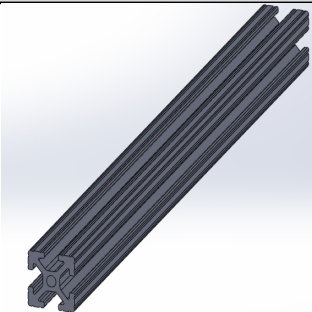
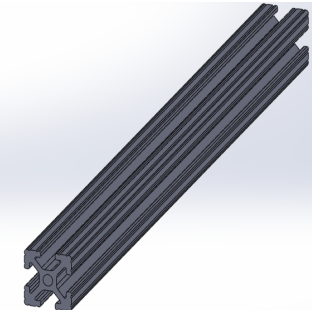
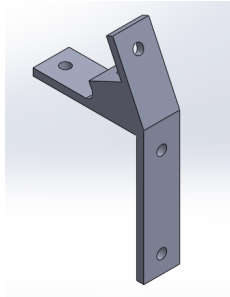


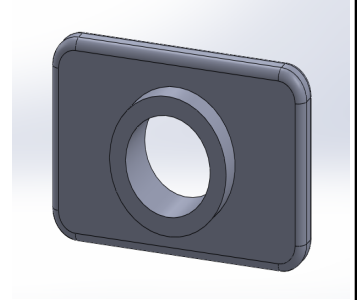


ID	Part Name	Vendor Number	Quantity	Description	Photo
A1	Aluminum Extrusion 80/20 Size 20-2020 Cut to 265 mm long Tapped M5 x 0.8 bolt	Misumi HFS5-2020-265-TPW	4	<i>T-Slotted Frame Shortest (x-axis)</i>	
A2	Aluminum Extrusion 80/20 Size 20-2020 Cut to 300 mm long Tapped M5 x 0.8 bolt	Misumi HFS5-2020-300-TPW	4	<i>T-Slotted Frame 2nd Shortest (yz-axis)</i>	
A3	Lower Middle Vertex	3D Printer N/A	4	<i>Middle Bracket (x-axis)</i>	
A4	M5 x 10 Bolt, SHCS Black-oxide	McMaster-Carr 91239A224	12	<i>M5 x 10 Bolt</i>	
A5	M5 Washer, Steel, Zinc Plated	McMaster-Carr 91166A240	16	<i>M5 Washer</i>	

A6	80/20 Slide-In Economy TNut M5 Thread	Misumi HNKK5-5	25	<i>T-Nut</i>
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A7	M5 x 14 Bolt, SHCS Black-Oxide	McMaster-Carr 91290A230	4	<i>M5 x 14 Bolt</i>
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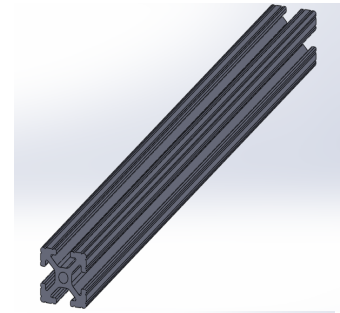
B1

