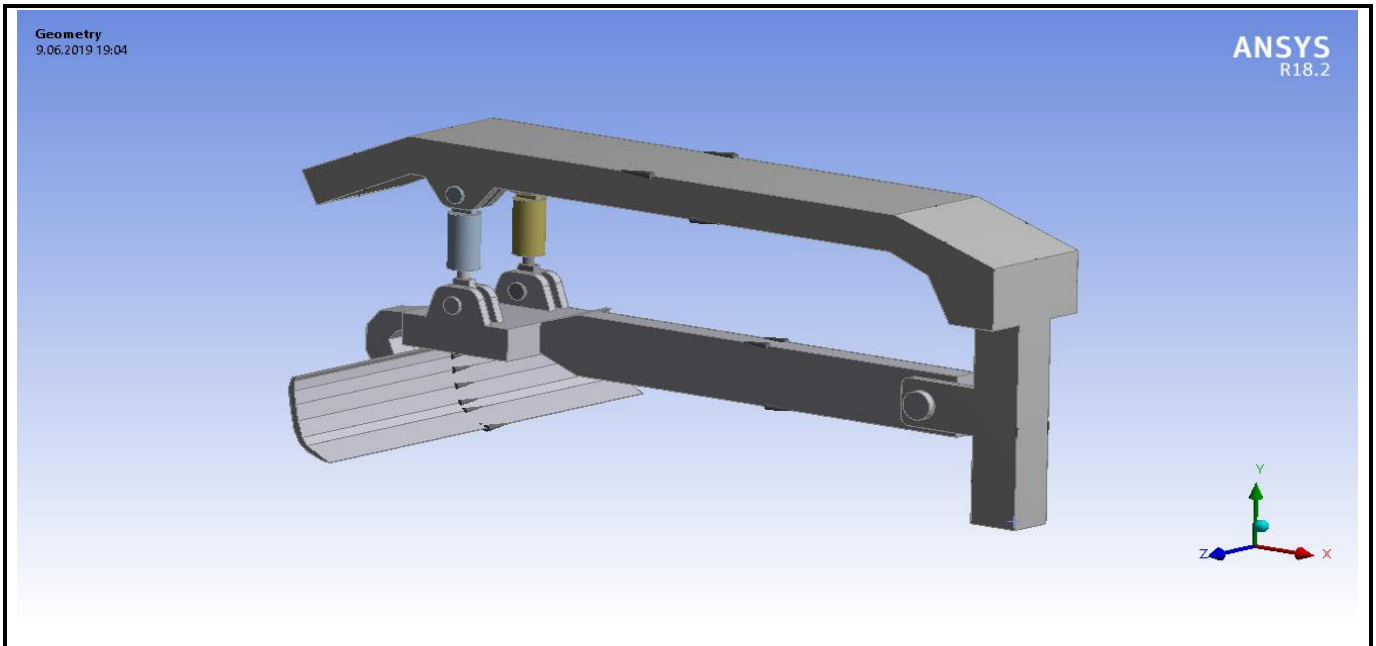
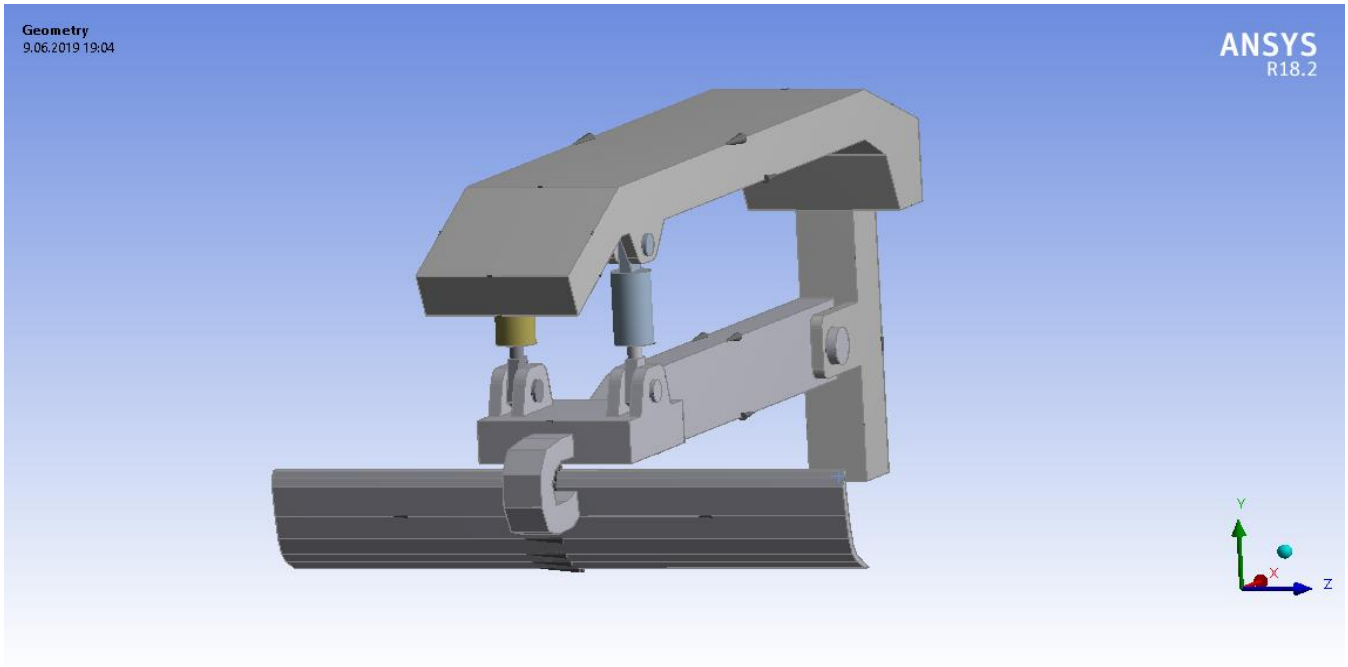
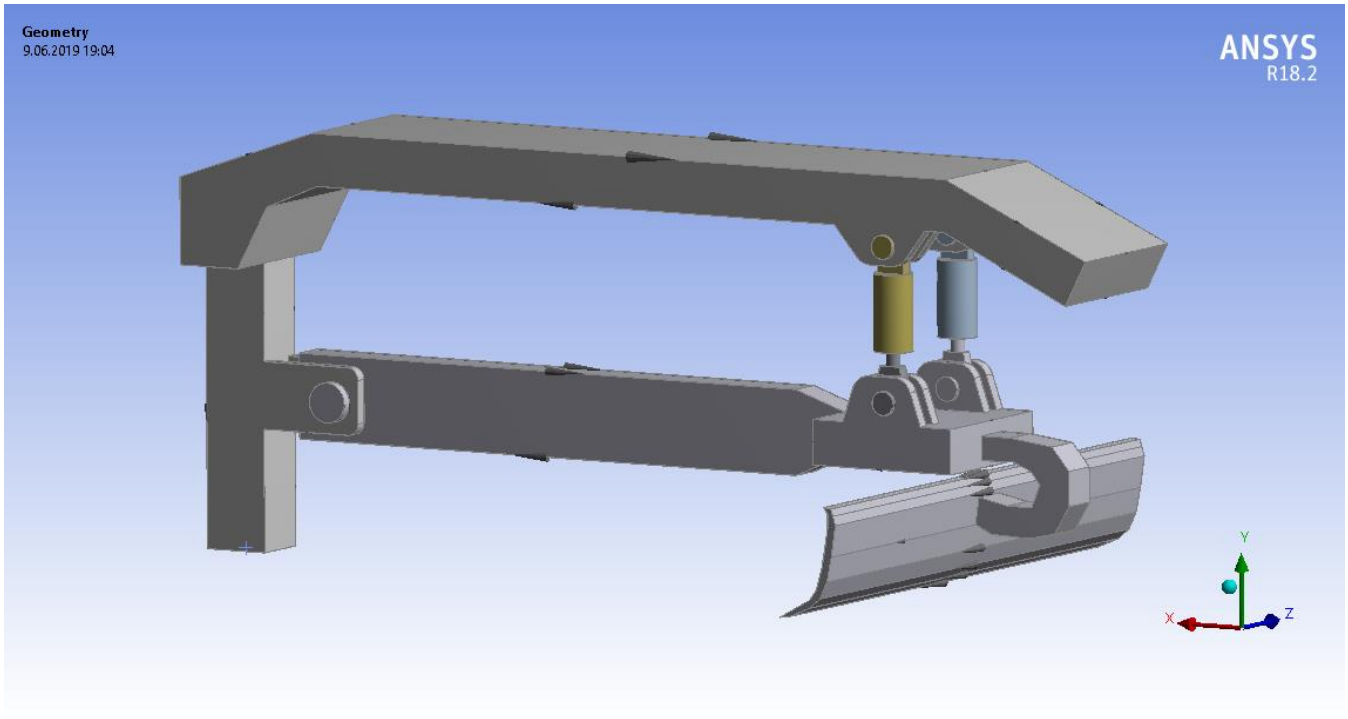
