

# SolidWorks Routing

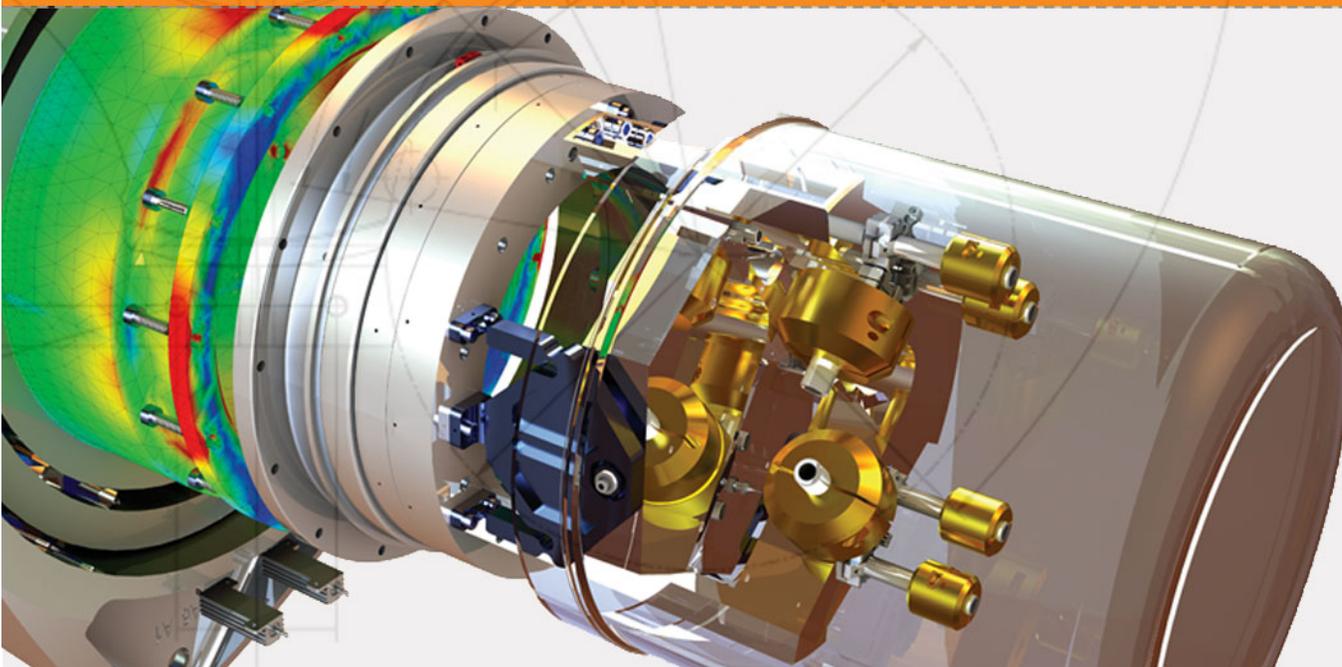
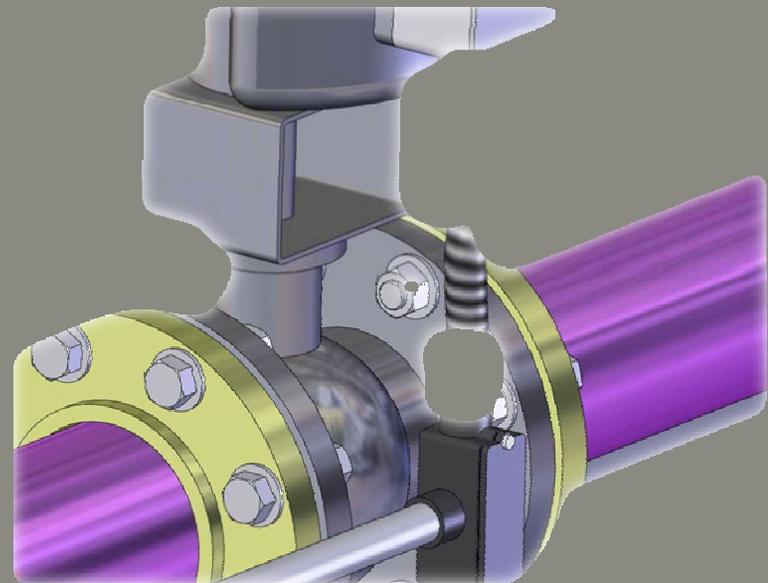


