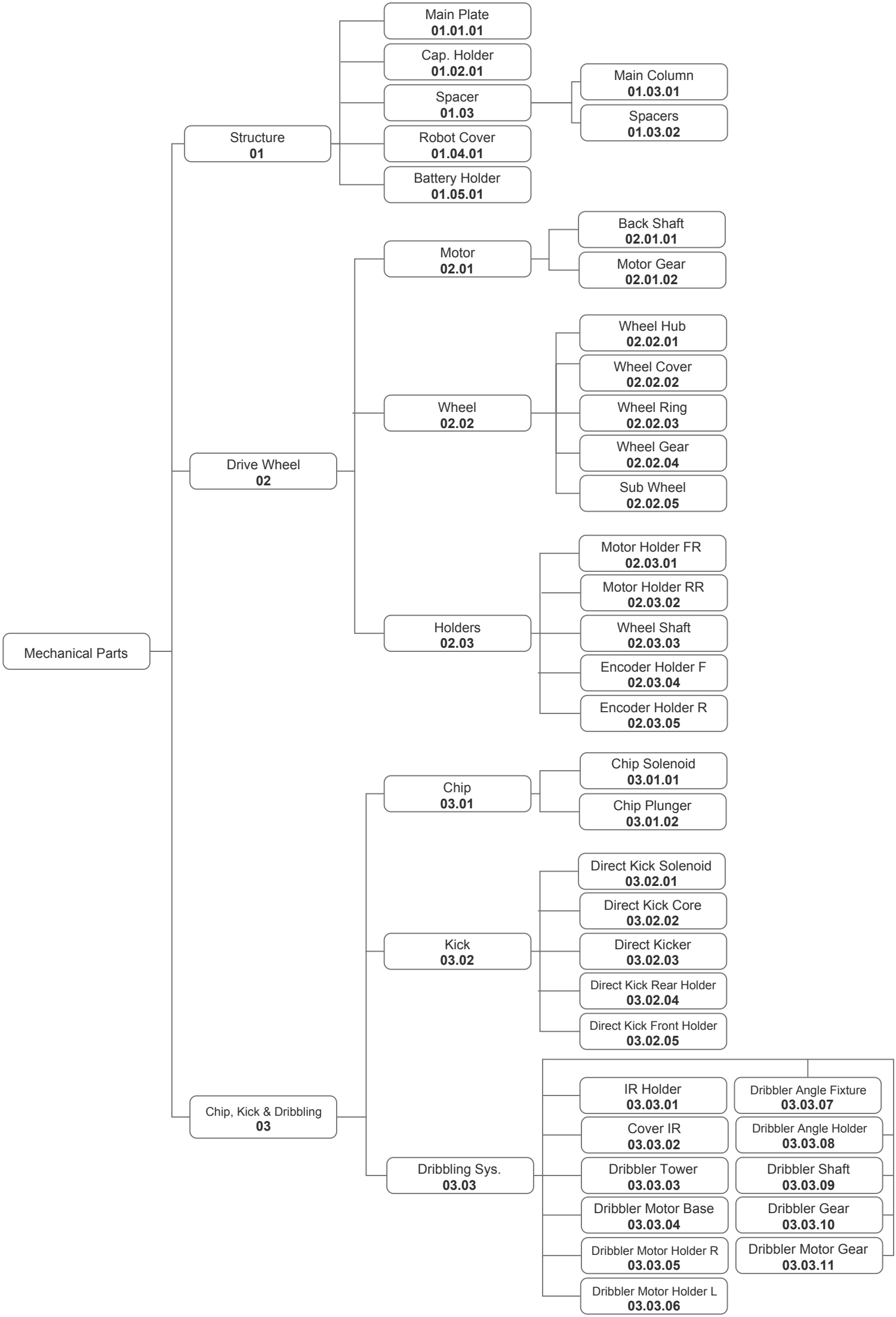
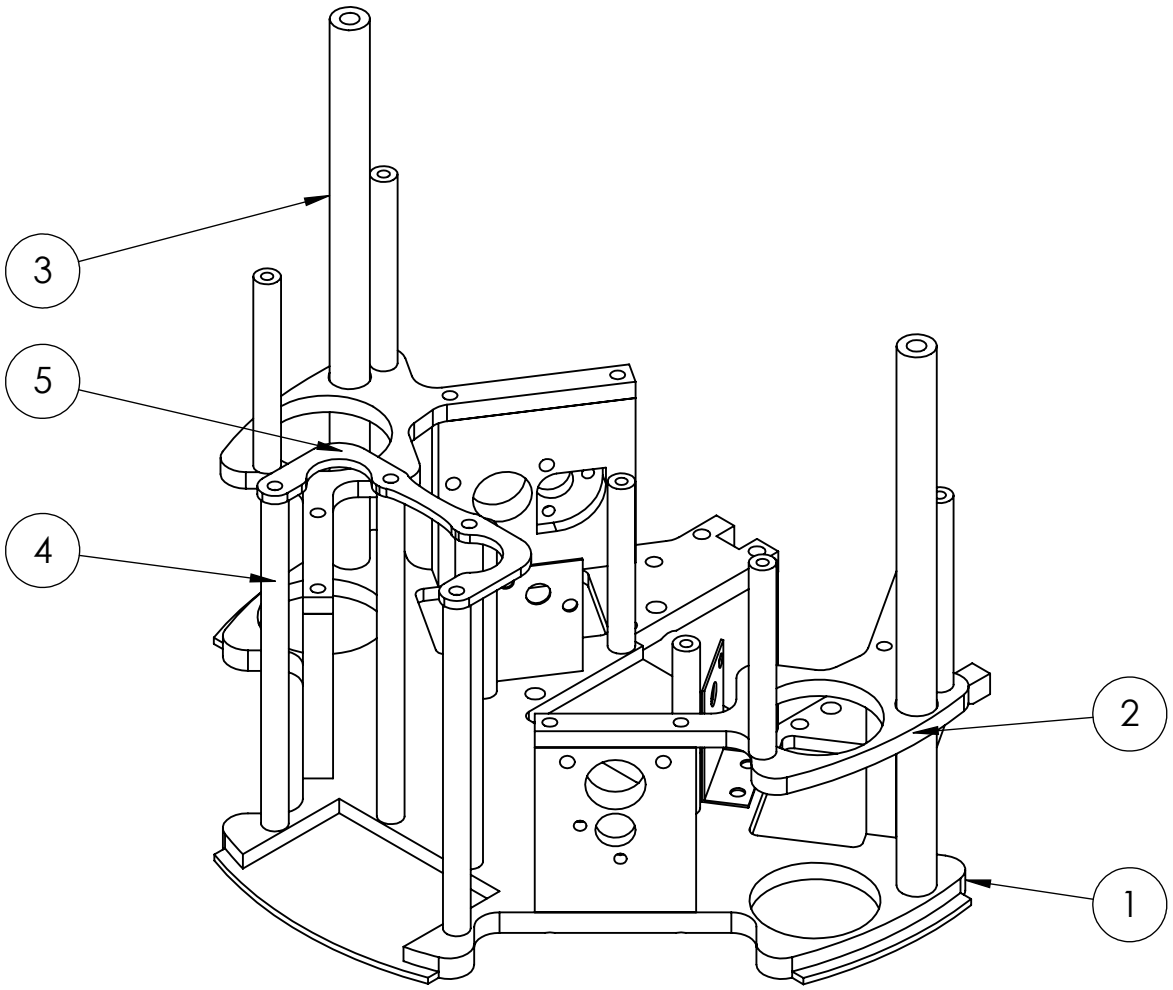
Small-Size Robot

Mechanical Parts

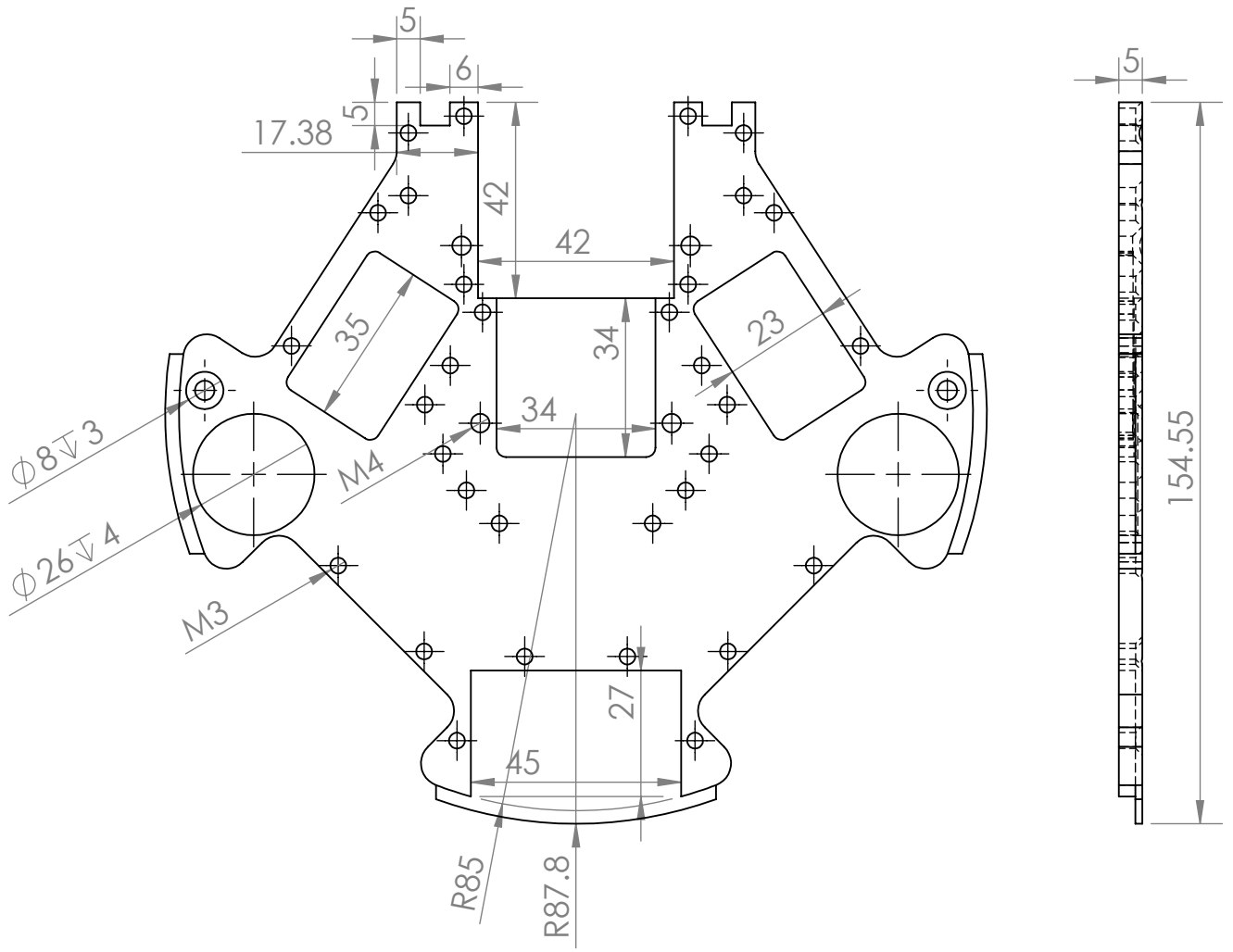
March 2010

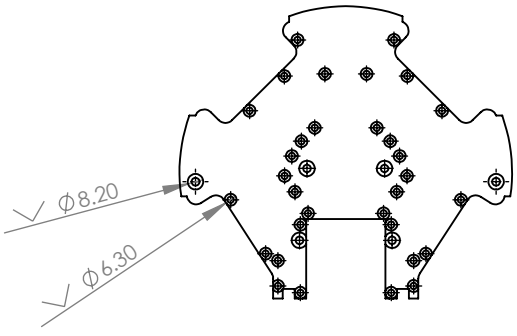

Mechanical Parts
Structure
01
Main Plate
01.01.01
Cap. Holder
01.02.01
Spacer
01.03
Main Column
01.03.01
Spacers
01.03.02
Robot Cover
01.04.01
Battery Holder
01.05.01
Drive Wheel
02
Motor
02.01
Back Shaft
02.01.01
Motor Gear
02.01.02
Wheel
02.02
Wheel Hub
02.02.01
Wheel Cover
02.02.02
Wheel Ring
02.02.03
Wheel Gear
02.02.04
Sub Wheel
02.02.05
Holders
02.03
Motor Holder FR
02.03.01
Motor Holder RR
02.03.02
Wheel Shaft
02.03.03
Encoder Holder F
02.03.04
Encoder Holder R
02.03.05
Chip, Kick & Dribbling
03
Chip
03.01
Chip Solenoid
03.01.01
Chip Plunger
03.01.02
Kick
03.02
Direct Kick Solenoid
03.02.01
Direct Kick Core
03.02.02
Direct Kicker
03.02.03
Direct Kick Rear Holder
03.02.04
Direct Kick Front Holder
03.02.05
Dribbling Sys.
03.03
IR Holder
03.03.01
Cover IR
03.03.02
Dribbler Tower
03.03.03
Dribbler Motor Base
03.03.04
Dribbler Motor Holder R
03.03.05
Dribbler Motor Holder L
03.03.06
Dribbler Angle Fixture
03.03.07
Dribbler Angle Holder
03.03.08
Dribbler Shaft
03.03.09
Dribbler Gear
03.03.10
Dribbler Motor Gear
03.03.11

