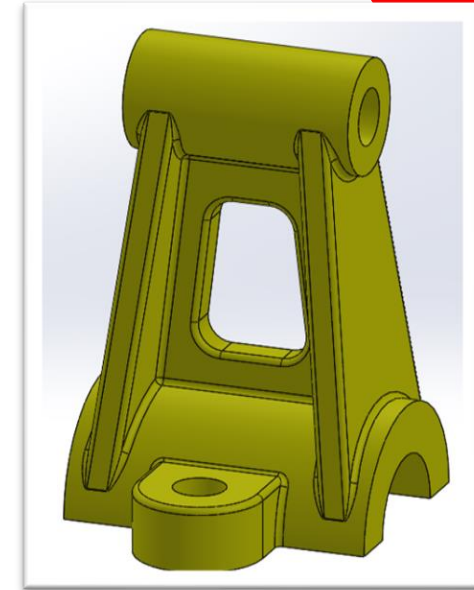
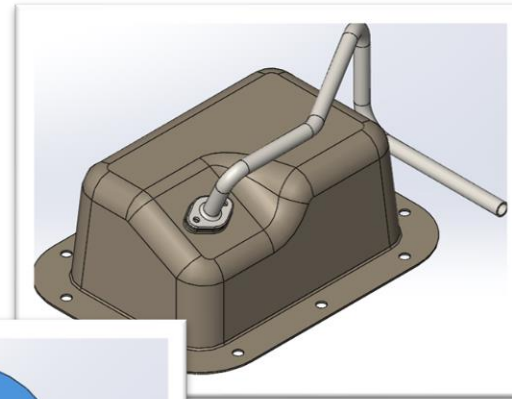
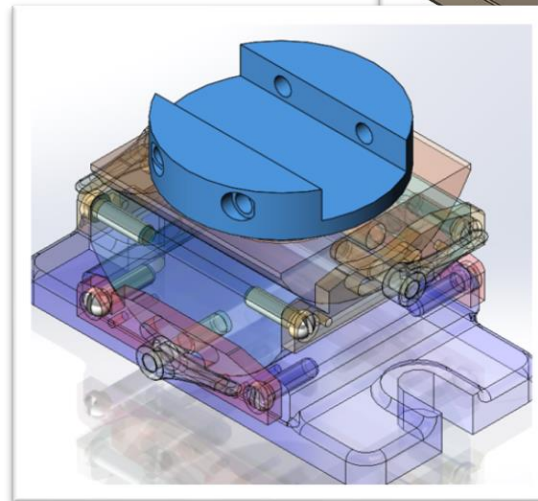


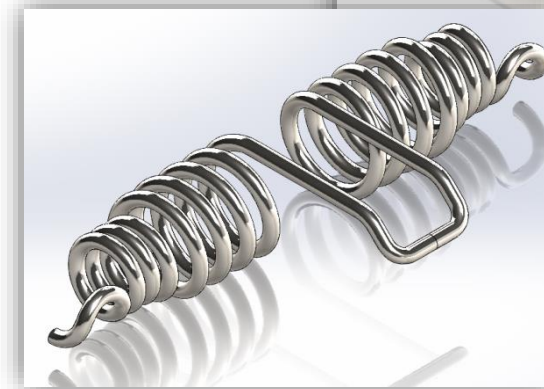
## Agenda

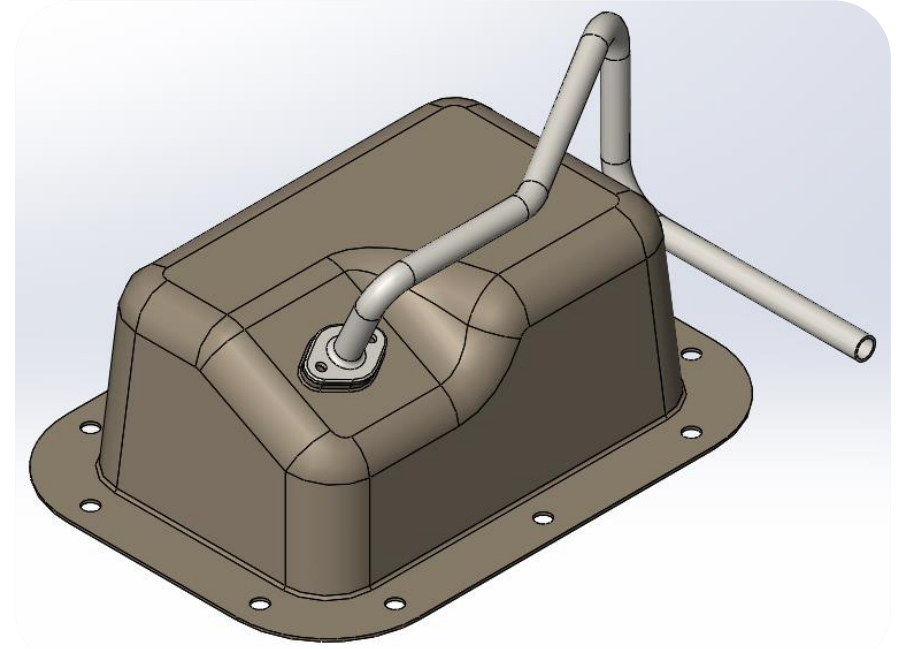
1. Modelado de diseño descendente
2. Operaciones de ensamblaje
3. Referencias de archivos
4. Técnicas de diseño Multicuerpo
5. Croquizado con Splines



# SOLIDWORKS Agenda

6. Introducción al barrido
7. Trabajo con curvas
8. Operación de limite y recubrimiento
9. Modelado con chapa metálica

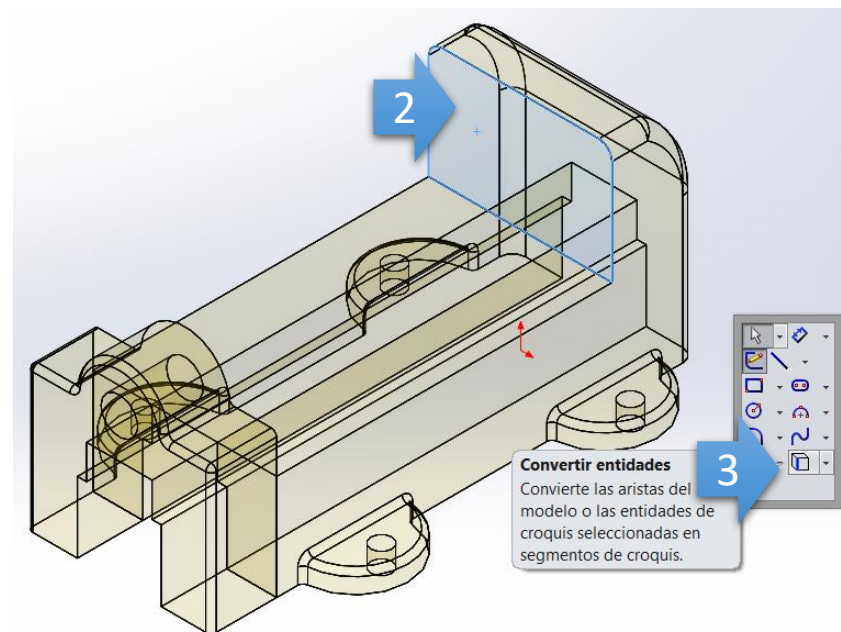
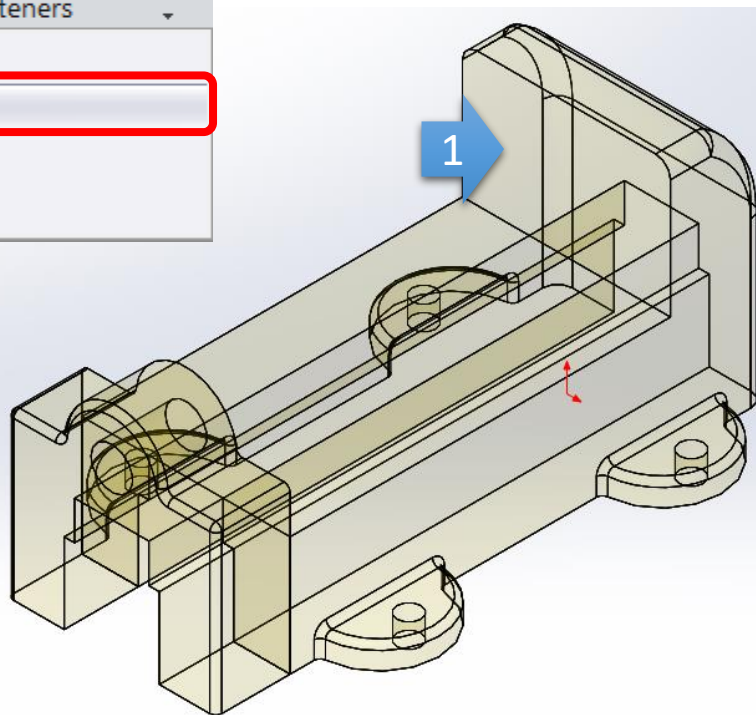
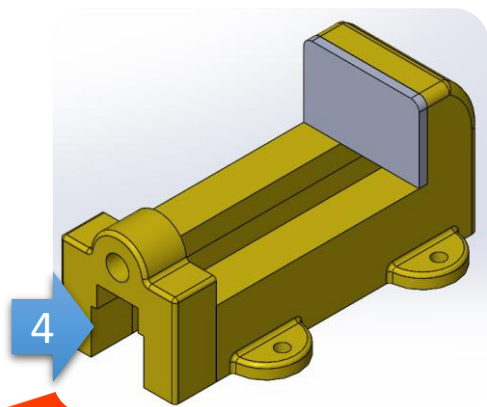
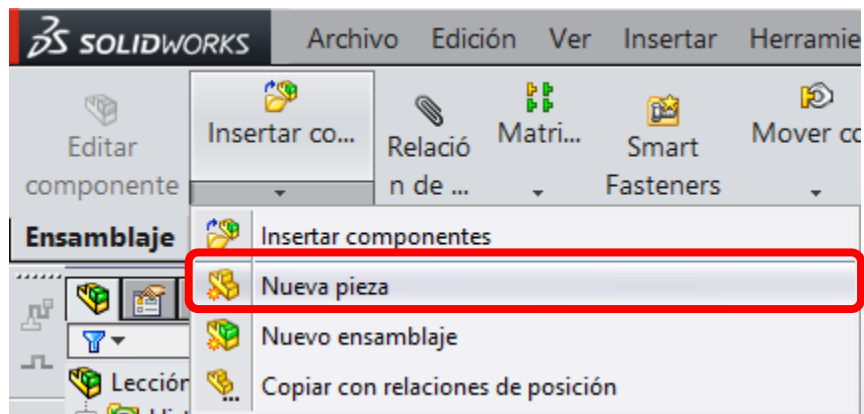




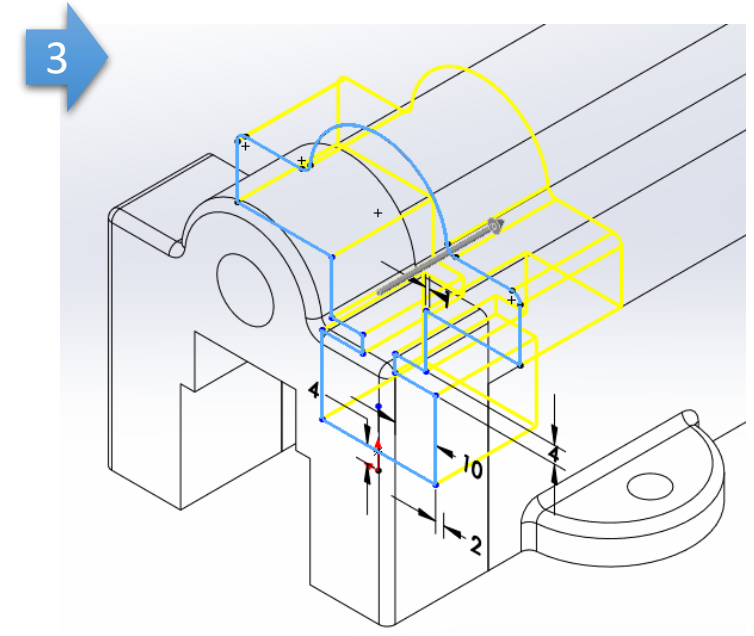
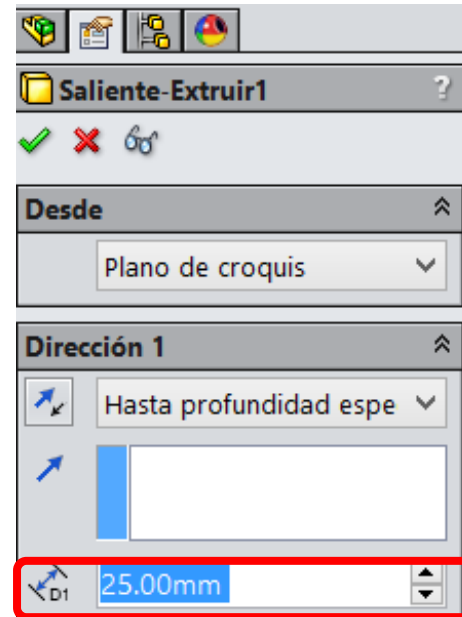
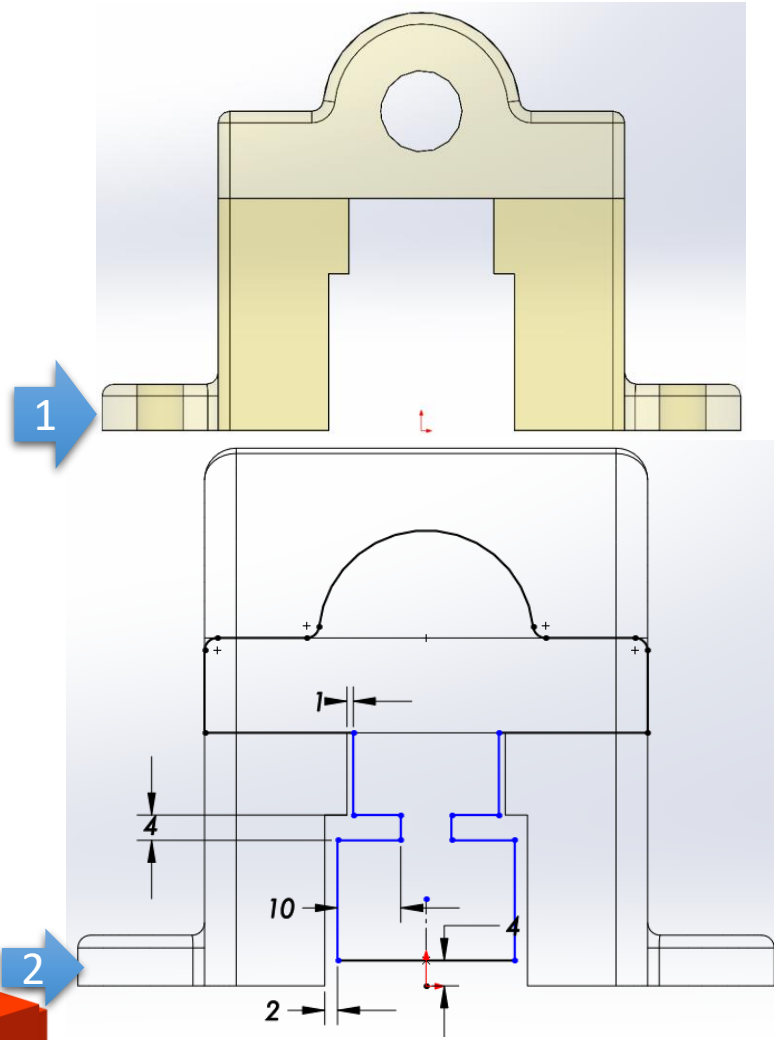
Modelado descendente



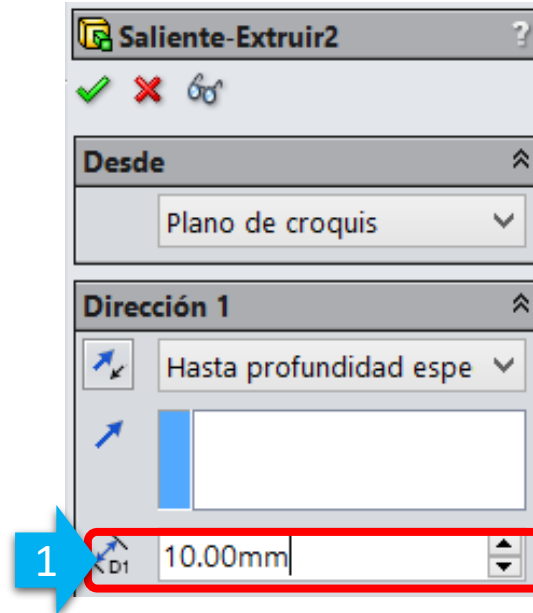
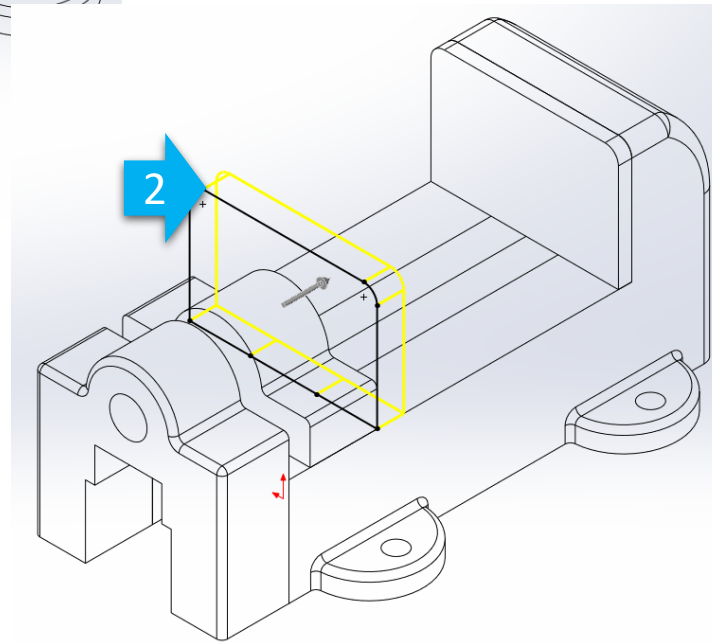
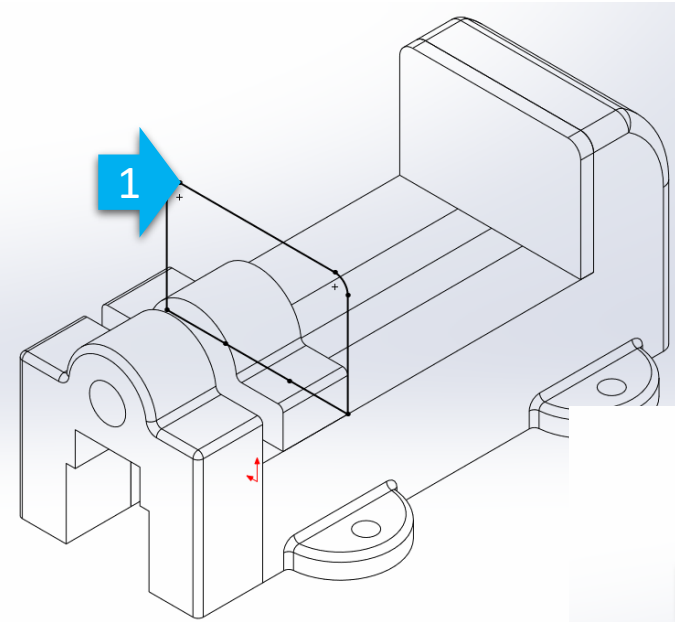
## Creación de operaciones en contexto



## Creación de operaciones en contexto

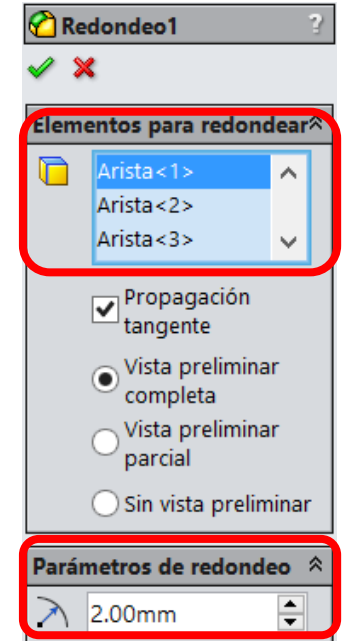
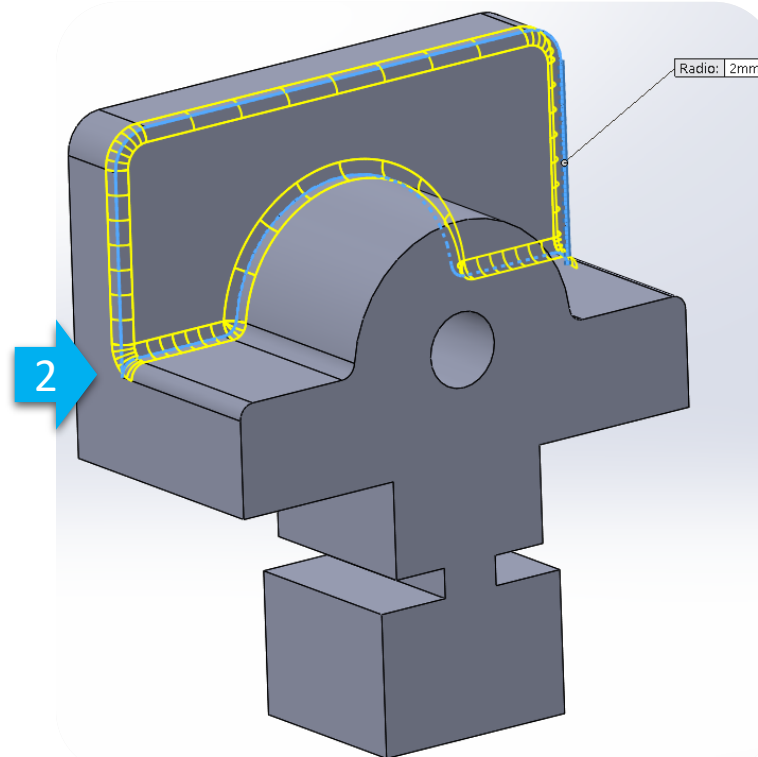
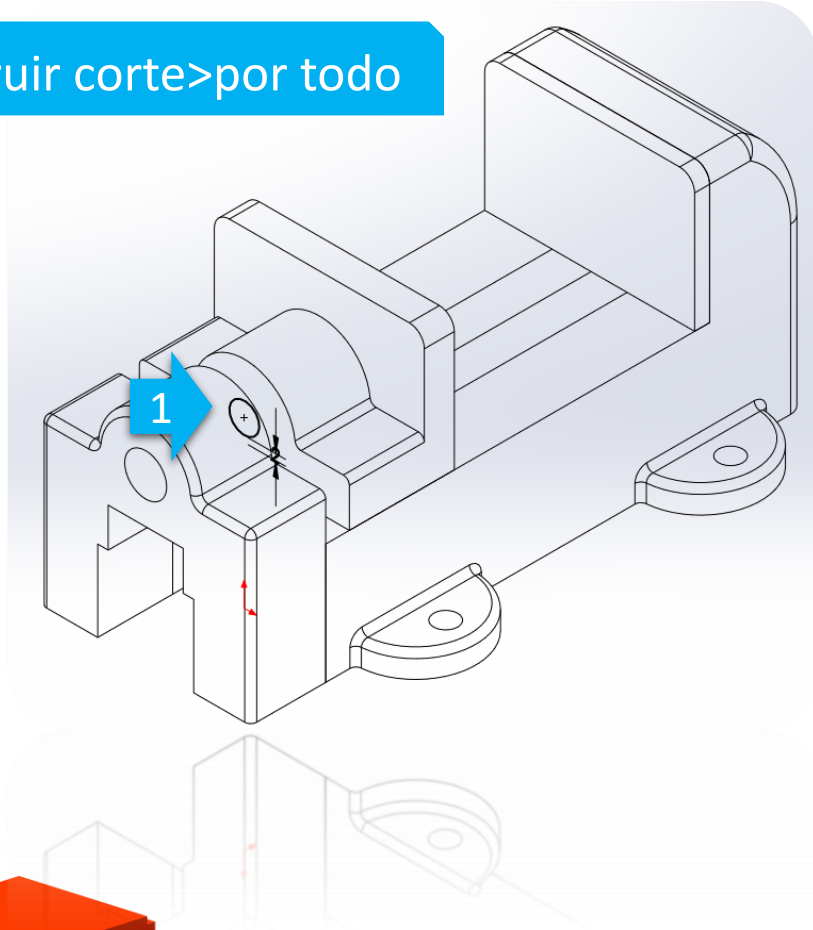


# Creación de operaciones en contexto

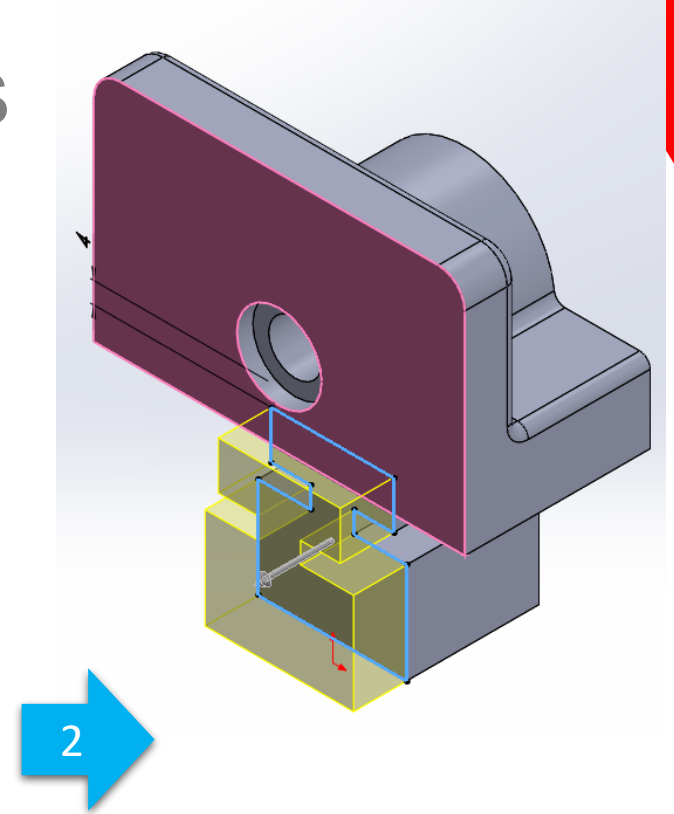
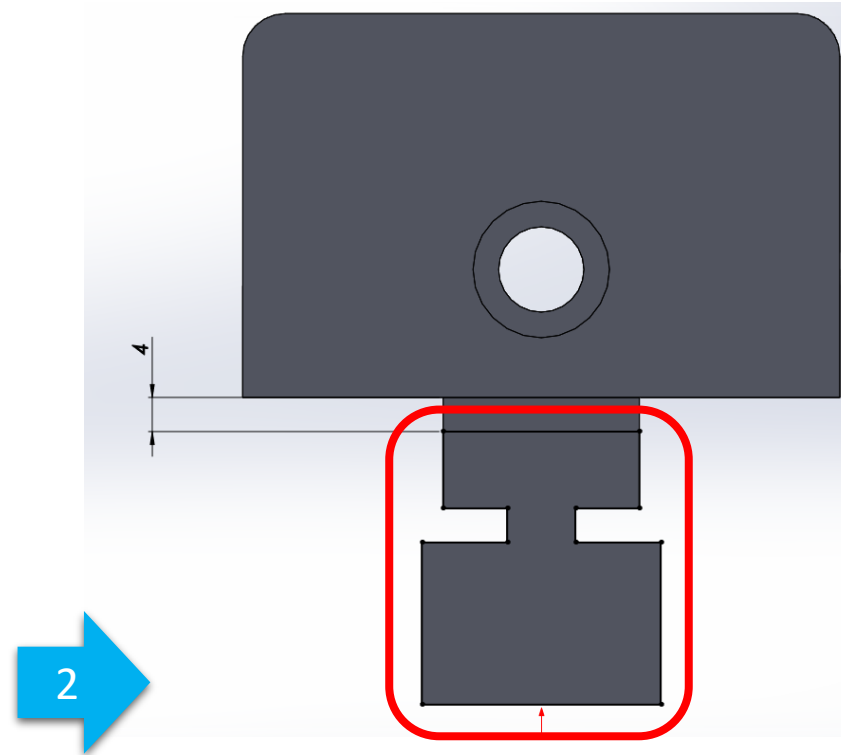
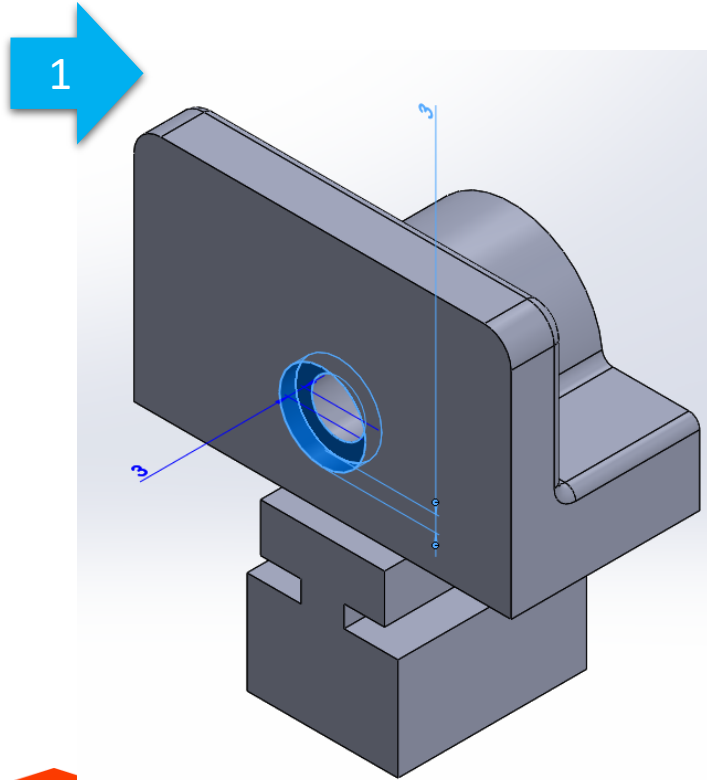


## Creación de operaciones en contexto

Extruir corte>por todo

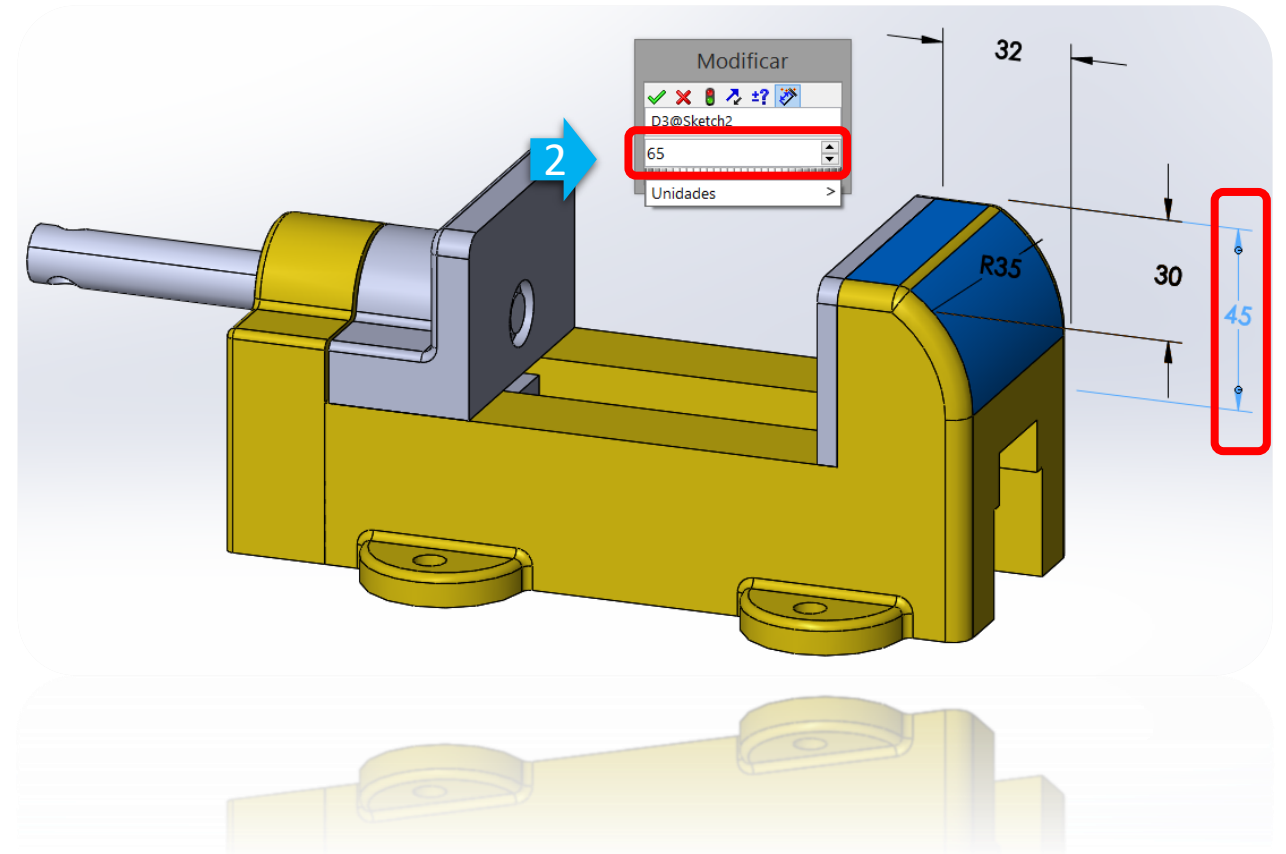
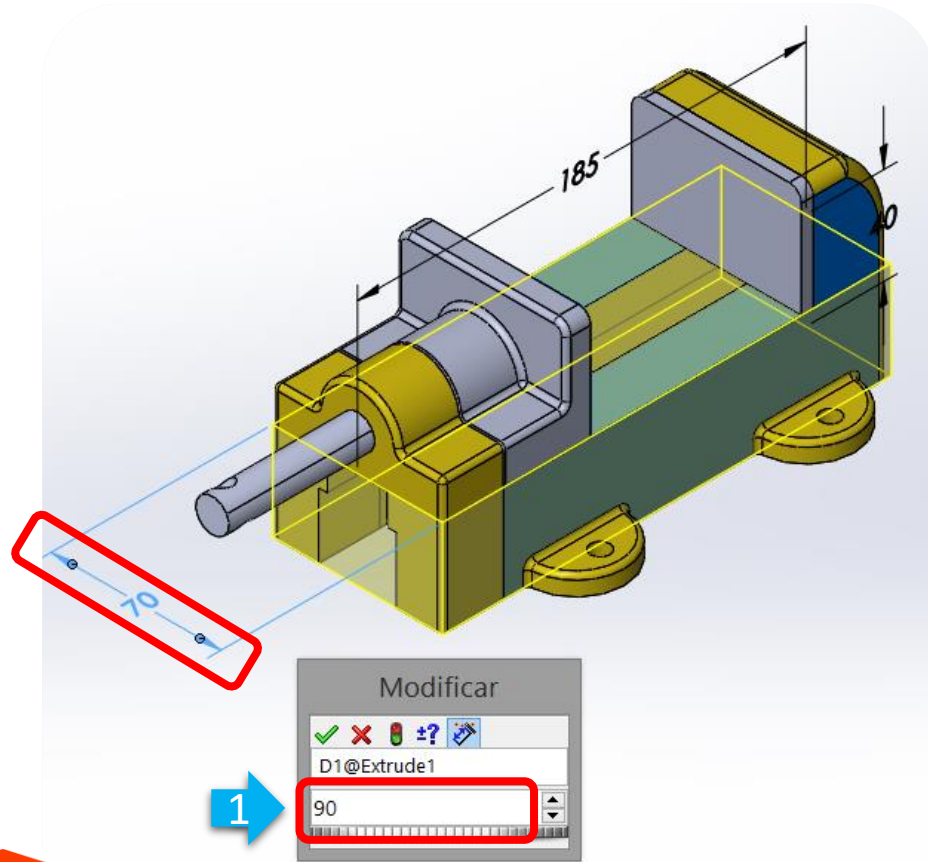


# Creación de operaciones en contexto

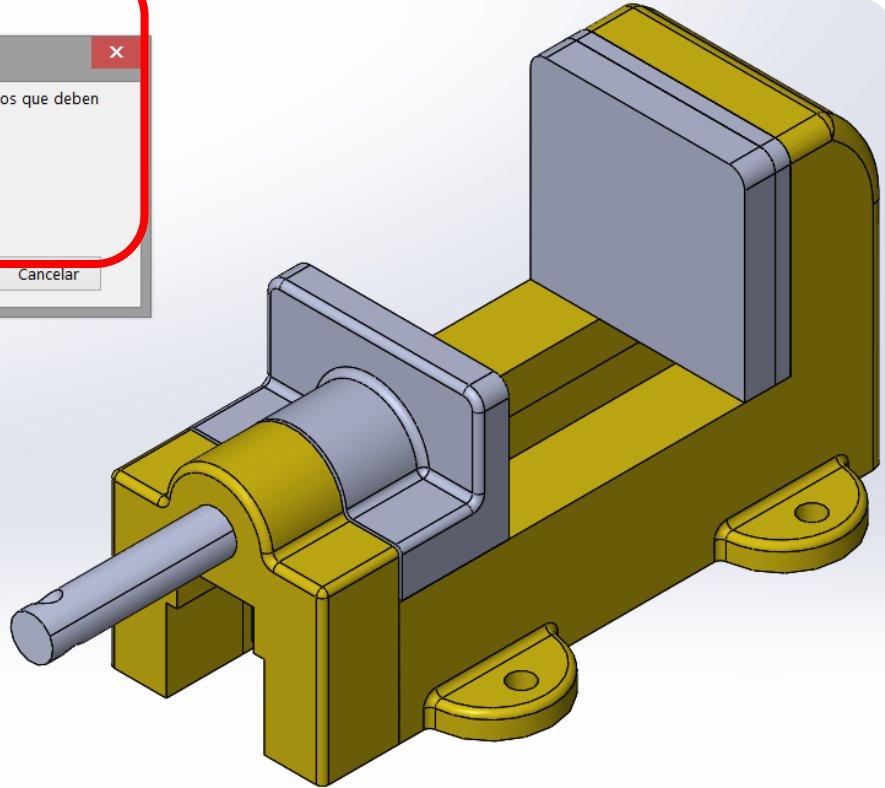
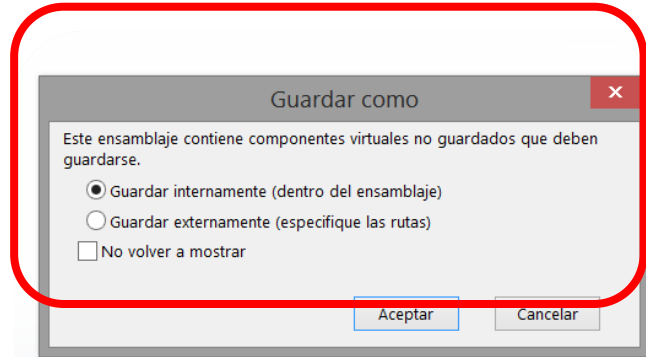