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# Overview

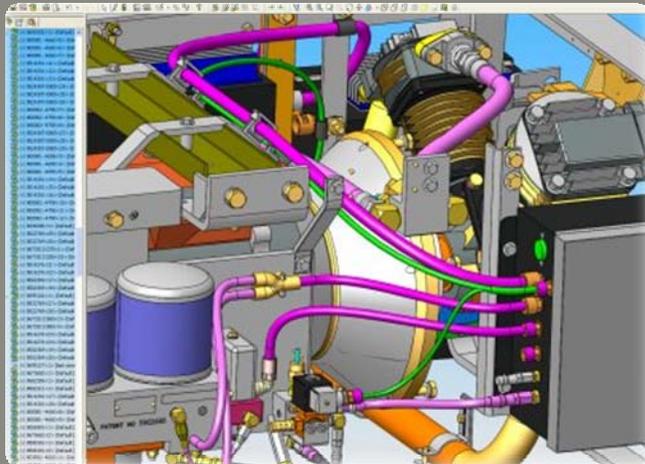
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- What is SolidWorks Routing?
- How does it work?
- How is it useful in the design process?
- Practical Examples?

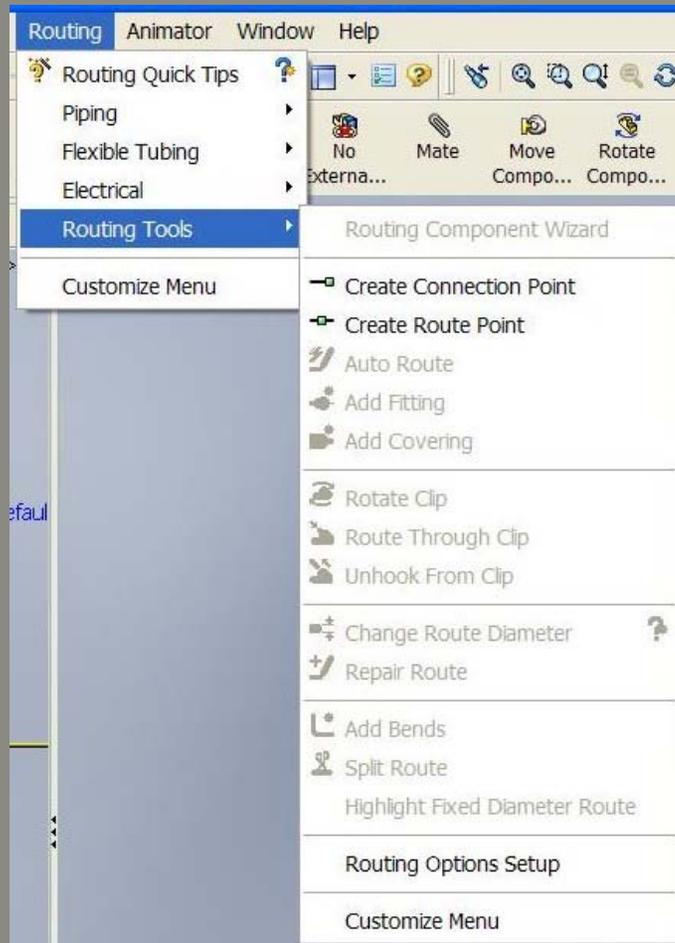


# What is SolidWorks Routing

- Part of a set of innovative design tools used to simplify the design of piping tubing and electrical cable systems

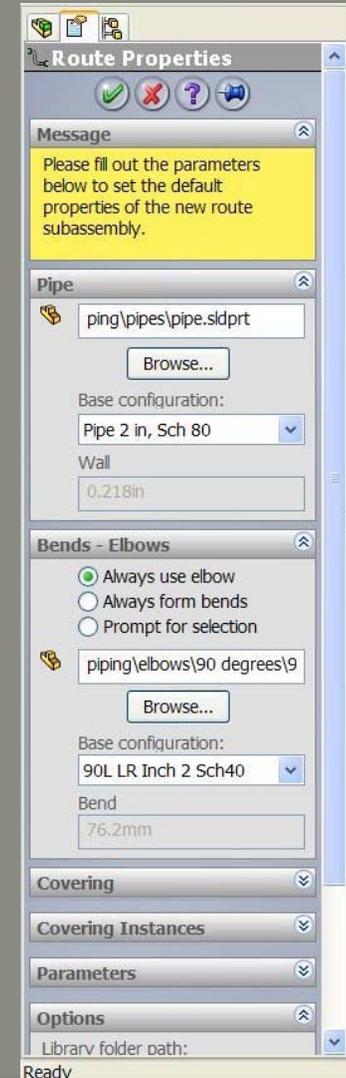


# Menus and Toolbars



# Rigid Piping

- After creating an assembly drag and drop fixtures such as flange from parts library
- Specify the nominal diameter and schedule of the pipe to be used through the routing properties tool
- Routes are created in the context of an assembly using sketch tools in the 3-D environment



