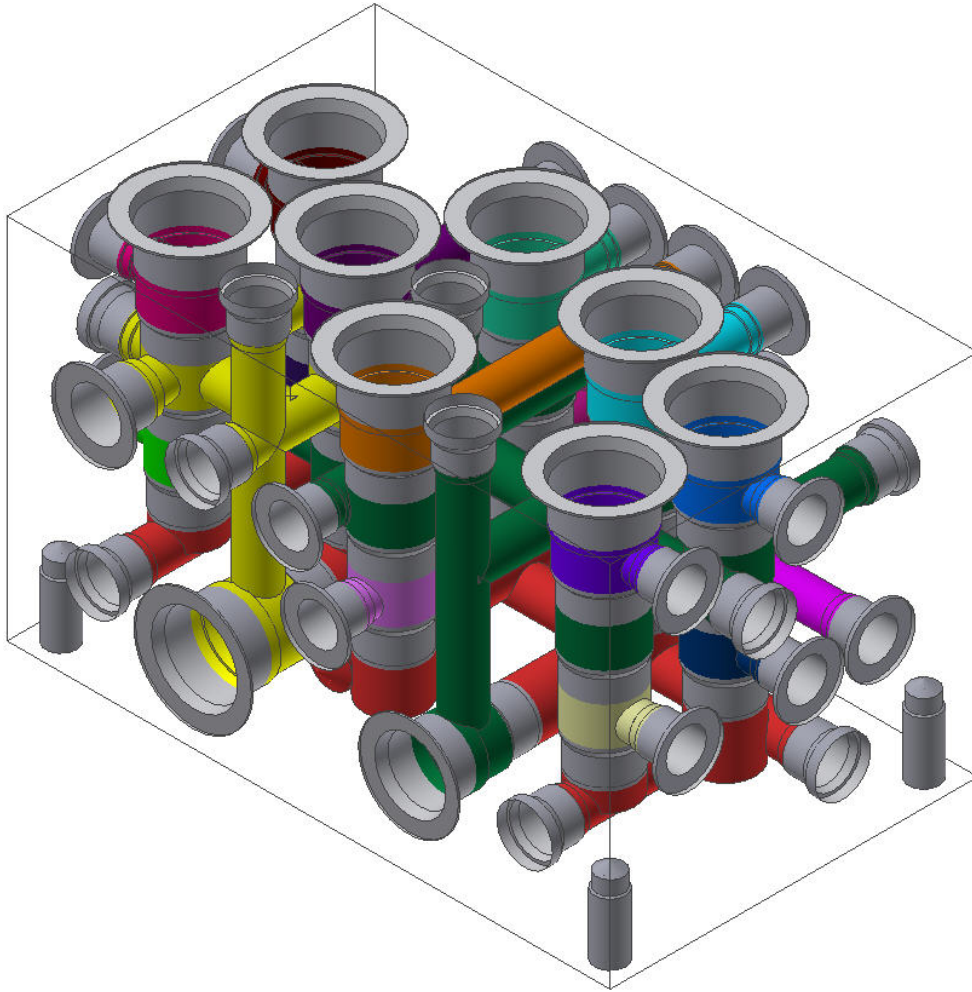


POWER-to-DESIGN MANIFOLDS

MDTools® 950 What's New



MDTools® 950 - What's New

Improved User Interface

- License Option in Drawing and Assembly Menu
- User Interface and Report Formats Improved
- Select a Net from List of Available Nets in Manifold

Shrink Wrap

- Shrink Wrap Manifold Assembly
- Shrink Wrap Non-Rectangular Manifolds

Generate Machining ID

- Retain Machining IDs when Revising Your Manifold Design

Manifold Assembly

- Modify Manifold Assembly
- Preview CAD Model on Selection
- Auto Assemble Components

Create Machining Drawing

- Specify Margin for Drawing Templates
- Specify Minimum Distance Between Views

New Interactive Functionality

- Position Cavities or Footprints by Dragging when Inserting or Connecting Cavities

New and Enhanced Checking Functionality

- Check Conformance to Schematic
- Check for Poor Connections
- Repetitive Information Removed in Meet List
- Manufacturing and Tooling Check – Actual and Standard Values Displayed

Miscellaneous

- Align Multiple Cavities
- Easily Manage O-ring Machining Information
- Maintain Existing Text Height when Editing All Engravings
- Enter Net Name for Orifice on Insertion