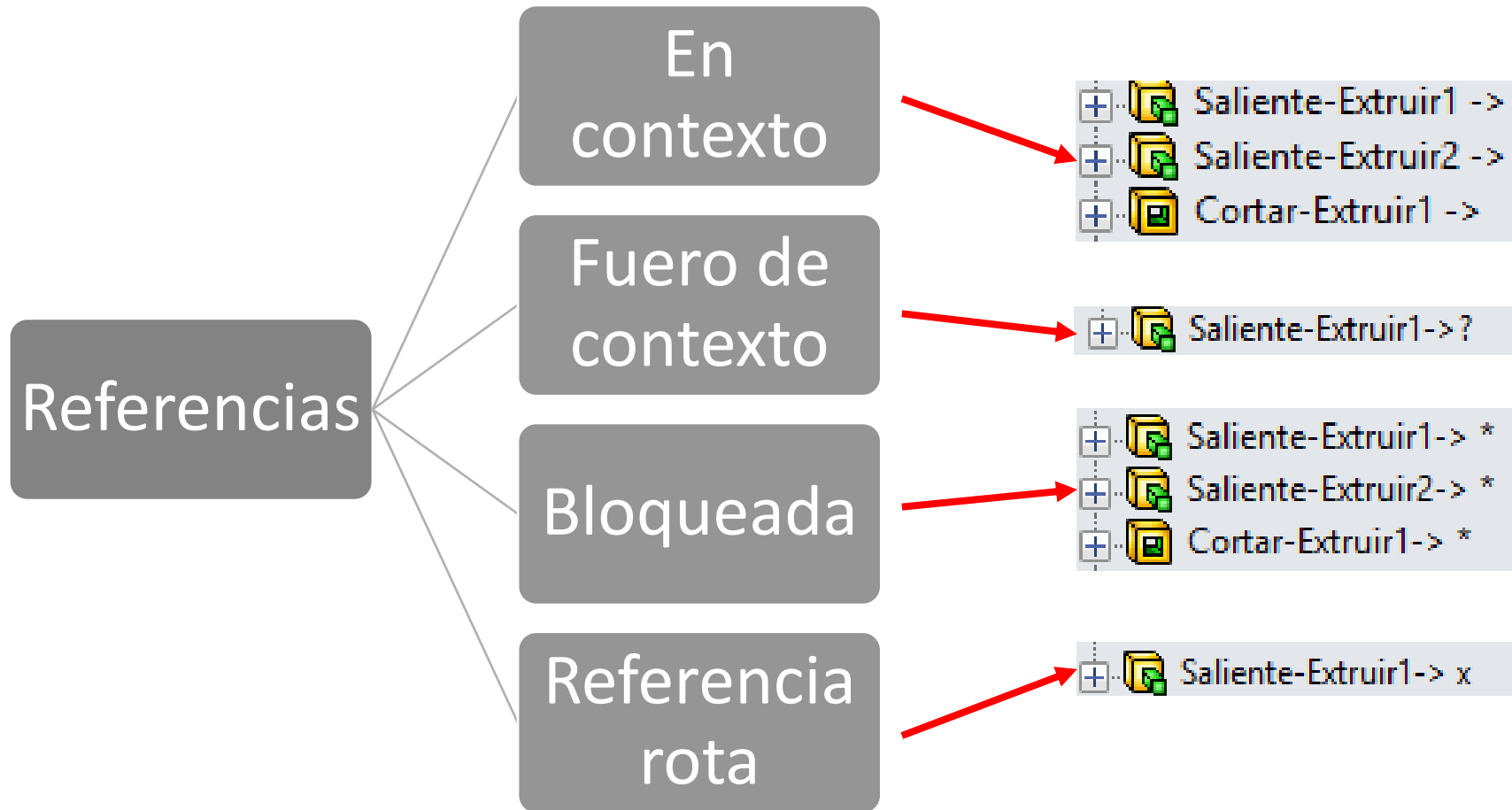
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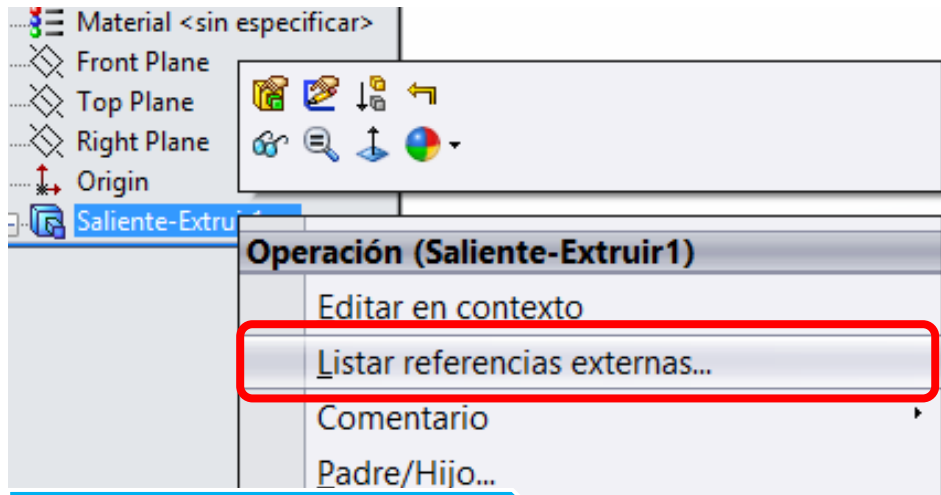
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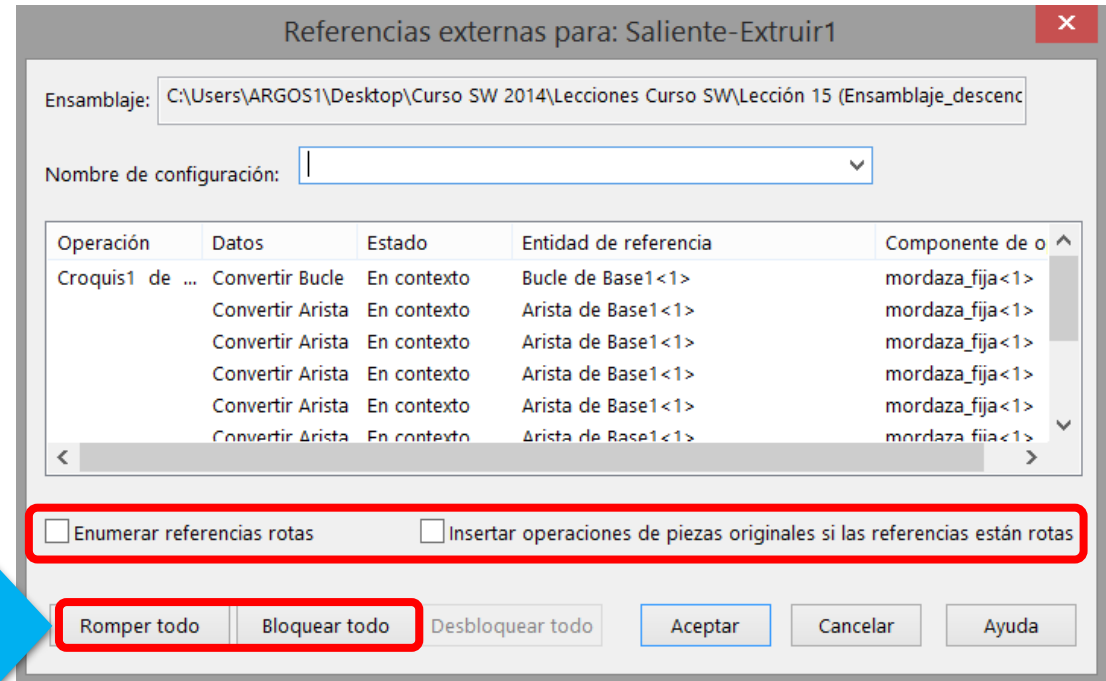
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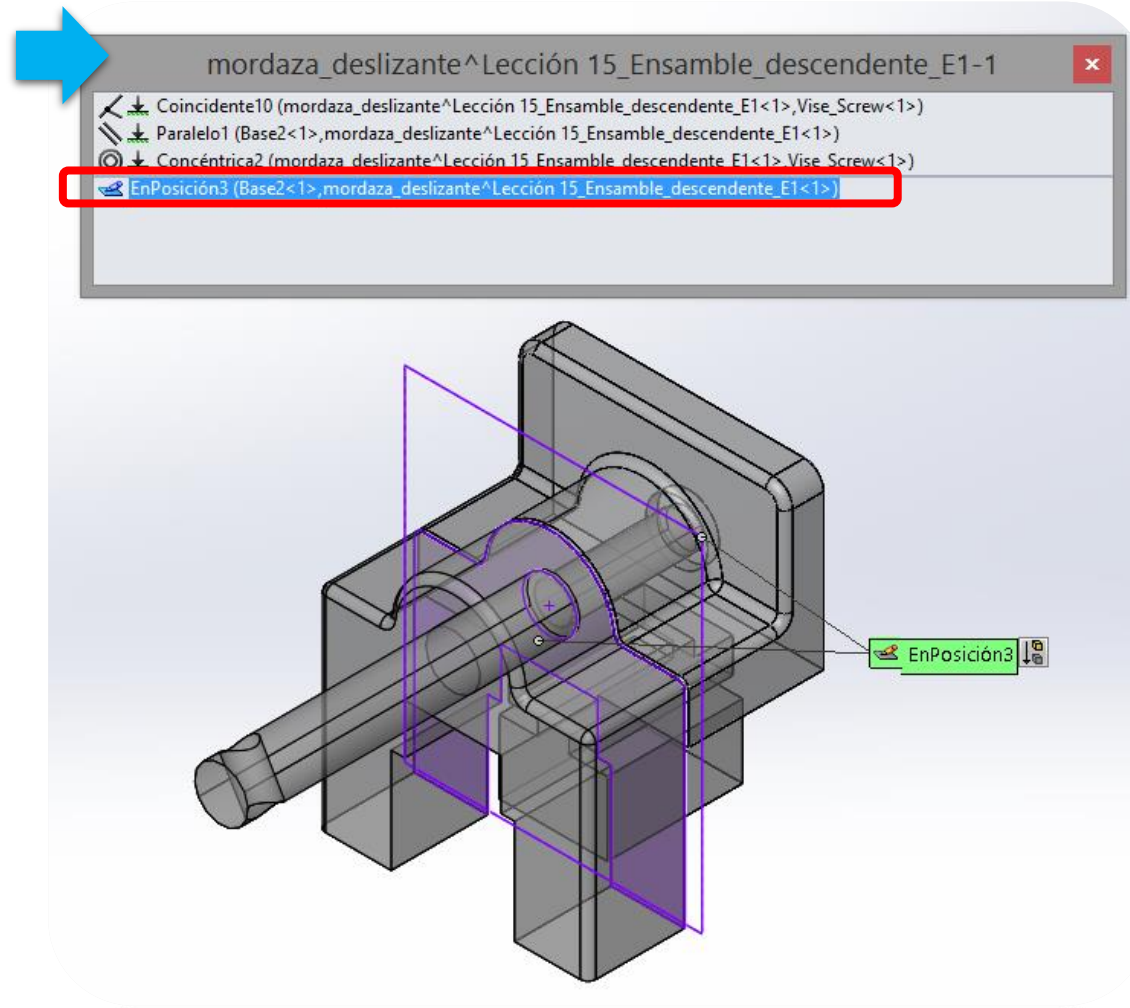
## Referencias externas



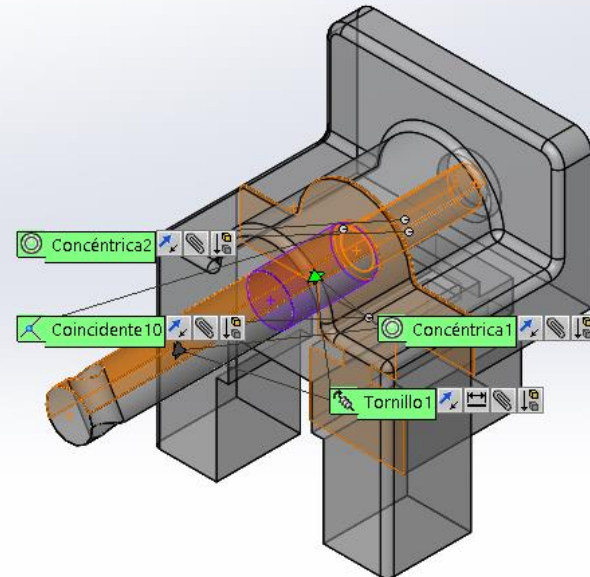
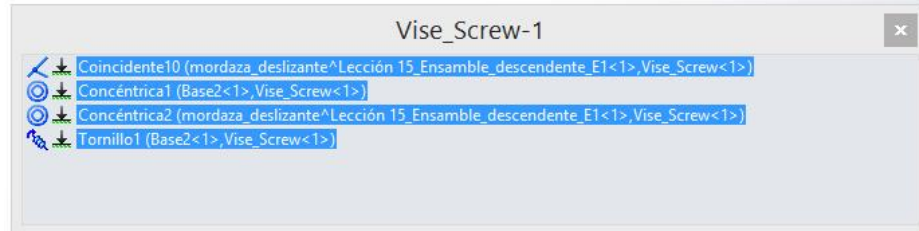
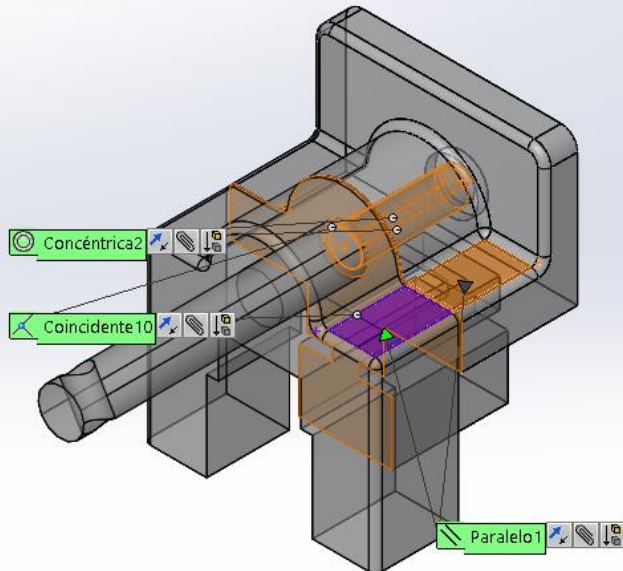
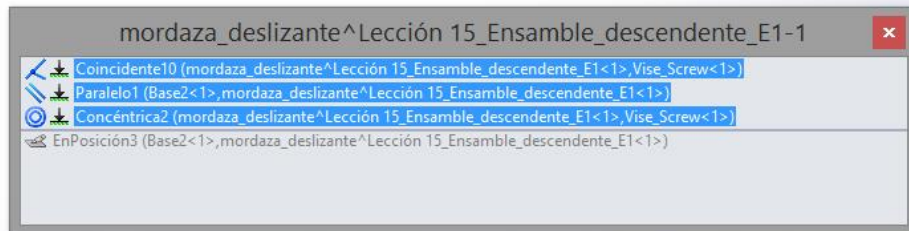
Referencias externas



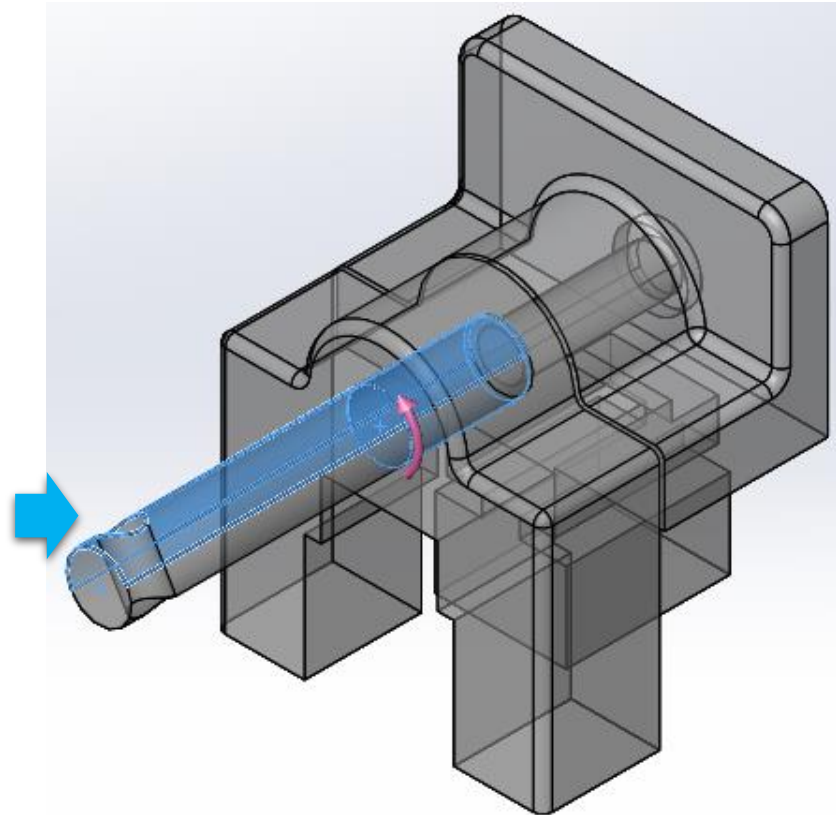
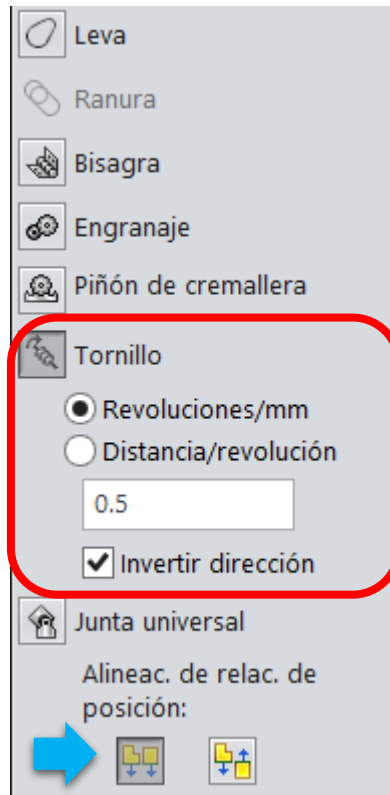
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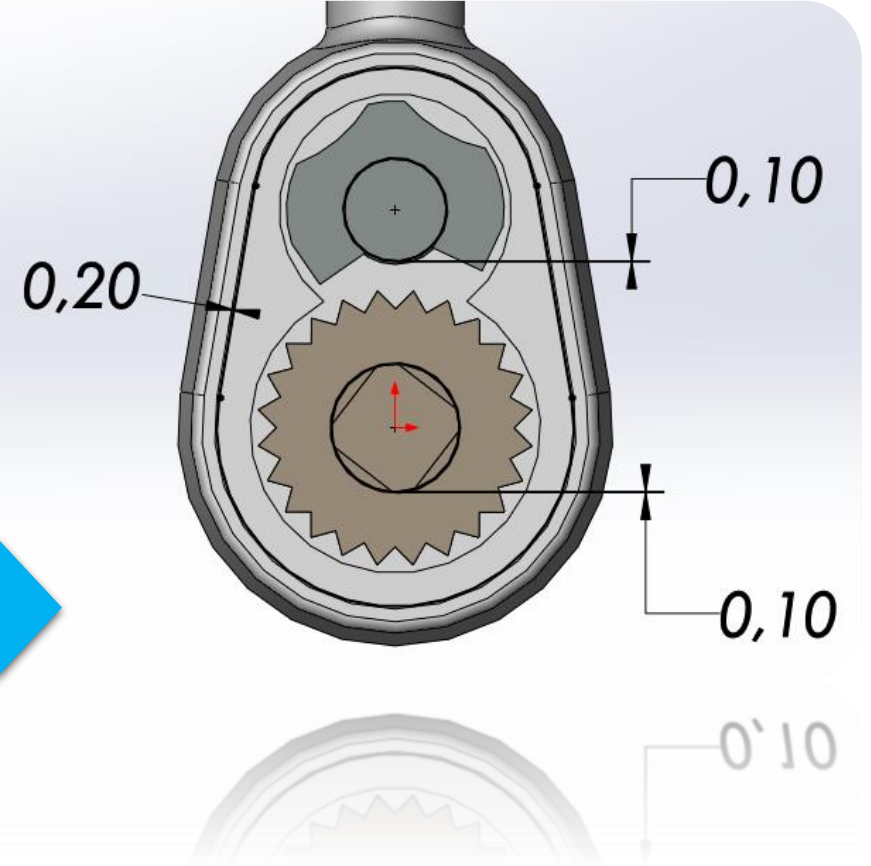
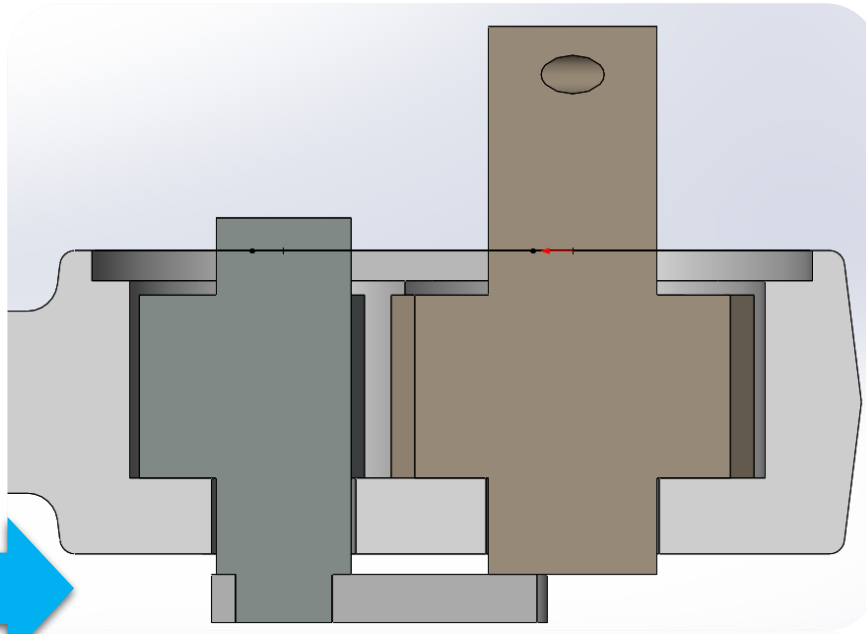
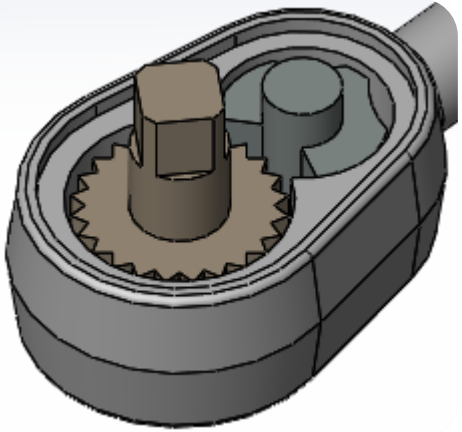
## Agregar relaciones y componentes



## Agregar relaciones y componentes

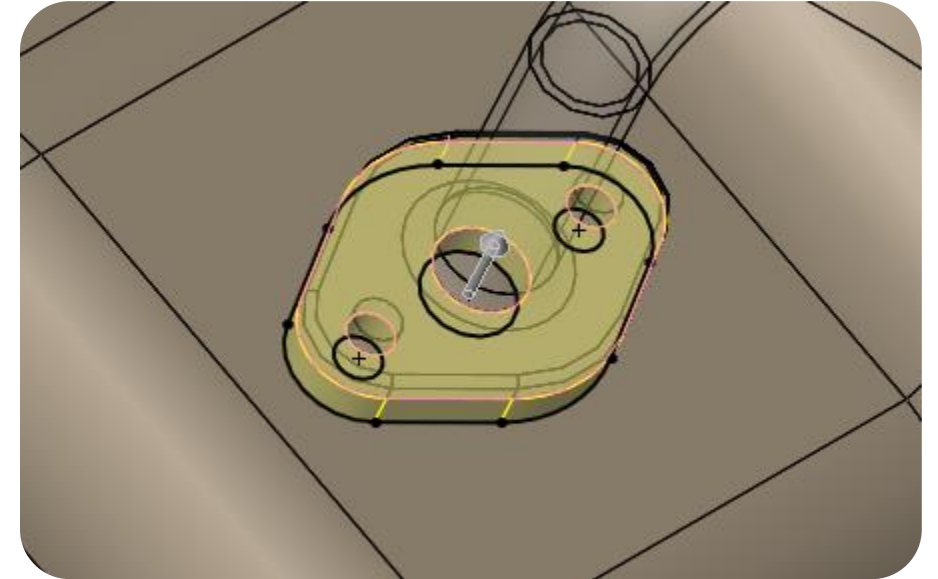
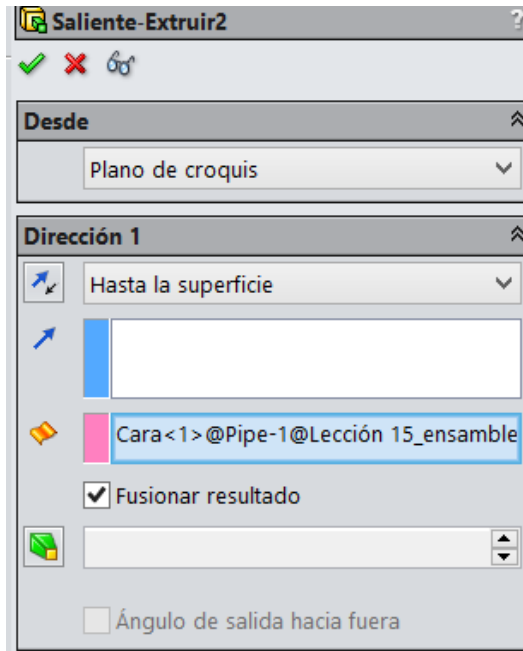
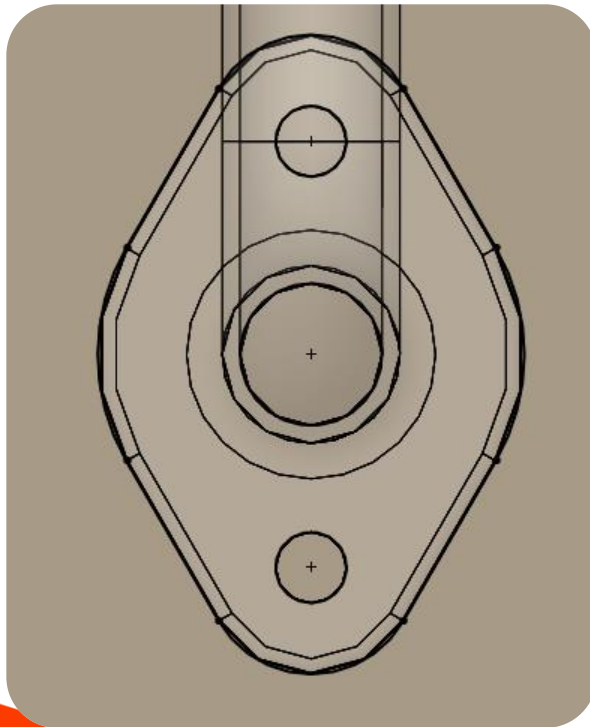


# Ejercicios: E2

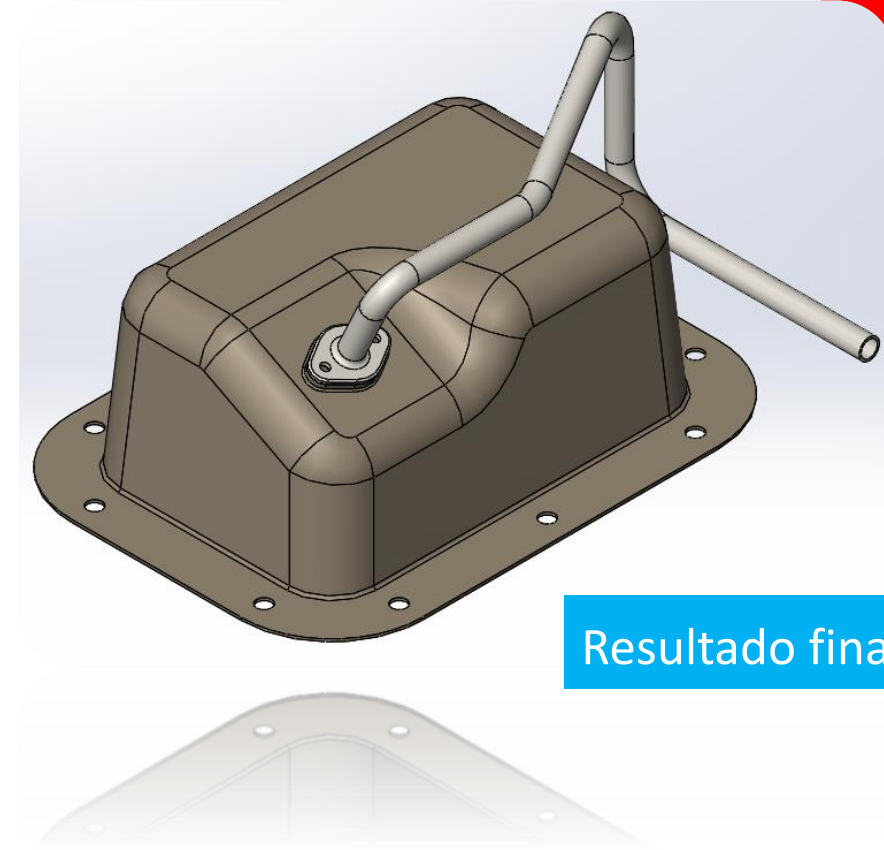
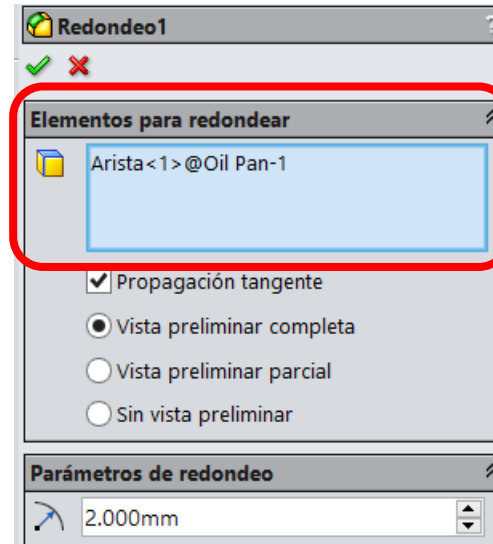
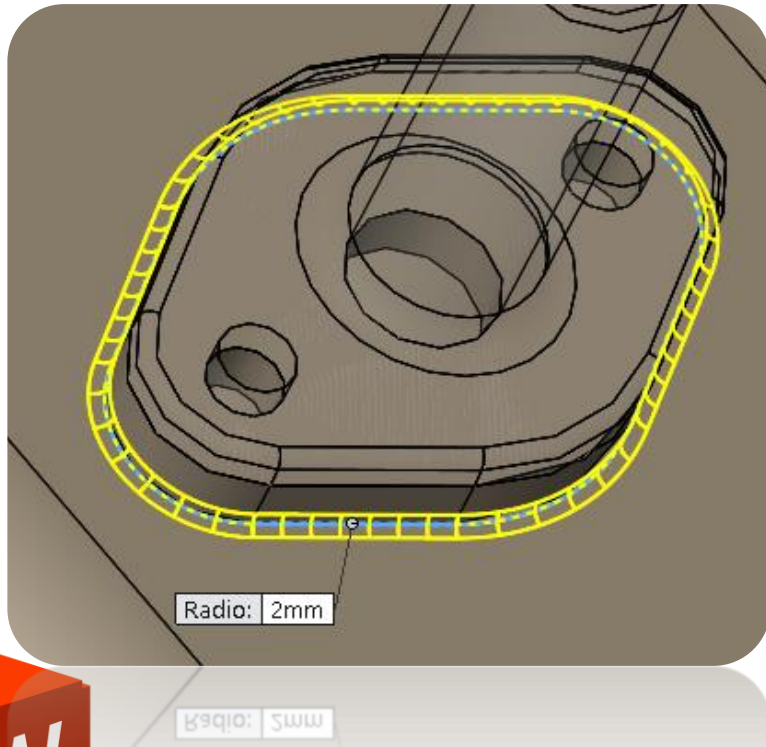


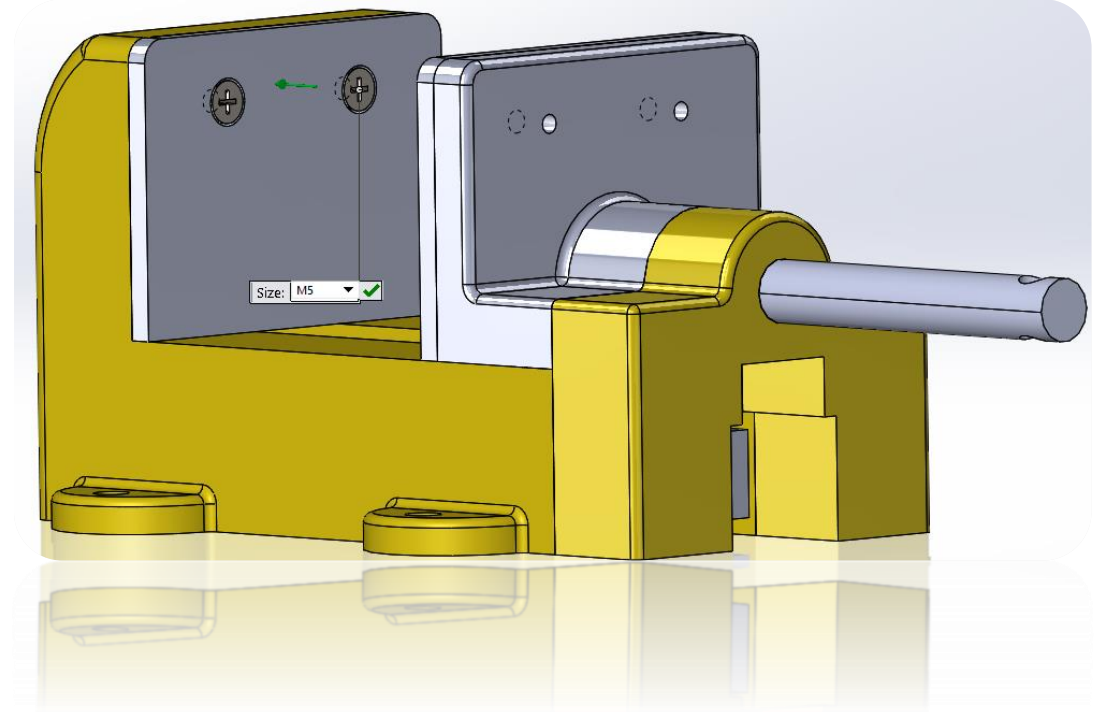


# Ejercicios: E3



## Ejercicios: E3

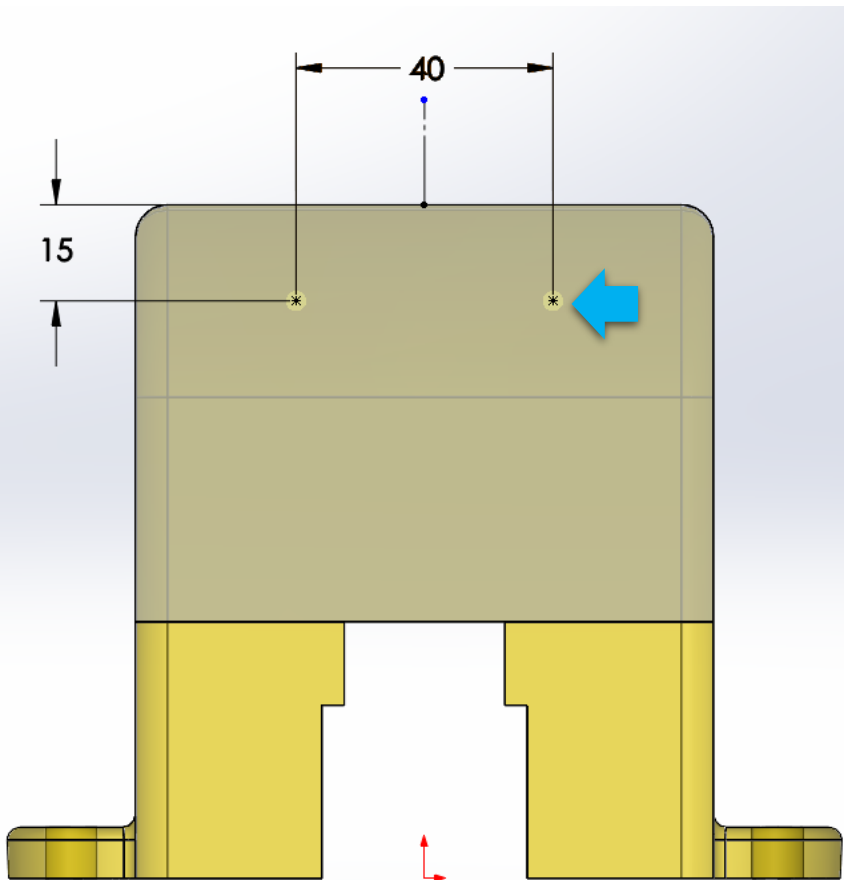
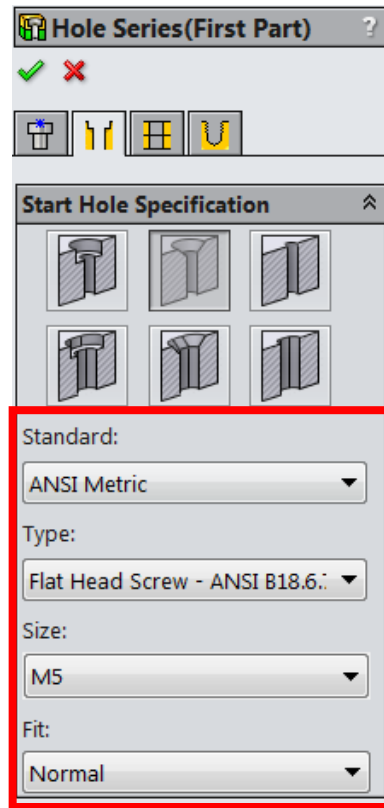