# Rigid Piping

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- As the assembly is created, pipe bends are automatically added
- If bend radiuses are not standard, custom bends will be generated
- Associations between routed components may be added in order to minimize human errors
- Routes may be modified using the drag and drop feature

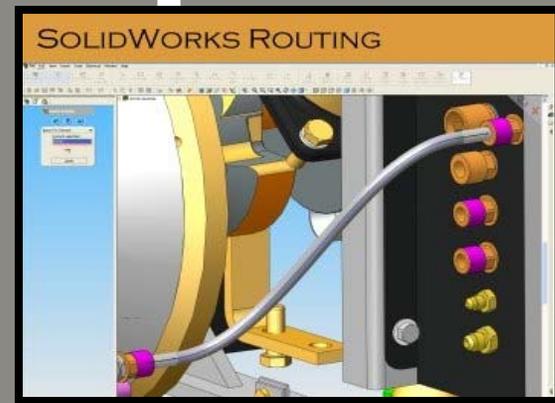
# Electrical Routing

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- Similar to piping
- Allows quick and easy connections between electrical components and harnesses
- Allows for routing of cables directly between components or through cable clips
- Previously routed cables can be easily modified using drag and drop feature

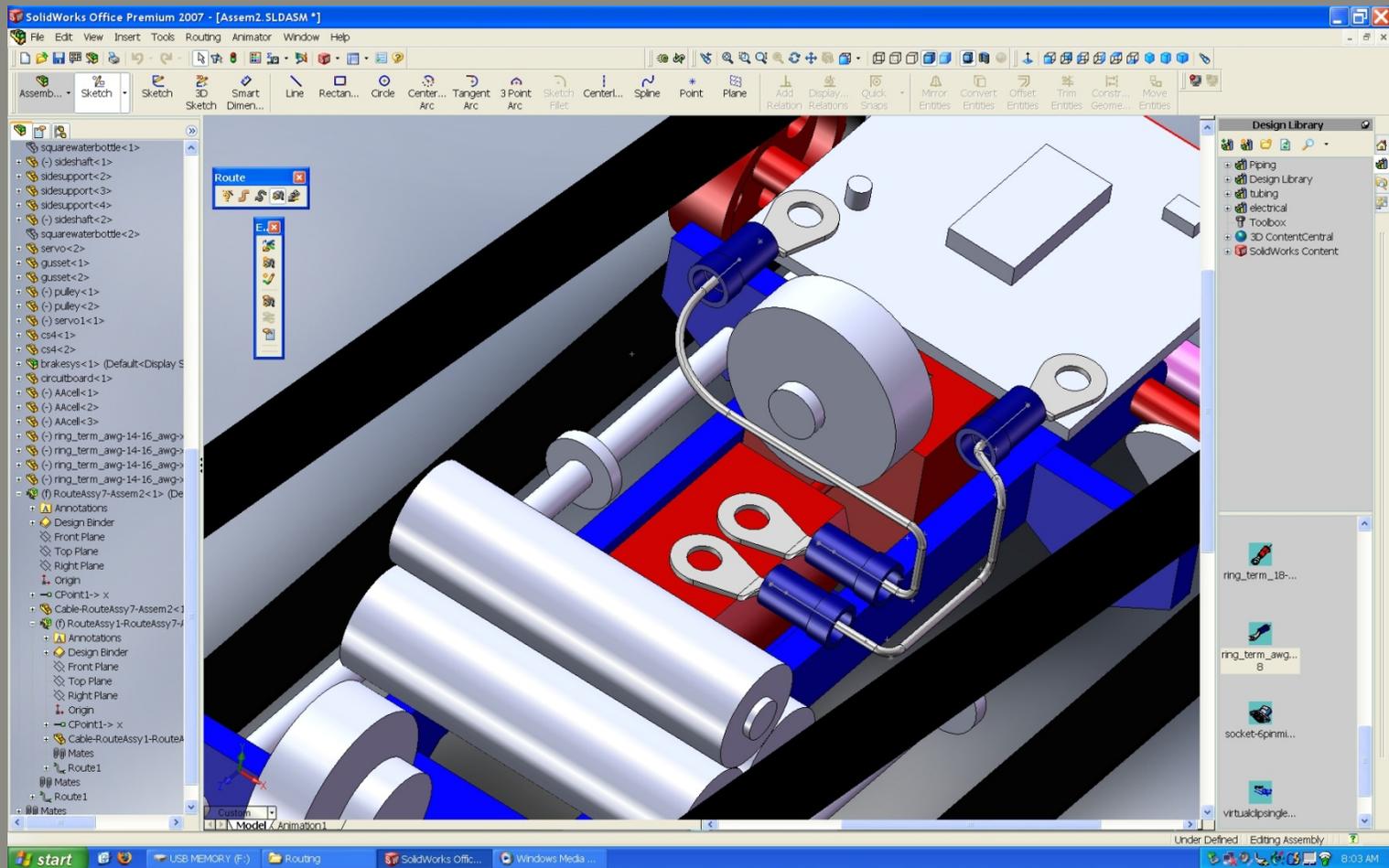
# Electrical Routing

- Routes can be sketched using standard sketching tools such as lines and splines
- Segment length will be calculated according to bend radii in cable
- SolidWorks will highlight areas where bend radii are too sharp for specified cable diameter