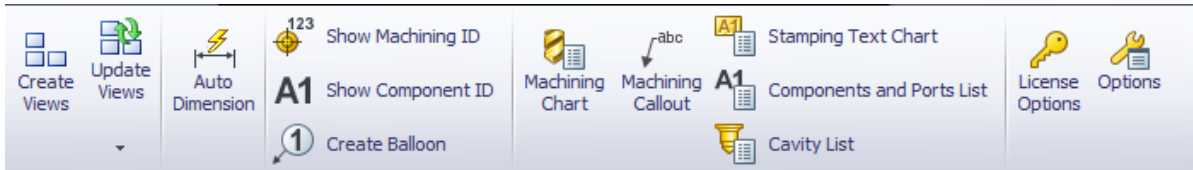
Recap

Contact Us

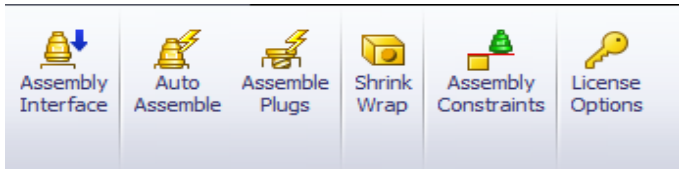
Improved User Interface



Drawing Menu

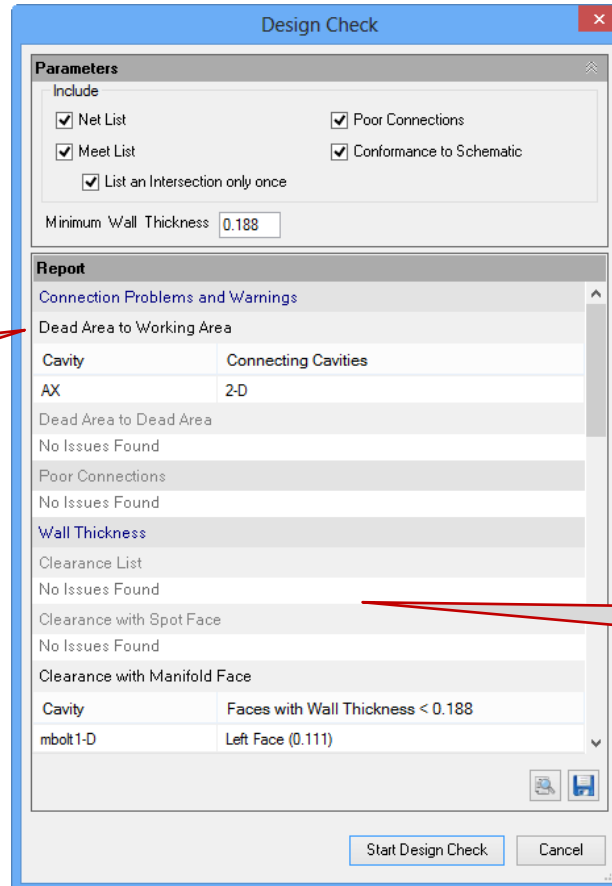


Assembly Menu



Manage MDTools license while working in the Drawing or Assembly environment

User Interface and Report Formats Improved



Sections with issues are highlighted

Sections with no issues are grayed out

Note: Similar changes are made in Wall Thickness Check, Connection Check, Create Meet List, and Manufacturing and Tooling Check

Select a Net from List of Nets in Manifold



The screenshot shows the MDTOOLS 950 interface. On the left, the 'Library' pane lists 'SP Ports' with 'SP-02' selected. Below it, the 'Port Information' table shows a port with 'Pressure' flow and 'Net Name' field. A popup menu is open over the 'Net Name' field, listing NET-1 (red), NET-2 (yellow), NET-3 (cyan), NET-4 (green), and NET-6 (magenta). A red callout box points to this popup with the text: "Popup appears when the Net Name field is clicked".

Port	Flow	Type	Net Name
1	Pressure		

- NET-1
- NET-2
- NET-3
- NET-4
- NET-6

List of nets used in manifold

The 'MDTools Options' dialog box is shown with the 'Net Color' tab selected. It features a 'Default Net Properties' table with columns for 'Net Name' and 'Color'. A red callout box points to this table with the text: "List of all nets defined as default nets".

Net Name	Color
NET-1	Red
NET-2	Yellow
NET-3	Cyan
NET-4	Green
NET-5	Magenta
NET-6	Blue
NET-7	Pink
NET-8	Grey
NET-9	Brown
NET-10	Light Blue
NET-11	Dark Green

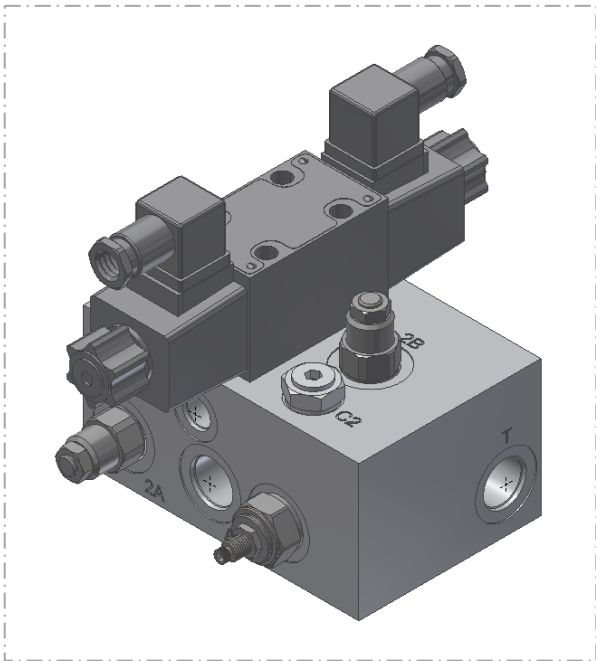
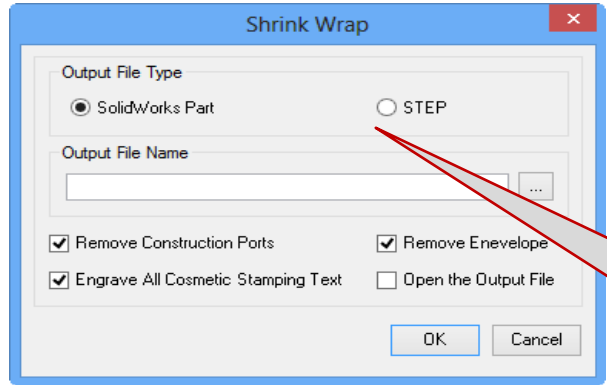
The screenshot shows the 'HyDraw Schematic' pane in MDTOOLS 950. It displays a list of components and ports under the 'Components and Ports' section. A red callout box points to this list with the text: "All nets used in HyDraw Schematic, if HyDraw Schematic data is saved in design".