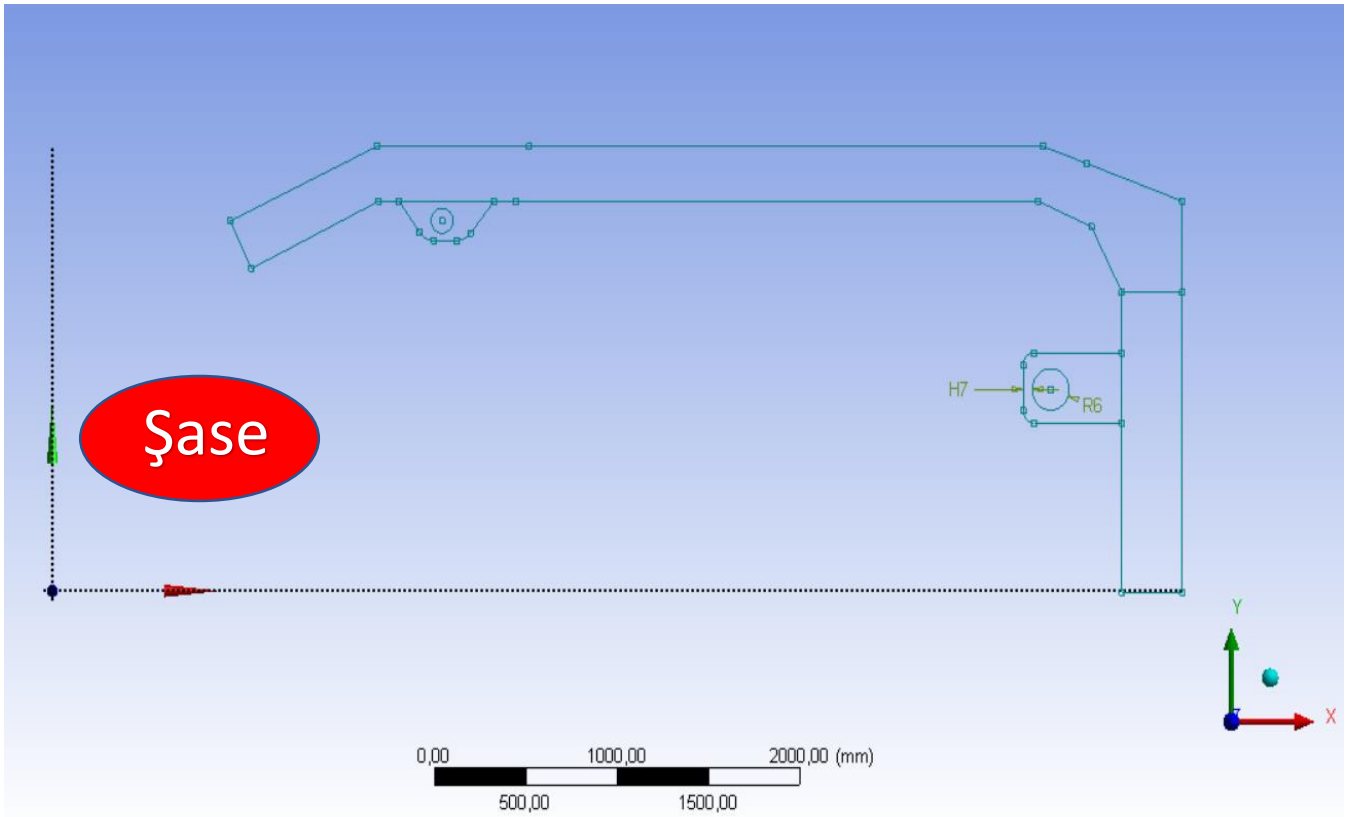
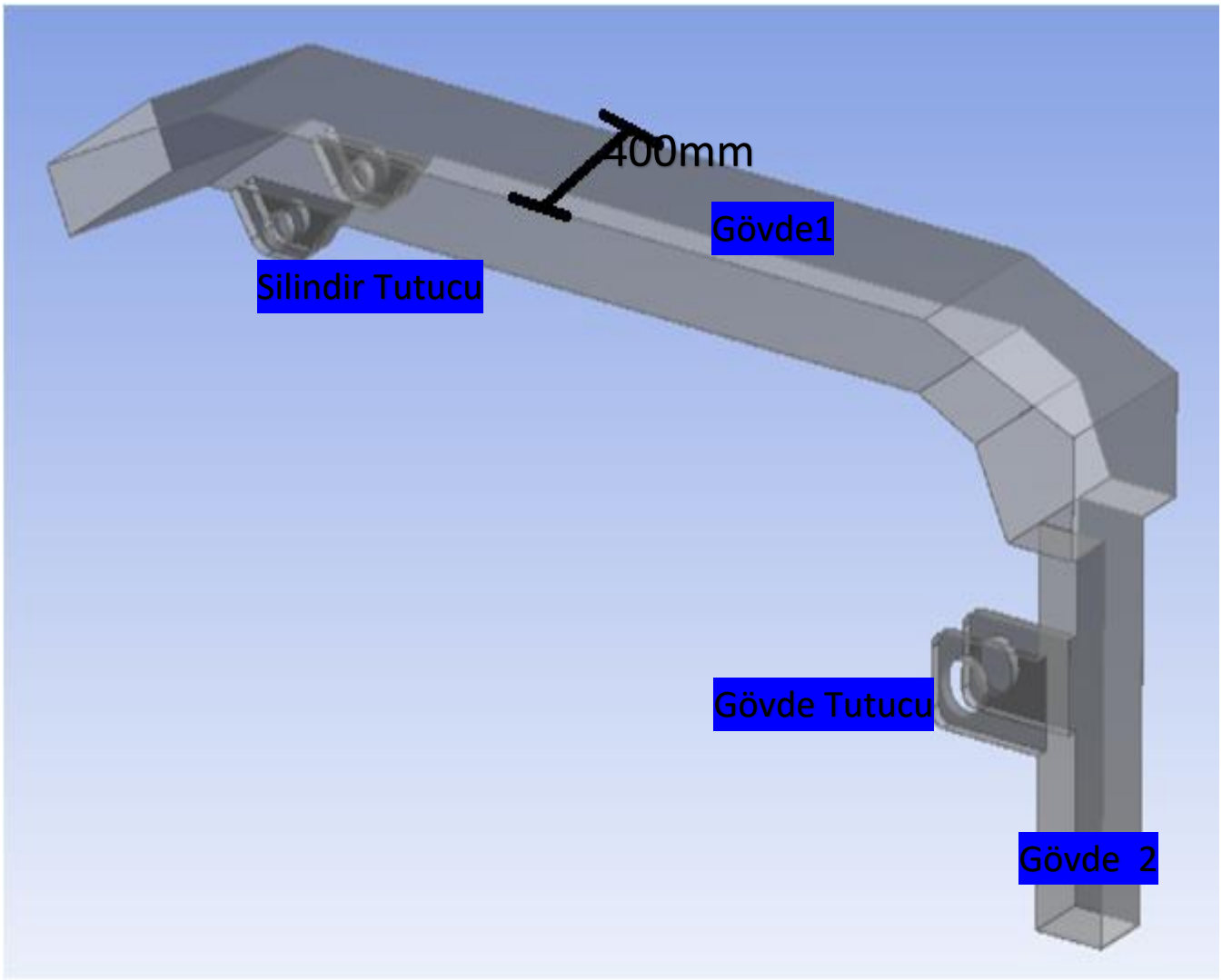
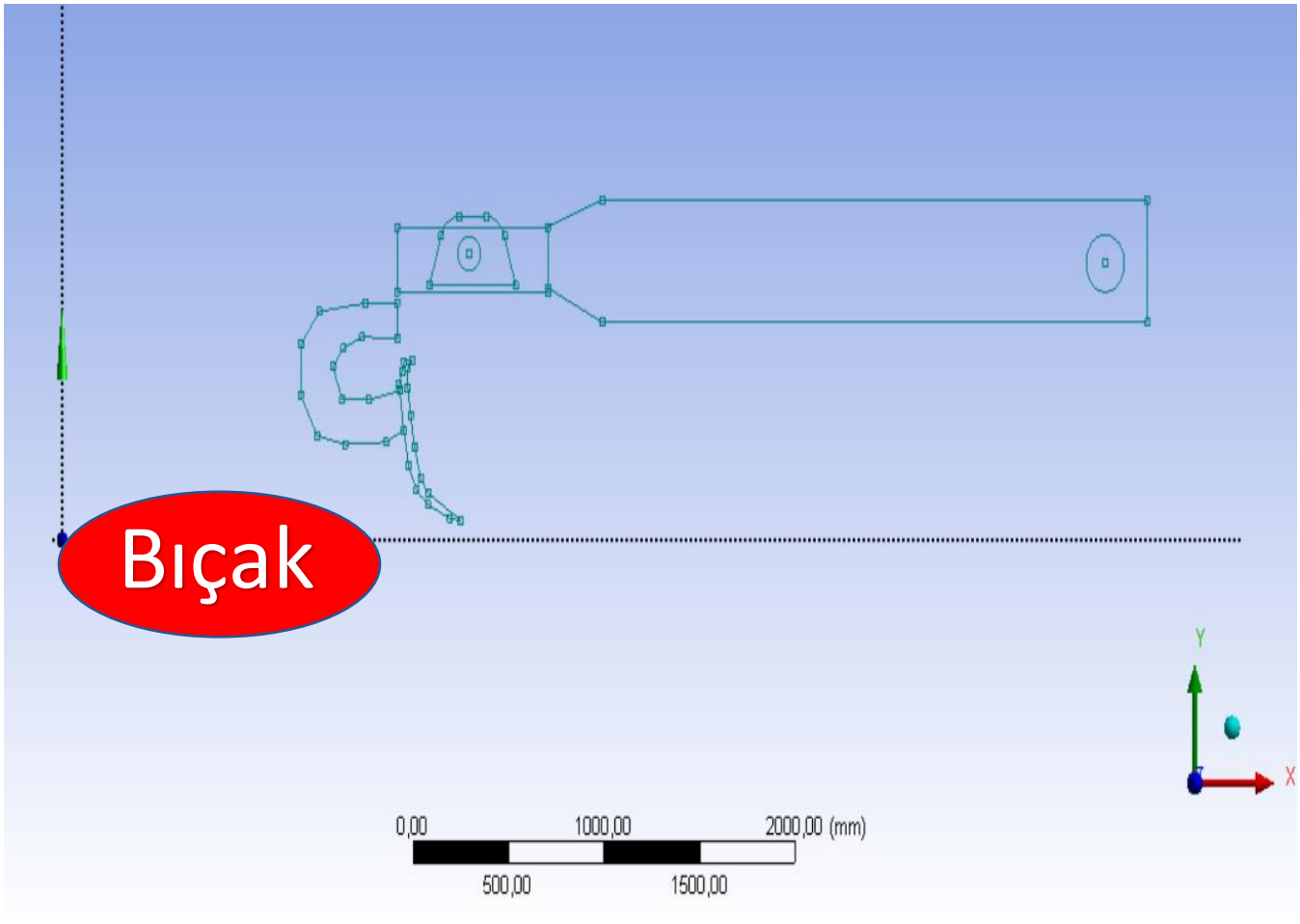

