

Service Reference

## A-dec 311, 411, and 511 Dental Chairs

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## Product Service

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## Regulatory Information

The *Regulatory Information and Specifications* document (p/n 86.0221.00) is delivered with A-dec dental device equipment as mandated by agency requirements. If you need this information, please go to the Document Library at [www.a-dec.com](http://www.a-dec.com). This document includes:

- Serial number identification
- Software revisions
- Deluxe touchpad help messages
- Intended application and use statements
- Identification of symbols
- Environmental specifications
- Classification of equipment
- Electrical rating and electromagnetic information
- Chair load capacity

## Service Guide

This document is a companion to the *A-dec 311, 411, and 511 Dental Chairs Service Guide* (p/n 86.0380.00). The Service Guide contains service, adjustments, maintenance, and troubleshooting information for the 311, 411, and 511 dental chairs. Circuit board components and flow diagrams are available in both the Service Guide and the Service Reference.

## Other A-dec Service Documents

The *A-dec 300, 400, and 500 Delivery Systems Service Guide* (p/n 86.0382.00) contains service, maintenance, and troubleshooting content. The *A-dec 300, 400, and 500 Delivery Systems Service Reference* (p/n 86.0383.00) contains illustrated parts breakdown content. Circuit board components and flow diagrams are in both documents. These documents include cuspidors, floor boxes, and support centers.

The *A-dec Dental Lights and Monitor Mounts Service Guide* (p/n 86.0326.00) contains service, maintenance, and troubleshooting content for A-dec dental lights and monitor mounts. The *A-dec Dental Lights and Monitor Mounts Service Reference* (p/n 86.0328.00) contains illustrated parts breakdown content. Circuit board components and flow diagrams are in both documents.

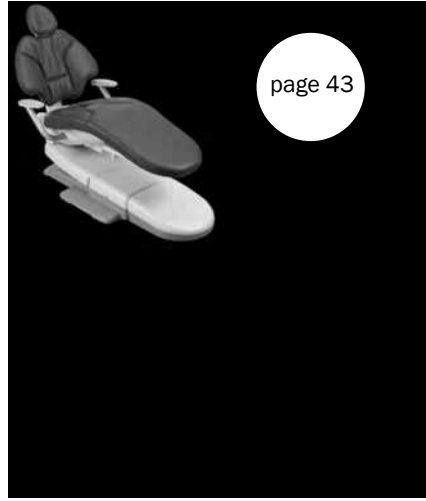
# Illustrated Parts Breakdown — A-dec Dental Chairs

**A-dec 311 Dental Chair**



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**A-dec 411 Dental Chair**



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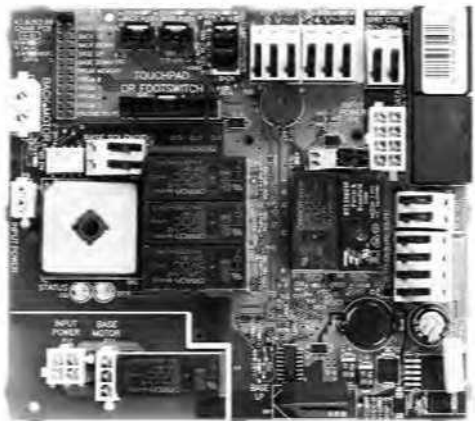
**A-dec 511 Dental Chair**



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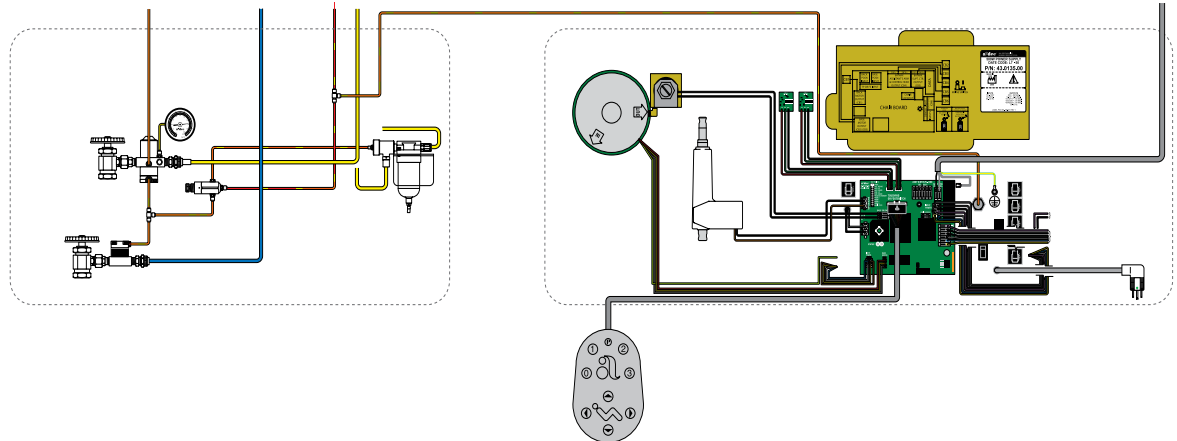
**Chair Circuit Boards**

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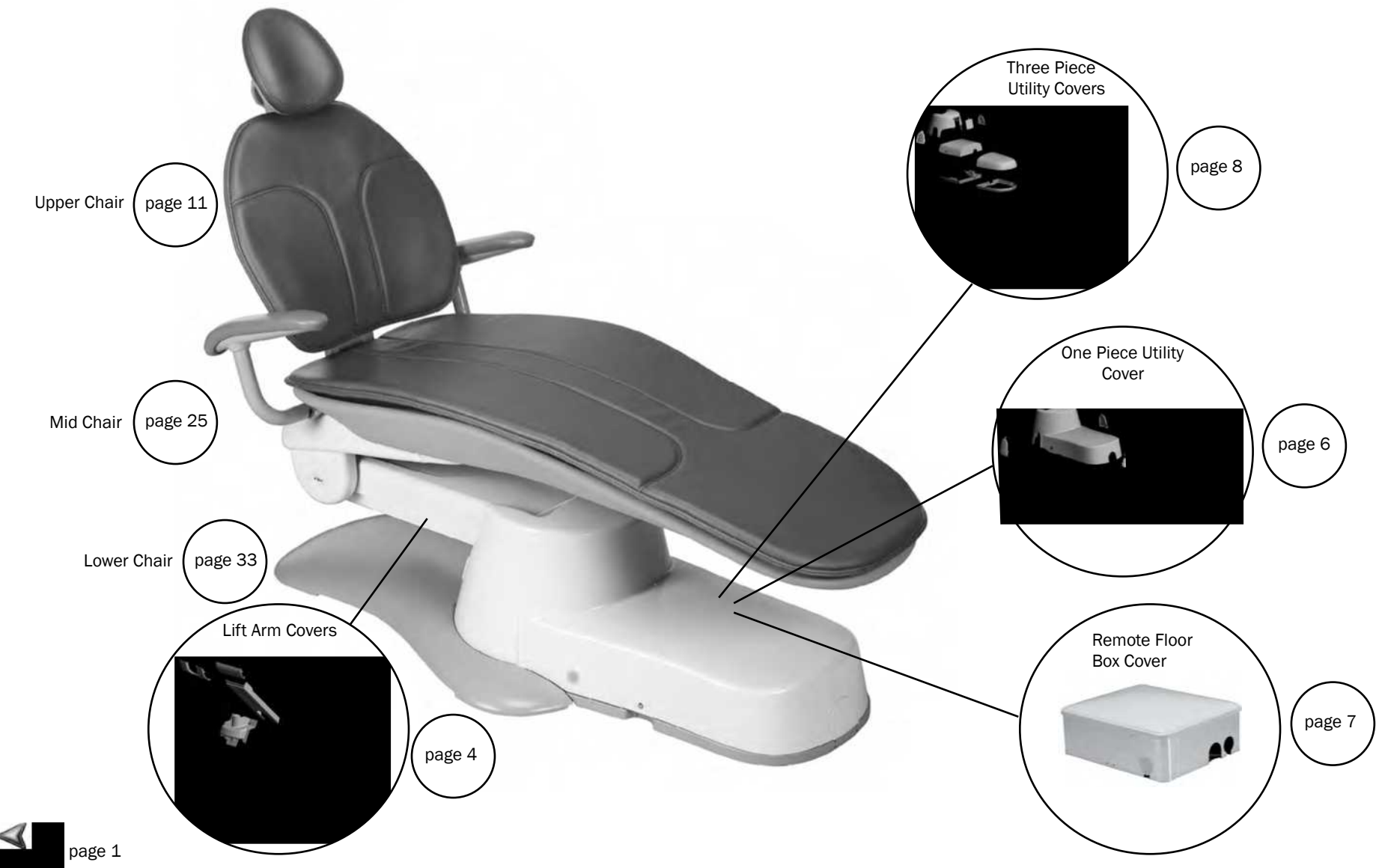
**Chair Flow Diagrams**

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# Illustrated Parts Breakdown – 311 Chair



## 311 Lift Arm Covers



### 311 Lift Arm Covers

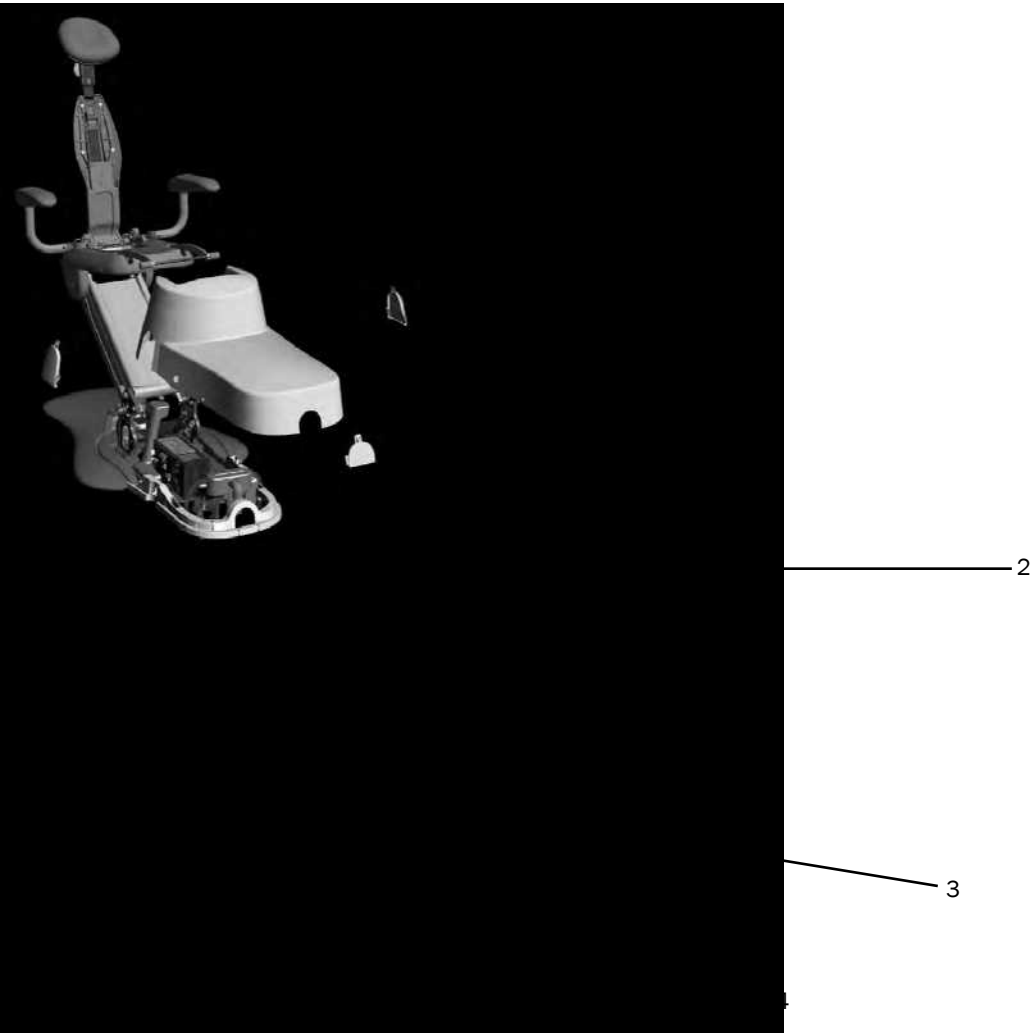
Item	Part Number	Description	Replacement Kit
1	62.0662.00 † 62.0651.00	Upper lift arm cover Upper assistant's lift arm cover	Part of 90.1266.00 –
2	62.0652.00 †	Lift arm cover	Part of 90.1266.00
3	62.0653.00 †	Lower lift arm cover	Part of 90.1266.00