# Operaciones de Ensamblaje



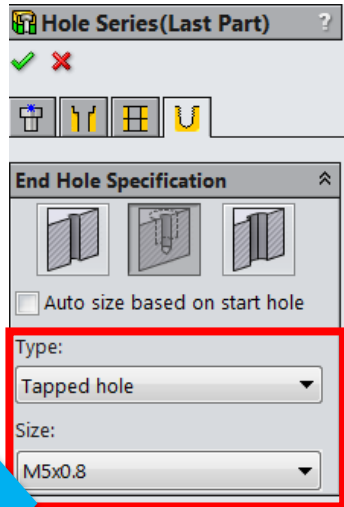
## Serie de Taladros



Detalle de taladros

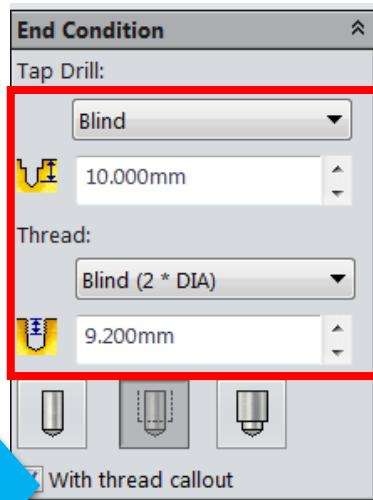


## Serie de Taladros

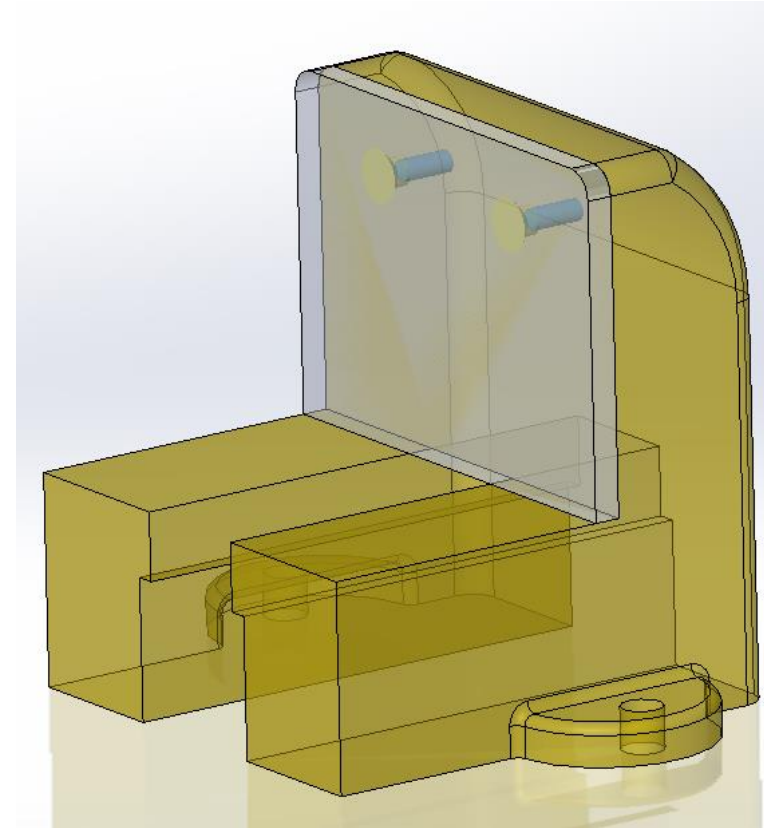


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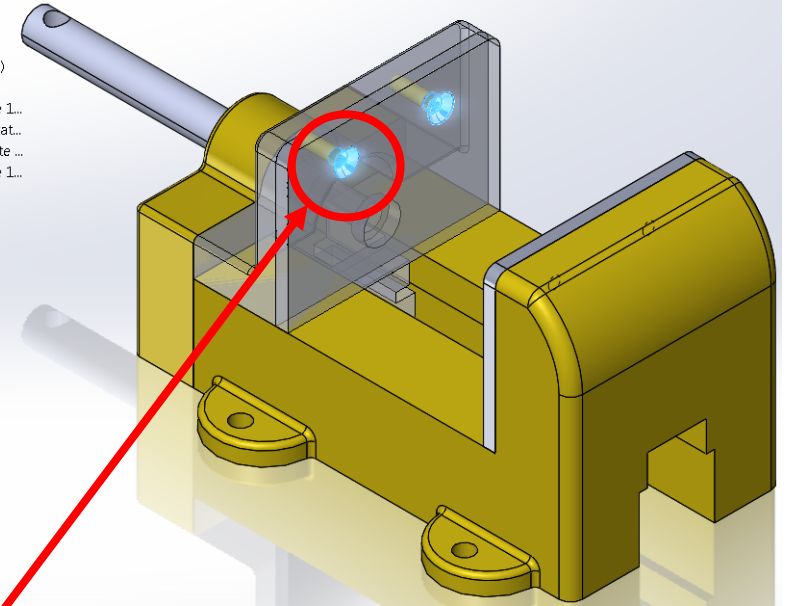
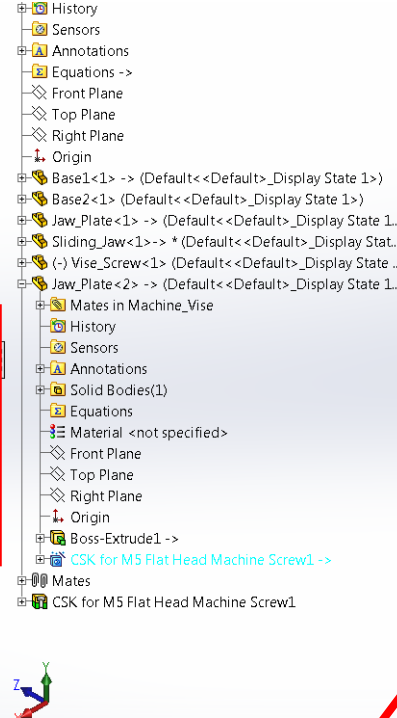
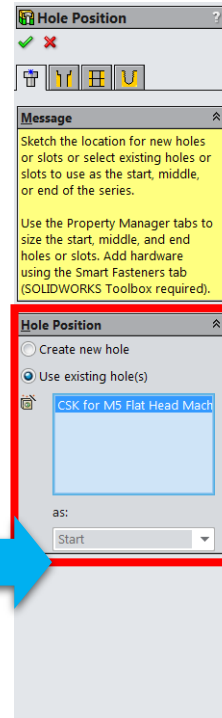
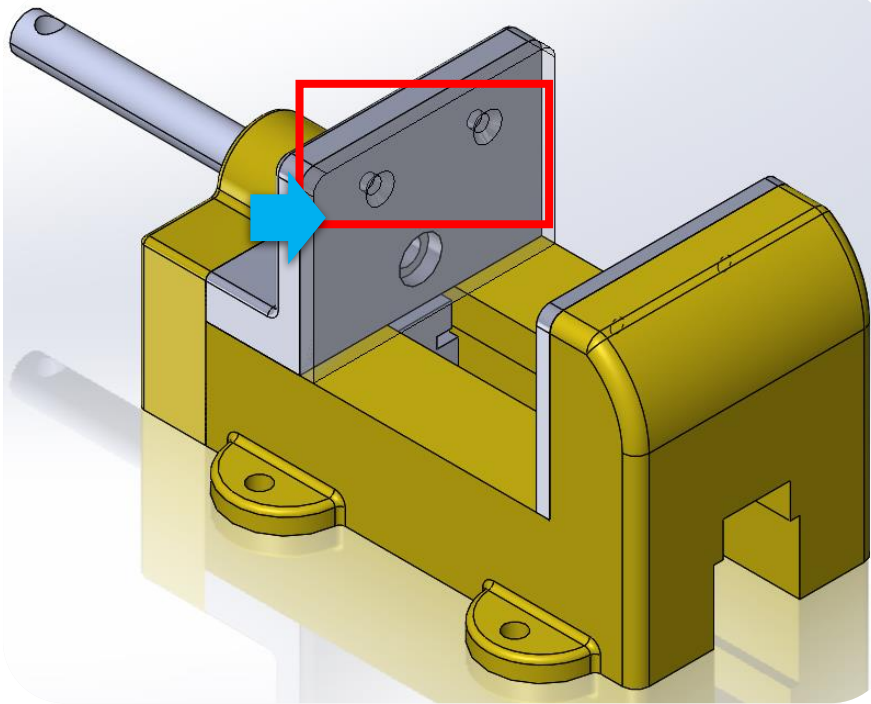
Detalle de taladros



2



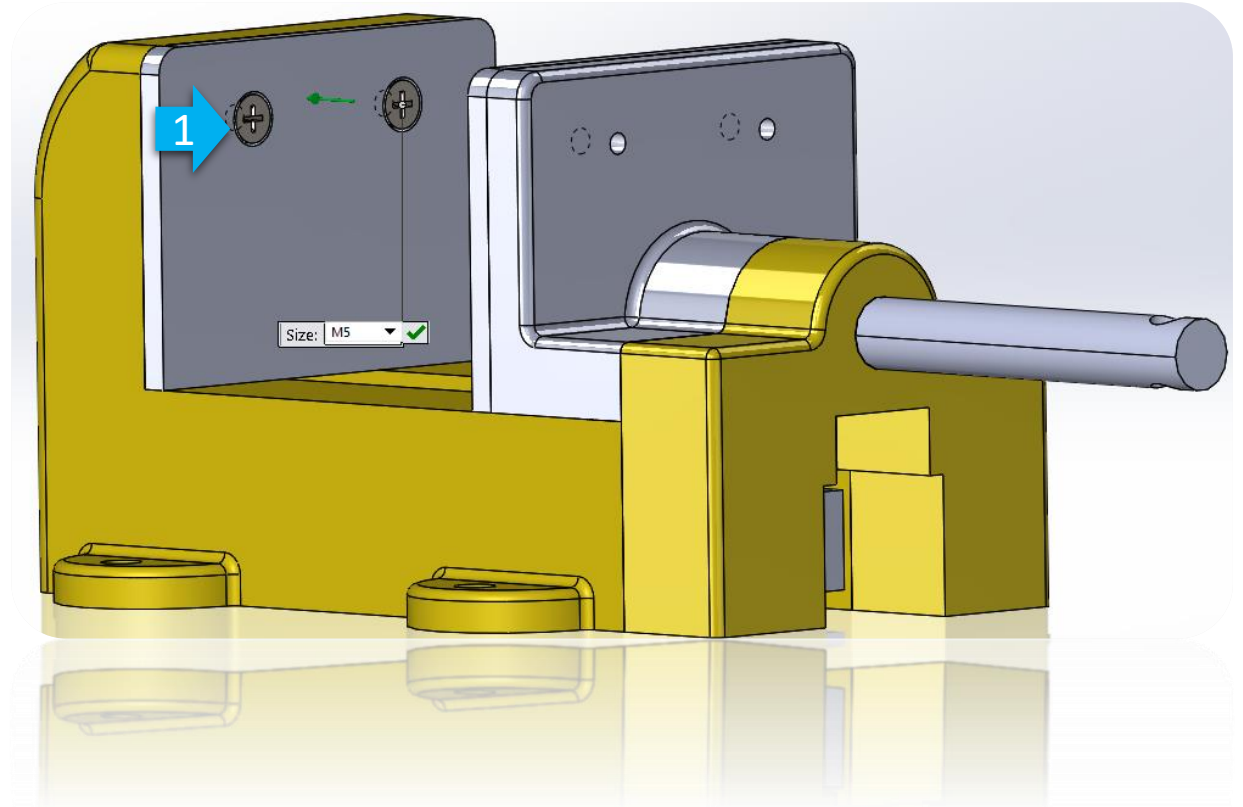
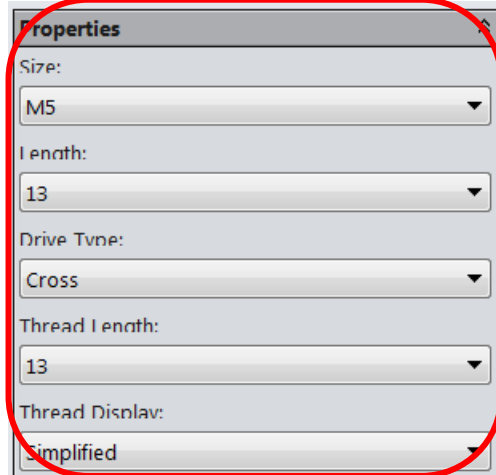
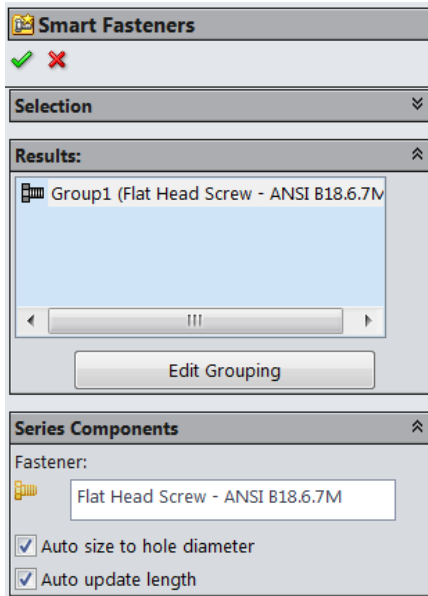
## Operaciones dependientes del tiempo



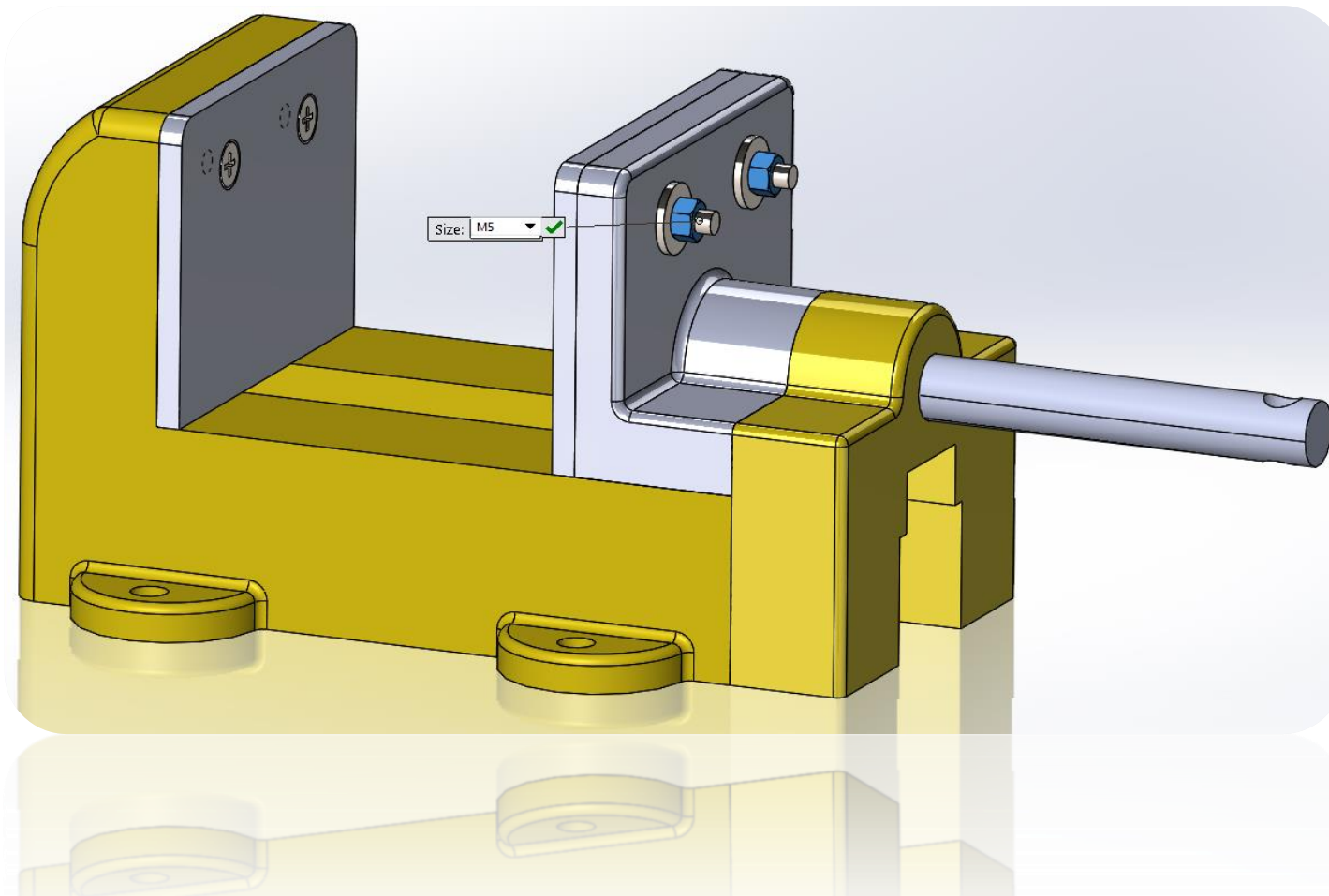
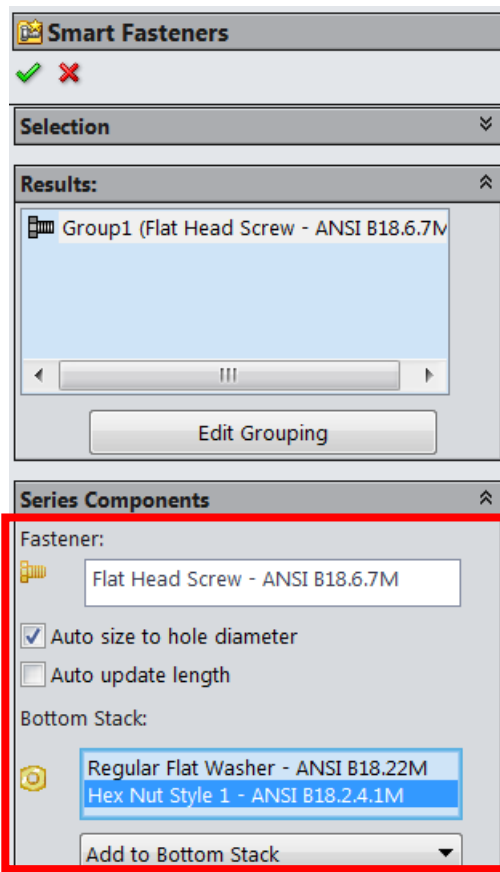
“Usar taladro existente”



## Smart Fasteners

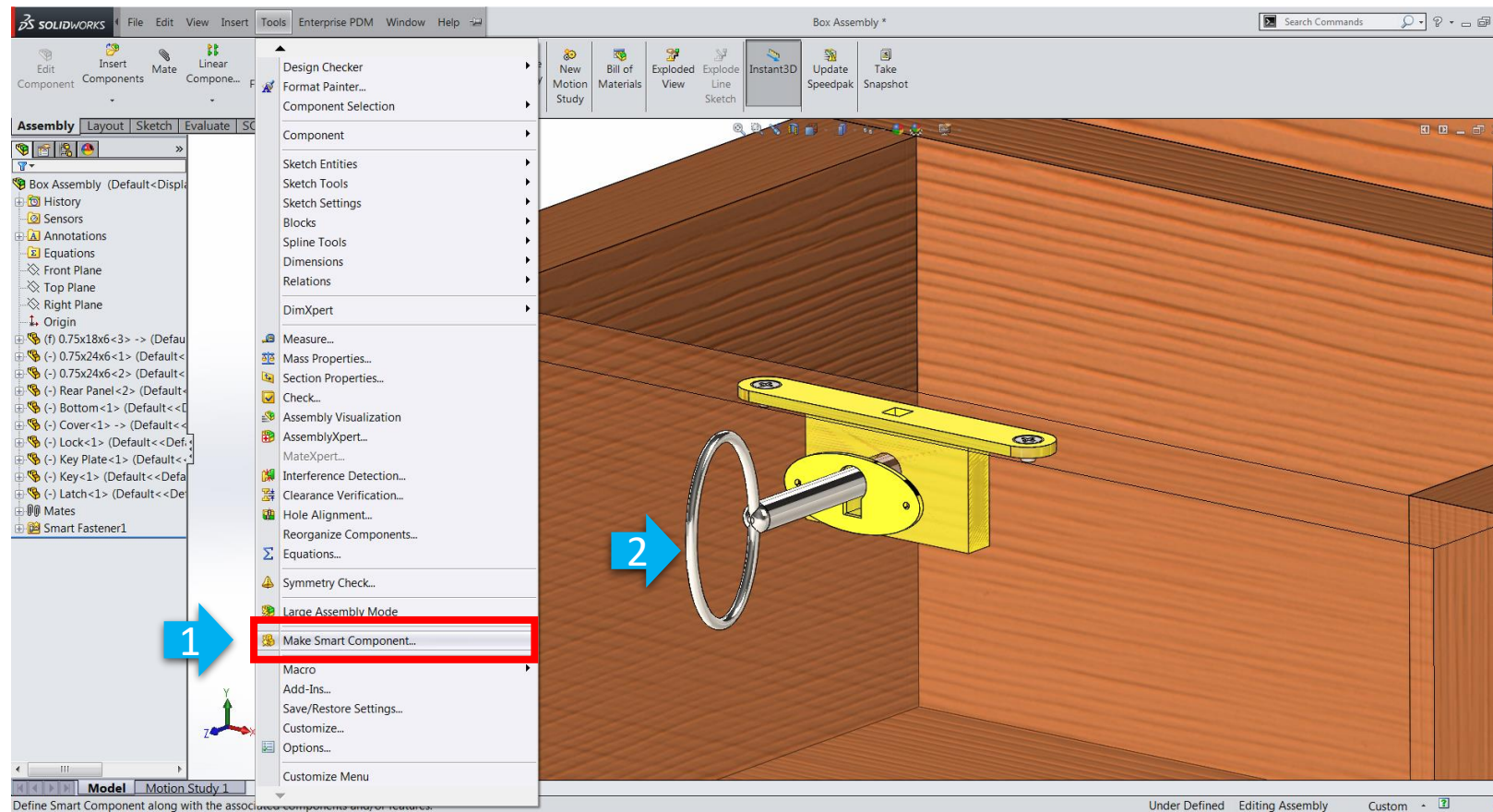


## Componentes de serie de Taladros

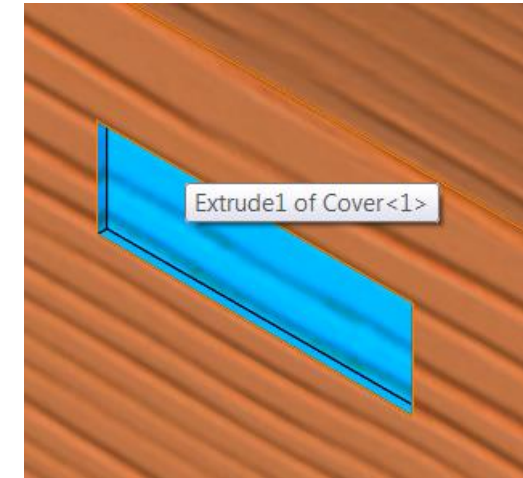
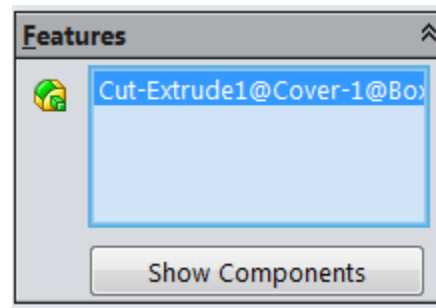
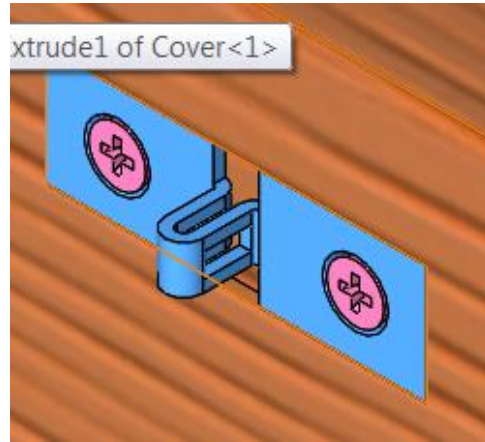
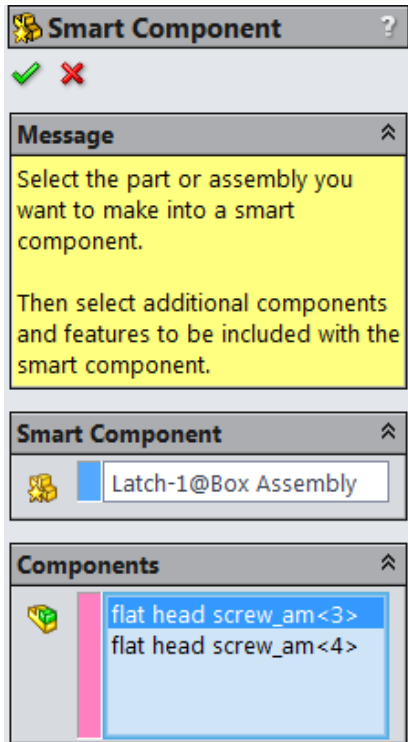




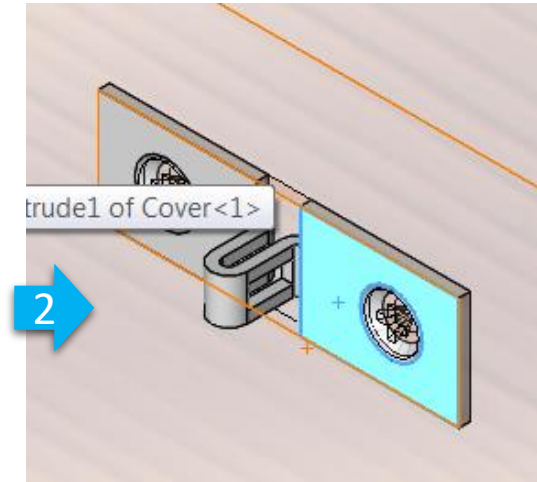
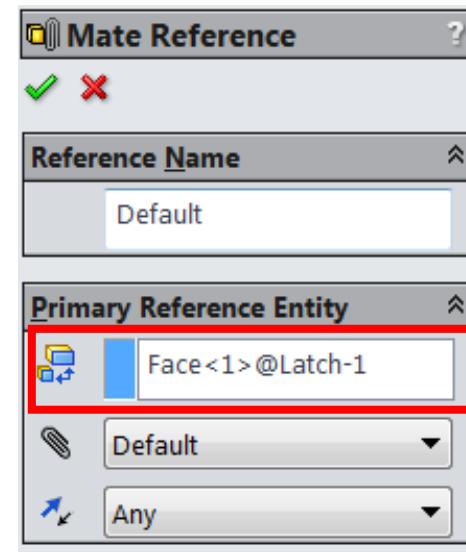
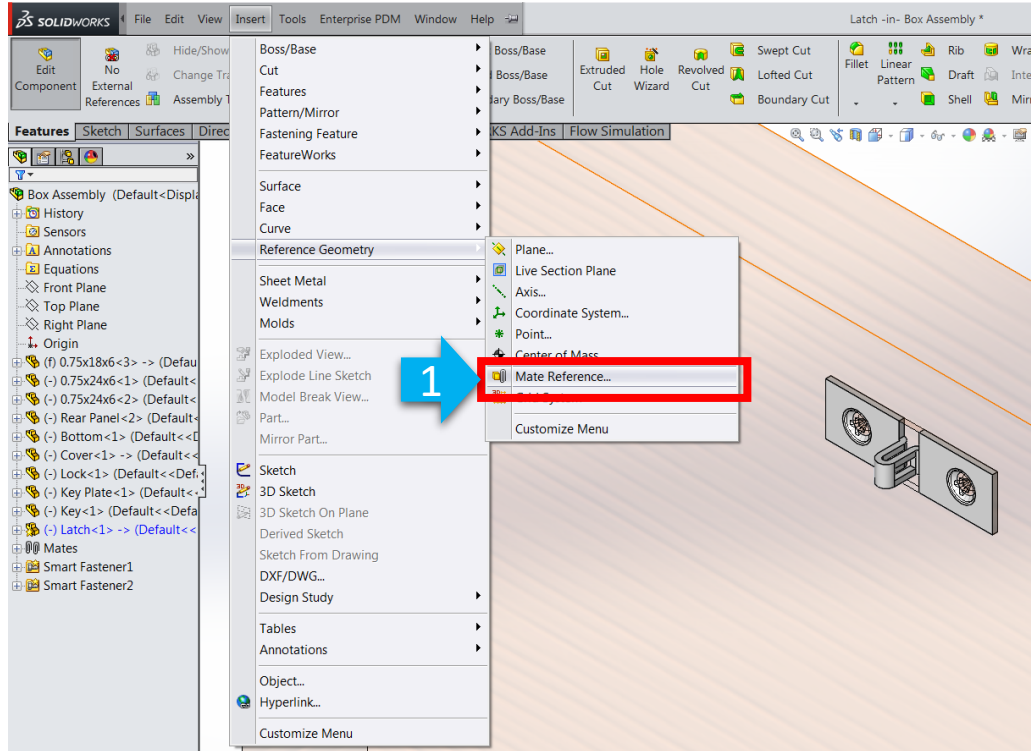
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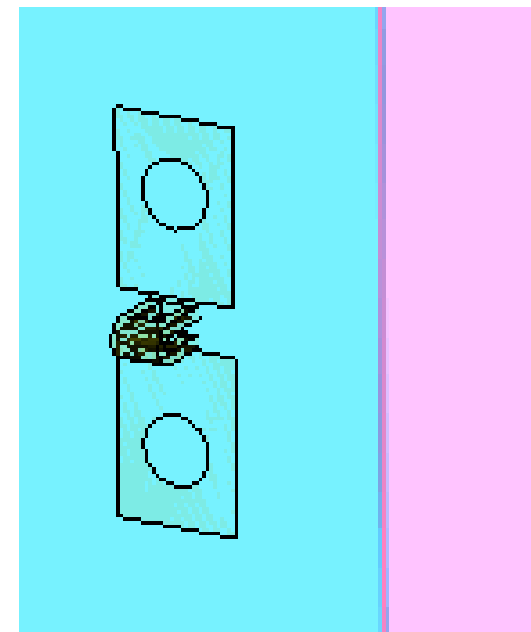
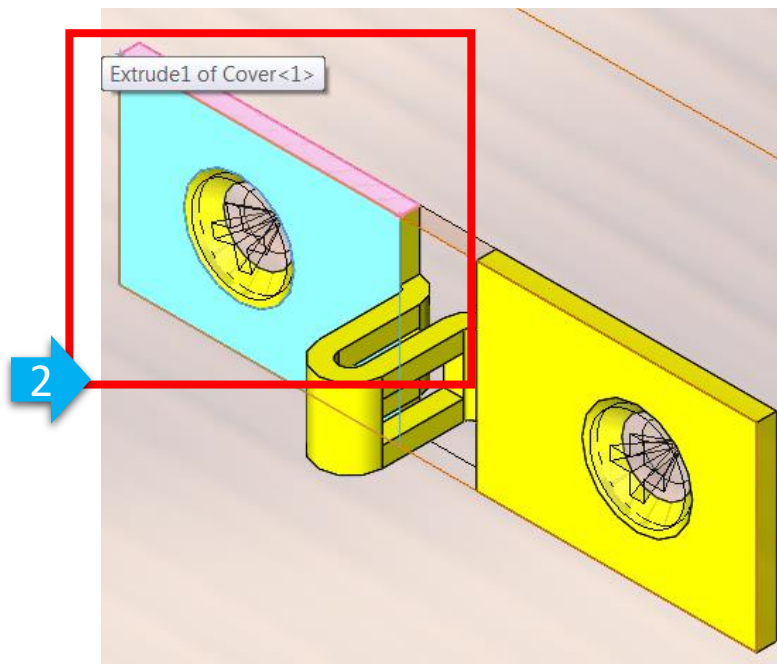
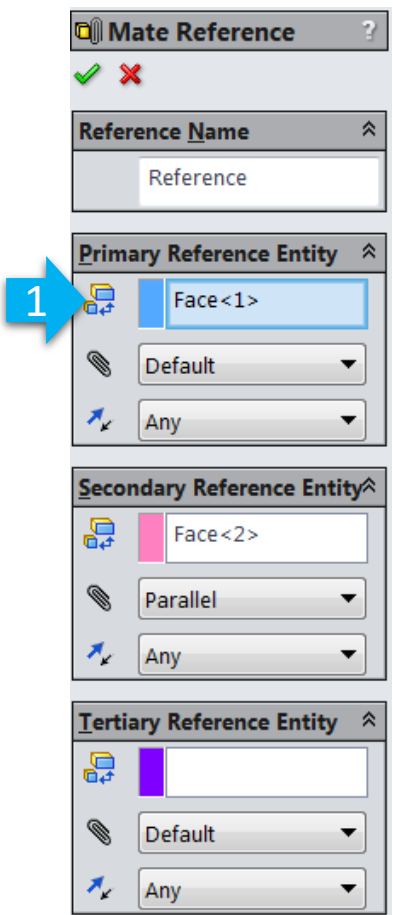
# Componentes Inteligentes



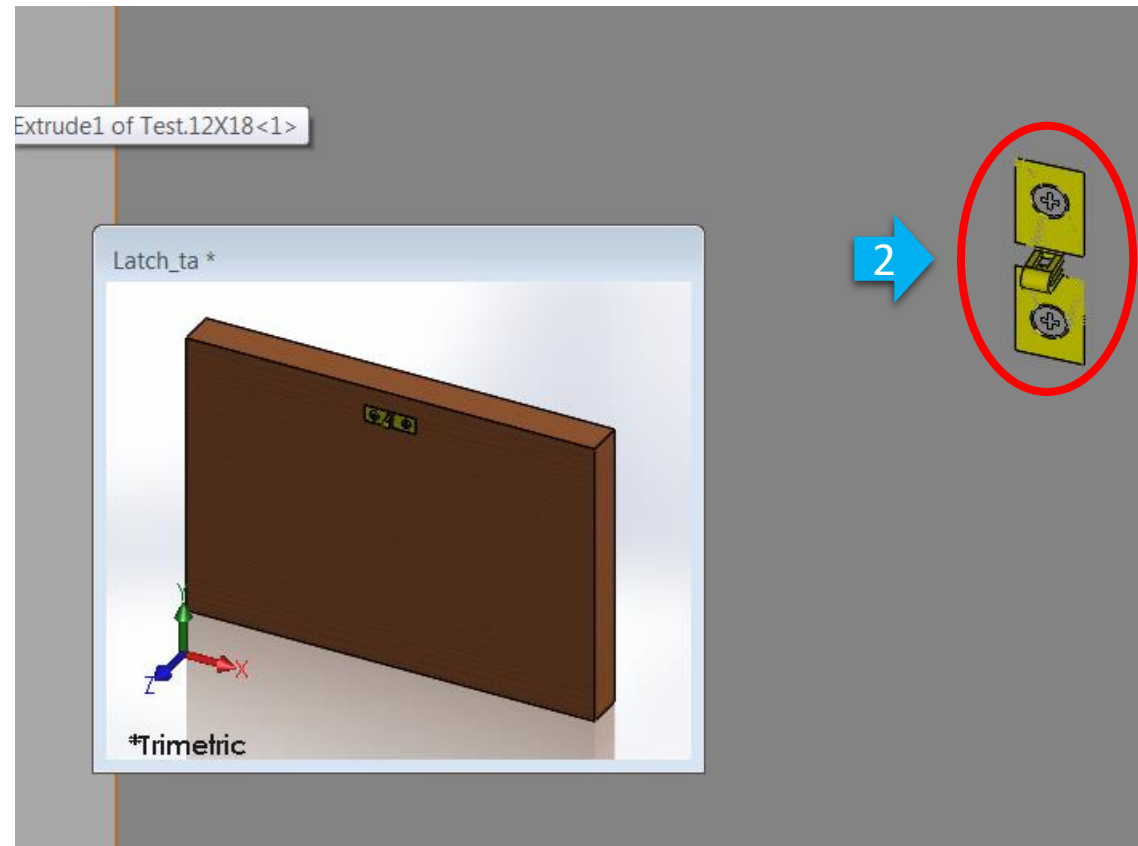
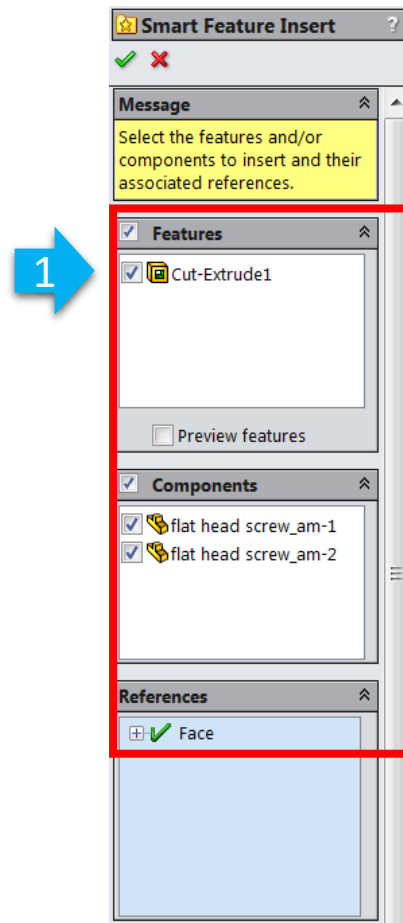
## Componentes Inteligentes

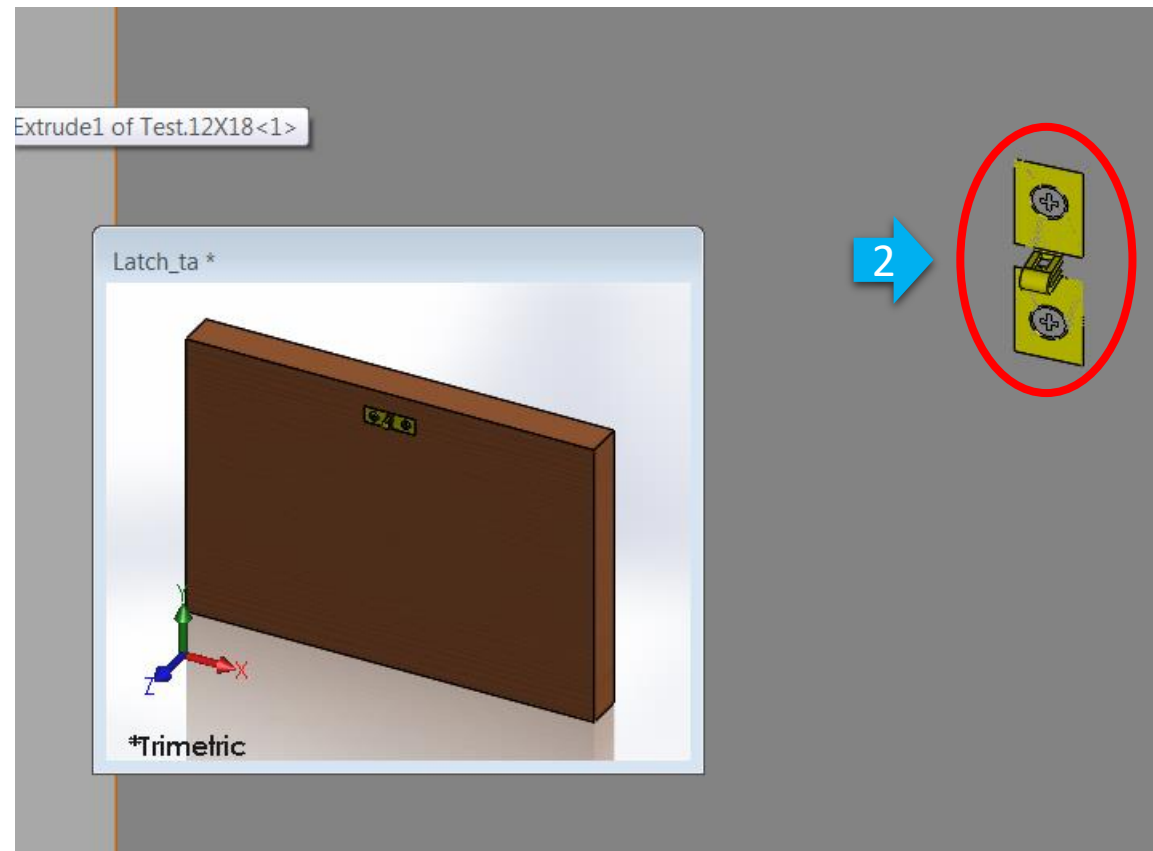
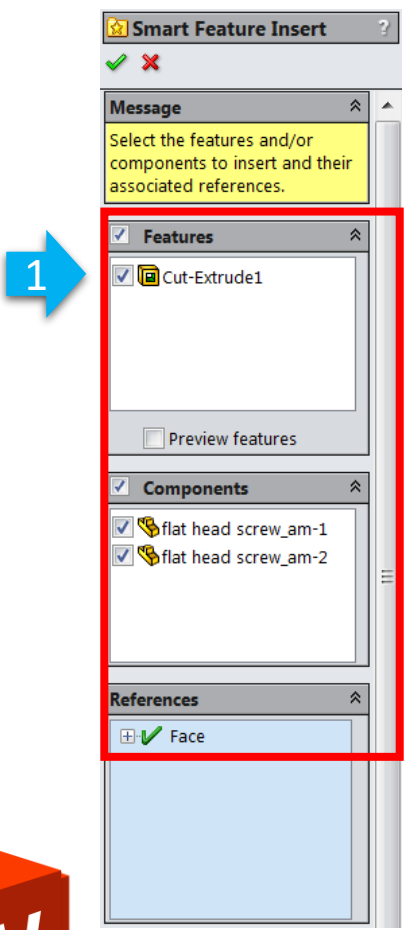