Geometry
9.06.2019 19:04
ANSYS
R18.2
Y
Z
X

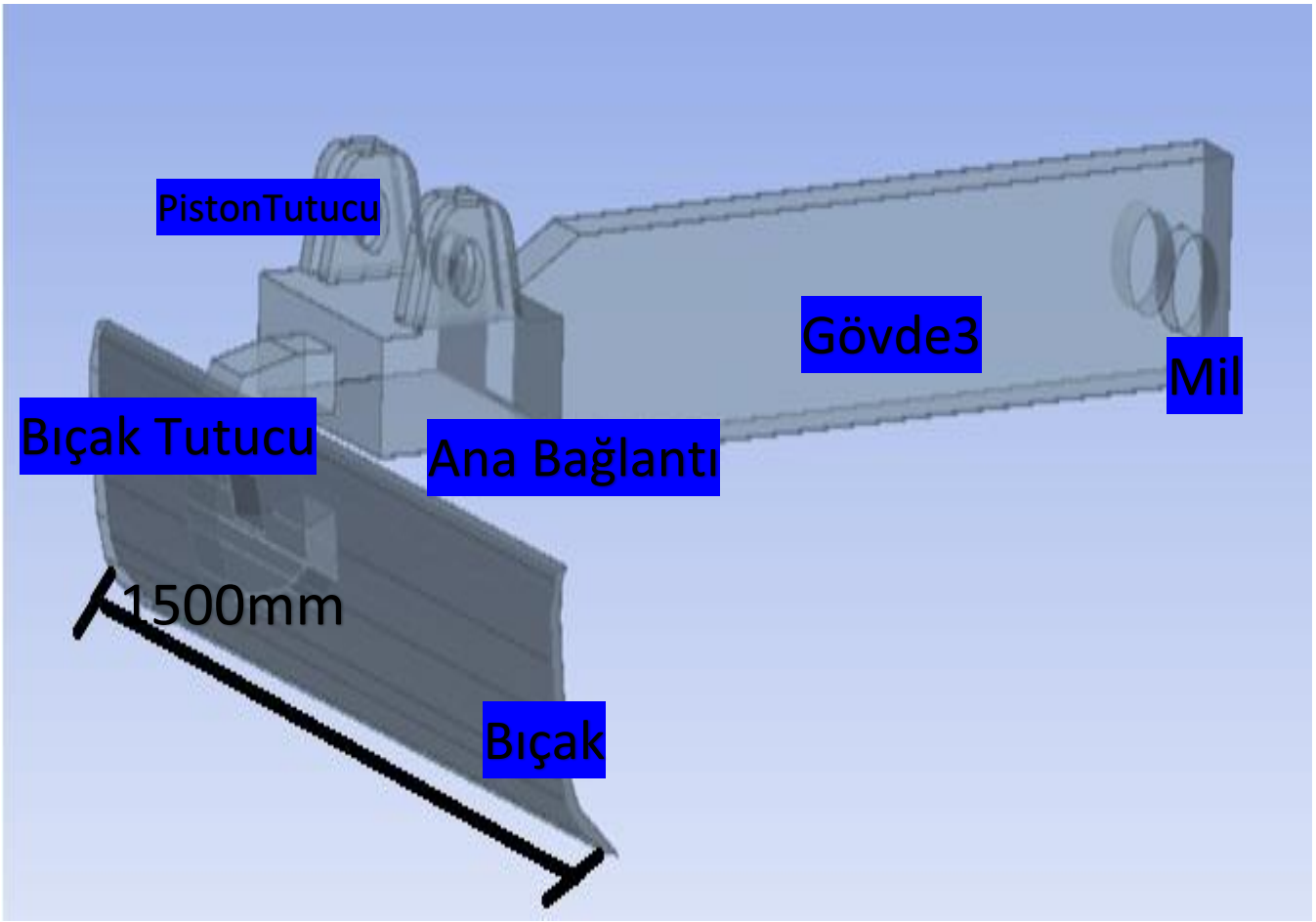

Geometry
9.06.2019 19:04
ANSYS
R18.2
Y
X
Z

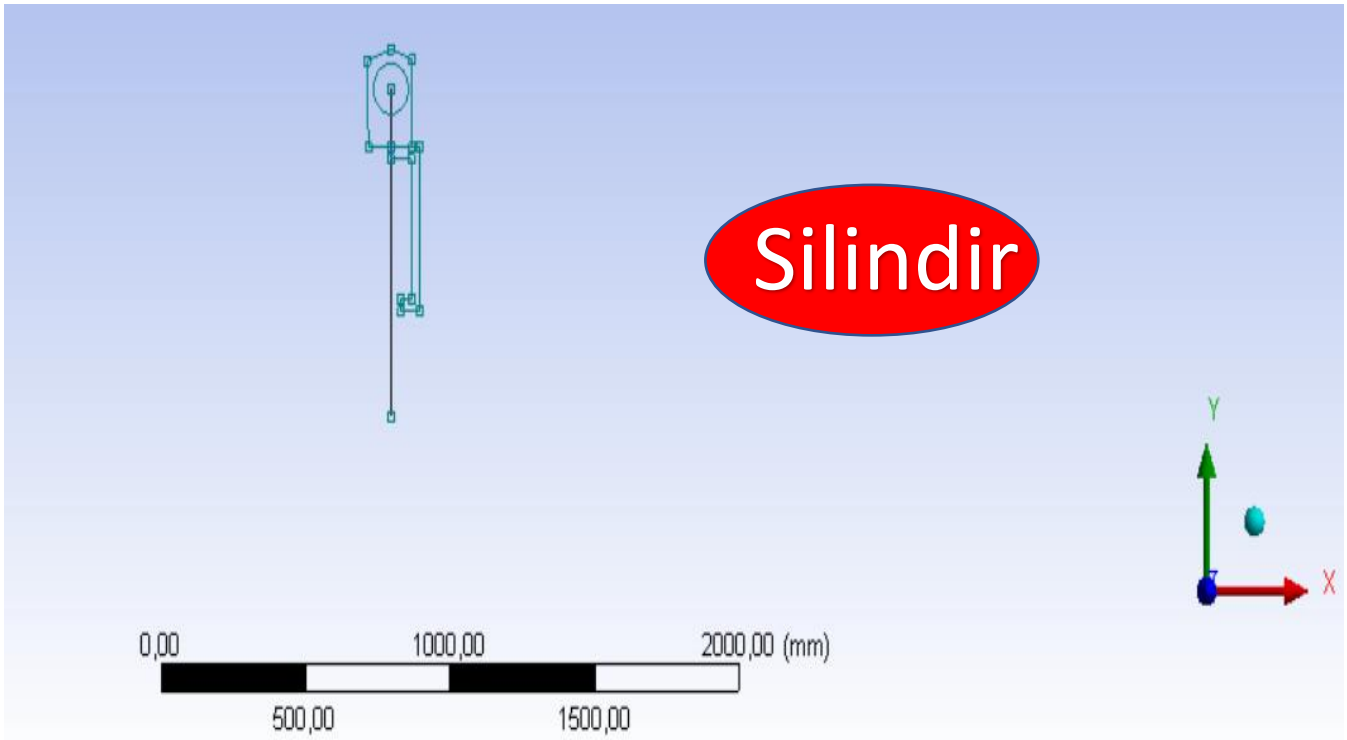

Geometry
9.06.2019 19:04
ANSYS
R18.2
Y
X
Z

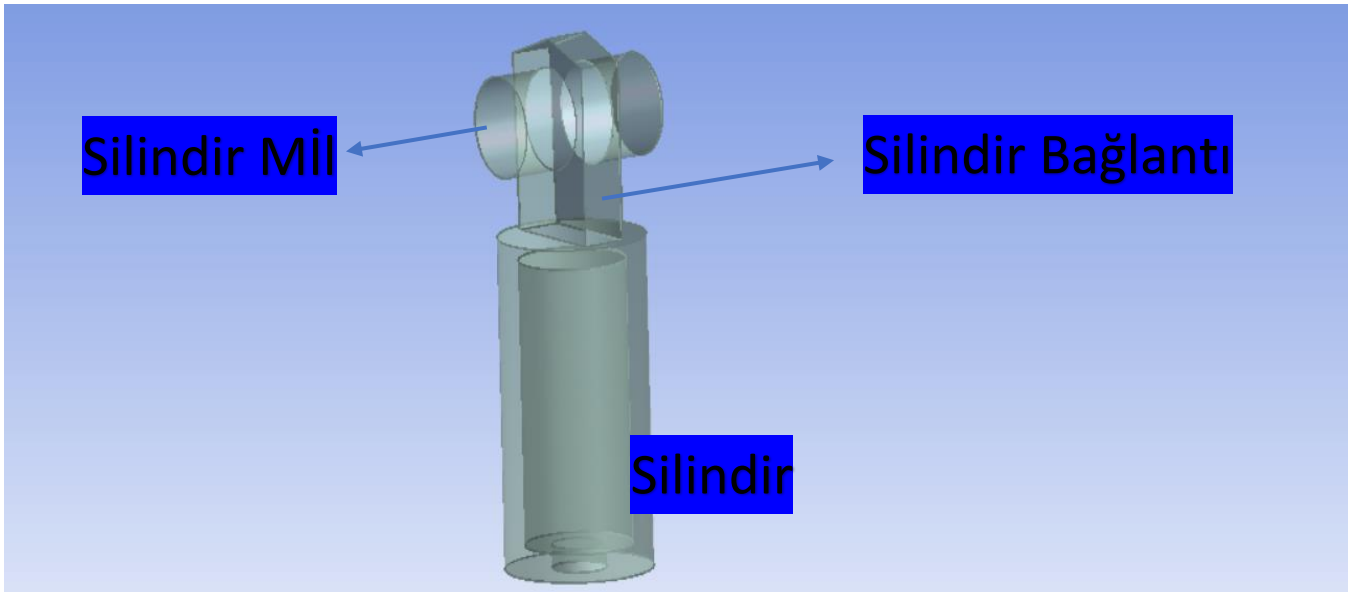

Şase
H7
R6
Y
X
0,00
1000,00
2000,00 (mm)
500,00
1500,00


400mm
Gövde1
Silindir Tutucu
Gövde Tutucu
Gövde 2

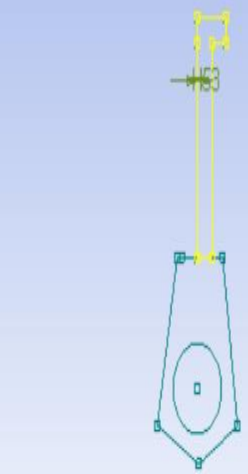

Bıçak
Y
X
0,00
1000,00
2000,00 (mm)
500,00
1500,00


PistonTutucu
Gövde3
Mil
Bıçak Tutucu
Ana Bağlantı
1500mm
Bıçak

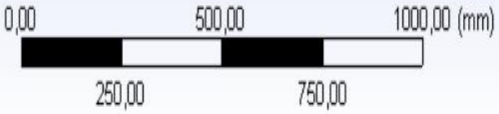

Silindir
Y
X
0,00
1000,00
2000,00 (mm)
500,00
1500,00

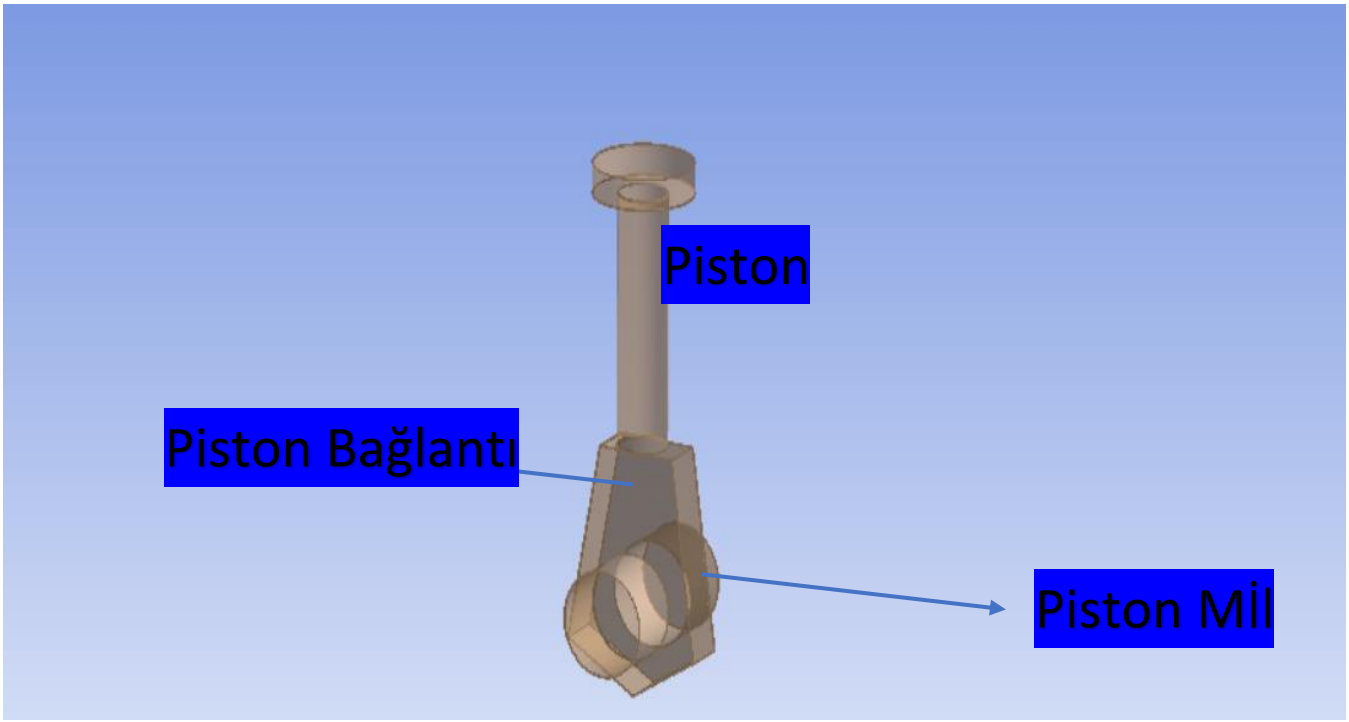

Silindir Mil
Silindir Bağlantı
Silindir

Piston

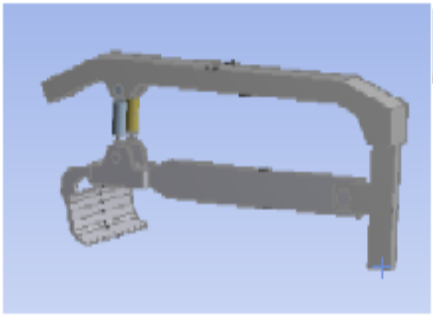



Y
X


0,00
500,00
1000,00 (mm)