† Indicates that the individual part is not available for sale



311 One Piece Utility Cover

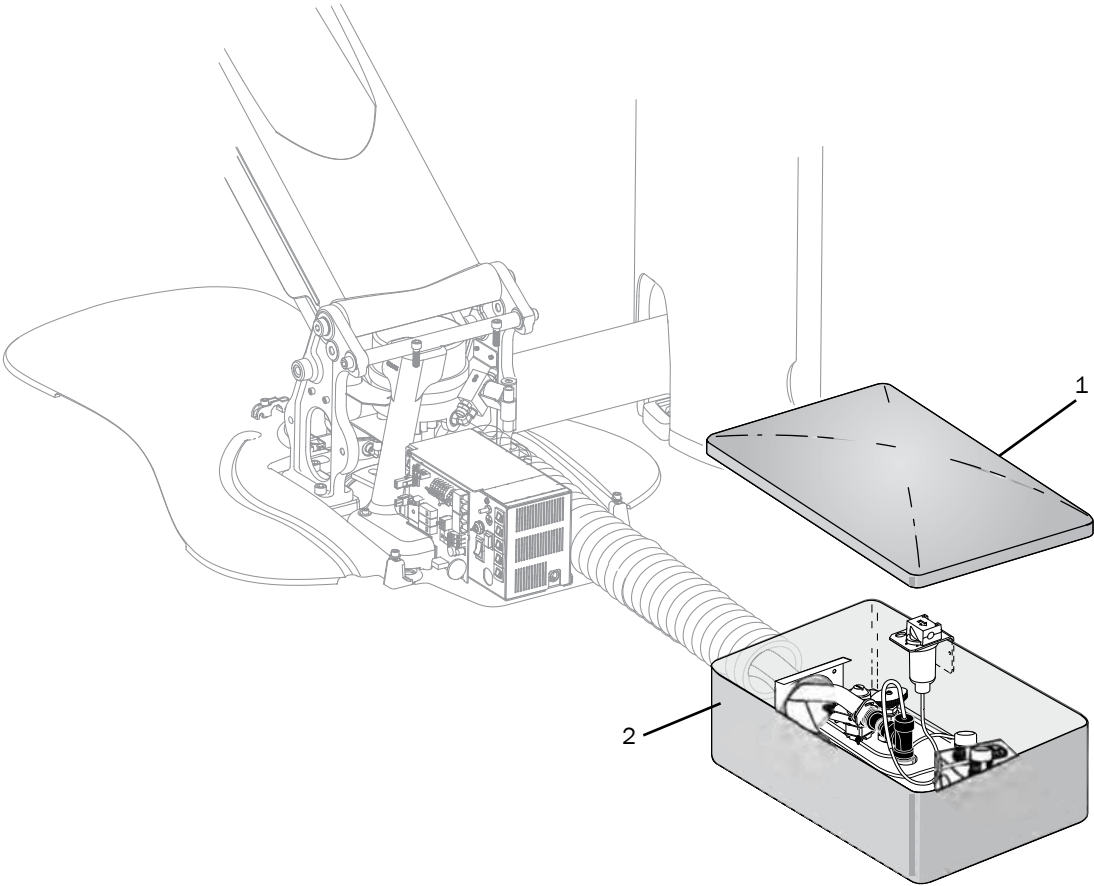
Item	Part Number	Description
1	62.0296.00	Utility cover
2	62.0347.00	Plug cover
3	62.0348.00	Umbilical plug cover
4	62.0300.00	Utility cover stiffener



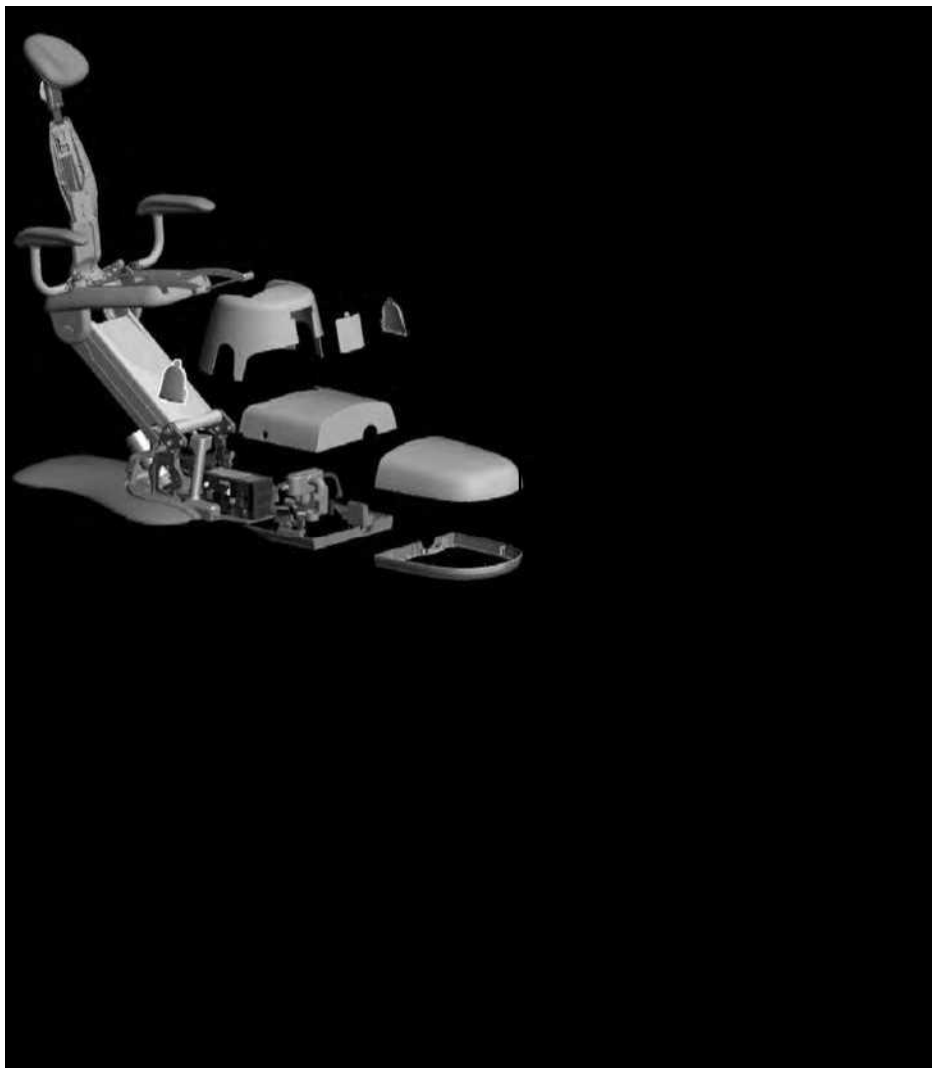


# 311 Remote Floor Box Covers (Optional)

Item	Part Number	Description
1	41.0413.00	Cover, Surf
	41.0413.01	Cover, Gray
2	41.1507.00	Box



## 311 Three Piece Utility Covers

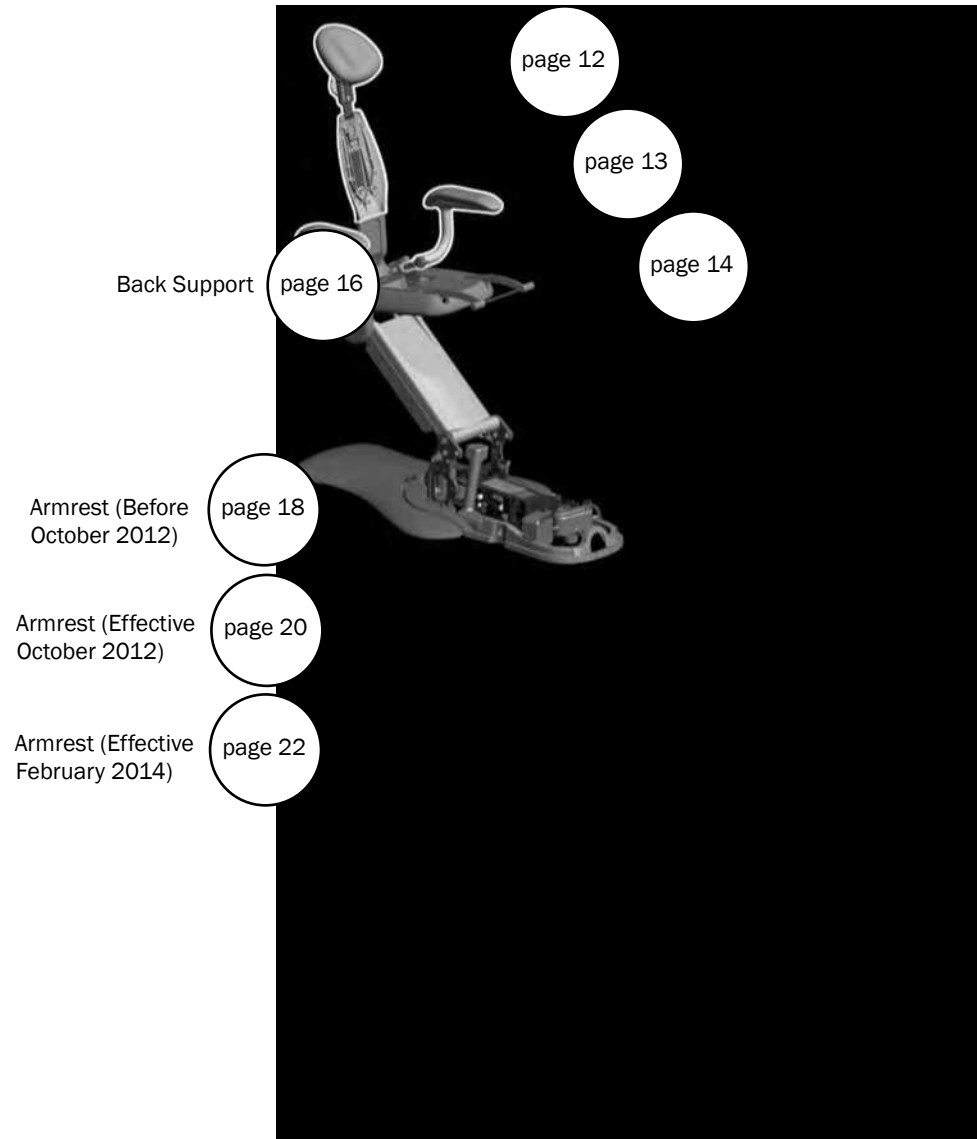


### 311 Three Piece Utility Covers

Item	Part Number	Description
1	62.0347.00	Plug cover
2	62.0657.00	Chair pump cover
3	62.0663.00	Radius mount plug cover
4	62.0656.00	Power supply cover
5	62.0655.00	Floor box cover
6	62.0659.00	Power supply frame
7	62.0658.00	Floor box frame