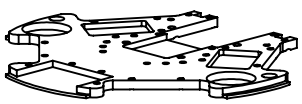
1	Main Plate	01.01.01
2	Cap. Holder	01.02.01
3	Main Column	01.03.01
4	Spacers	01.03.02
5	Battery Holder	01.05.01



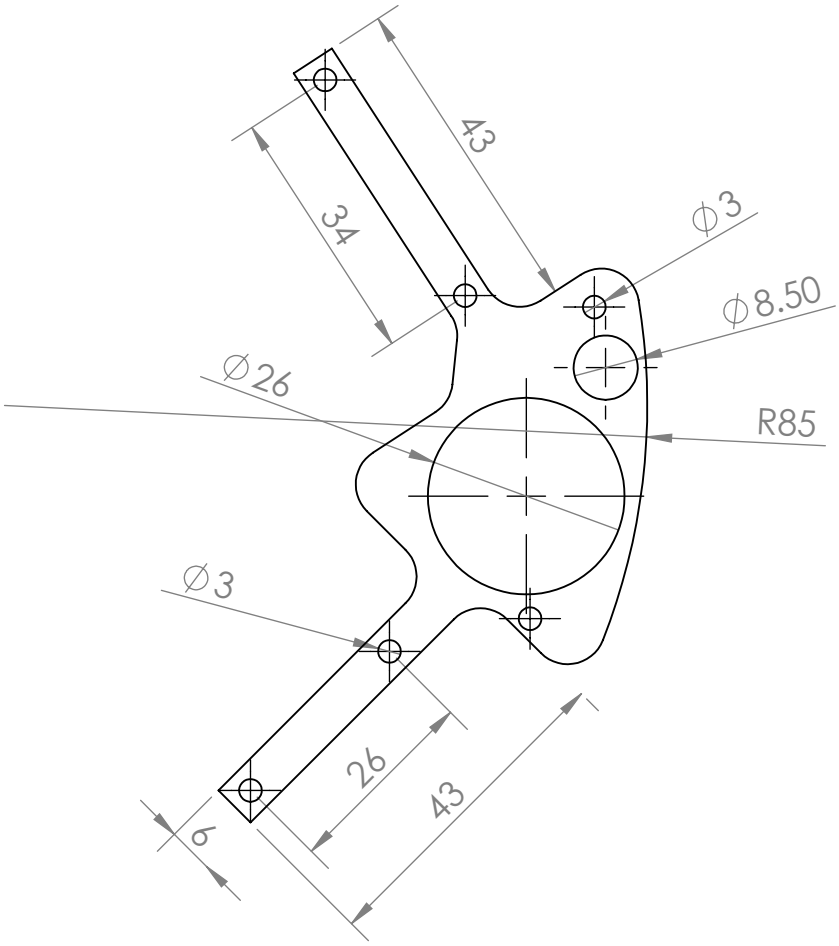
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Structure	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL:		DWG NO. IMMD 01	A4
		WEIGHT:		SCALE:	SHEET 1 OF 1

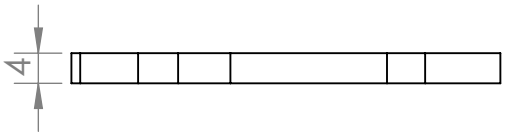


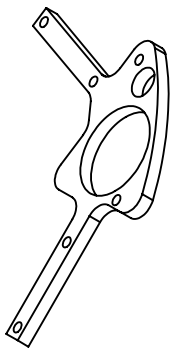




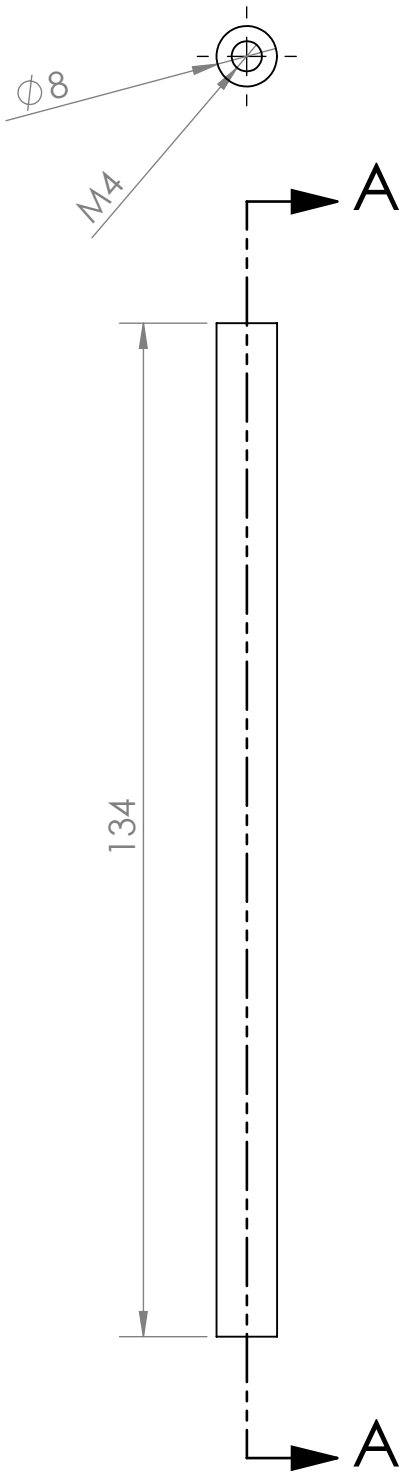
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Main Plate	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 01.01.01	A4
		WEIGHT: 150.7 gr		SCALE: 2:3	SHEET 1 OF 1

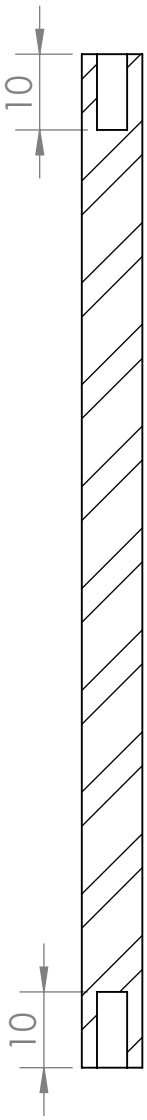






	NAME	DATE		TITLE:
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Cap Holder
APPV'D	Ali Amoozandeh	Mar. 2010		
MFG	Mohammad Hosein Fazeli	MATERIAL: 6061 Aluminum	DWG NO. IMMD 01.02.01	A4
		WEIGHT: 12.4 gr	SCALE: 1:1	SHEET 1 OF 1

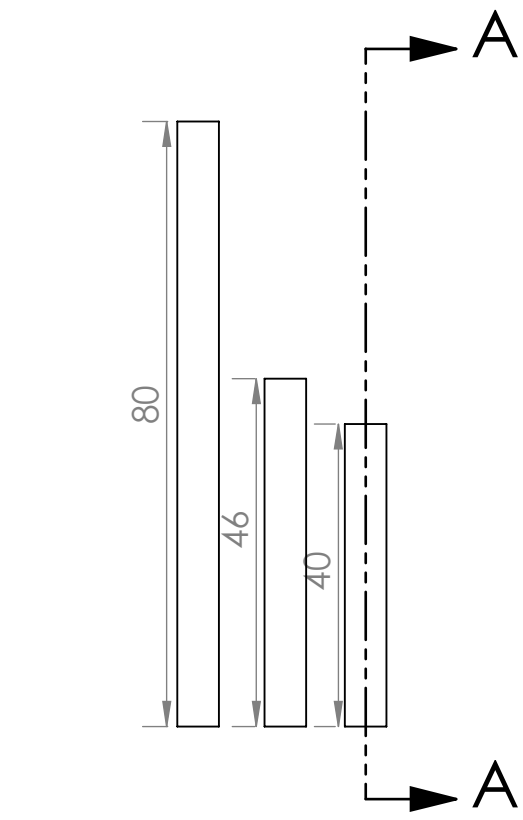


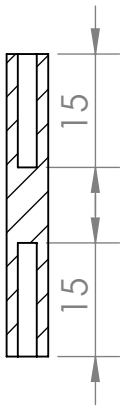


SECTION A-A

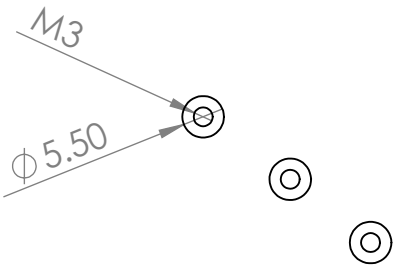
SCALE 1 : 1

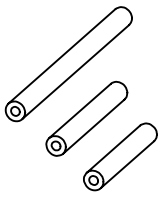
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Main column	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 304 Steel		DWG NO. IMMD 01.03.01	A4
		WEIGHT: 51.9 gr		SCALE: 1:1	SHEET 1 OF 1



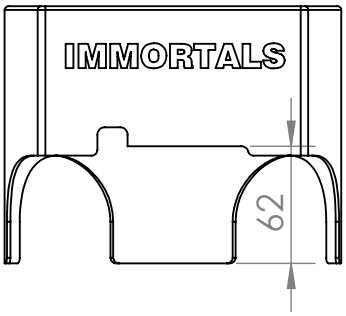


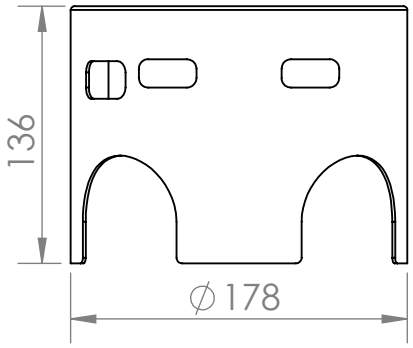
SECTION A-A

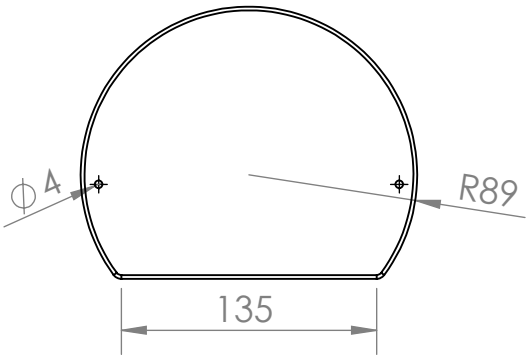


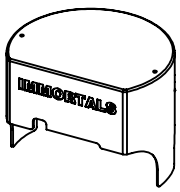


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Spacers	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 6061 Aluminum		DWG NO. IMMD 01.03.02	A4
		WEIGHT:		SCALE: 1:1	SHEET 1 OF 1

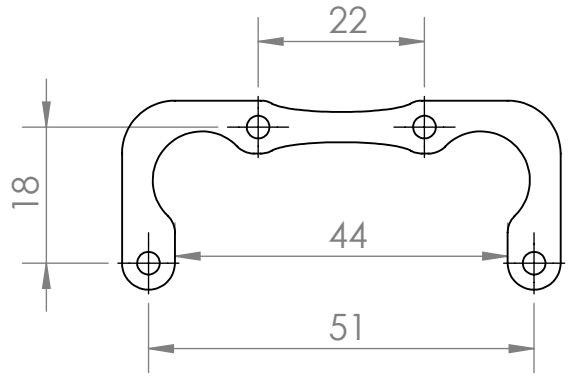


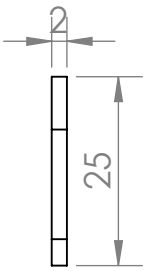


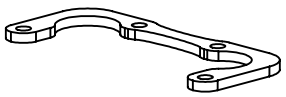




	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Robot Cover	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: Carbon/Glass Hybrid Composite		DWG NO. IMMD 01.04.01	A4
		WEIGHT: 164.2 gr		SCALE: 1:4	SHEET 1 OF 1

