

The background of the slide is a repeating pattern of faint, light-gray technical drawings. These drawings include various mechanical components such as shafts, gears, and pulleys, along with dimension lines and feature callouts. The pattern is dense and covers the entire slide area.

# Datum Targets

# Datum Targets

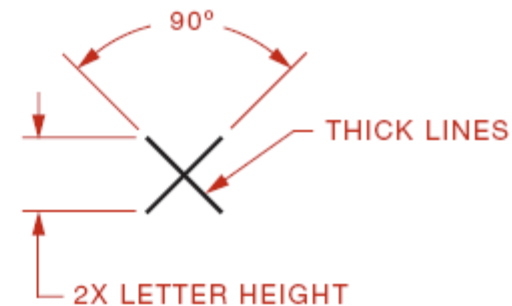
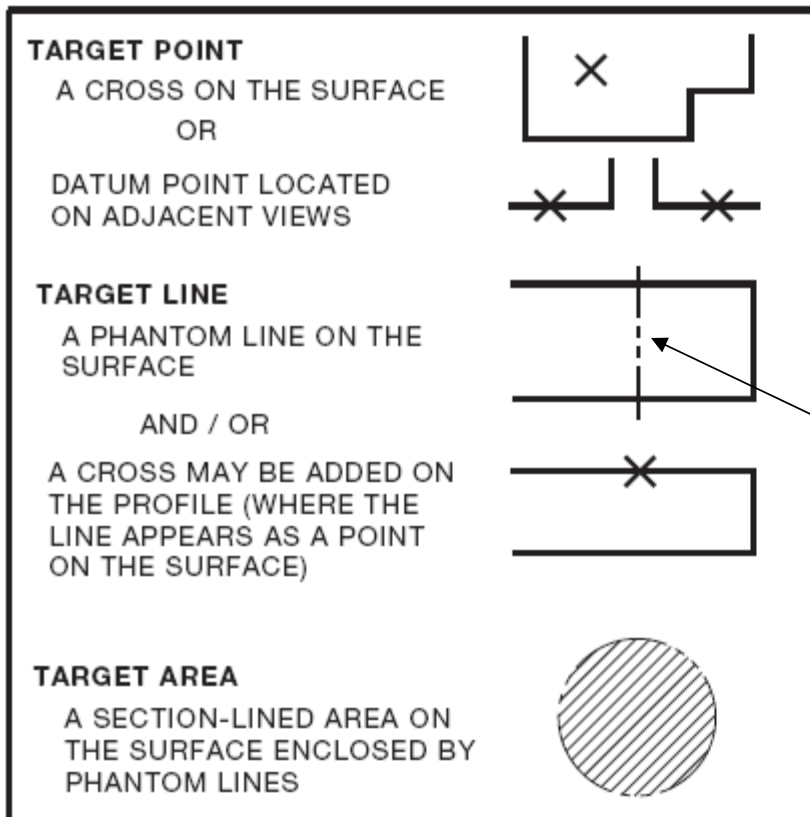
**– Datum Targets are used to establish datums in the following situations:\***

- Uneven or Irregular parts – Not Flat or Cylindrical Surfaces**
- Very Large Parts**
- If only a portion of a surface part is to be used. For example, the portion that contacts a mating part in an assembly**

# Datum-Target Drawing Callouts

There are three types of datum targets:

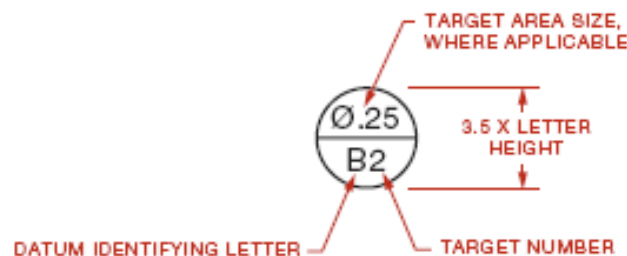
1. Points
2. Lines
3. Areas



Phantom Linetype\*

# Datum-Target Callout Symbol

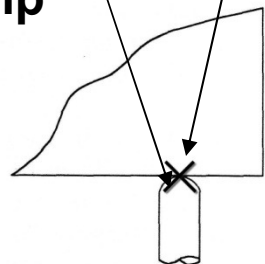
- The Datum Target symbol is the Callout for each specific Target
- They are placed outside the part outline with an arrowless leader directed to the targets. If the leader is under the part, it is indicated with a hidden line
- The symbol circle is divided horizontally into two halves
  - The upper half is only used for circular datum target areas and therefore is often left blank\*



# Identification of Targets

- *Datum Target Points\**
  - Datum target points generally represent the top or end views of inspection gage pins where they come in contact with the part feature
  - Target *point* locations are always located with Basic Dimensions

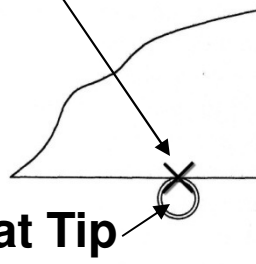
**Spherical  
Tip**



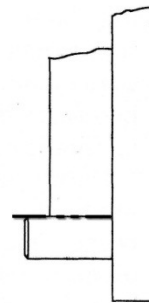
DATUM TARGET POINT  
(SPHERICALLY SHAPED)