250,00
750,00


Piston
Piston Bağlantı
Piston Mil

- Geometry
  - Sase
  - Silindir2
  - Piston2
  - Silindir1
  - Piston1
  - Bıcak



Details of "Geometry"	
Properties	
Volume	[illegible] mm³
Mass	241,09 kg
Scale Factor Va...	1,

Details of "Sase"	
Properties	
Volume	1,144e+007 mm³
Mass	89,804 kg
Centroid X	4003,1 mm
Centroid Y	1711, mm
Centroid Z	1,4608e-011 mm
Moment of Inertia ...	2,4183e+007 kg·mm²
Moment of Inertia ...	2,6594e+008 kg·mm²
Moment of Inertia ...	2,7771e+008 kg·mm²

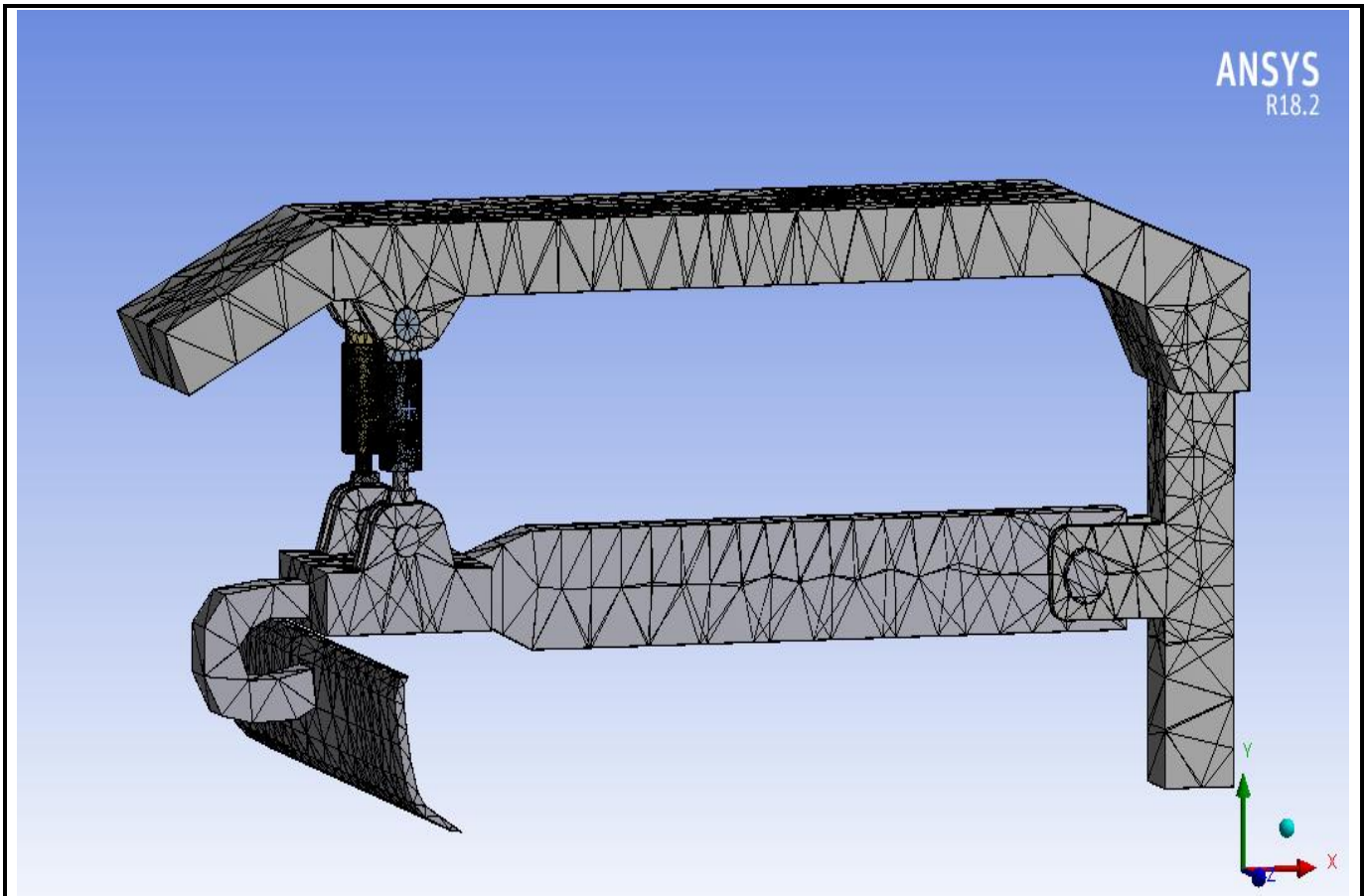
Details of "Bıcak"	
Properties	
Volume	[illegible] mm³
Mass	92,564 kg
Centroid X	2693,8 mm
Centroid Y	609,1 mm
Centroid Z	-1,1909e-004 mm
Moment of Inertia Ip1	3,4827e+007 kg·mm²
Moment of Inertia Ip2	1,6792e+008 kg·mm²
Moment of Inertia Ip3	1,4554e+008 kg·mm²