Aluminum Extrusion
80/20 Size 20-2020
Cut to 380 mm long
Tapped M5 x 0.8 bolt

McMaster-Carr
HFS5-2020-380-TPW

4

*T-Slotted Frame
2nd Longest
(y-axis)*



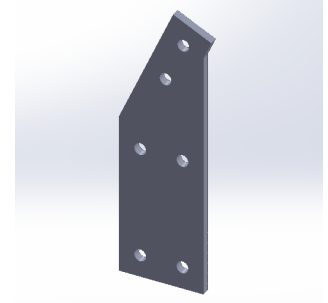
B2

Lower Left-Right
Vertex

3D Printer N/A

4

*Left/Right Bottom
Corners
(y-axis)*



A4

M5 x 10 Bolt,
SHCS Black-Oxide

McMaster-Carr
91290A115

28

M5 x 10 Bolt



A5

M5 Washer,
Steel, Zinc Plated

McMaster-Carr
91166A240

28

M5 Washer



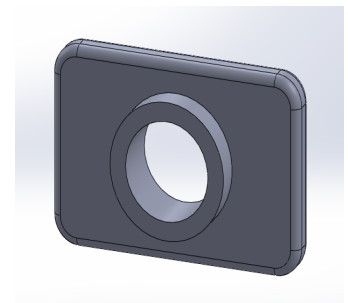
A6

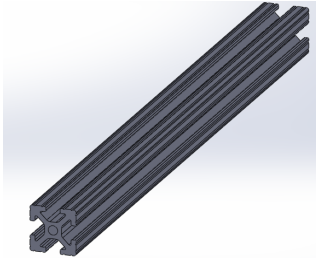
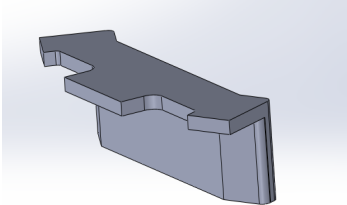



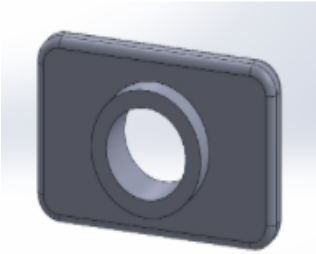
80/20 Slide-In
Economy
TNut M5 Thread

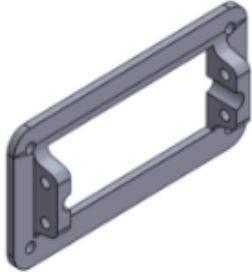
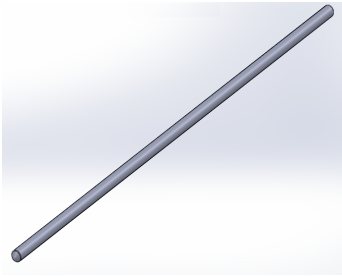
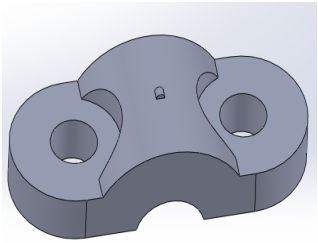
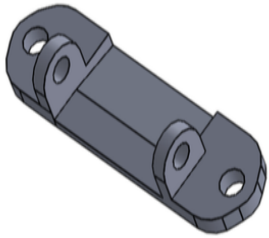
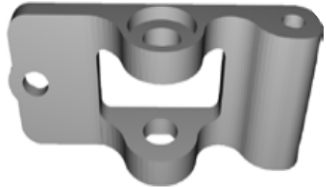
Misumi
HNKK5-5

28

T-Nut

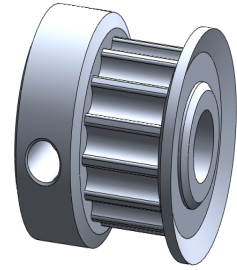


C1	Aluminum Extrusion 80/20 Size 20-2020 Cut to 385 mm long Tapped M5 x 0.8 bolt Horz Drilled Holes	Misumi HFS5-2020-385-TPW- AH70-BH315	2	<i>T-Slotted Frame Longest (x-axis)</i>	
C2	Z Upper Idler	3D Printer N/A	2	<i>Upper Mount (z-axis)</i>	
C3	M5 x 16 Bolt, BHCS Black-Oxide	McMaster-Carr 91239A232	4	<i>M5 x 16 Bolt</i>	
A4	M5 x 10 Bolt, SHCS Black-Oxide	McMaster-Carr 91290A115	8	<i>M5 x 10 Bolt</i>	
A5	M5 Washer, Steel, Zinc Plated	McMaster-Carr 91166A240	8	<i>M5 Washer</i>	
A6	80/20 Slide-In Economy TNut M5 Thread	Misumi HNKK5-5	5	<i>T-Nut</i>	

