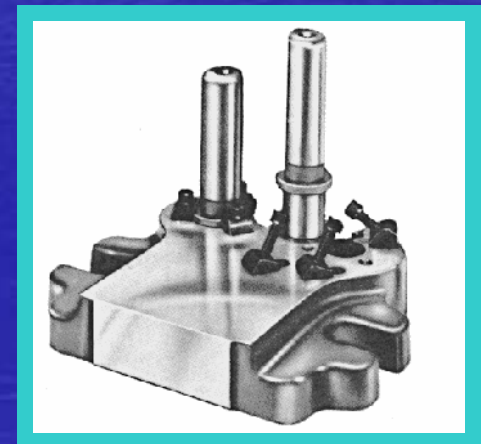
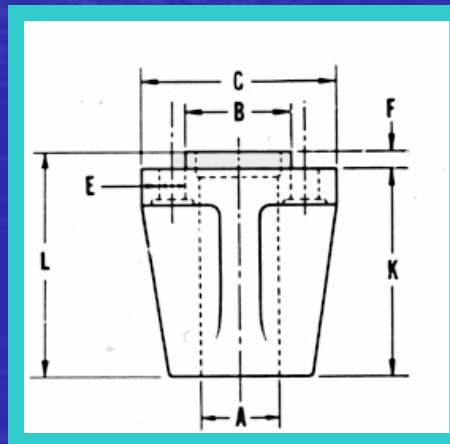
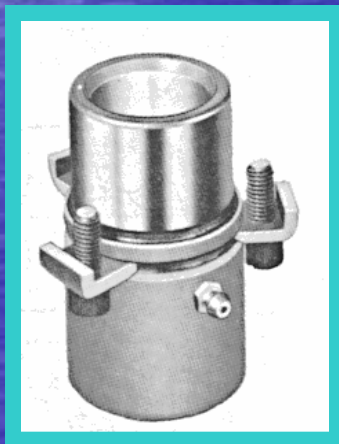
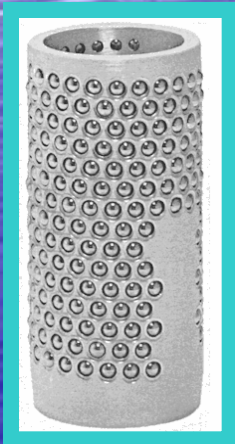


# Pins & Bushing Training



# **Pins & Bushing Training**

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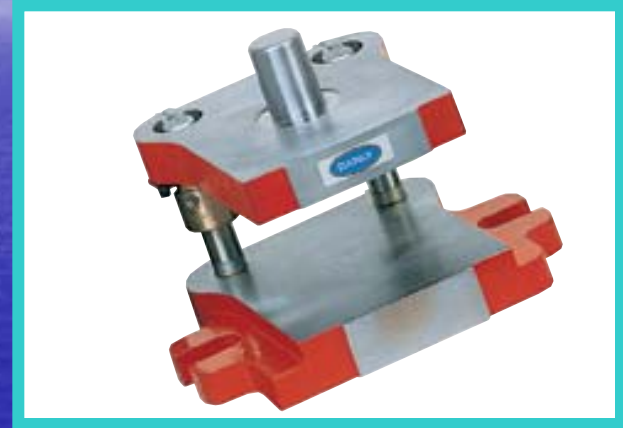
## **Agenda**

- **Product Lines**
- **Features & Benefits**
- **Competition**
- **Market/Applications**

# System Types

## Plain or Ball Bearing

- **Plain Bearing/Bushing System**
  - Consists of guide post & bushing
  - Speed limitations
  - Lower initial purchase cost
- **Ball Bearing System**
  - Precision guidance
  - Higher initial purchase cost
  - Consists of guide post, bushing & ball cage
  - Higher speed applications





# Plain Bearing & Ball Bearing Selection Criteria

- **Press velocity and SPM**

- **Ball bearing system preferred for high speed operations**
- **100 ft/min maximum for plain bearing (40ft/min for grease lube)**