- NET-1
- NET-2
- NET-3
- NET-4
- NET-6
- NET-7

All nets used in HyDraw Schematic, if HyDraw Schematic data is saved in design

Shrink Wrap

Shrink Wrap Manifold Assembly

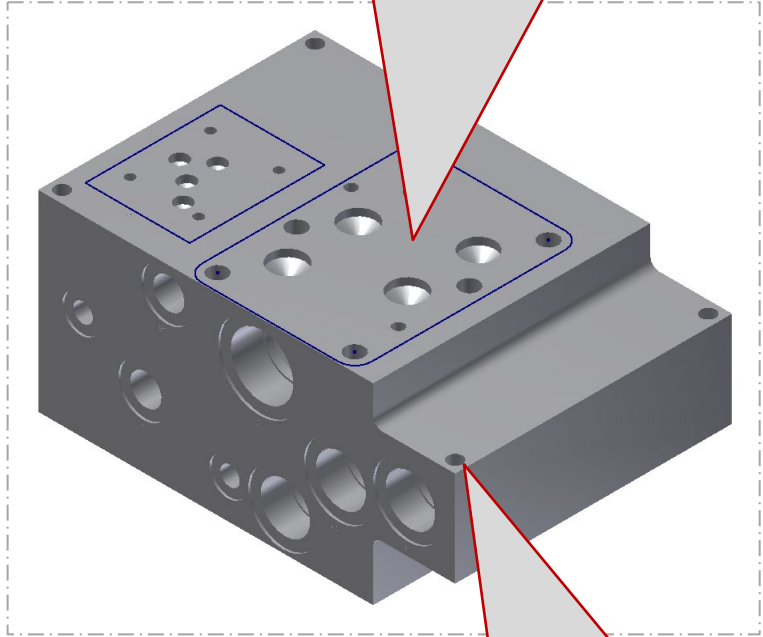
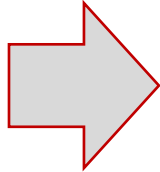
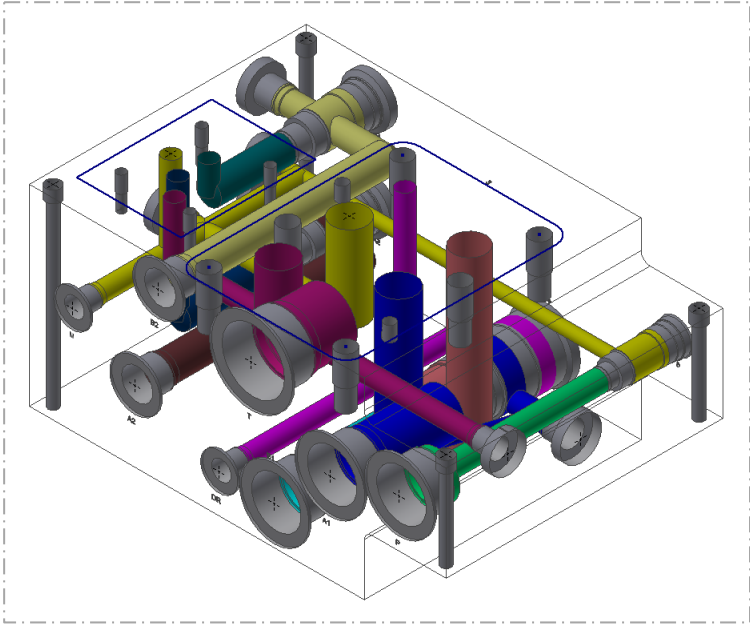


Deliver shrink-wrapped assembly in Solidworks Assembly (.sldasm) or the STEP format (.stp)

Shrink Wrap Non-Rectangular Manifolds



Internal connectivity information is removed



Through bolt holes are kept unchanged

Generate Machining ID

Retain Machining IDs when Revising Manifold Design



Generate Machining ID

Naming Scheme

- 1, 2A, 2B, 3, 4...
- 1A, 1B, 2A1, 2A2, 2B...
- AA, AB1, AB2, BA, BB...
- 101, 102, 201, 202, 203...

Group Identical Cavities

Change Face Name

Sort by

- Diameter
- Distance

Text

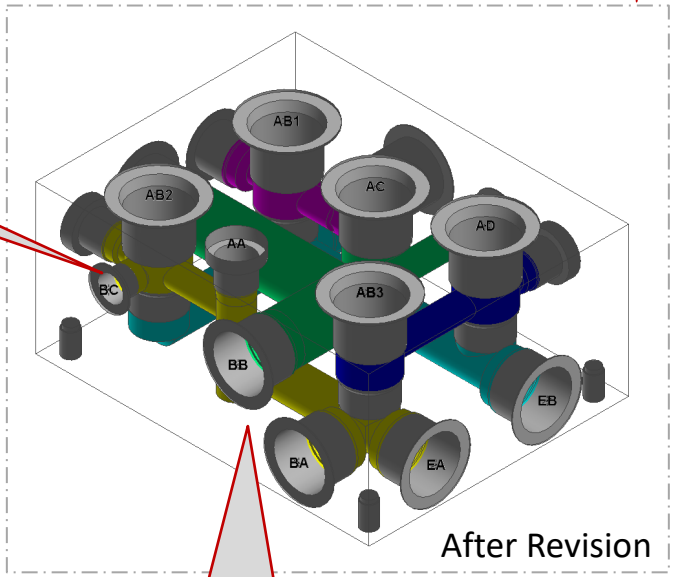
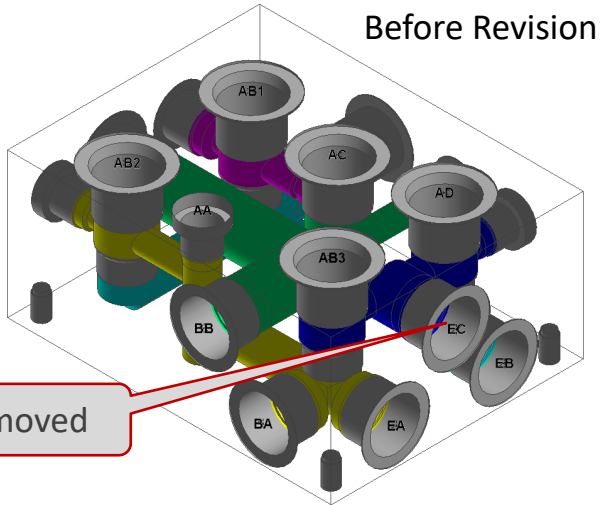
- Upper Case
- Lower Case