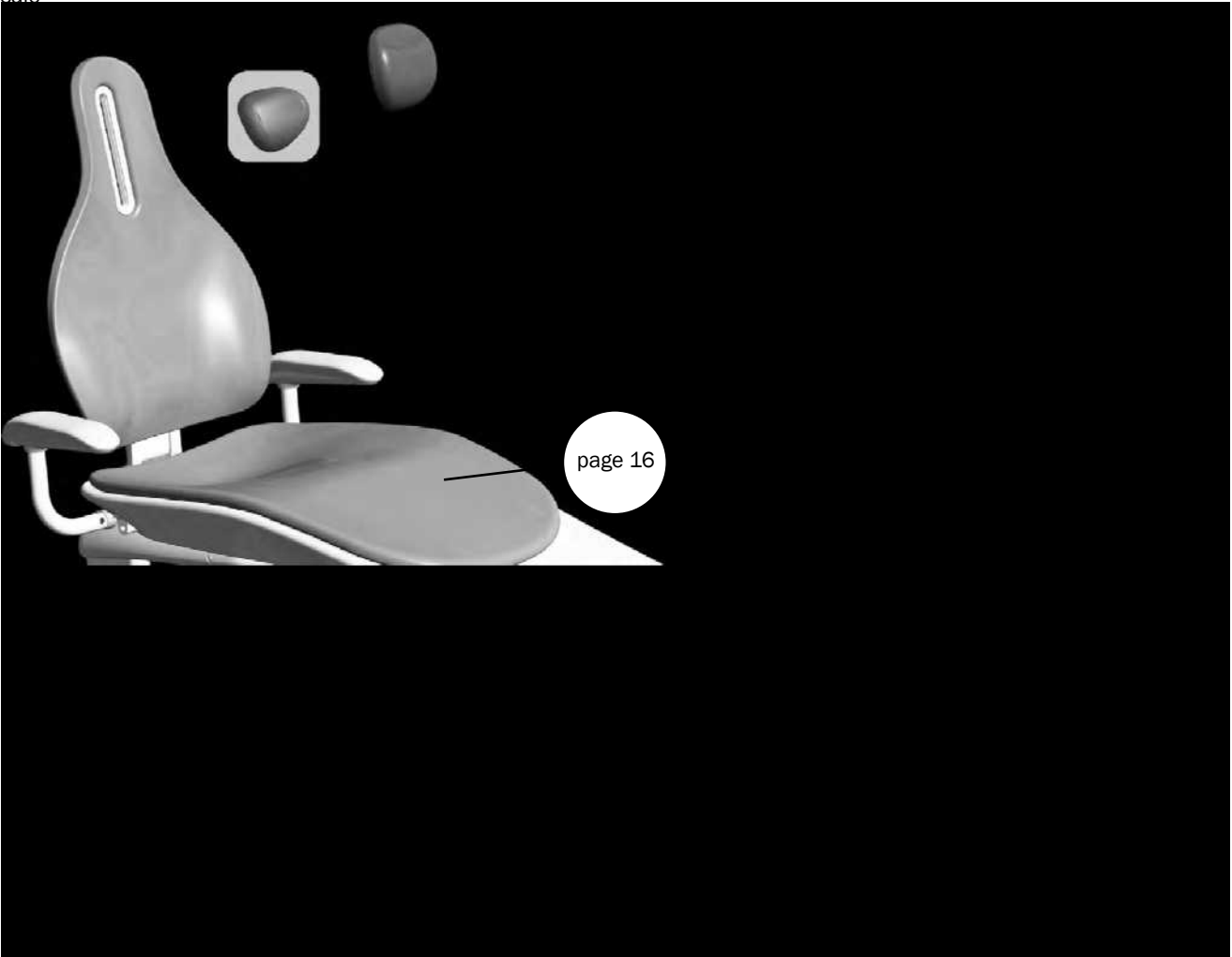
## 311 Upper Chair



### 311 Thin-Line Back With Integrated Neck Support

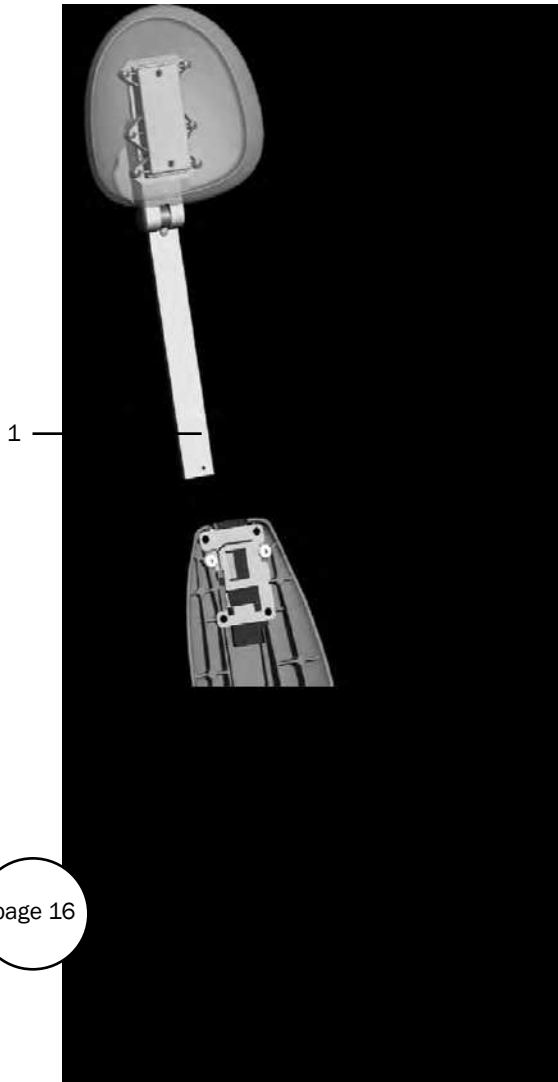
Item	Part Number	Description
1	62.0405.00 †	Neckrest assembly - Before September 2013 (for reference only)
	62.0877.00	Neckrest assembly - Effective September 2013

† Indicates that the individual part is not available for sale.



311 Thin-Line Back with Headrest (311/411)

Item	Part Number	Description
1	62.0631.01	Double articulating headrest (headrest cushion not included)



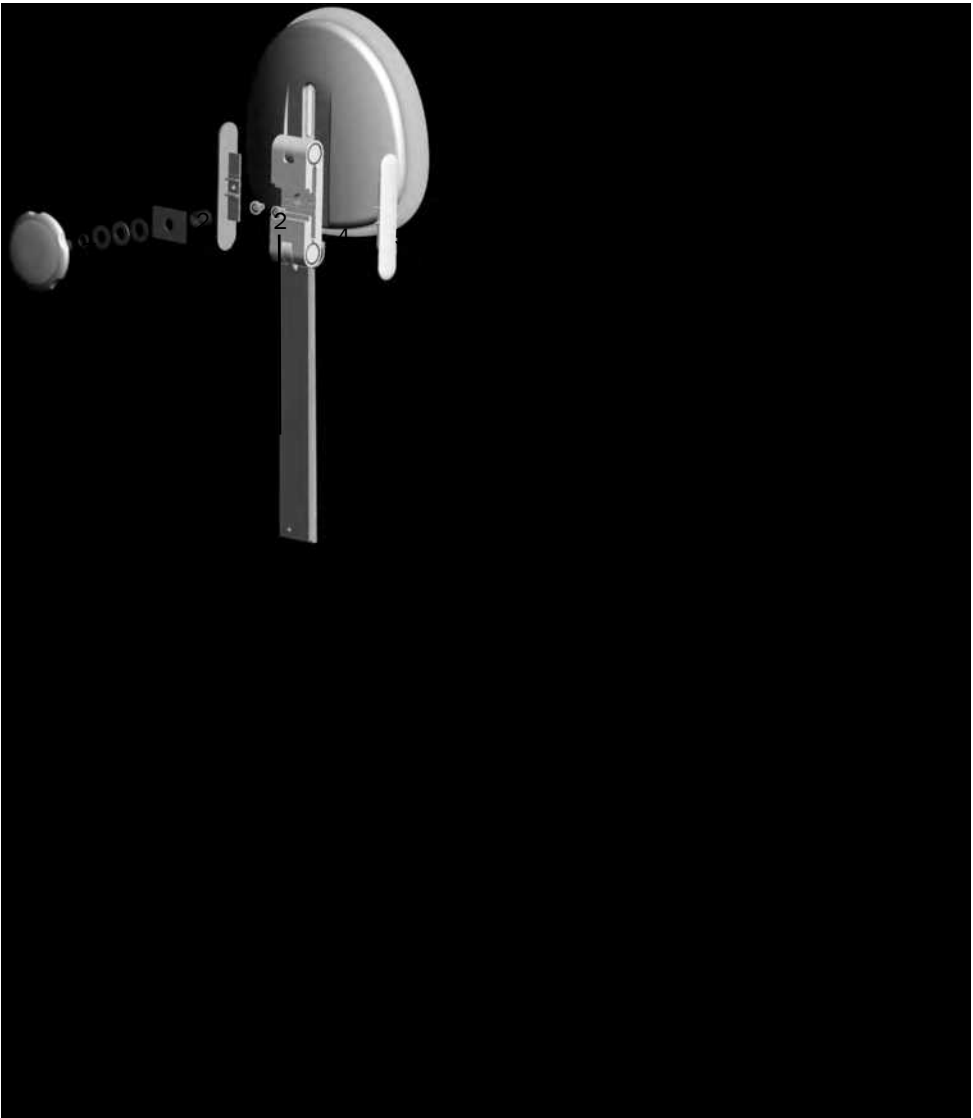
Back Support

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**311 Double-Articulating Locking Knob Headrest Mechanism (311/411)**



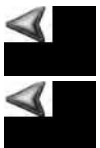


### 311 Double Articulating Locking Knob Headrest Mechanism (311/411)

p/n 62.0631.01

Item	Part Number	Description	Replacement Kit
1	62.0427.00 †	Knob assembly	Part of 90.1221.00 Knob kit
2	004.136.00	Thrust washer	Part of 90.1221.00 Knob kit
3	016.033.00	Thrust needle bearing	Part of 90.1221.00 Knob kit
4	62.0749.00 †	Clamp plate	Part of 90.1221.00 Knob kit
5	014.015.00 †	Threaded insert	
6	001.191.01	Hex head screw, GR8 5/8-18 x 3-1/4	
7	62.0429.00	Side cap	
8	030.012.00	O-ring	

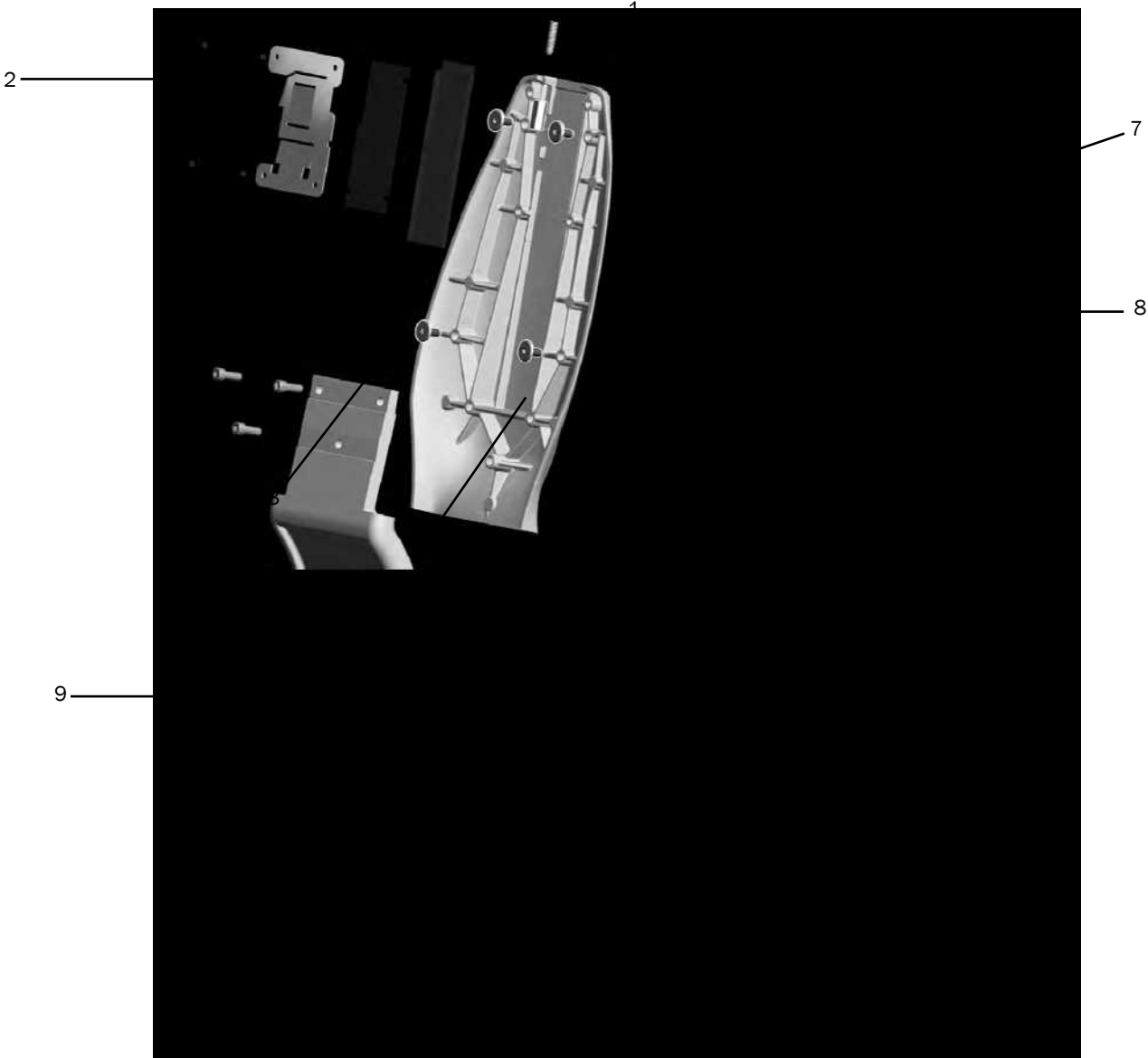
† Indicates that the individual part is not available for sale