**100 SPM \* .5 ft/stroke (6 inch stroke) = 50 ft/min**

# Plain Bearing & Ball Bearing Selection Criteria

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- **Punch to Die Clearances**
  - **Ball bearing systems are always in pre-load; therefore no die set play**
  - **Plain bearing systems have clearance between post & bushing**  
*(Clearance Can Be From .0002" To .0010")*

# Plain Bearing & Ball Bearing Selection Criteria

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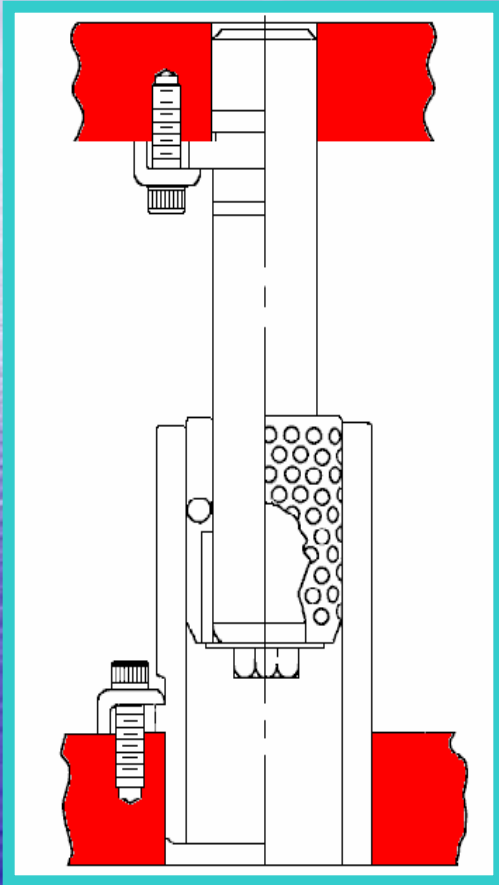
- **Condition of Press**
  - **If relying on die set for alignment, ball bearing system preferred**
- **Abrasives Impurities**
  - **Plain bearing preferred as ball bearings can get jammed and not roll**
  - **Chrome plated posts with steel bushings**



