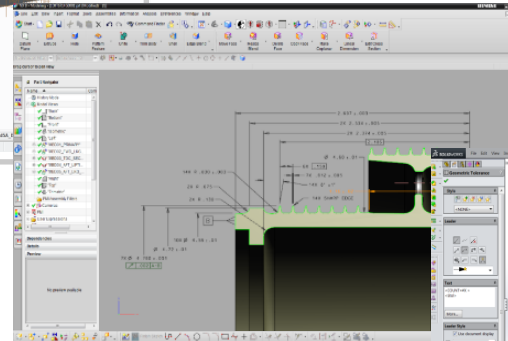
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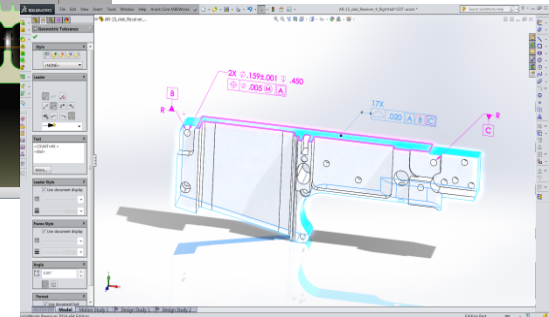
Native **CATIA** + **MBD**



Native **Creo** + **MBD**
creo
A PTC Product



Native **NX** + **MBD**



Native **SW** + **MBD**



Designers want to use the Best CAD tool for their Design Requirement

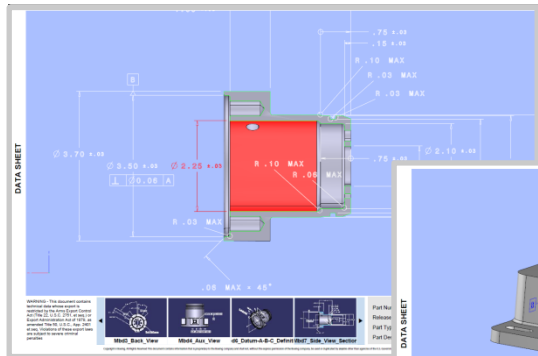


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INTEROPERABILITY
SUMMIT 2014

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Anark creates a Common 3D-MBE from multi-CAD

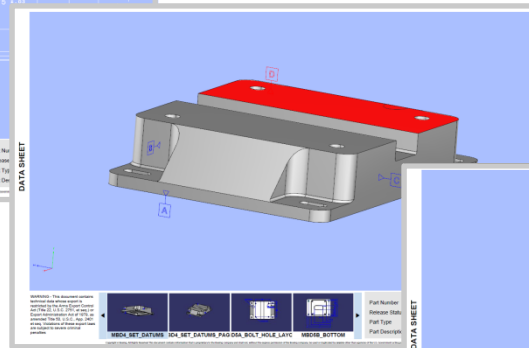
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From Native
CATIA + MBD