Keep Existing Machining ID

Cavity Machining ID

A A 1

- Count - Number
- Index - Alphabetic
- Face Name - Alphabetic



Machining IDs of other cavities are unchanged

Manifold Assembly

Modify Manifold Assembly



Assembly Interface

CAD Model Library: D:\MDTools Demo Part Lib\SolidWorks Files

Component ID	Cavity Name	Status
MP-12	5/16"-18 UNC	
	5/16"-18 UNC	
	5/16"-18 UNC	
	#6 SAE	
	#6 SAE	
5	C10-4	
4	C10-2	
M2	#6 SAE	✖
2A	C10-2	✖
L	#6 SAE	🔄
M1	#6 SAE	✔
2B	C10-2	✔
C2	#6 SAE	✔
3	D03	✔

CAD Model: SAE2new.SLDPRT

Items Included | Select CAD Model | Show All | Update | Cancel

Status showing assembled and unassembled cavities

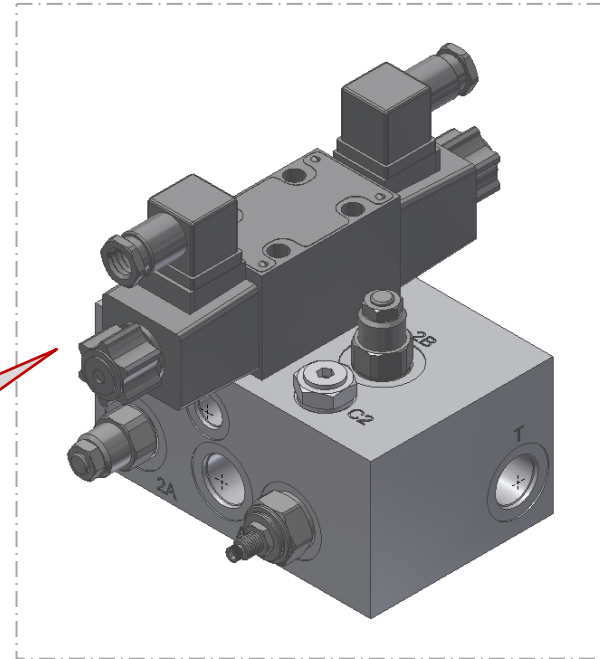
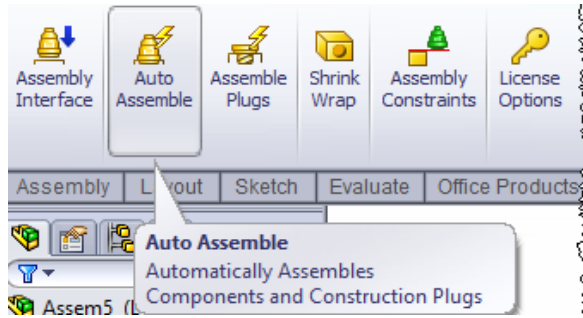
Update Icon indicates update is required

Items Included

- ✓ All
- ✓ Footprints
- ✓ Cartridge Valves
- ✓ Ports
- ✓ Construction Ports
- ✓ Bolt Holes