## Referencia de relación de posición

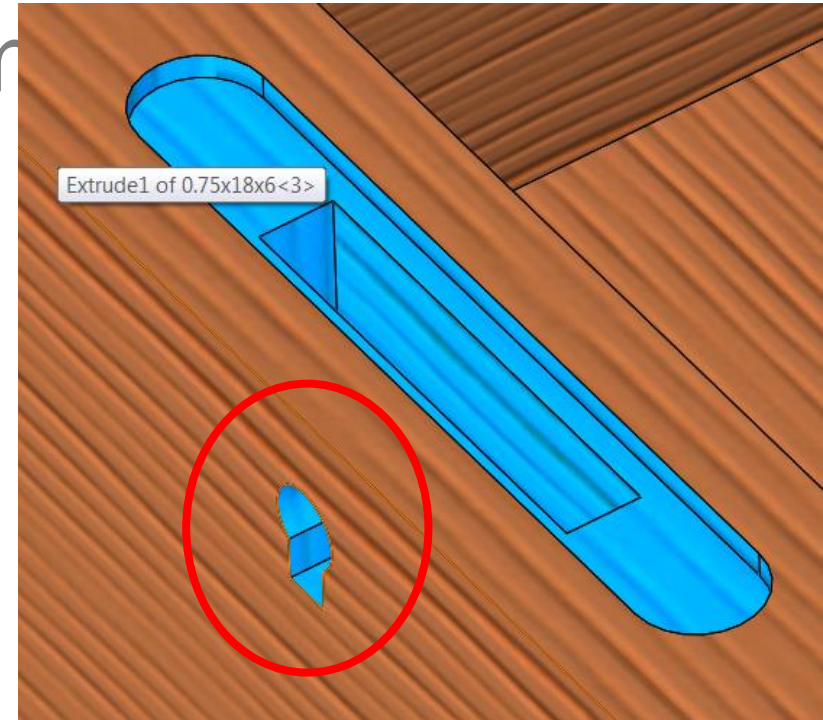
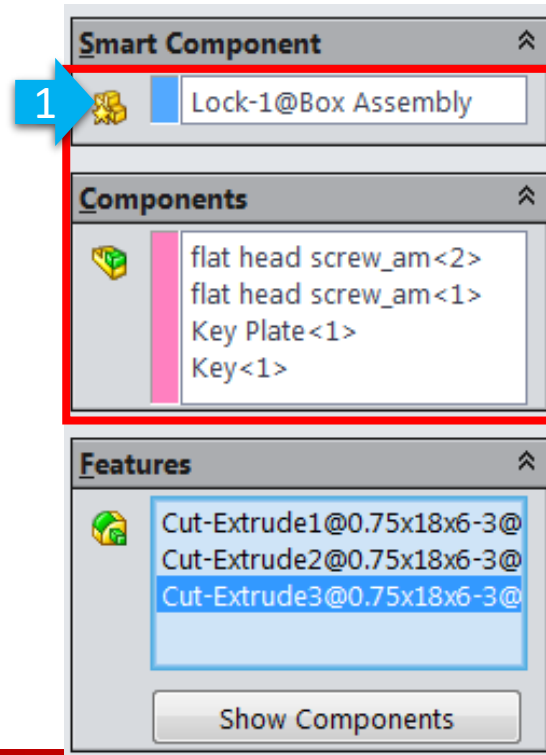
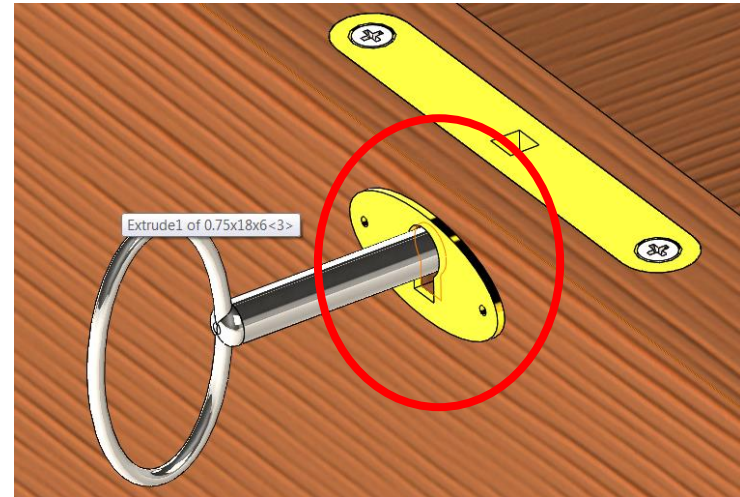


## Componentes Inteligentes

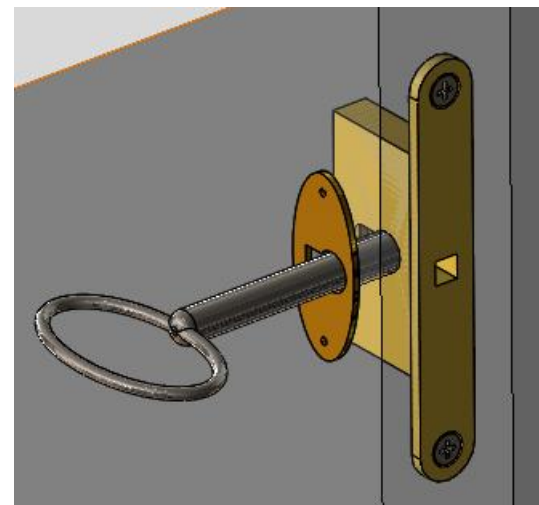
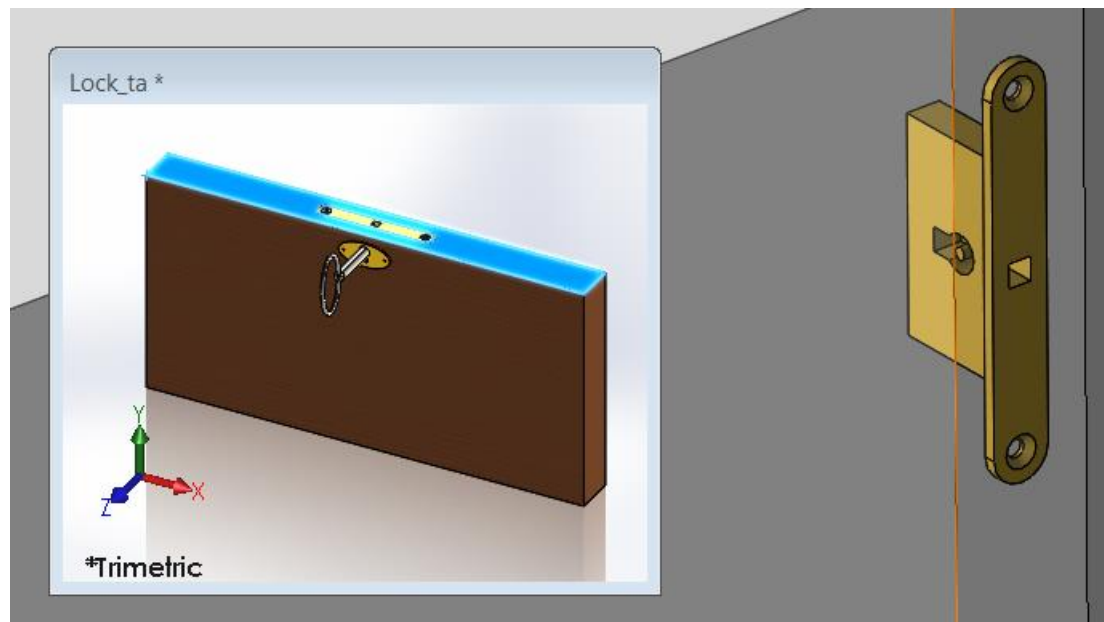
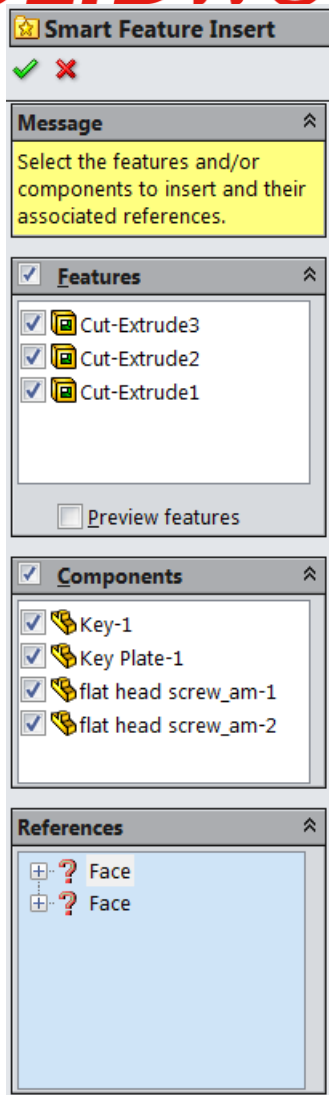




## Múltiples operaciones



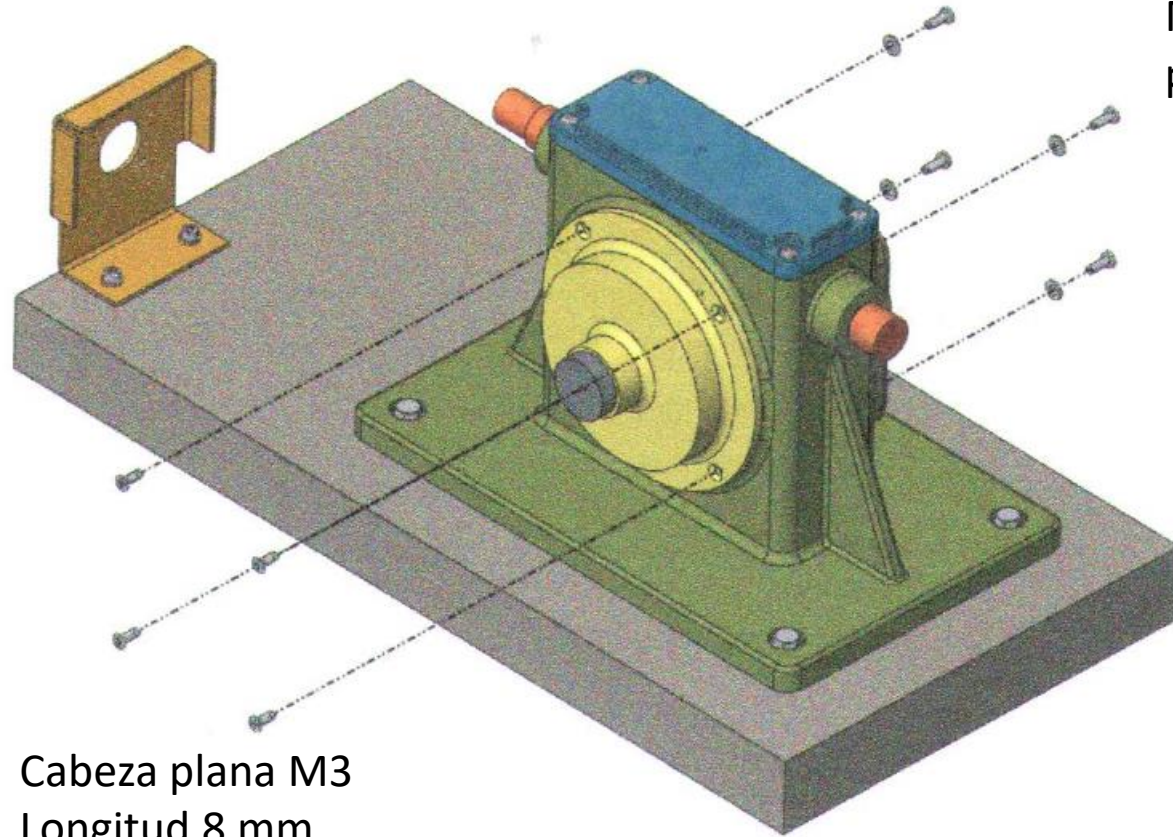
## Múltiples operaciones





## Ejercicios

Tornillo de cabeza tronconica en cruz  
M3 de 8 mm de longitud, con arandela  
plana, estrecha

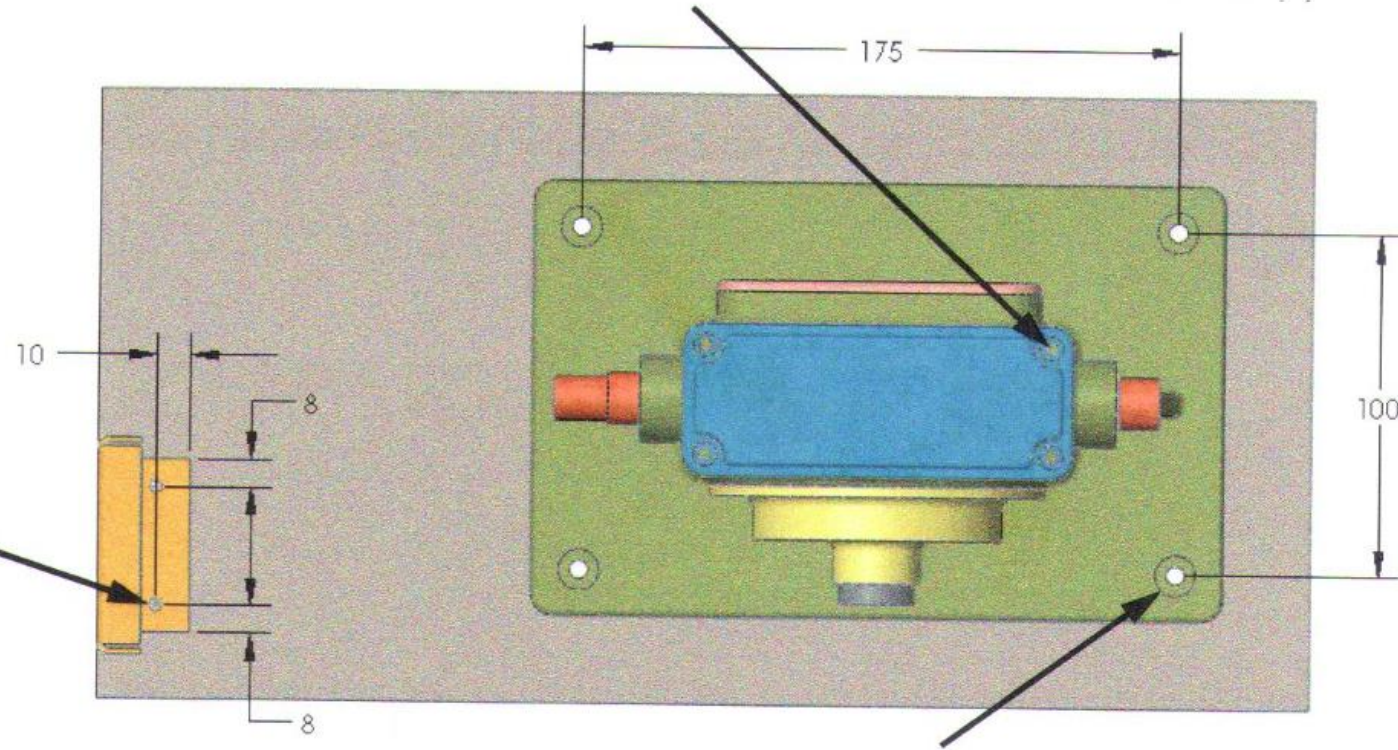


Cabeza plana M3  
Longitud 8 mm



# Ejercicios

Refrentado para tornillo con cabeza troconica en cruz  
M3 y M3x0,5, perforador para roscar de 7,5 mm (4)



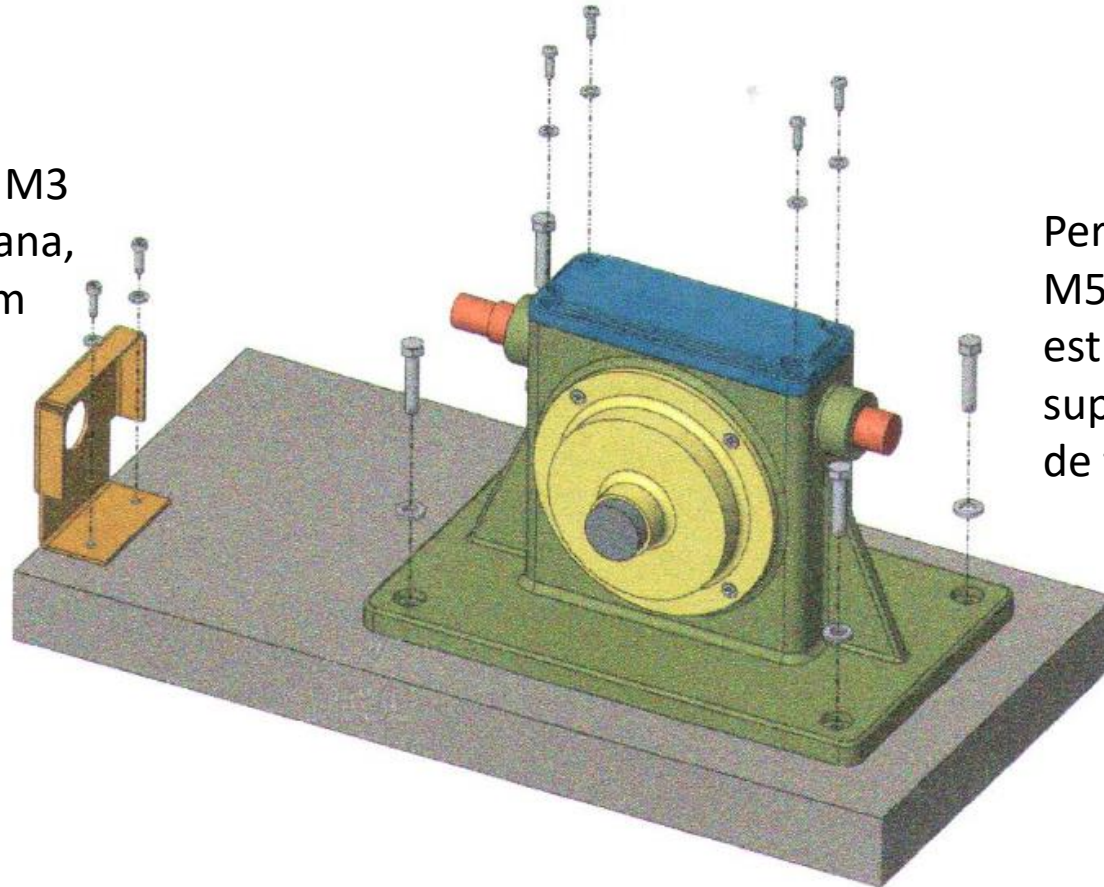
Distancia M3 y  
perforador para roscar  
M3x0,5 7,5 mm de  
profundidad (2)

Refrentado para tornillo con cabeza  
hexagonal M5 por todo (4)

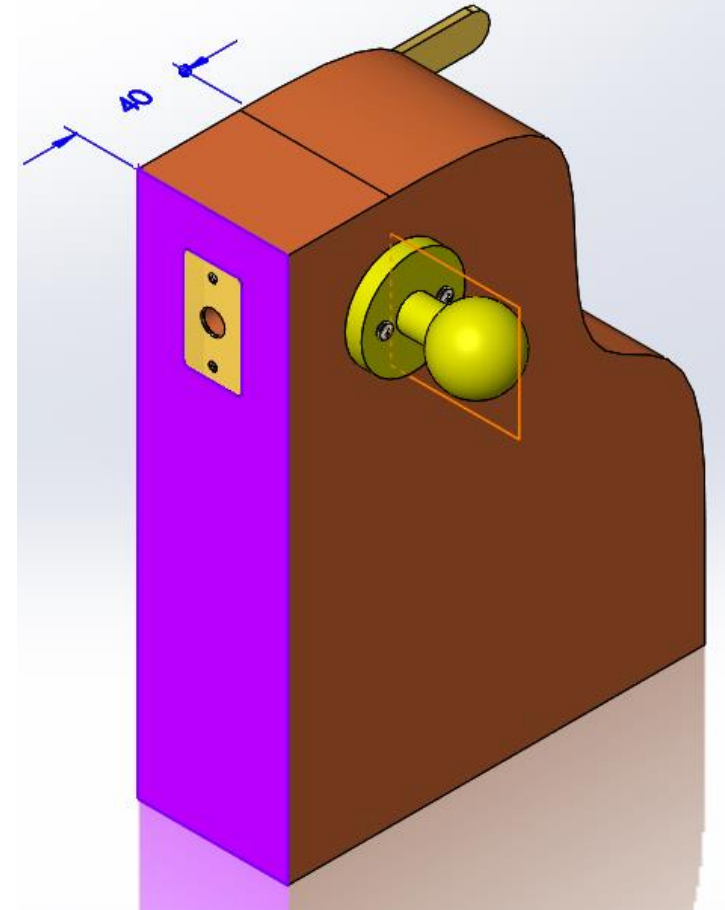
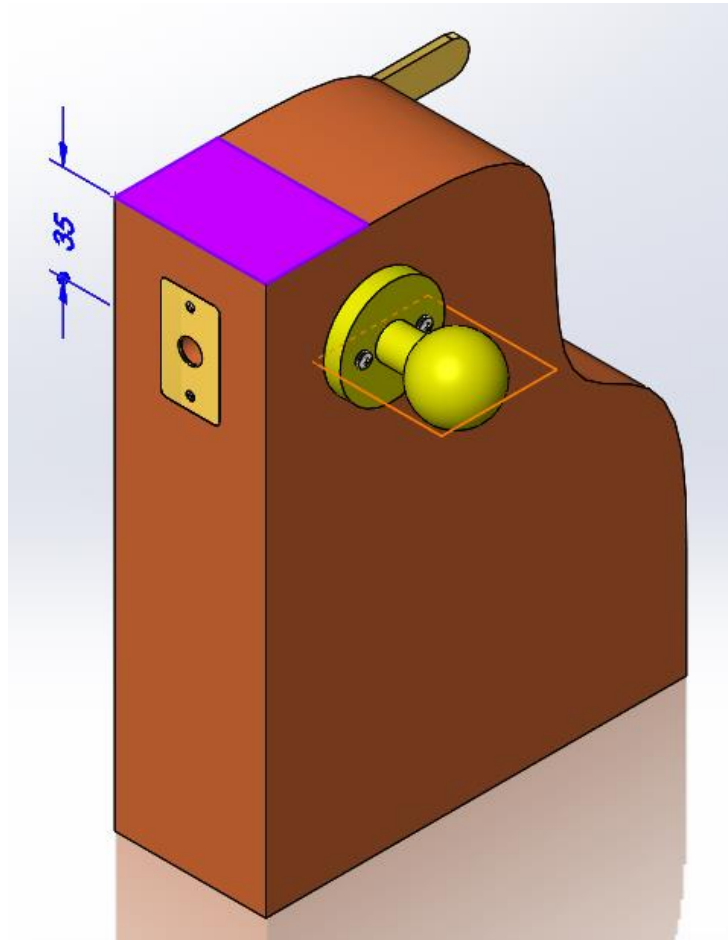
# Ejercicios

Tornillo de cabeza tronconica en cruz  
M3 con arandela estrecha plana,  
longitud de tornillo: 8 mm

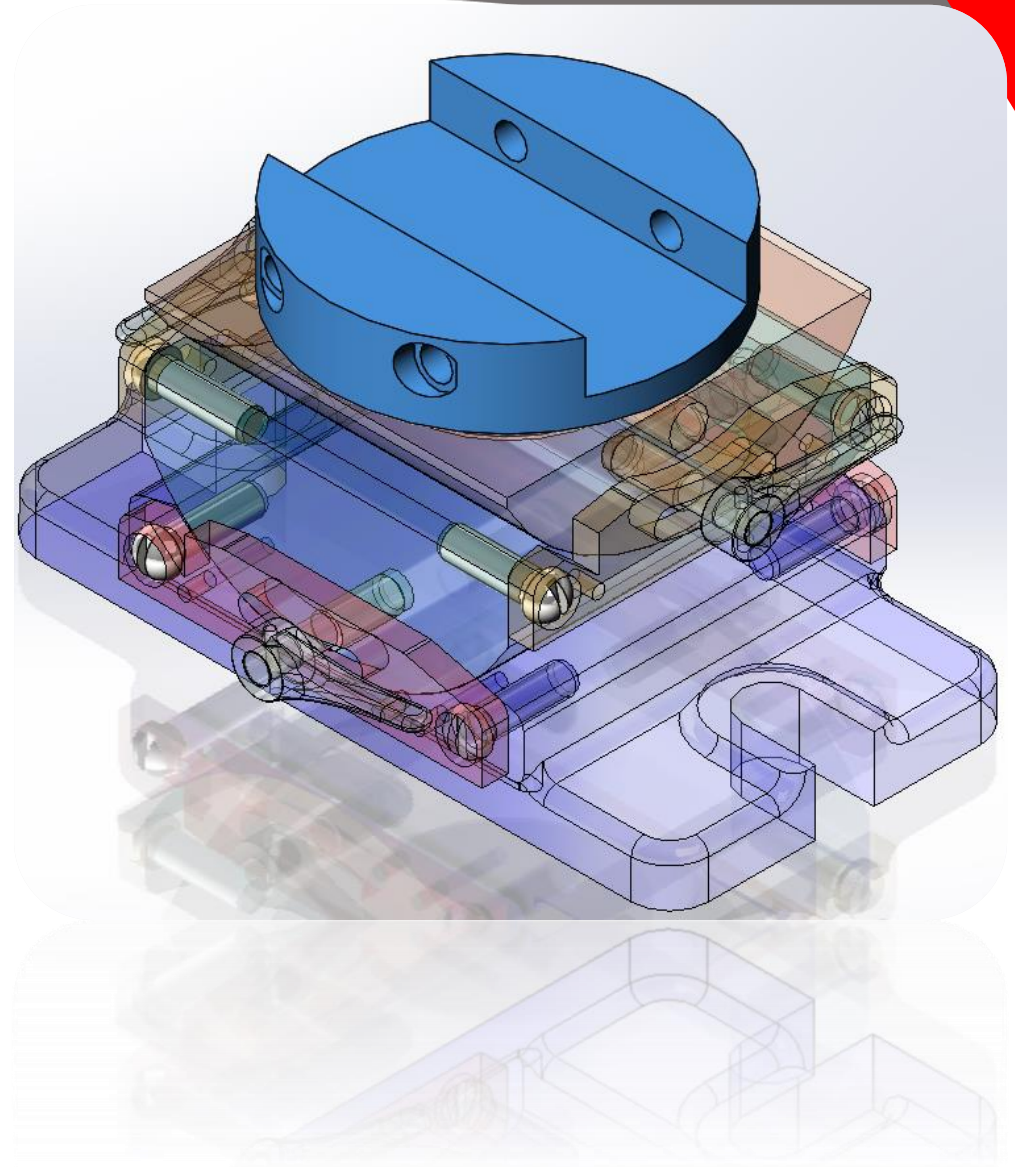
Tornillo de cabeza hueca M3  
con arandela estrecha plana,  
longitud de tornillo: 8 mm



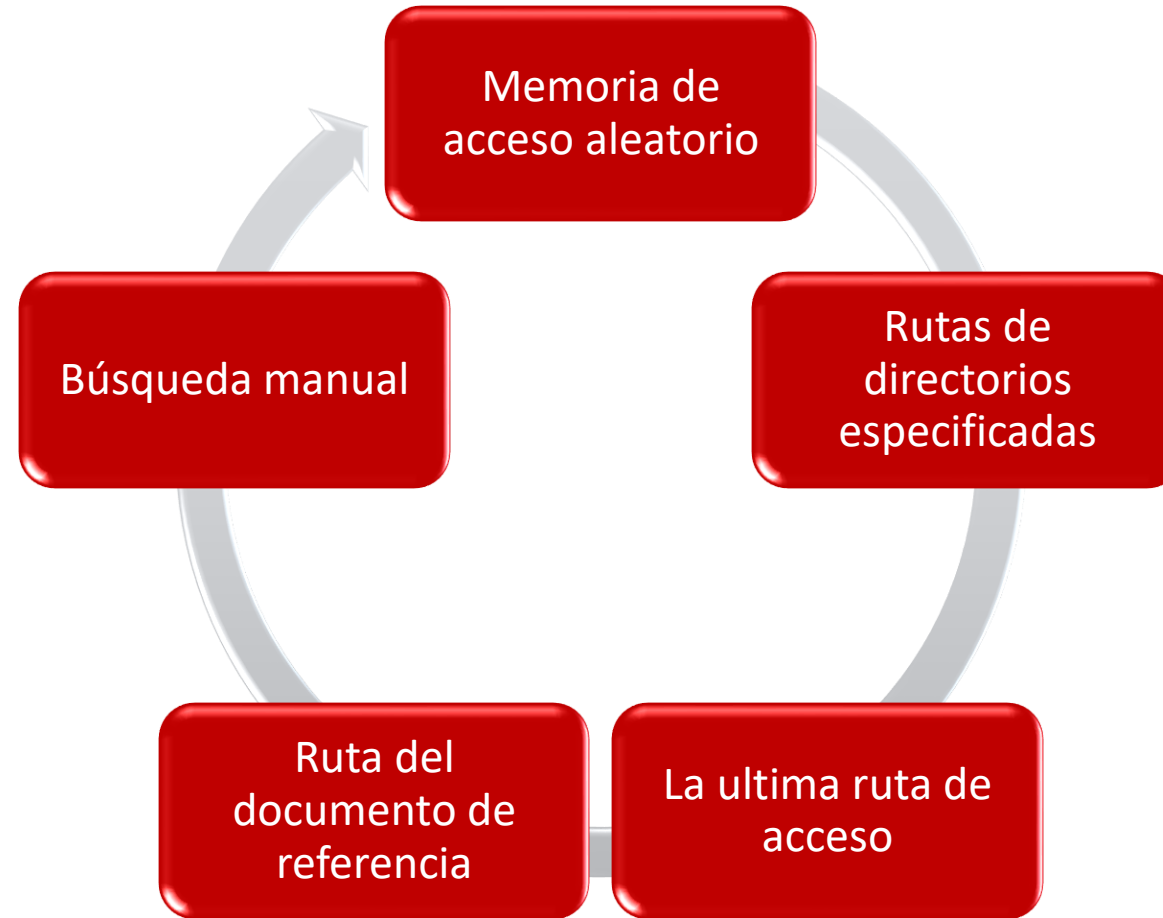
Perno de cabeza hexagonal  
M5 y tuerca con arandela  
estrecha plana en la pila  
superior e inferior, longitud  
de tornillo: 30 mm



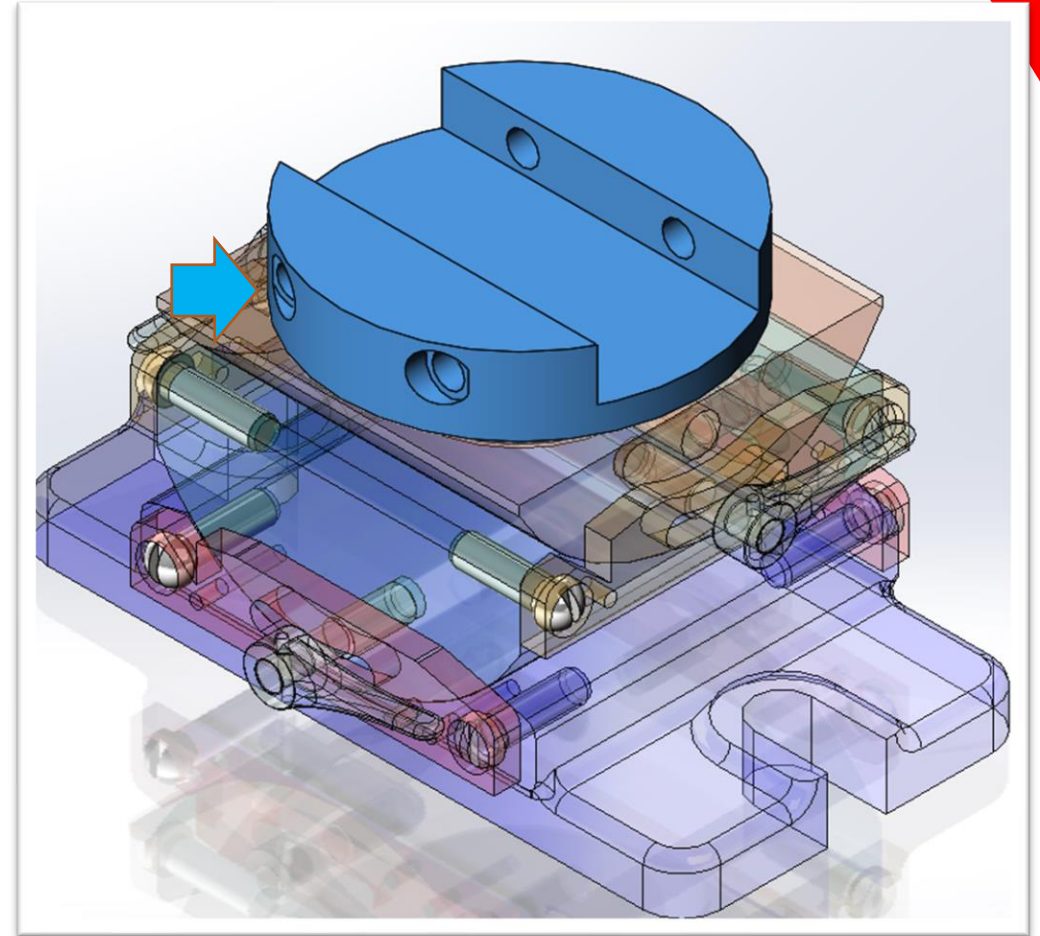
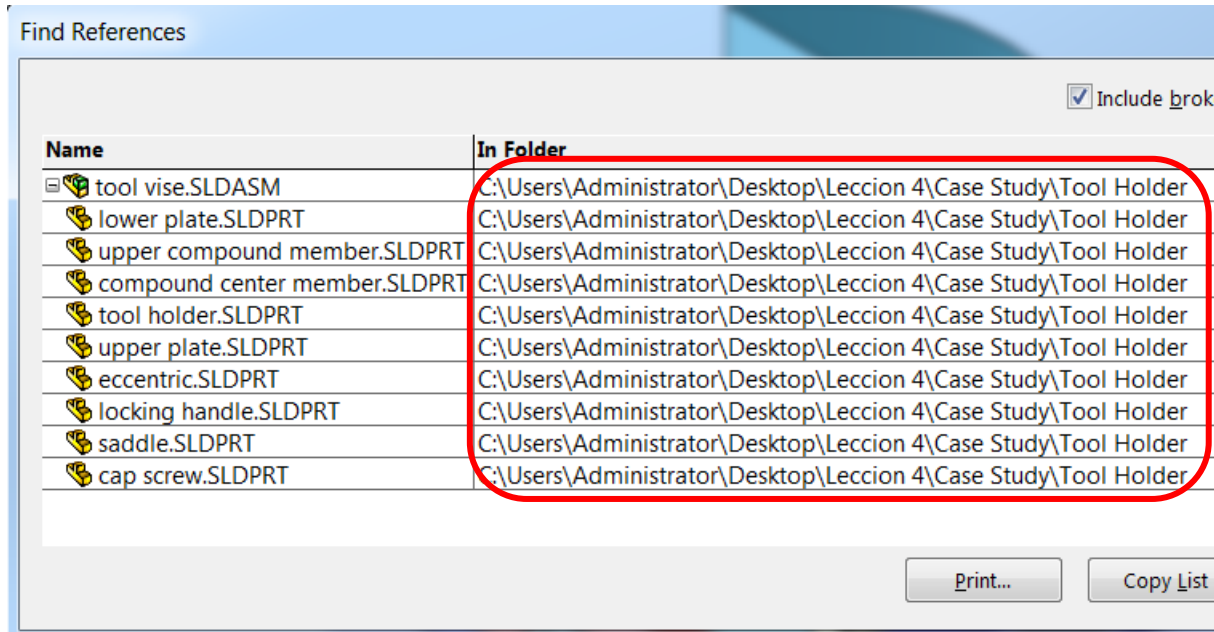
# Referencias de archivos



# Búsqueda referencias

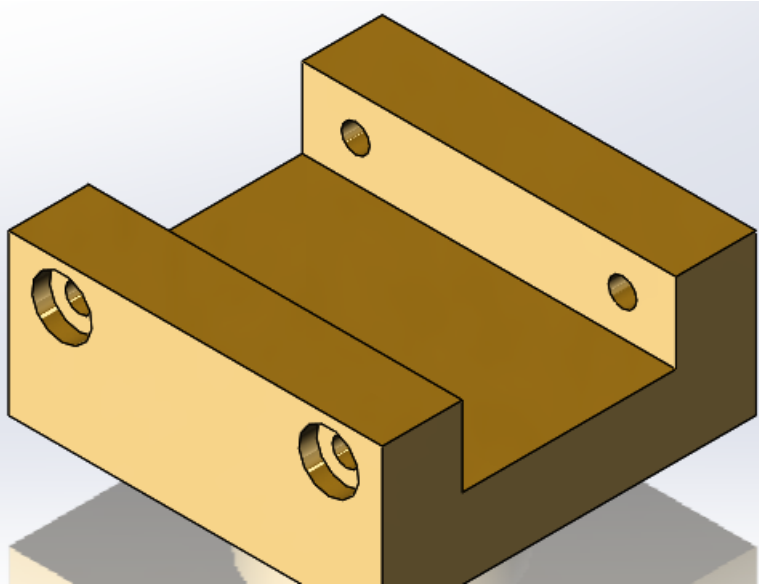


## Caso practico



# SOLIDWORKS

## Caso practico / ID Externo



Find References

Includ

| Name               | In Folder                                                 |
|--------------------|-----------------------------------------------------------|
| tool holder.SLDPRT | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Other |

SOLIDWORKS (Automatically dismissing in 6 seconds)

The document being opened references a file with the same name as an already-open document.

The internal ID of the file, C:\Users\Administrator\Desktop\Leccion 4\Case Study\Other\tool holder.SLDPRT, does not match that of the currently-open document.

→ Open without this document  
All instances of this document will be suppressed.

→ Accept this file anyway  
Choose this option if you know the file was deleted and replaced with another of the same name.

Don't show again

To open the document with its original component, close the currently-open document first. SOLIDWORKS cannot open two different documents with the same name at the same time.