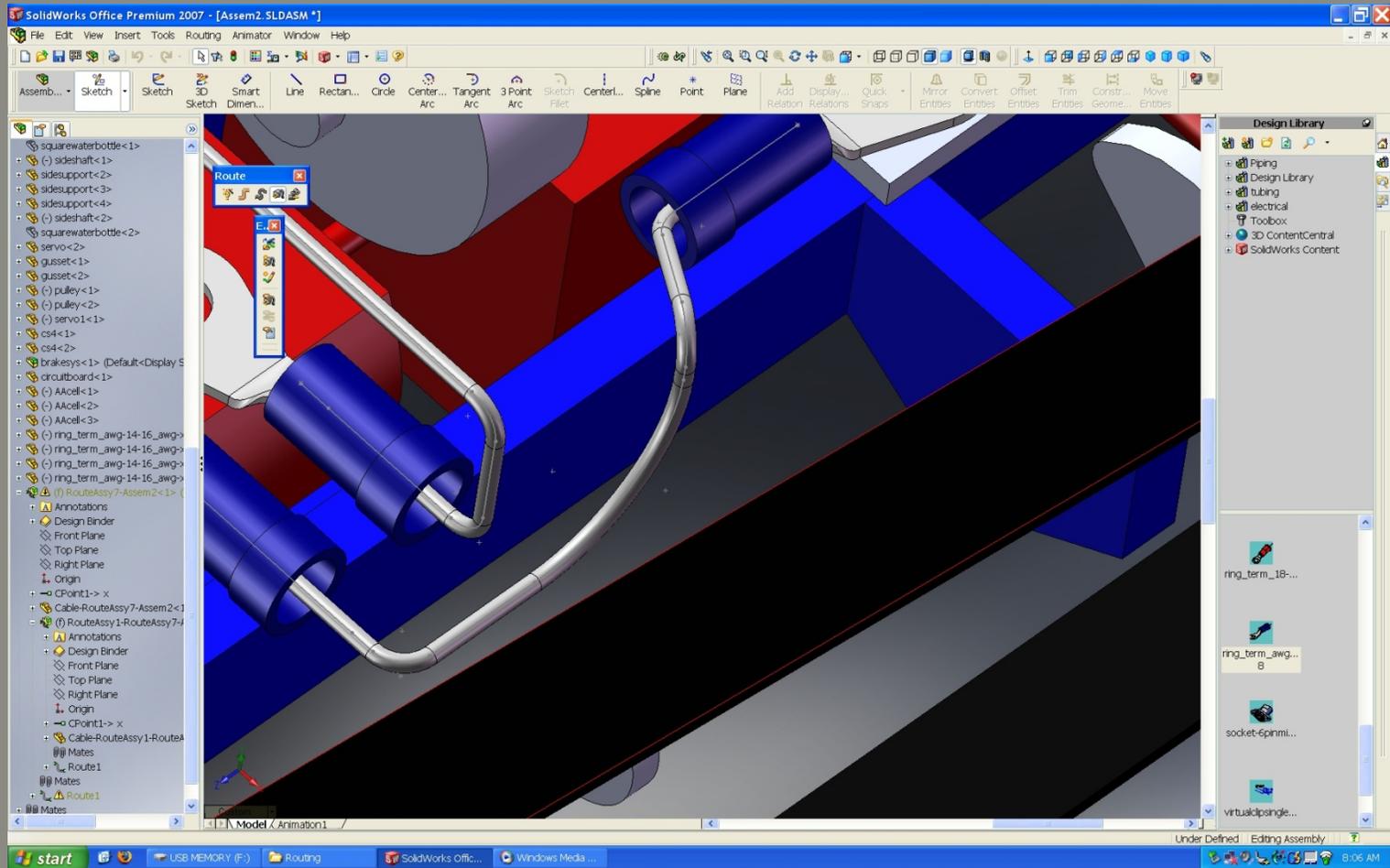




# Electrical Routing



# Electrical Routing



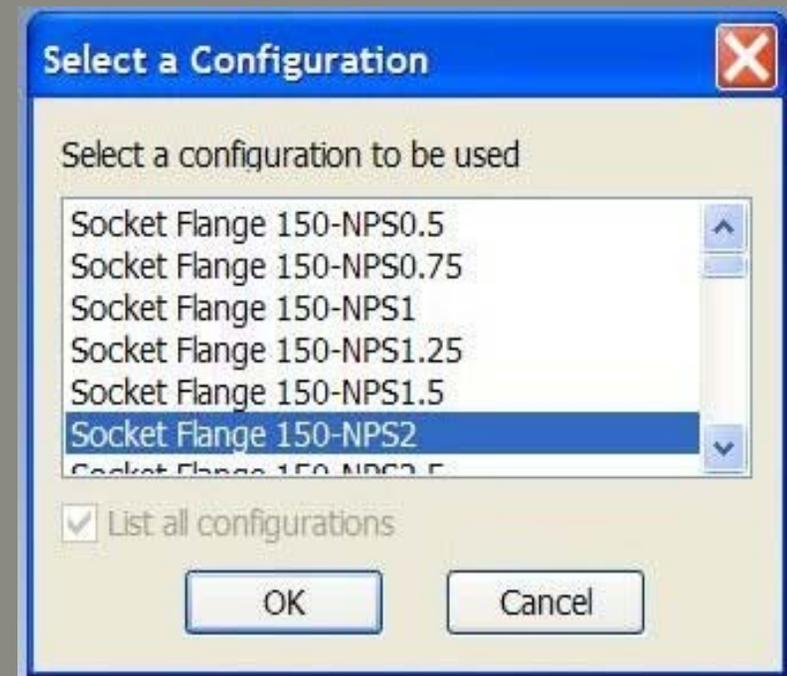
# Auto Routing

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- Auto routing between two points allows for quick review of several routing options
- Allows for optimization of space and material being used
- Also quickly screens for possible interference issues

