

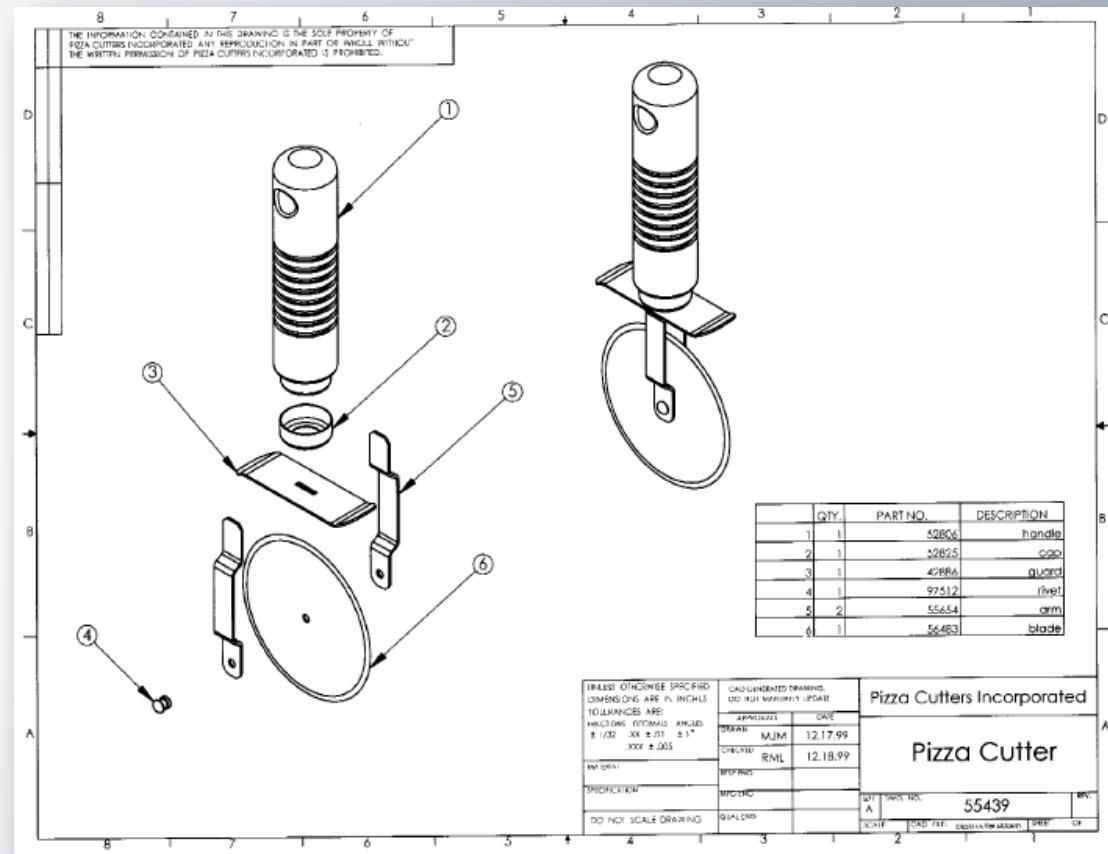
Computer-Aided Design

Assembly Drawing |

INTRODUCTION

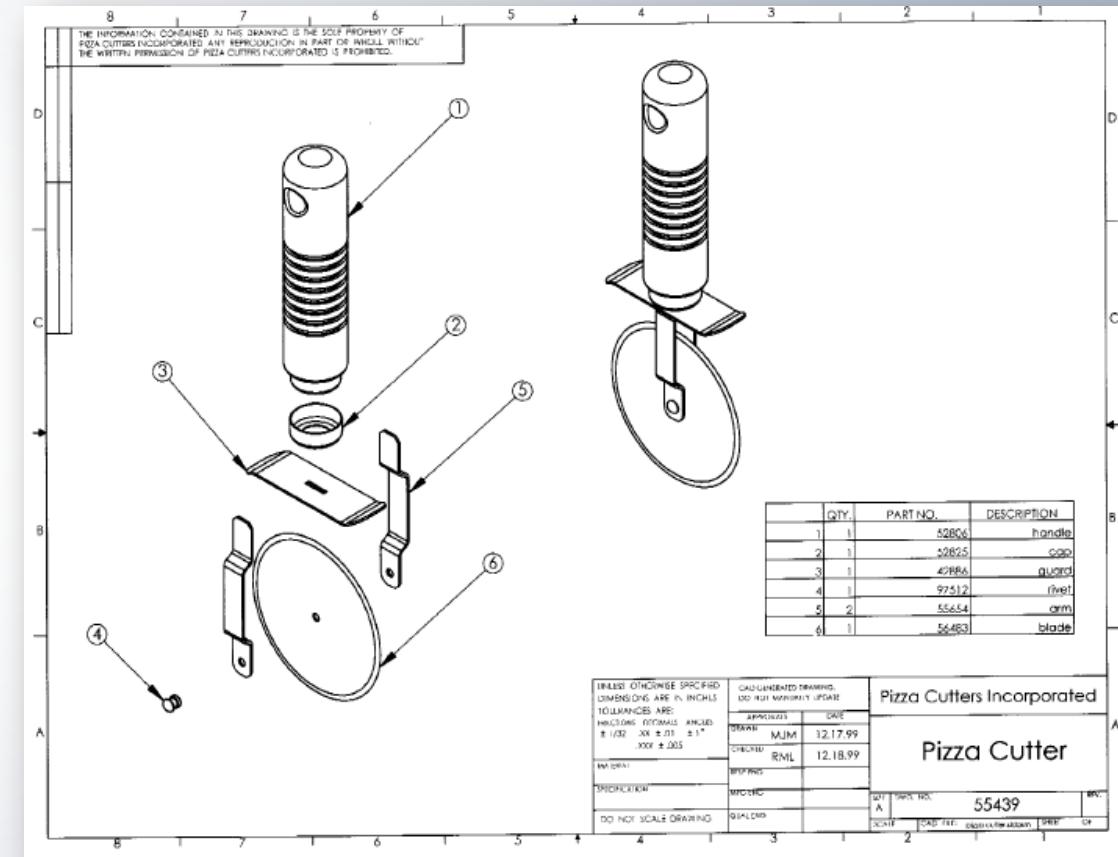
➤ Used for:

- Shows how the **components** of a design **fit together**
- Used in the description of the **assembly order**
- To represent the **working relationships** of the mating parts of a machine or structure and the function of each.
- To give a general idea of **how the finished product should look**.
- Other illustrative purposes (**catalog**, **maintenance manual** etc.)



INTRODUCTION

- **Details are omitted** for clarity
- **Includes secondary views** to explain the assembled device completely (sectional views are commonly used)
- Usually scaled to 1:1
- It is not dimensioned unless necessary (only center distances, overall dimensions etc.).
- Parts list: Bill of materials (BOM) must be included



INTRODUCTION

- Information required in the drawing:
 1. Assembly and disassembly of the part
 2. Possibility to draw manufacturing drawings
 3. The shapes and numbers of the parts
 4. The role of machine
 5. Parts that works together