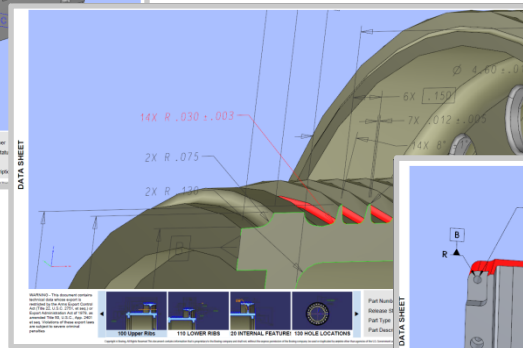
to Native
3D PDF - 3D HTML



From Native
Creo + MBD



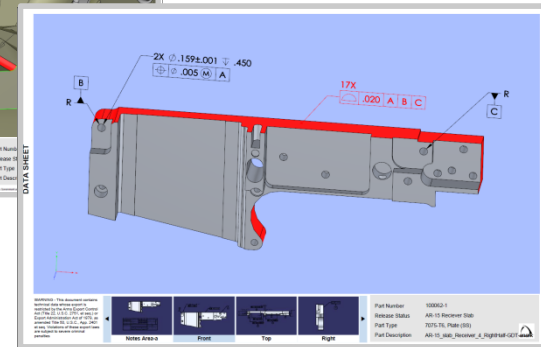
to Native
3D PDF - 3D HTML



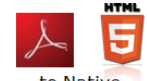
From Native
NX + MBD



to Native
3D PDF - 3D HTML



From Native
SW + MBD



to Native
3D PDF - 3D HTML

Consumers of Engineering Data want low-cost Open Platforms }

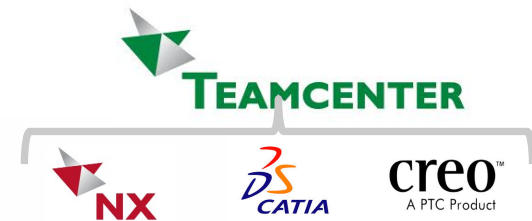


to Native
3D PDF - 3D HTML

Some Enterprises use multiple Proprietary PLM Systems

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Dassault Enovia
CATIA + MBD



Windchill®
A PTC Product

PTC Windchill
Creo + MBD

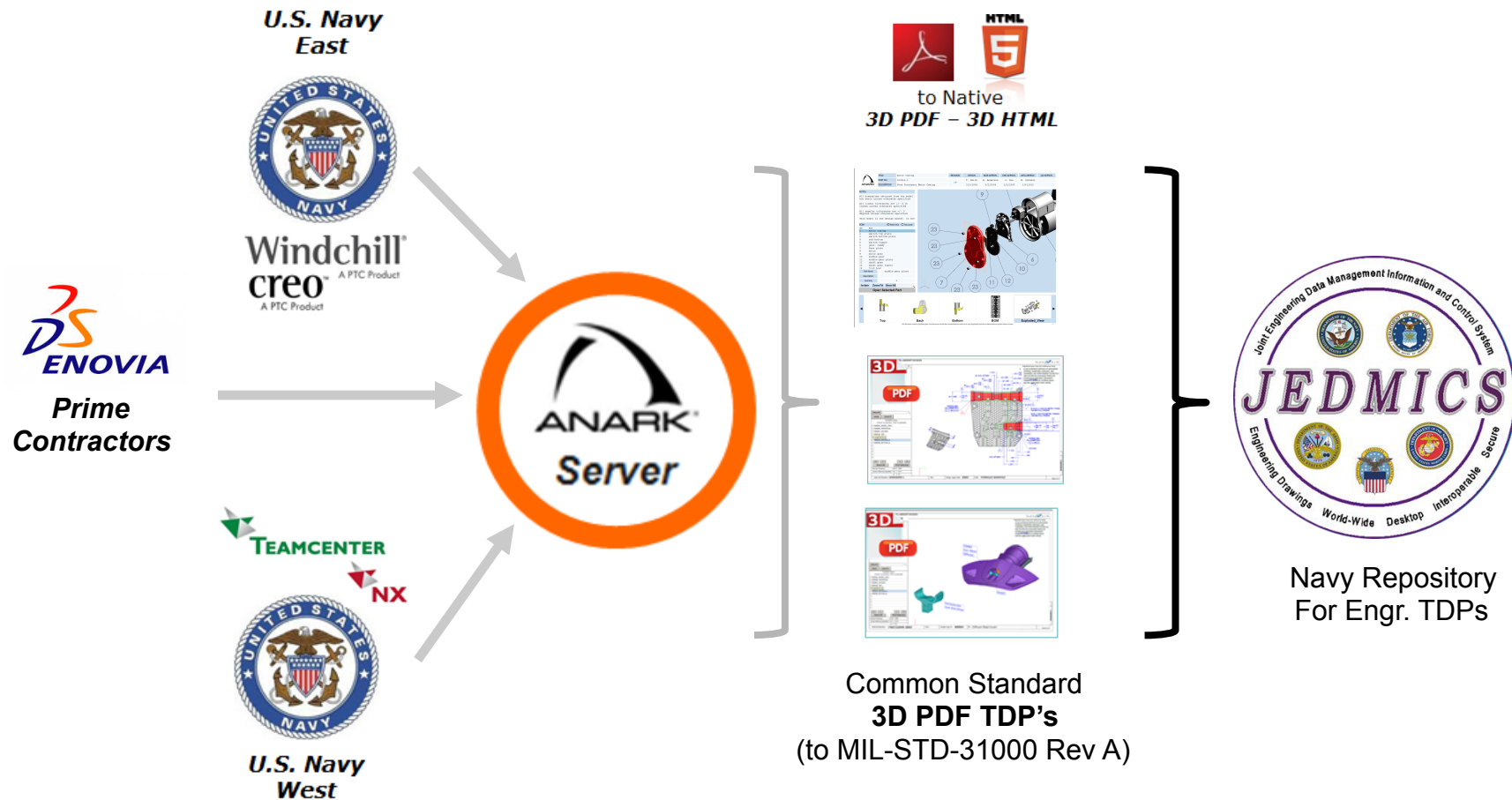


Siemens Teamcenter
NX + MBD

Enterprises want to avoid high cost of migrating PLM data to a single software platform