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311 Back Support (311/411/511)

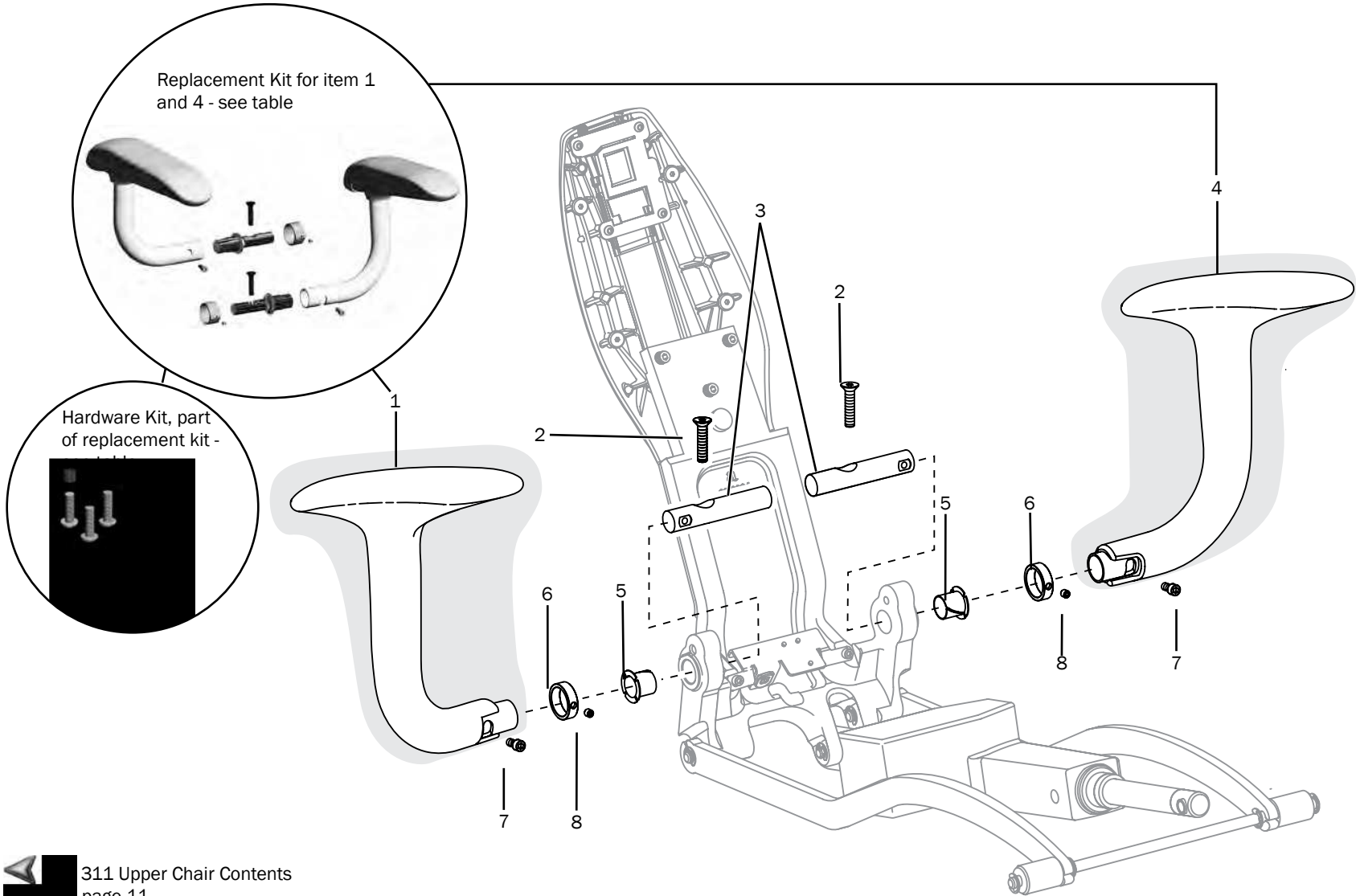


### 311 Back Support (311/411/511)

Item	Part Number	Description	Replacement Kit
1	001.244.00	JCB socket screw, 1/4-20 x 15 mm	
2	005.138.01	Button head socket path screw, 10-32 x 5/16	
3	62.0104.00 †	Bracket	90.0719.00 Glide bar brake kit
4	62.0103.00	Upper wear pad	
5	62.0102.00	Lower wear pad	
6	007.158.00	Set screw, 1/4-20 x 1	
7	006.144.00	Coupling	
8	62.0048.01 †	Back support, White	90.1099.01 00 Support back assembly
9	001.245.00	Screw	

† Indicates that the individual part is not available for sale

311 Armrest (Before October 2012)

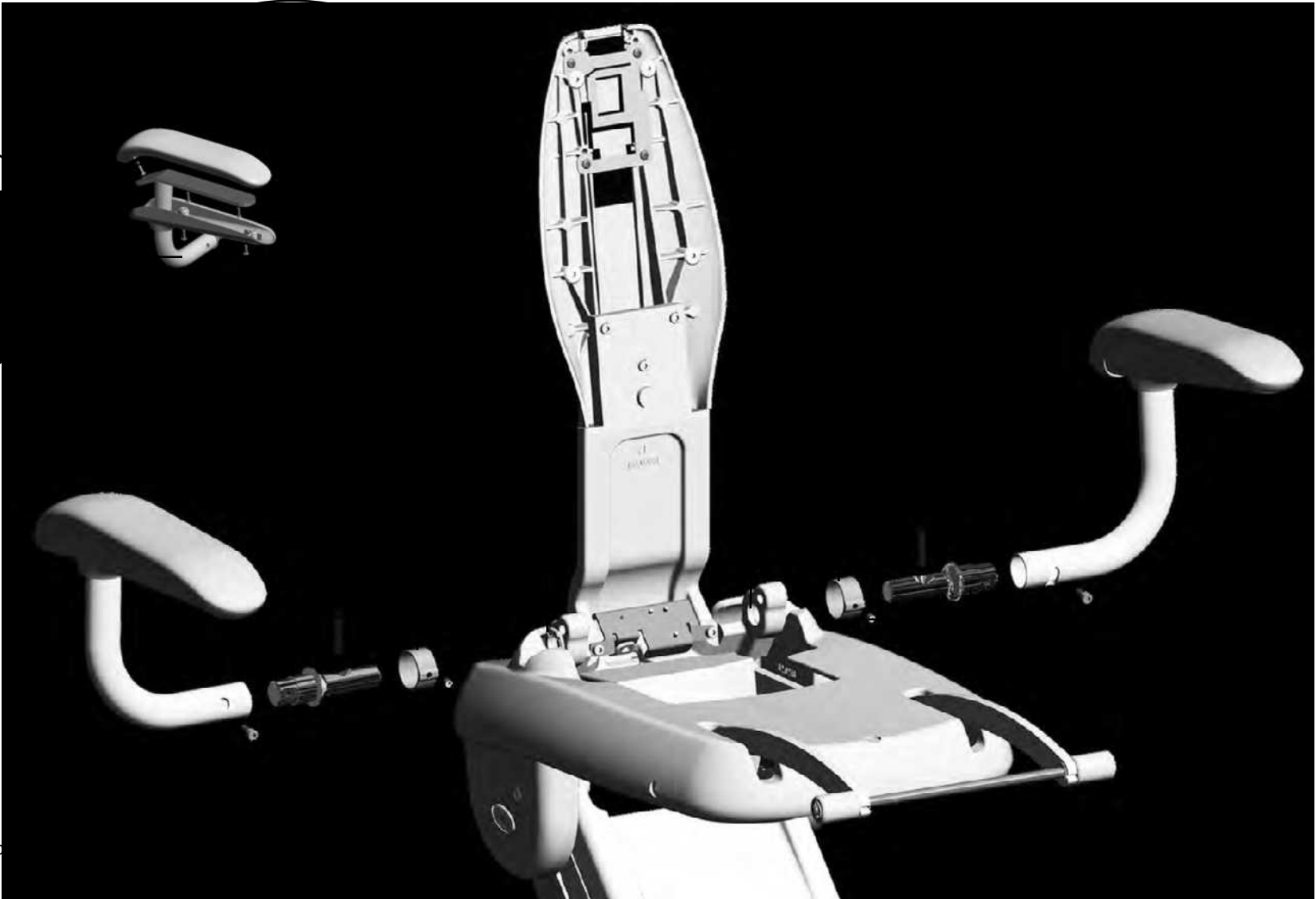
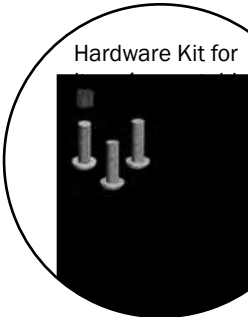


### 311 Armrest (Before October 2012)

Item	Part Number	Description	Replacement Kit
1	90.1222.00 †	Armrest, right (reference only)	90.1389.00 311 Armrests kit 61.3861.00 Armrest hardware kit
2	001.263.00	Flat head socket screw, 5/16-18 x 1-1/2	
3	62.0339.00 †	Pivot pin	90.1389.00 311 Armrests kit 61.3861.00 Armrest hardware kit
4	90.1223.00 †	Armrest, left (reference only)	90.1389.00 311 Armrests kit 61.3861.00 Armrest hardware kit
5	016.047.00 †	Flanged bearing	90.1389.00 311 Armrests kit 61.3861.00 Armrest hardware kit
6	62.0393.00 †	Collar	90.1389.00 311 Armrests kit 61.3861.00 Armrest hardware kit
7	001.264.00 †	Socket cup head screw, 1/4-28 x 1/2	90.1389.00 311 Armrests kit 61.3861.00 Armrest hardware kit
8	007.056.00	Setscrew	

† Indicates that the individual part is not available for sale

311 Armrest (Effective October 2012 Through January 2014)



### 311 Armrest (Effective October 2012 Through January 2014)

Item	Part Number	Description	Replacement Kit
1	90.1389.00	Armrest assemblies, right and left	61.3875.00 Armrest cap replacement kit 61.3861.00 Armrest hardware kit
2	001.263.00	Flat head socket screw, 5/16-18 x 1-1/2	
3	62.0812.00	Pivot pin	
4	016.047.00	Flanged bearing	
5	62.0819.00	Collar	
6	001.264.00 †	Socket cup head screw, 1/4-28 x 1/2	
7	007.056.00	Setscrew	