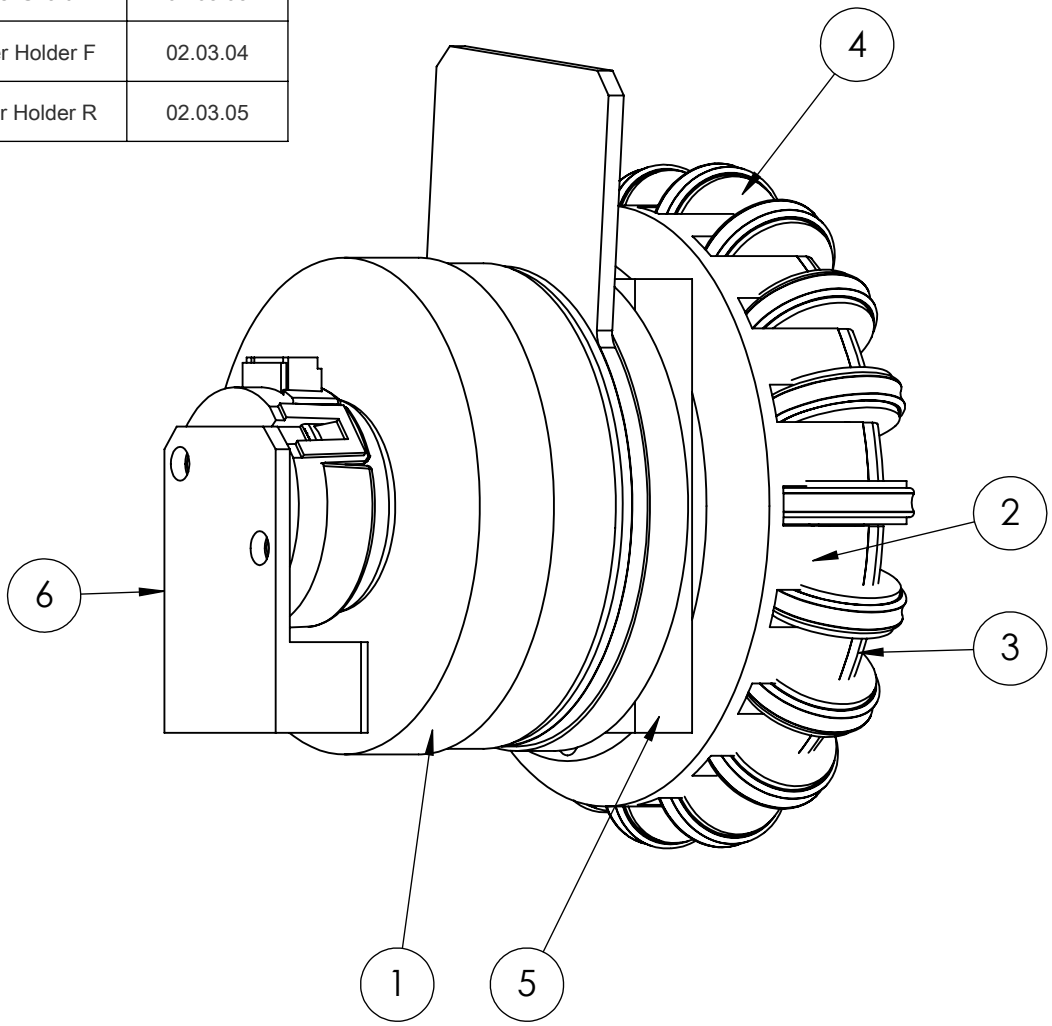




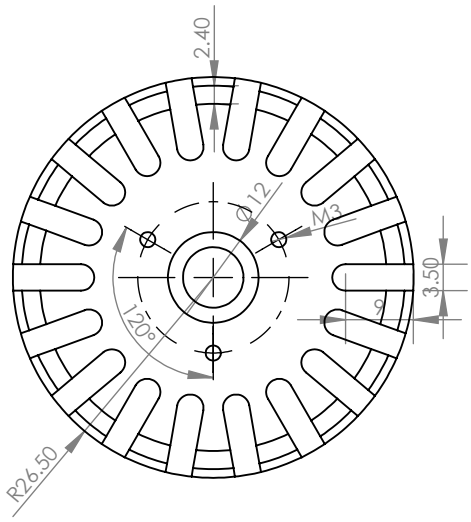


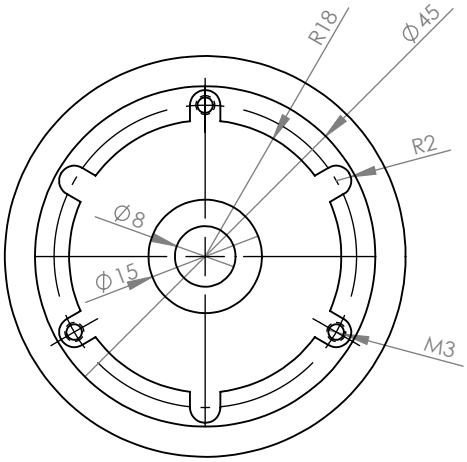
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Battery Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 6061 Aluminum		DWG NO. IMMD 01.05.01	A4
		WEIGHT: 2.5 gr		SCALE: 1:1	SHEET 1 OF 1

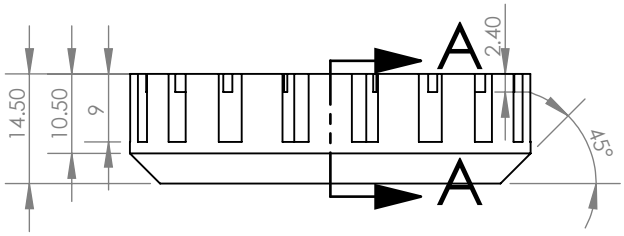
1	Back Shaft	02.01.01
7	Motor Gear	02.01.02
2	Wheel Hub	02.02.01
3	Wheel Cover	02.02.02
8	Wheel Ring	02.02.03
9	Wheel Gear	02.02.04
4	Sub Wheel	02.02.05
5	Motor Holder FR	02.03.01
10	Motor Holder RR	02.03.02
11	Wheel Shaft	02.03.03
6	Encoder Holder F	02.03.04
12	Encoder Holder R	02.03.05

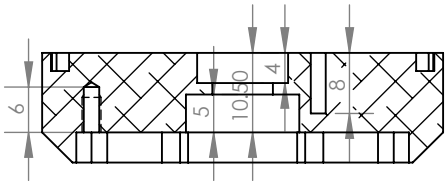


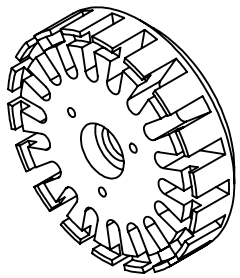
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Drive Wheel	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL:		DWG NO. IMMD 02	A4
		WEIGHT:		SCALE:	SHEET 1 OF 1



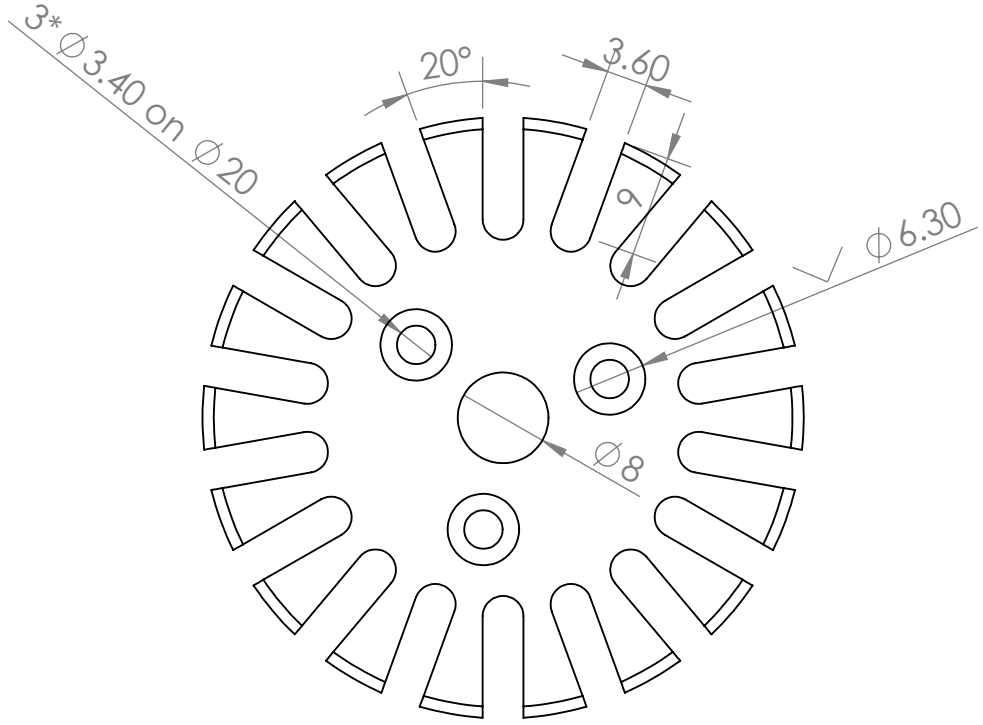


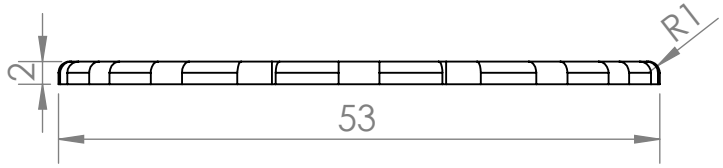


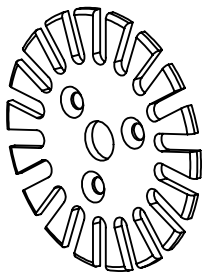




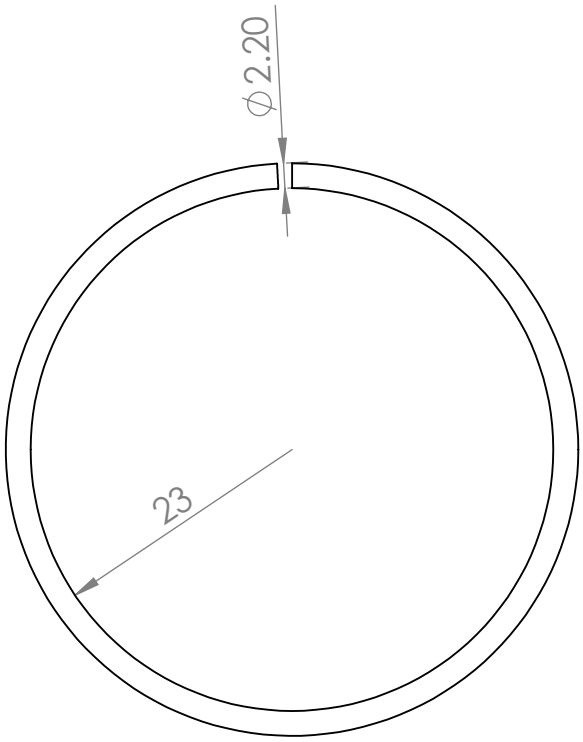
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Wheel Hub	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 02.02.01	A4
		WEIGHT: 51.7 gr		SCALE: 1:1	SHEET 1 OF 1

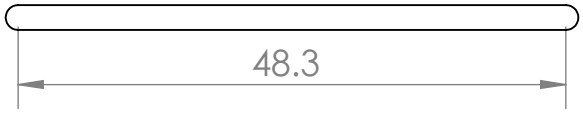


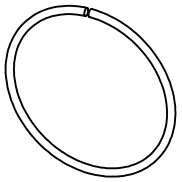




	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Wheel Cover	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 02.02.02	A4
		WEIGHT: 8 gr		SCALE: 3:2	SHEET 1 OF 1

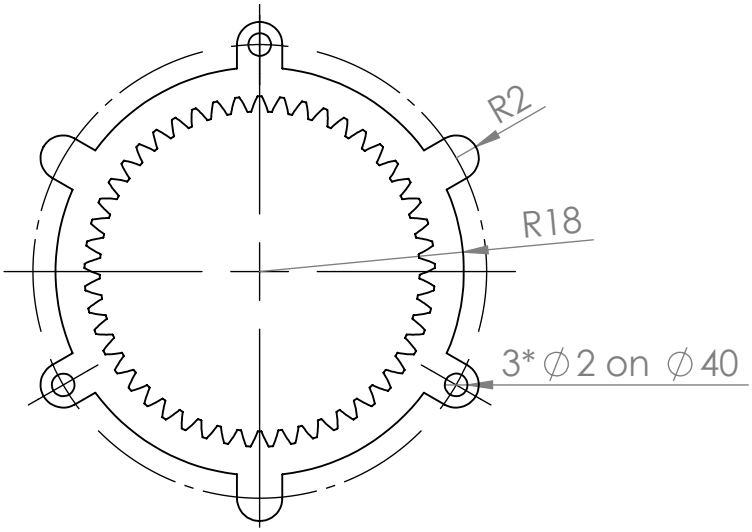


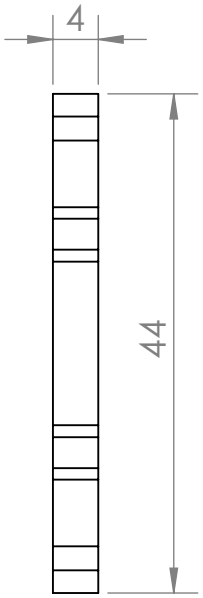


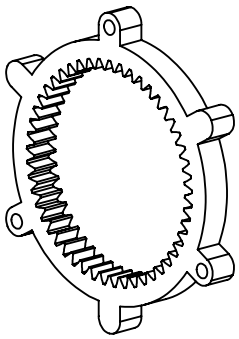


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Wheel Ring	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 304 Steel		DWG NO. IMMD 02.02.03	A4
		WEIGHT: 4.6 gr		SCALE: 3:2	SHEET 1 OF 1

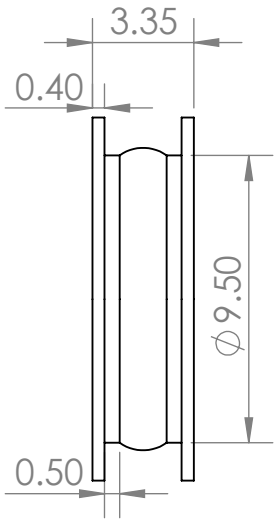
Proproties	Value
Module	0.7
No. of Teeth	49
Pitch diameter	29.4
Inside diameter	28.2
Outside diameter	30.9
Face Width	4
Pressure Angle	20