Anark creates Common 3D-MBE from multi-PLM

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Consumers of Enterprise Data want low-cost Open Platforms



The Complete Product Def...is stored in many places

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...Most Manufacturing data is stored in ERP, MES, CRM

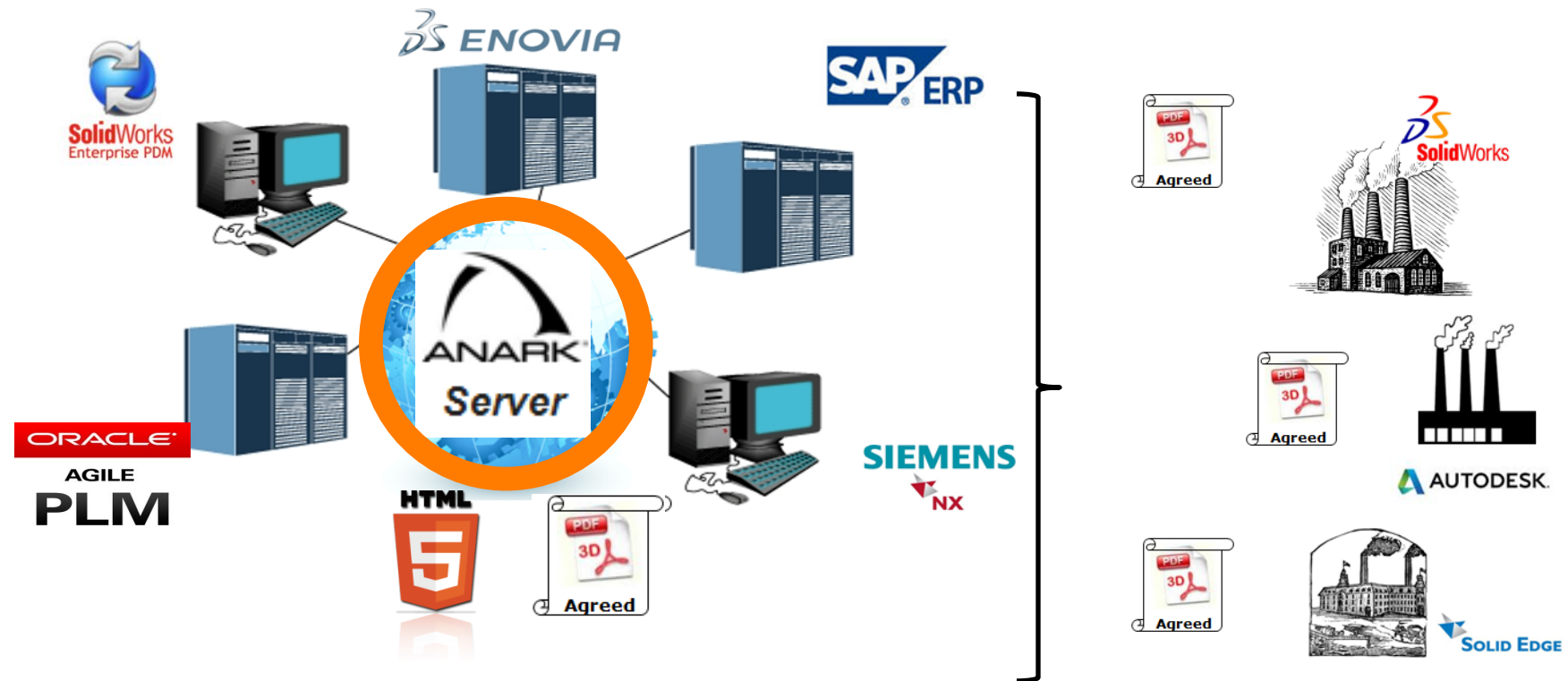
...Most Engineering data is stored in Multi-CAD & Multi-PLM Environments



PLM is good for Engr. data but ERP is Best for Manufacturing data

Anark creates Common 3D-MBE from multi-Source

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Suppliers

Consumers of Manufacturing Data want low-cost Open Platforms



Not all Open 3D PDFs / 3D HTML Docs are created equal...