† Indicates that the individual part is not available for sale

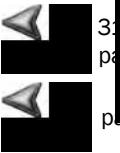
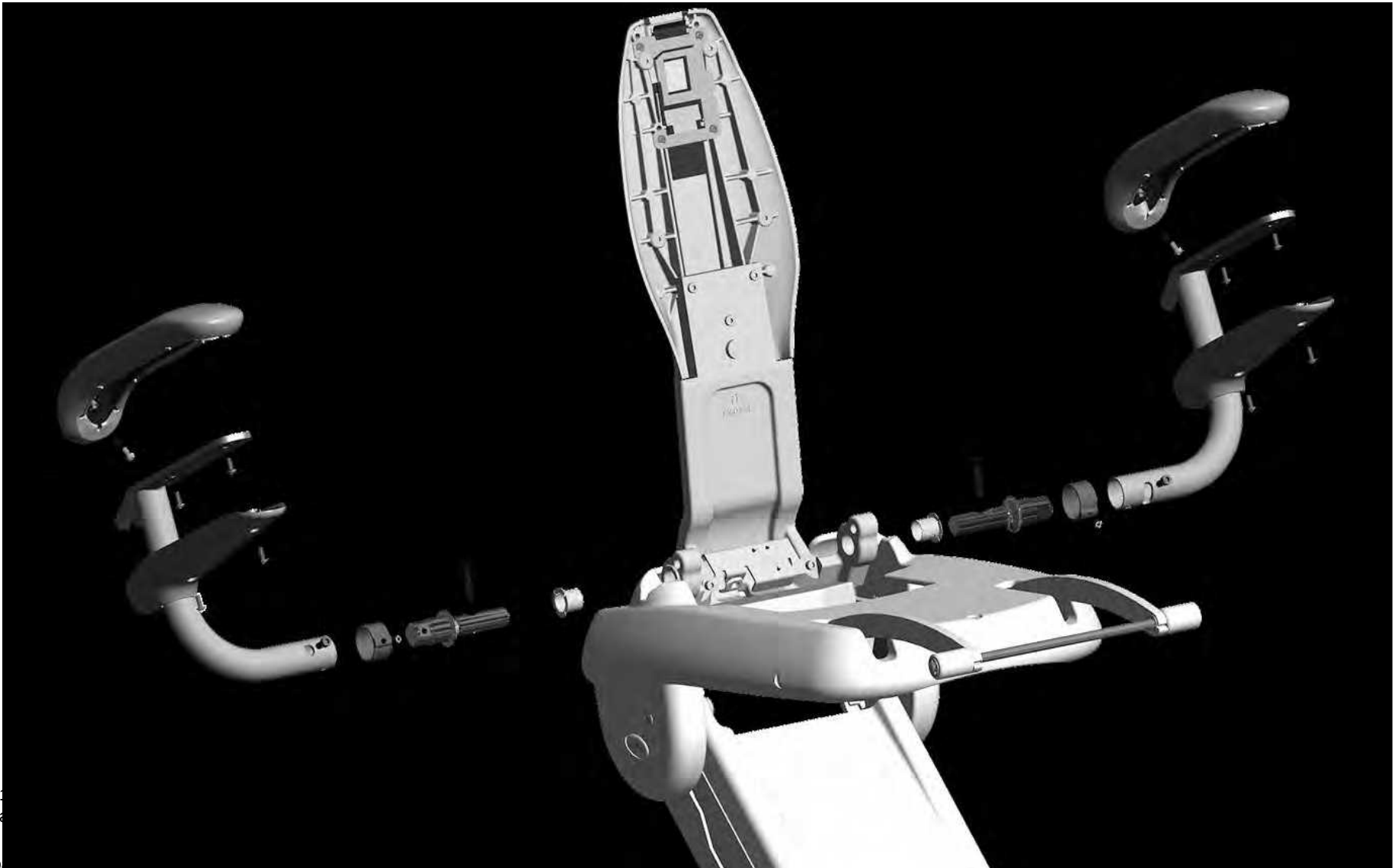


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311 Armrest (Effective February 2014)





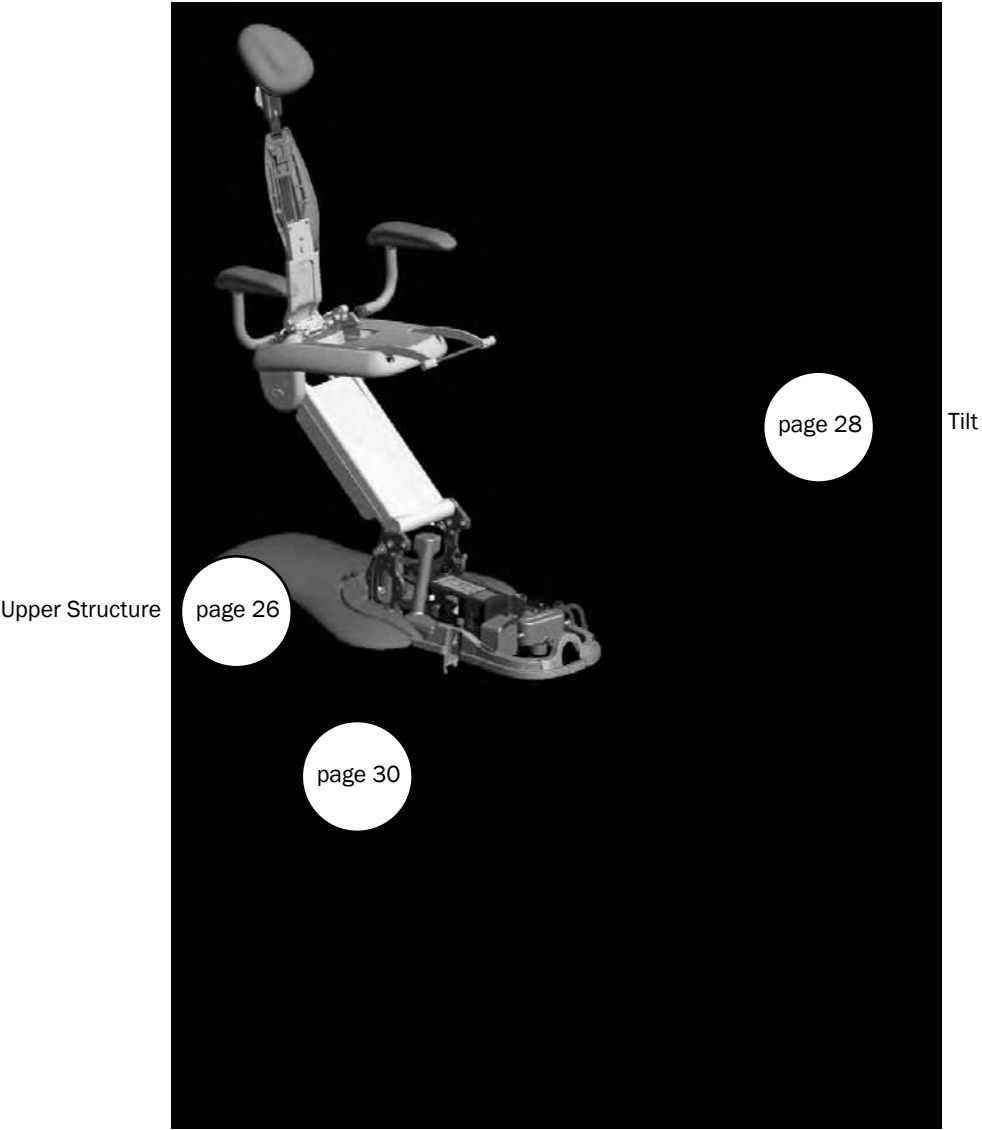
### 311 Armrest (Effective October 2012)

Item	Part Number	Description	Replacement Kit
1	61.3903.00	311/200 Armrest cap assembly	90.1434.00 311 Armrest cover/replacement kit
2	61.2630.00	Spacer	
3	005.110.00	Screw	
4	62.0815.00 †	Right side armrest weldment	Part of 62.0835.00 assembly
5	001.264.00	Screw	
6	62.0819.00	Collar	
7	007.056.000	Setscrew	
8	001.263.00	Screw	
9	62.0812.00	Pivot	
10	016.047.00	Sleeve bearing	
11	62.0814.00 †	Left side armrest weldment	Part of 62.0834.00 assembly

† Indicates that the individual part is not available for sale



311 Mid Chair



### 311 Upper Structure



## 311 Upper Structure

Item	Part Number	Description
1	62.0247.00 †	Upper structure
2	018.050.00	Hole plug
3	62.0311.00	Roller cam
4	010.031.01	Retaining ring
5	62.0309.00 †	Pin
6	018.002.06	Hole plug
7	62.0315.00	Toe board pin
8	010.040.01	Retaining ring
9	62.0367.00 †	Retainer
10	001.089.00	Screw
11	001.165.00	Socket shoulder screw

† Indicates that the individual part is not available for sale

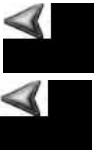
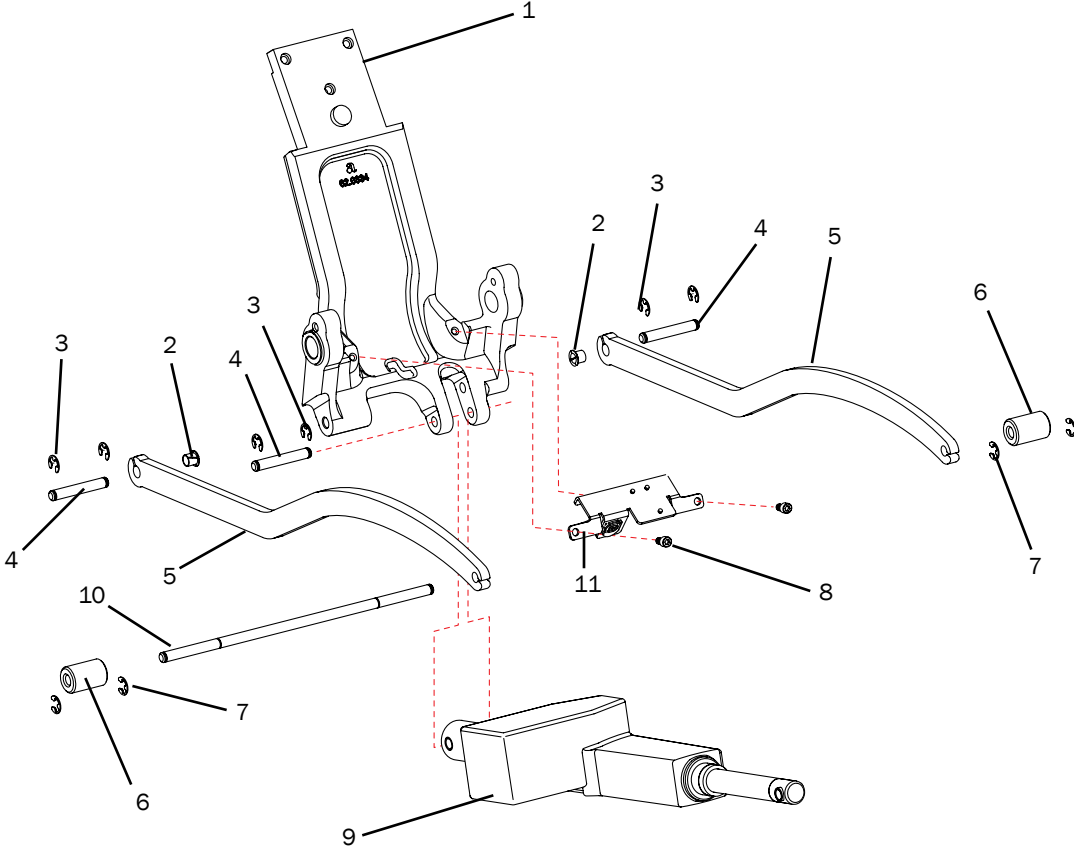


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311 Back Tilt



## 311 Back Tilt

Item	Part Number	Description	Replacement Kit
1	62.0352.00†	Back pivot	
2	016.162.00	Bearing, flange	
3	010.040.01	E-ring	
4	62.0315.00	Pin, toeboard, short	
5	62.0290.00 †	Seat lift cam	
6	62.0351.00	Roller	
7	010.040.01	E-ring	
8	002.010.00	Screw, socket head, patch, 1/4 - 20 x 3/8"	
9	62.0226.00 †	Tilt actuator assembly	Part of 90.1228.00 Tilt actuator assembly kit
10	62.0263.00 †	Trolley pin, long	
11	90.1183.00	Tilt position sensor	