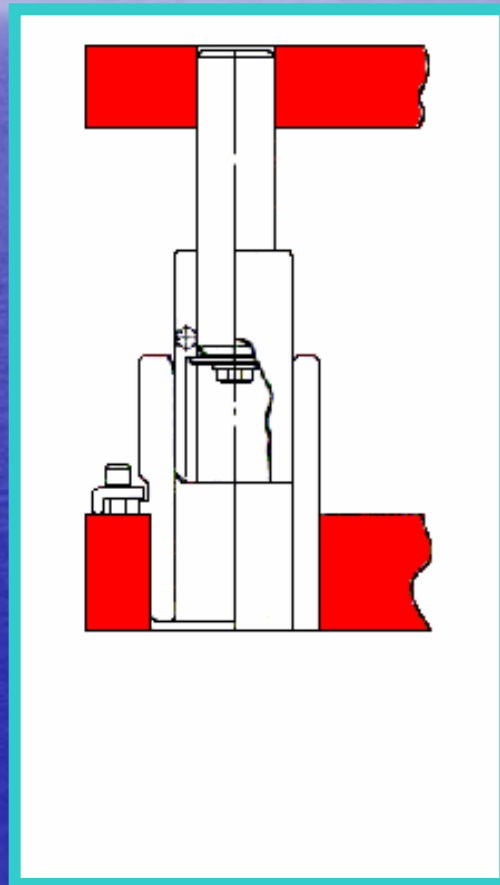
# Ball Bearing Type I, II, III

## Ball Bearing Selection Criteria

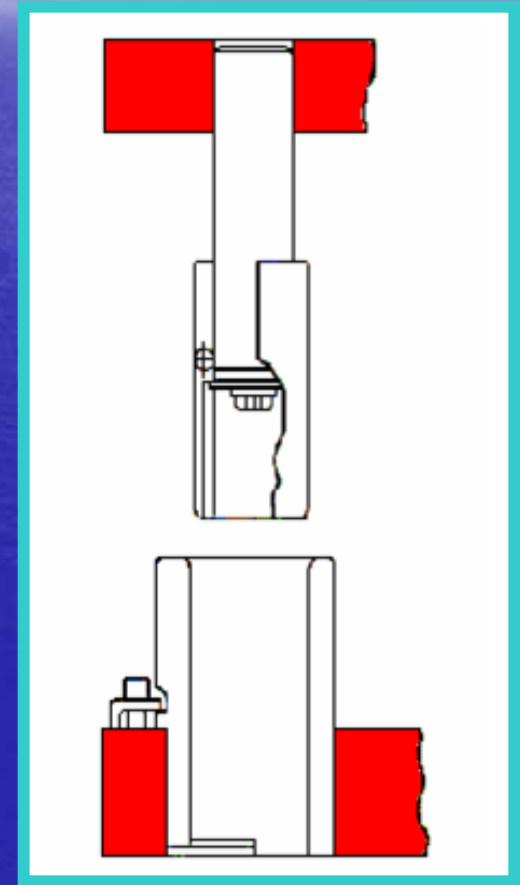
Type I  
Full Pre-load



Type I  
Pre-load Relieved



Type I  
Disengagement



# Mounting Method

## Press fit or Demountable

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- **Press fit**



- Pin/ Bushing non-working end is larger than the bored hole in the die set
- ID of bushings are honed to fit
- Less expensive



# Mounting Method

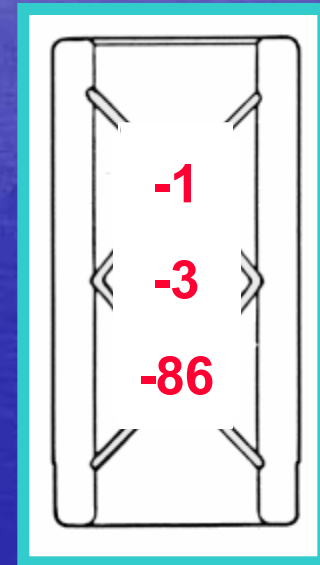
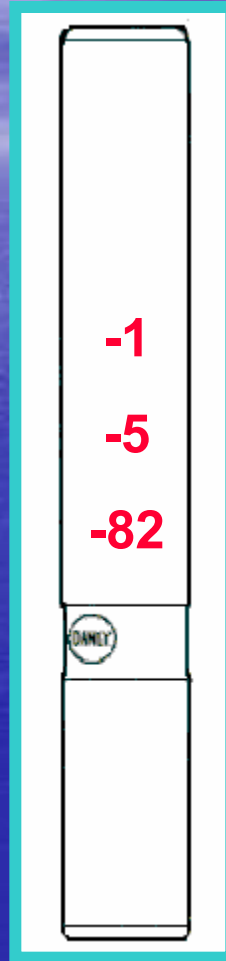
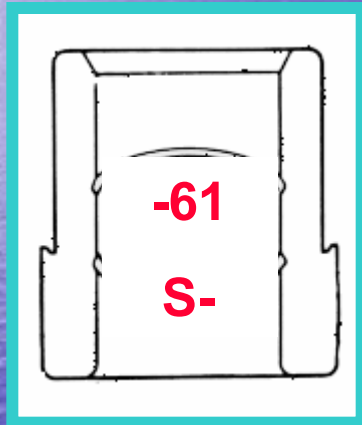
## Press fit or Demountable