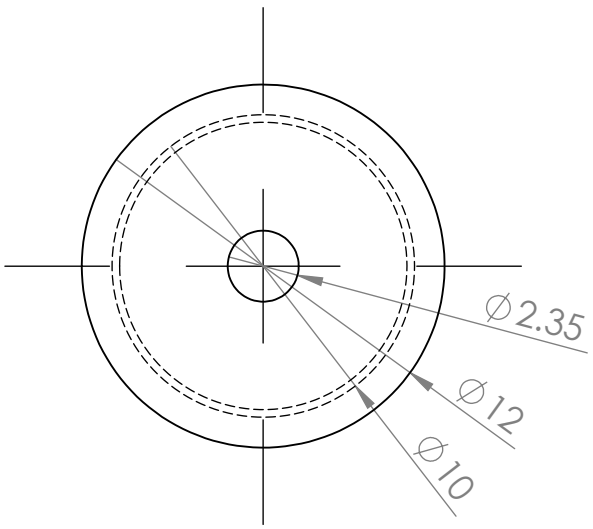


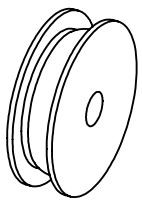




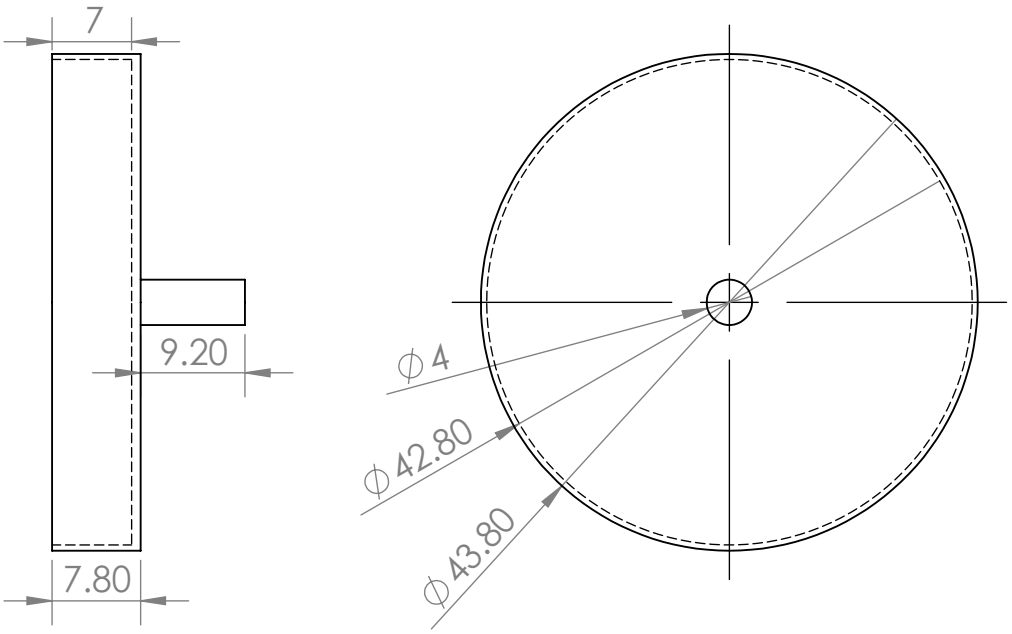
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Wheel Gear	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 1045 Steel		DWG NO. IMMD 02.02.04	A4
		WEIGHT: 12.7 gr		SCALE: 3:2	SHEET 1 OF 1

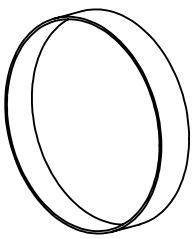






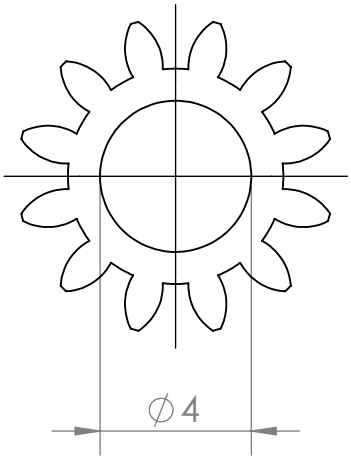
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Sub Wheel	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 12L14 Steel		DWG NO. IMMD 02.02.05	A4
		WEIGHT: 2.15 gr		SCALE: 4:1	SHEET 1 OF 1

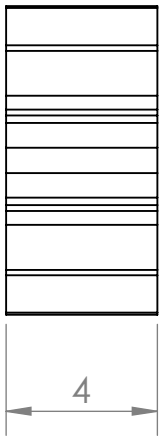


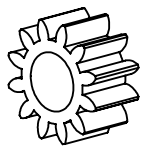


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Back Shaft	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 02.01.01	A4
		WEIGHT: 5.1 gr		SCALE: 3:2	SHEET 1 OF 1

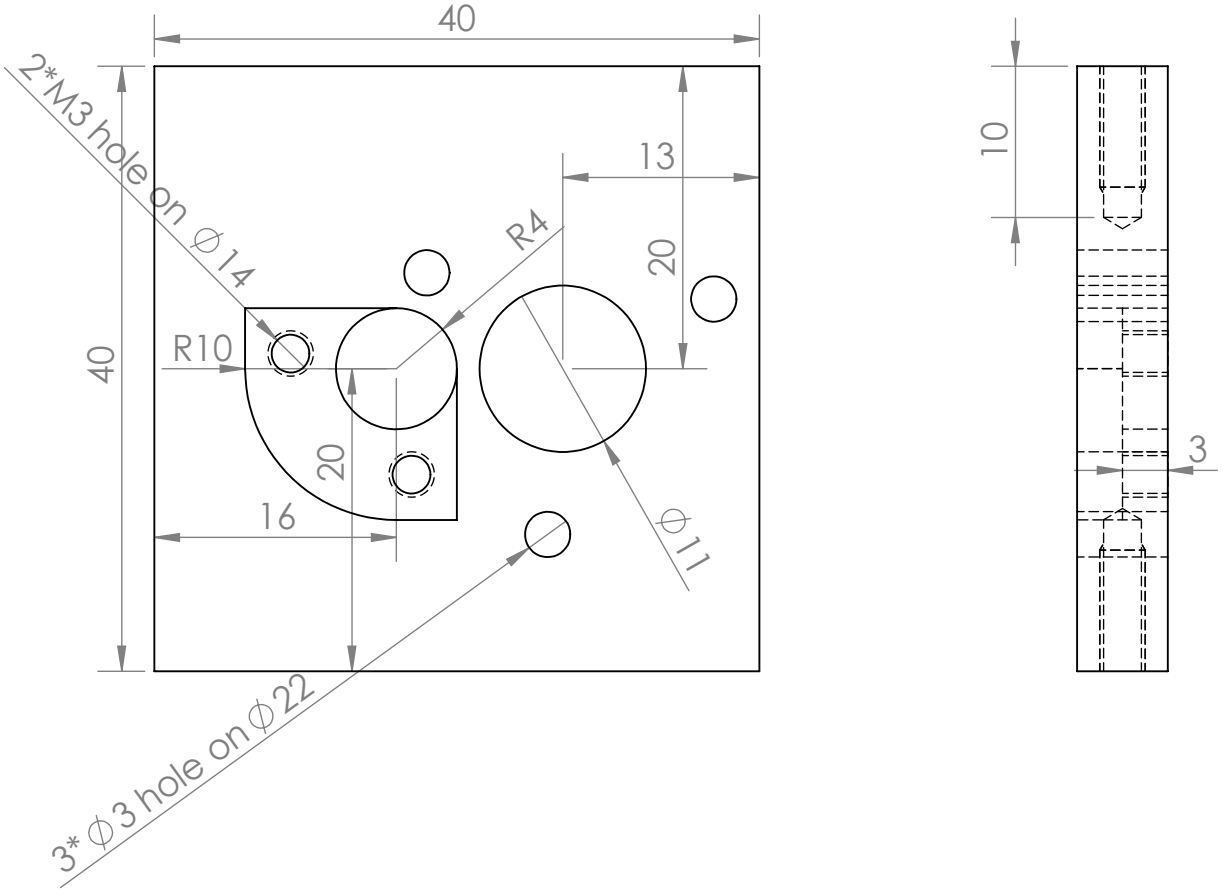
Proproties	Value
Module	0.7
No. of Teeth	12
Pitch diameter	6.8
Inside diameter	5.7
Outside diameter	8.4
Face Width	4
Pressure Angle	20

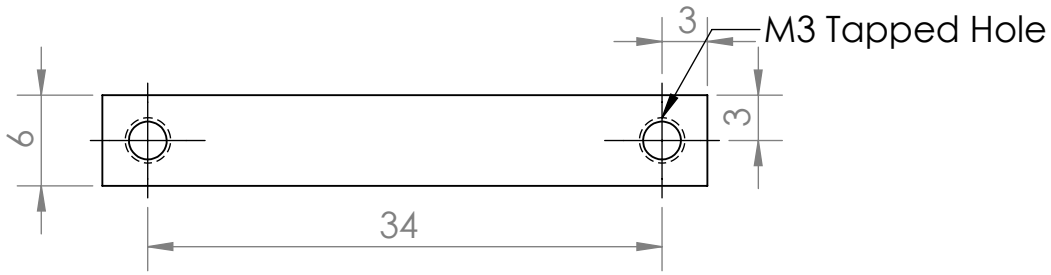


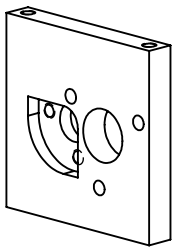




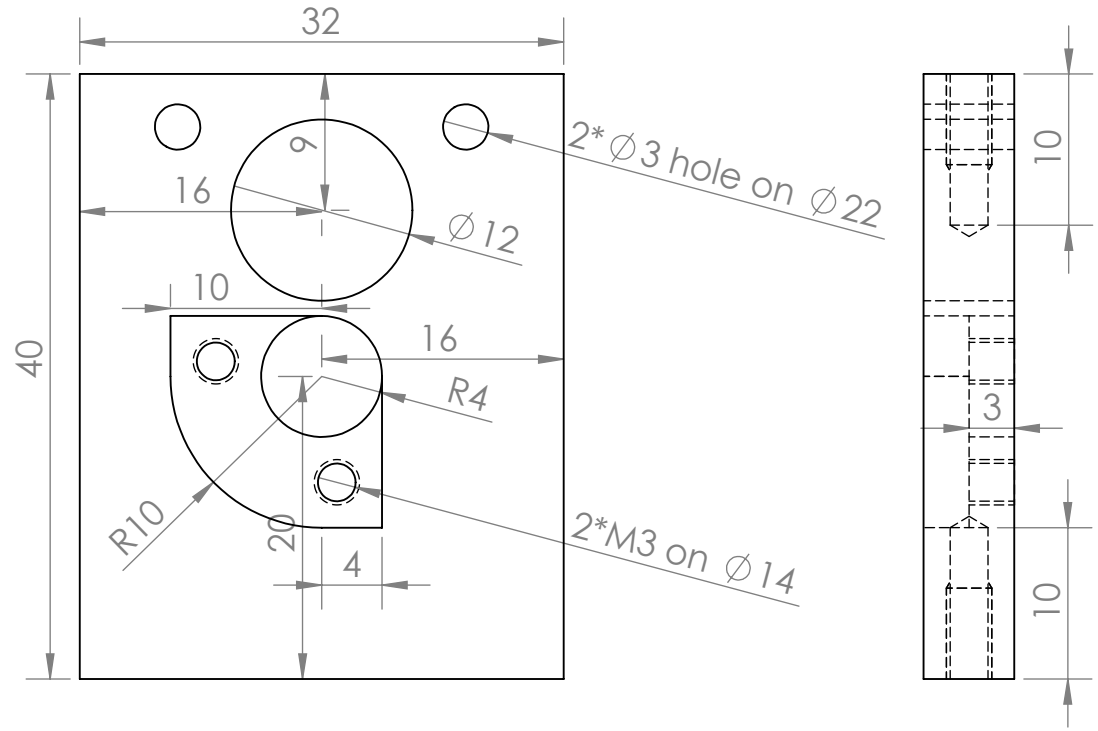
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Motor Gear	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 1045 Steel		DWG NO. IMMD 02.01.02	A4
		WEIGHT: 0.8 gr		SCALE: 5:1	SHEET 1 OF 1

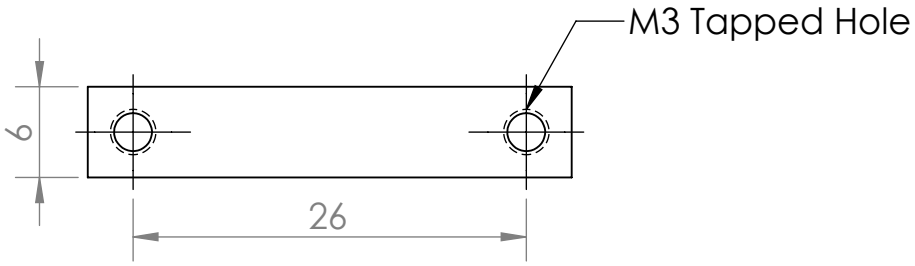


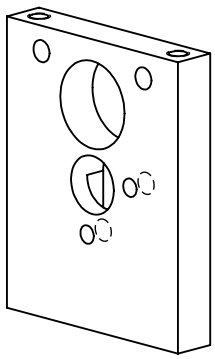




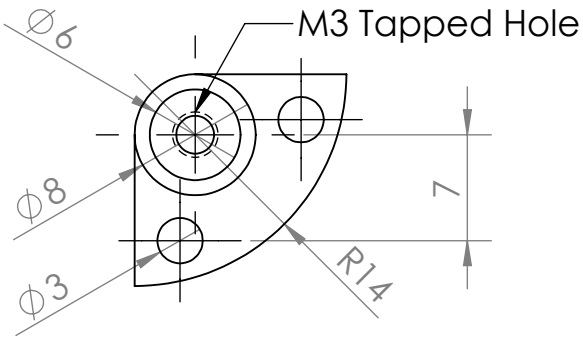
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Front Right Motor Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 02.03.01	A4
		WEIGHT: 21.6 gr		SCALE: 2:1	SHEET 1 OF 1