D1	Y Rod Mount	3D Printer N/A	2	<i>Rod Mount (y-axis)</i>	
D2	8mm rod (5/16" drill rod) 36"	Fastenal 47768	2	<i>Steel Rod (y-axis)</i>	
D3	Z Rod Clamp	3D Printer N/A	4	<i>Clamp (z-axis)</i>	
D4	Y Tensioner Mount	3D Printer N/A	1	<i>Idler Mount (y-axis)</i>	
D5	Y Idler Tensioner	3D Printer N/A	1	<i>Idler Tensioner (y-axis)</i>	

D6	LM8UU Bearing Holder	3D Printer N/A	4	<i>Bearing Mount</i>	
D7	12x LM8UU Linear Bearings	Amazon 0601227135386	4	<i>Bearings</i>	
D8	608ZZ Bearings	Amazon 0793200418750	4	<i>Bearings</i>	
D9	Y Motor Mount	3D Printer N/A	1	<i>Motor Mount (y-axis)</i>	
D10	Nema 17 Stepper Motor 2 A 45 Ncm (64oz.in)	Amazon 17HS16-2004S1	1	<i>Nema 17 Stepper Motor</i>	

D11	2x Aluminum GT2 16T Pulley and 2M Belt for RepRap 3D printer Prusa i3	Amazon 0087169815683 6907496758795	1	16T Pulley
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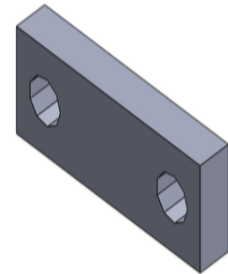
D12	2x Aluminum GT2 16T Pulley and 2M Belt for RepRap 3D printer Prusa i3	Amazon 0087169815683 6907496758795	1	2M Belt
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D13	Base Stage Plate	Custom Machine Fabrication N/A	1	N/A
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D14	Belt Clamp	3D Printer N/A	2	Belt Clamp (y-axis)
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D15	M8 x 30 Bolt, SHCS Black-Oxide	McMaster-Carr 91290A434	1	M8 x 30 Bolt
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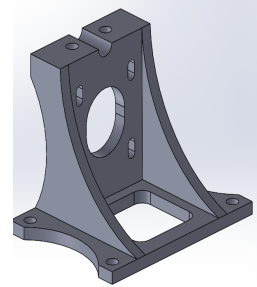
D16	M8 Nut Nyloc	McMaster-Carr 90576A117	1	<i>M8 Nut</i>	
D17	M5 Nut	McMaster-Carr 90591A146	18	<i>M5 Nut</i>	
D18	M3 x 10 Bolt, SHCS Black-Oxide	McMaster-Carr 91290A115	14	<i>M3 x 10 Bolt</i>	
D19	M3 Washer, Steel, Zinc Plated	McMaster-Carr 91166A210	14	<i>M3 Washer</i>	
A4	M5 x 10 Bolt, SHCS Black-oxide	McMaster-Carr 91239A224	12	<i>M5 x 10 Bolt</i>	
A5	M5 Washer, Steel, Zinc Plated	McMaster-Carr 91166A240	16	<i>M5 Washer</i>	