† Indicates that the individual part is not available for sale

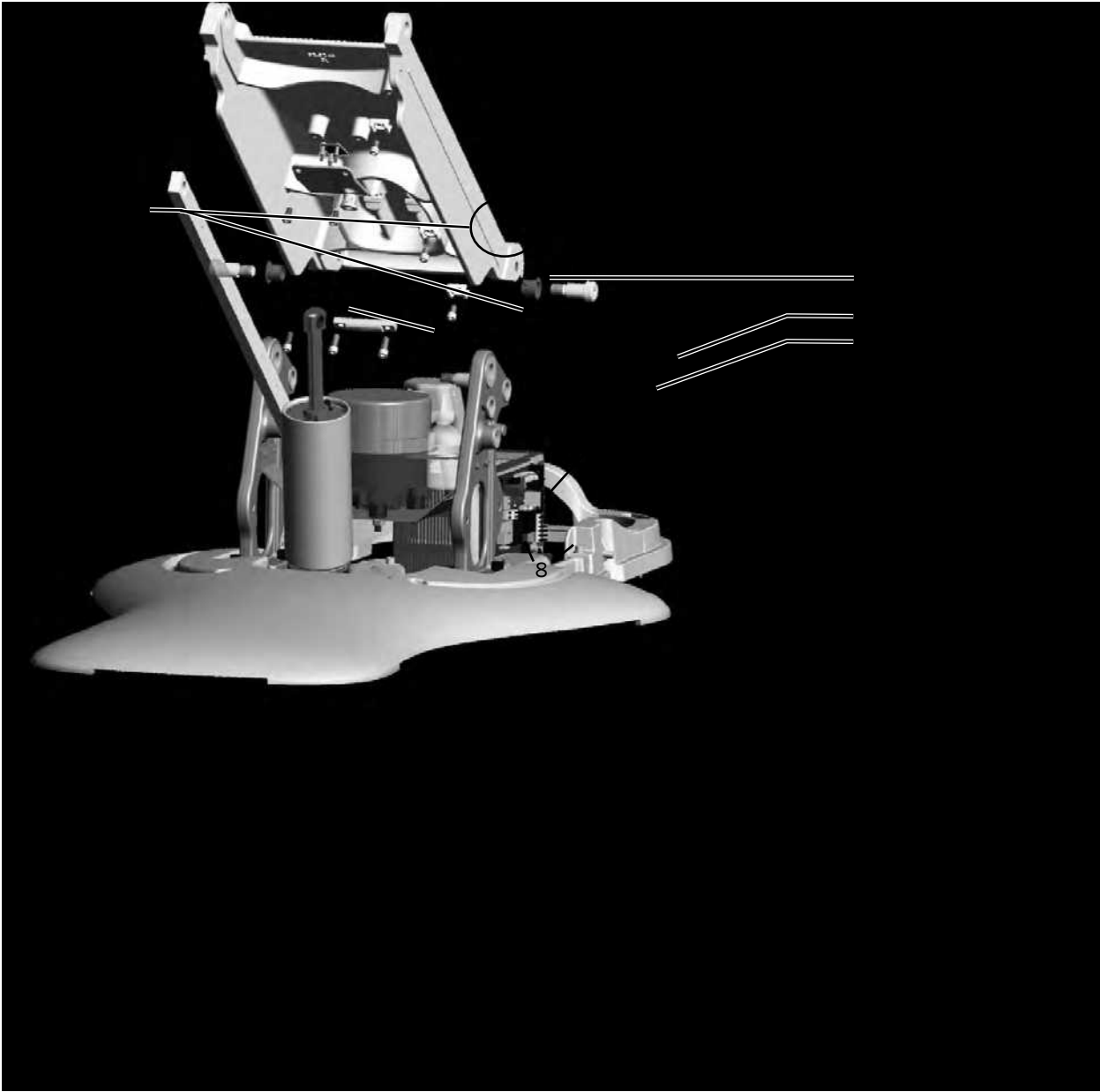


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311 Lift Arm





## 311 Lift Arm

Item	Part Number	Description
1	90.1183.00	Position sensor kit
2	002.010.00	Socket head 1/4-20 x 3/8 patch screw
3	62.0244.00 †	Lift arm
4	025.072.00	Cable tie mounting block
5	016.164.00	Brg, flange, nylon, 5/8" ID x 5/8 Lg
6	001.165.00	Screw, socket shoulder, 1/2 - 13 x 5/8" x 5/8"
7	62.0350.00	Pin
8	001.089.00	Socket head 1/4-20 x 5/8 screw
9	62.0312.00 †	Bracket

† Indicates that the individual part is not available for sale



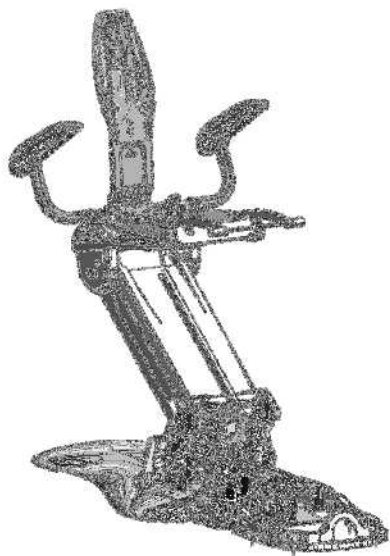
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311 Lower Chair



Lift Cylinder/Base

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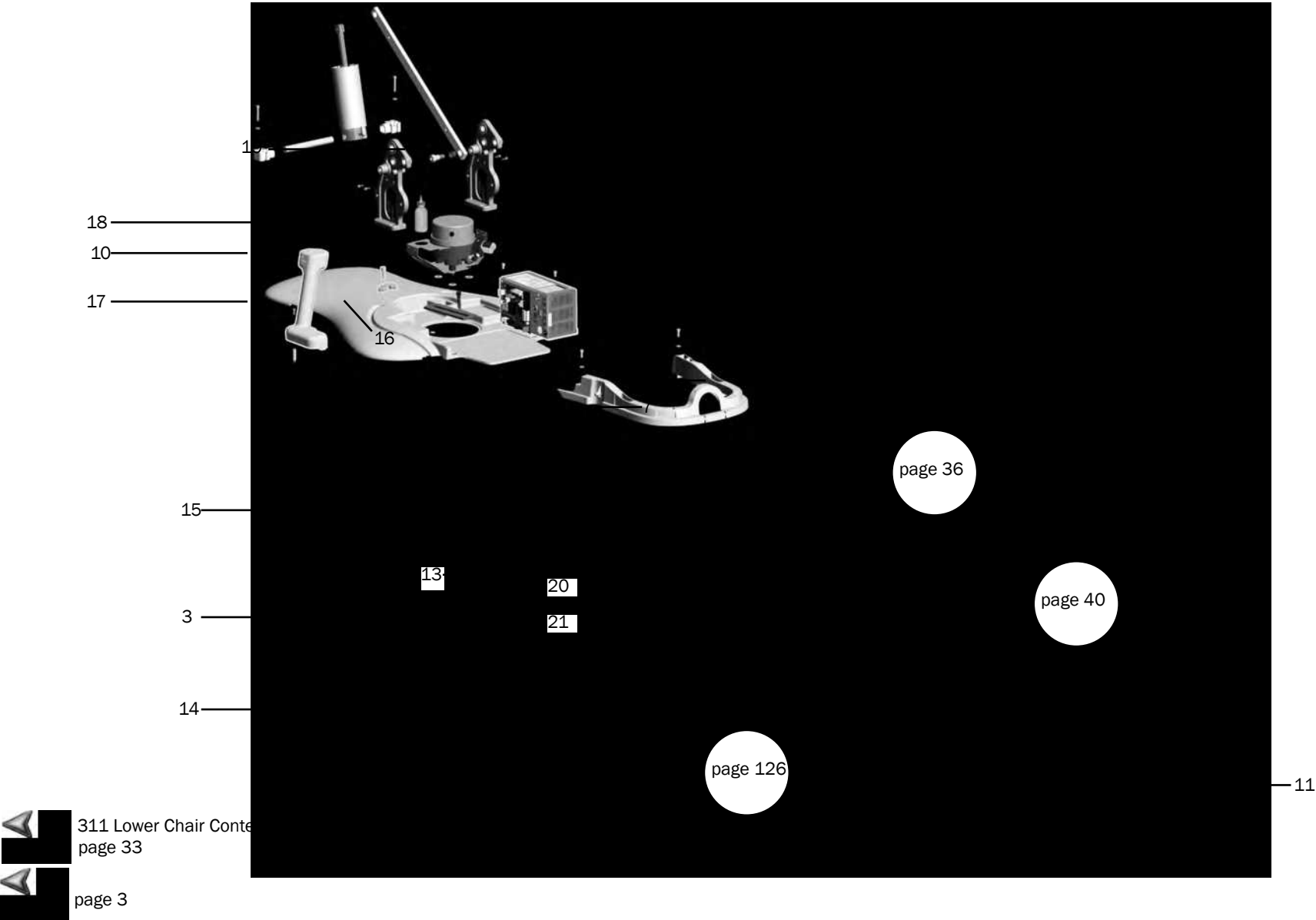
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Hydraulic Pump and  
Manifold



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311 Lift Cylinder and Chair Base

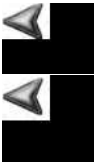
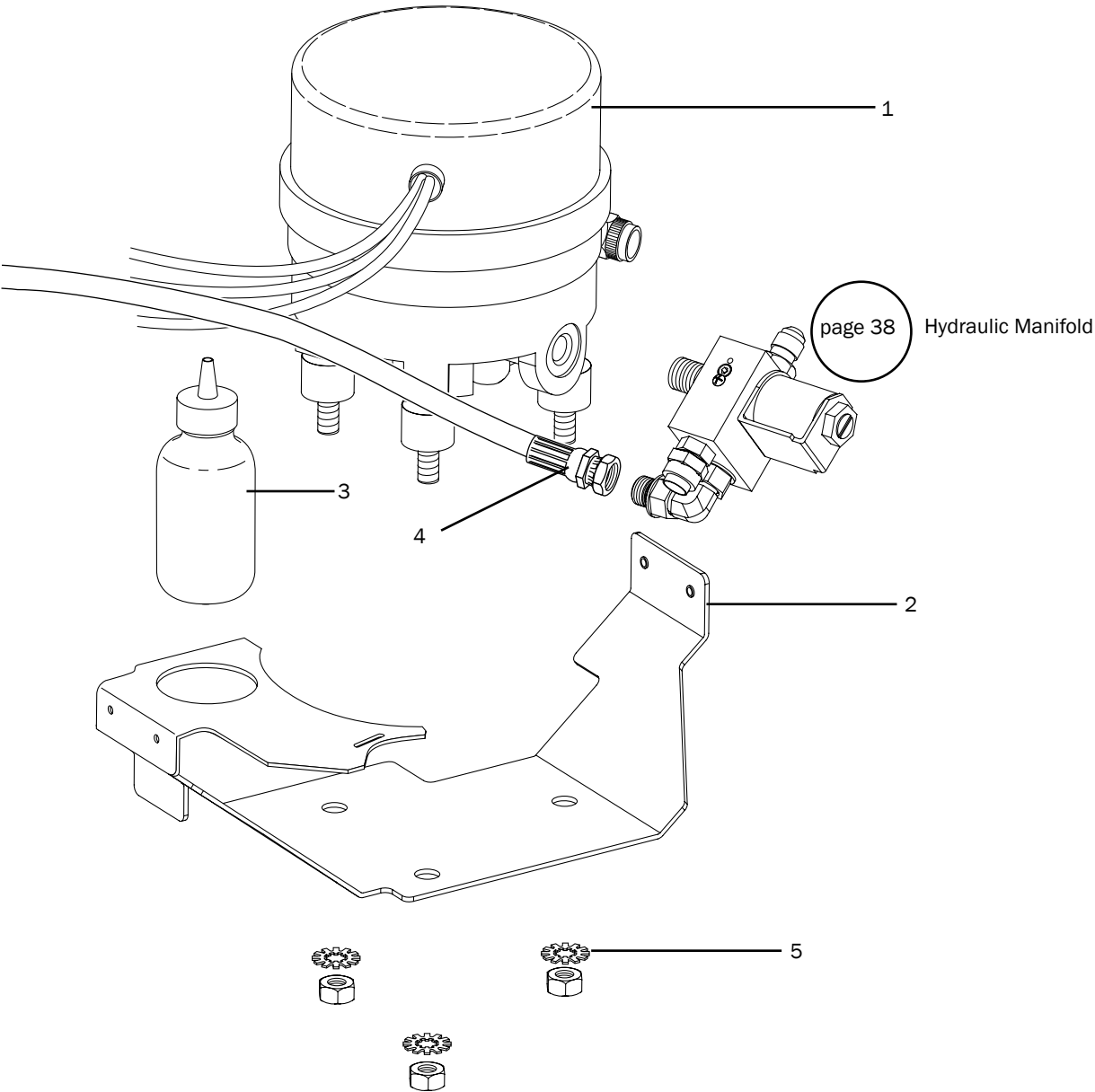