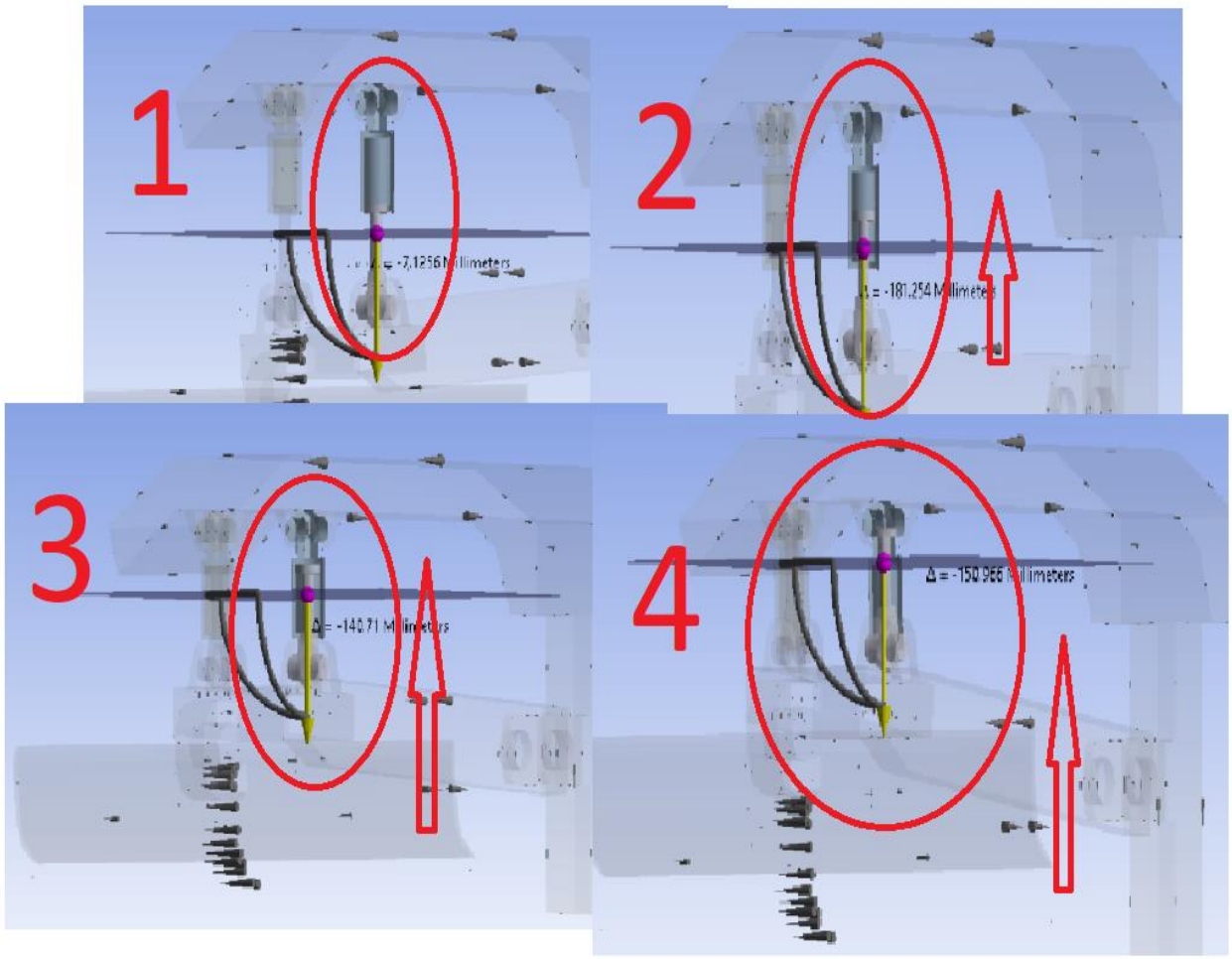
Details of "Silindir1"	
Properties	
Volume	6,347e+005 mm³
Mass	4,9824 kg
Centroid X	2129,7 mm
Centroid Y	1528,9 mm
Centroid Z	310, mm
Moment of Inertia Ip1	1,7834e+005 kg·mm²
Moment of Inertia Ip2	35194 kg·mm²
Moment of Inertia Ip3	1,7639e+005 kg·mm²

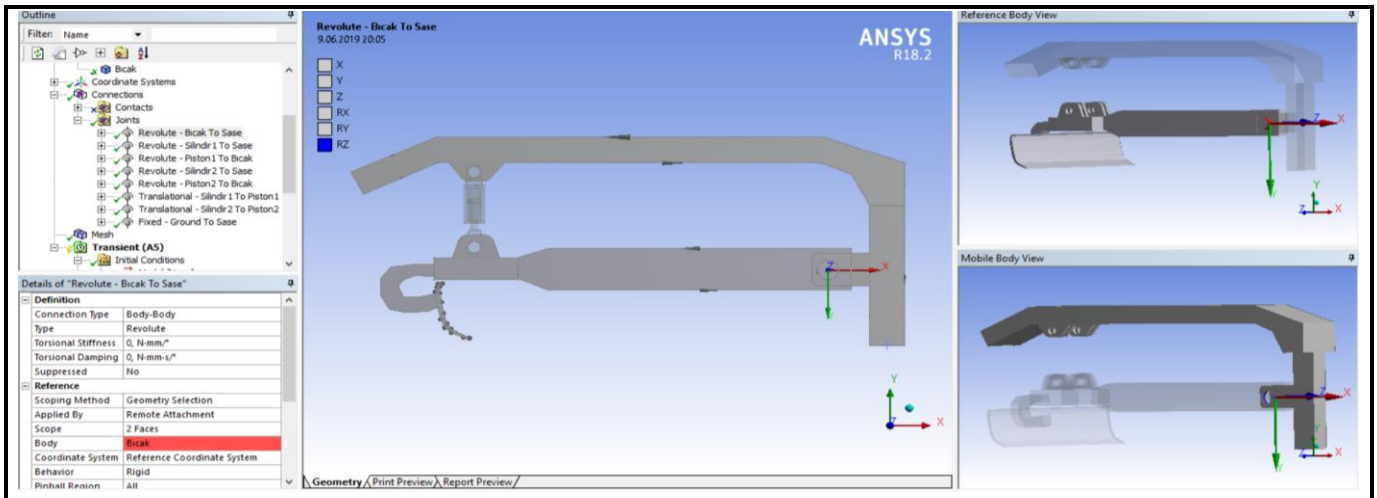
Details of "Silindir2"	
Properties	
Volume	6,347e+005 mm³
Mass	4,9824 kg
Centroid X	2129,7 mm
Centroid Y	1528,9 mm
Centroid Z	-310, mm
Moment of Inertia Ip1	1,7834e+005 kg·mm²
Moment of Inertia Ip2	35194 kg·mm²
Moment of Inertia Ip3	1,7639e+005 kg·mm²

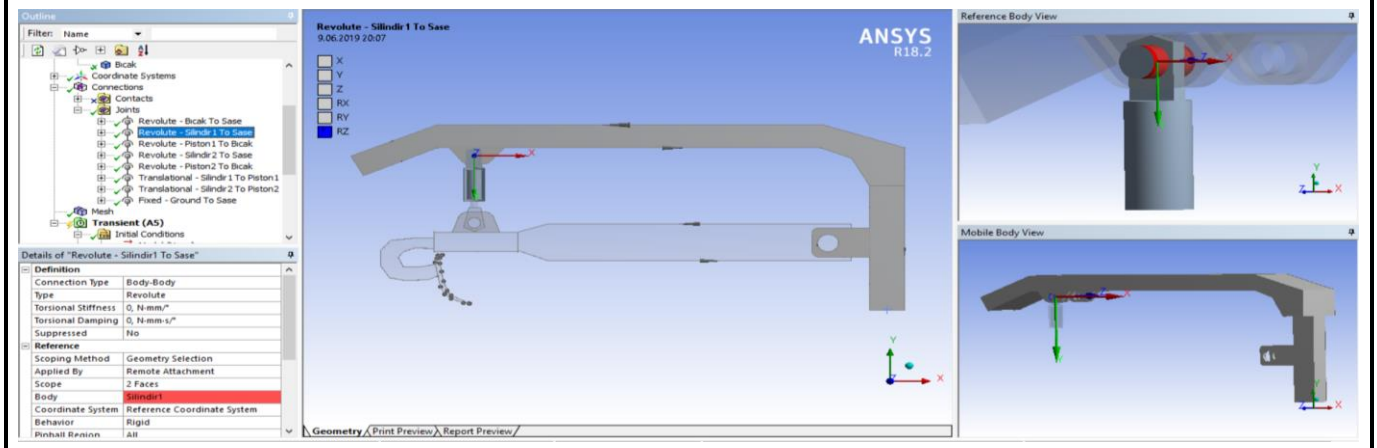
Details of "Piston1"	
Properties	
Volume	5,9228e+006 mm³
Mass	46,494 kg
Centroid X	2131,3 mm
Centroid Y	1126, mm
Centroid Z	310, mm
Moment of Inertia Ip1	1,499e+006 kg·mm²
Moment of Inertia Ip2	1,5201e+005 kg·mm²
Moment of Inertia Ip3	1,4695e+006 kg·mm²

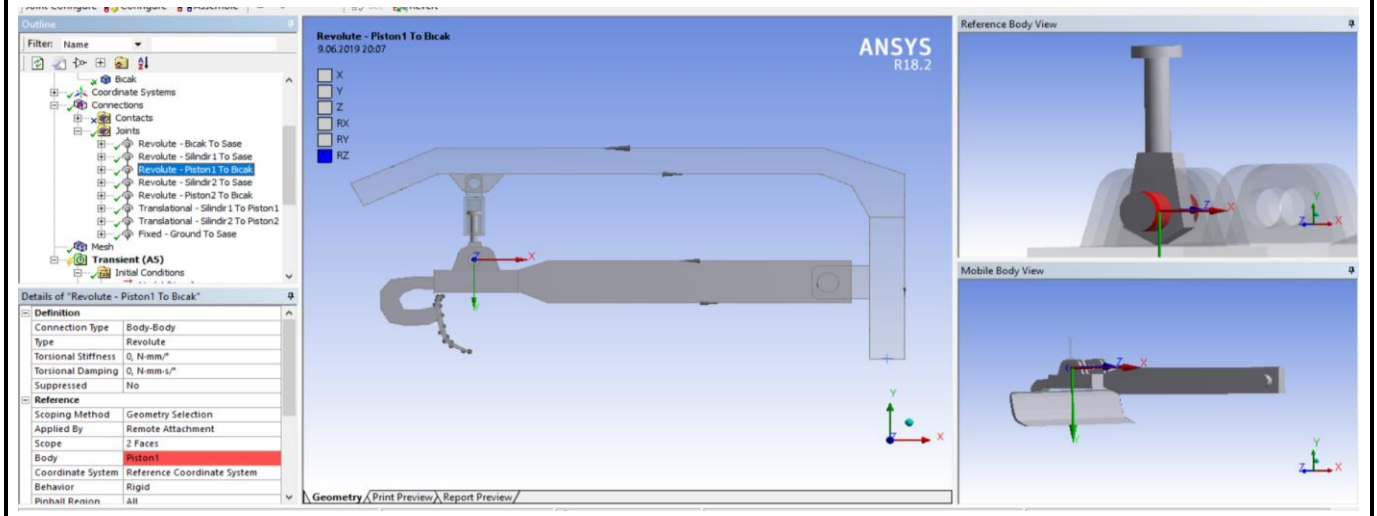
Details of "Piston2"	
Properties	
Volume	2,885e+005 mm³
Mass	2,2647 kg
Centroid X	2131,4 mm
Centroid Y	1159,3 mm
Centroid Z	-310, mm
Moment of Inertia Ip1	89279 kg·mm²
Moment of Inertia Ip2	10690 kg·mm²
Moment of Inertia Ip3	88025 kg·mm²