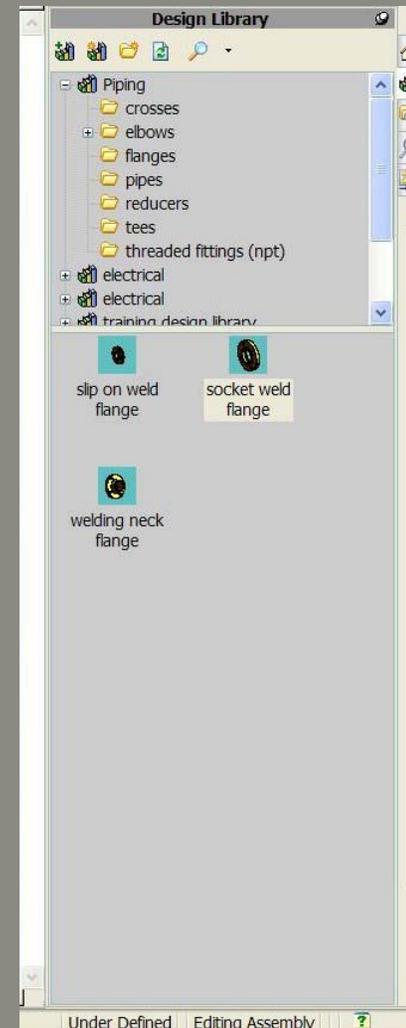
# Design Library

- SolidWorks design library has various pre-made components such as valves, electrical harnesses etc.
- Use of design tables provides an extensive selection of available parts and fittings
- Fittings will automatically associate the proper dimensions when dropped into a pre-existing route