DATUM TARGET POINT AND LINE CALLOUTS  
SUPERIMPOSED ON INSPECTION GAGE PINS

**Flat Tip**

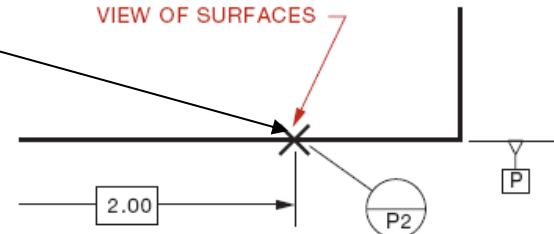


DATUM TARGET POINT  
(END VIEW)

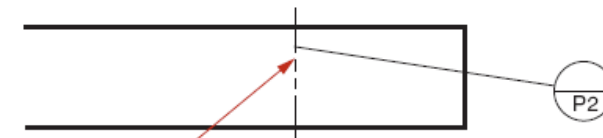


DATUM TARGET  
LINE

"X" SHOWN ON EDGE  
VIEW OF SURFACES

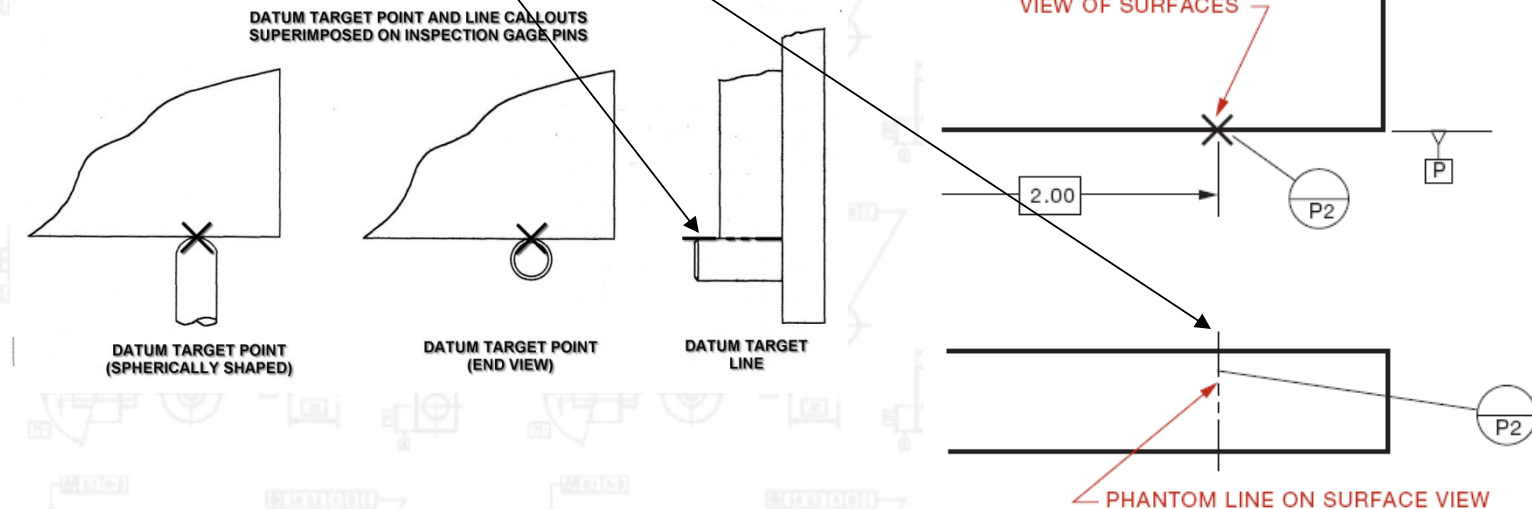


PHANTOM LINE ON SURFACE VIEW



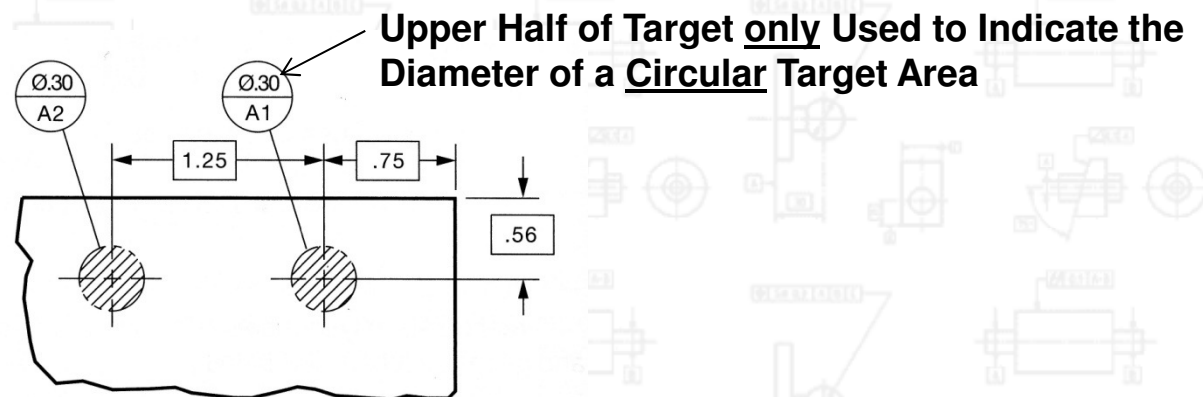
# Identification of Targets

- *Datum Target Lines\**
  - Datum target lines indicate the profile view of inspection gage pins
  - Target *line* locations are always located with Basic Dimensions