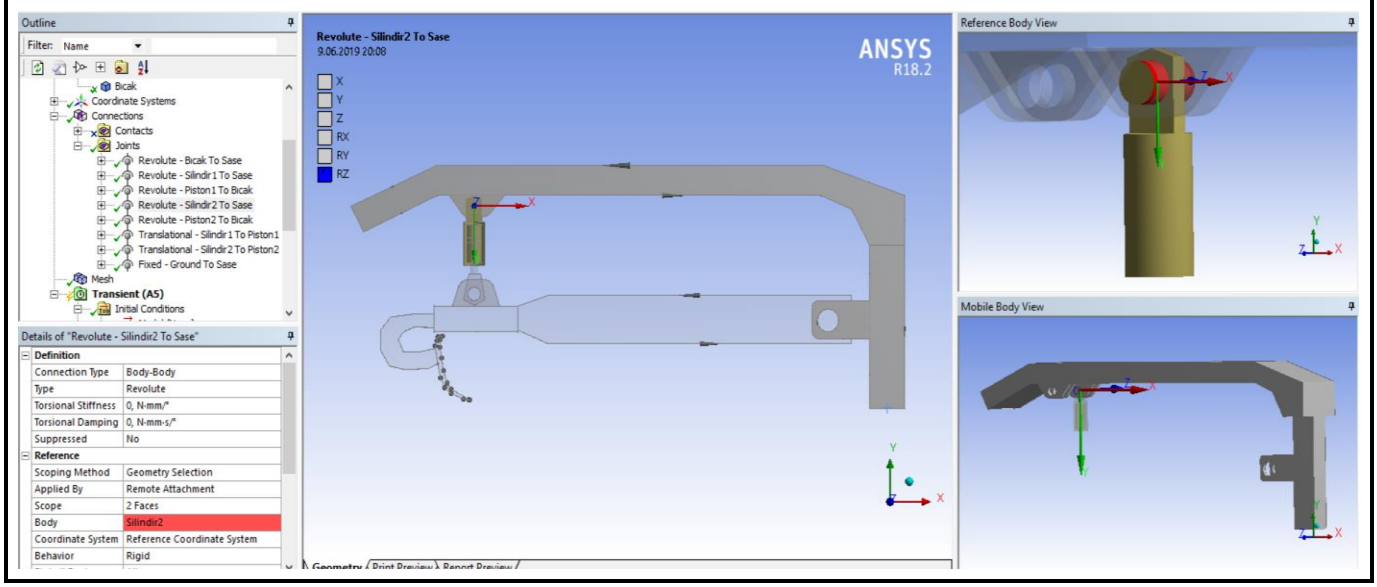

ANSYS
R18.2
Y
X

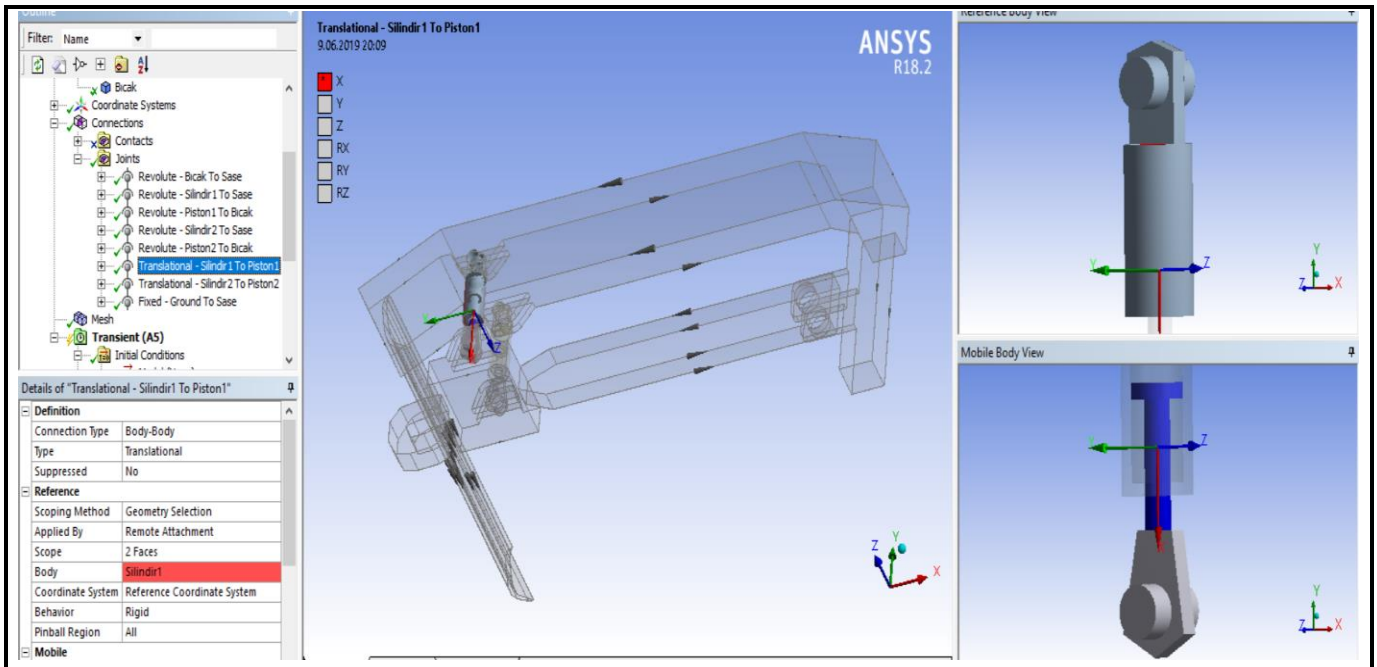

1
2
3
4

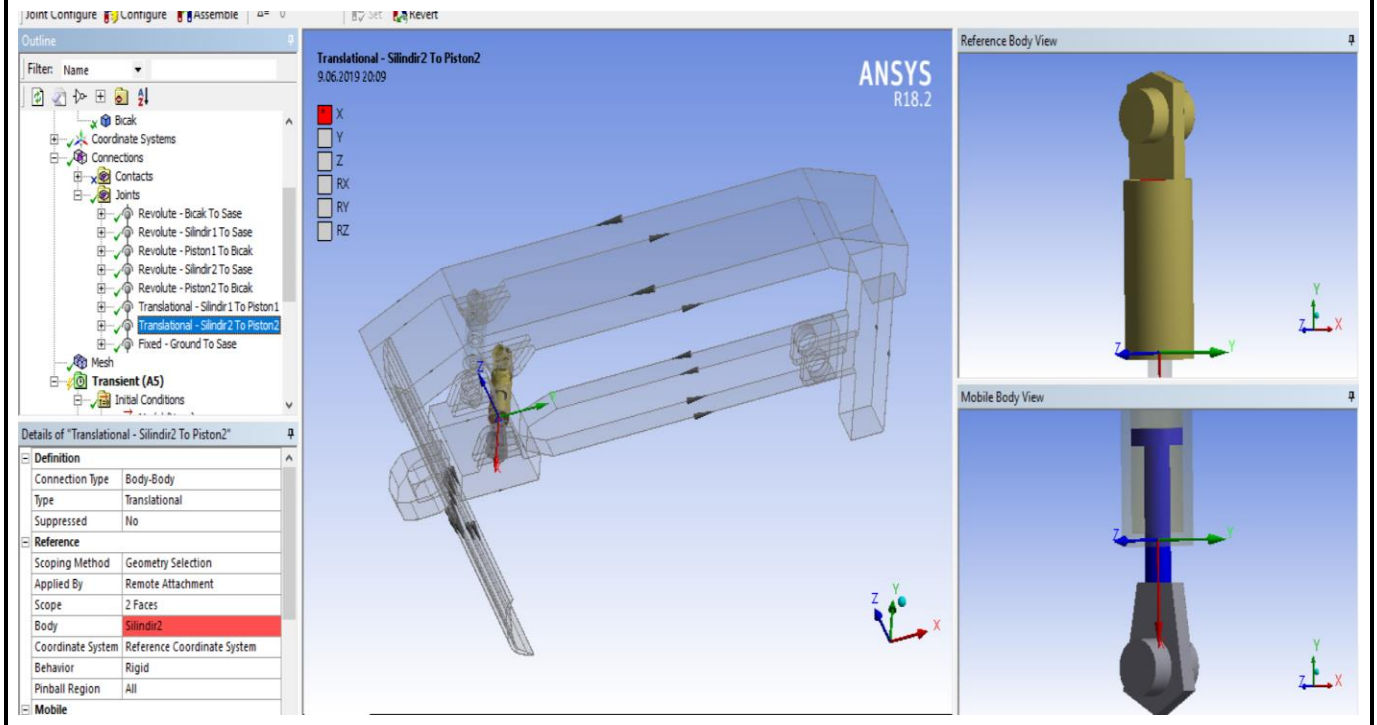

Outline
Filter: Name
Bicak
Coordinate Systems
Connections
Contacts
Joints
Revolute - Bicak To Sase
Revolute - Silindir 1 To Sase
Revolute - Piston1 To Bicak
Revolute - Silindir2 To Sase
Revolute - Piston2 To Bicak
Translational - Silindir 1 To Piston1
Translational - Silindir2 To Piston2
Fixed - Ground To Sase
Mesh
Transient (A5)
Initial Conditions
Details of "Revolute - Bicak To Sase"
Definition
Connection Type Body-Body
Type Revolute
Torsional Stiffness 0, N-mm/°
Torsional Damping 0, N-mm-s/°
Suppressed No
Reference
Scoping Method Geometry Selection
Applied By Remote Attachment
Scope 2 Faces
Body Bicak
Coordinate System Reference Coordinate System
Behavior Rigid
Pinball Region All
Revolute - Bicak To Sase
9.06.2019 20:05
ANSYS
R18.2
X
Y
Z
RX
RY
RZ
Geometry
Print Preview
Report Preview
Reference Body View
Mobile Body View