- **Demountable**

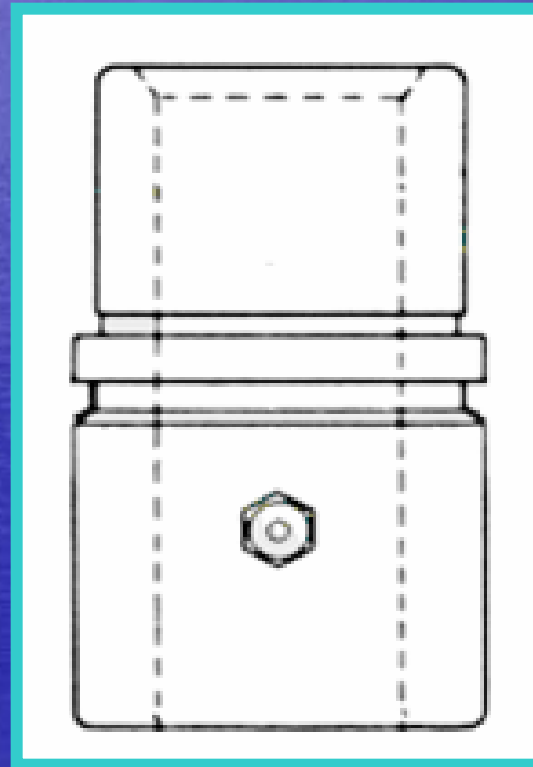
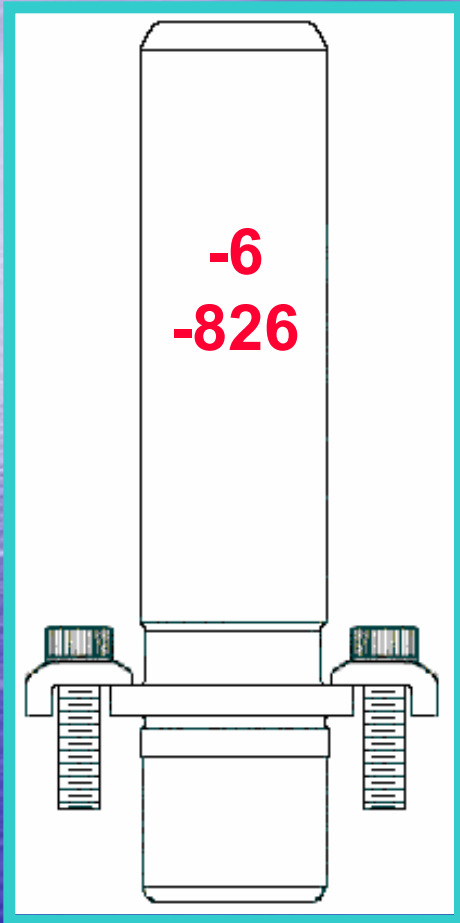


- Pin/ Bushing tap fit in place & held with toe clamps & screws
- All bushings are pre-fit
- Can be removed & assembled many times without damaging the hole in the die set
- Replace press fit posts when die set bore has been damaged
- 4 X the holding power compared to press fit
- More expensive