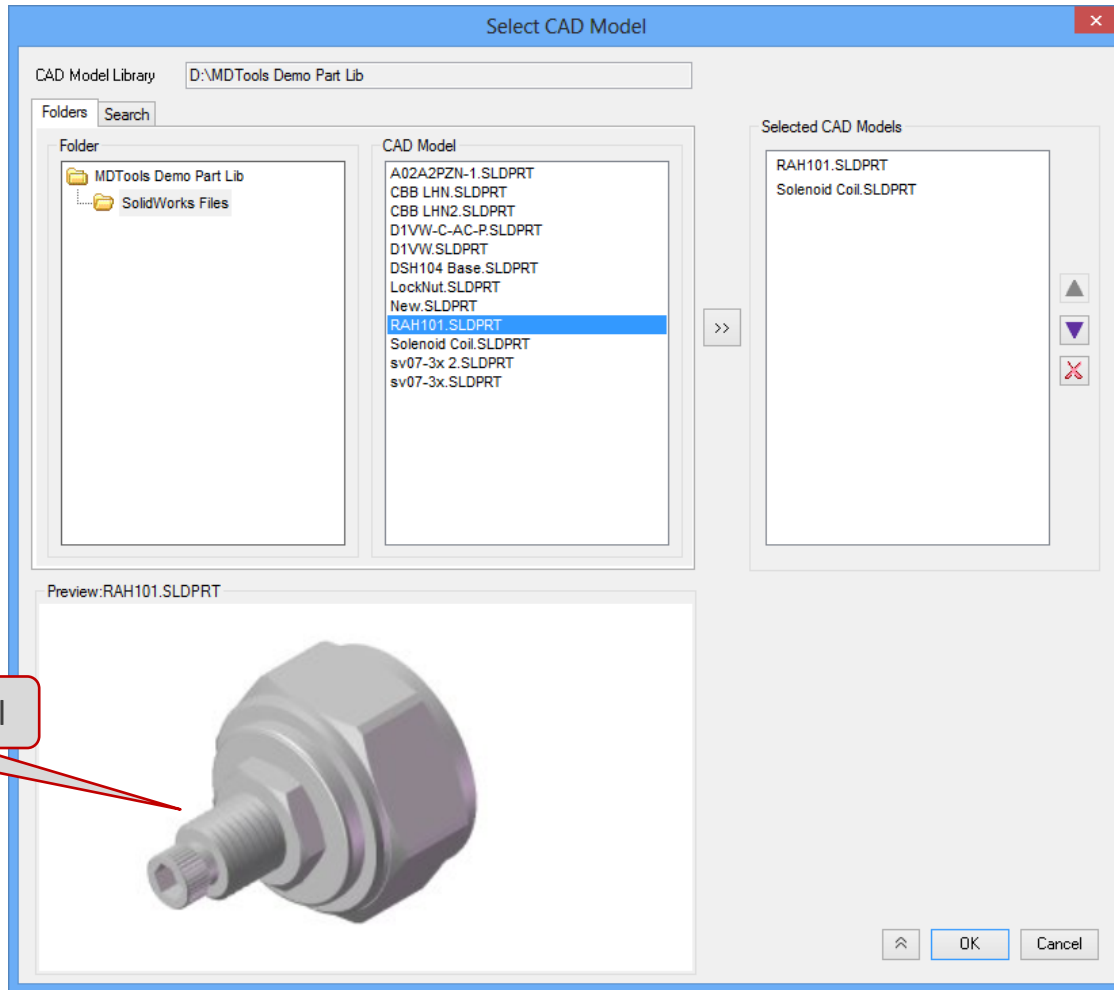
Filter list by cavity type

Apply changes and update your assembly



Automatically assembles Components and Construction plugs defined in the HyDraw Schematic XML

Preview CAD Model on Selection



Preview of CAD model

Create Machining Drawing



Specify Margin for Drawing Templates

Specify the top, bottom, left and right margin for each template to generate the machining drawing

Machining Drawing Options

Stamping Text Chart | Components and Ports List | Cavity List

Format | Face Origin | Drawing View | Dimensions | Machining Chart | Machining Callout

Sheet	Template	Margin			
		Top	Bottom	Left	Right
Drawing View	orks 2013\templates\Drawing.drwdot	4	0.5	0.5	4
Machining Chart	orks 2013\templates\Drawing.drwdot	0.2	0.2	0.2	0.2
Miscellaneous Chart	orks 2013\templates\Drawing.drwdot	0.2	0.2	0.2	0.2

Annotations

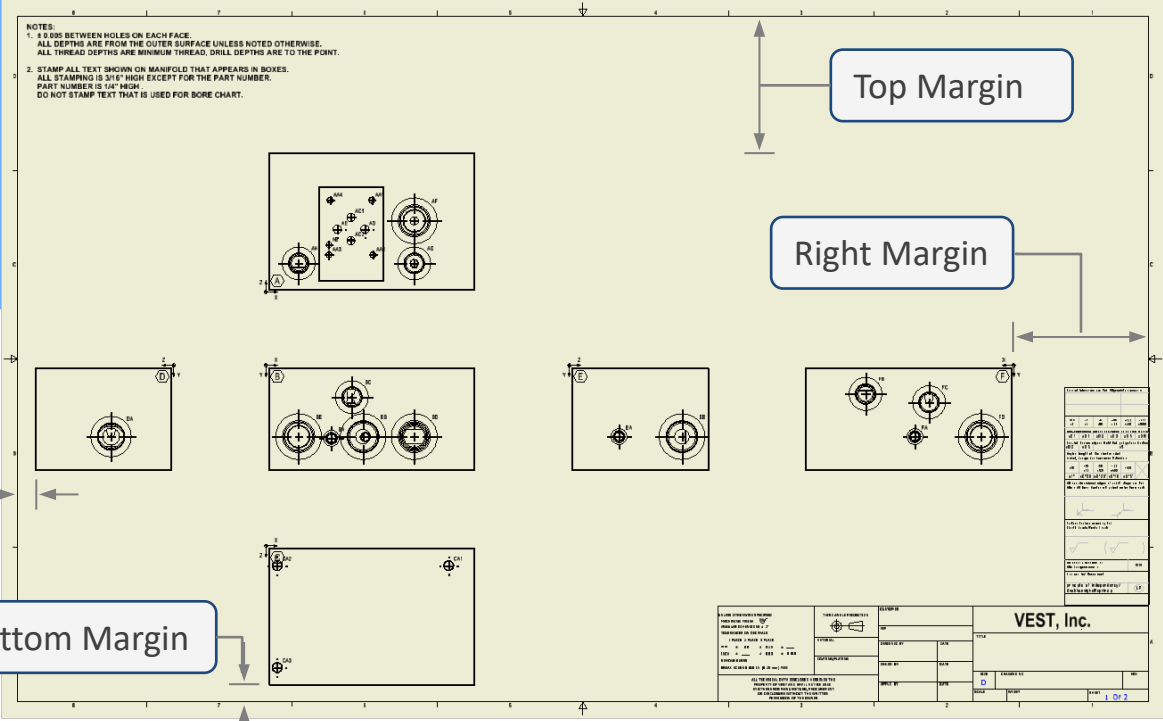
Dimensioning Machining Callout

Component ID Stamping Text Chart

Machining ID Components and Ports List

Machining Chart Cavity List

Apply Cancel



Note: Specific to Machining Drawing command in Part Model



Specify Minimum Distance Between Views



Machining Drawing Options

Stamping Text Chart Components and Ports List Cavity List
Format Face Origin Drawing View Dimensions Machining Chart Machining Callout