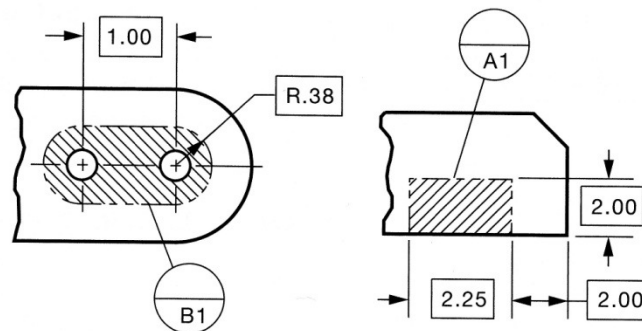
# Identification of Targets

- *Datum Target Areas –Circular\**
  - Denote a Circular Flat-End Datum Target
  - The diameter of circular areas is given in the upper half of the datum-target symbol\*
  - The areas are located with basic dimensions



# Identification of Targets

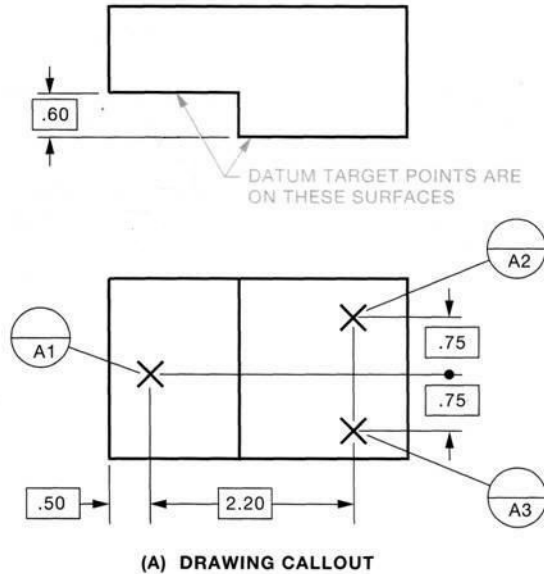
- *Datum Target Areas – Non Circular*
  - Datum target areas indicate a specific datum area to be established.
  - They are indicated by section lines inside a phantom outline of the desired shape, with controlling dimensions added.
  - The areas are dimensioned and located with basic dimensions



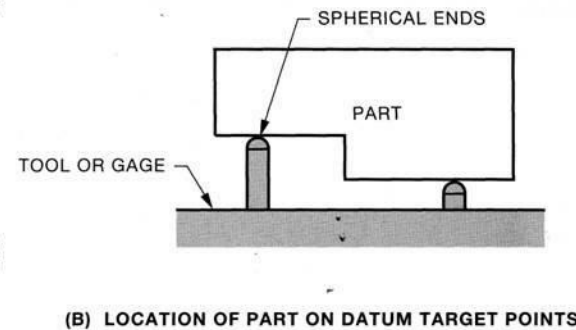


# Targets and the 3, 2, 1 Rule

- The 3, 2, 1 rule generally applies to establishing datums:
  - A Primary datum requires 3 targets (A1, A2, A3 Shown Below)



EXAMPLE OF ESTABLISHING A  
PRIMARY DATUM WITH DATUM  
TARGETS

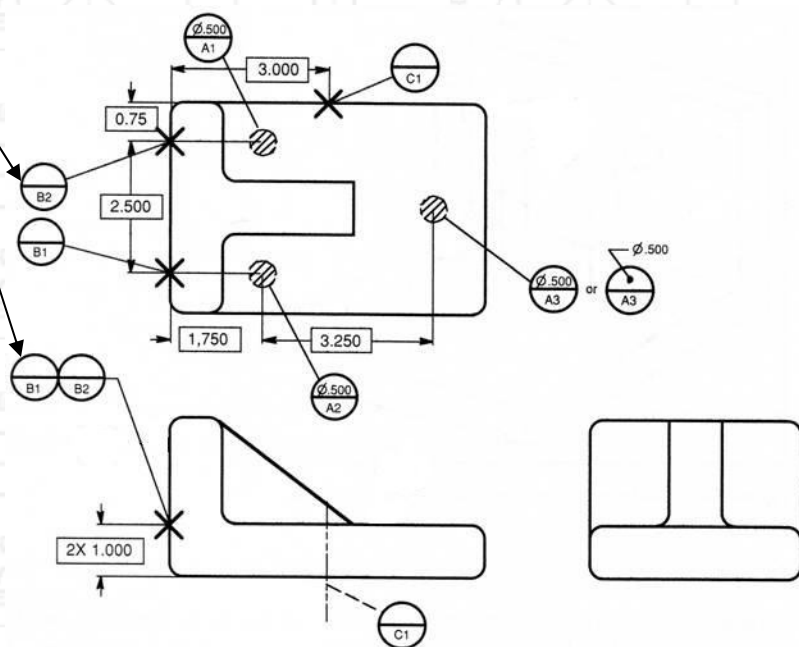


# Targets and the 3, 2, 1 Rule

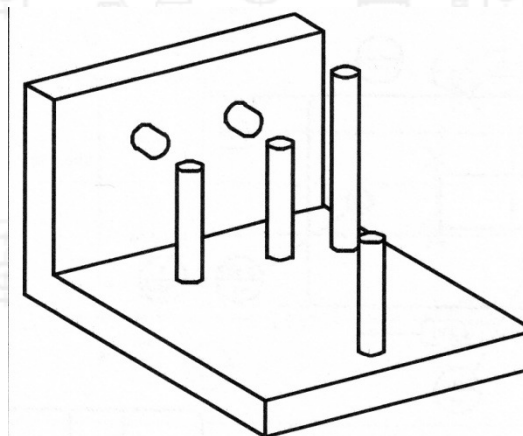
Targets Often  
Appear More  
Than Once  
on a Drawing  
Sheet