E1 Lower Z Motor Mount

3D Printer
N/A

2

*Lower Motor
Mount
(z-axis)*

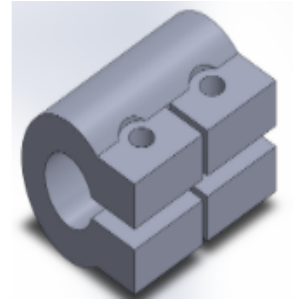


E2 Beefy Coupler

3D Printer
N/A

2

*Beefy Coupler
(z-axis)*



E3 M3 x 20 Bolt,
SHCS Black-Oxide

McMaster-Carr
91290A123

10

M3 x 20 Bolt



E4 M3 Nylon Lock Nut

McMaster-Carr
90576A102

12

M3 Lock Nut

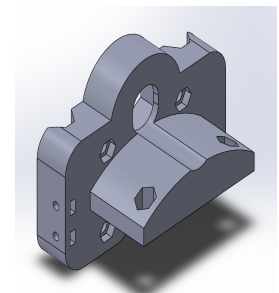


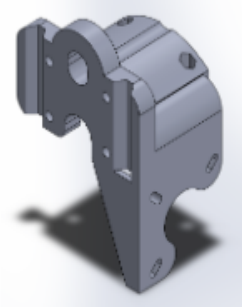
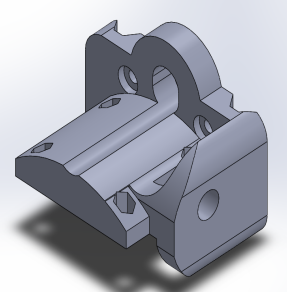
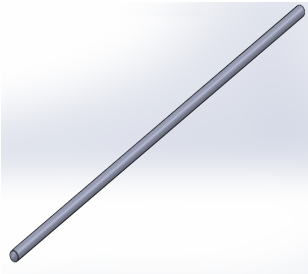


E5 Lower Z Mount Clamp




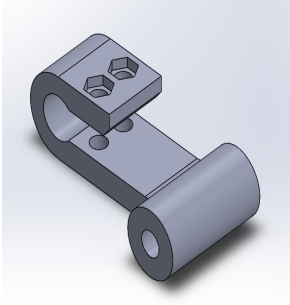

3D Printer
N/A


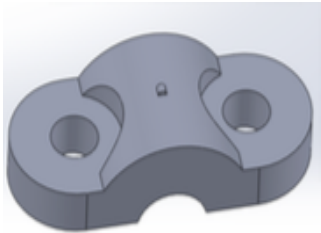
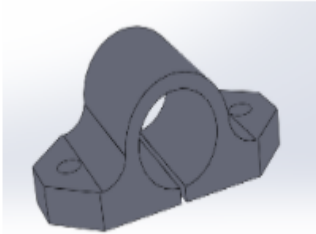
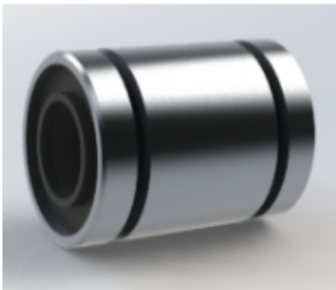

2

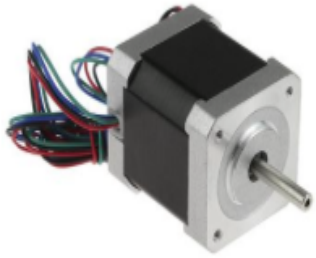
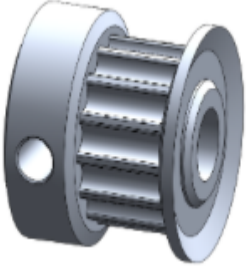


*Lower Mount
Clamp
(z-axis)*



E6	Upper Z Motor Mount	3D Printer N/A	1	<i>Upper Motor Mount (z-axis)</i>	
E7	Upper Z Idle Mount	3D Printer N/A	1	<i>Upper Idle Mount (z-axis)</i>	
E8	8mm rod (5/16" drill rod) 36"	Fastenal 47768	2	<i>Steel Rod (z-axis)</i>	
E9	Leadscrews - 3/8-12 Thread, 6 Ft. Long, Left Hand, Acme Threaded Rod	MSC Industrial Supply 4354635	2	<i>Threaded Steel Rods</i>	
E10	M3 x 16 Bolt, SHCS Black-Oxide	McMaster-Carr 91290A120	12	<i>M3 x 16 Bolt</i>	

E11	M3 Nut	McMaster-Carr 90592A009	10	<i>M3 Nut</i>	
E12	M8 Washer	McMaster-Carr 91166A270	1	<i>M8 Washer</i>	
E13	3/8-12 ACME Hex Nut	McMaster-Carr 95155A111	2	<i>Hex Nut</i>	
E14	Z Emergency Stop	3D Printer N/A	1	<i>Emergency Stop (z-axis)</i>	
A5	M5 Washer, Steel, Zinc Plated	McMaster-Carr 91166A240		<i>M5 Washer</i>	