Projection Type
 First Angle
 Third Angle

Base View
Front

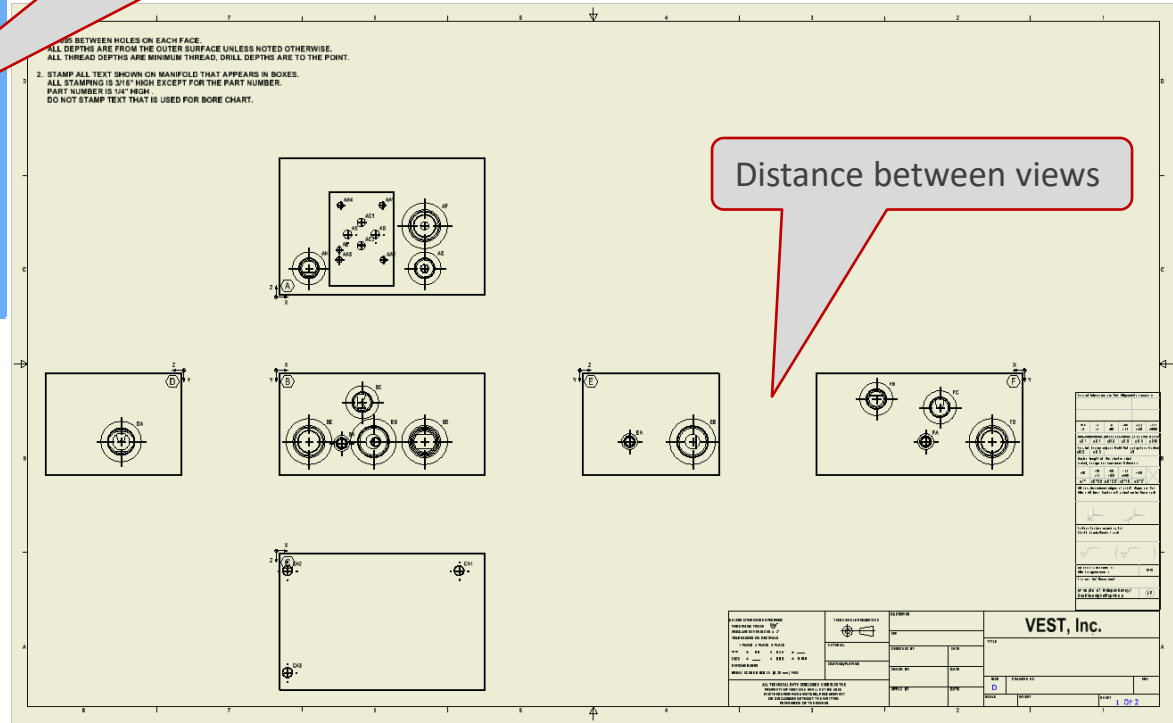
View Style

Display
 Face Name Text Height 0.125 in
 Origin and Axes Origin and Axes
 Footprint Envelope and PAN
 Angle Hole Direction
 Stamping Text
 Mark X-Ports
 Internal Details

View
Min. Distance (d) 1

Apply Cancel

Specify minimum distance between views



New Interactive Functionality

Position Cavities /Footprints by Dragging when Inserting or Connecting Cavities



Specify Cavity Location

Face & Location

Face X < 2.07 > Y < 1.084 >

Reference1 Reference2

Connect cavity to

Cavity1 Port

Cavity2 Port Drill Diameter 0.25

Energy Efficiency

Optimize Diameter Optimize Depth

With minimum wall thickness

Cavity Wall Thickness 0.188

OK Cancel

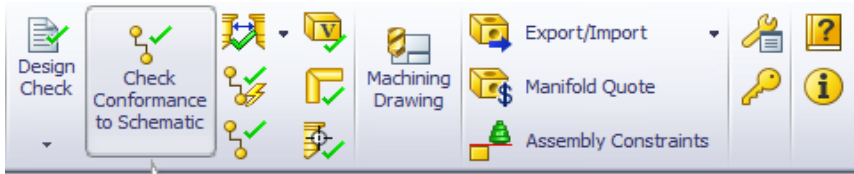
Position a cavity in the model by dragging the center point of the selected cavity

Move and position a cavity along an ordinate by grabbing one of the directional arrows

Note: Similar functionality is available for the **Connect Cavities** command

New Checking Functionality

Check Conformance to Schematic



Check Conformance to Schematic
Checks conformance of design to the HyDraw schematic

Checks manifold design conformance against the HyDraw Schematic

Check Conformance to Schematic

Report

Missing Components and Ports

Component ID	Cavity Name
T	SAE-10

Extra Components and Ports

Component ID	Cavity Name
T1	SAE-10

Wrong Cavity

Component ID	Cavity Name in Model	Cavity Name in Schematic
1B	CA-10A-2N	C08-2

Non-Preferred Construction Ports

Cavity ID	Cavity Name
PLUG1	SP-04

Cavities on Non-Preferred Face

Component ID	Face	Preferred Faces
1A	Top	Front, Left, Right, Back

Wrong Net Name

Cavities/Ports	Net Name in Model	Net Name in Schematic
1B-2	NET-3	NET-7

Wrong Flow

Cavities/Ports	Flow in Model	Flow in Schematic
1A-1	7	8

Wrong Port Type

Cavities/Ports	Port Type in Model	Port Type in Schematic
1A-1	Pilot	Pressure
1B-1	Pressure	Undefined

Start Conformance Check Close

Check for Poor Connections



Design Check

Parameters

Include

- Net List
- Poor Connections
- Meet List
- Conformance to Schematic

List an Intersection only once

Minimum Wall Thickness:

Report

Connection Problems and Warnings

No Issues Found

Poor Connections

Cavity	Connecting Cavities
1B-1	R (55%)

Wall Thickness

Clearance List

Cavity	Cavities with Wall Thickness < 0.3
2-1 [NET-7]	1B-2 [NET-3] (0.061)
3-A [NET-7]	3-T [NET-2] (0.283)

Start Design Check Cancel

Poor Connections selected

List connections having area of the connection less than the area of cross-section of hole with a smaller diameter in the connection

Note: This section is available in **Connection Check** command also.

Repetitive Information removed in Meet List



Before

Cavity	Connecting Cavities
1A-1	MP, P2
1A-2	T1
1B-1	R
2-2	MR
3-B	4-1
3-P	P1
3-T	T1
4-1	3-B
4-2	C, MC
C	4-2, MC
MC	4-2, C
MP	1A-1, P2
MR	2-2, R
P1	3-P
P2	1A-1, MP
R	1B-1, MR
T1	1A-2, 3-T
1B-2	Unconnected
2-1	Unconnected
3-A	Unconnected
PLUG1	Unconnected

After

Cavity	Connecting Cavities
1A-1	MP, P2
1A-2	T1
1B-1	R
2-2	MR
3-B	4-1
3-P	P1
3-T	T1
4-2	C, MC
C	MC
MP	P2
MR	R
1B-2	Unconnected
2-1	Unconnected
3-A	Unconnected
PLUG1	Unconnected

Program removes repetitive information

Note: This option is available in the Design Check command also.