- Secondary datums require 2 targets (B1, B2)
- Tertiary datums require 1 target (C1)

**Datum Target Callouts**



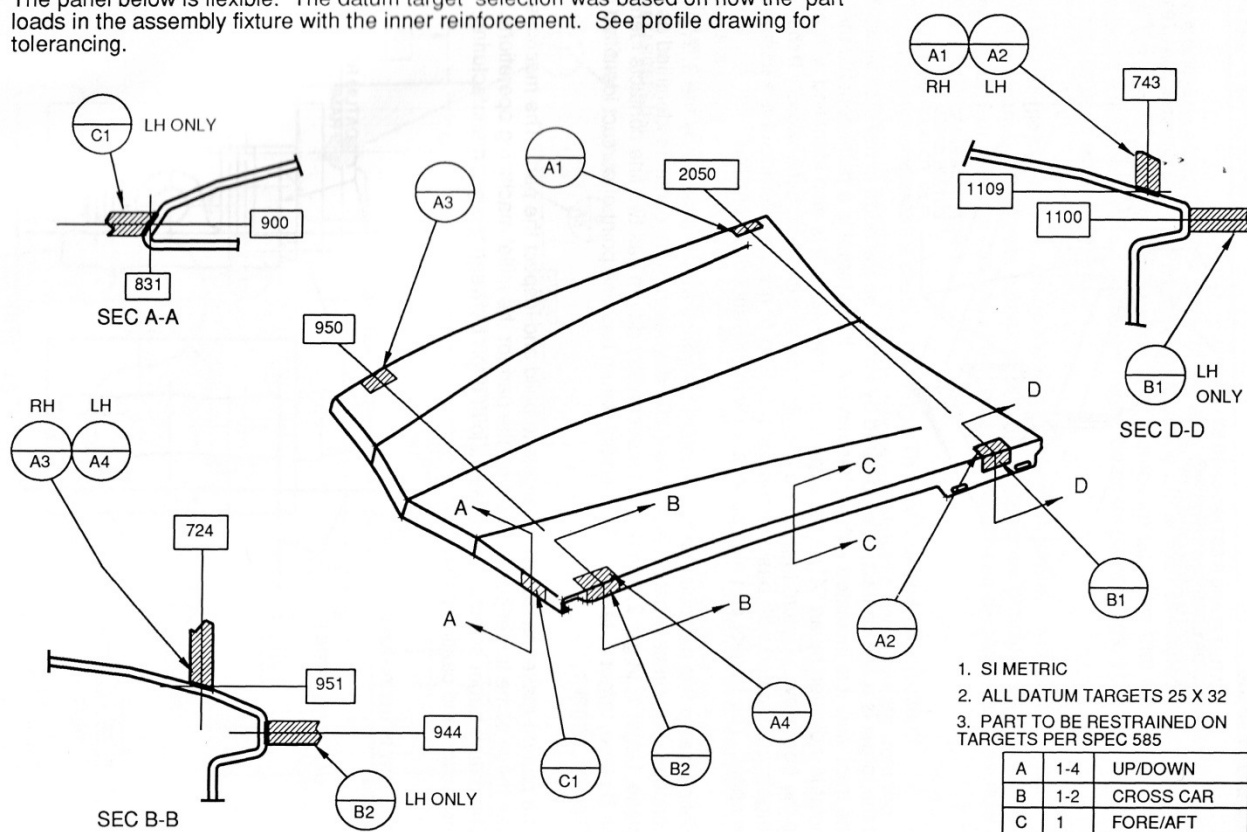
**Datum Target Simulator\***



**\*Part is mounted on datum simulator upside down**

# Datum Target Example

The panel below is flexible. The datum target selection was based on how the part loads in the assembly fixture with the inner reinforcement. See profile drawing for tolerancing.



# Screenshots From GD&T Basics



## Datum Targets Applications

**Consider using Datum Targets when:**

- It is not practical to use an entire surface as a datum feature or the surface is made up of complex geometry (i.e. car hood).
- The datum feature is likely to be bowed or warped, rough, wavy etc. (i.e. weldments, casting and forgings).



With casted surfaces, it is difficult to establish a flush contact surface using typical surface datums.

Datum Targets are used to establish the Datum Reference Frame when using these unstable surfaces.

**NOTE:** Use of Datum Targets does not increase cost and will almost certainly result in more precise and repeatable inspection.

Establishing a Datum Reference Frame for measuring the profile of a car hood is almost impossible without Datum Targets.