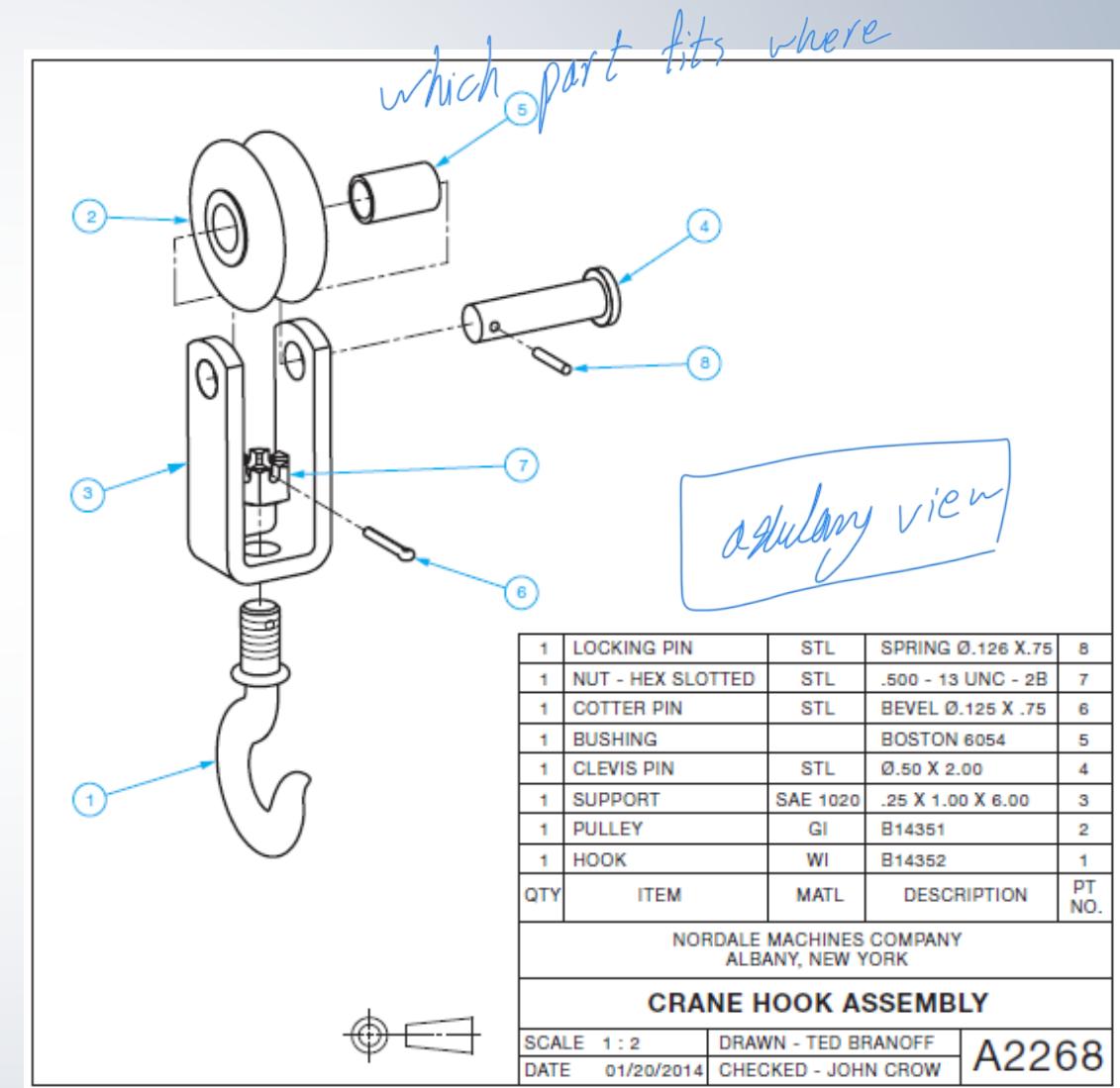
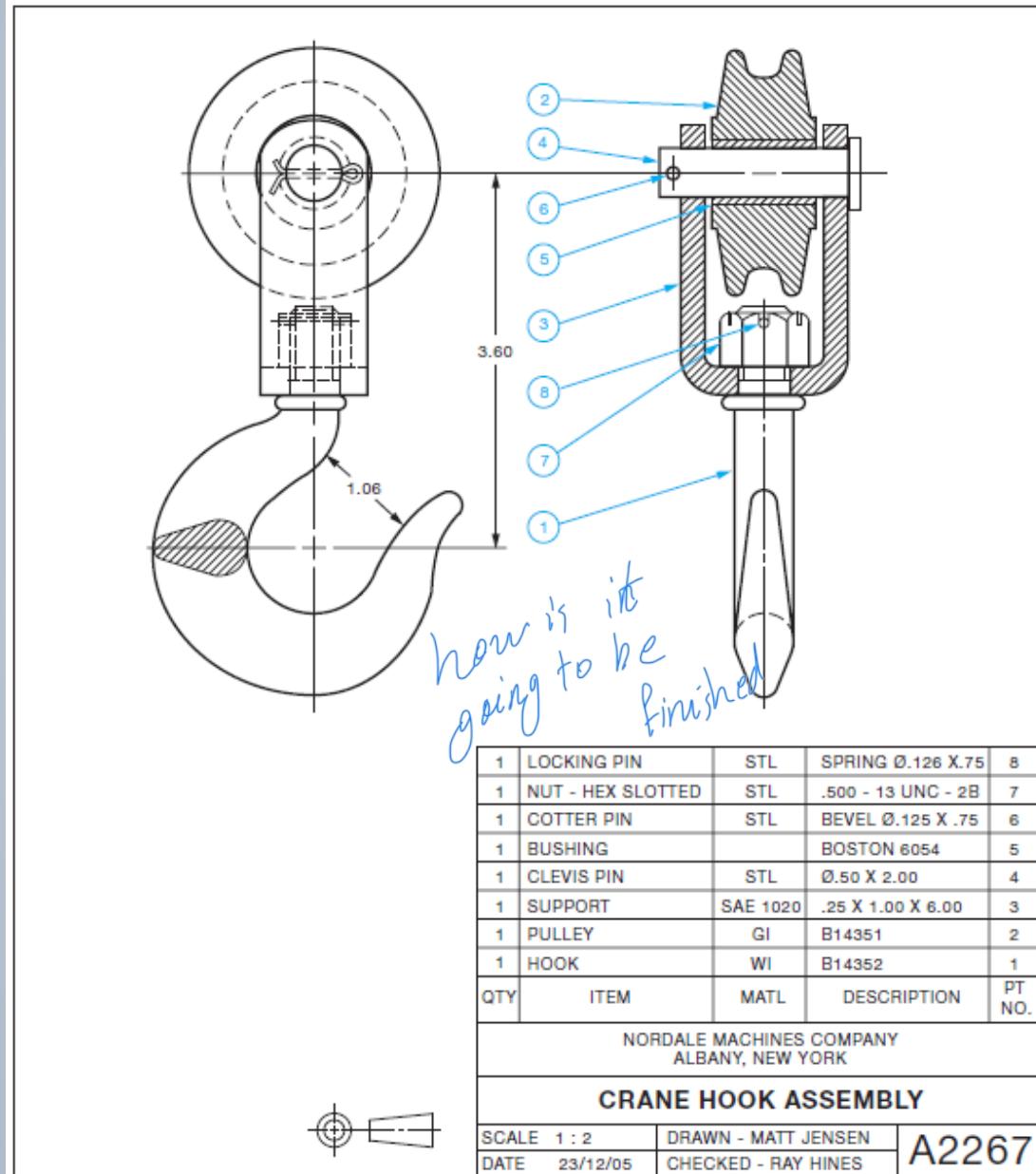
BILL OF MATERIALS

*what you have → what you need
what you need to buy*

4	NUT-HEX REG	STL	.375-16 UNC	7
4	BOLT-HEX REG	STL	.375-16 UNC X 1.50	6
1	KEY	MS	WOODRUFF 608	5
2	BEARINGS	SKF	RADIAL BALL 620	4
1	SHAFT	CRS	Ø1.00 X 6.50 LG	3
1	SUPPORT	MST	.375 X 2.00 X 5.50	2
1	BASE	GI	PATTERN - A3154	1
QTY	ITEM	MATL	DESCRIPTION	PT No.

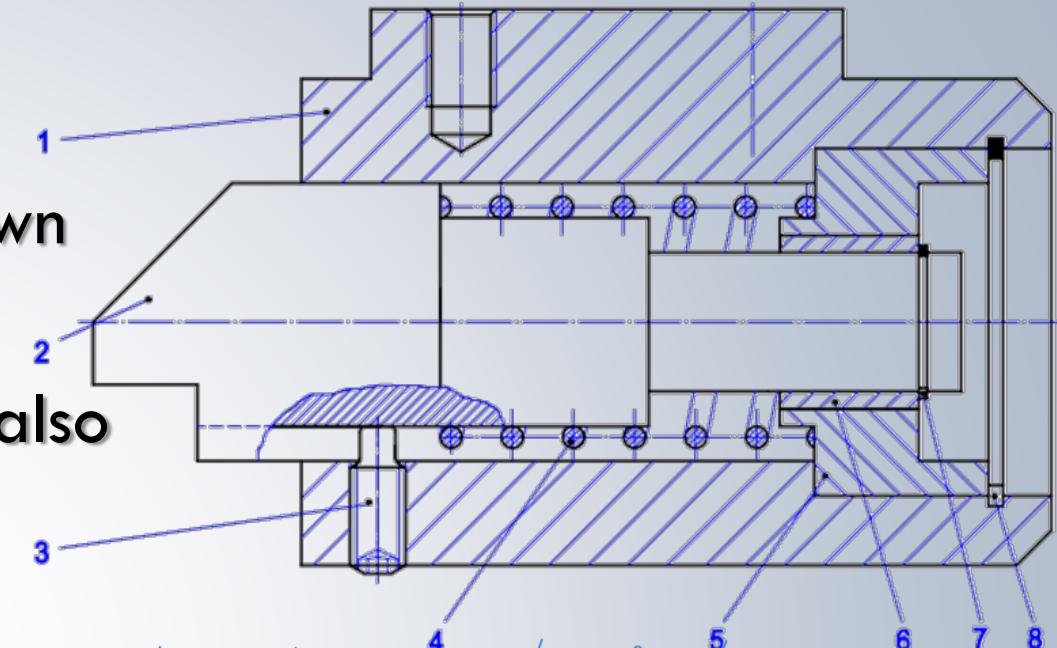
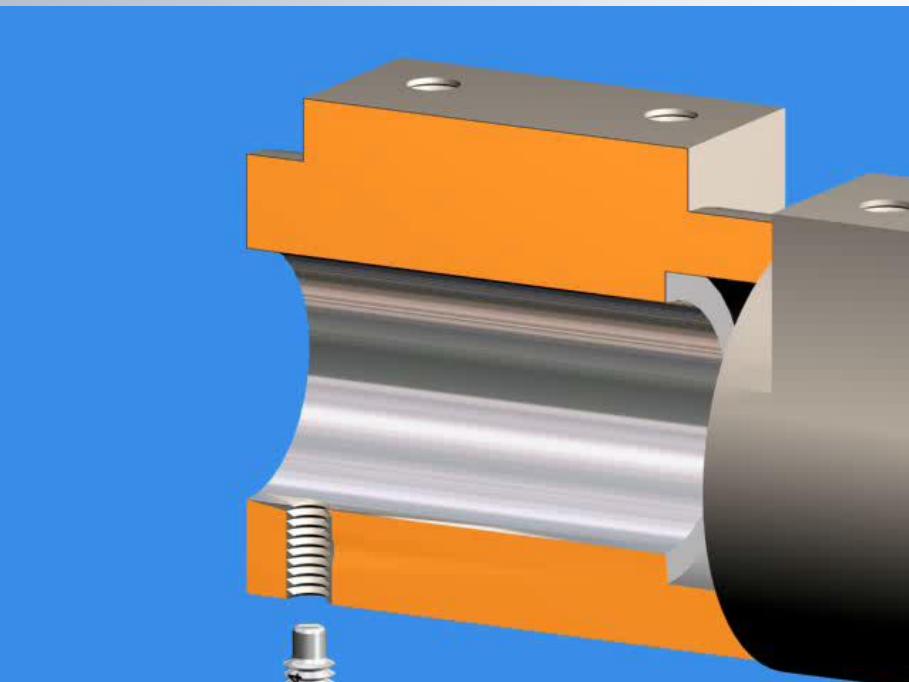
7	4	REG HEX HD NUT - .375-16UNC	P5513	STL
6	4	REG HEX HD BOLT - .375-16UNC X 1.50	P3598	STL
5	1	#608 WOODRUFF KEY	P6605	MS
4	2	BEARINGS - RADIAL BALL 620	P8598	SKF
3	1	SHAFT - Ø1.00 X 6.50 LG	A2743	CRS
2	1	SUPPORT - .375 X 2.00 X 5.50	A3267	MST
1	1	BASE	A3154	GI
ITEM	QTY	DESCRIPTION	PART NO.	MATL