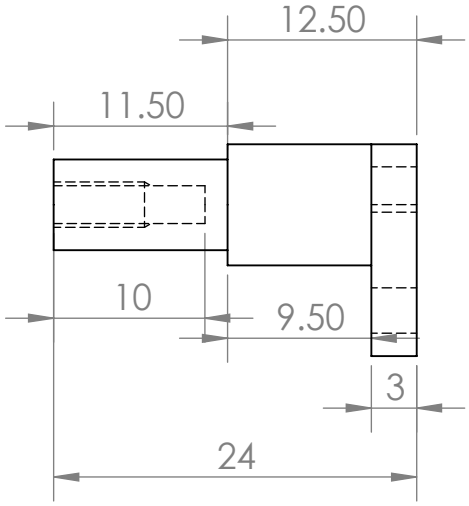


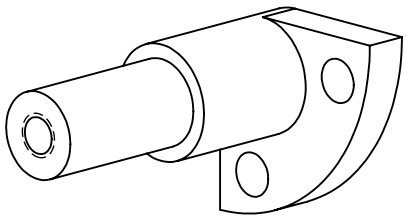




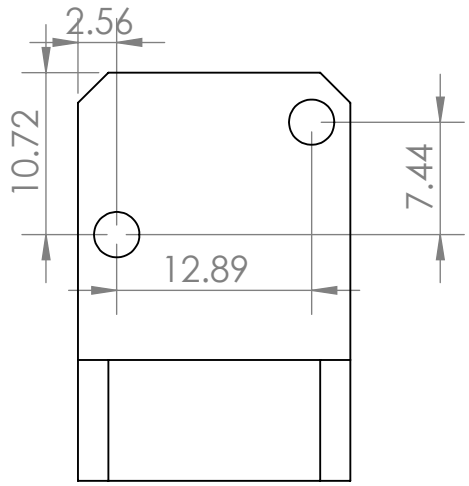
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Rear Right Motor Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 02.03.02	A4
		WEIGHT: 16.3 gr		SCALE: 2:1	SHEET 1 OF 1

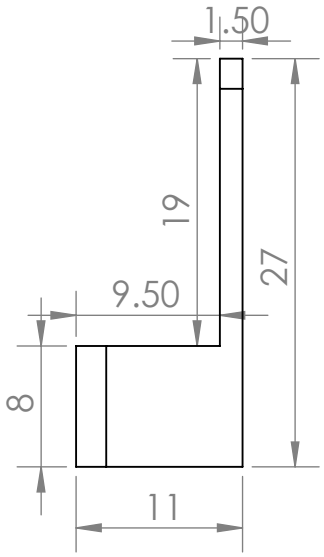


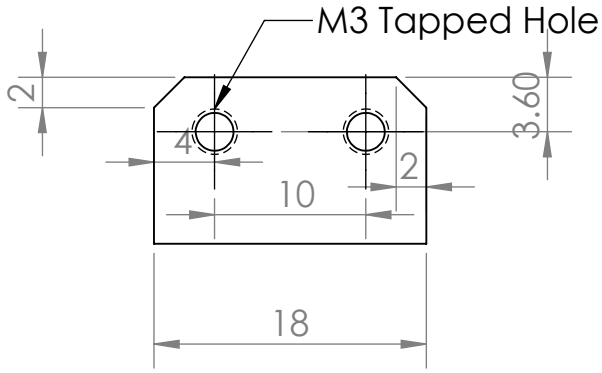


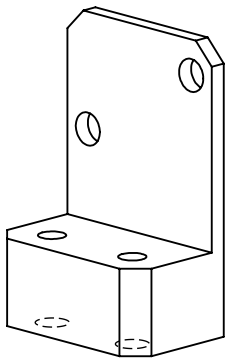


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Wheel Shaft	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 1020 Steel		DWG NO. IMMD 02.03.03	A4
		WEIGHT: 9.2 gr		SCALE: 2:1	SHEET 1 OF 1

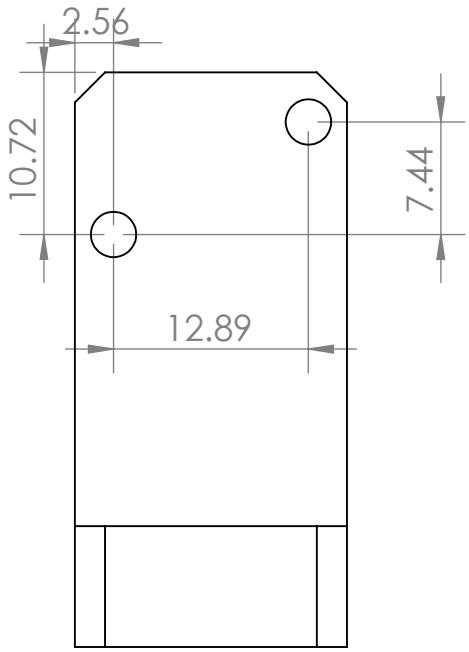


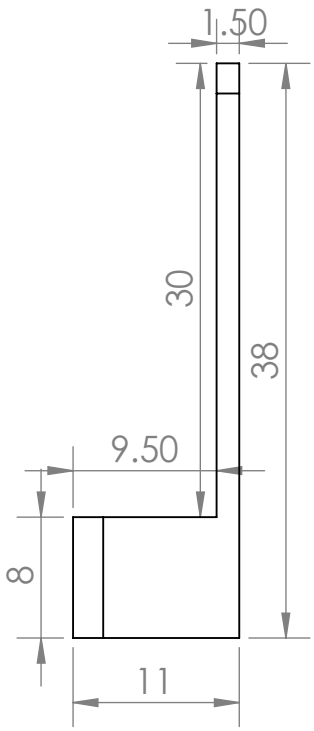


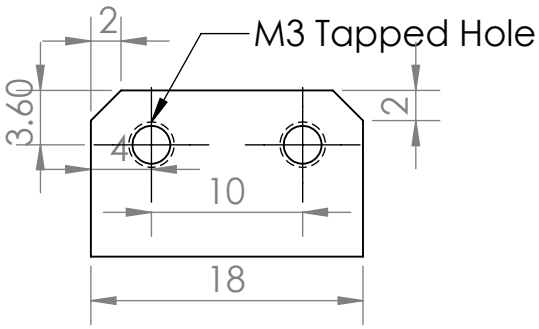


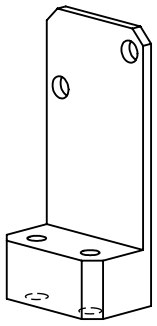


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Front Encoder Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 02.03.04	A4
		WEIGHT: 5.5 gr		SCALE: 2:1	SHEET 1 OF 1



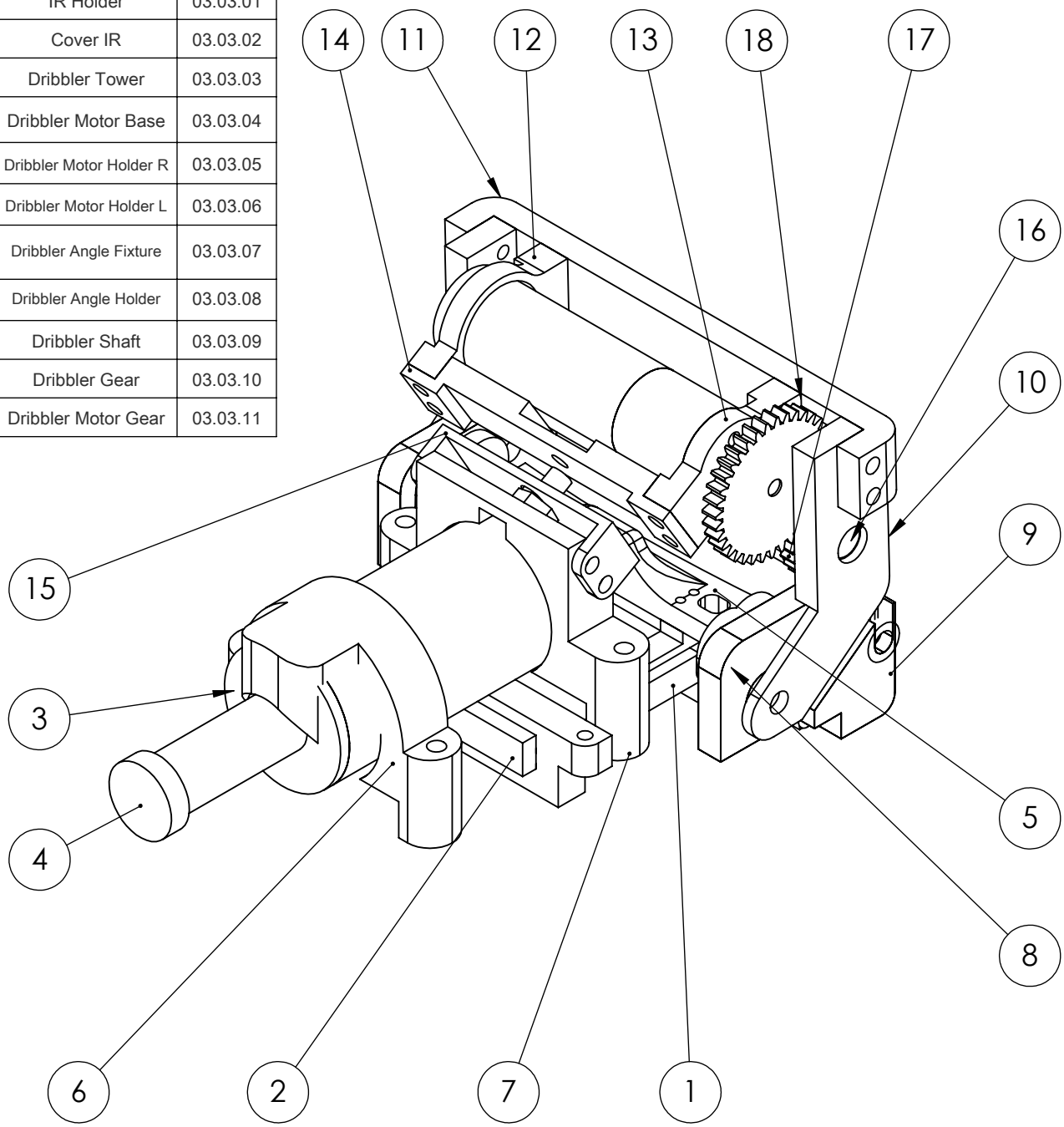




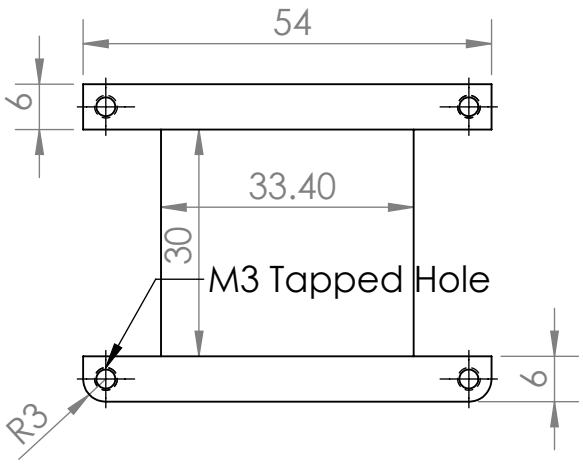


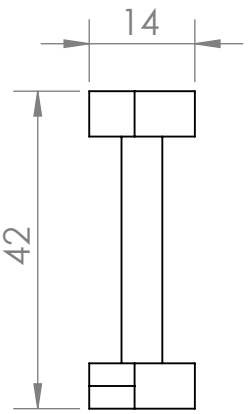
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Rear Encoder Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 02.03.05	A4
		WEIGHT: 6.3 gr		SCALE: 2:1	SHEET 1 OF 1

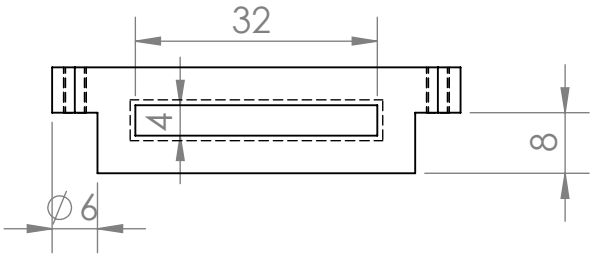
1	Chip Solenoid	03.01.01
2	Chip Plunger	03.01.02
3	Direct Kick Solenoid	03.02.01
4	Direct Kick Core	03.02.02
5	Direct Kicker	03.02.03
6	Direct Kick Rear Holder	03.02.04
7	Direct Kick Front Holder	03.02.05
8	IR Holder	03.03.01
9	Cover IR	03.03.02
10	Dribbler Tower	03.03.03
11	Dribbler Motor Base	03.03.04
12	Dribbler Motor Holder R	03.03.05
13	Dribbler Motor Holder L	03.03.06
14	Dribbler Angle Fixture	03.03.07
15	Dribbler Angle Holder	03.03.08
16	Dribbler Shaft	03.03.09
17	Dribbler Gear	03.03.10
18	Dribbler Motor Gear	03.03.11

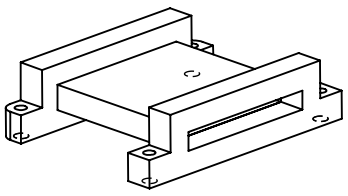


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Chip, Kick & Dribbling System	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL:		DWG NO. IMMD 03	A4
		WEIGHT:		SCALE:	SHEET 1 OF 1