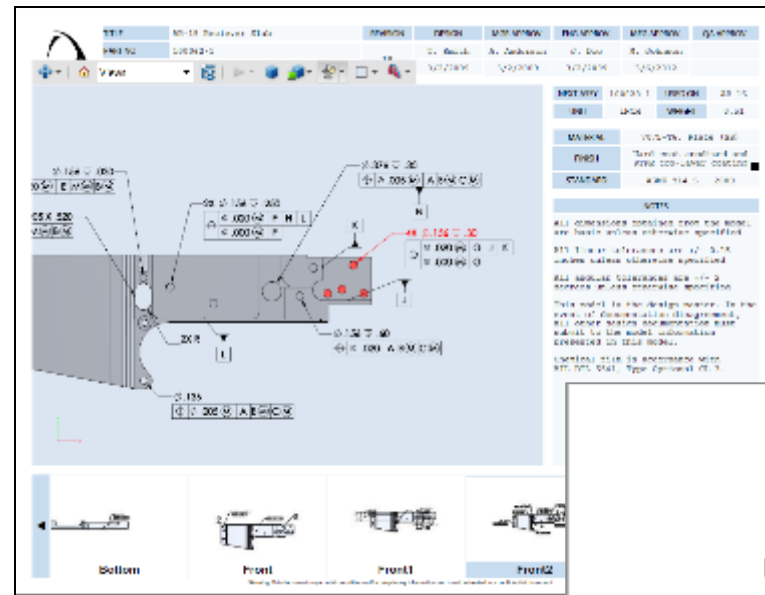
**PIXEL PERFECT
3D MBE DOWNSTREAM**

**TRANSFORMS COMPLETE
PRODUCT DEFINITION**

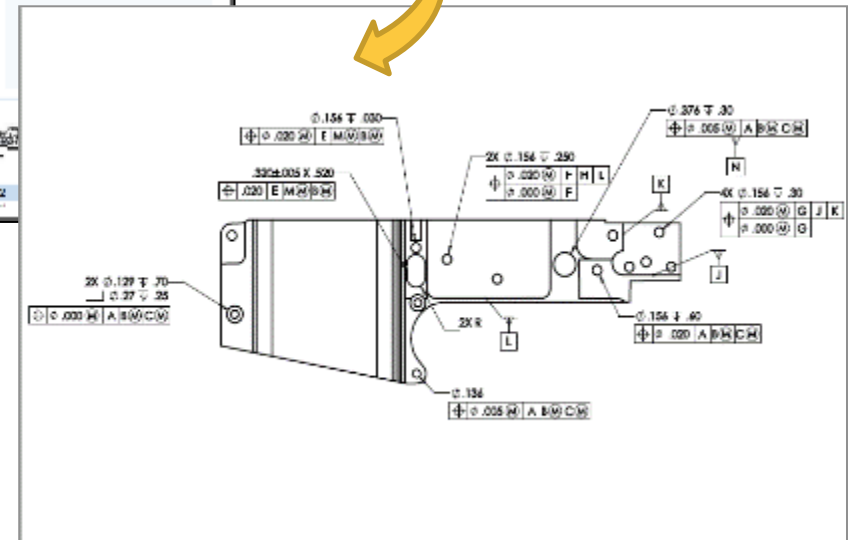
**TEMPLATE DRIVEN,
FIT FOR PURPOSE**

**EBOM-MBOM
SYNCHRONIZED,
COMMON 3D VIEW**

**AUTOMATIC UPDATES &
ALWAYS IN-SYNC**



3D MBD for 3D MBE Processes




**High Quality 2D Vector MBD for Paper-Based
Processes**

3D MBE to 2D MBD

Transforms 3D MBD to 3D MBE & 2D MBE Process Docs

Common 3D MBE Deployment on Open Platforms (demo)