NORMAL VS EXPLODED ASSEMBLY DRAWING



NUMBERING OF ASSEMBLY DRAWINGS

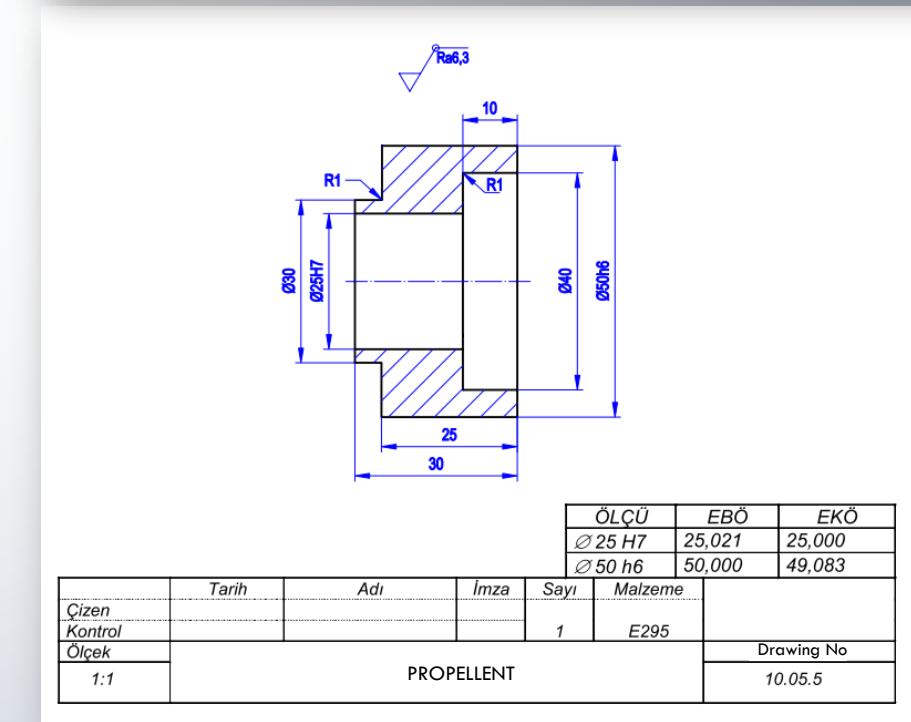
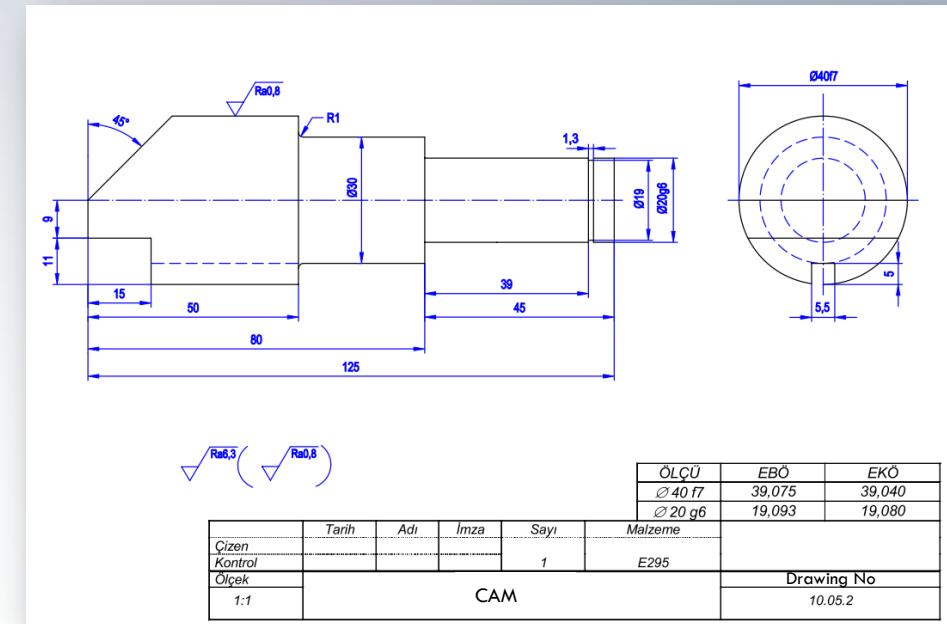
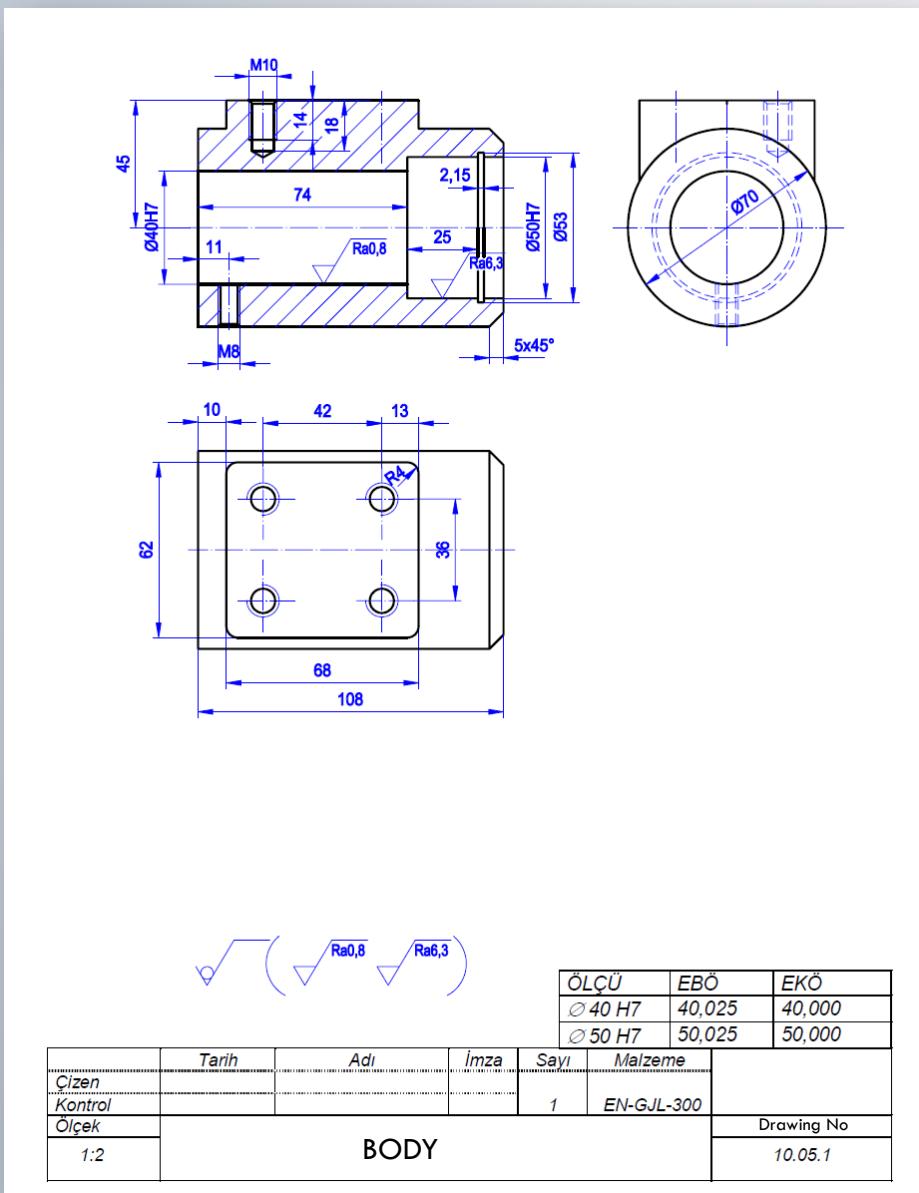
1. It is organized according to the institutions' own systems.
2. Master number is given and, the groups are also numbered, if any.
3. Each part is separately numbered.