# Design Library

- To save time, entire assemblies such as ball valves and pin connectors are available
- Additional components can be easily added to a route using drag and drop function
- Cable routes can be modified to run through added components such as clips
- For piping, appropriate length and diameter of pipe will be added to route



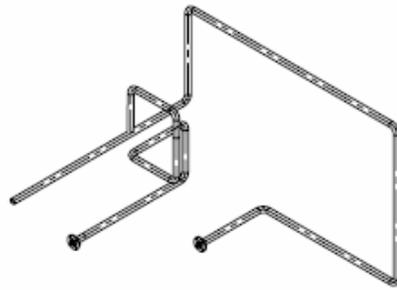
# Engineered Piping Drawings

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- After route has been completed an SolidWorks can create an engineered drawing showing an isometric view of the piping
- A bill of materials showing the fittings as well as appropriate lengths of pipe and cuts can also be generated and placed in drawing

# Engineered Piping Drawing

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Socket Flange 150-NPS2		2
2	90L LR Inch 2 Sch40		10
3	2 in, Schedule 80, 1		2
4	Pipe 2 in, Sch 80		1
5	Pipe 2 in, Sch 80		1
6	Pipe 2 in, Sch 80		1
7	Pipe 2 in, Sch 80		1
8	2 in, Schedule 80, 6		7
9	Pipe 2 in, Sch 80		1



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 <INSERT COMPANY NAME HERE>. ANY  
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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	TITLE:
		DIMENSIONS ARE IN INCHES		DRAWN		
		TOLERANCES:		CHECKED		
		FRACTIONAL: ±		ENG APPR.		
		ANGULAR: MACH ±		MFG APPR.		G.A.
		TWO PLACE DECIMAL ±		COMMENTS:		
		THREE PLACE DECIMAL ±				SIZE
		INTERPRET GEOMETRIC TOLERANCING PER:				DWG. NO.
		MATERIAL				<b>Piping</b>
		FINISH				REV
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5

4

3

2

1

# Engineered Electrical Drawings

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- After cable routing has been created, a 2-D cable diagram of the 3-D configuration can be created
- A bill of materials can be automatically inserted to document cable lengths as well as harness connections
- Information on connectors including pin and cable color can also be added to match the color coded drawing



# Electrical Engineered Drawings

SolidWorks [power-Signal control system - Harnessboard]

File Edit View Insert Tools Electrical Wiring Window Help

Annotations  
Blocks  
Harnessboard  
Sheet Format

Notes:  
1. See note on page 24.  
2. Draw to 4th order.  
3. See SW-CAD-001 (Installation) and SW-CAD-002 (Maintenance) instructions.  
4. Check to be sure the manufacturer's data for CDA is correct before the release of any drawing which is used as a reference for the installation of wiring harness.

31 (PN: Socket-Spinrindin)

Pin	Wire Color
1	RED
2	RED
3	GREEN
4	BLACK
5	BLACK
6	BLACK

20.2 40.25

3.5 Ø0.25

4.6 Ø0.25

32 (PN: Socket-Spinrindin)

Pin	Wire Color
1	RED
2	GREEN
3	BLACK
4	BLACK
5	BLACK
6	BLACK

Group Summary

WIRE	WIRE COLOR	LENGTH	WIRE	IN
4025	RED	30.2%	274	202
4026	RED	30.2%	274	202
4027	RED	30.2%	274	202
4028	RED	30.2%	274	202
4029	RED	30.2%	274	202
4030	RED	30.2%	274	202
4031	RED	30.2%	274	202
4032	RED	30.2%	274	202
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4284	RED	30.2%	274	202
4285	RED			

# Intuitive Designing

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- Routing allows for designers to more easily capture true design intent
- Routing tools simplify process of adding and modifying complex cable and piping systems
- Allows designer to quickly explore many cable/pipe layouts

# Piping Example

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# Questions

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- What types of components can be designed using SolidWorks Routing Tools?

- Ans:

*Routing can be used to design and modify piping and electrical systems within simple and complex assemblies.*

# Question

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● What features in routing make it useful to the design process?

● Ans:

*Several convenient features include:*

*- extensive library of drag and drop components*

*- auto-routing between points*

*- drag and drop modification of route*

*- quick interference checking and route optimization*

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● Questions or Comments?

● Additional routing videos available at:

<http://www.solidworks.com/pages/onlinetour/popup.cfm>