### 311 Lift Cylinder and Chair Base

Item	Part Number	Description	Replacement Kit
1	62.0249.00 †	Link	
2	62.0271.00 †	Tower	
3	002.135.01	Socket head patch screw, 10-32 x 1/2	
4	001.164.00	Socket shoulder bolt, 1/2-13 x 5/8 x 5/8	
5	016.164.00	Flanged bearing	
6	002.042.01	Socket head screw, 3/8-16 x 1/2	
7	62.0626.00	Bottle	
8	004.091.00	Washer	
9	001.089.00	Socket head screw, 1/4-20 x 5/8	
10	004.043.00	Washer	
11	62.0300.00	Stiffner	
12	002.120.00	Socket head patch screw	
13	62.0131.00	Strain relief	
14	037.046.00 †	Stand off pin	
15	62.0415.00 †	Motor wires cover	
16	62.0377.00	Lower lift cylinder pin	
17	62.0376.00	Bearing block	
18	002.082.03	Socket head screw, 1/4-20 x 1-1/2	
19	62.0368.00 †	Lift cylinder	90.1267.010 Lift cylinder kit
20	001.231.00 † 003.101.00	Hex head anchor bolt, 1/2 x 3-3/4 Lag bolt, 1/2	90.1161.00 Mounting kit, floor, 300
21	62.0285.00	Cleat	

† Indicates that the individual part is not available for sale

311 Hydraulic Pump and Manifold



### 311 Hydraulic Pump and Manifold

Item	Part Number	Description	Kit Replacement
1	61.3126.00 † 61.3127.00 †	Motor pump assembly (100/115 V) Motor pump assembly (240 V)	90.1429.00 120 V Hydraulic pump kit 90.1430.00 240 V Hydraulic pump kit
2	62.0380.00 †	Motor pump tray	90.1429.00 120 V Hydraulic pump kit 90.1430.00 240 V Hydraulic pump kit
3	62.0626.00	Overflow bottle	
4	62.0394.00	Hydraulic hose assembly, straight 90°, 13" long	
5	004.091.00	Lock washer	

† Indicates that the individual part is not available for sale

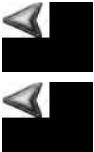
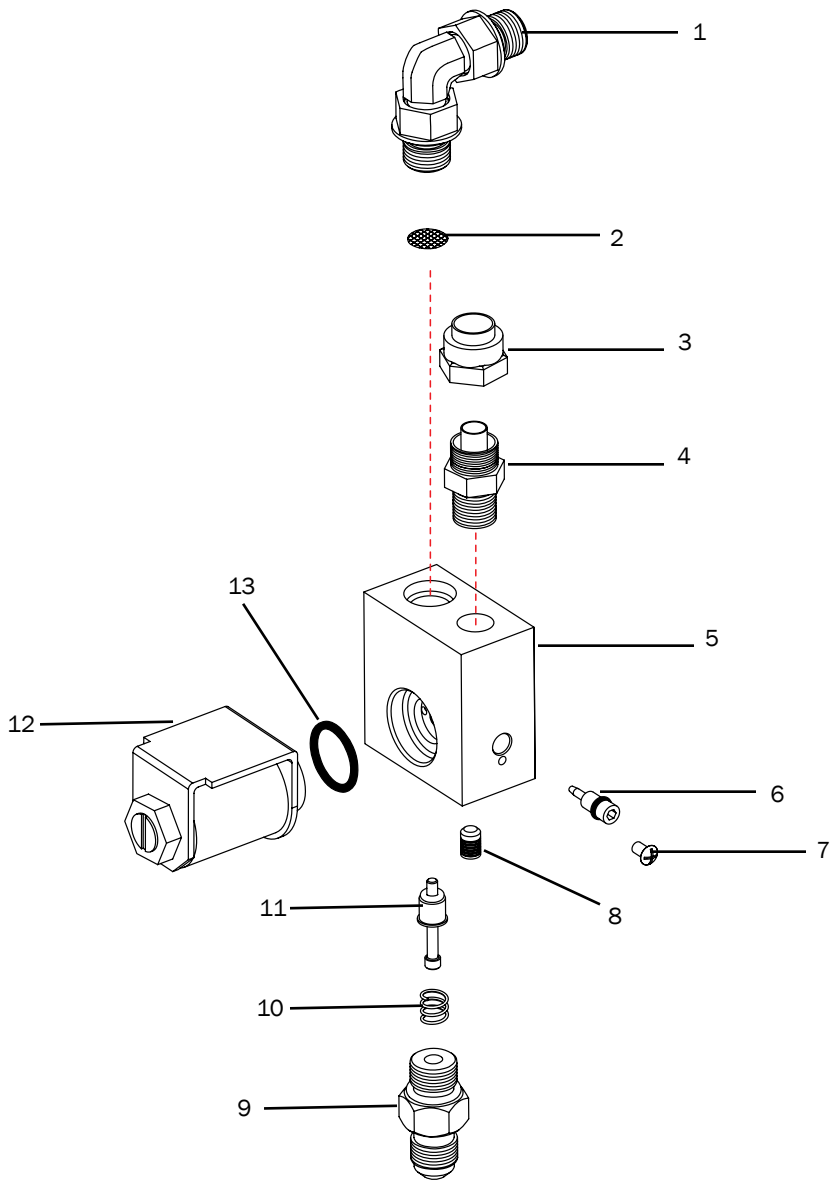


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311 Hydraulic Manifold





### 311 Hydraulic Manifold

p/n 62.0402.01 (part of 90.1429.00 100-120 V / 90.1430.00 240 V hydraulic pump kit)

Item	Part Number	Description
1	021.111.00 †	Elbow with O-rings, 7/16"
2	61.0464.00	Manifold screen, inlet
3	022.014.01	Nut, with sleeve, 3/8" poly
4	022.065.00 †	Adaptor, 3/8" poly x 1/8" MPT
5	62.0389.00 †	Manifold
6	61.0460.00	Flow adjustment screw, with O-ring
7	002.118.02	Screw, button head socket, patch, 4-40 x 3/16", package of 5
8	018.057.00	Plug, 3/16" expanding
9	022.049.00	Straight fitting with O-ring
10	013.044.00	Spring, compression, .250 OD x .40 FL
11	61.0461.01	Stem, with O-rings, check valve
12	62.0317.00	Solenoid assembly
13	030.015.02	O-ring AS568-015, .551ID X.070W, package of 10

† Indicates that the individual part is not available for sale

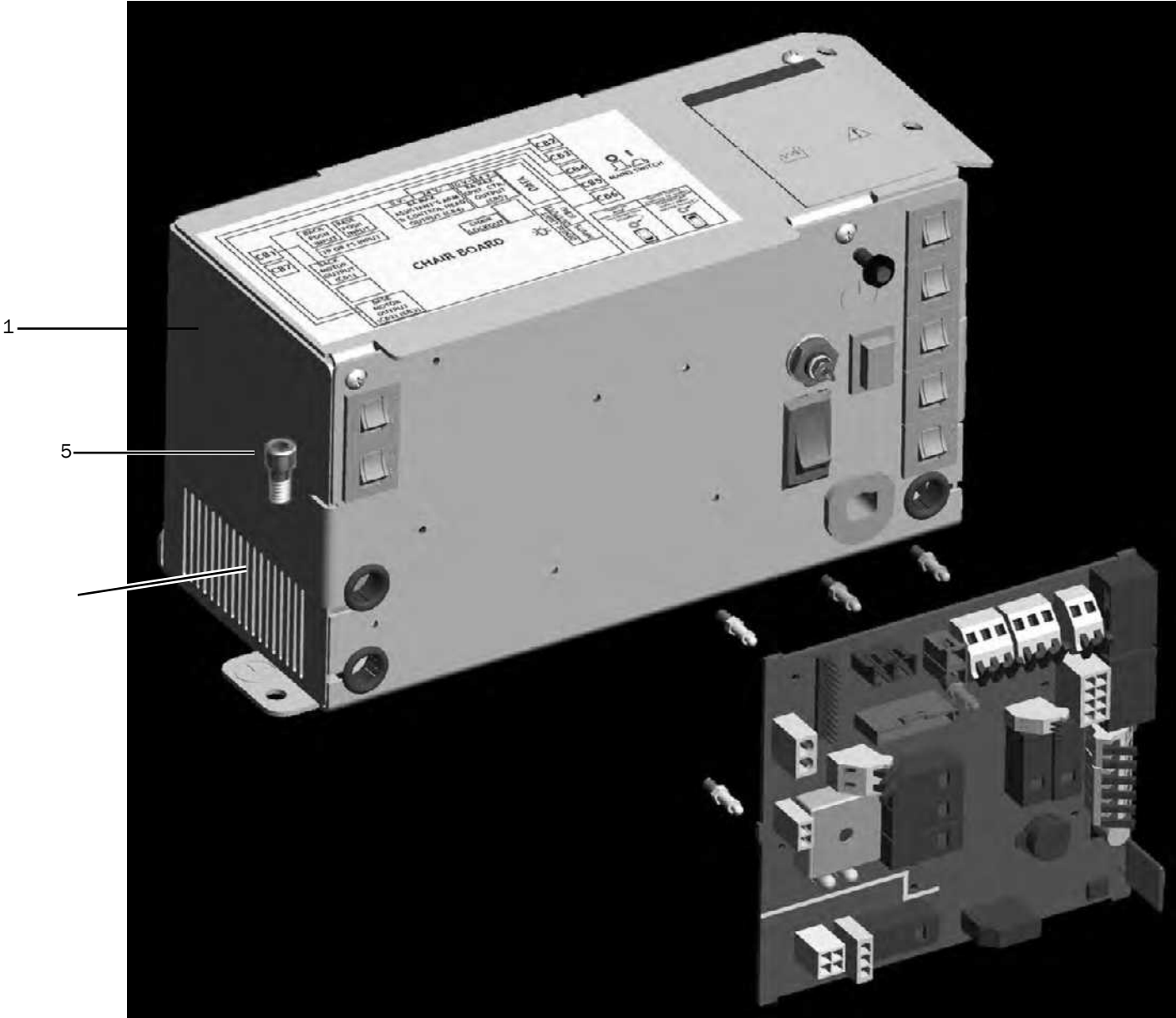
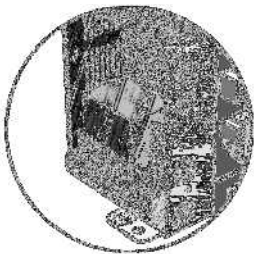


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311 Power Supply (311/411)




### 311 Power Supply (311/411)

p/n 90.1178.00 100 V / 90.1179.00 110-120 V / 90.1180.00 220-240 V

Item	Part Number	Description	Replacement Kit
1	43.0265.00 † 43.0266.00 † 43.0267.00 †	300 W 100 V Power supply assembly 300 W 120 V Power supply assembly 300 W 240 V Power supply assembly	90.1178.00 - 100 V Power supply kit 90.1179.00 - 120 V Power supply kit 90.1080.00 - 240 V Power supply kit
2	90.1082.00	Standoff, package of 5	
3	90.1177.00	Chair circuit board kit	
4	90.1198.00 90.1199.00 90.1200.00	Motor capacitor, 100 V kit Motor capacitor, 110-120 V kit Motor capacitor, 220-240 V kit	
5	002.010.00	Socket head patch screw, 1/4-20 X 3/8	