if the part is standard we only give dimension & code

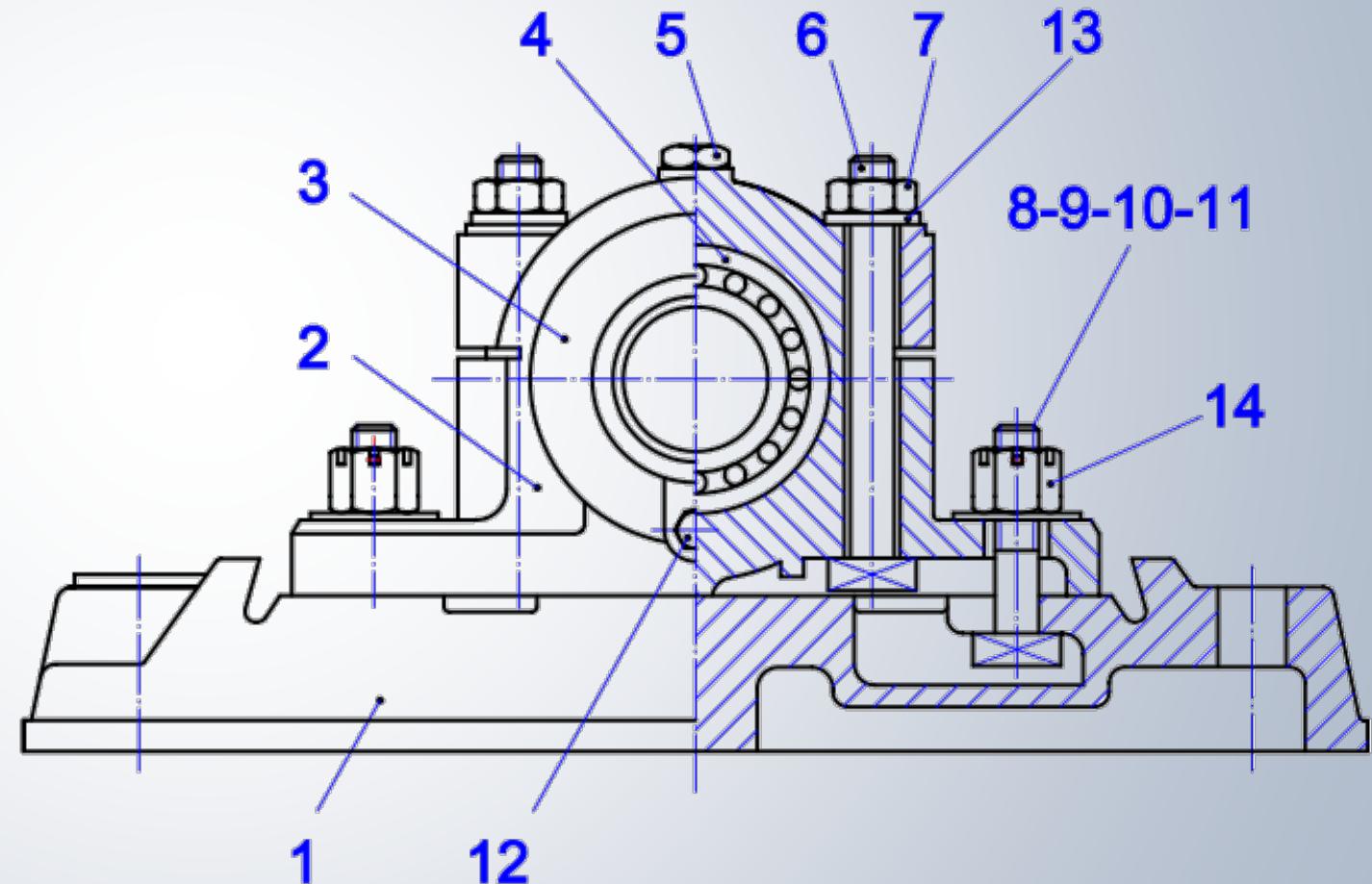
1	Snap ring	50x2	DIN 471	8			
1	Snap ring	20x1,2	DIN 471	7			
1	Bush		DIN 1850	6			
1	Propellent			5	10.05.5	E295	
1	Pressure spring		TS 1444/2	4			
1	Screw pin M8x20		TS 1024/9	3			
1	Cam			2	10.05.2	E295	
1	Body			1	10.05.1	EN-GJL-300	
Qty.	Part name	Standard no		Assem. no	Drawing no	Material	Explanations
	Name	Date	Signature				
Drawn							
Checked							
Scale							
1:1				LOCK			
							Drawing no
							10.05.0

NUMBERING OF ASSEMBLY DRAWINGS~ TECHNICAL DRAWINGS OF PARTS



ASSEMBLY EXAMPLE~ BALL BEARING ASSEMBLY

1. Bearing
2. Lower lid
3. Upper lid
4. Ball bearing
5. Lubricating point
6. Fastening screw
7. Hexagonal nut
- 8-11. Bearing fixing bolts
12. Oil draining plug
13. Washers
14. Crown Head Hexagonal Nut

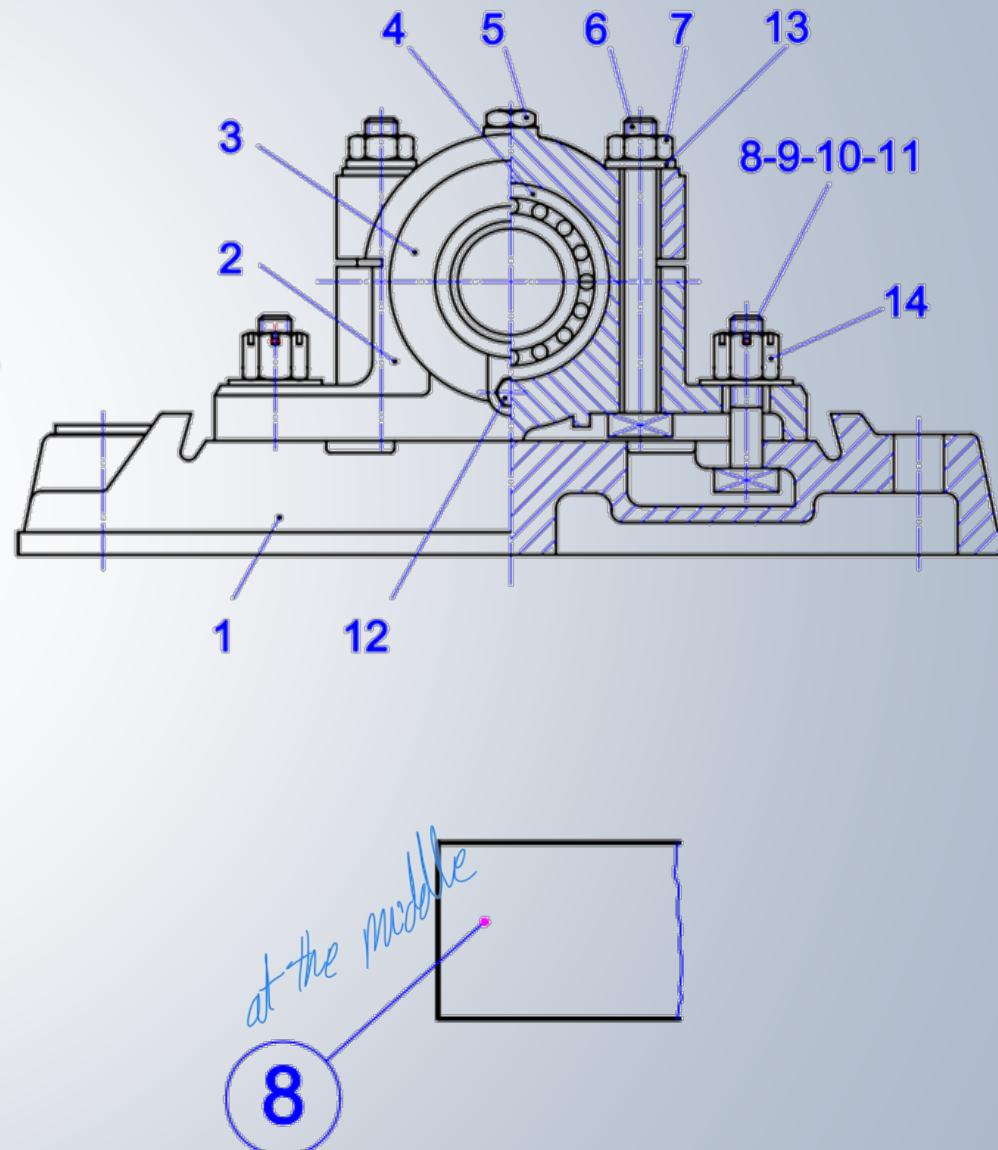


NUMBERING OF ASSEMBLY DRAWINGS

- Standard parts are given only the assembly number (Their technical drawings are not drawn).
- Same parts are assigned the same assembly number.
- If the same parts are made of different materials, a different number is given.
- Numbers' font, size and distance between them must comply with the standards.
- The text height should be the same for the part numbers, and it should be distinguishable from other texts.

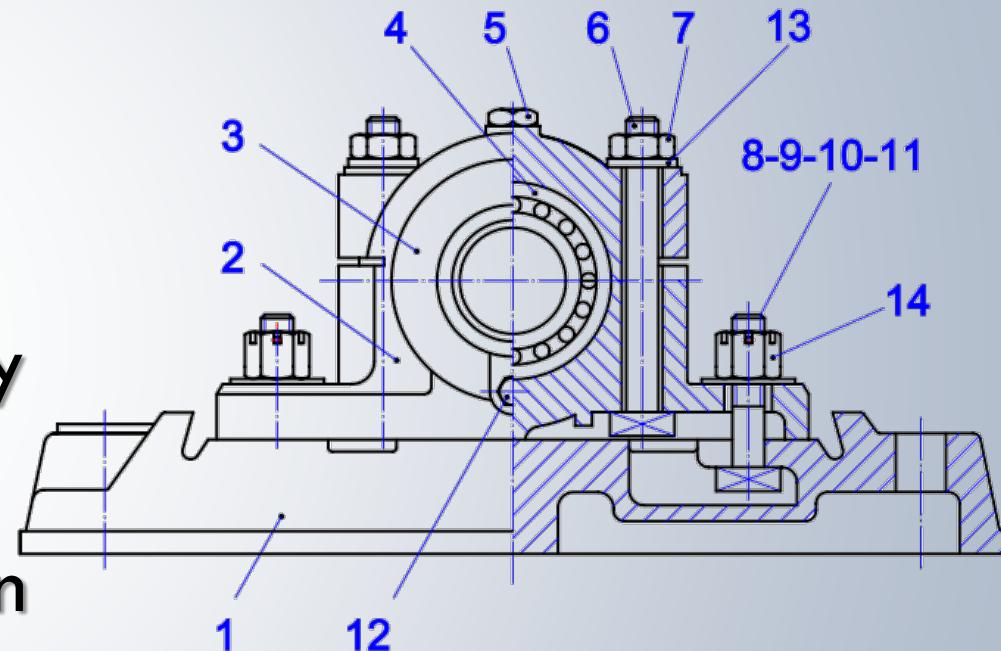
NUMBERING OF ASSEMBLY DRAWINGS

- Use large text heights for numbers and/or balloon.
- If balloon method is used, the leader line must point towards the center of the balloon.
- Part numbers must be written outside the drawing, and each part number must be combined with the relevant part with a leader line.
- Leader lines should not cross each other.