## Caso practico / ID Externo

Find References

Include bro

| Name                          | In Folder                                                       |
|-------------------------------|-----------------------------------------------------------------|
| tool vise.SLDASM              | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| lower plate.SLDPRT            | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| upper compound member.SLDPRT  | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| compound center member.SLDPRT | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| tool holder.SLDPRT            | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Other       |
| upper plate.SLDPRT            | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| eccentric.SLDPRT              | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| locking handle.SLDPRT         | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| saddle.SLDPRT                 | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| cap screw.SLDPRT              | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |

What's Wrong

| Type  | Feature      | Preview | Help | Description                                                                    |
|-------|--------------|---------|------|--------------------------------------------------------------------------------|
| Error | Coincident18 |         |      | One of the entities of this mate is suppressed, invalid, or no longer present. |
| Error | Concentric32 |         |      | One of the entities of this mate is suppressed, invalid, or no longer present. |

Show errors    Show warnings    Display What's Wrong during rebuild

Close Help



# Referencias externas

Show folders for:

Referenced Documents

Folders:

D:\test\_fasteners

Add...

Delete

Move Up

Move Down

Find References

Include bro

| Name                          | In Folder                                                       |
|-------------------------------|-----------------------------------------------------------------|
| tool vise.SLDASM              | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| lower plate.SLDPRT            | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| upper compound member.SLDPRT  | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| compound center member.SLDPRT | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| tool holder.SLDPRT            | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| upper plate.SLDPRT            | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| eccentric.SLDPRT              | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| locking handle.SLDPRT         | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| saddle.SLDPRT                 | C:\Users\Administrator\Desktop\Leccion 4\Case Study\Tool Holder |
| cap screw.SLDPRT              | D:\test_fasteners                                               |

System Options

General

Drawings

Display Style

Area Hatch/Fill

Performance

Colors

Sketch

Relations/Snaps

Display/Selection

Performance

Assemblies

External References

Default Templates

File

- Open referenced documents with read-only access
- Don't prompt to save read-only referenced documents (discard changes)
- Allow multiple contexts for parts when editing in assembly

Load referenced documents: Changed Only

Search file locations for external references

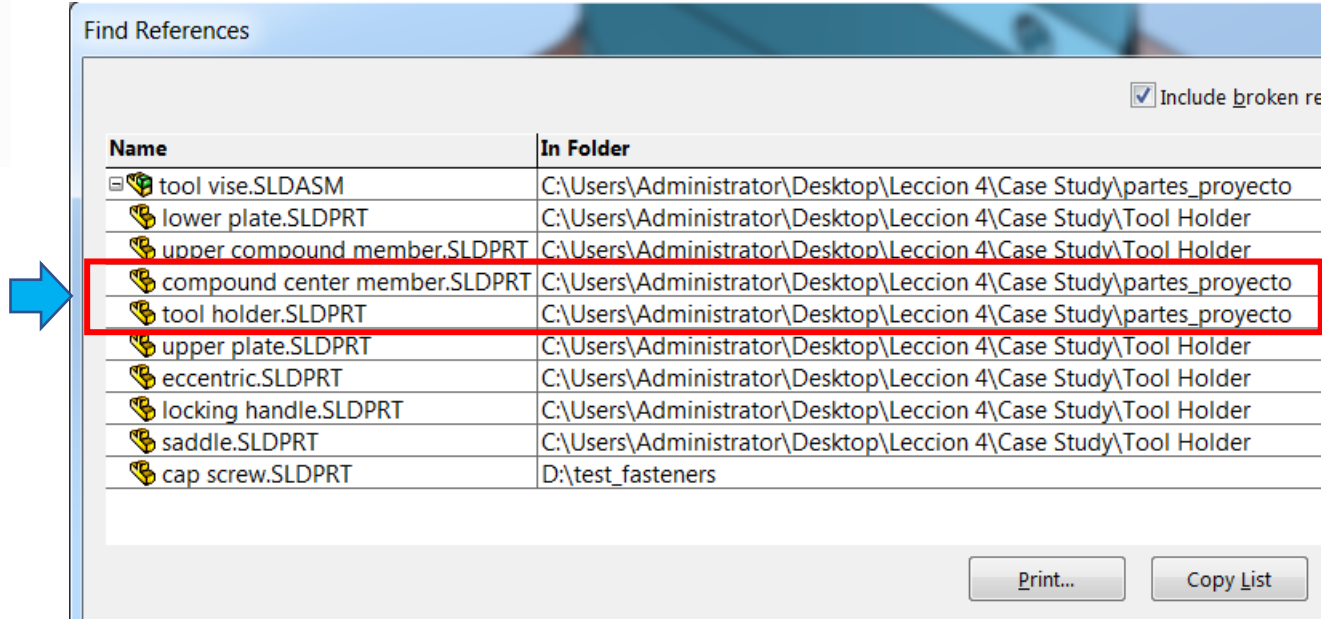
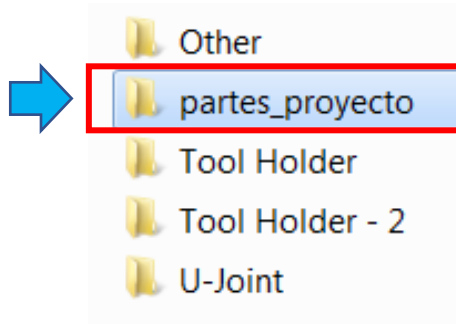
Update out-of-date linked design tables to: Prompt

Assemblies

- Automatically generate names for referenced geometry
- Update component names when documents are replaced
- Do not create references external to the model

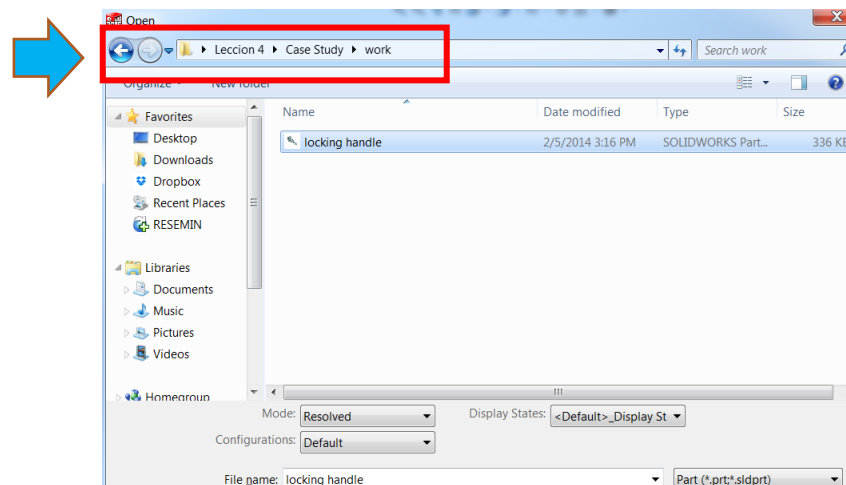
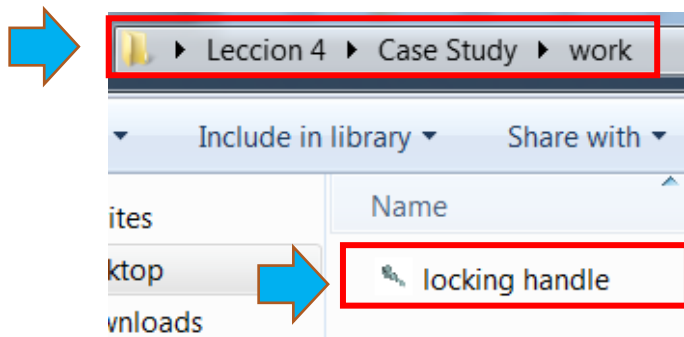
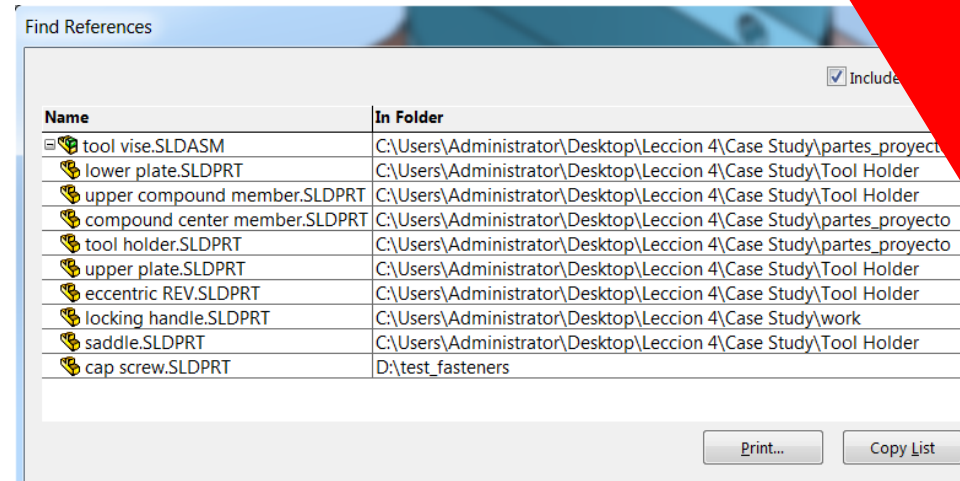
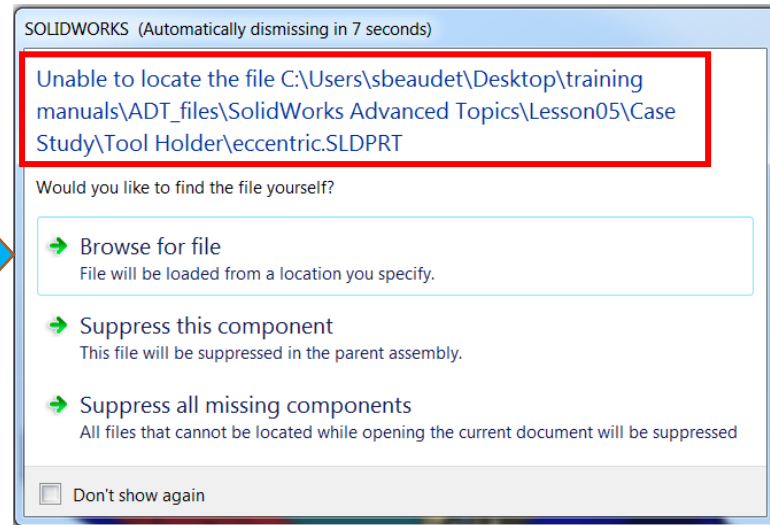
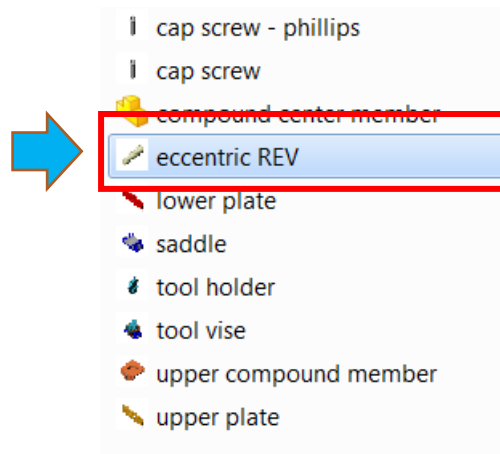


# Múltiples Instancias

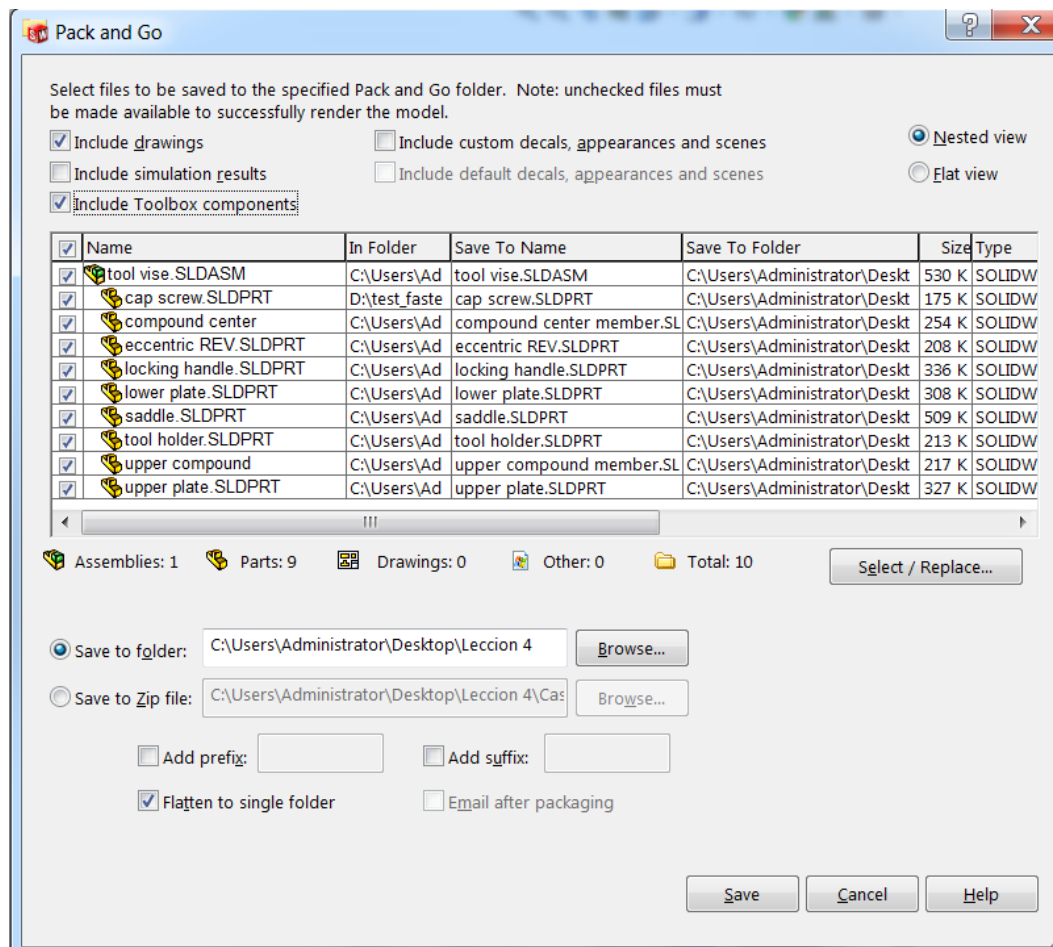
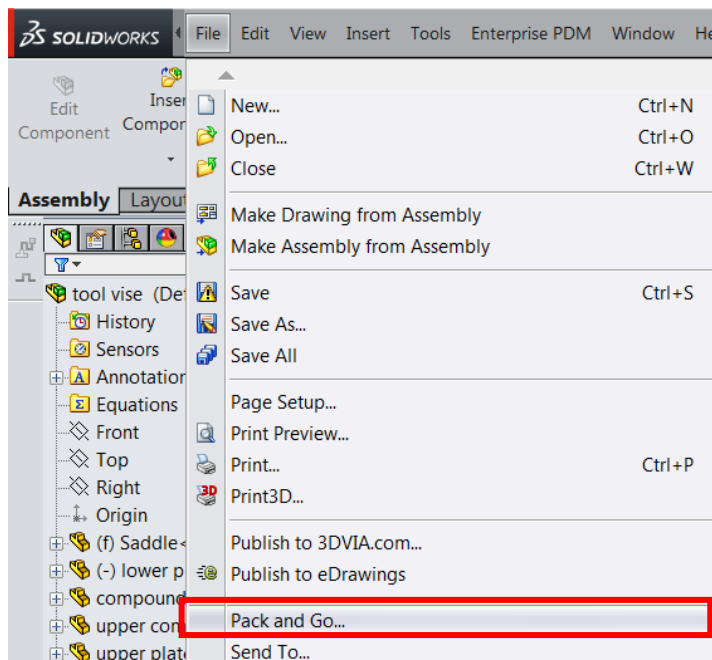


# Múltiples instancias

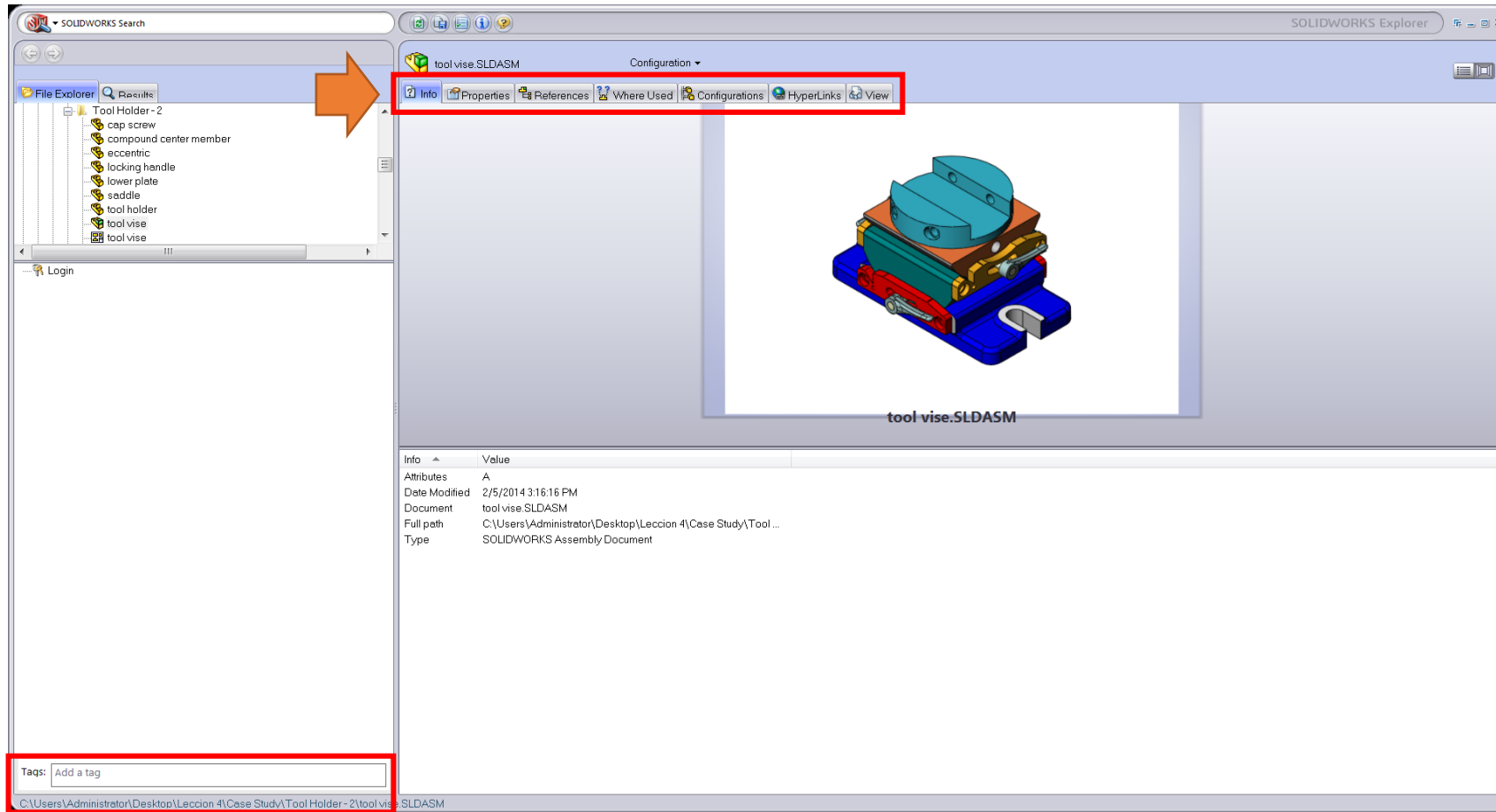




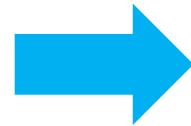
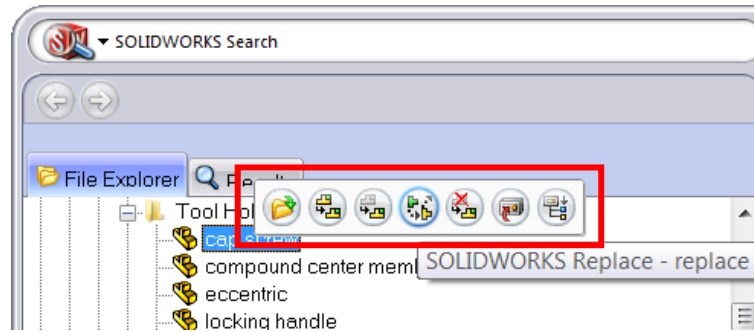
# Empaquetar dependencias



## SOLIDWORKS Explorer



## Opciones de Administración



- Abrir
- Empaquetar dependencias
- Cambiar Nombre
- Reemplazar





# Preguntas

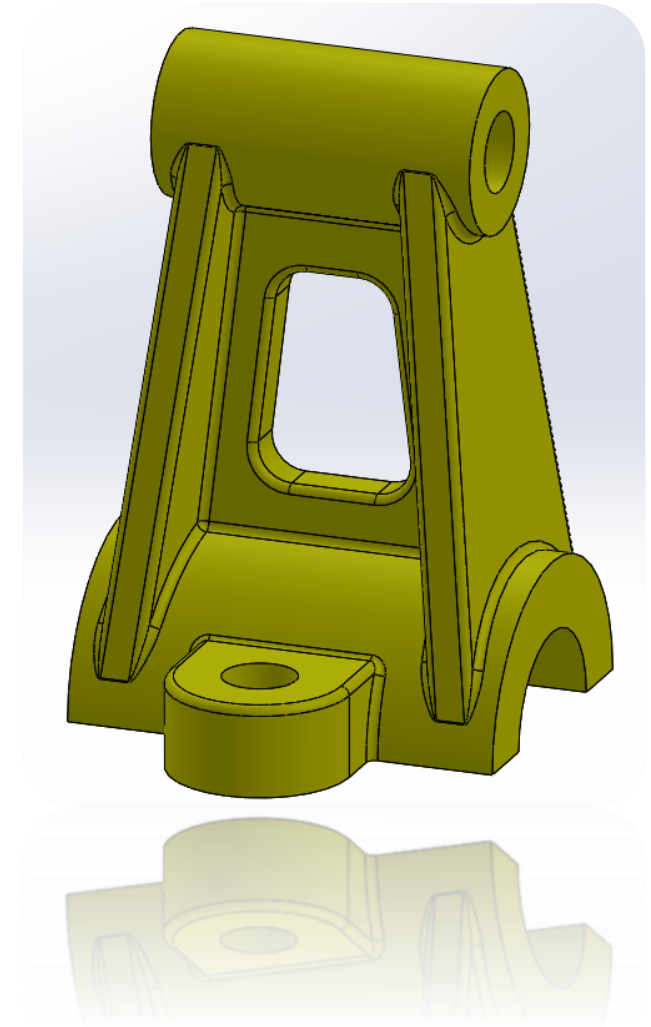
1. Que es un ID interno?
2. Cuando se abre un documento cual es la primera ubicación donde busca el software?
3. Defina el concepto de “empaquetar dependencias”
4. Defina el nombre de la herramienta de SOLIDWORKS que facilita la administración de documentos.



# Respuestas

1. Es una identificación que asigna SOLIDWORKS de manera automática
2. La memoria RAM
3. Copia todos los archivos en una ubicación específica.
4. SOLIDWORKS Explorer

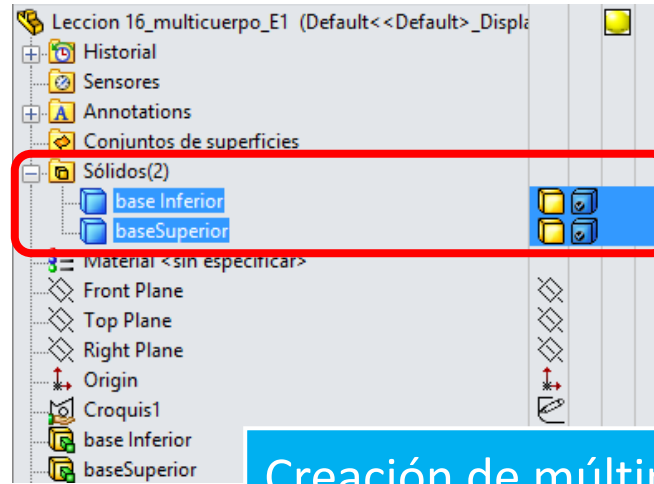
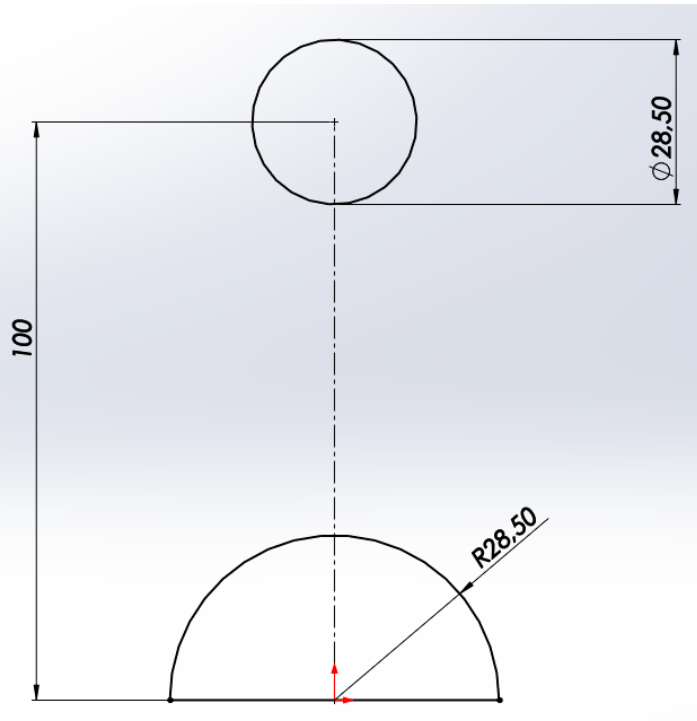




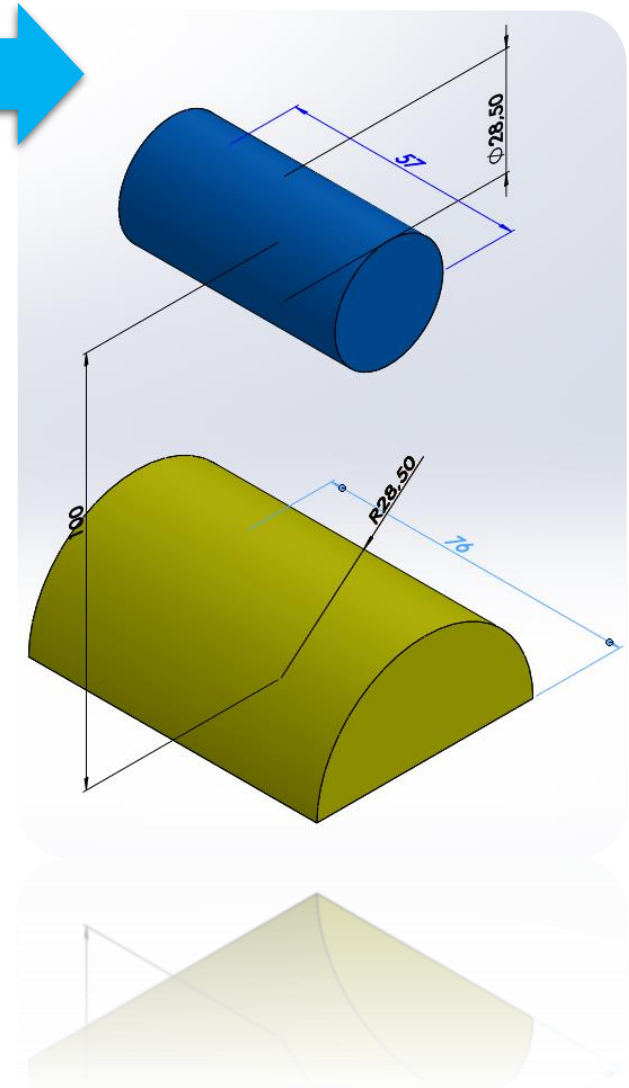
# Diseño Multi cuerpo



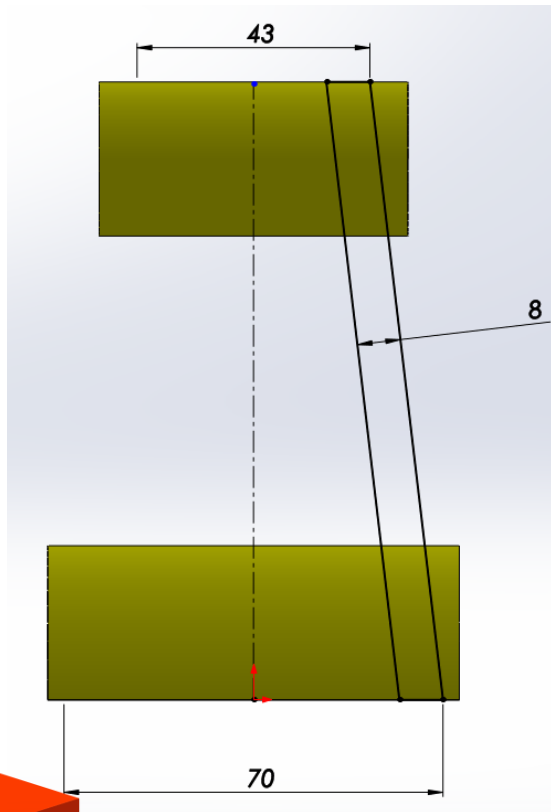
## Técnicas Multi cuerpo



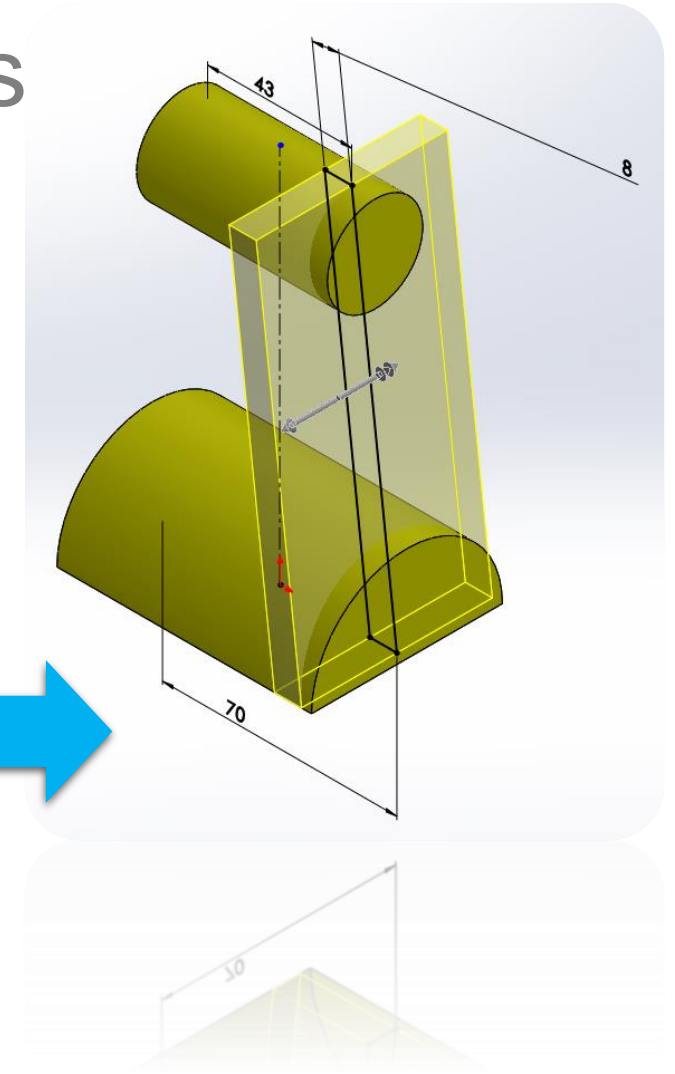
Creación de múltiples sólidos



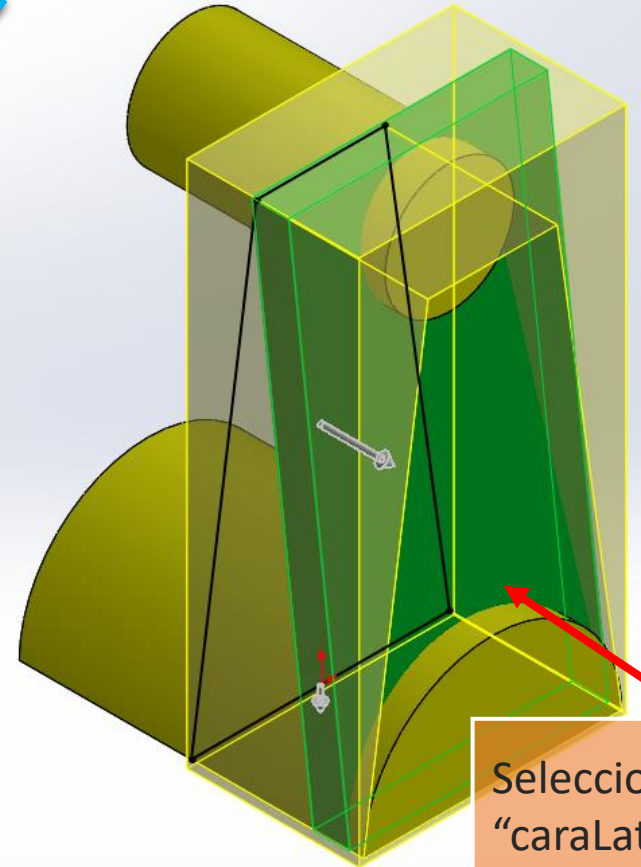
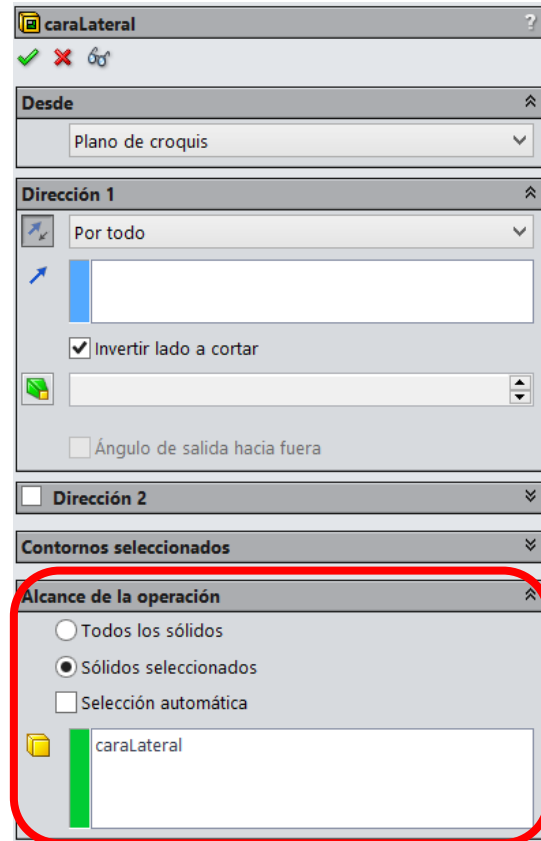
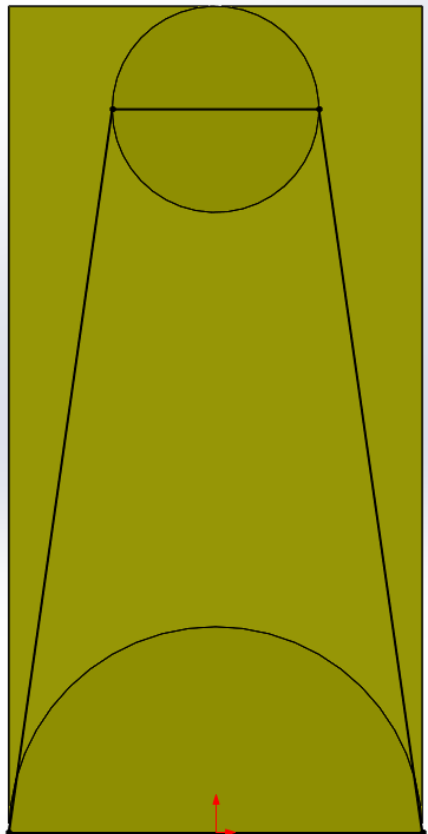
# Creación de solidos



Creación del tercer sólido



## Alcance de operación

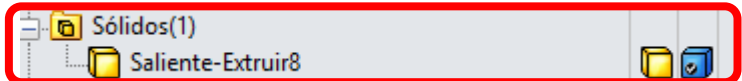
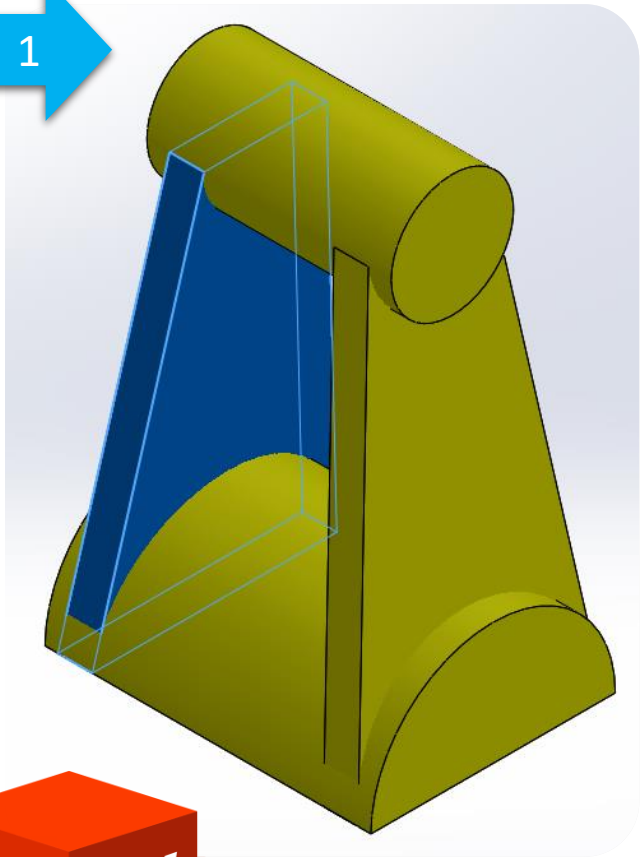


Seleccione el cuerpo "caraLateral"