# Press Fit Examples



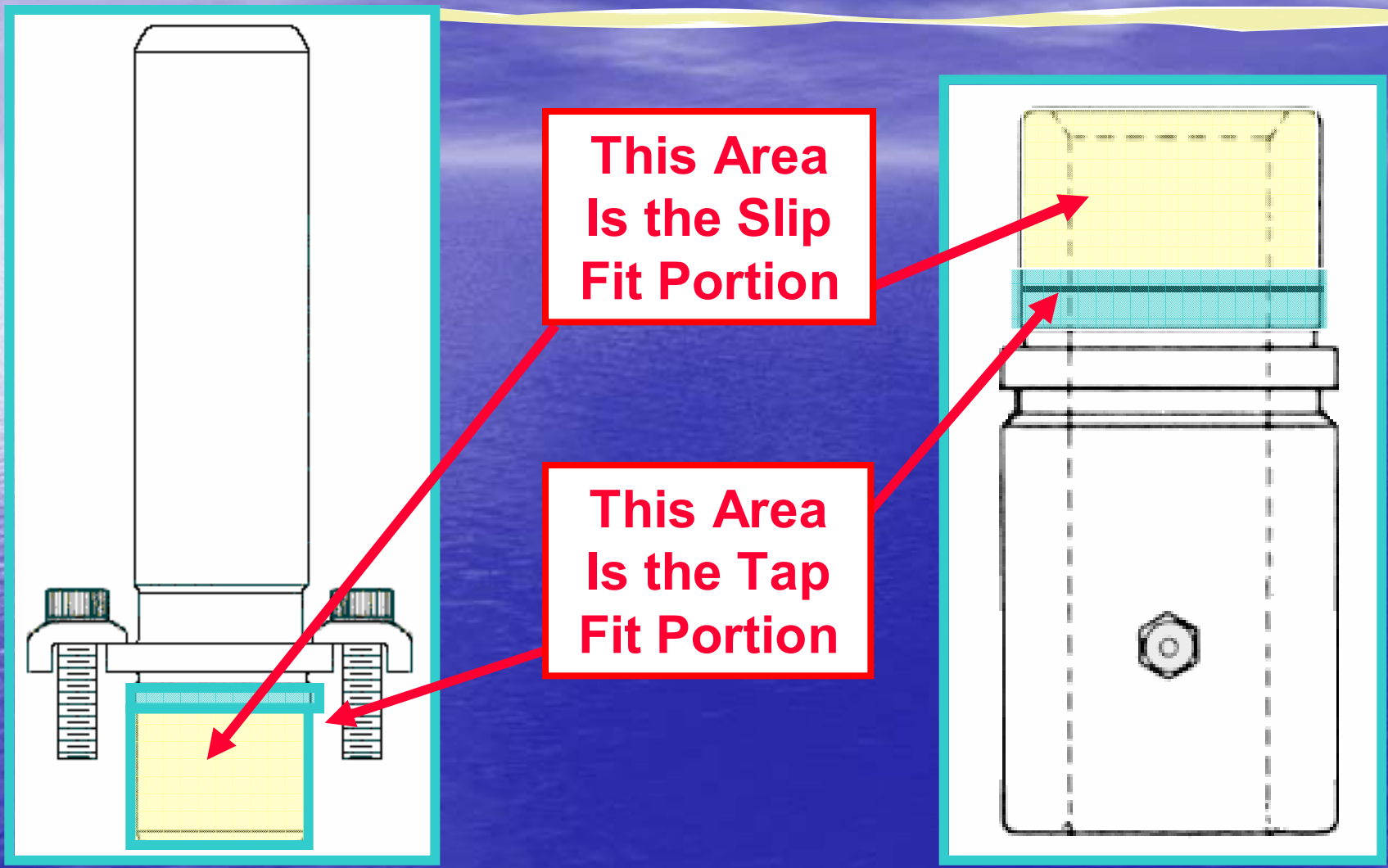
# Demountable Examples



-64, -63, -56  
-28, -24, -23, -27  
-48,  
-85  
GS-, GD-



# Examples of Slip Fit & Press Fit



# **Bushing Materials**

**Steel, Bronze, Bronze plated, Graphite**

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- **Steel**
  - **Less expensive**
- **Bronze or bronze plated**
  - **Offer superior resistance to seizure, the major cause of bushing wear**
  - **High speed applications**
  - **High side thrust load applications**
  - **More expensive**

# **Bushing Materials**

**Steel, Bronze, Bronze plated, Self lubricating**

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- **Graphite Plug**

**(Contain graphite plugs impregnated with oil)**

- **At 80-90°F (result of friction), oil is drawn from the plug lubricating the wear surface.**
- **A dark smear pattern is created on the wear surface as the oil and graphite are imbedded into the bronze or steel grain. This provides the lubrication necessary for continuous performance of the tool.**
- **Only break-in oil necessary**



# **Demountable bushing options**

**Standard shoulder, short shoulder,  
extra-long shoulder & low profile**

- **Standard, short & extra long shoulder**
  - **Varying amount of bushing projection below the punch holder**
- **Low profile**
  - **The main body of the bushing is contained within the punch holder**
  - **Ideal for dies running in transfer presses**
  - **Bushings do not need removed during grinding**

# Types of Guide Post

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- **Chrome plated press fit**
- **Shoulder**
- **Removable**
- **Press fit**
- **Demountable**

# Guide Post Material

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- **Commercial-Standard Steel**
  - High quality hardened steel finish ground for high precision finish
  - Lower cost
- **Precision-Microme (Hard chrome plating)**
  - Provides an exceptionally smooth, hard-wearing surface thus reducing friction between the post and bearing
  - Will greatly improve the accuracy and working life of die sets
  - Additional corrosion resistance
  - Higher cost