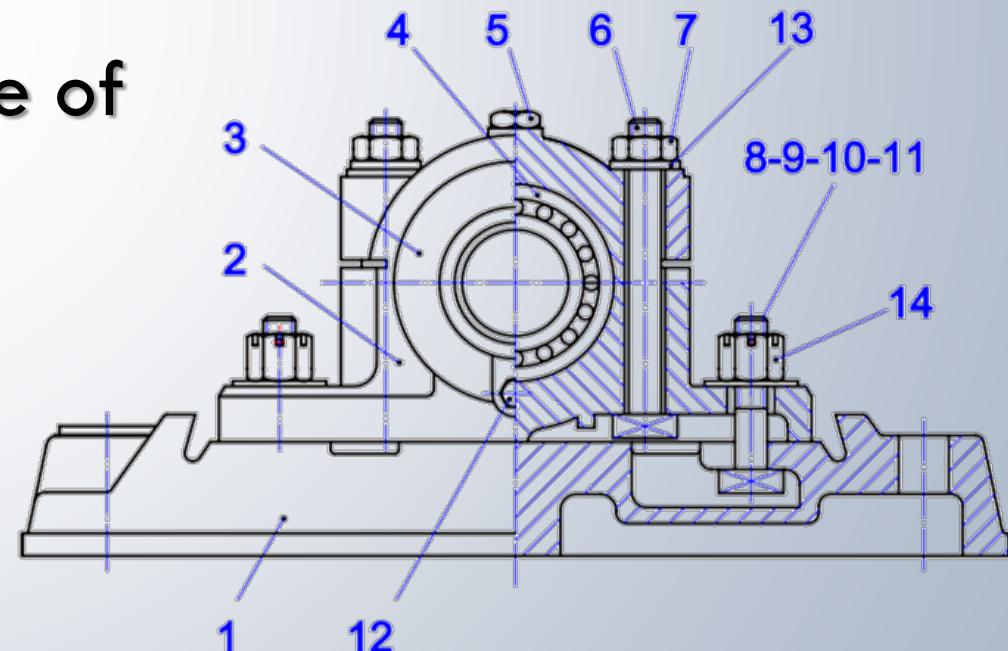
NUMBERING OF ASSEMBLY DRAWINGS

- The leader lines should be as short as possible and drawn at an angle from the part number.
- To make the drawing clear and legible, part numbers should be arranged primarily in vertical and/or horizontal lines.
- The part numbers of the related parts can be shown with the same leader line.



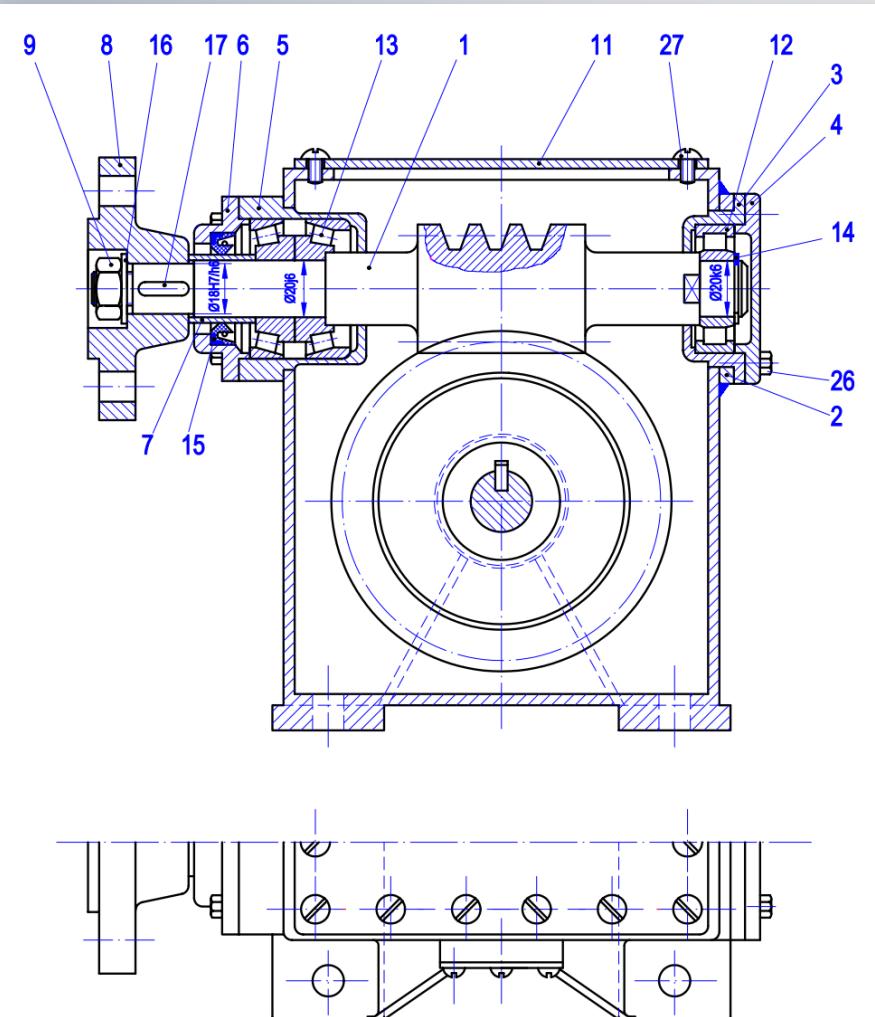
NUMBERING OF ASSEMBLY DRAWINGS

- To avoid confusion, the part numbers of the same parts should be shown only once.
- For clear and understandable numbering
 - According to the possible assembly order in the whole
 - According to the order of importance of the parts
 - It should be done based on an appropriate logic.