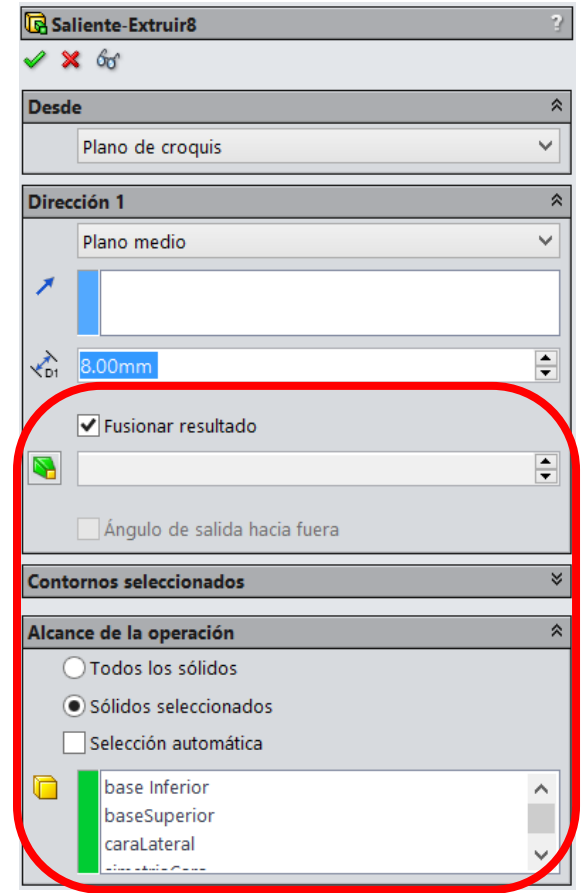
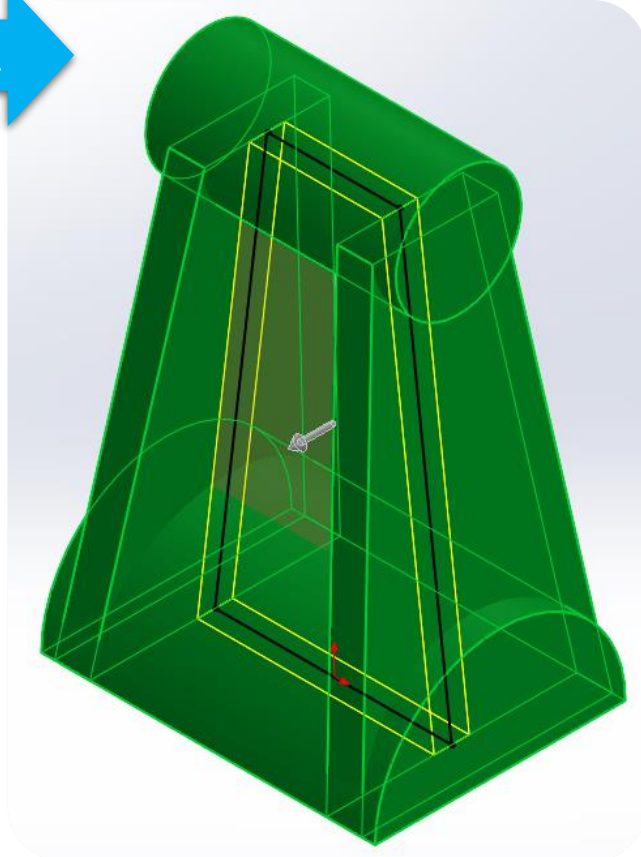




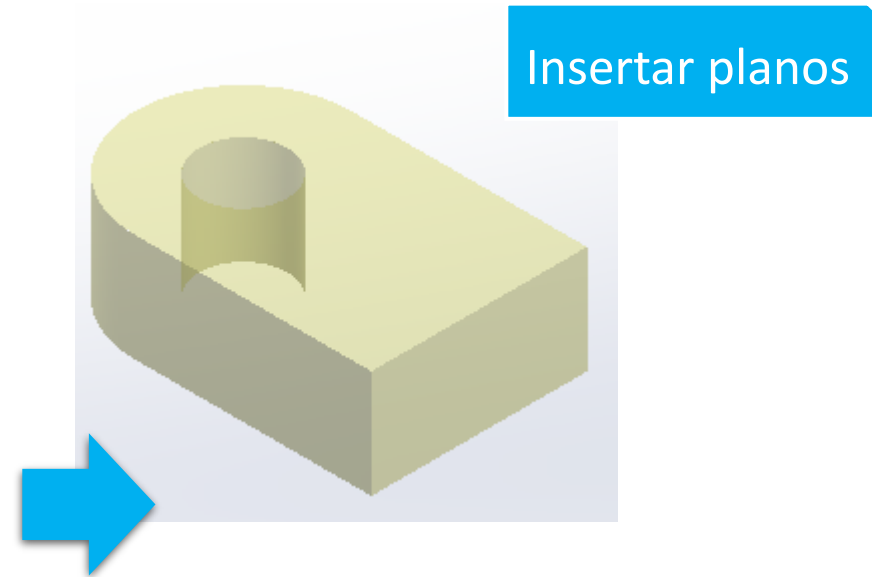
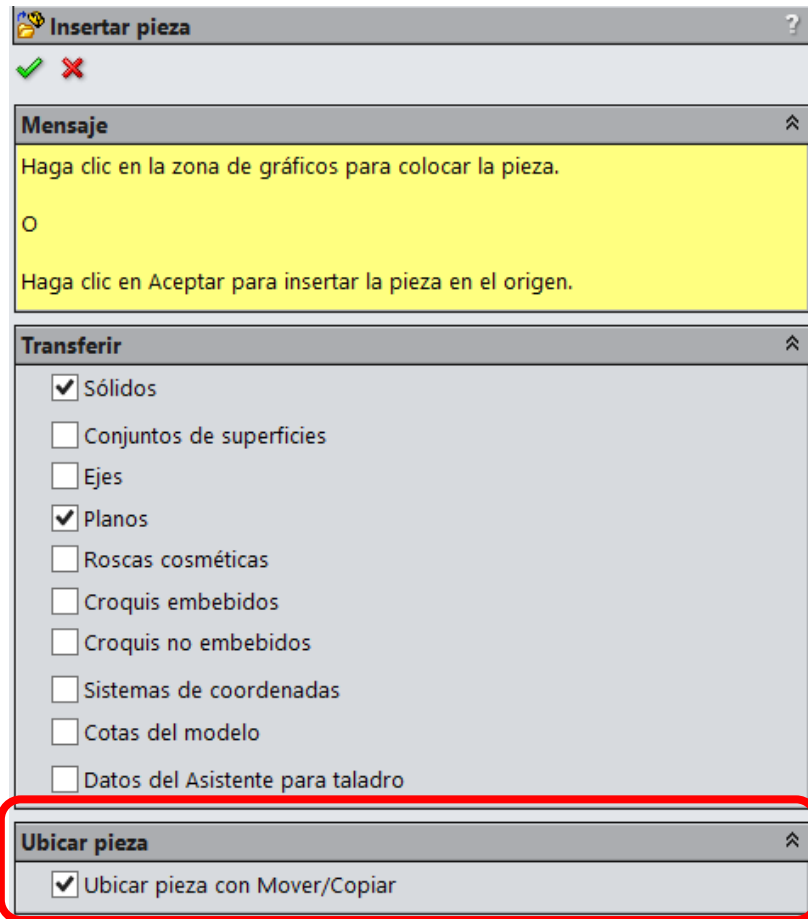
1



2

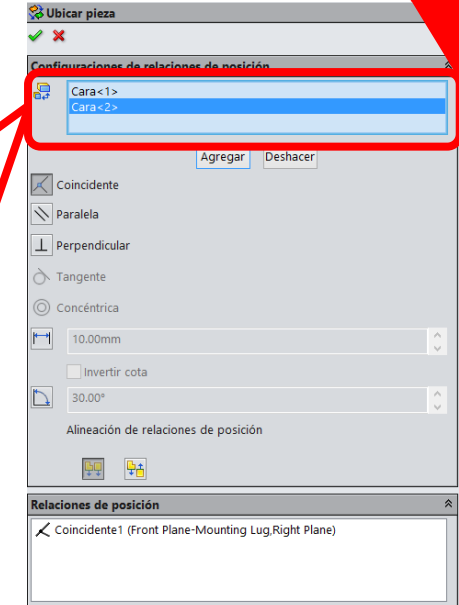
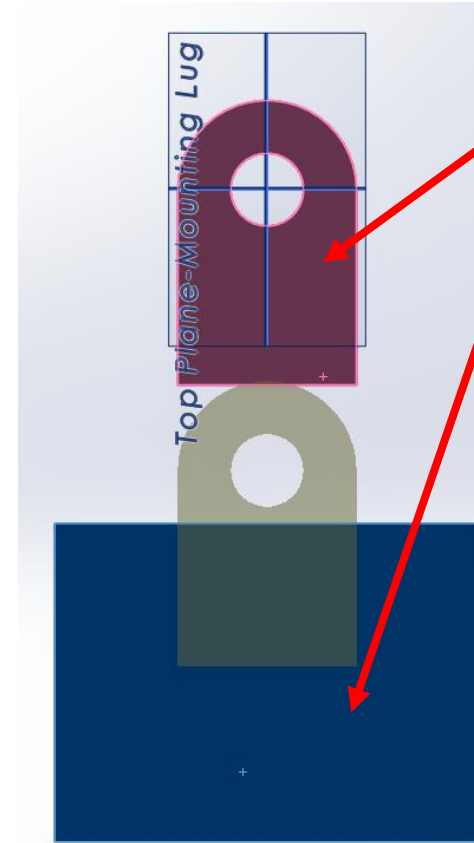
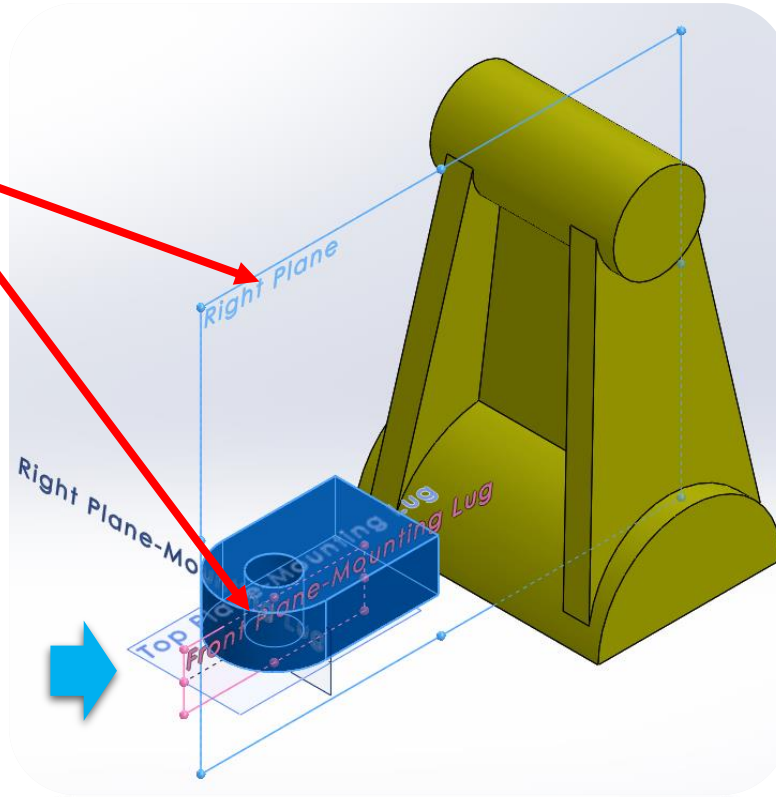
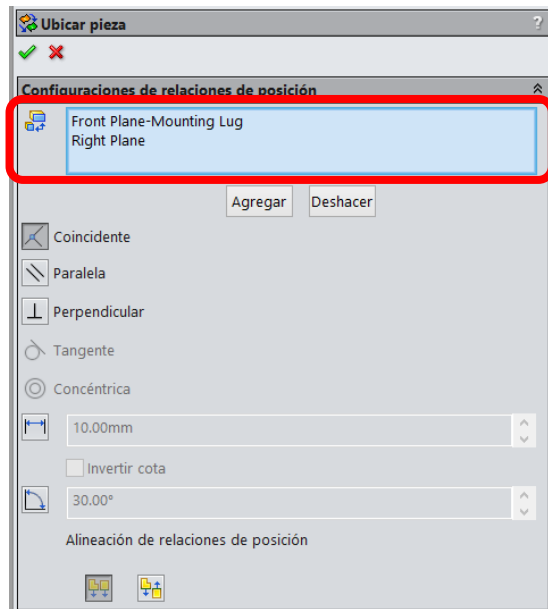


## Insertar pieza

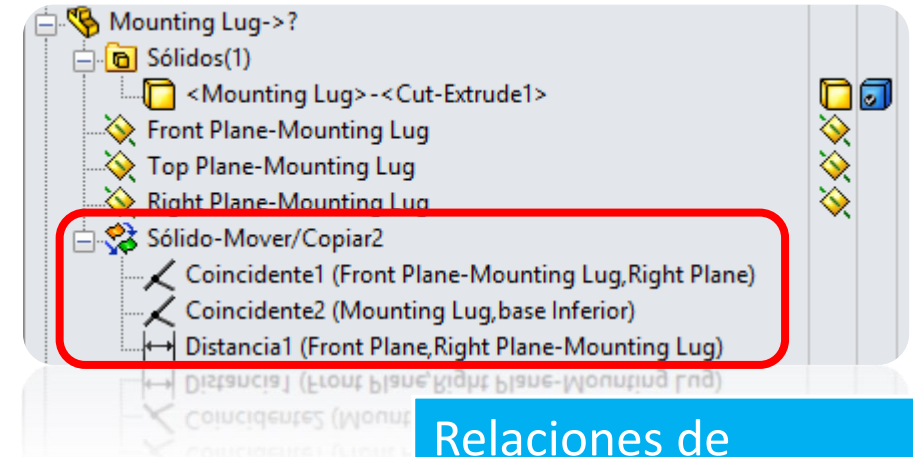
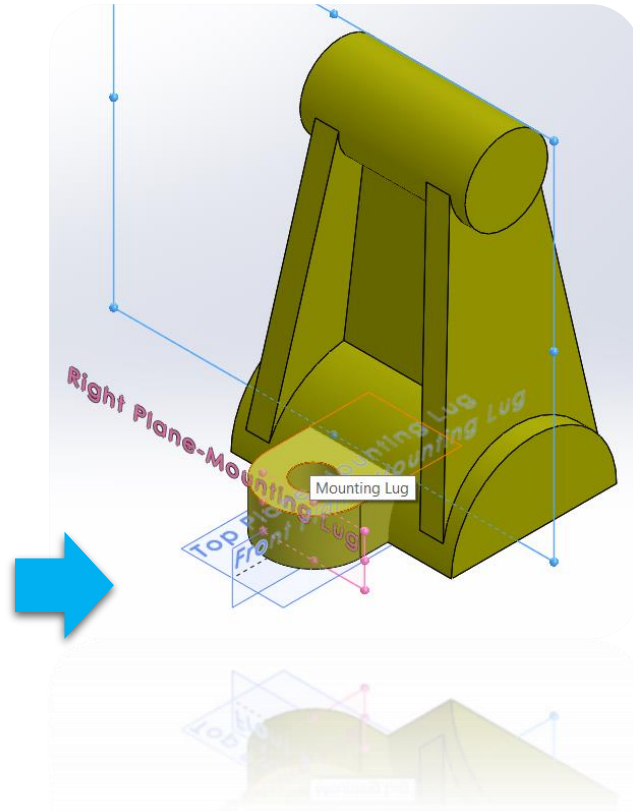
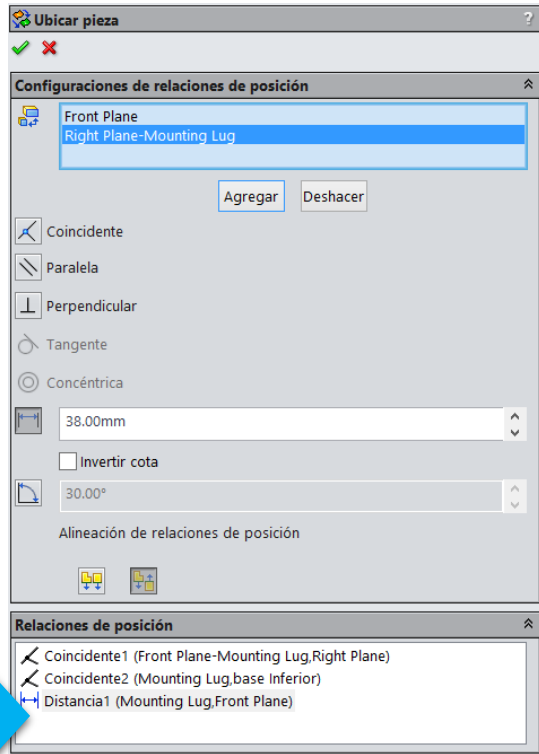




## Ubicar pieza



## Ubicar pieza



Relaciones de posición agregadas



## Combinación de sólidos

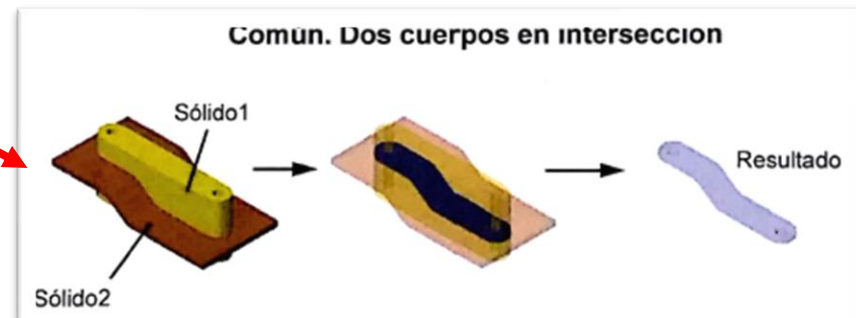
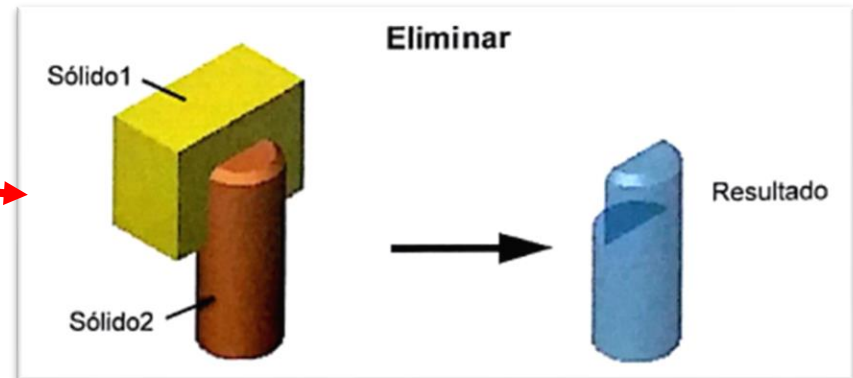
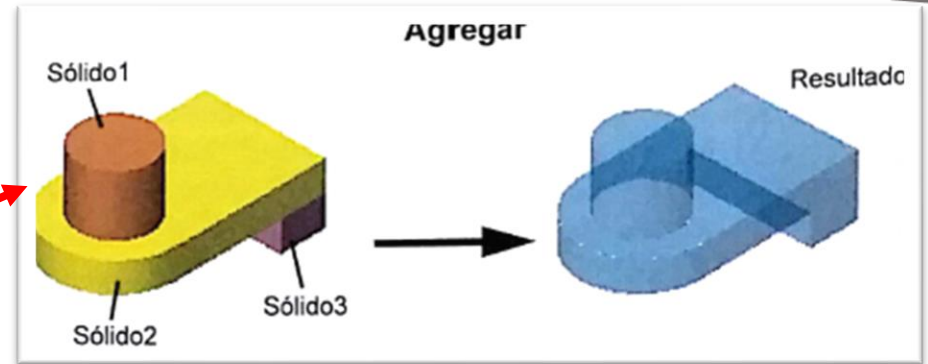
Operaciones

Agregar

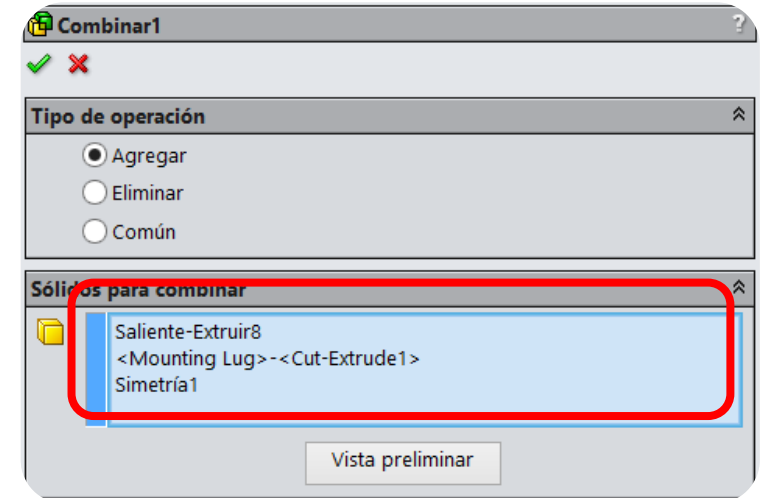
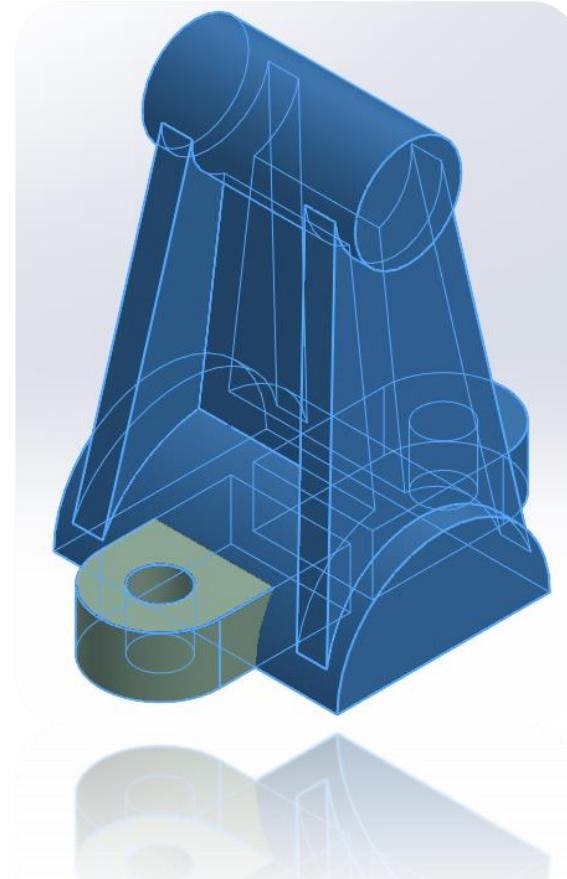
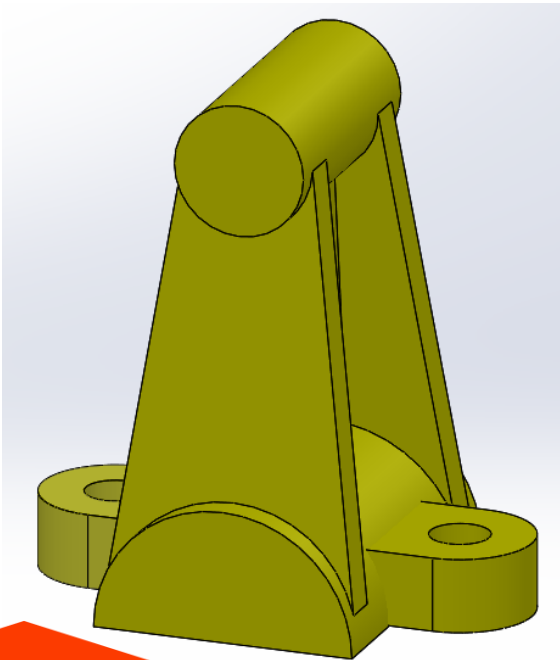
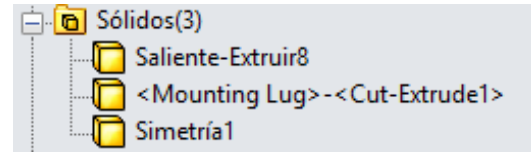
Eliminar

Común 2  
cuerpos

Común 3  
cuerpos



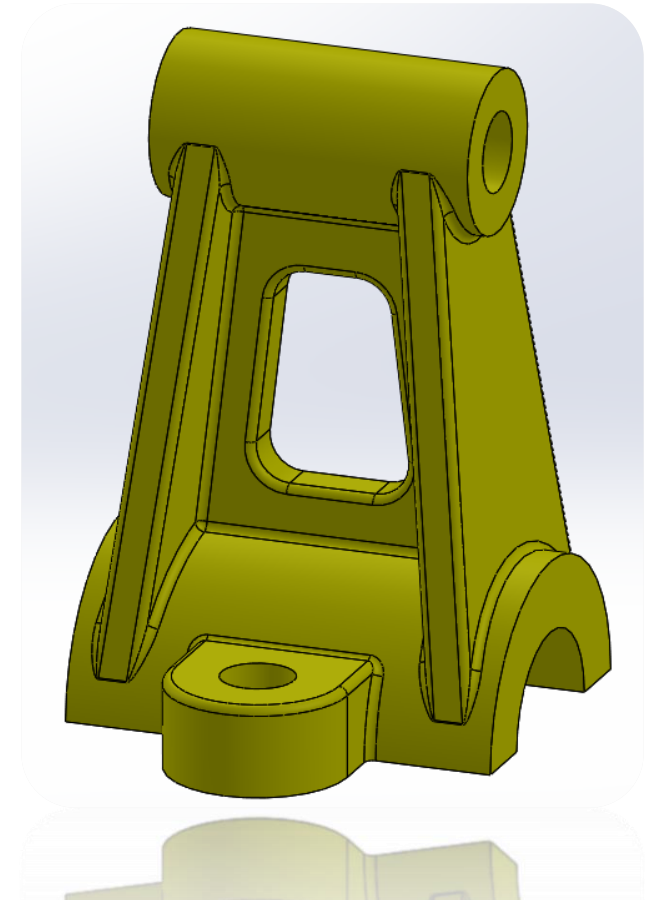
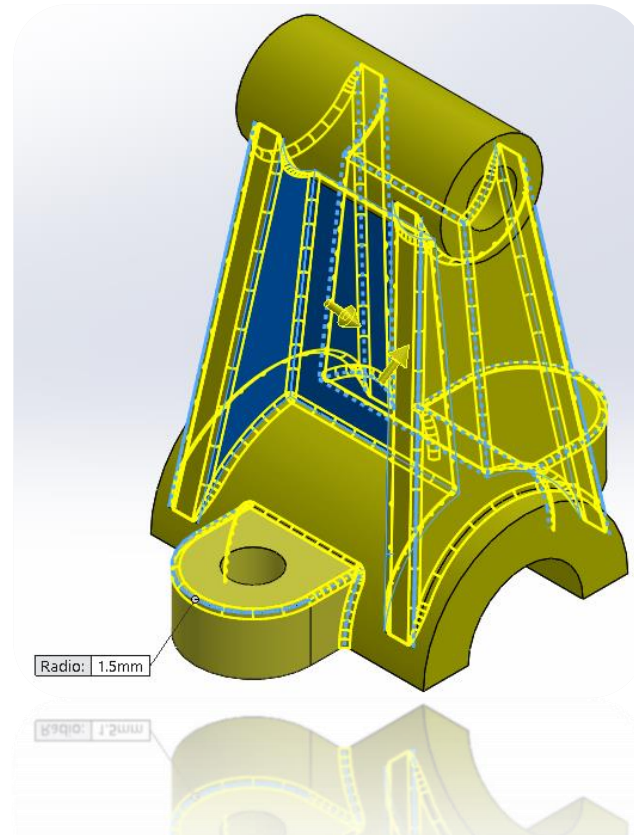
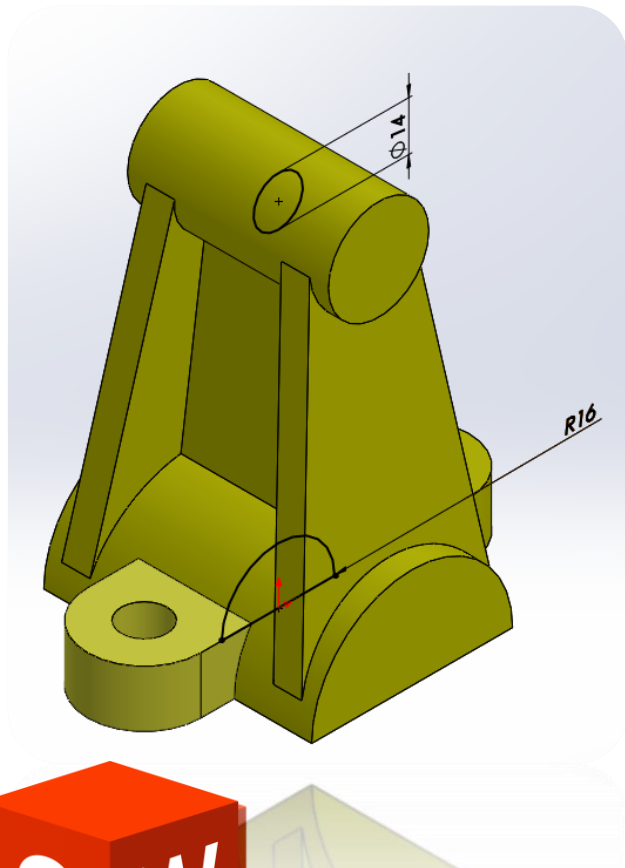
## Combinación de sólidos



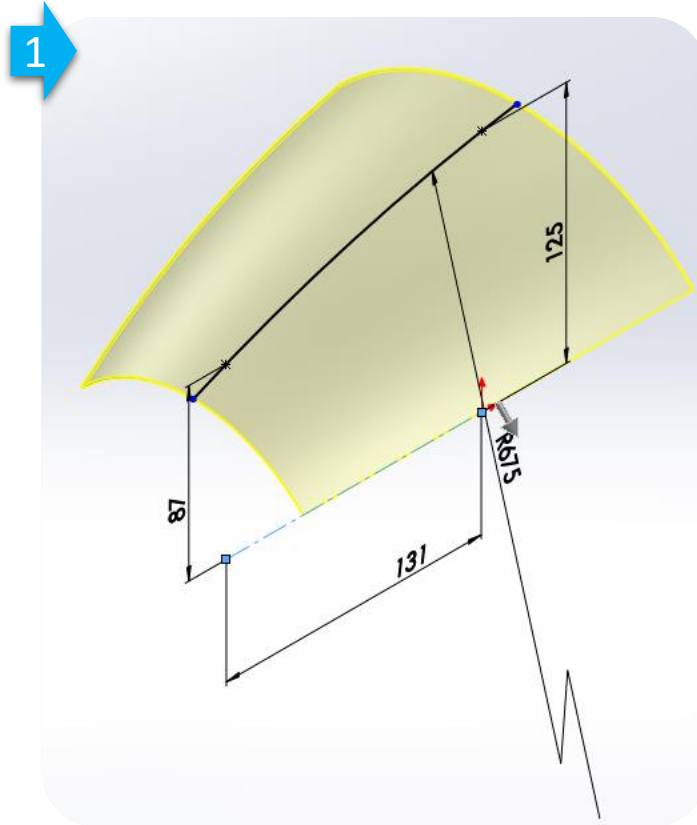
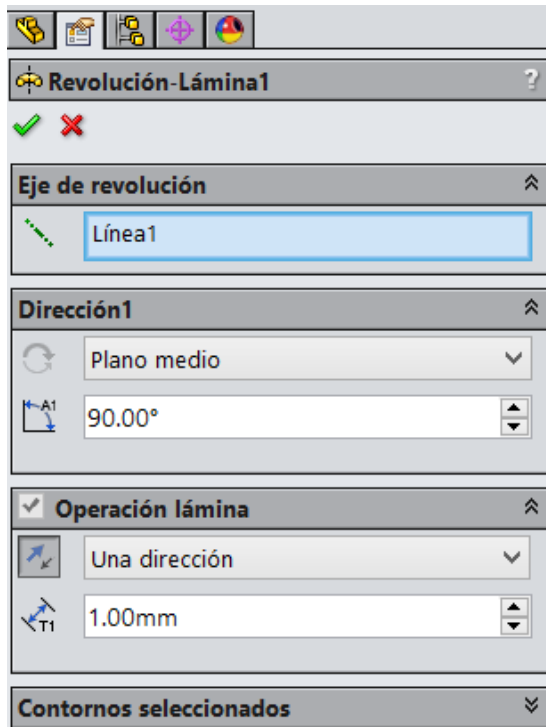
Combinar>agregar



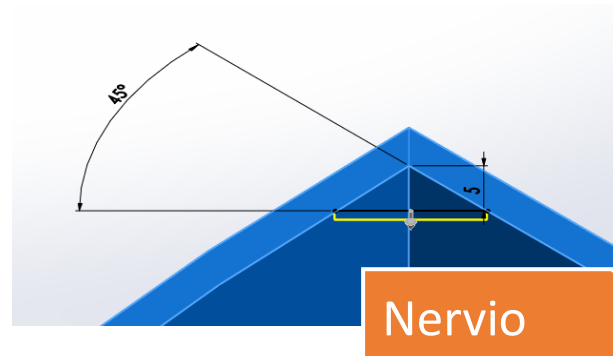
# Detalles de modelamiento



## Combinar sólidos: común



## Combinar sólidos: común



Nervio5

✓ ✗ ⚙

Parámetros

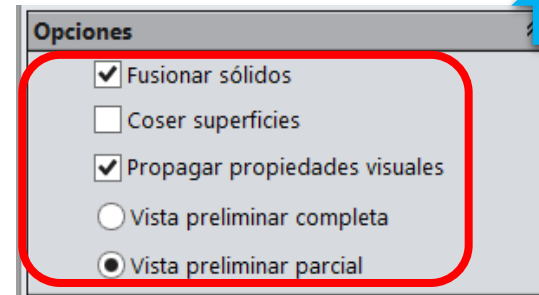
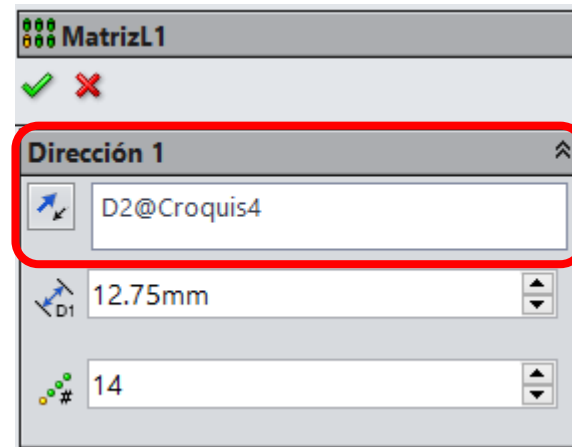
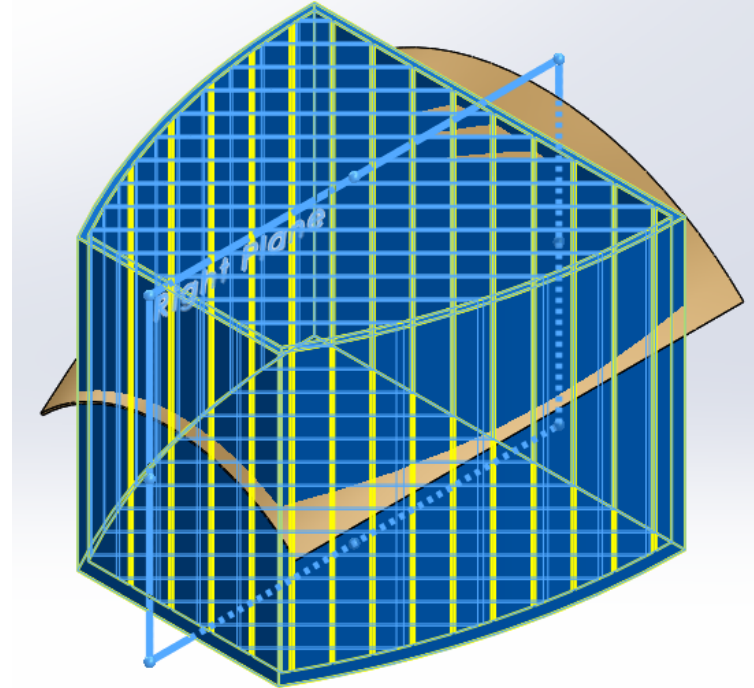
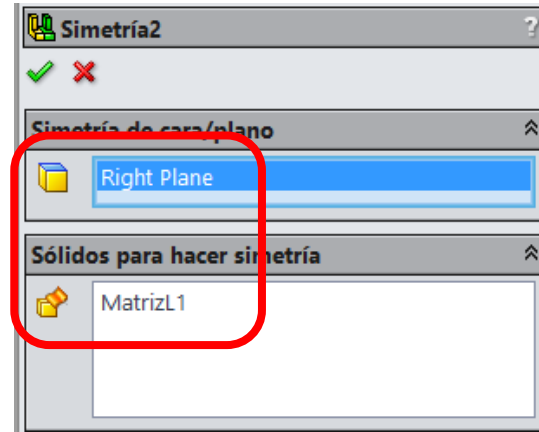
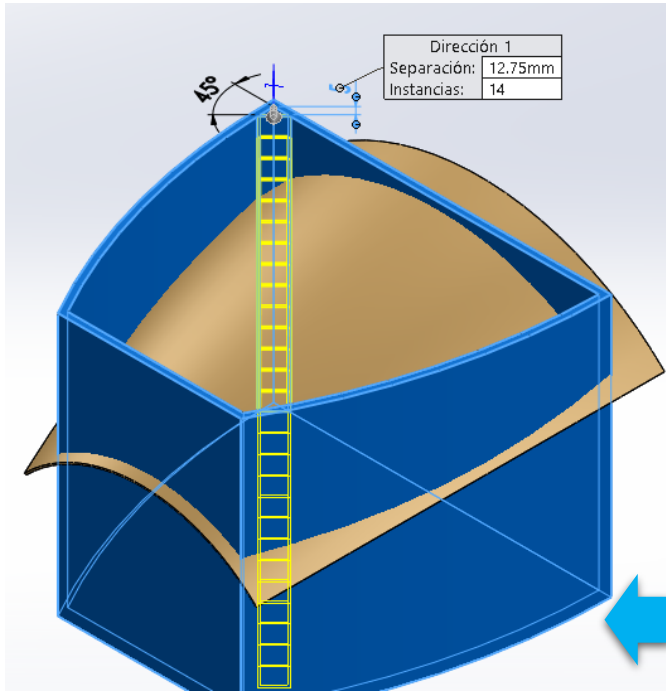
Espeor:  
1.00mm