Manufacturing & Tooling Check

Parameters

Include

Simple Angle Hole Drill Tool Slenderness Ratio

Compound Angle Hole Spot Face Tool Slenderness Ratio 12

Report

Simple Angle Hole

Cavity	Diameter	Beta Angle	Alpha Angle
3-A	0.25	15	0

Compound Angle Hole

No Issues Found

Non-Standard Drill

Cavity	Diameter	Depth	Tool Length (Max.)
3-P	0.25	2.25	2

Non-Standard Spot Face

Cavity	Diameter	Depth	Tool Length (Max.)
MP	0.829	0.02	

Slenderness Ratio > 12

Cavity	Diameter	Depth	Ratio
MR	0.297	3.659	12.3

Start Manuf. & Tooling Check Close

Actual value:
Depth in Model

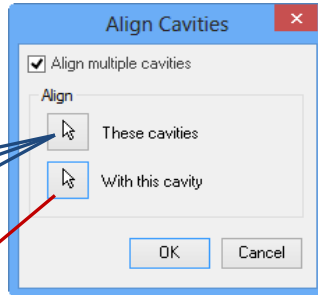
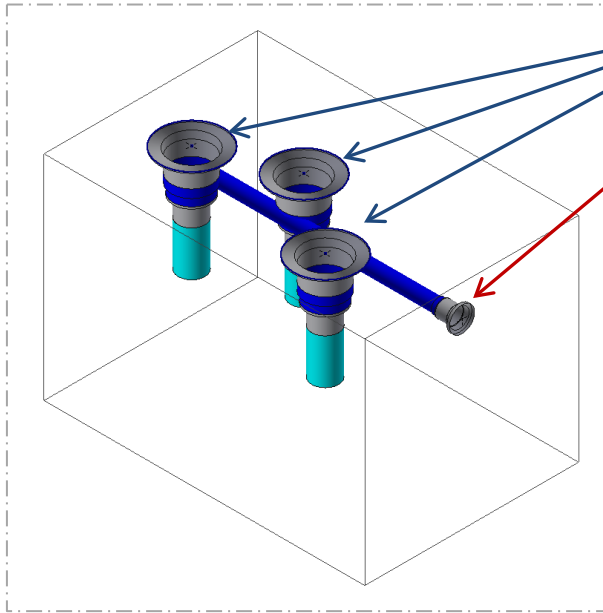
Standard value :
Max Tool Length in Library

Miscellaneous

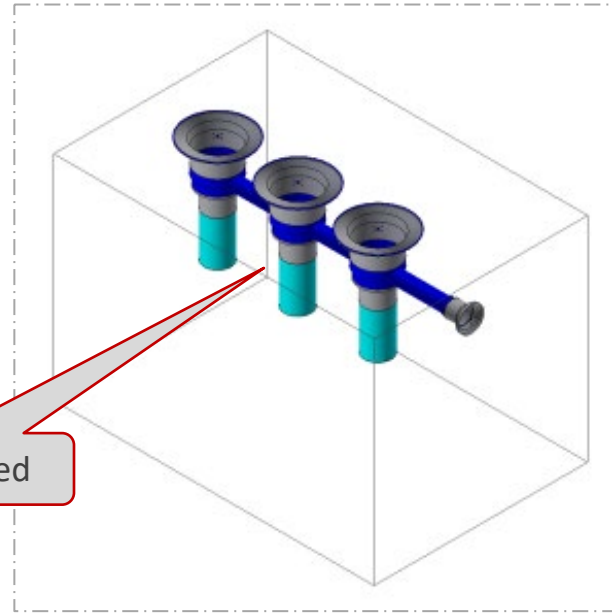
Align Multiple Cavities



Before



After



Cavities aligned

Manage O-ring Machining Information



Insert O-ring Groove

Groove Counter Bore

Dash #	ID	OD	Width
-110	0.563	0.300	3/32
-208	0.645	0.875	1/8
-210	0.765	1.000	1/8
-021	0.862	1.062	1/16
-214	0.910	1.245	1/8
-219	1.227	1.557	1/8
-220	1.295	1.625	1/8

Show All

Operation	Tool Name	Diameter	Depth
O-RING GROOVE	Refer Detail	0.645	0.109

Buttons:

Machining information now stored with O-ring

Edit O-ring Groove

Groove Counter Bore

Dash #	ID	OD	Width
-021	0.862	1.062	1/16
-110	0.563	0.300	3/32
-208	0.645	0.875	1/8
-210	0.765	1.000	1/8
-214	0.910	1.245	1/8
-219	1.227	1.557	1/8
-220	1.295	1.625	1/8

Show All

Operation	Tool Name	Diameter	Depth
O-RING GROOVE	Refer Detail	0.645	0.109

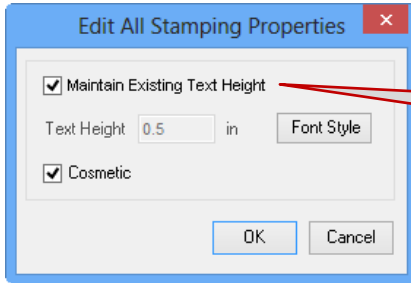
Buttons:

Edit O-ring machining information

NAME	OPERATION	TOOL	DIAMETER	DEPTH
1A	DRILL		0.500	1.997
	C08-2		1.188	0.031
1B	DRILL		0.500	3.138
	CA-10A-2N		1.181	0.031
2	DRILL		0.297	1.822
	C08-2		1.188	0.031
3-A	DRILL		0.250	1.000
	O-RING GROOVE	Refer Detail	0.645	0.109
3-B	DRILL		0.250	1.000
3-PH1	TAP DRILL		0.250	0.537