A7	M5 x 14 Bolt, SHCS Black-Oxide	McMaster-Carr 91290A230			<i>M5 x 14 Bolt</i>	
D3	Z Rod Clamp	3D Printer N/A	4		<i>Clamp (z-axis)</i>	
D6	LM8UU Bearing Mount	3D Printer N/A	4		<i>Bearing Mount</i>	
D7	12x LM8UU Linear Bearings	Amazon 0601227135386	4		<i>Bearings</i>	
D8	608ZZ Bearings	Amazon 0793200418750	4		<i>Bearings</i>	

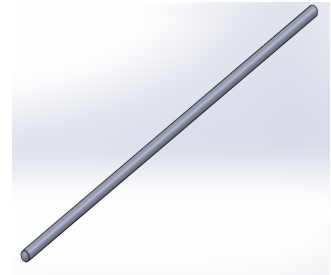
D10	Nema 17 Stepper Motor 2 A 45 Ncm (64oz.in)	Amazon 17HS16-2004S1	1	<i>Nema 17 Stepper Motor</i>	
D11	2x Aluminum GT2 16T Pulley and 2M Belt for RepRap 3D printer Prusa i3	Amazon 0087169815683 6907496758795	1	<i>16T Pulley</i>	
D15	M8 x 30 Bolt, SHCS Black-Oxide	McMaster-Carr 91290A434	1	<i>M8 x 30 Bolt</i>	
D16	M8 Nut Nyloc	McMaster-Carr 90576A117	1	<i>M8 Nut</i>	

F1

8mm rod
(5/16" drill rod) 36"