Dirección de extrusión:  
 Invertir lado de material  
1.00°

Tipo:  
 Lineal  
 Natural

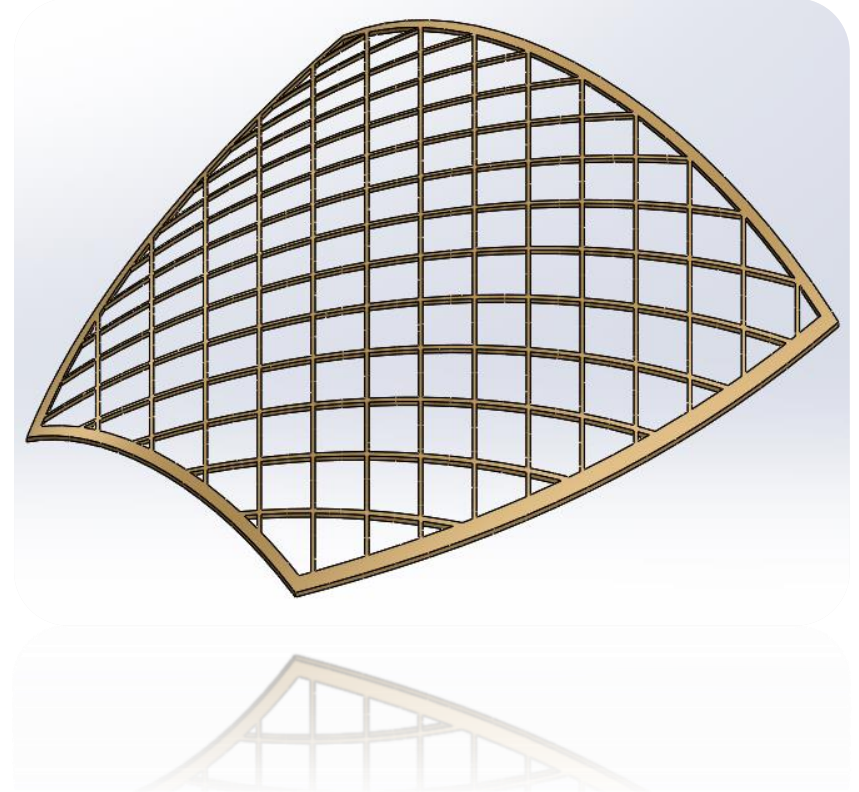
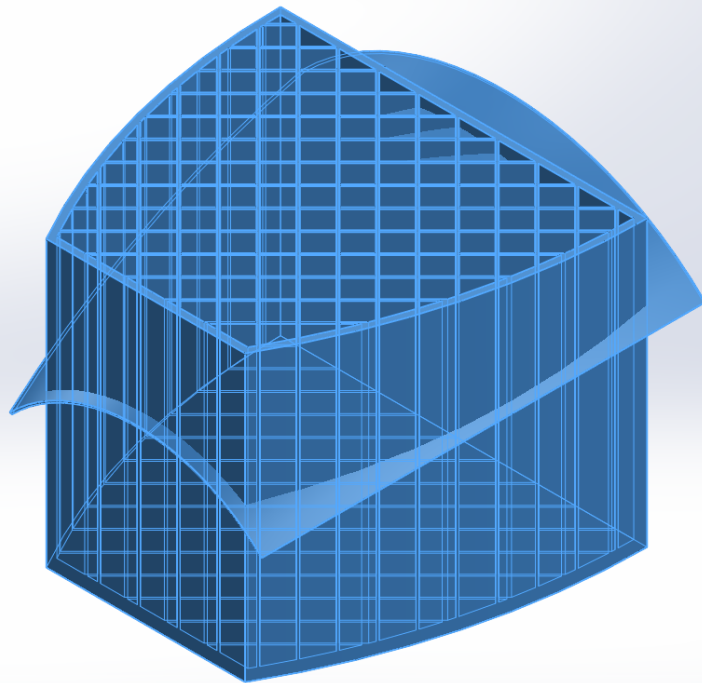
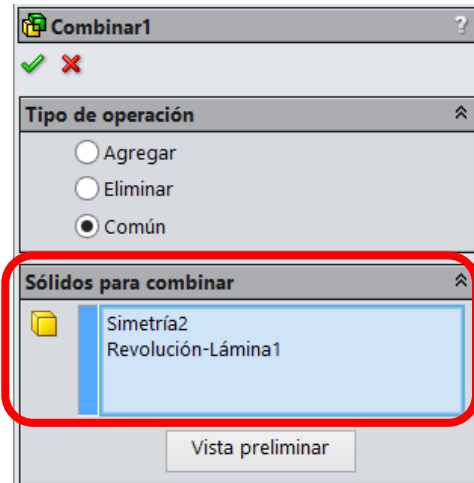
Sólido seleccionado:  
Vaciado1

## Combinar sólidos: común





## Combinar sólidos: común



## Indentación

**Matriz circular**

✓ ✗

**Parámetros**

Eje1

360.00°

3

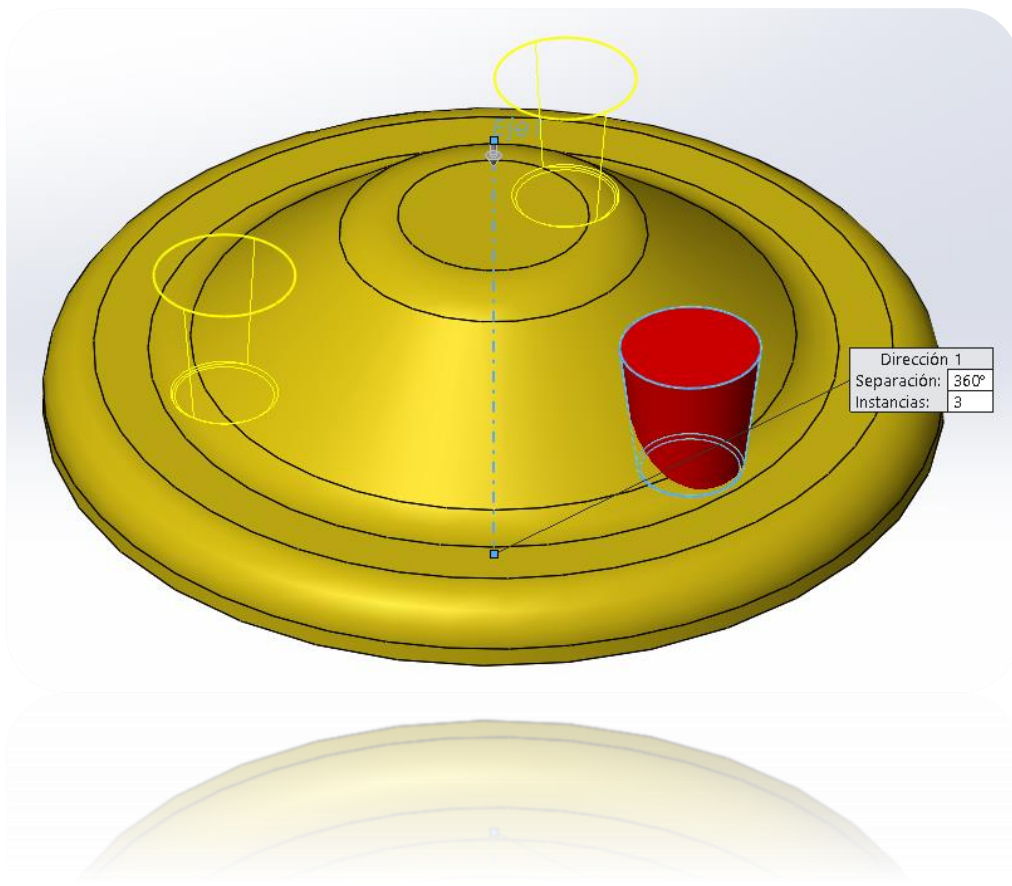
Separación igual

**Operaciones para la matriz**

**Caras para crear matriz**

**Sólidos para crear matriz**

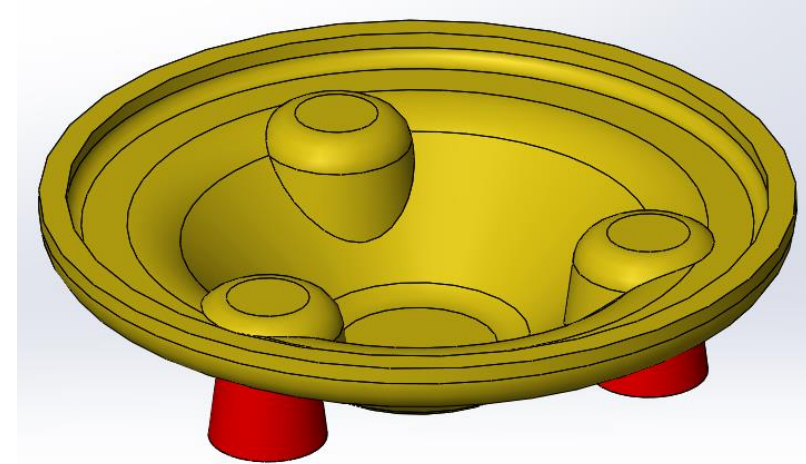
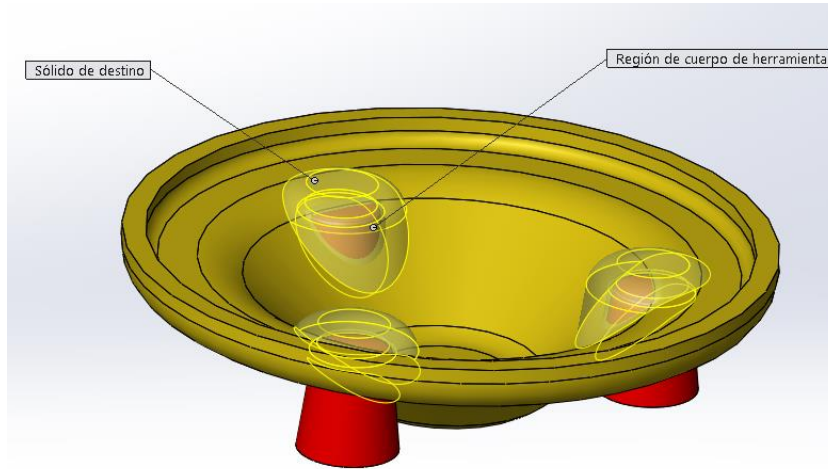
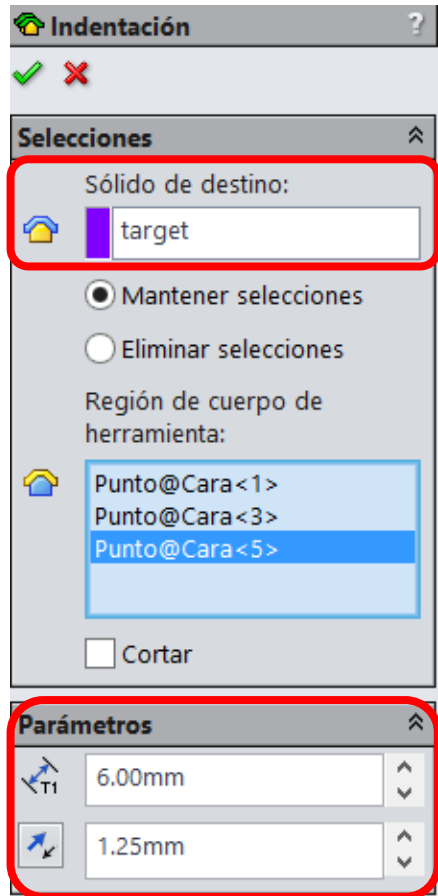
tool



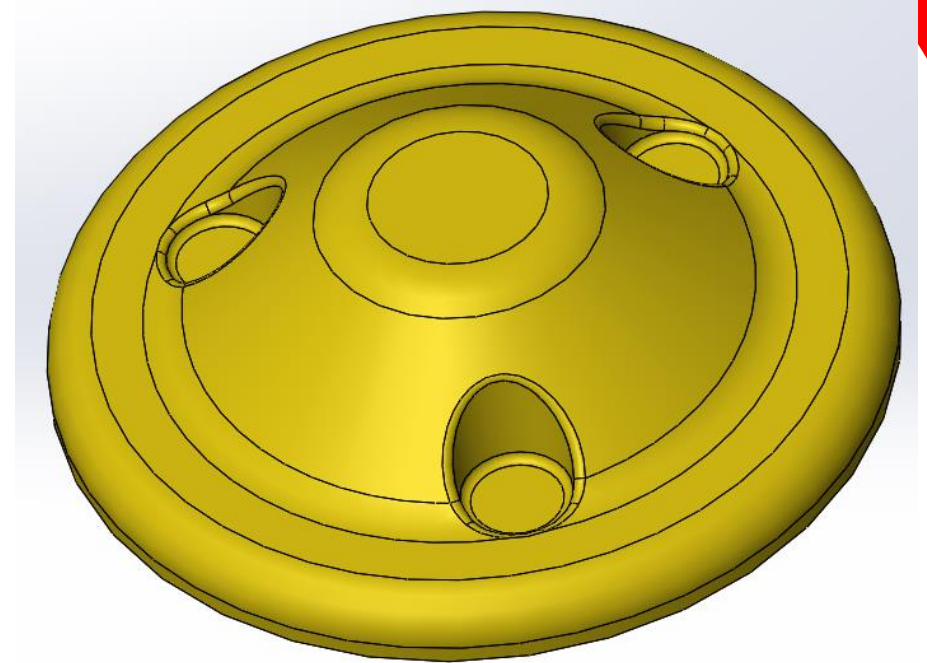
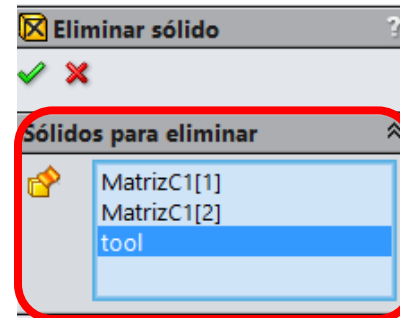
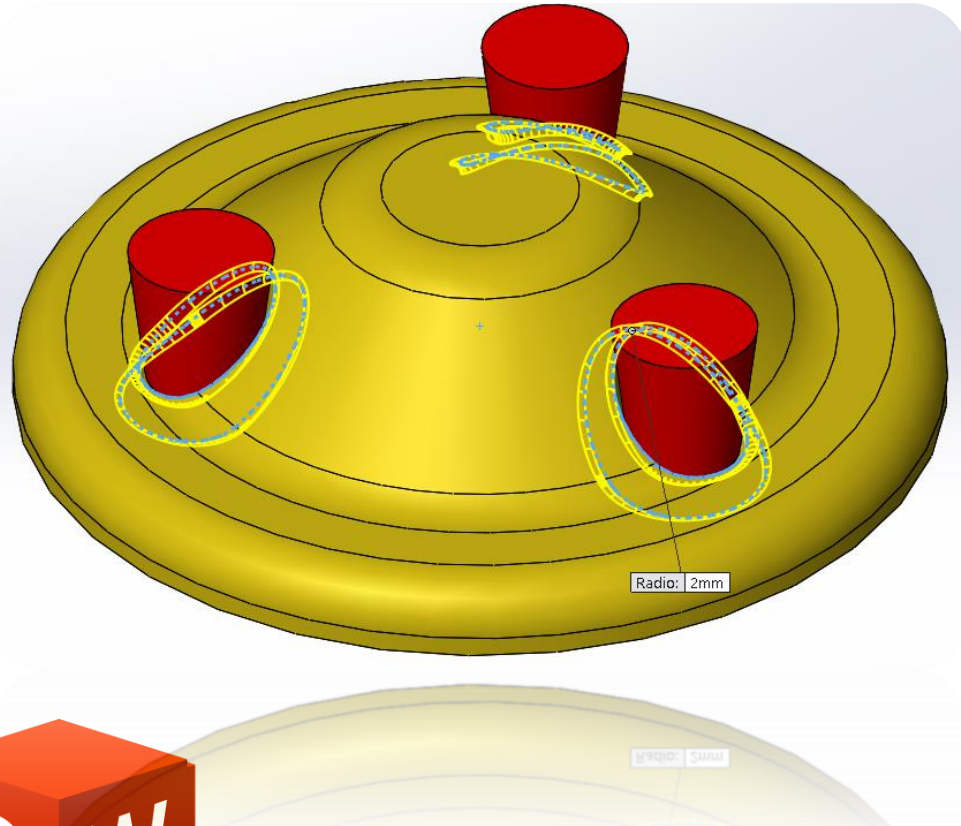
- Leccion 16\_multicuerpo\_E...
- History
- Sensors
- Annotations
- Sólidos(2)**
  - target
  - tool
- Conjuntos de superficies
- Material <sin especific...
- Front Plane
- Top Plane
- Right Plane
- Origin
- Revolve-Thin1
- Revolve1
- Fillet1
- Eje1



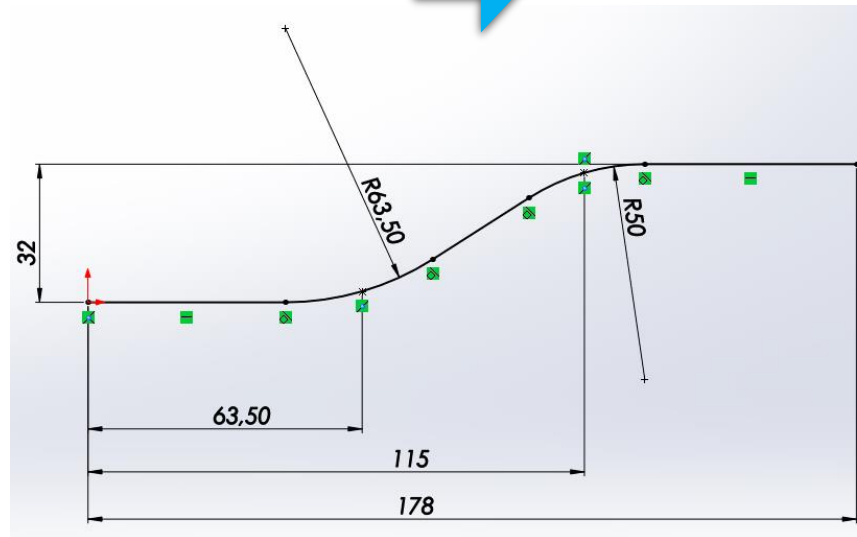
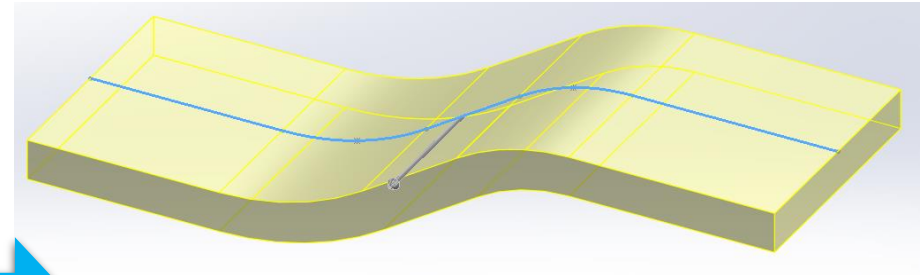
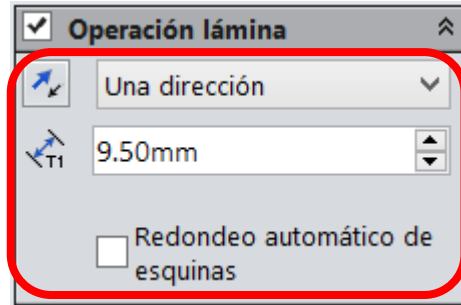
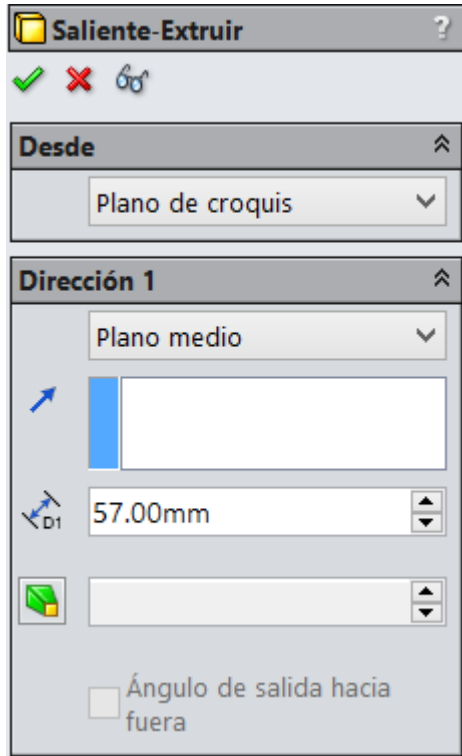
## Indentación



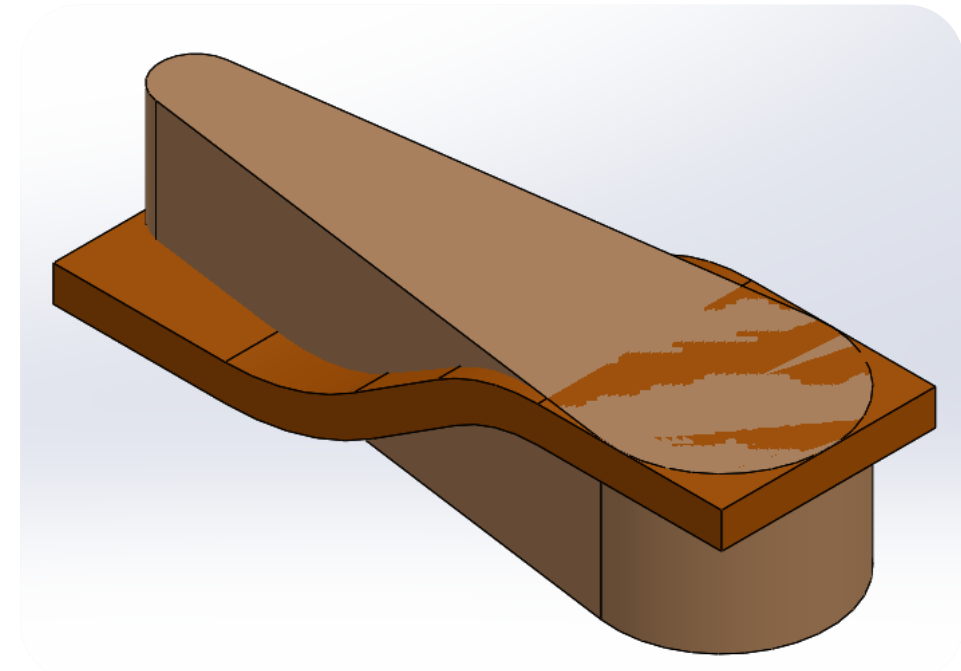
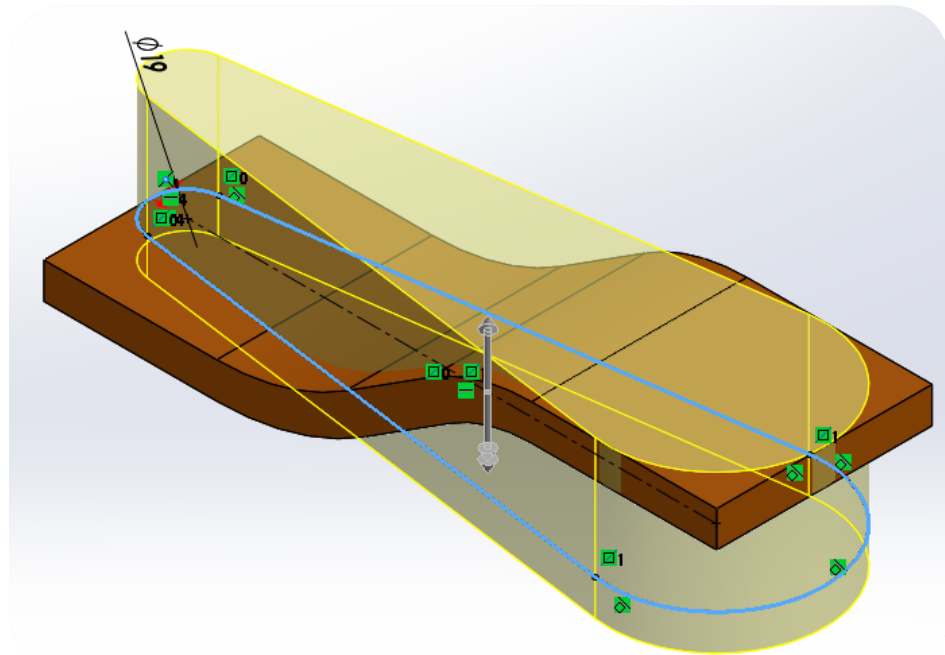
## Eliminación de Sólidos



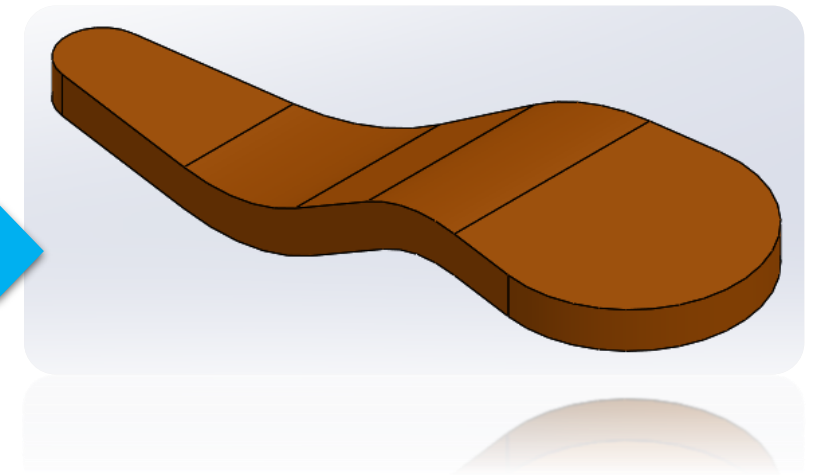
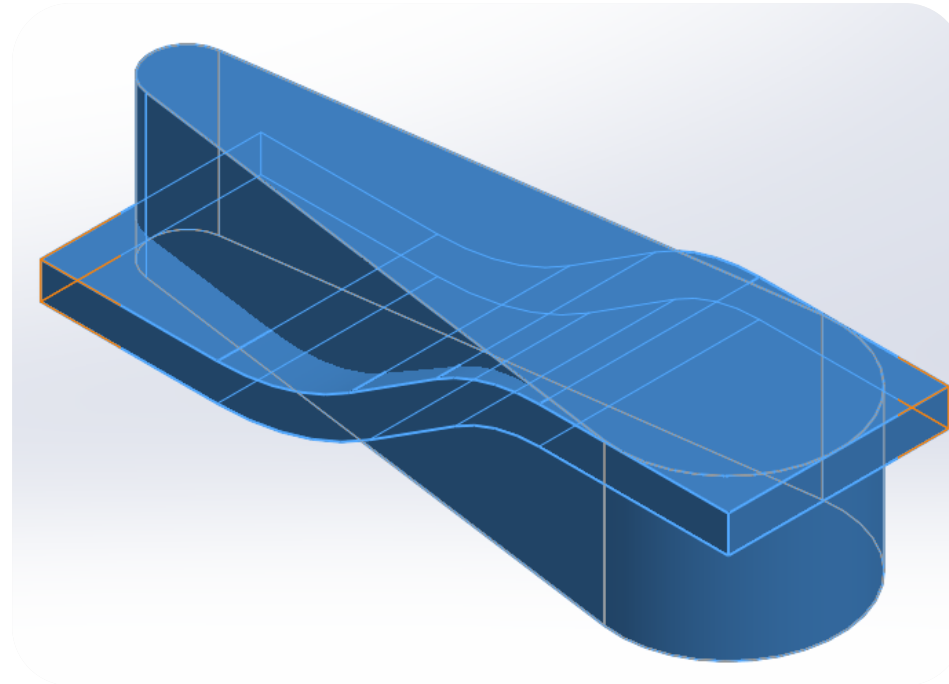
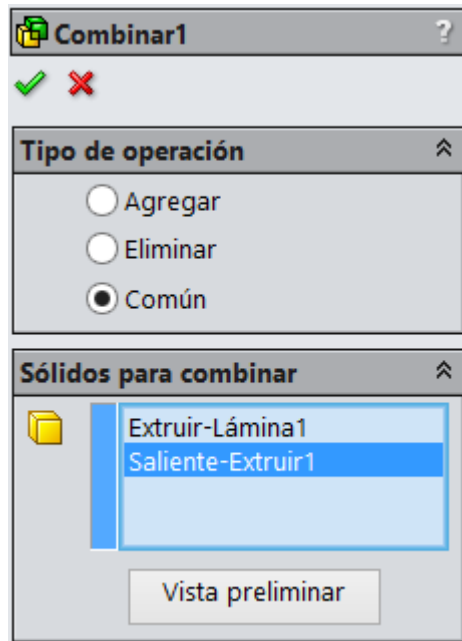
## Combinación de una pieza multi cuerpo



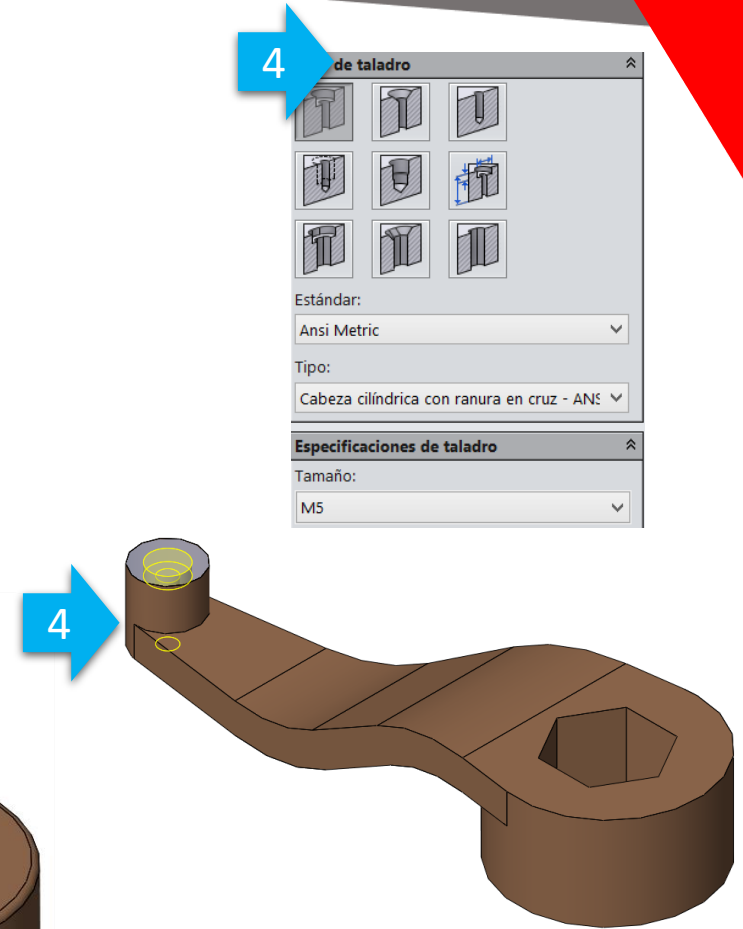
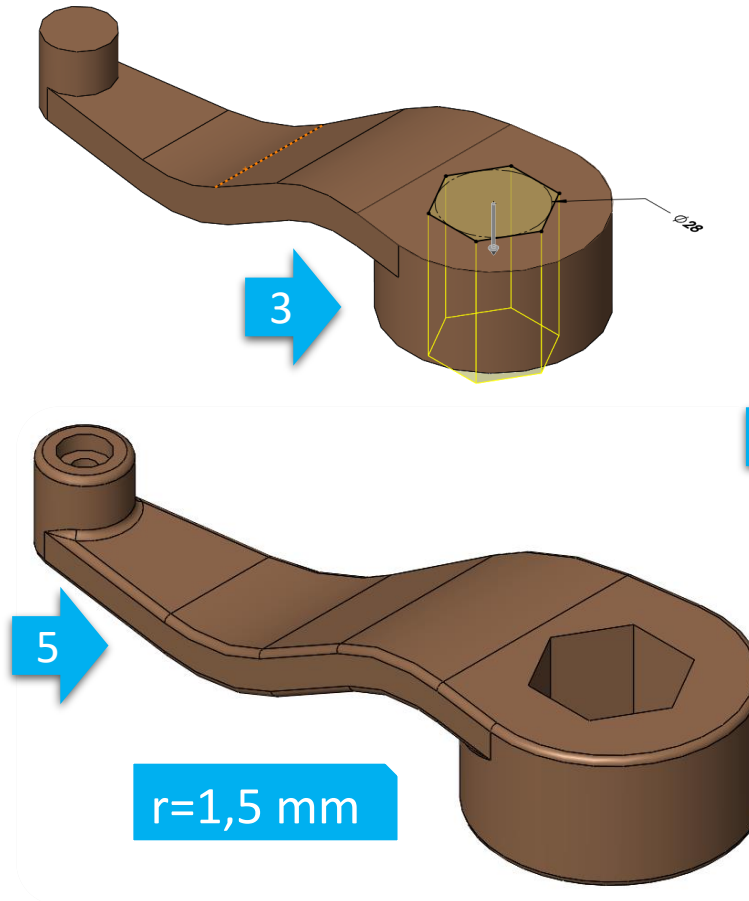
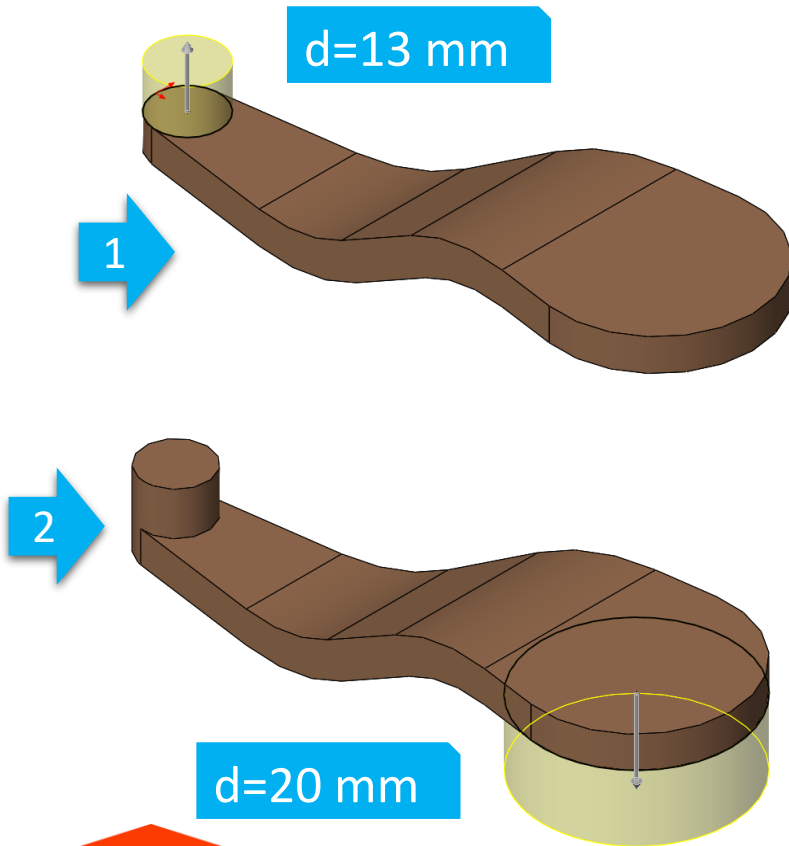
# Combinación de una pieza multi cuerpo



## Combinación de una pieza multi cuerpo



## Combinación





# Preguntas

1. Que es modelado multi cuerpo?
2. Que es alcance de operación?
3. Defina con sus propias palabras el uso de la técnica de insertar componente
4. Especifique las opciones que tiene la herramienta combinar.