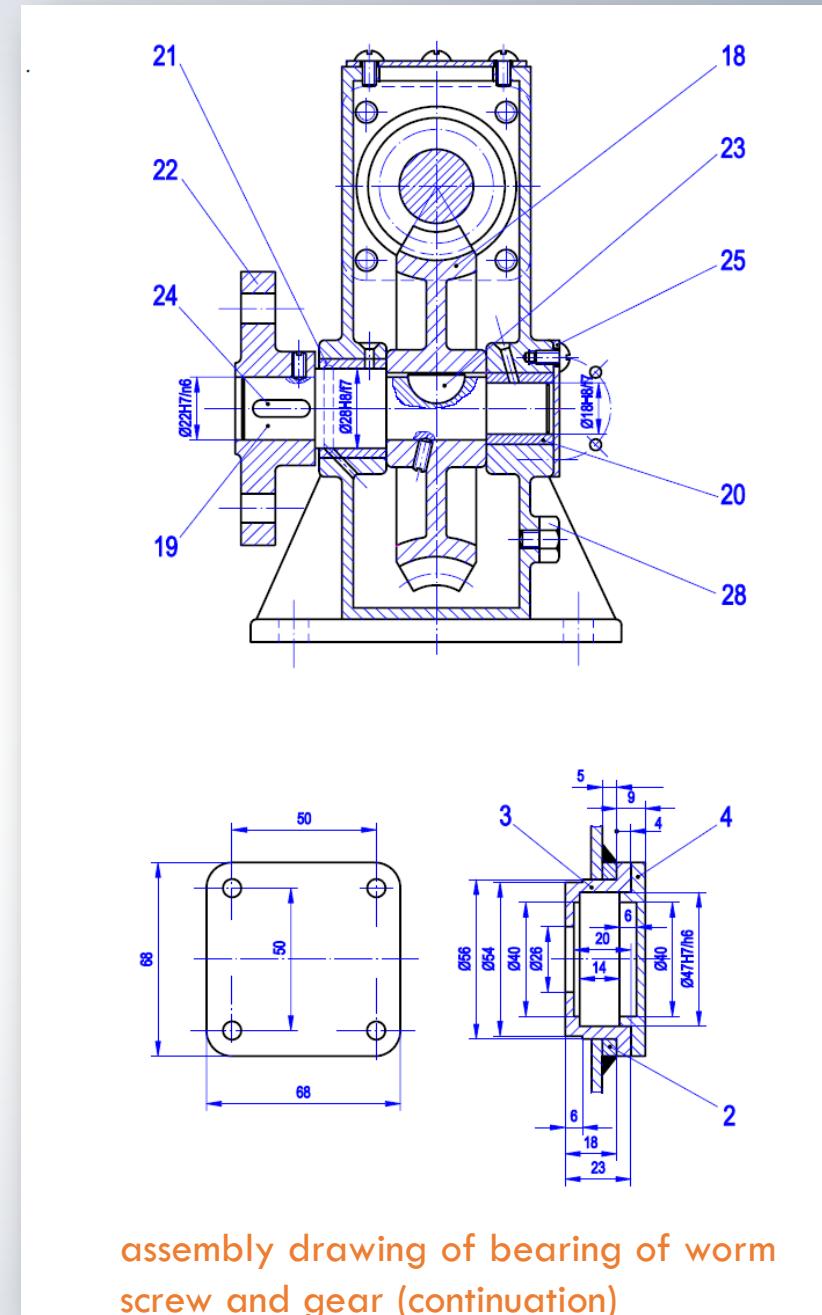


EXAMPLE

alignment not mandatory



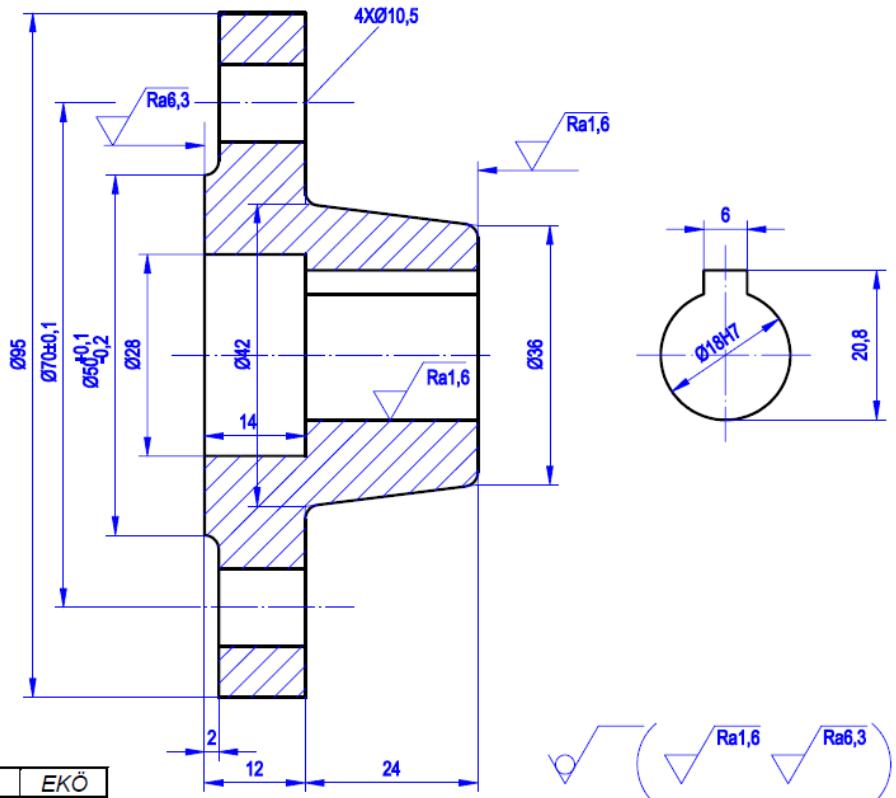
assembly drawing of bearing of worm screw and gear



assembly drawing of bearing of worm screw and gear (continuation)

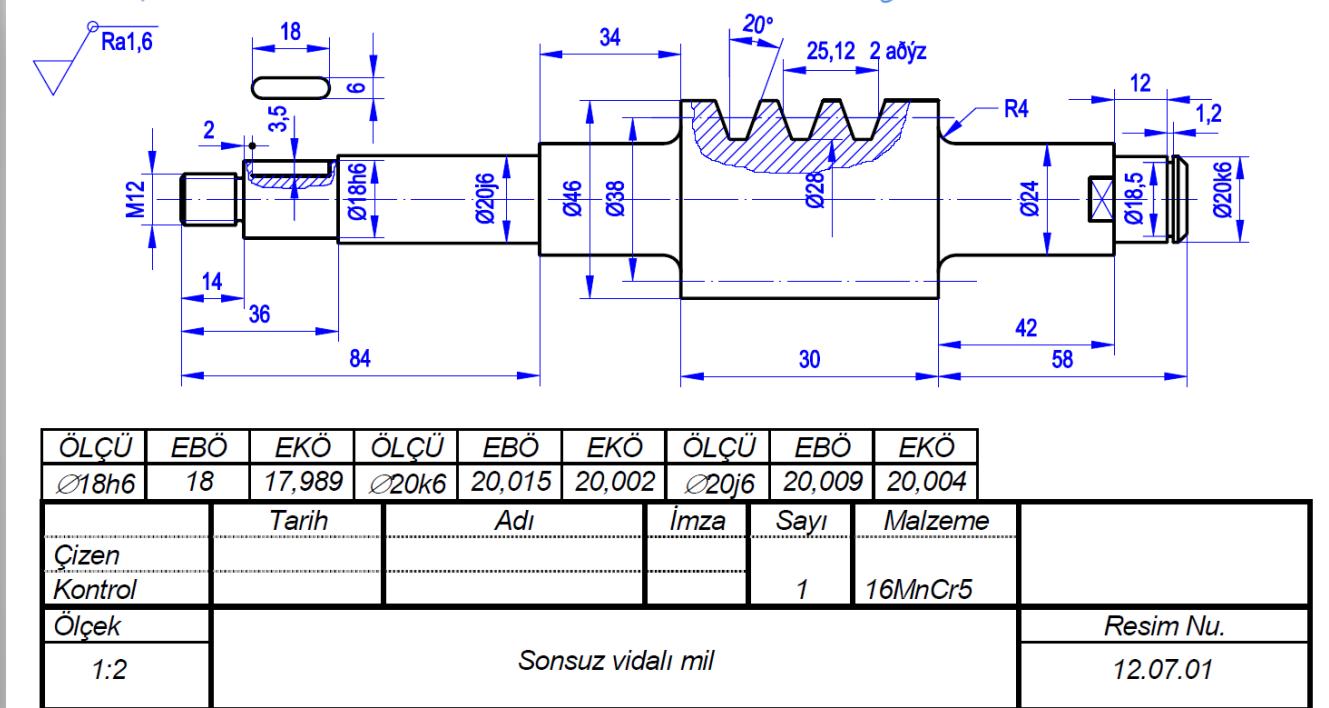
CONT.

Detailed information is given on detail drawings of the parts



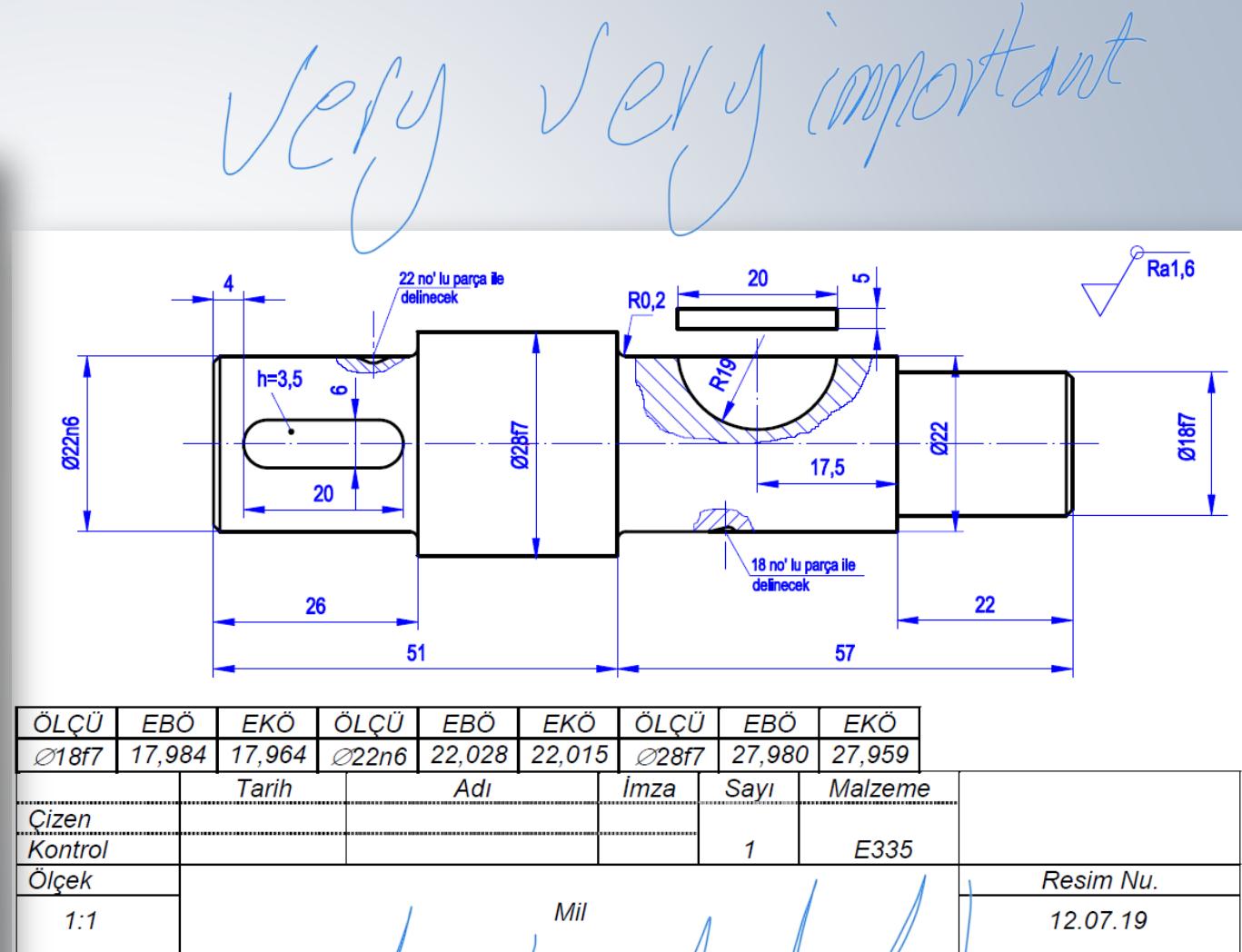
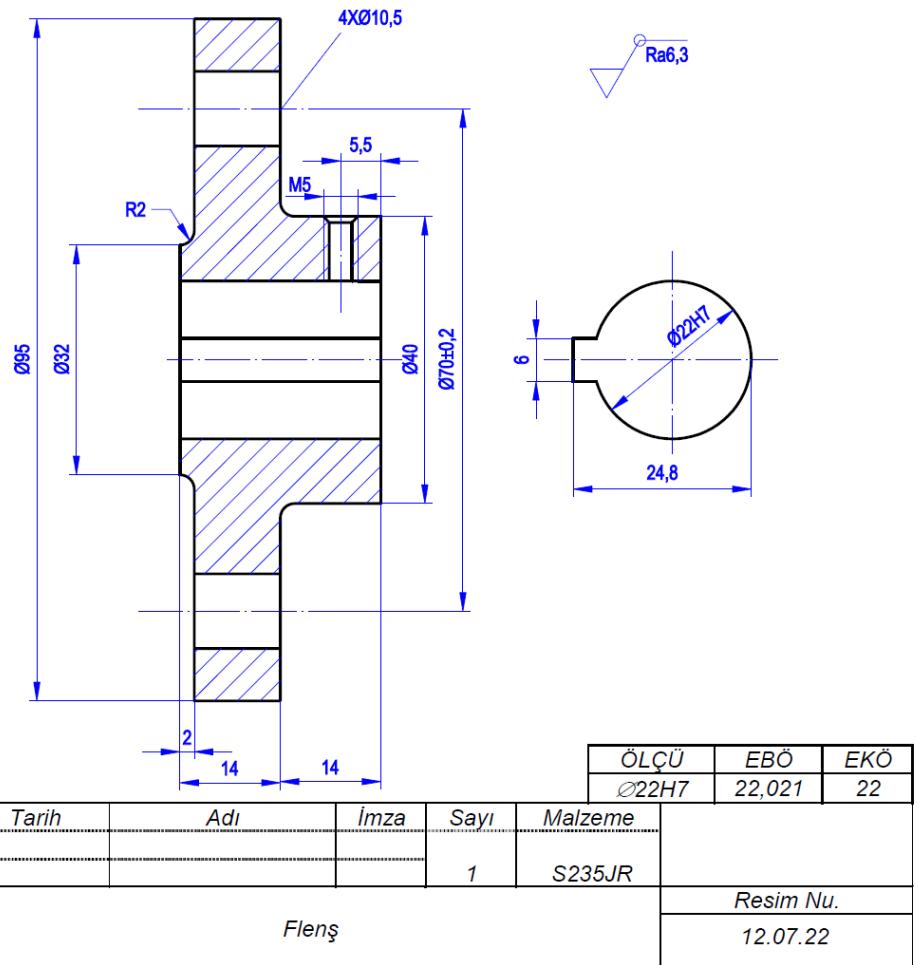
ÖLÇÜ	EBÖ	EKO					
Ø18H7	18,018	18					
			12	24			
Cizen Kontrol		Tarih	Adı	İmza	Sayı	Malzeme	
Ölçek					1	EN-GJL-300	
1:1		DİSK					Resim Nu. 12.07.08