Fastenal 47768

2

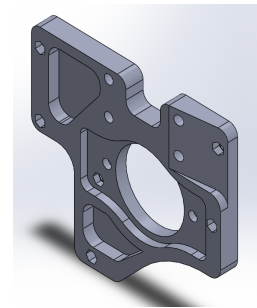
*Steel Rod
(x-axis)*

F2

Stabilized X-Carriage

3D Printer
N/A

1

Printer Stage Plate

F3

M3 Threaded Insert

McMaster-Carr
94180A333

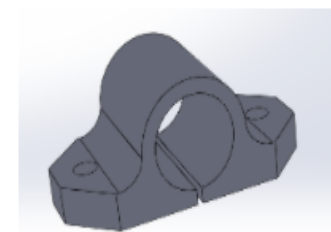
10

Threaded Inserts

D6

LM8UU Bearing
Mount3D Printer
N/A

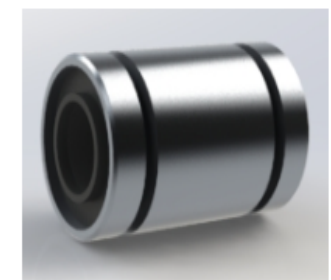
4

Bearing Mount

D7

12x LM8UU Linear
BearingsAmazon
0601227135386

4

Bearings

D12 2x Aluminum GT2 16T
Pulley
and
2M Belt for RepRap
3D printer Prusa i3

Amazon
0087169815683
6907496758795

1

2M Belt

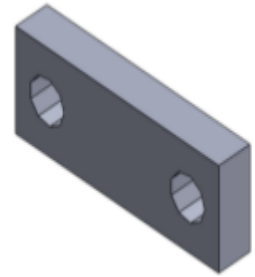


D14 Belt Clamp

3D Printer
N/A

2

*Belt Clamp
(x-axis)*



D19 M3 Washer,
Steel, Zinc Plated

cMaster-Carr 91166A2

14

M3 Washer



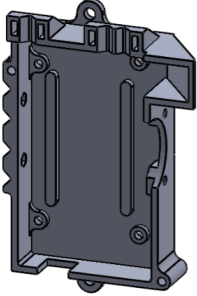


E10 M3 x 16 Bolt,
SHCS Black-Oxide

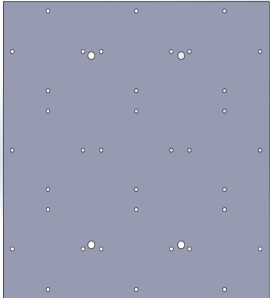
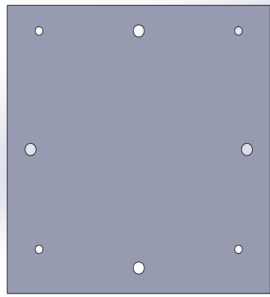
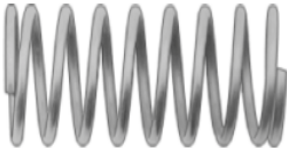
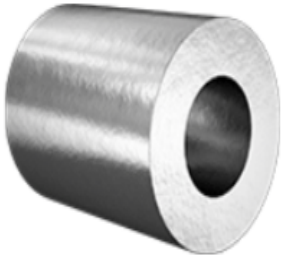

cMaster-Carr 91290A1:




12

M3 x 16 Bolt



G1	RAMPS Mount	3D Printer N/A	1	<i>RAMPS Mount</i>	
A4	M5 x 10 Bolt, SHCS Black-oxide	McMaster-Carr 91239A224	2	<i>M5 x 10 Bolt</i>	
A5	M5 Washer, Steel, Zinc Plated	McMaster-Carr 91166A240	2	<i>M5 Washer</i>	

H1	Large Stage Plate	Custom Machine Fabrication N/A	1	<i>Printer Stage Plate</i>	
H2	Small Stage Plate	Custom Machine Fabrication N/A	2	<i>Printer Stage Plate</i>	
H3	Compression Spring - 0.360OD, 0.032 music wire, 1.000 overall length	w.b. Jones Spring Co Inc C12-032-032	8	<i>Springs</i>	
H4	6-32 x .750 inch Aluminum Standoffs (Round)	Servo City 534-3488	8	<i>Spacer</i>	
H5	6-32 x 1" Bolt	Servo City Actobotics Hardware Pack A (632146) Pack B (632148)	8	<i>6-32 x 1" Bolt</i>	

A4	M5 x 10 Bolt, SHCS Black-oxide	McMaster-Carr 91239A224	4	<i>M5 x 10 Bolt</i>	
A5	M5 Washer, Steel, Zinc Plated	McMaster-Carr 91166A240	4	<i>M5 Washer</i>	
D17	M5 Nut	McMaster-Carr 90591A146	4	<i>M5 Nut</i>	

I1

Dry Braided Sleeve
Carbon Fiber - 0.5"RockWest
BR-C-050

1

*Carbon Fiber
Sleeves
for Tubing Heaters*

I2

22 AWG (7/36) BC
6820AlphaWire 22 AWG
(7/36) BC
6820

1

2 AWG Copper Wire

I3

CONN HOUSING
2POS .100 W/LATCHDigiKey
WM2900-ND

3

le 2 POS wire housing

I4

CONN HOUSING
3POS .100 W/LATCHDigiKey
WM2901-ND

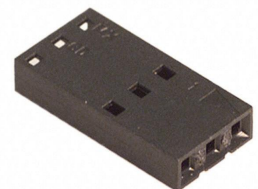
2

le 3 POS wire housing

I5

CONN HOUSING
3POS .100 SINGLEDigiKey
WM2801-ND

1

ale 3 POS wire housing

I6	CONN TERM FEMALE 24-30AWG GOLD	DigiKey WM2513-ND	3	<i>Female 24-30 Gauge Crimp Connector</i>
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I7	CONN TERM MALE 22-24AWG GOLD	DigiKey WM2515-ND	12	<i>Male 24-30 Gauge Crimp Connector</i>
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I8	Extreme-Temperature Teflon® PTFE Semi- Clear Tubing	McMaster-Carr 5239K12	1	<i>Plastic Tubing</i>
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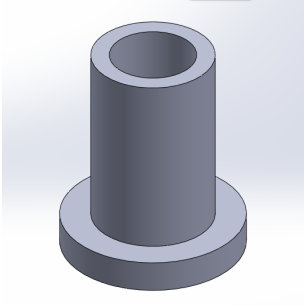
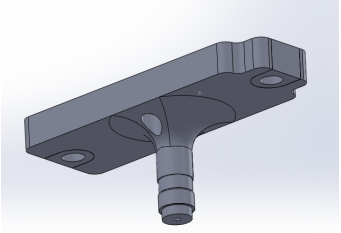