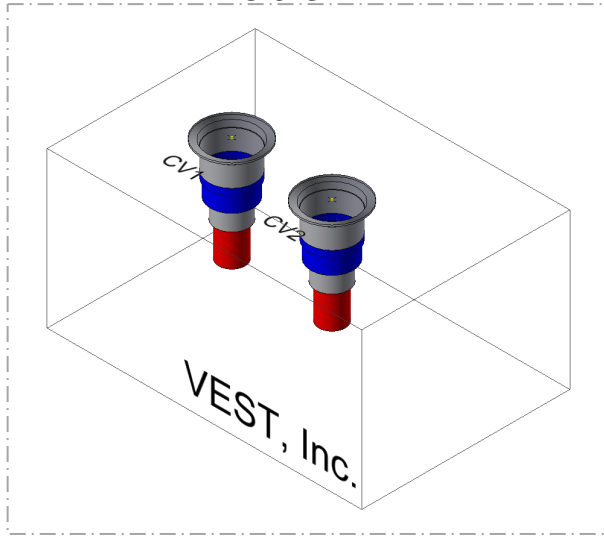
Machining information included in Machining Chart

Maintain Existing Text Height when Editing All Engravings

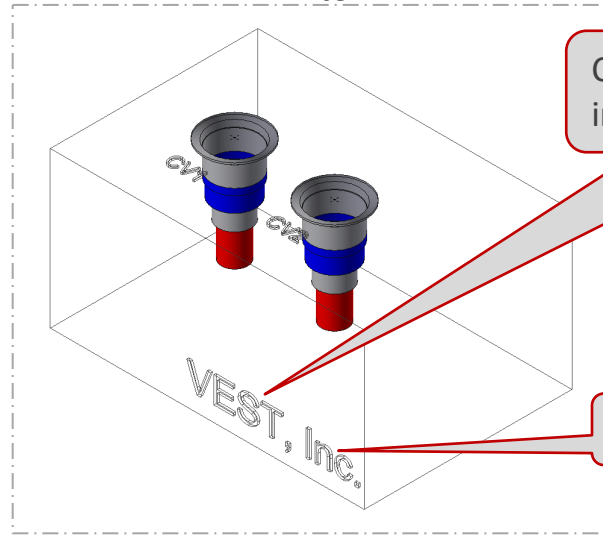


Maintain Existing Text Height selected

Before



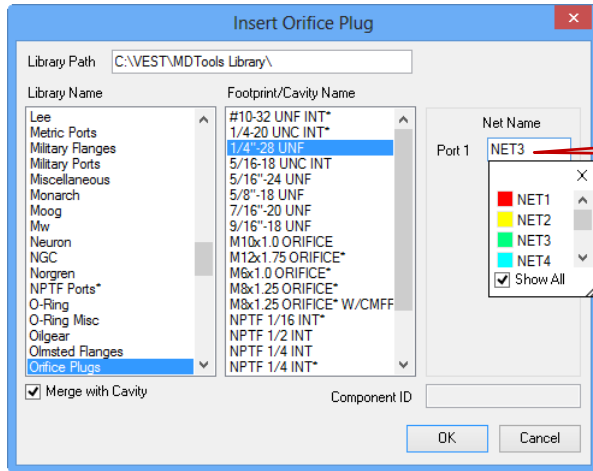
After



Cosmetic text converted into engraved text

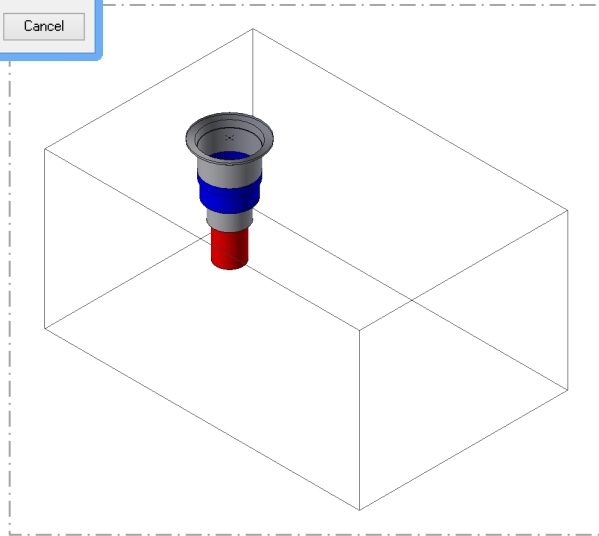
Text height unchanged

Enter Net Name for Orifice on Insertion

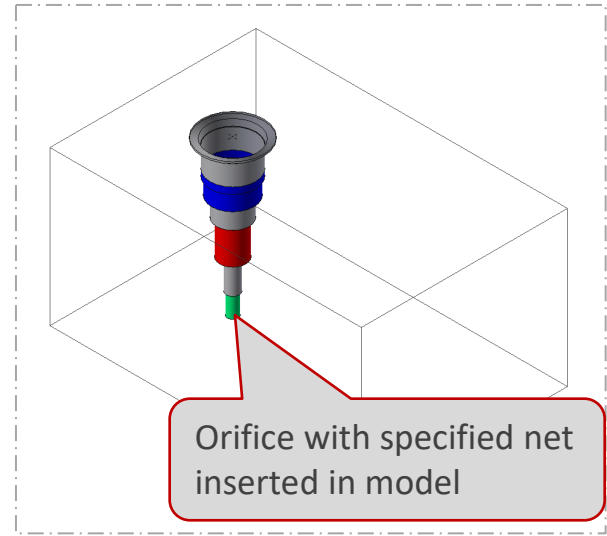


Specify net name for orifice

Before



After



Recap

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Do more...

MDTools® manifold design software



“Power-to-Design” manifolds

MDTools 950 Evaluation Software



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