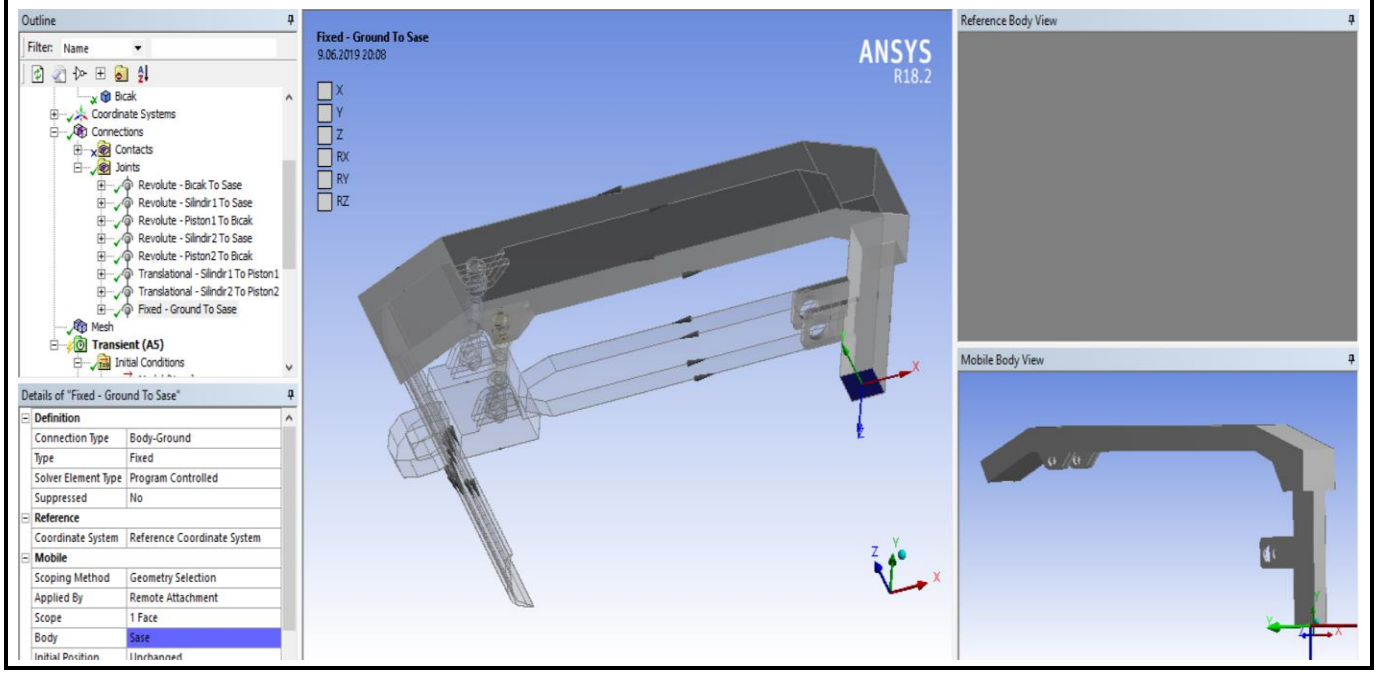

Outline
Filter: Name
Bicak
Coordinate Systems
Connections
Contacts
Joints
Revolute - Bicak To Sase
Revolute - Silindir 1 To Sase
Revolute - Piston1 To Bicak
Revolute - Silindir2 To Sase
Revolute - Piston2 To Bicak
Translational - Silindir 1 To Piston1
Translational - Silindir2 To Piston2
Fixed - Ground To Sase
Mesh
Transient (A5)
Initial Conditions
Details of "Revolute - Silindir1 To Sase"
Definition
Connection Type Body-Body
Type Revolute
Torsional Stiffness 0, N-mm/°
Torsional Damping 0, N-mm-s/°
Suppressed No
Reference
Scoping Method Geometry Selection
Applied By Remote Attachment
Scope 2 Faces
Body Silindir1
Coordinate System Reference Coordinate System
Behavior Rigid
Pinball Region All
Revolute - Silindir1 To Sase
9.06.2019 20:07
ANSYS
R18.2
X
Y
Z
RX
RY
RZ
Geometry
Print Preview
Report Preview
Reference Body View
Mobile Body View

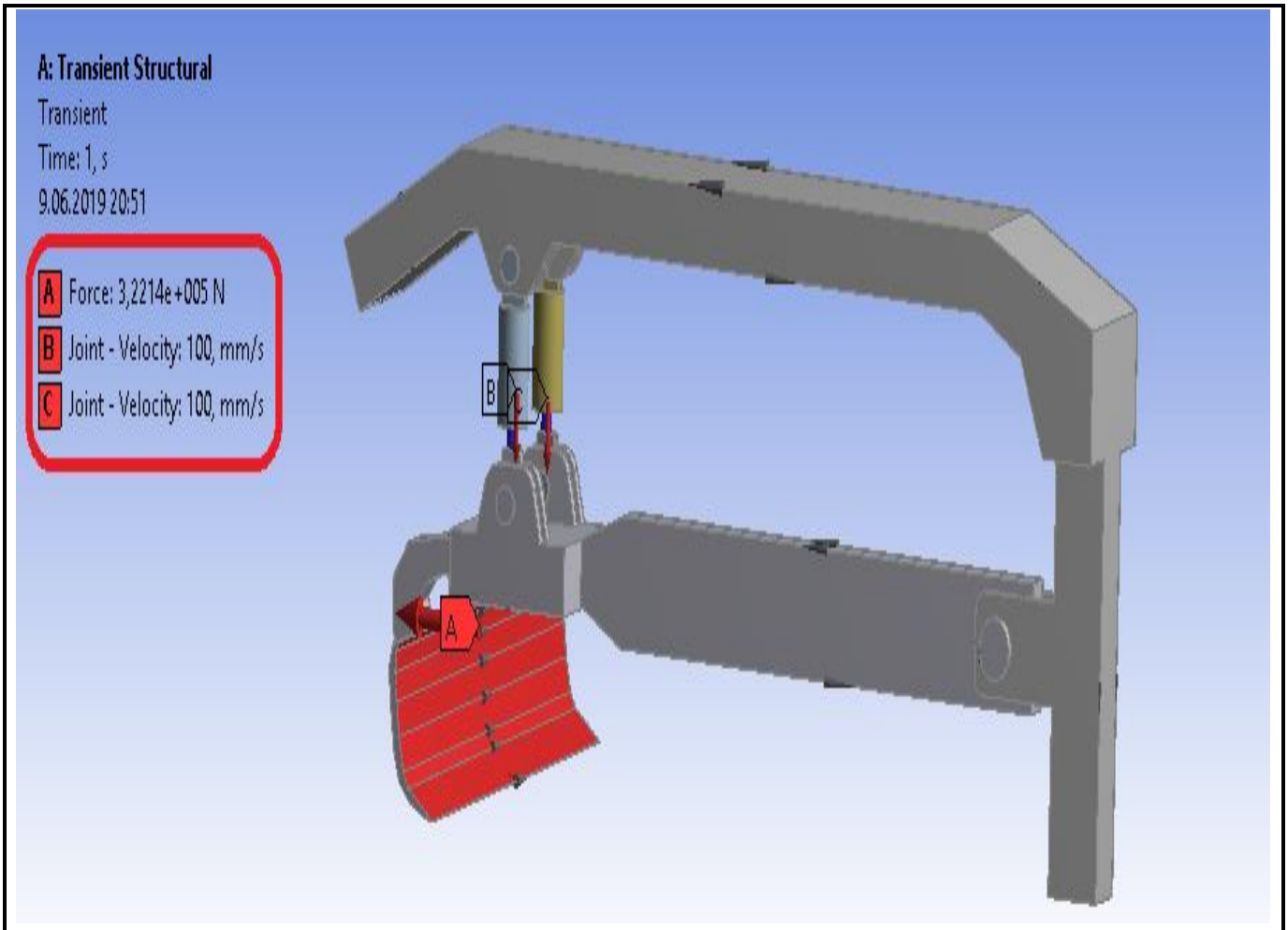

Outline
Filter: Name
Bicak
Coordinate Systems
Connections
Contacts
Joints
Revolute - Bicak To Sase
Revolute - Silindir 1 To Sase
Revolute - Piston1 To Bicak
Revolute - Silindir2 To Sase
Revolute - Piston2 To Bicak
Translational - Silindir 1 To Piston1
Translational - Silindir2 To Piston2
Fixed - Ground To Sase
Mesh
Transient (A5)
Initial Conditions
Details of "Revolute - Piston1 To Bicak"
Definition
Connection Type Body-Body
Type Revolute
Torsional Stiffness 0, N-mm/°
Torsional Damping 0, N-mm-s/°
Suppressed No
Reference
Scoping Method Geometry Selection
Applied By Remote Attachment
Scope 2 Faces
Body Piston1
Coordinate System Reference Coordinate System
Behavior Rigid
Pinball Region All
Revolute - Piston1 To Bicak
9.06.2019 20:07
ANSYS
R18.2
X
Y
Z
RX
RY
RZ
Geometry
Print Preview
Report Preview
Reference Body View
Mobile Body View