I9	Carbon Fiber Sleeve Outer Bracket (No Temp)	3D Printer N/A	1	<i>Sleeve Bracket</i>
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I10	Carbon Fiber Sleeve Outer Bracket (Temp)	3D Printer N/A	1	<i>Sleeve Bracket</i>
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I11	Carbon Fiber Sleeve Inner Bracket	3D Printer N/A	1	<i>Sleeve Bracket</i>	
I12	Needle Holder	3D Printer N/A	1	<i>Needle Guide for Stabilized X- Carriage</i>	

J1

3 inch Aluminum
Channel

ServoCity 585442

1

Gear Box



J2

55:1 Gear Ratio
55 Teeth Worm Gear

P-SI S1C83Z-P048B05

1

Gear Box



J3

Center Hole Adaptors
(4 pack)

ServoCity 633138

4

Gear Box



J4

1/8 inch ID x 3/8 inch
OD
Ball Bearing (2 pack)

ServoCity 535206

4

Gear Box



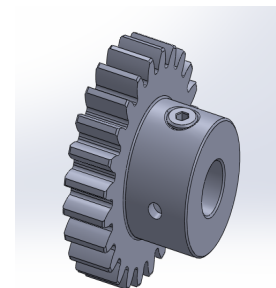
J5

48 D.P. 24 Teeth
20° Pressure Angle
AGMA Q10 Quality
With (Hub / S.S.)
2024 Aluminum Alloy
Gear

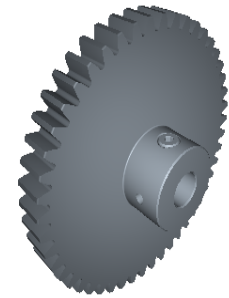
DP-SI S1063Z-048A02

1

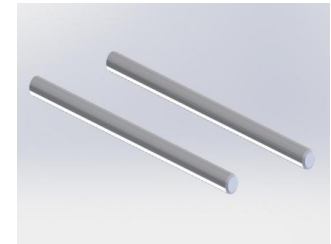
Gear Box



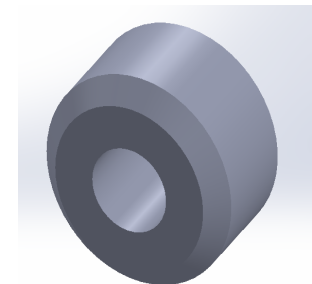
J6	48 D.P. 48 Teeth 20° Pressure Angle AGMA Q10 Quality With (Hub / S.S.) 303 Stainless Steel Gear	DP-SI S1063Z-048S04	1	<i>Gear Box</i>
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J7	.12470" (+.000/- .0002) Dia. 2.375" Long 303 Stainless Steel Shaft	SDP-SI A 7X 1-04023	2	<i>Gear Box</i>
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J8	0.1248" Bore 0.3125" O.D. 0.18" Wide 303 Stainless Steel Collar Style	SDP-SI S5000Y-12510	1	<i>Gear Box</i>
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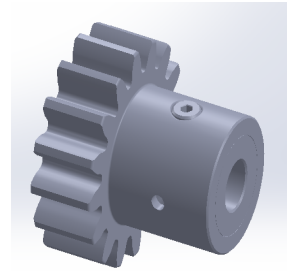
J9	0.125" I.D. 0.1875" O.D. 0.016" Thick Shaft Spacer	SDP-SI A 7X 8-C04016	3	<i>Gear Box</i>
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J10	0.125" I.D. 0.1875" O.D. 0.031" Thick Shaft Spacer	SDP-SI A 7X 8-C04031	1	<i>Gear Box</i>
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J11	32 DP 16 Teeth 20° Pressure Angle Acetal / Brass Insert Spur Gear	SDP-SI A 1T 2-Y32016	1	<i>Gear Box</i>
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J12	90 Degree Quad Hub Mount B	ServoCity 545424	1	<i>Gear Box</i>
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J13	Beam Bracket T (Pair)	ServoCity 585656	2	<i>Gear Box</i>
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J14	Beam Attachment Block B (4 pack)	ServoCity 585600	4	<i>Gear Box</i>
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J15	1 inch Bore Tube Clamp A	ServoCity 585434	2	<i>Gear Box</i>
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J16