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TITLE	motor casing	REVISION	DESIGN	MGR APPROV.	ENG APPROV.	MFG APPROV.	QA APPROV.
PART NO	100062-1	19	T. Smith	A. Anderson	J. Doe	M. Johnson	
DESCRIPTION	Food Processor Motor Casing						

NOTES

All dimensions obtained from the model are basic unless otherwise specified

All linear tolerances are +/- 0.15 inches unless otherwise specified

All angular tolerances are +/- 2 degrees unless otherwise specified

This model is the design master. In the

BOM

Item Name

1	motor casing
2	switch top plate
3	switch bottom plate
4	red button
5	switch toggle
6	gear- caddy
7	base plate
8	motor
9	motor gear
10	middle-gear
11	middle-gear plate
12	shaft gear
13	shaft gear insert
14	front bowl

Part Name middle-gear plate


Description

Quantity 1

Isolate Zoom Fit Show All

Open Selected Part

Top



TITLE	Base Plate	REVISION	DESIGN	MGR APPROV.	ENG APPROV.	MFG APPROV.	QA APPROV.
PART NO	100062-1	19	T. Smith	A. Anderson	J. Doe	M. Johnson	
DESCRIPTION	Base Plate						

NEXT ASSY 100028-1 USED ON AR-15

UNIT INCH WEIGHT 64.14


MATERIAL Material -not specified-

FINISH Hard coat anodized and top-layer coating

Model Tree

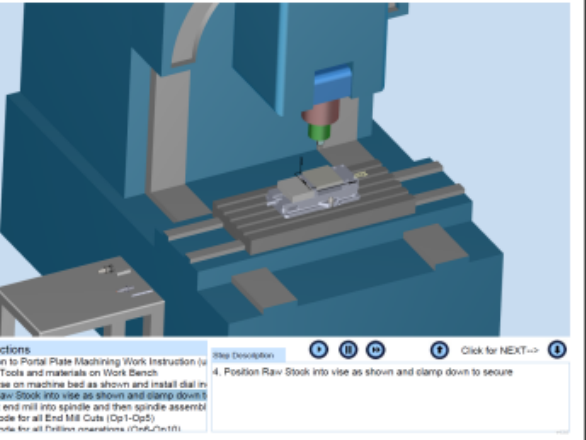
- brake caliper t
- Ball Joint Steer
- Ball Joint Steer
- Tie Rod
- lower control
- Bracket Upper
- Bracket Lower
- Collover
- Revised On
- Revised On
- Revised On
- Control Arm N
- Control Arm N
- carter pin
- carter pin
- carter pin
- Brake Caliper
- Brake Caliper
- Upper Control
- Upper Control
- Lower Control

001Default 002Front



Geometric

Plate Portal NC Machine Work Instruction



Step Instructions

1. Introduction to Portal Plate Machining Work Instruction (v
2. Set these Tools and materials on Work Bench
3. Position vise on machine bed as shown and install dial in
4. Position Raw Stock into vise as shown and clamp down
5. Install Flat end mill into spindle and then spindle assembly
6. Run NC-code for all End Mill Cuts (Op1-Op5)
7. Run NC-code for all Flatness operations (Op6-Op10)

Step Description

Click for NEXT-->

Engr. Rel 3D PDF
Assembly
Technical Data
Packages

Engr. Rel 3D PDF
and 2D PDF
Part Level TDPs

MBOM-EBOM Alignment
Make-Buy Bill of Materials

3D MBE NC Machining Animated Work Instr.

Deploying a Common 3D MBE Open Platform (Summary)

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- **3D MBE will be the preferred information exchange method**
 - For Design to Manufacturing and the Supply Channel
 - Over 2D Drawings and Paper Based Processes
- **The value is clear**
 - With savings of 30% Engr, 20% Scrap & 50% Supplier time common.
- **Many Enterprises chose to use Multiple CAD Design Software**
 - Use the Best CAD tool for the Design Requirements
- **Many Enterprises must continue to use Multiple PLM Systems**
 - Cost of migration is prohibitive if even possible
- **All Enterprises have Enterprise data stored in multiple databases**
 - Design Data is best stored in PLM, Manufacturing Data best stored in ERP
- **Anark Unleashes the Model Based Enterprise on Low-cost Open Platforms**

Ride the 3D MBE Open Platform Wave...

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...Don't just sit on the boat

Thank you for joining us today!!

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and/or the 3D PDFs used...

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chris.garcia@anark.com