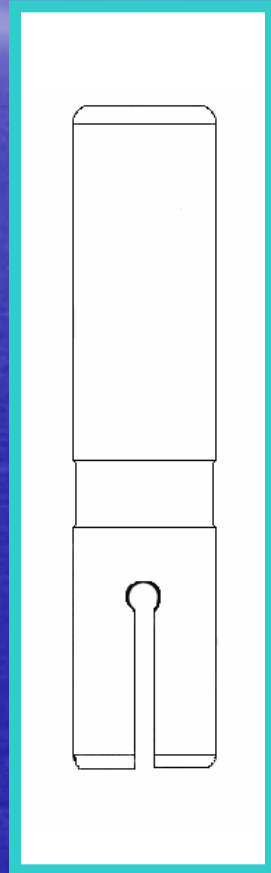
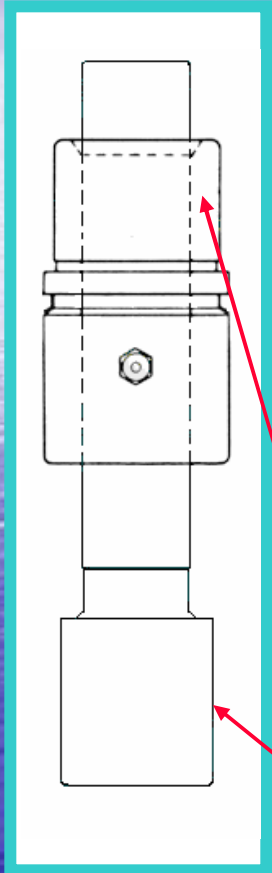


# Standard Alternatives

## Removable posts & oversize shoulder components

- **Removable posts**
  - Held in place with a taper pin
- **Oversize shoulder posts & bushings**
  - Used for repairing die sets
  - **.0075" stock on the press fit for grinding to fit**
  - **The same hole may be bored through the punch and die holder**

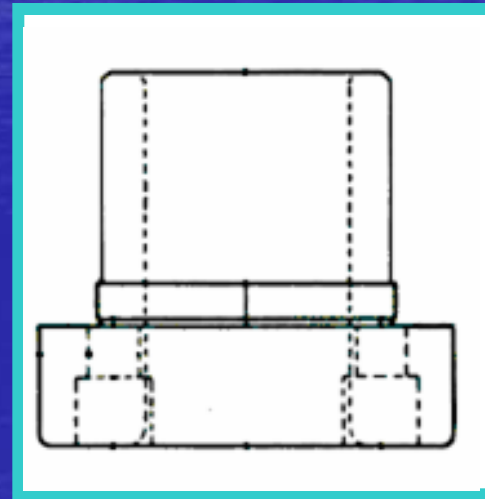
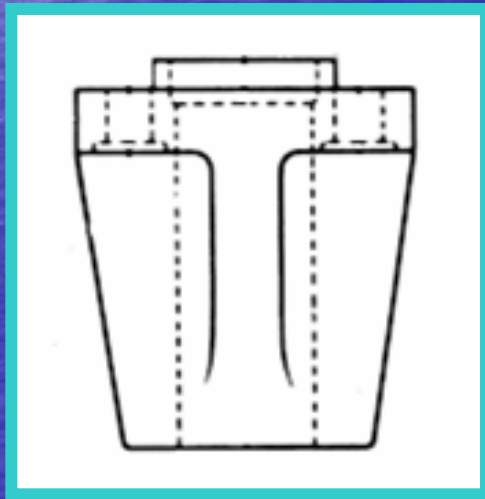
**Same diameters**



# Standard Alternatives

## Bosses

- Available for 2", 2 1/2" & 3" posts
- Made for thin die sets
  - The boss provides the support instead of the die set
- Can be used as a pin support or as a bushing



# **Product Features**

## **Guide Posts**

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- **Manufactured from high quality hardened steel**
  - **58 to 62RC**
- **Finish ground for a high precision finish (better than 18 micron surface finish)**
- **Demountable posts include clamps & screws**
- **All demountable posts have slip fit & tap fit for optimal alignment & ease of assembly**