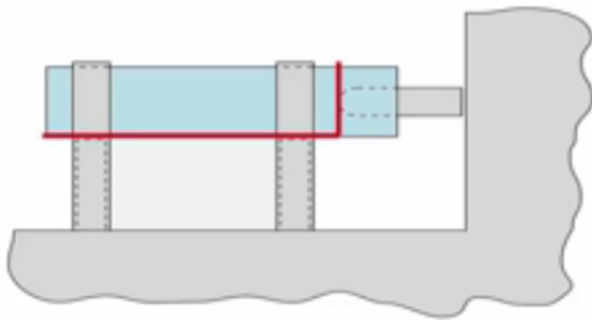
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Targets

# Screenshots From GD&T Basics

## Datum Targets Introduction

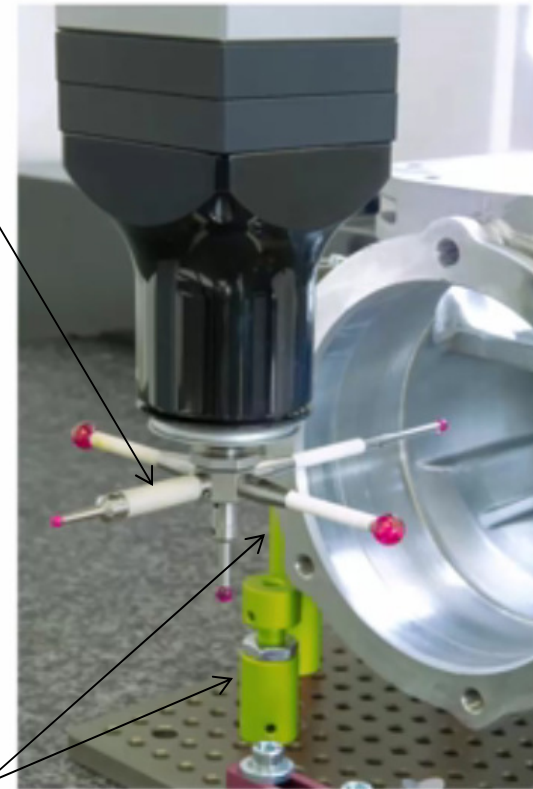
**Datum Targets** - In certain scenarios it is not always possible to use an edge, surface or axis to create a traditional Datum Reference Frame. In these instances Datum Targets are used to create a virtual datum surface by establishing a datum point, plane, or axis.



Datum Targets allow you to specify exact locations to secure your parts for measurement. This is usually done when securing the part using surface or feature datums is impossible.

CMM

Targets





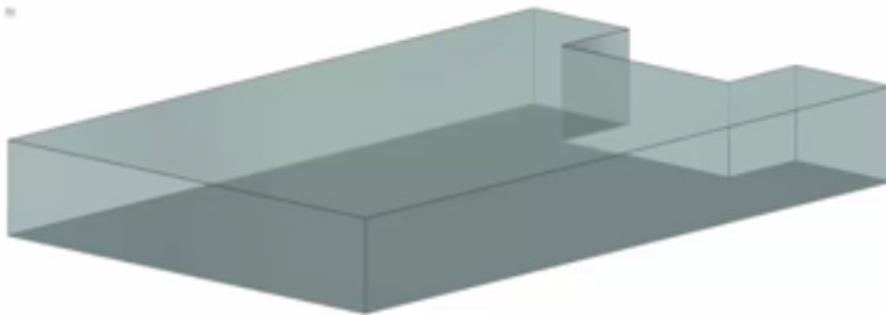
# Screenshots From GD&T Basics



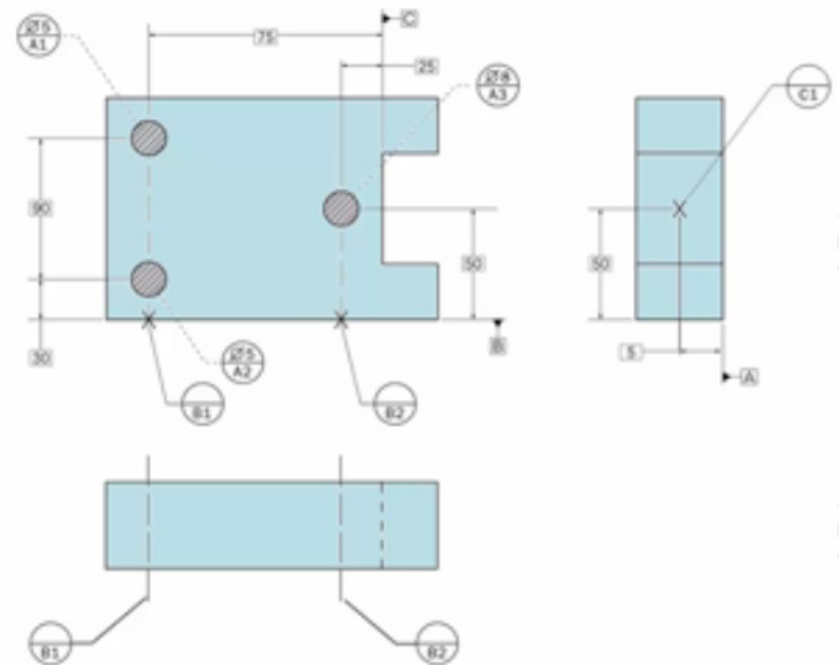
## Datum Targets

### Example: Datum Target Setup

It is important to remember the **3-2-1 Rule** with Datum Targets. Depending on which datum you are setting up, this rule will guide you as to how many points, lines or areas are required to establish a Datum Reference Frame.



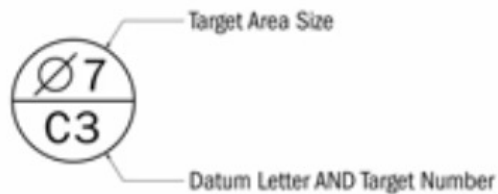
In this example, what type of Datum Targets make up each datum? Is the part fully constrained?