90 Degree Quad Hub
Mount C

ServoCity 545360

1

Gear Box

J17

Attachment Blocks (12
pack)

ServoCity 585400

1

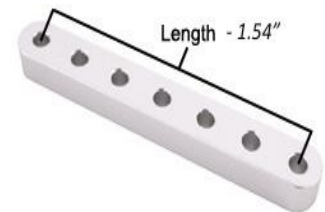
Extruder Arm

J18

1.54 inch Aluminum
Beam (2 pack)

ServoCity 585404

2

Extruder Arm

J19

Beam Crossover
Adaptor A

ServoCity 585490

1

Extruder Arm

J20

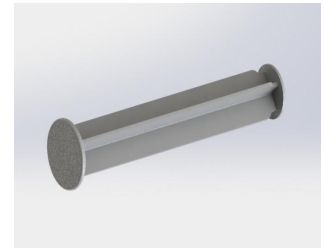
Beam Bracket F (Pair)

ServoCity 585612

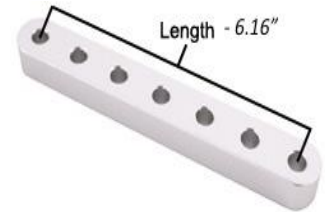
2

Extruder Arm

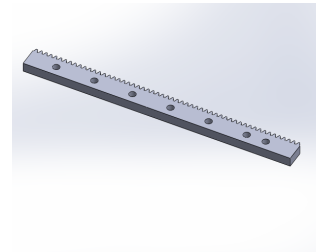
J21	Syringe Plunger	N/A	1	<i>Extruder Arm</i>
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J22	6.16 inch Aluminum Beam (2 pack)	ServoCity 585416	1	<i>Extruder Arm</i>
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J23	32P Beam Gear Rack	ServoCity 615410	1	<i>Extruder Arm</i>
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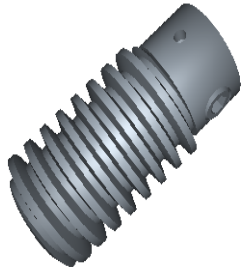




J24	Syringe Body	N/A	1	<i>Extruder Arm</i>
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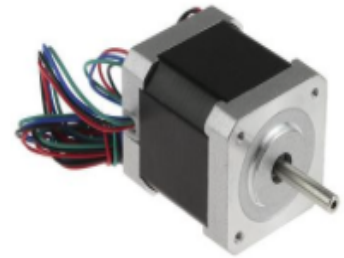


J25	Stepper Motor Mount (NEMA 17)	ServoCity 555152	1	<i>Motor Mount</i>
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J26	3/16 inch to 5mm Set Screw Shaft Coupler	ServoCity 625176	1	<i>Motor Mount</i>	
J27	1/2 inch x 1 inch Precision	ServoCity 634136	1	<i>Motor Mount</i>	
J28	48DP/1 Lead/.33PD 20° Pressure Angle Stainless Steel Worm	SDP-SI S1D94Z-P048SS	1	<i>Motor Mount</i>	
A4	M5 x 10 Bolt, SHCS Black-Oxide	McMaster-Carr 91290A115	1	<i>Motor Mount</i>	
A5	M5 Washer, Steel, Zinc Plated	McMaster-Carr 91166A240	1	<i>Motor Mount</i>	

D10	Nema 17 Stepper Motor 2 A 45 Ncm (64oz.in)	Amazon 17HS16-2004S1	1	<i>Motor Mount</i>
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H4	6-32x .750 inch Aluminum Standoffs (Round)	ServoCity 534-3488	4	<i>Motor Mount</i>
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