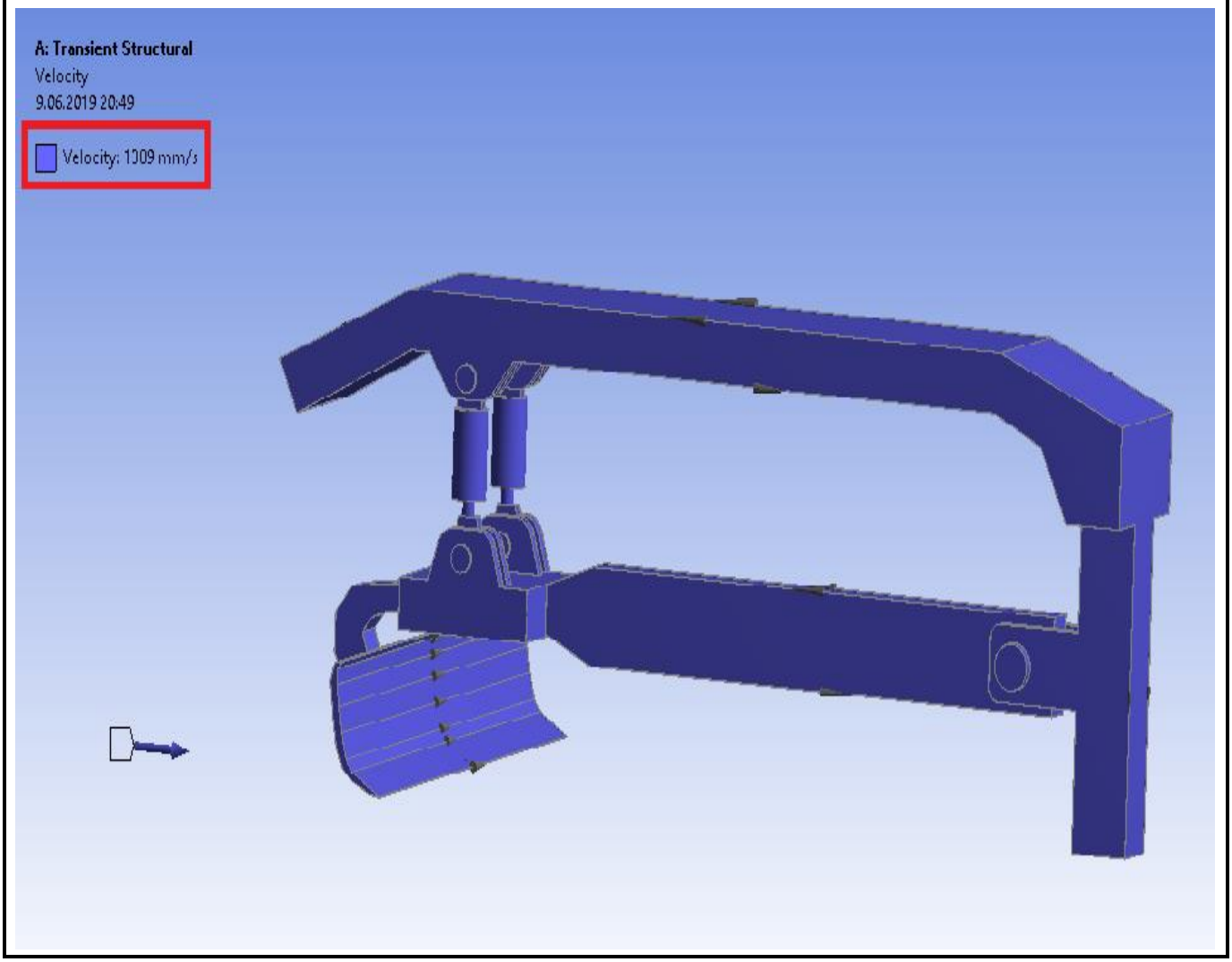

Outline
Filter: Name
Bicak
Coordinate Systems
Connections
Contacts
Joints
Revolute - Bicak To Sase
Revolute - Silindir 1 To Sase
Revolute - Piston1 To Bicak
Revolute - Silindir2 To Sase
Revolute - Piston2 To Bicak
Translational - Silindir 1 To Piston1
Translational - Silindir2 To Piston2
Fixed - Ground To Sase
Mesh
Transient (A5)
Initial Conditions
Details of "Revolute - Silindir2 To Sase"
Definition
Connection Type Body-Body
Type Revolute
Torsional Stiffness 0, N-mm/°
Torsional Damping 0, N-mm-s/°
Suppressed No
Reference
Scoping Method Geometry Selection
Applied By Remote Attachment
Scope 2 Faces
Body Silindir2
Coordinate System Reference Coordinate System
Behavior Rigid
Revolute - Silindir2 To Sase
9.06.2019 20:08
ANSYS
R18.2
X
Y
Z
RX
RY
RZ
Reference Body View
Mobile Body View

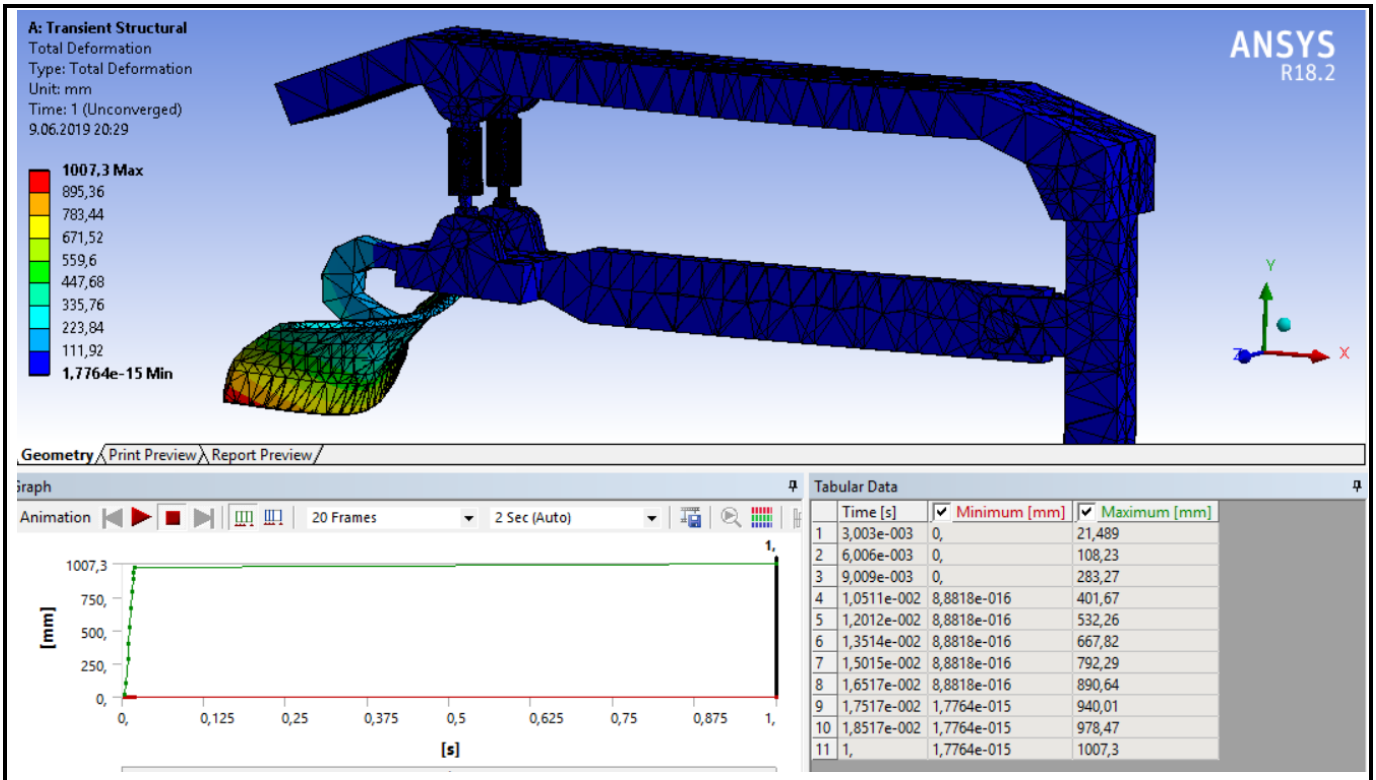

Filter: Name
Bicak
Coordinate Systems
Connections
Contacts
Joints
Revolute - Bicak To Sase
Revolute - Silindir1 To Sase
Revolute - Piston1 To Bicak
Revolute - Silindir2 To Sase
Revolute - Piston2 To Bicak
Translational - Silindir1 To Piston1
Translational - Silindir2 To Piston2
Fixed - Ground To Sase
Mesh
Transient (A5)
Initial Conditions
Translational - Silindir1 To Piston1
9.06.2019 20:09
ANSYS
R18.2
X
Y
Z
RX
RY
RZ
Reference Body View
Mobile Body View
Details of "Translational - Silindir1 To Piston1"
Definition
Connection Type Body-Body
Type Translational
Suppressed No
Reference
Scoping Method Geometry Selection
Applied By Remote Attachment
Scope 2 Faces
Body Silindir1
Coordinate System Reference Coordinate System
Behavior Rigid
Pinball Region All
Mobile


Joint Configure
Configure
Assemble
Set
Revert
Outline
Filter: Name
Bicak
Coordinate Systems
Connections
Contacts
Joints
Revolute - Bicak To Sase
Revolute - Silindir1 To Sase
Revolute - Piston1 To Bicak
Revolute - Silindir2 To Sase
Revolute - Piston2 To Bicak
Translational - Silindir1 To Piston1
Translational - Silindir2 To Piston2
Fixed - Ground To Sase
Mesh
Transient (A5)
Initial Conditions
Translational - Silindir2 To Piston2
9.06.2019 20:09
ANSYS
R18.2
X
Y
Z
RX
RY
RZ
Reference Body View
Mobile Body View
Details of "Translational - Silindir2 To Piston2"
Definition
Connection Type Body-Body
Type Translational
Suppressed No
Reference
Scoping Method Geometry Selection
Applied By Remote Attachment
Scope 2 Faces
Body Silindir2
Coordinate System Reference Coordinate System
Behavior Rigid
Pinball Region All
Mobile


Outline
Filter: Name
Bicak
Coordinate Systems
Connections
Contacts
Joints
Revolute - Bicak To Sase
Revolute - Silindir1 To Sase
Revolute - Piston1 To Bicak
Revolute - Silindir2 To Sase
Revolute - Piston2 To Bicak
Translational - Silindir1 To Piston1
Translational - Silindir2 To Piston2
Fixed - Ground To Sase
Mesh
Transient (A5)
Initial Conditions
Fixed - Ground To Sase
9.06.2019 20:08
ANSYS
R18.2
X
Y
Z
RX
RY
RZ
Reference Body View
Mobile Body View
Details of "Fixed - Ground To Sase"
Definition
Connection Type Body-Ground
Type Fixed
Solver Element Type Program Controlled
Suppressed No
Reference
Coordinate System Reference Coordinate System
Mobile
Scoping Method Geometry Selection
Applied By Remote Attachment
Scope 1 Face
Body Sase
Initial Position Unchanged


A: Transient Structural
Transient
Time: 1, s
9.06.2019 20:51
A Force: 3,2214e+005 N
B Joint - Velocity: 100, mm/s
C Joint - Velocity: 100, mm/s
A
B
C


A: Transient Structural
Velocity
9.06.2019 20:49
Velocity: 1309 mm/s



Bıçak en alt noktaya indiğinde bir taşa takıldığında ve motor 5 km/h saat hızla 600 Beygir güç uyguladığında, bağlantı noktaları ve bıçak kırılmasın. Motorun ne kadar itme kuvveti oluşturduğunu hesaplayıp sisteme bu kuvveti uygulayın. Gerilme en fazla 200 MPa olsun.

- ✓ 1 beygir güç (hp)=745,699 N*m/s, Watt
- ✓ P=W/t (Güç=İş/Zaman) (Watt)
- ✓ 1 saat=60dk=3600sn
- ✓ 1Km=1000m
- ✓ W=F*x (İş=Kuvvet*Yol) (Joule)
- ✓ F=m*a (N=kg*m/s^2)
- ✓ a=V/t
- ✓ I=F*t

1. 600 hp=600*745,699=447.419,92 W
2. 447.419,92=W/3600 →W=1.610.711.712 j
3. 1.610.711.712=F*5000 →F=322.142,3424 N
4. a=5000/3600=1,38 m/s^2
4. 322.142,3424=m*1,38 →m=233.436,48 Kg
5. I=322.142,3424*1 →I=322.142,3424 N/s

Ölçek	Ad Soyad	CENGİZHAN TOPÇU	KARABÜK ÜNİVERSİTESİ MÜHENDİSLİK FAKÜLTESİ MEKATRONİK MÜHENDİSLİĞİ
	Numara	2017010225048	
	GREYDER TASARIMI		