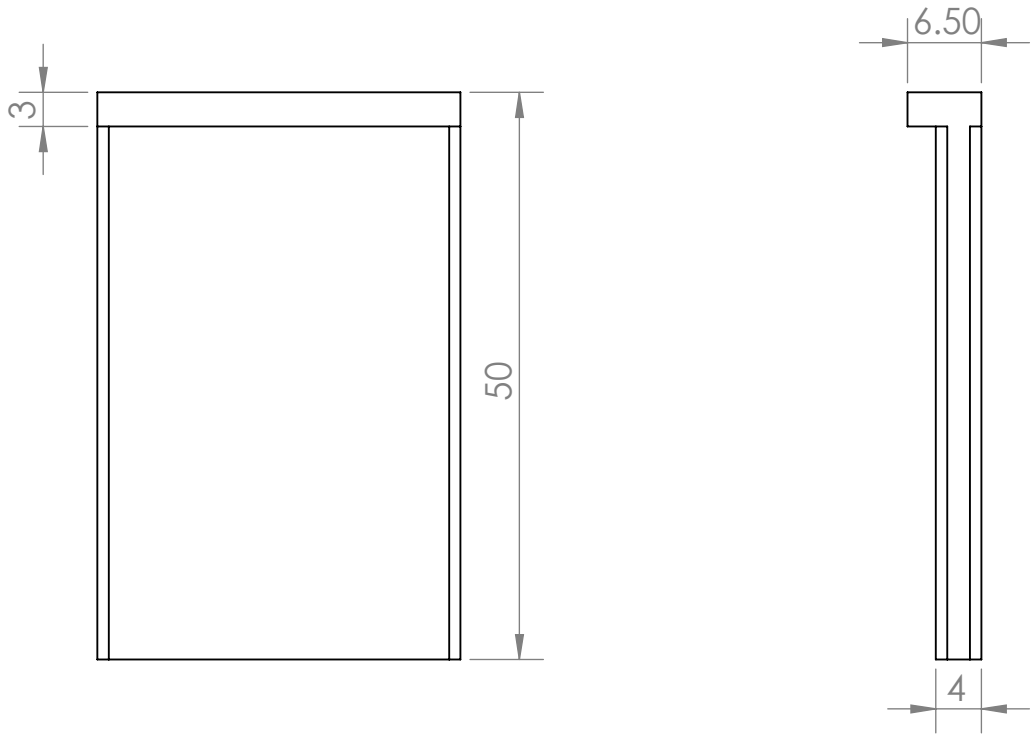


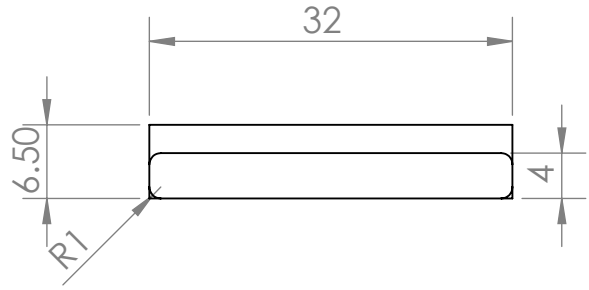




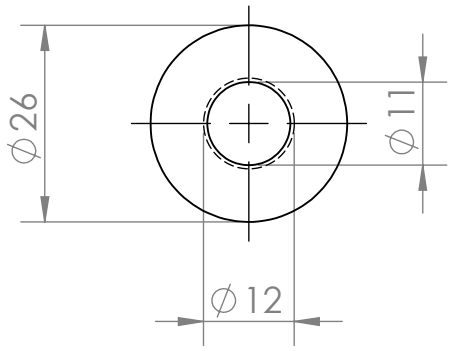


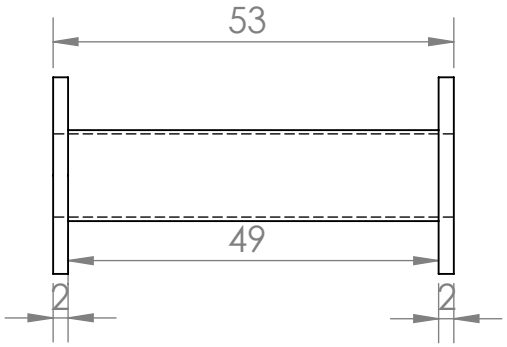
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Chip Solenoid	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: Brass		DWG NO. IMMD 03.01.01	A4
		WEIGHT: 66.4 gr		SCALE: 1:1	SHEET 1 OF 1

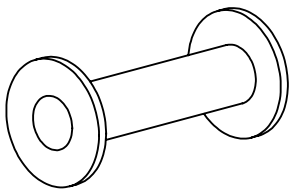




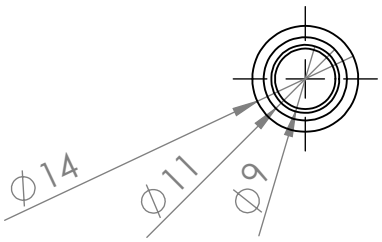
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Chip Plunger	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 1020 Steel		DWG NO. IMMD 03.01.02	A4
		WEIGHT: 52.1 gr		SCALE: 3:2	SHEET 1 OF 1

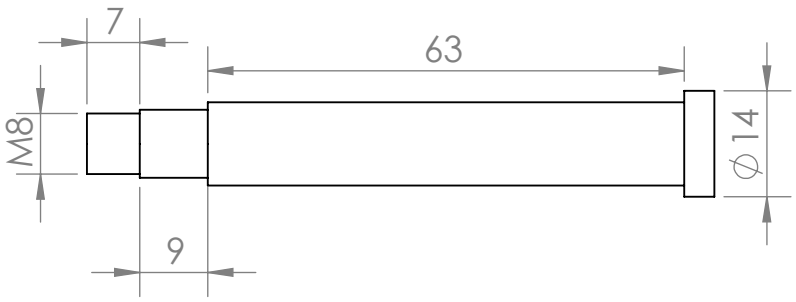


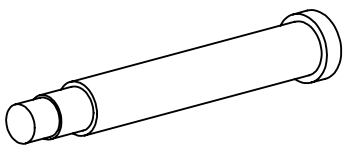




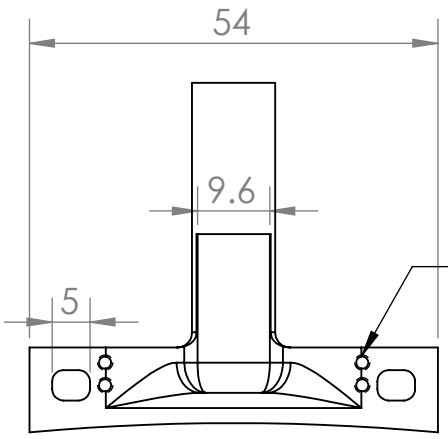
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Direct Kick Solenoid	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: Brass		DWG NO. IMMD 03.02.01	A4
		WEIGHT: 22.3 gr		SCALE: 1:1	SHEET 1 OF 1

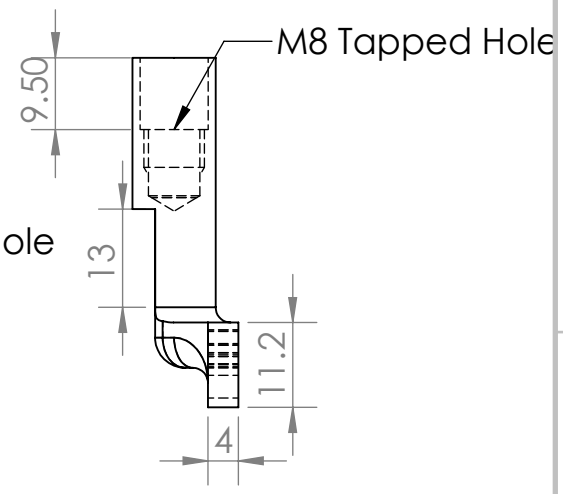


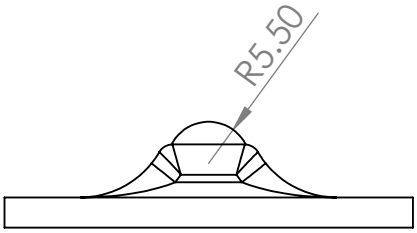


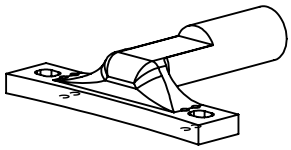


	NAME	DATE		TITLE:
DRAWN	Ali Ghazi	Jan. 2010		Direct Kick Core
APPV'D	Ali Amoozandeh	Mar. 2010		
MFG	Mohammad Hosein Fazeli	MATERIAL: 1020 Steel	DWG NO. IMMD 03.02.02	A4
		WEIGHT: 59.5 gr	SCALE: 1:1	SHEET 1 OF 1

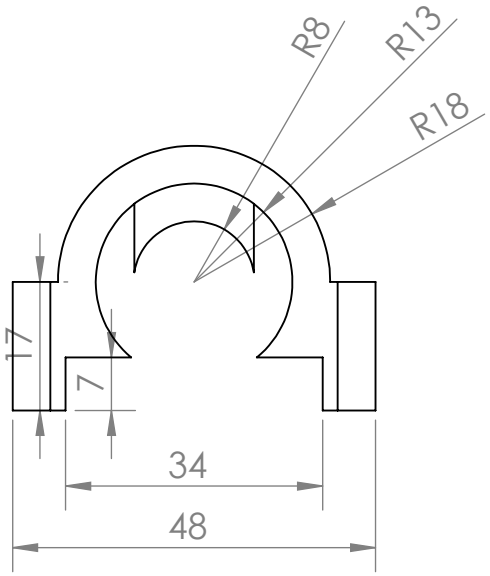


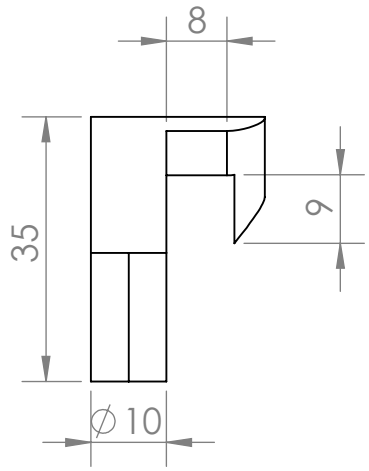


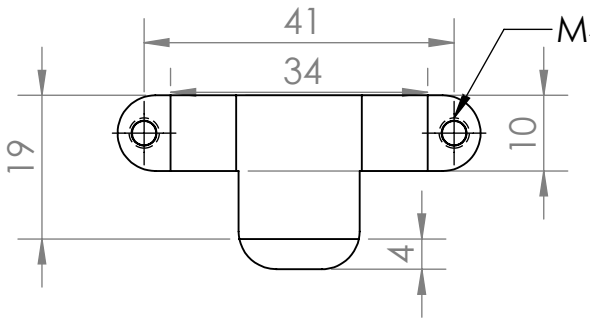


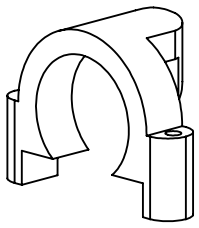


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Direct Kicker	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 03.02.03	A4
		WEIGHT: 13.7 gr		SCALE: 1:1	SHEET 1 OF 1

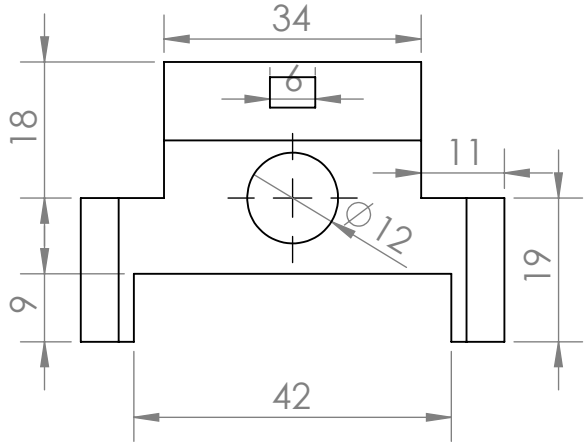


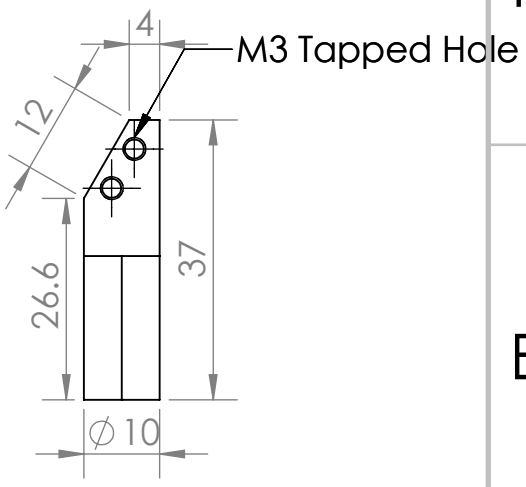


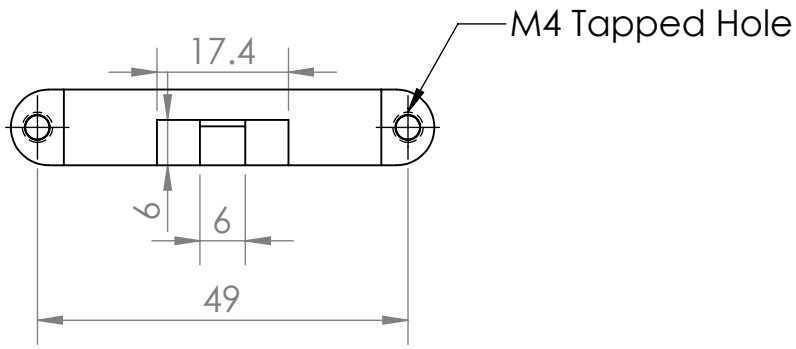


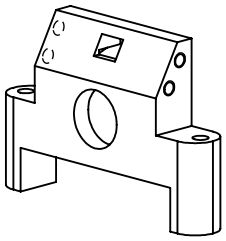


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Direct Kick Rear Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 03.02.04	A4
		WEIGHT: 18.5 gr		SCALE: 1:1	SHEET 1 OF 1