Not all dimensions
because we only need to find fitting parameters

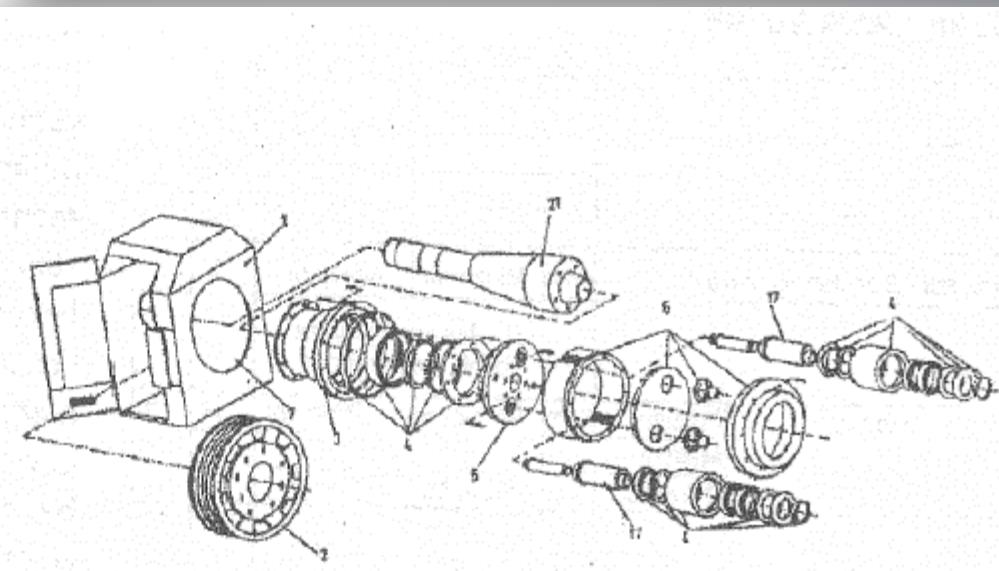
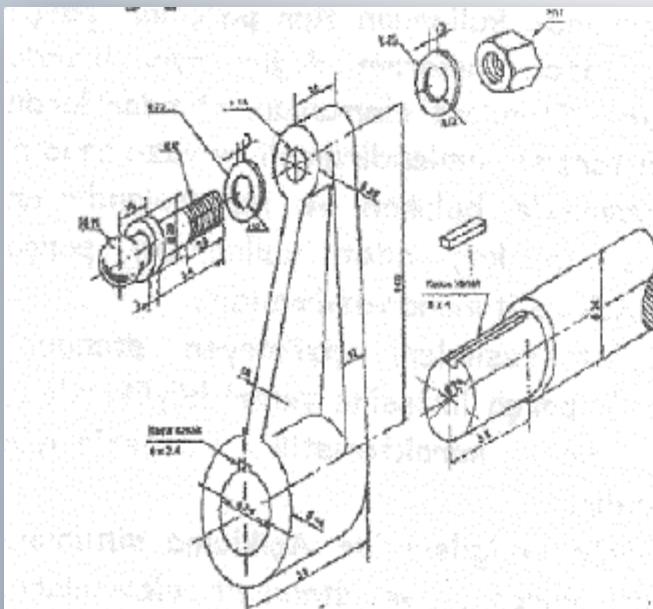
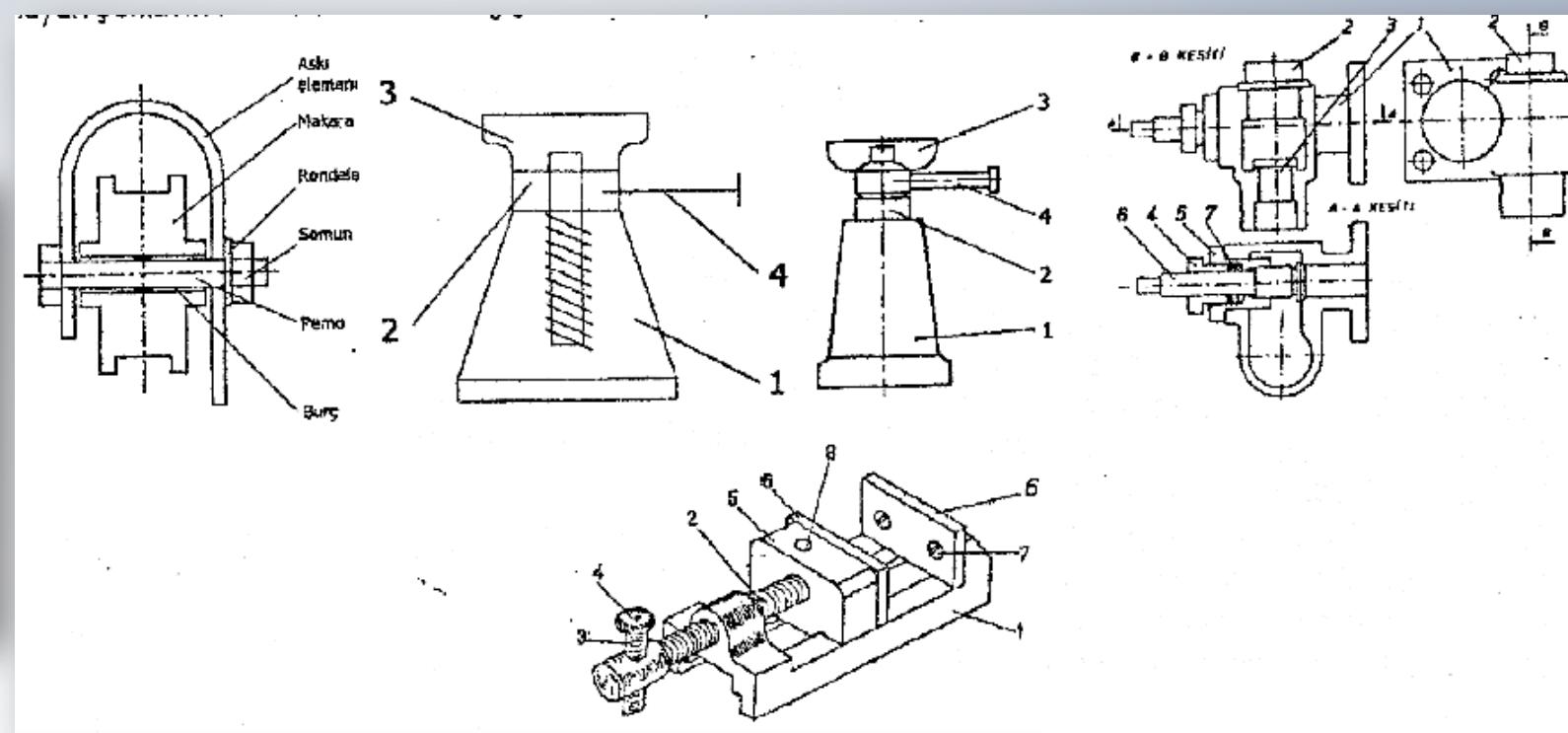
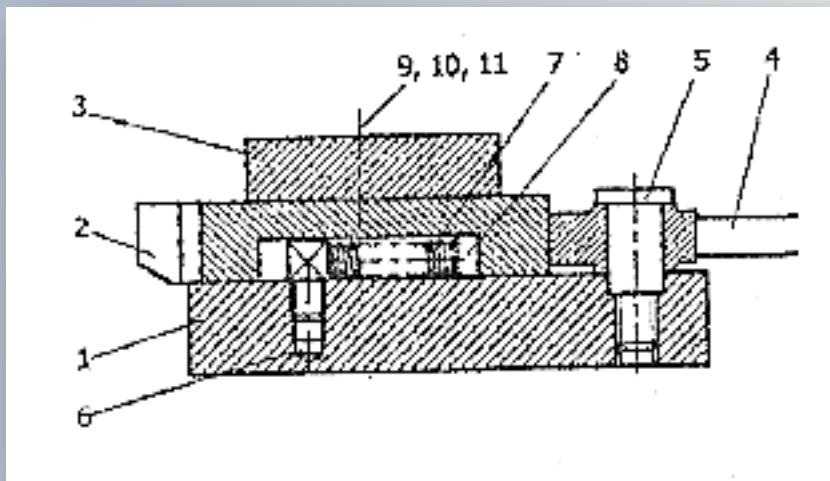


CONT.