# Screenshots From GD&T Basics

## Datum Targets Drawing Symbols

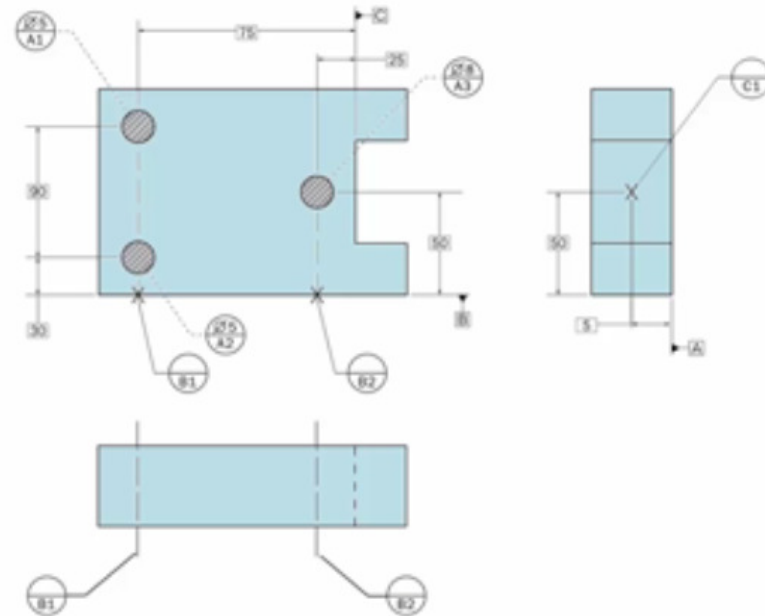
The Datum Target symbol is a circle divided horizontally.  
The **upper portion** contains the target **area size**



The **lower portion** contains the Datum Target letter and number. (In the case the third Datum Target of datum C is simulated.)

A leader line from the Datum Target symbol to the part indicates the location of the target.

- **Solid** line indicates the target is on **surface shown (near)**.
- **Dashed** line indicates the target is on the **hidden (far)** surface.



There are three different types of Datum Targets:

- Datum Target **Points**
- Datum Target **Lines**
- Datum Target **Areas**

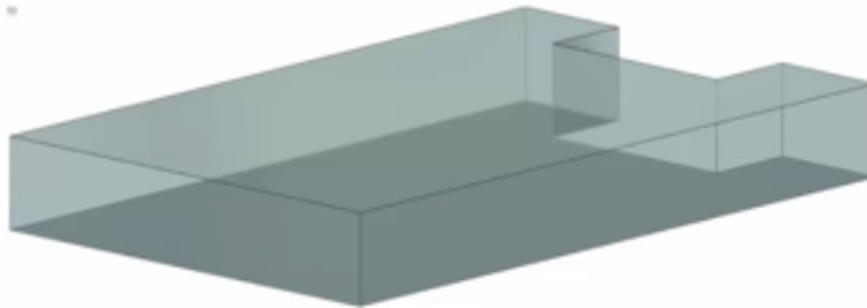
# Screenshots From GD&T Basics



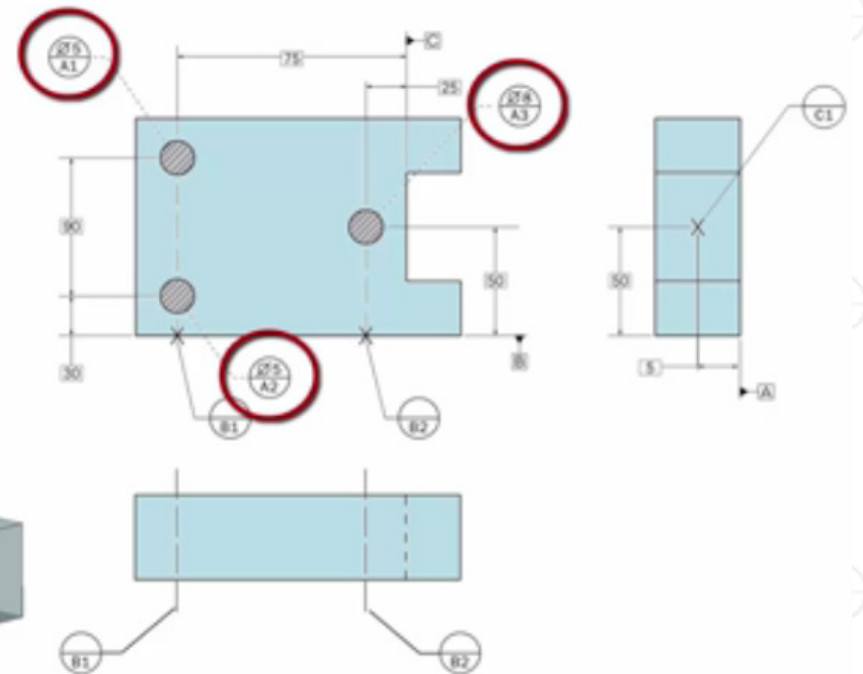
## Datum Targets

### Example: Datum Target Setup

It is important to remember the **3-2-1 Rule** with Datum Targets. Depending on which datum you are setting up, this rule will guide you as to how many points, lines or areas are required to establish a Datum Reference Frame.



In this example, what type of Datum Targets make up each datum? Is the part fully constrained?