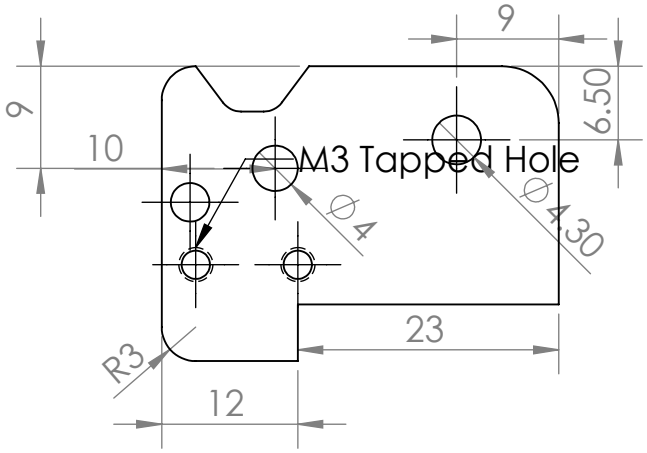


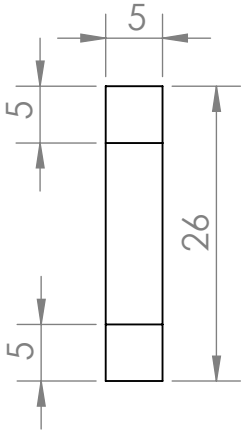


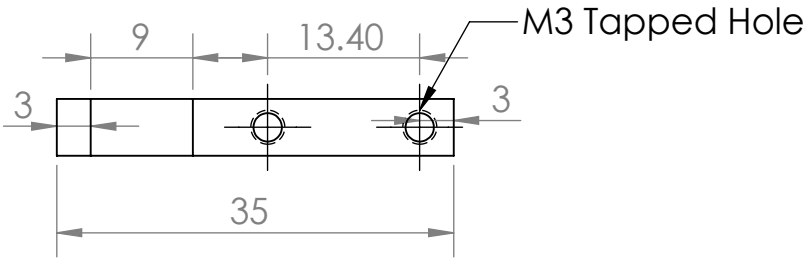


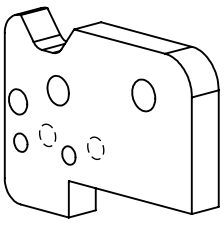


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Direct Kick Front Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 03.02.05	A4
		WEIGHT: 21 gr		SCALE: 1:1	SHEET 1 OF 1

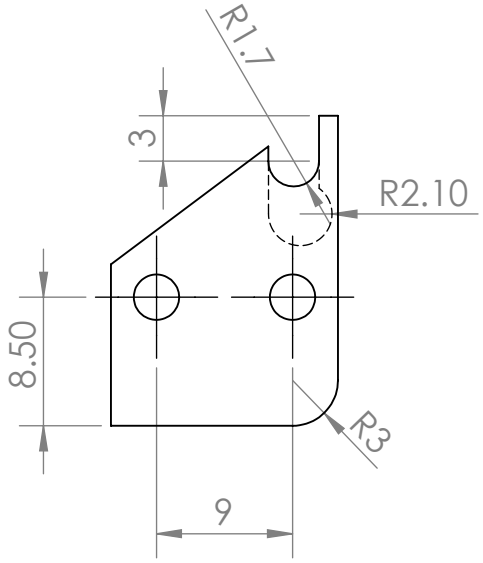


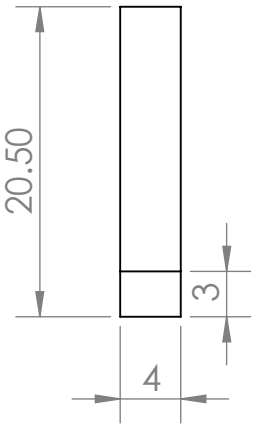


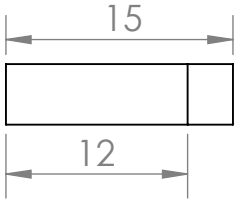


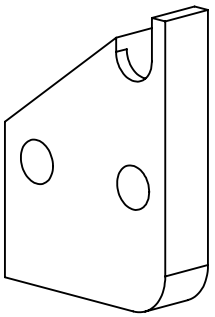


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		IR Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 03.03.01	A4
		WEIGHT: 9.7 gr		SCALE:	SHEET 1 OF 1

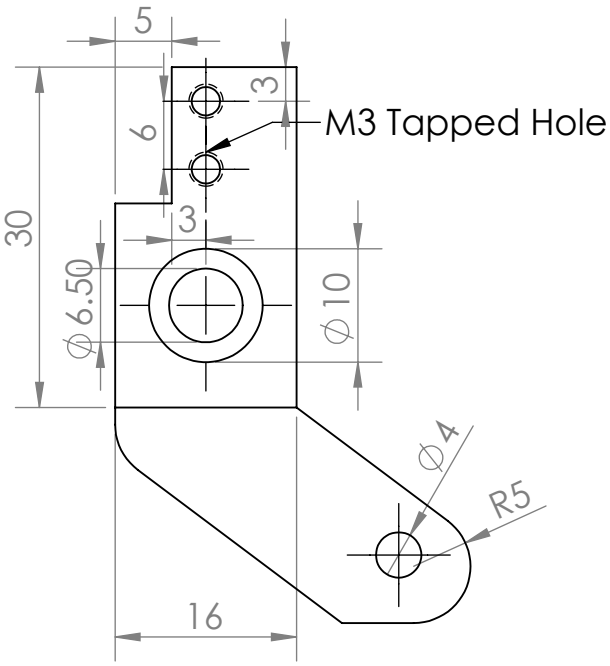


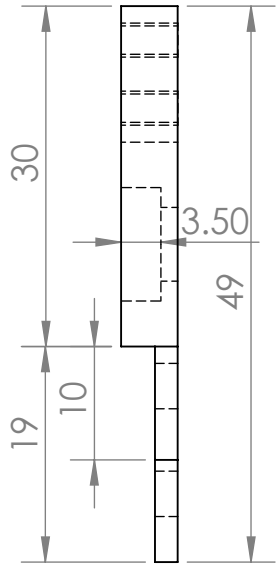


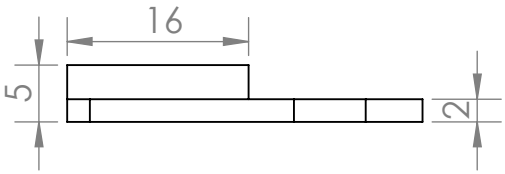


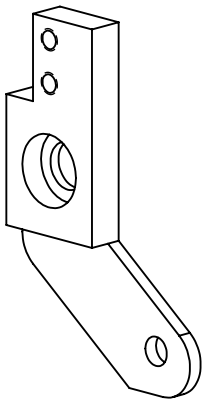


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Cover IR	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 304 Steel		DWG NO. IMMD 03.03.02	A4
		WEIGHT: 6.5 gr		SCALE: 2:1	SHEET 1 OF 1

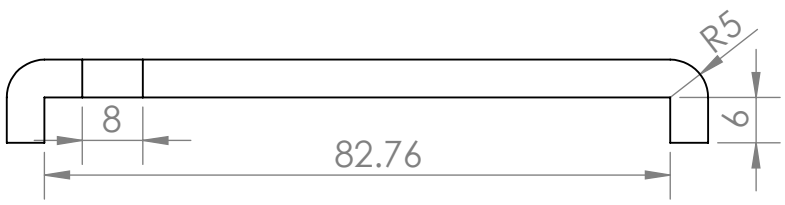


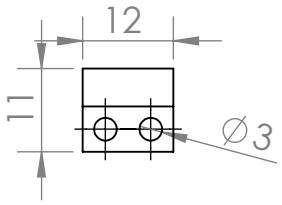


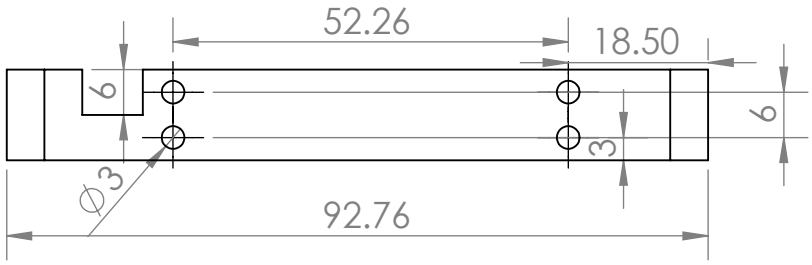


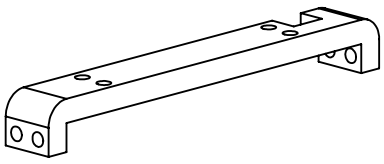


	NAME	DATE		TITLE:
DRAWN	Ali Ghazi	Jan. 2010		Dribbler Tower
APPV'D	Ali Amoozandeh	Mar. 2010		
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum	DWG NO. IMMD 03.03.03	A4
		WEIGHT: 6.8 gr	SCALE: 3:2	SHEET 1 OF 1

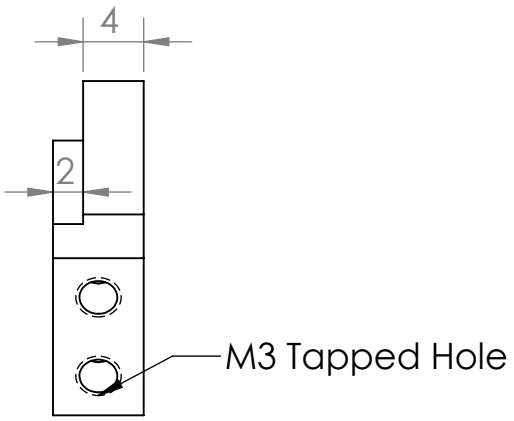


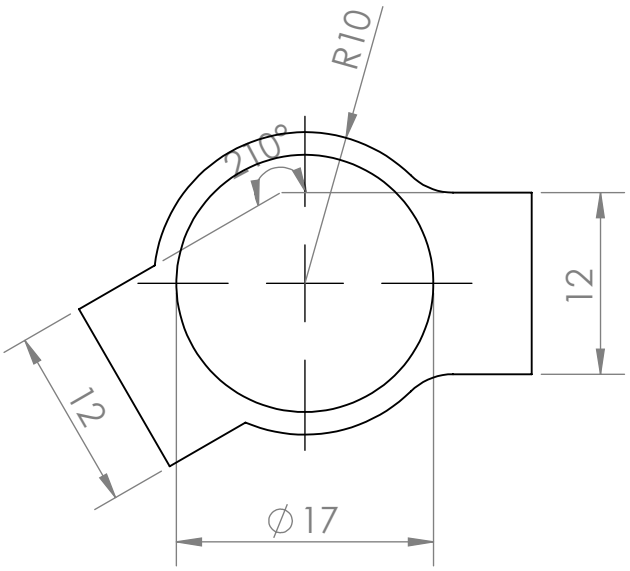


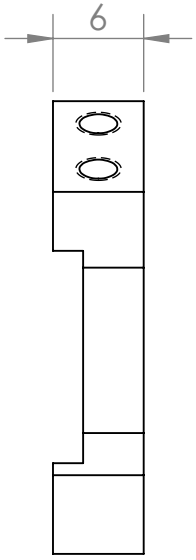


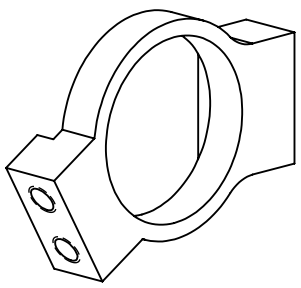


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Dribbler Motor Base	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 03.03.04	A4
		WEIGHT: 15.8 gr		SCALE: 1:1	SHEET 1 OF 1