# Respuestas

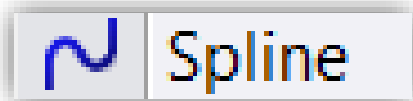
1. Es la creación de un modelo 3D a partir de varios modelos individuales
2. Permite seleccionar los solidos que se ven afectados por una determinada operación
3. Permite agregar o eliminar volumen de modelo.
4. Agregar, Eliminar, Común



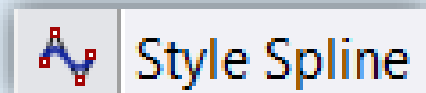
# Croquizado con splines



## Croquizado con splines



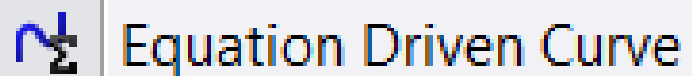
La curvatura de las splines cambia continuamente. Para crearlas es necesario ubicar puntos a través de los cuales la curva interpola su forma



Se crea mediante la ubicación de puntos de un polígono de control en los que se encaja la curva



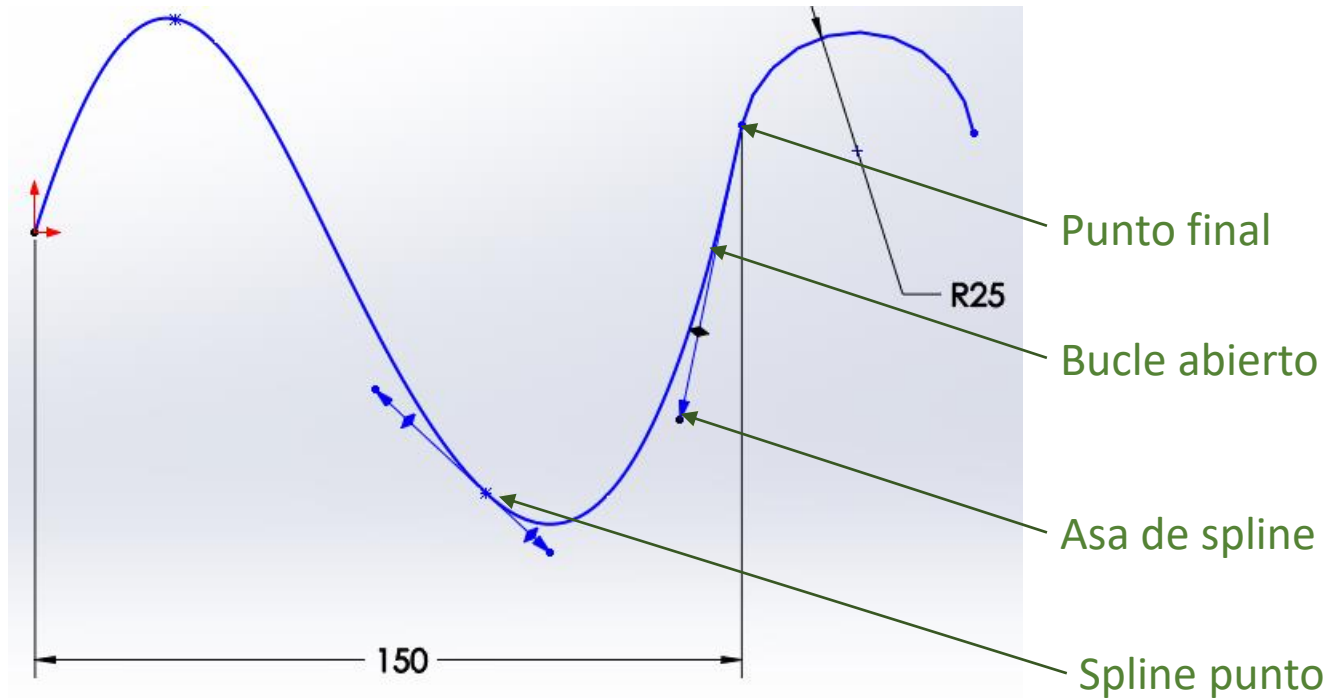
Cuando trabaja con un croquis 3D, este comando crea una spline restringida a la superficie 2D o 3D



Generada a partir de ecuaciones especificadas por el usuario



## Practicar con splines



Al crear splines, es recomendable mantener la curva lo más simple posible, utilizando el menor número de puntos posibles



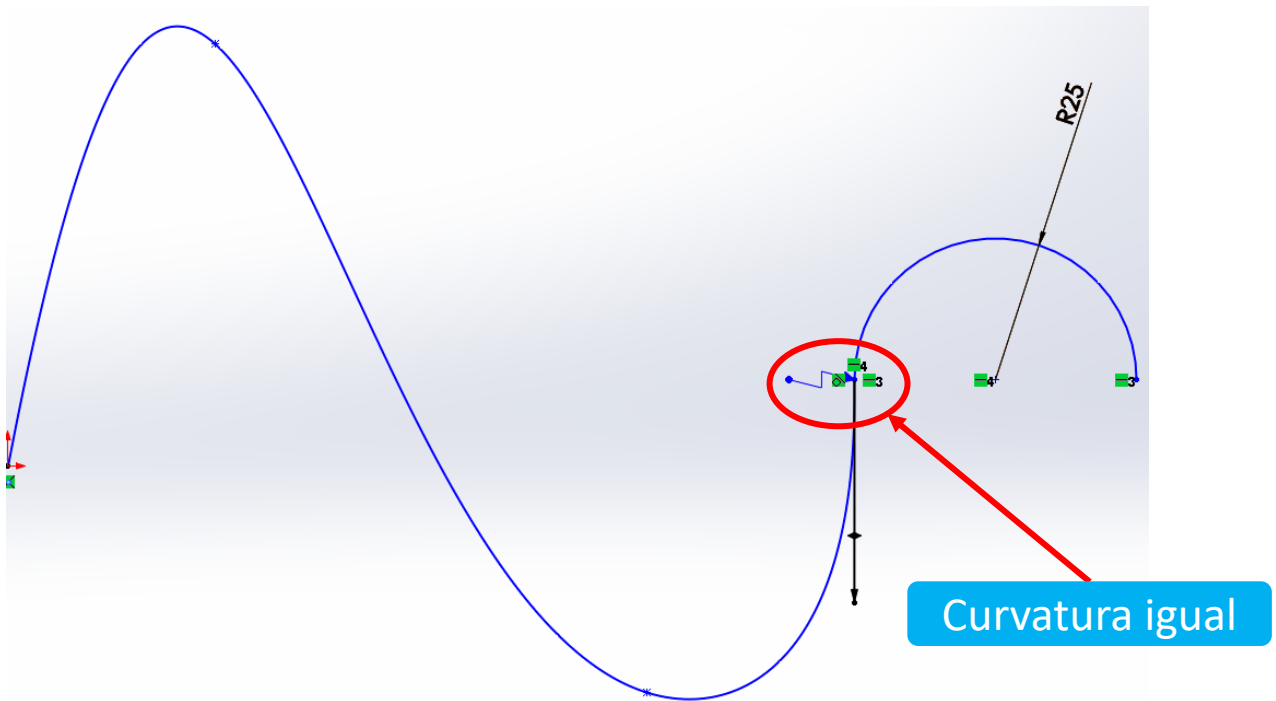
## Manipulación de splines

- Configure geometría constructiva
- Utilice una spline lo mas sencilla posible
- Agregue cotas y relaciones
- Mueva los puntos según sea necesario
- Si es necesario use las asas para modificar magnitud y dirección



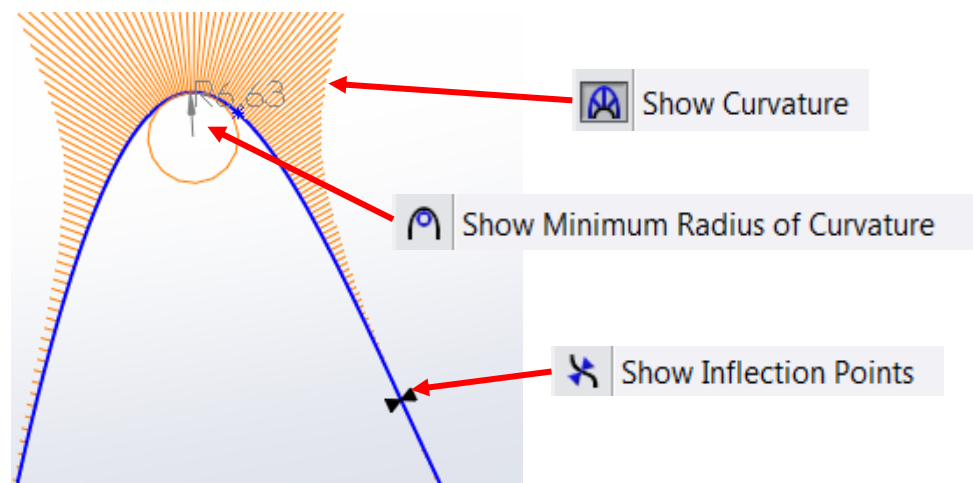
## Herramientas de spline

### Curvatura

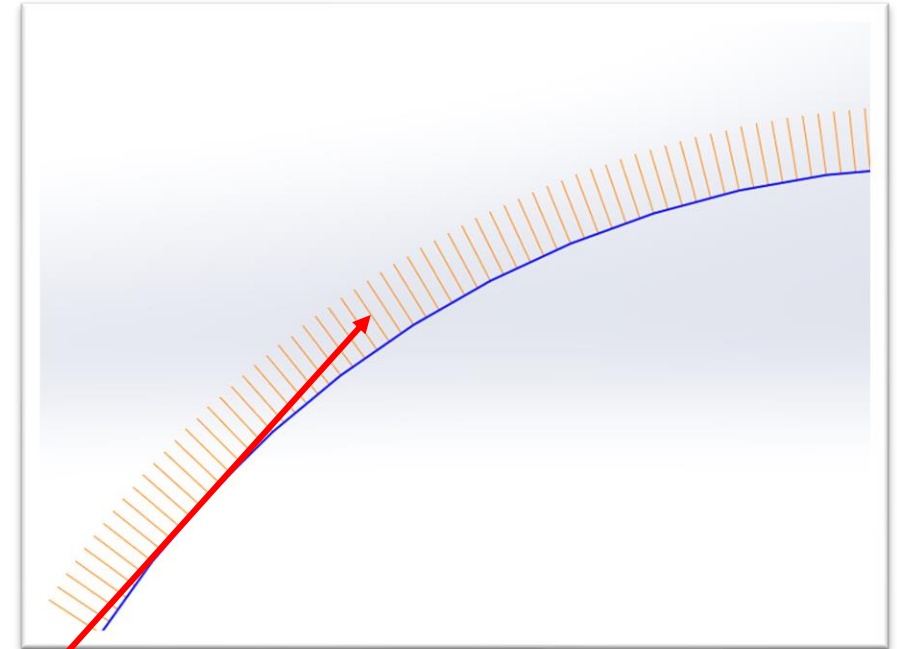
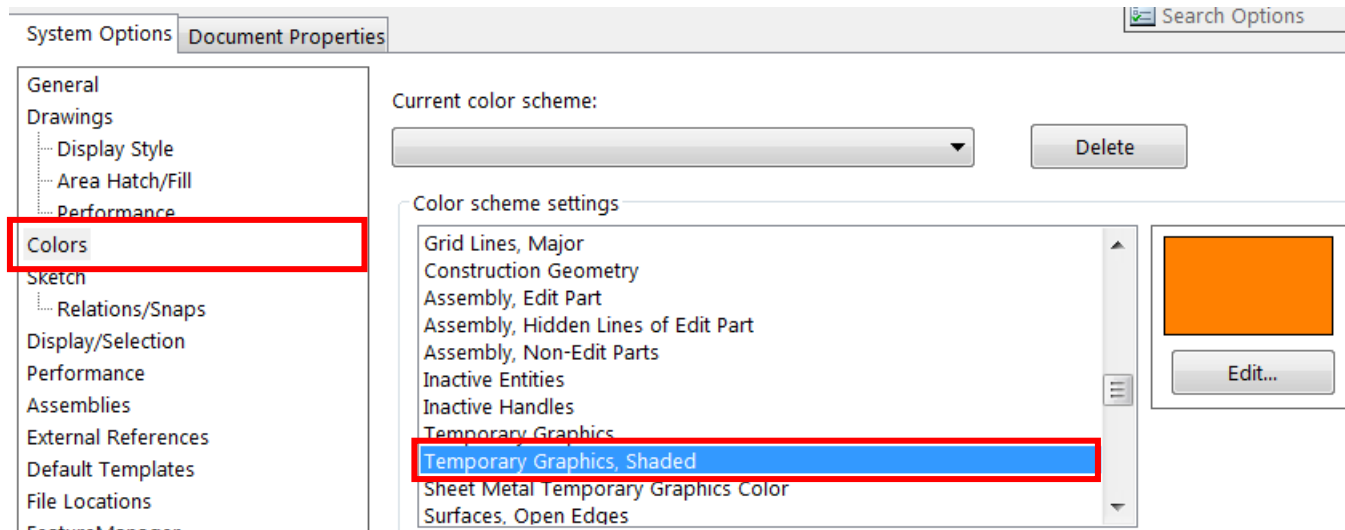


Curvatura igual = Transición mas uniforme

- Show Spline Handles
- Show Spline Control Polygon
- Show Inflection Points
- Show Minimum Radius of Curvature
- Show Curvature



## Evaluación pines de curvatura



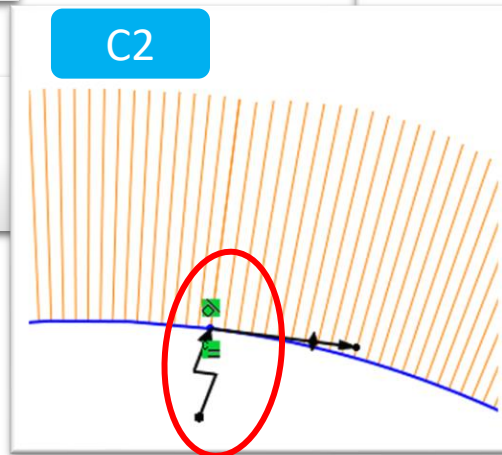
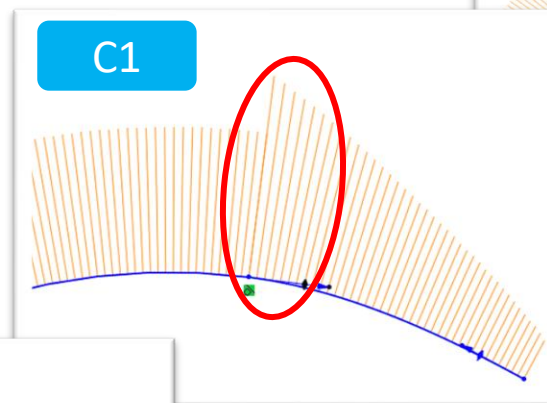
Peines de curvatura



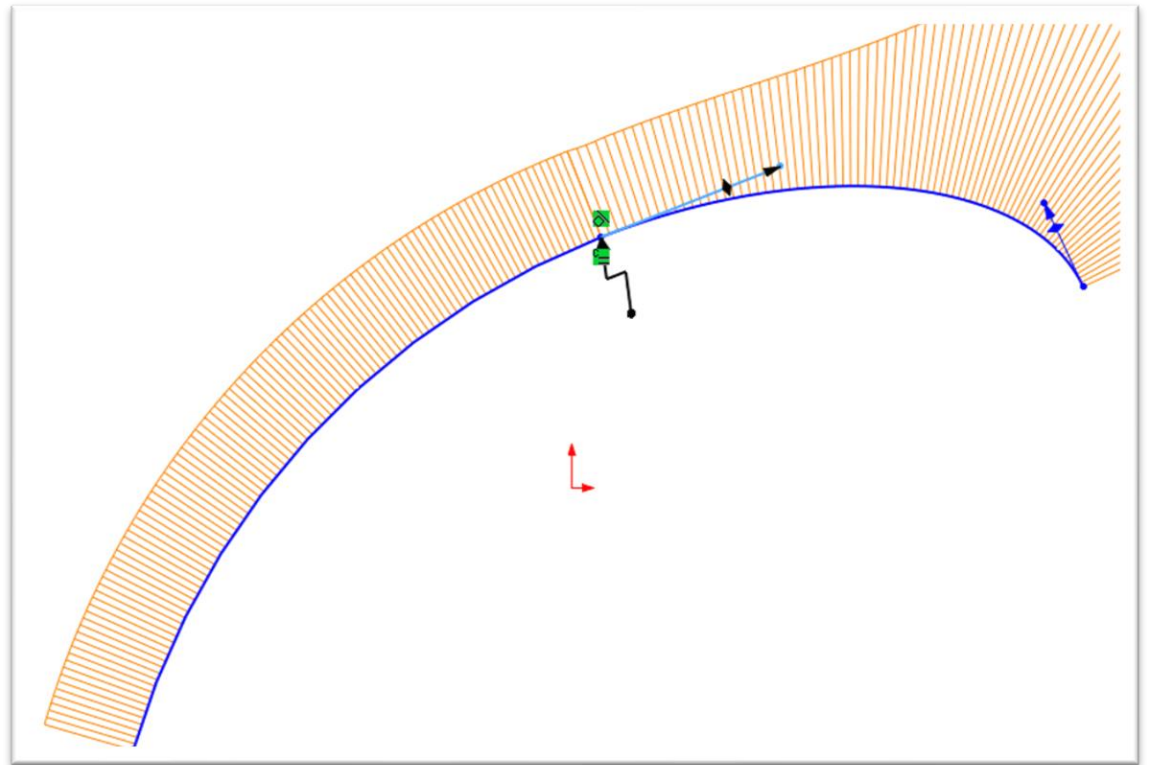
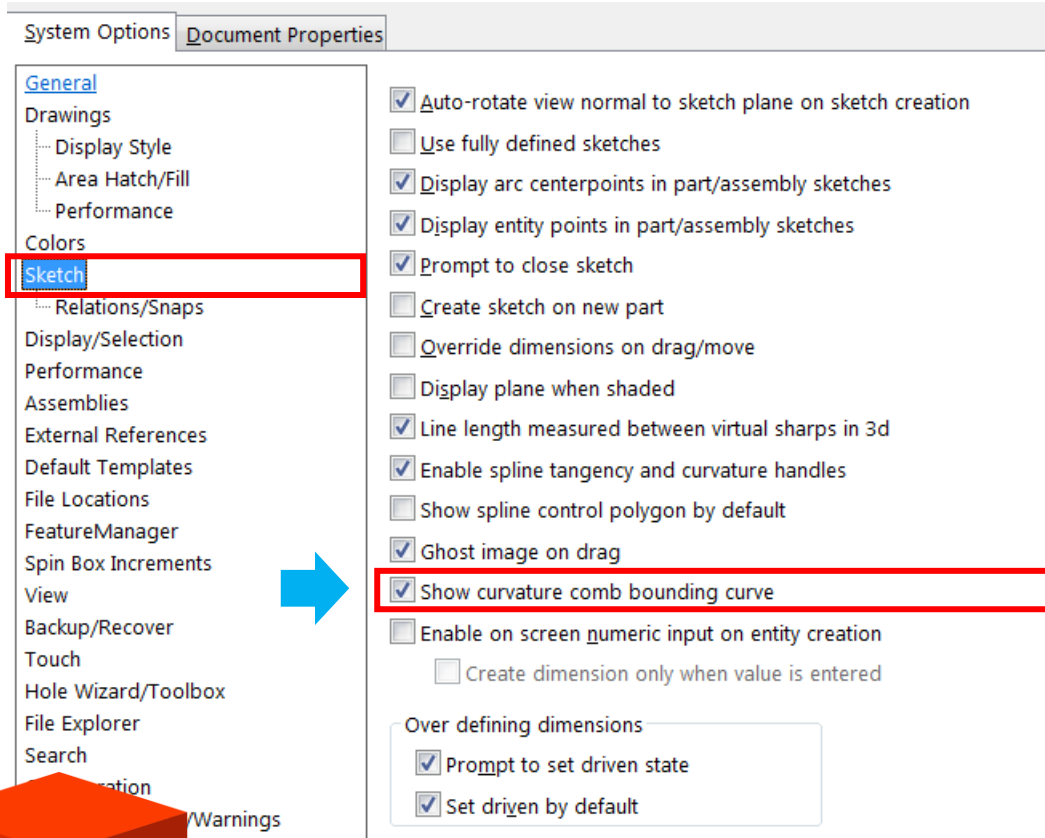


## Evaluación pines de curvatura

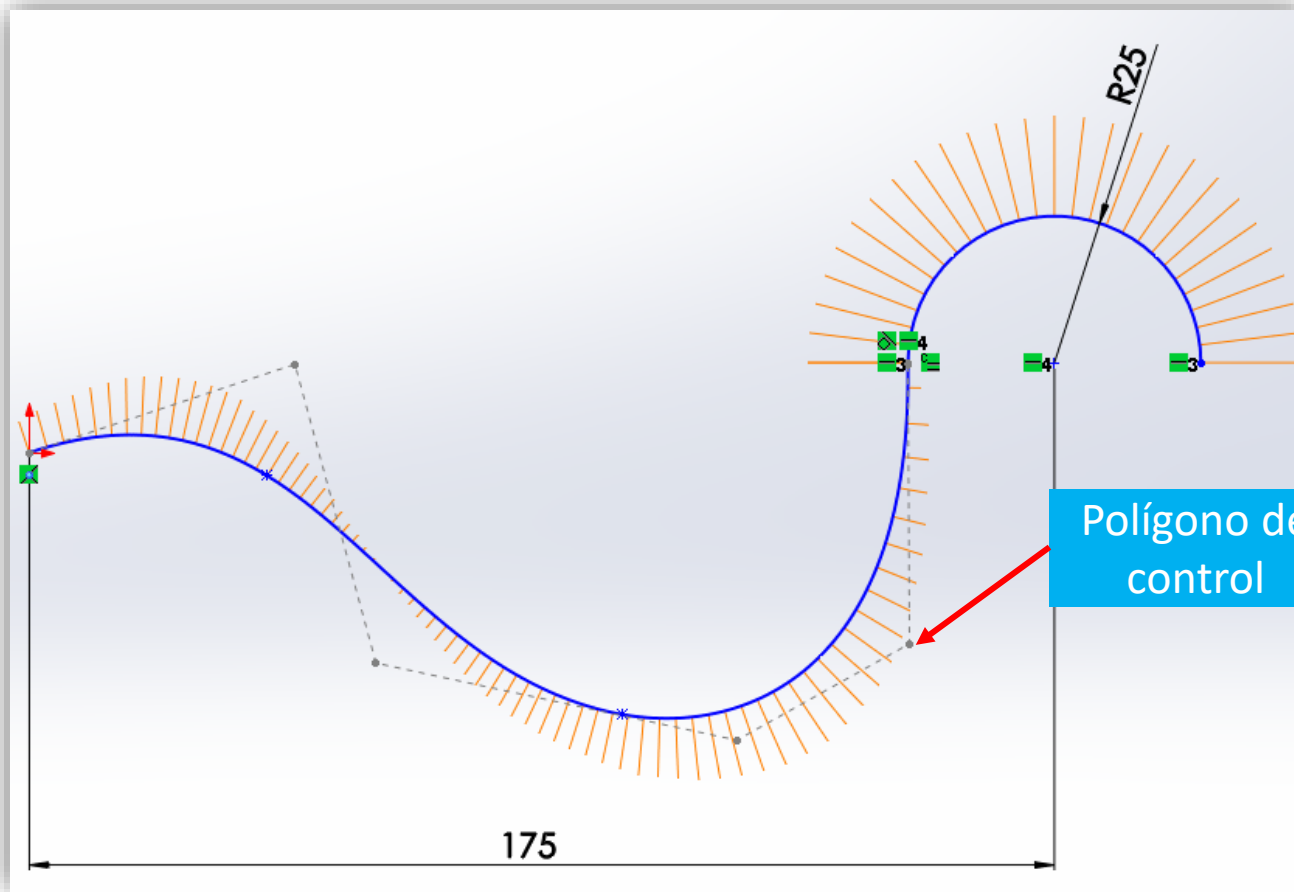
- Curvatura de contacto C0
- Curvatura tangente C1
- Curvatura continua C2



## Peine de curvatura



# Polígono de control

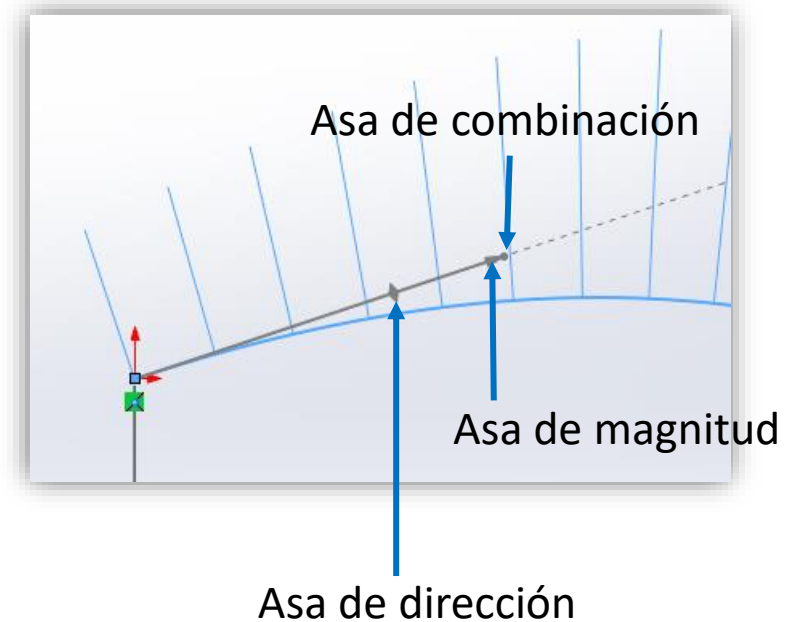


*“Manipula la spline al mismo tiempo que la mantiene en su forma mas simple”*

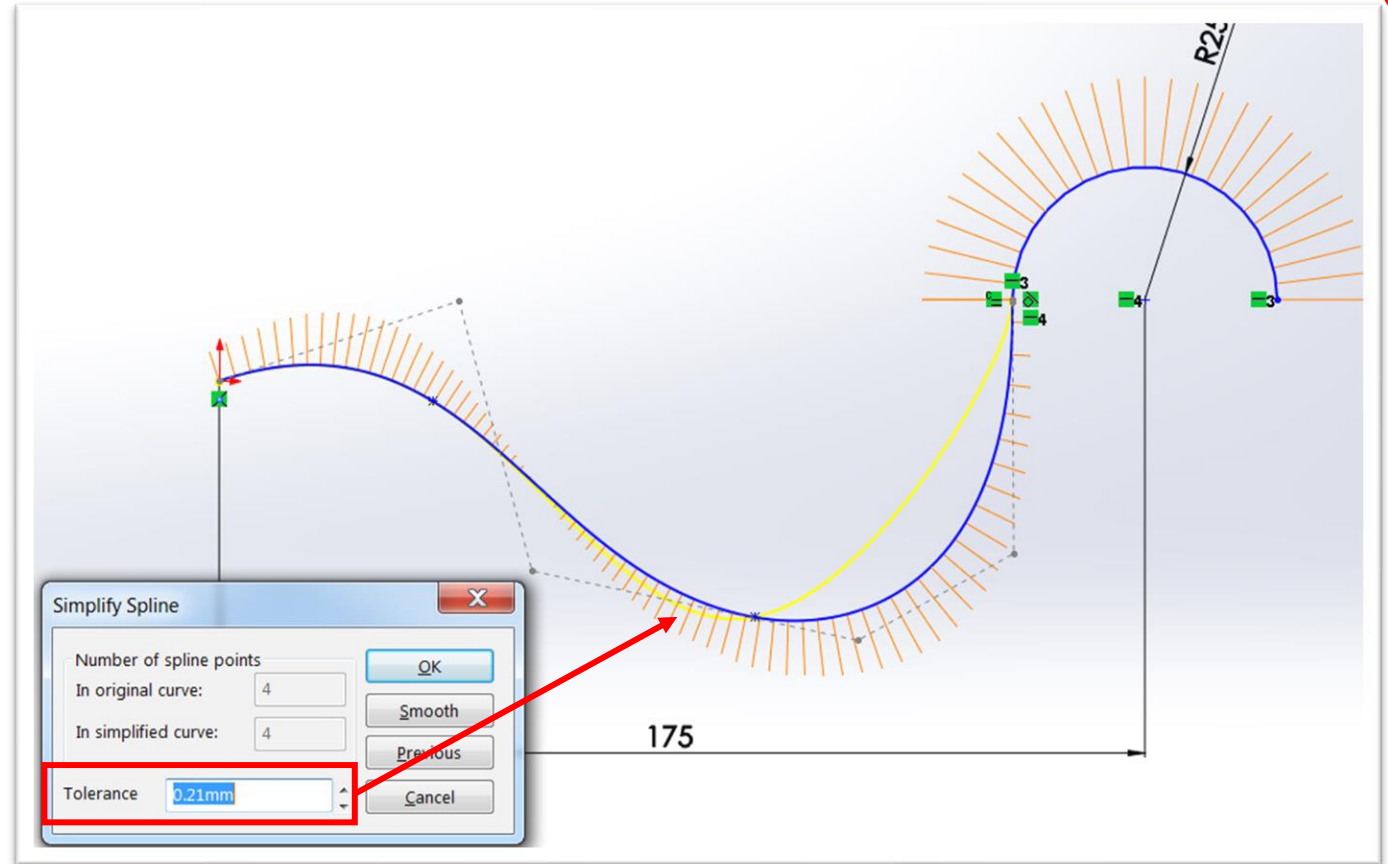
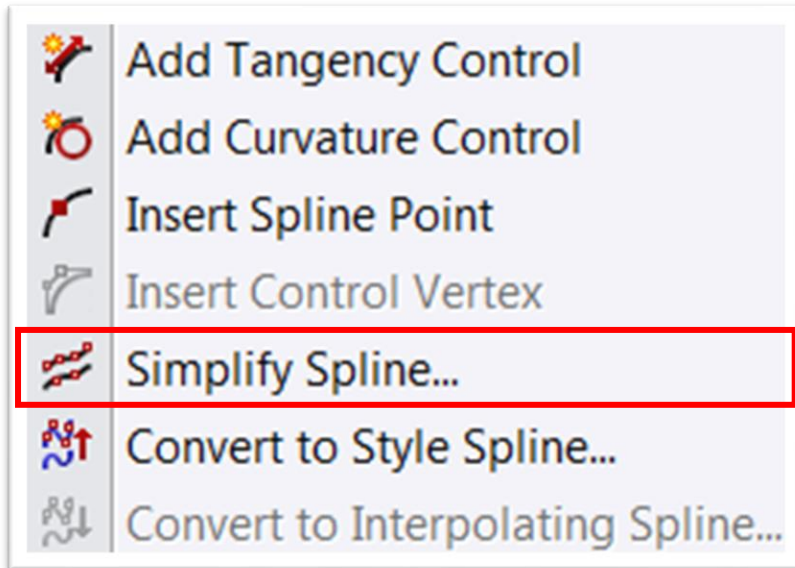


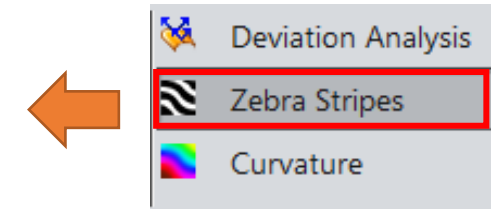
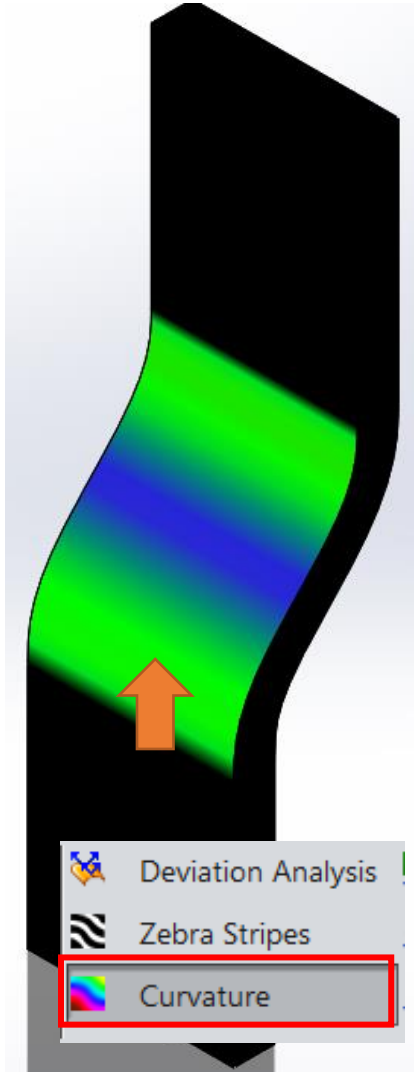
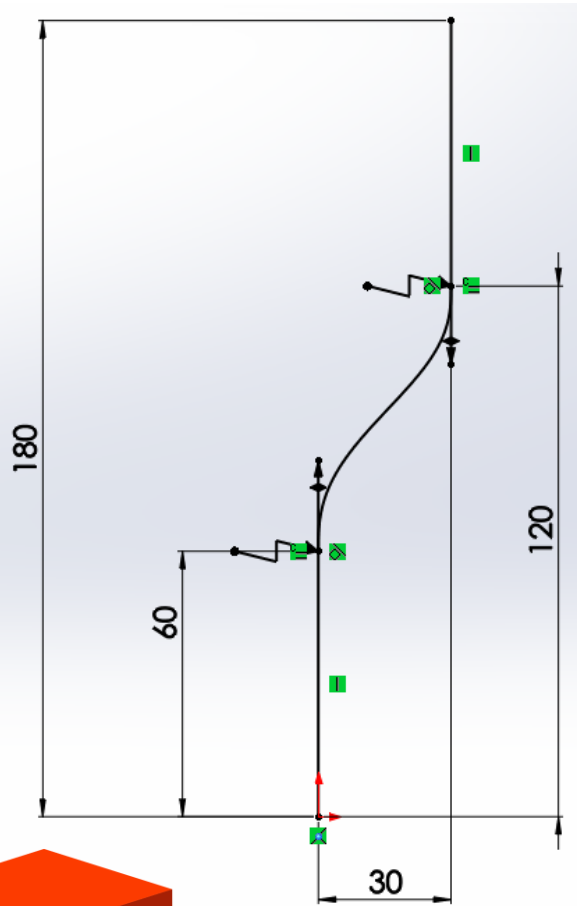
## Ajustes de una spline

- Asa de dirección: modifica la dirección de la curvatura
- Asa de magnitud: Aumenta o reduce la curvatura
- Asa de combinación: Manipula tanto la dirección como la magnitud



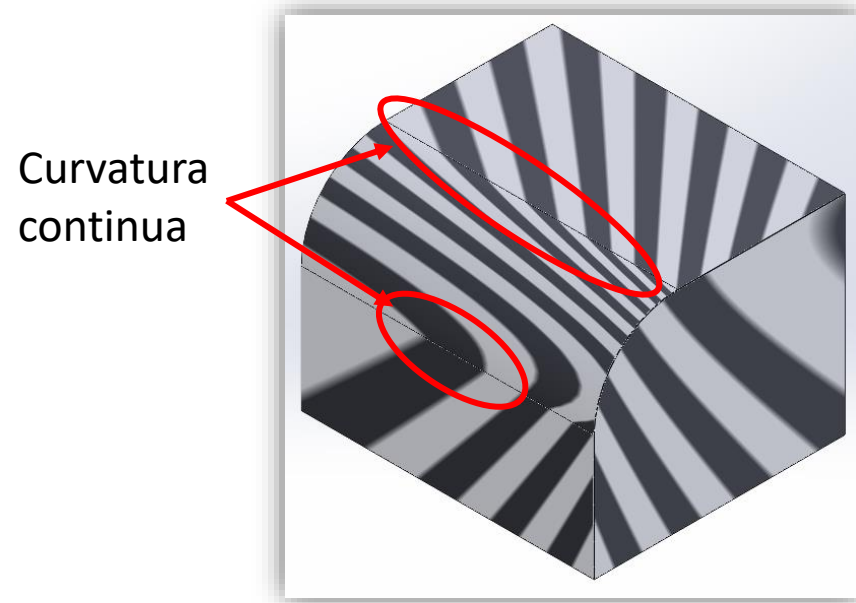
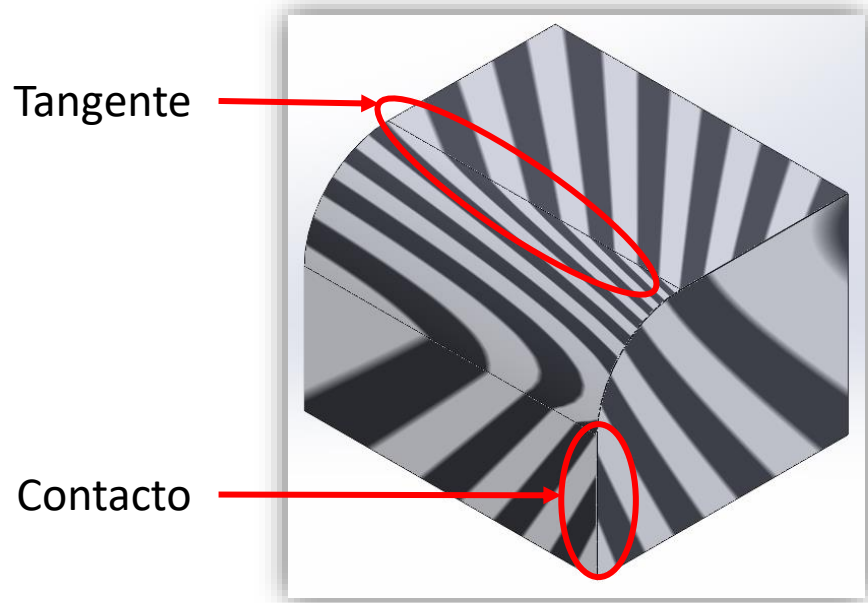
## Modificac spline



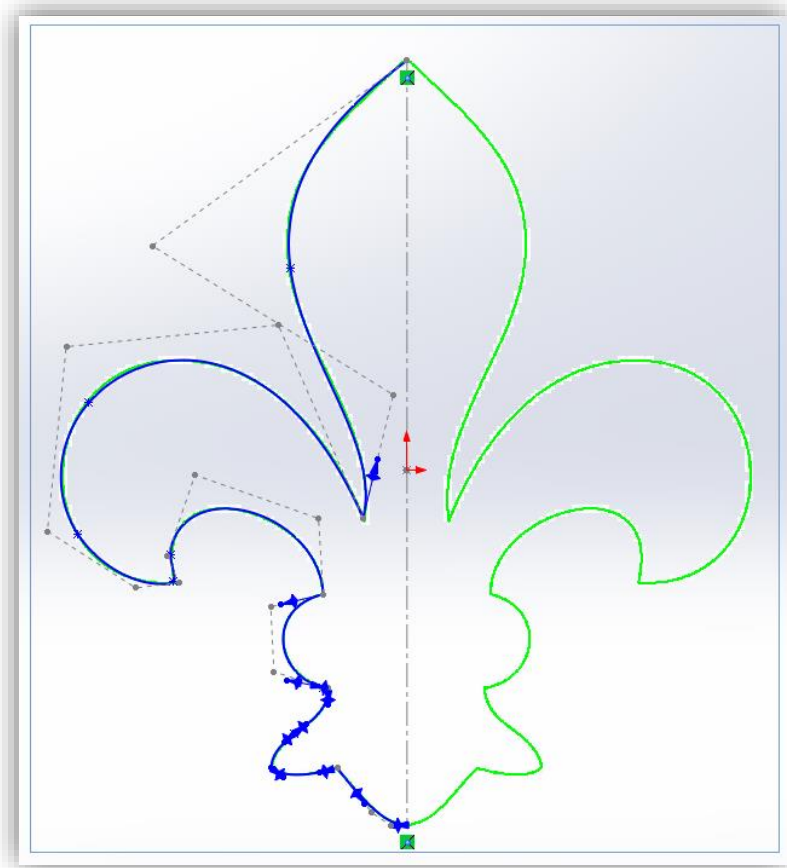
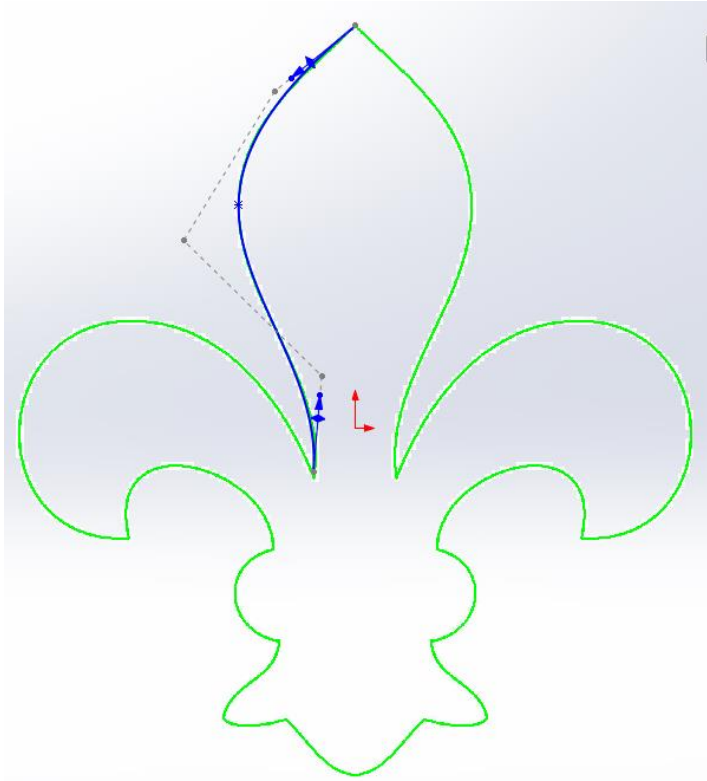


*“Se puede utilizar para ver la calidad de una superficie y el modo en que se fusionan las caras adyacentes”*

# Líneas Cebra



# Ejercicios





# Preguntas

1. Cite una recomendación del uso de SPLINES
2. Defina el concepto de curvatura y especifique para que sirve la relación “curvatura igual”
3. Describa los tres tipos de curvatura existentes en SOLIDWORKS
4. Para que sirve el análisis de curvatura



# Respuestas

1. Mantener lo mas sencilla posible
2. La curvatura indica cuanto se desvía un objeto de su posición recta, es el reciproco del radio. Curvatura igual = Transición mas uniforme
3. Contacto, Tangente, Continua
4. Identificar la calidad de las superficies y la transición entre sus caras adyacentes

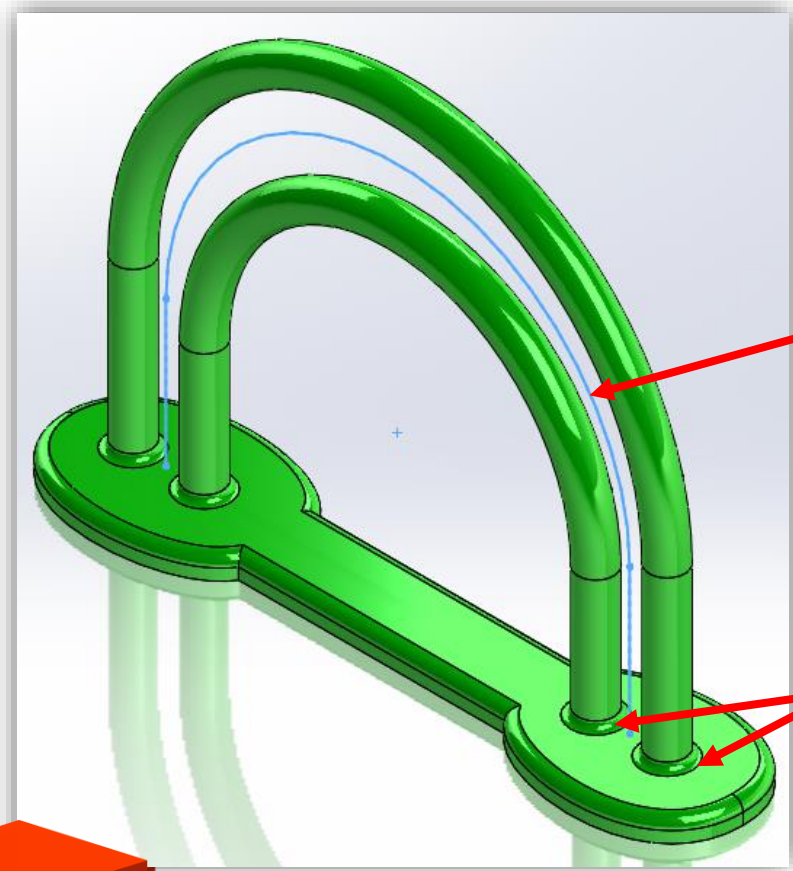




# Introducción al barrido



## Introducción al barrido



Trayecto

Contornos desarticulados

Perfil: El perfil de barrido debe estar contenido en un croquis y constituir un limite cerrado

Trayecto de barrido: Un trayecto de barrido puede ser 2D o 3D y estar compuesto de entidades de croquis