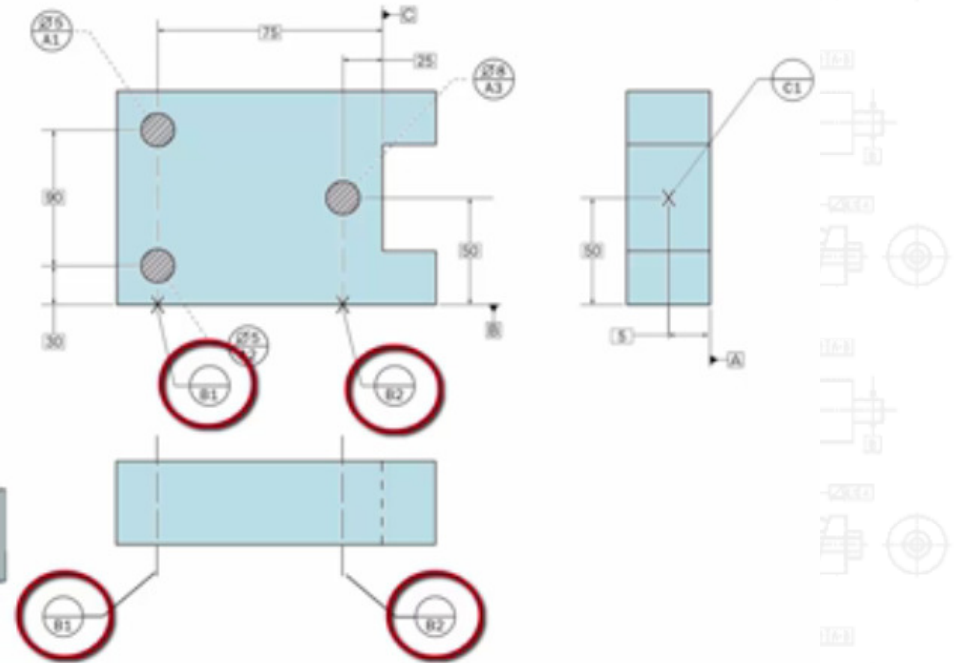
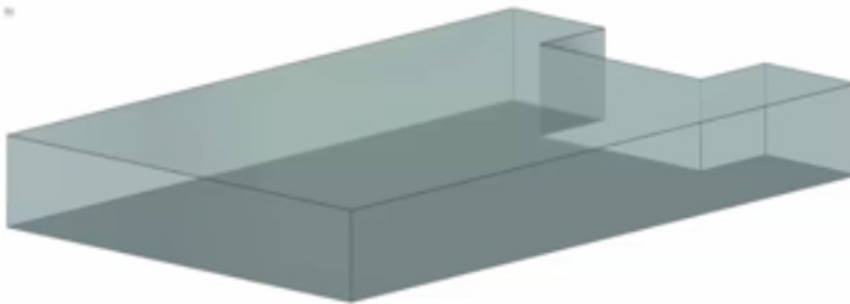
# Screenshots From GD&T Basics

C3

## Datum Targets

### Example: Datum Target Setup

It is important to remember the **3-2-1 Rule** with Datum Targets. Depending on which datum you are setting up, this rule will guide you as to how many points, lines or areas are required to establish a Datum Reference Frame.



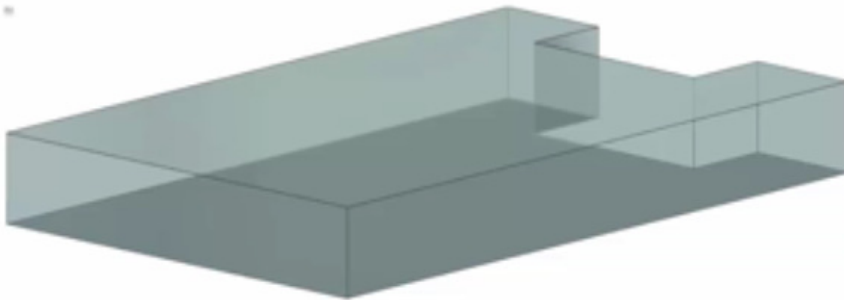
In this example, what type of Datum Targets make up each datum? Is the part fully constrained?

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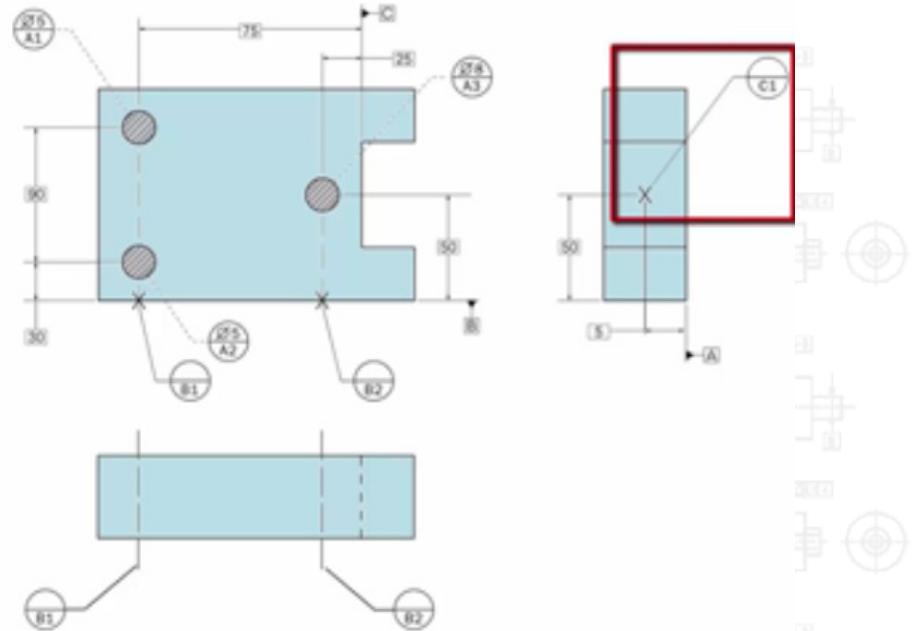
## Datum Targets

Example: Datum Target Setup

It is important to remember the **3-2-1 Rule** with Datum Targets. Depending on which datum you are setting up, this rule will guide you as to how many points, lines or areas are required to establish a Datum Reference Frame.