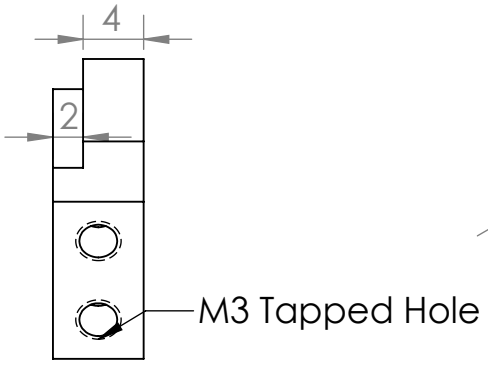


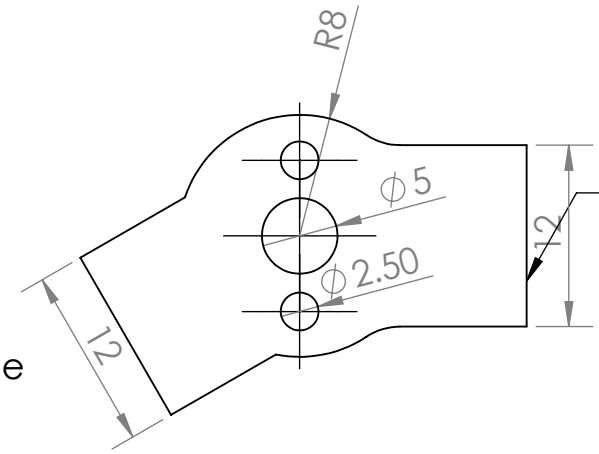


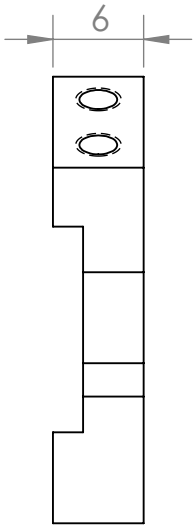


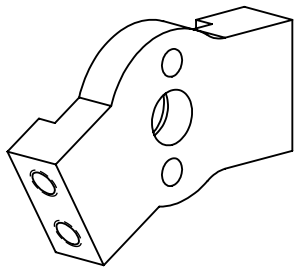


	NAME	DATE		TITLE:
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Right Dribbler Motor Holder
APPV'D	Ali Amoozandeh	Mar. 2010		
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 03.03.05 A4
		WEIGHT: 2.8 gr		SCALE: 2:1 SHEET 1 OF 1

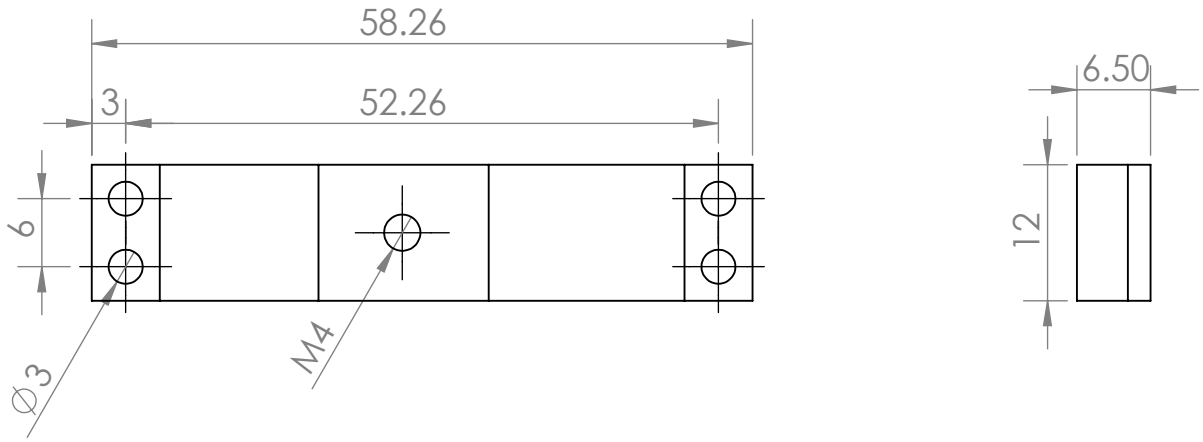


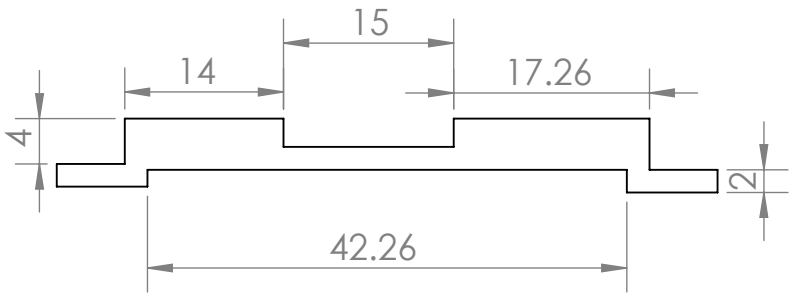


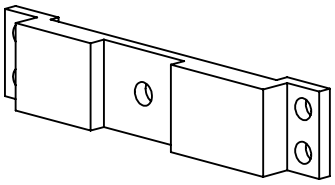




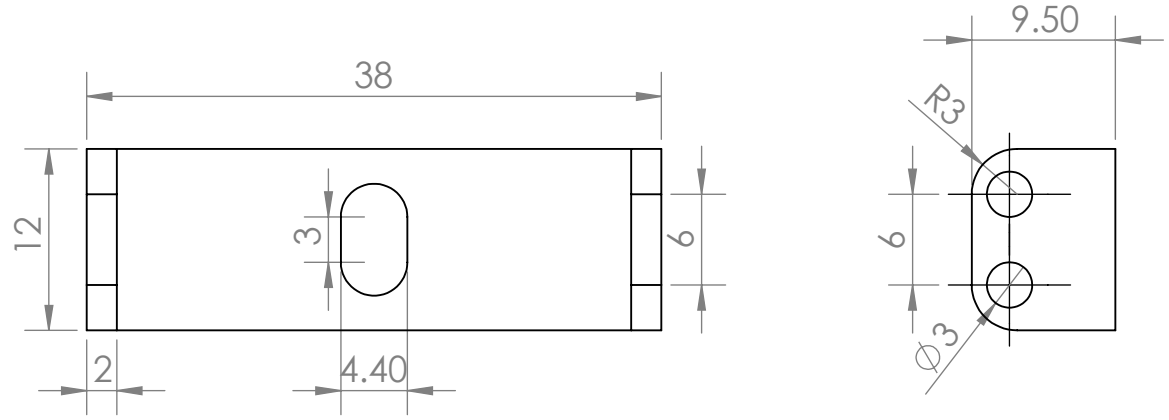
	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Left Dribbler Motor Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 03.03.06	A4
		WEIGHT: 4.2 gr		SCALE: 2:1	SHEET 1 OF 1

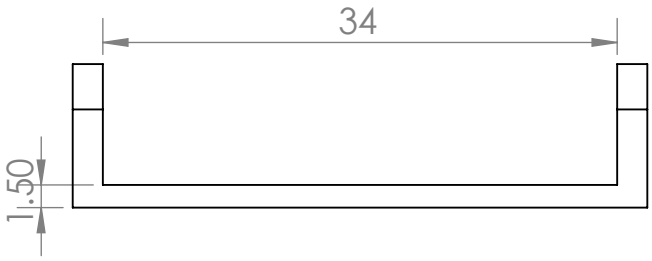


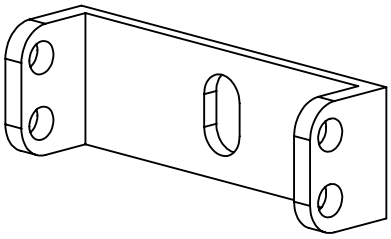




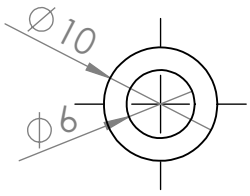
	NAME	DATE		TITLE:
DRAWN	Ali Ghazi	Jan. 2010	IMMORIALS	Dribbler Angle Fixture
APPV'D	Ali Amoozandeh	Mar. 2010		
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum	DWG NO. IMMD 03.03.07	A4
		WEIGHT: 6.6 gr	SCALE: 3:2	SHEET 1 OF 1

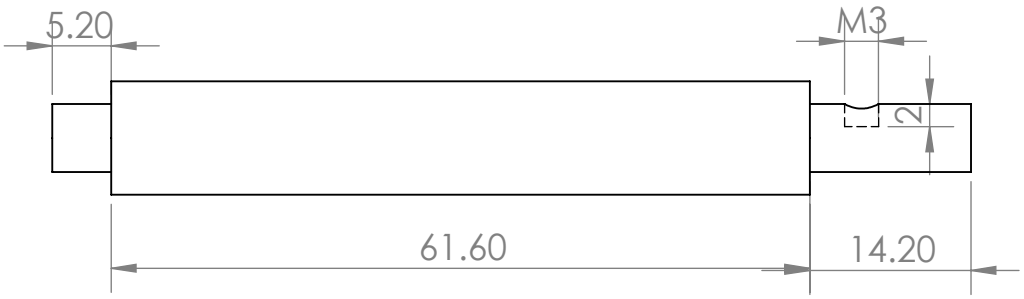


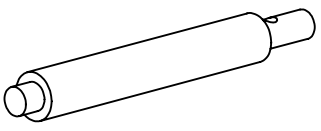




	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Dribbler Angle Holder	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 7075 Aluminum		DWG NO. IMMD 03.03.08	A4
		WEIGHT: 1 gr		SCALE: 2:1	SHEET 1 OF 1

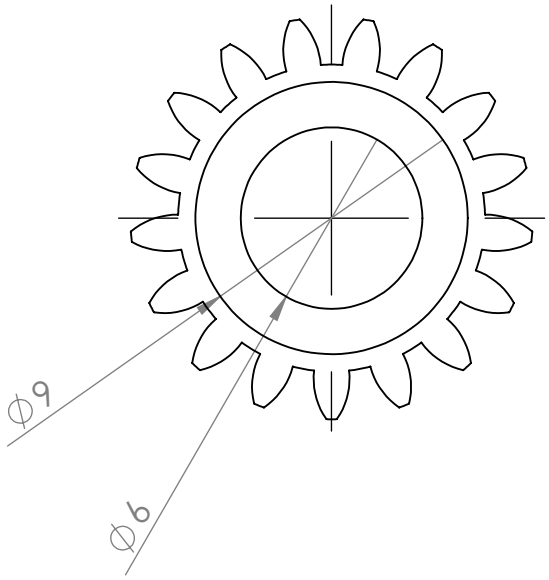


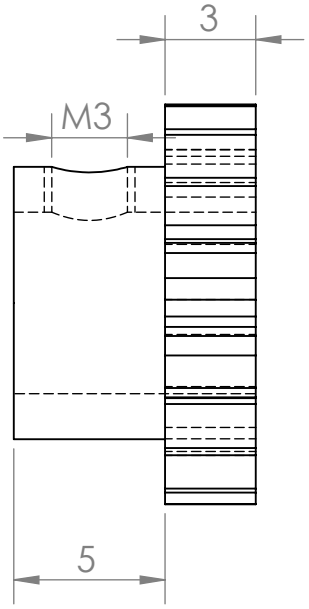


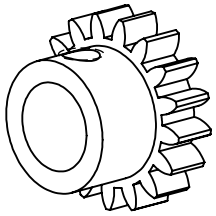


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010	IMMORTALS	Dribbler Shaft	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 1045 Steel		DWG NO. IMMD 03.03.09	A4
		WEIGHT: 42.2 gr		SCALE: 3:2	SHEET 1 OF 1

Proproties	Value
Module	0.7
No. of Teeth	17
Pitch diameter	11.9
Inside diameter	10.15
Outside diameter	13.3
Face Width	3
Pressure Angle	20

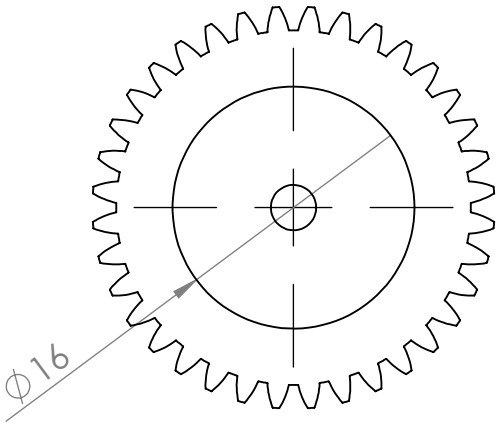


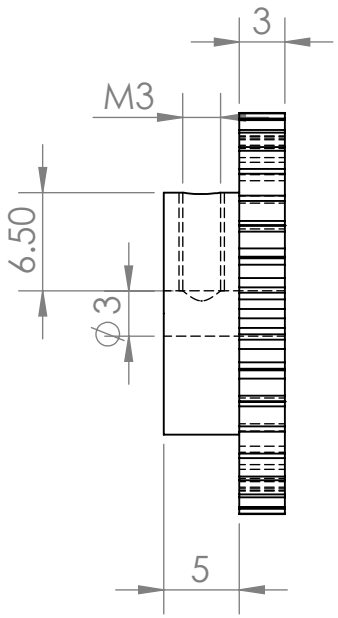


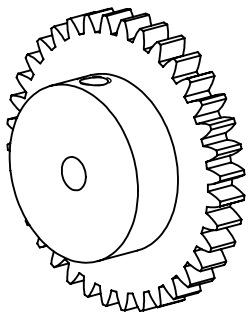


	NAME	DATE		TITLE:	
DRAWN	Ali Ghazi	Jan. 2010		Dribbler Gear	
APPV'D	Ali Amoozandeh	Mar. 2010			
MFG	Mohammad Hosein Fazeli	MATERIAL: 1045 Steel		DWG NO. IMMD 03.03.10	A4
		WEIGHT: 3.4 gr		SCALE: 4:1	SHEET 1 OF 1

Proproties	Value
Module	0.7
No. of Teeth	36
Pitch diameter	25.7
Inside diameter	23.45
Outside diameter	26.6
Face Width	3
Pressure Angle	20







	NAME	DATE		TITLE:
DRAWN	Ali Ghazi	Jan. 2010		Dribbler Motor Gear
APPV'D	Ali Amoozandeh	Mar. 2010		
MFG	Mohammad Hosein Fazeli	MATERIAL: 1045 Steel		DWG NO. IMMD 03.03.11 A4
		WEIGHT: 18.7 gr		SCALE: 2:1 SHEET 1 OF 1