Detailed information is given on detail drawings of the parts



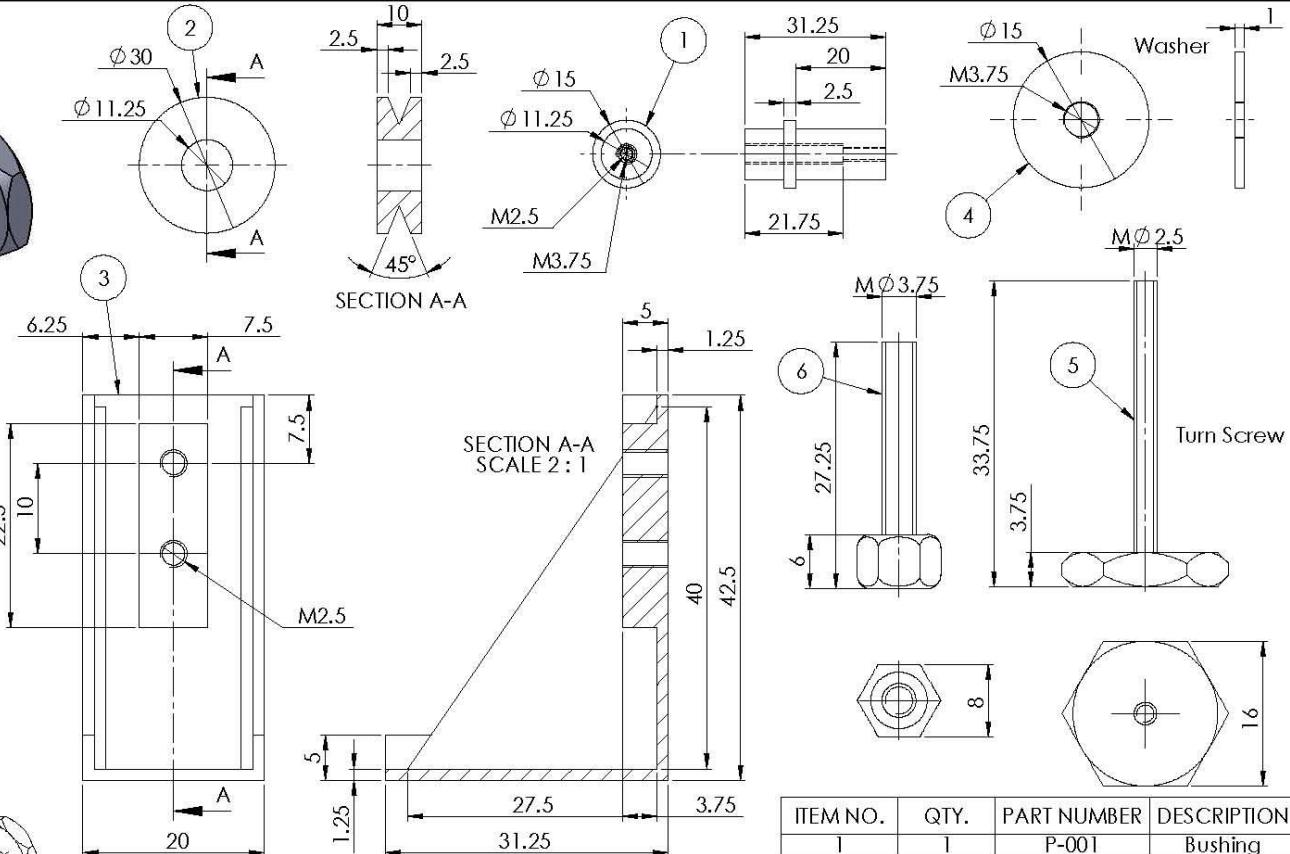
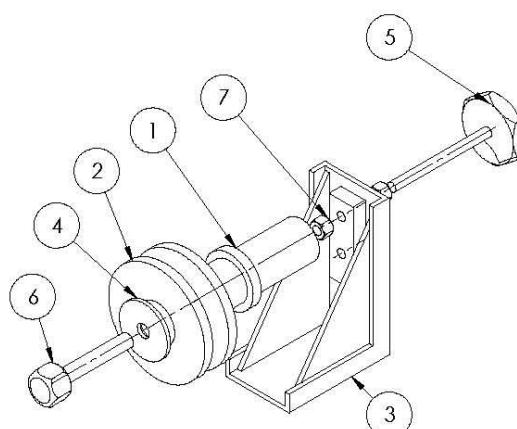
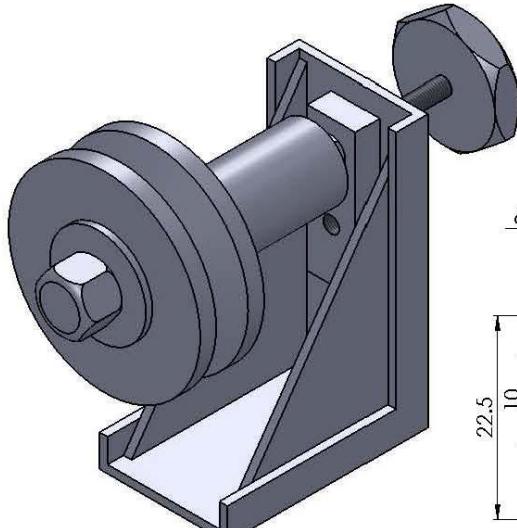
EXAMPLES



[Click for more examples](#)

EXAMPLE

Pulley Support



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOP SURFACES: LINEAR: ANGULAR:			FINISH:	DEBUR AND BREAK SHARP EDGES:	DO NOT SCALE DRAWING	REVISION
NAME	SIGNATURE	DATE				
DRAWN:						
CHKD:						
APPV'D:						
IMG:						
Q.A.			MATERIAL:		DWG NO.:	A3
			WEIGHT:	SCALE 1:1	SHEET 1 OF 1	

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Cebu City, Cebu
Philippines 6000

MATERIAL SELECTION

- The mechanical properties of the selected material are primarily effective in forming the dimensions of its parts.
 - The supply of the material should be taken into consideration while writing the selected material on the TECHNICAL DRAWING.
 - Drawing title blocks should be filled in accordance with EN (EURONORM) standard.)

MİT yapsızına uygun bazi politik malzemeklär								
Malzeme No	EN	TÜ	CEN	SAE	Above Sheet (Sheet#)	Çeviriye Sayı (Reff#)	Çeviriye	Kullanıcılar / Tutar
1. 00006	E904	F9-0-5	98-0-2		206	460	Birinci yelpaz	Orta derecede yatkı istenilen malzemeler, bağlayıcı, makrol, stoper, poliüretan yapsız
1. 00008	E904	F9-0-5	98-0-2	(CEN 17205)	335	680	Güven yelpaz	
1. 00793	E904	F9-0-5	98-0-2	(CEN 17205)	365	680	Birinci yelpaz	
1. 01002	C-950	CX-10	CX-10		1042	490	750	Üçüncü yelpaz
1. 06011	90C400	90C400	90C400		8840	900	1100	Üçüncü yelpaz
1. 08002	90C400B4	90C400B4	90C400B4		8840	1000	1200	Üçüncü yelpaz
1. 08002	90C400B4	90C400B4	90C400B4		8840	1000	1200	Üçüncü yelpaz
1. 7200	34CH404	34CH404	34CH404		4158	800	1000	Üçüncü yelpaz
1. 7202	34CH404	34CH404	34CH404	(CEN 17205)	4158	800	1000	Üçüncü yelpaz
1. 7205	42CH404	42CH404	42CH404	(CEN 17205)	4140	900	1100	Üçüncü yelpaz
1. 7205	51CH404	51CH404	51CH404	(CEN 17205)	5882	780	880	Üçüncü yelpaz
1. 7319	18MnCr5	18MnCr5	18MnCr5	(TÜ 2086)	5115	650	900	Sorunsuzluğunu yelpaz
1. 07028	38Si20	38Si20	38Si20	(DIN 19121)	1140	260	480	Üçüncü yelpaz (İkinci istihdam) Tülin istihdamının yelpaz
1. 4921	40Si20	40Si20	40Si20	(CEN 17465)	420	460	600	Polymerdeki istihdam üçüncü yelpaz

technical drawing
last step

REFERENCES

The content of this presentation has been compiled from the following sources

1. Branoff, T. 2015. Interpreting engineering drawings. Cengage Learning.
2. İTÜ Transport Tekniği Grubu, MAK 105 Makina Tasarımına Giriş, Ders Notları.
3. S. Kurt, İ. Gerdemeli, C. E. İmrak, "Mühendislik Çizimin Esasları", Birsen Yayınevi, İstanbul, 2005.
4. Türkdemir, K. 2008. Teknik Resim I. Denizli: Boy Yayıncıları.