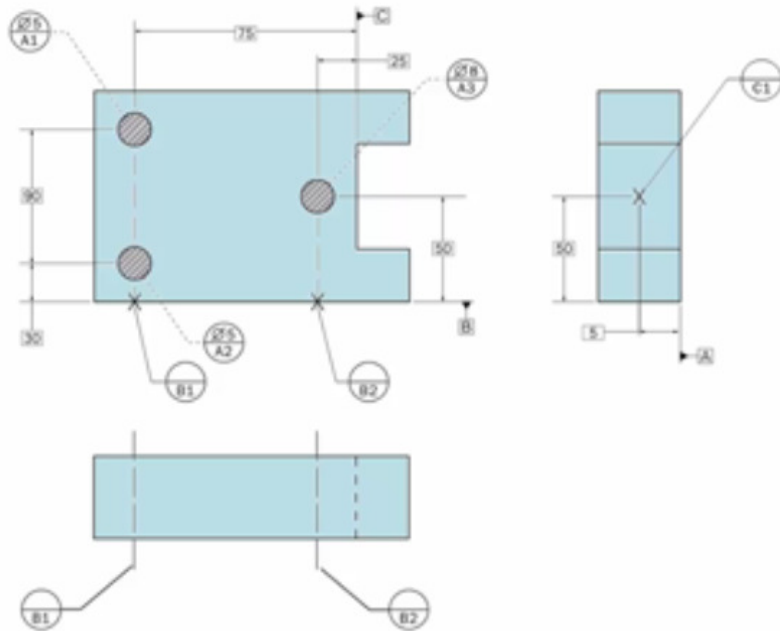


In this example, what type of Datum Targets make up each datum? Is the part fully constrained?

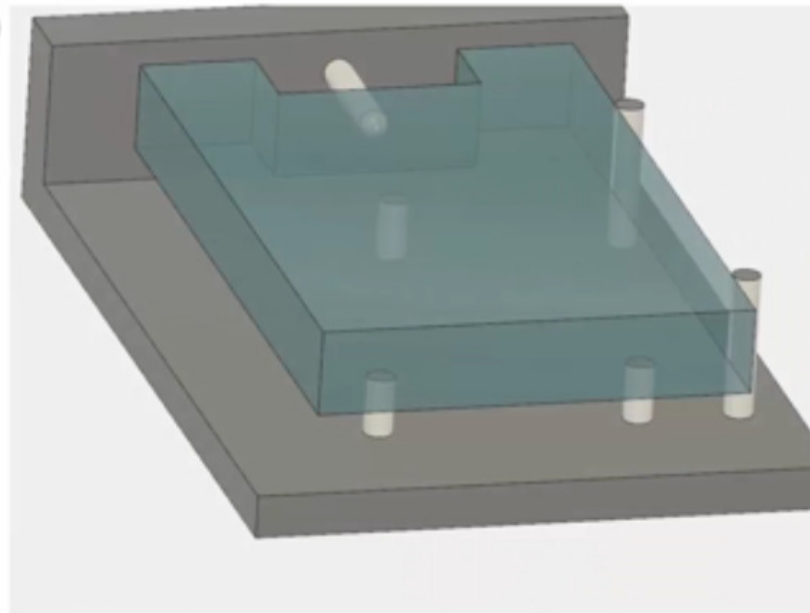


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## Datum Targets Example



All of the Datum Targets combine to create a single Datum Reference Frame (A-B-C) and follow the 3-2-1- Rule.

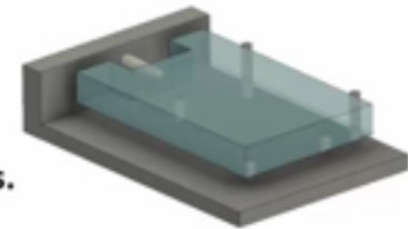


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## Datum Targets Review

1. Datum Targets are frequently used with parts of **complex geometry** or those that do not allow or require the use of a complete surface.
2. There are **three** different types of **Datum Targets**:
  - Datum Target **Areas** – Represented by **flat topped pins**.
  - Datum Target **Lines** – Simulated from the **edge of cylindrical gauge elements**.
  - Datum Target **Points** – Created from **spherical tipped pins**.
3. Leader **lines** from the Datum Target symbol that are **solid** indicate the target **applies to the surface shown**. **Dashed lines** specify that the target exists on the **far or hidden side**.
4. Datum Targets are most commonly **used with basic dimensions**.



Note: When designing functional gauges, gauge tolerances can be derived from **ASME 14.43-2003**.

**Final Design Tip:** When defining a primary datum plane using Datum Target Points, they should be spaced as far enough apart as allowed by the design for stability. These points should not be in a straight line.