# Product Features

## Bushings

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- **All demountable bushings are pre-fitted**
  - **Pre-fitted to mating posts to ensure bushings & posts of the same diameter are completely interchangeable**
- **All bushings are equipped with figure 8 oil grooves & lubrication fittings**
- **Demountable bushings include clamps & screws**
- **All demountable bushings have slip fit and tap fit for optimal alignment & ease of assembly**

# **Product Features**

## **Ball Bearing Cages**

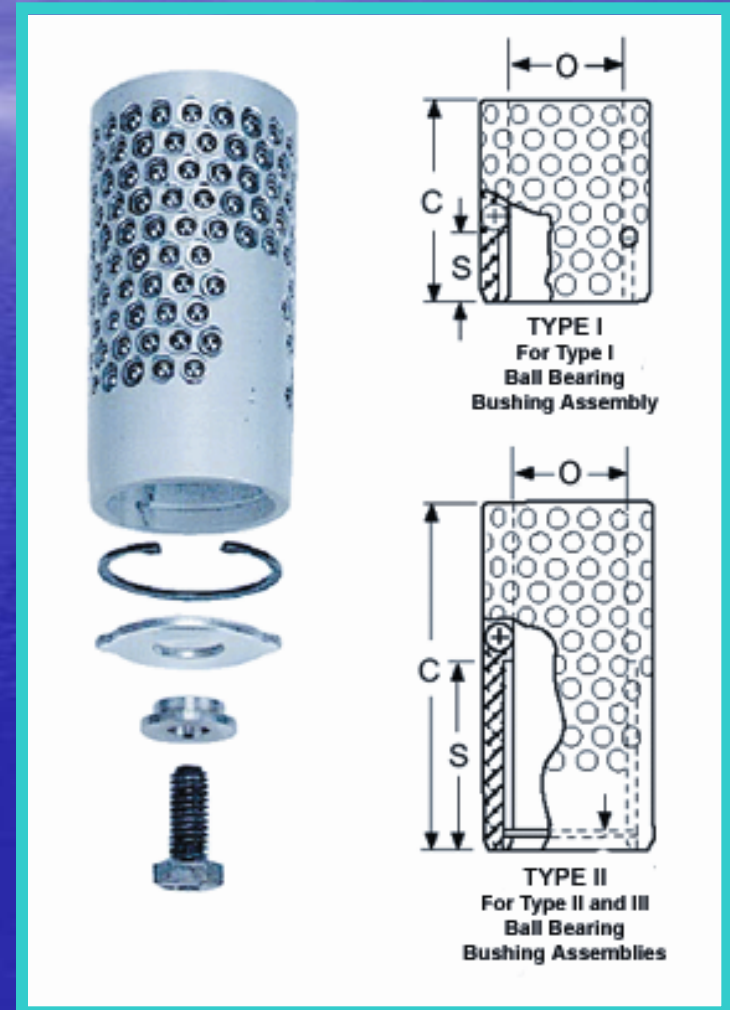
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- **Ball cages**
  - **Heat treated aluminum alloy**
    - **Tough & wear resistant**
    - **Smooth burr free finish**
  - **Balls arranged in a spiral pattern**
    - **Minimizes tracking**
    - **Assures uniform wear**
  - **Balls spun 360° into place for max. holding power; superior to the competition**

# Product Features

## Ball Bearing Systems

- Cages mounted to drilled & tapped posts by a special washer assembly.
  - Cage rotates freely when not under pre-load
  - Type I design different than type II and III.





# Market

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- **Selected when designing your die set**
- **Replacement parts is a large market**
- **Custom applications**

# Summary

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- **Complete product line**
  - **Metric & Imperial**
    - **Include NAAMS, GM Ford & Chrysler standard components**
    - **1/2" to 3" post diameters & respective plain bushings**
    - **1" to 3" post diameters & respective ball bearing bushings**
    - **18mm to 125mm post diameters & respective plain bushings**
    - **25mm to 80mm post diameters & respective ball bearing bushings**

# Summary

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- **Complete product line**
  - **Many designs and material options to choose from**
  - **Product availability**
    - **Vast distribution network**
    - **Large inventory**
    - **Short manufacturing lead times**