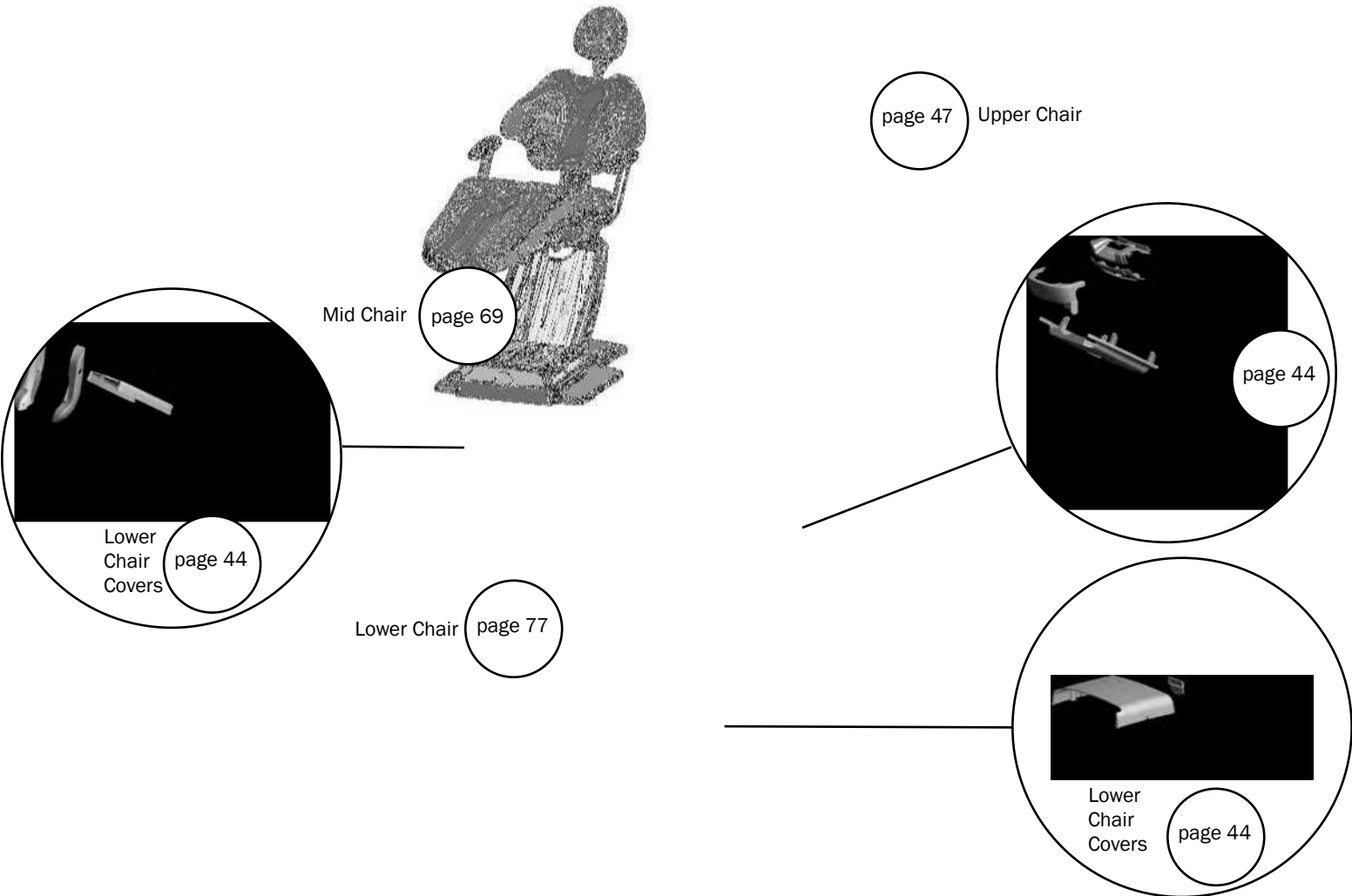
† Indicates that the individual part is not available for sale

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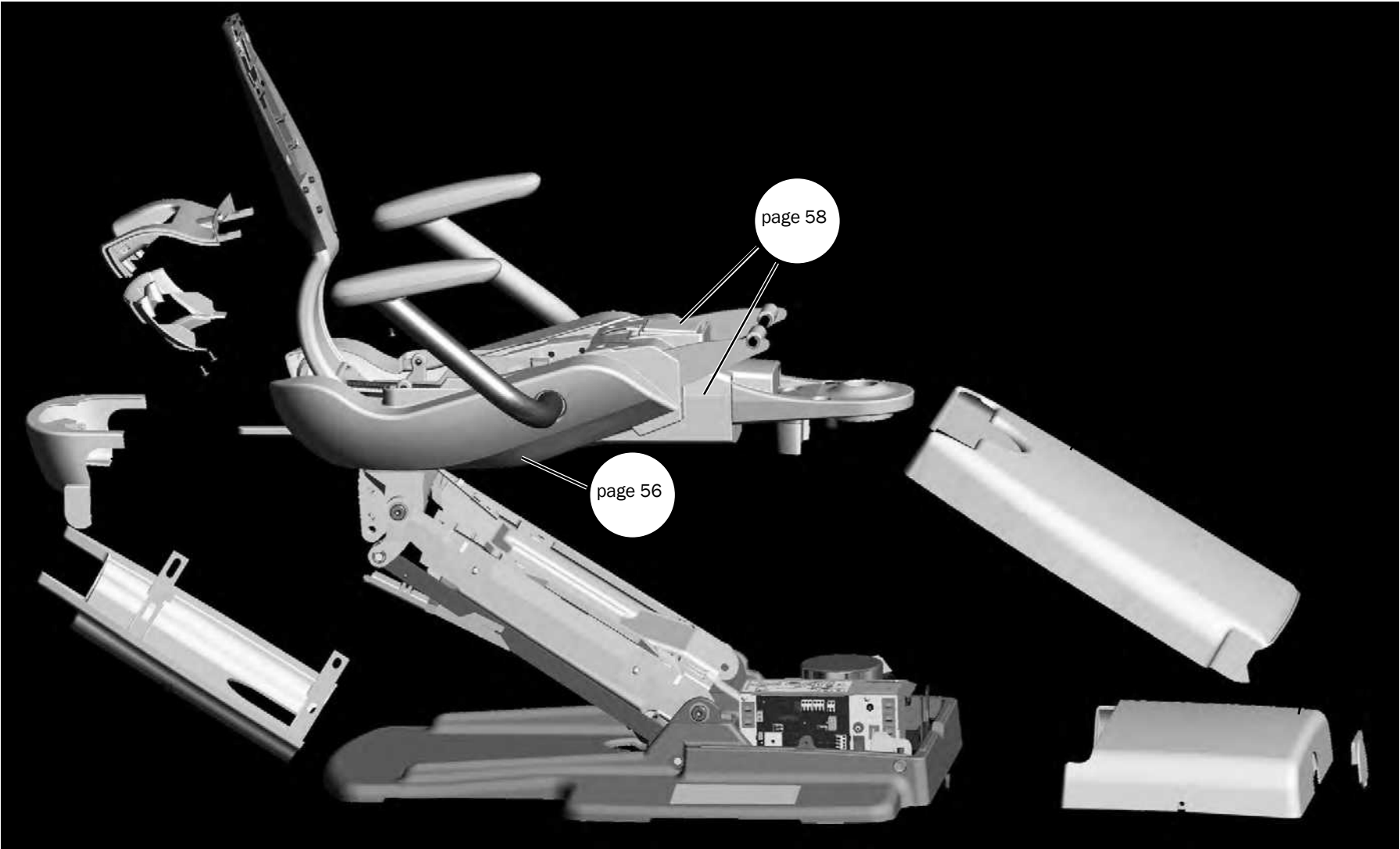
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# Illustrated Parts Breakdown – 411 Chair



411 Lower Chair Covers



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## 411 Lower Chair Covers

Item	Part Number	Description	Replacement Kit
1	62.0081.01	Lift arm cover	
2	62.0080.01	Motor pump cover	
3	62.0101.01	Pump cover plug	
4	62.0084.01	Chair stop plate	
5	62.0765.00	Swivel cover	
6	62.0786.00 †	Rear cover assembly (2 piece cover assembly)	90.1417.00 Upper structure cover kit

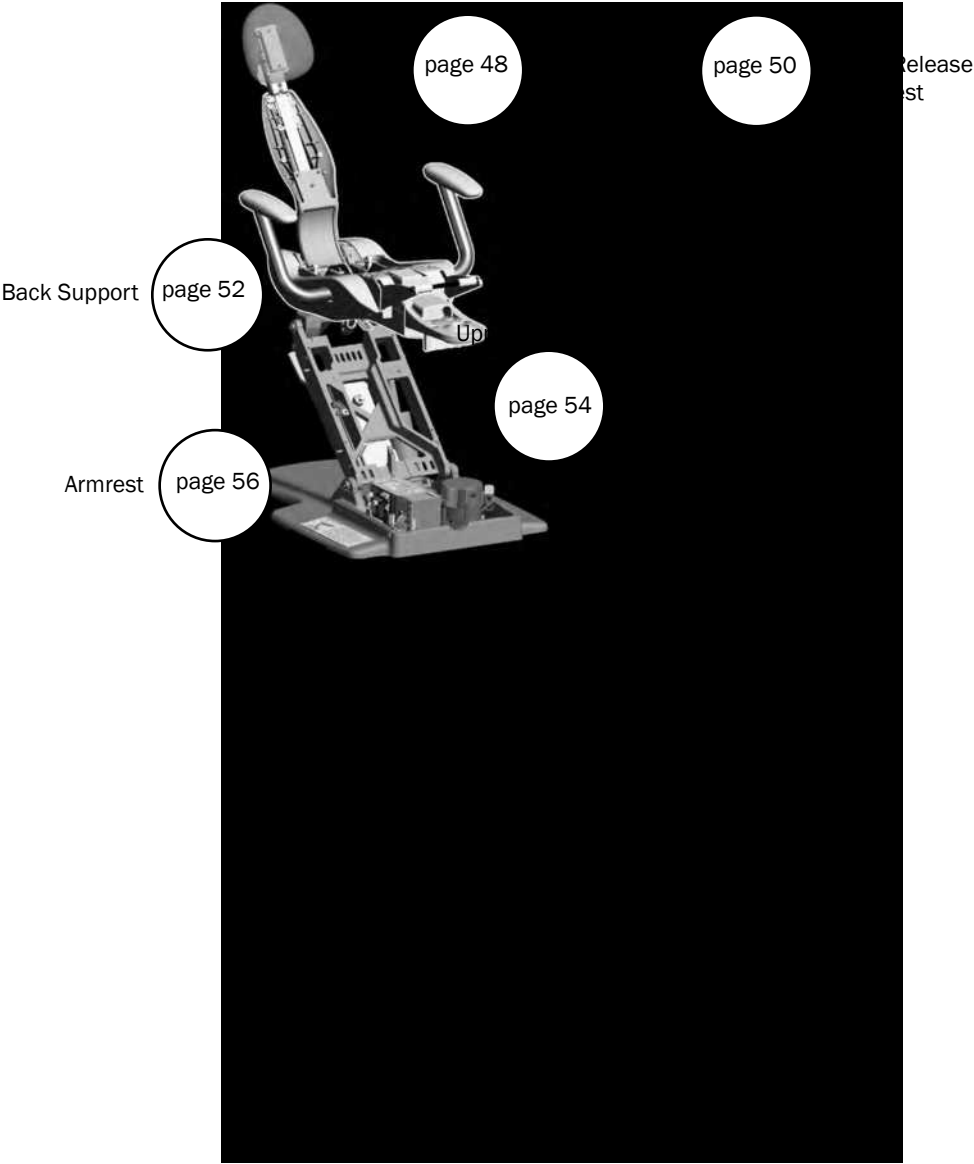
† Indicates that the individual part is not available for sale







411 Upper Chair



**411 Double-Articulating Locking Knob Headrest (311/411)**



## 411 Locking Knob Headrest (311/411)

p/n 62.0631.01

Item	Part Number	Description	Replacement Kit
1	62.0427.00 †	Knob assembly	Part of 90.1221.00 Knob kit
2	004.136.00	Thrust washer	Part of 90.1221.00 Knob kit
3	016.033.00	Thrust needle bearing	Part of 90.1221.00 Knob kit
4	62.0749.00 †	Clamp plate	Part of 90.1221.00 Knob kit
5	014.015.00 †	Threaded insert	
6	001.191.01	Hex head screw, GR8 5/8-18 x 3-1/4	
7	62.0429.00	Side cap	
8	030.012.00	O-ring	

† Indicates that the individual part is not available for sale

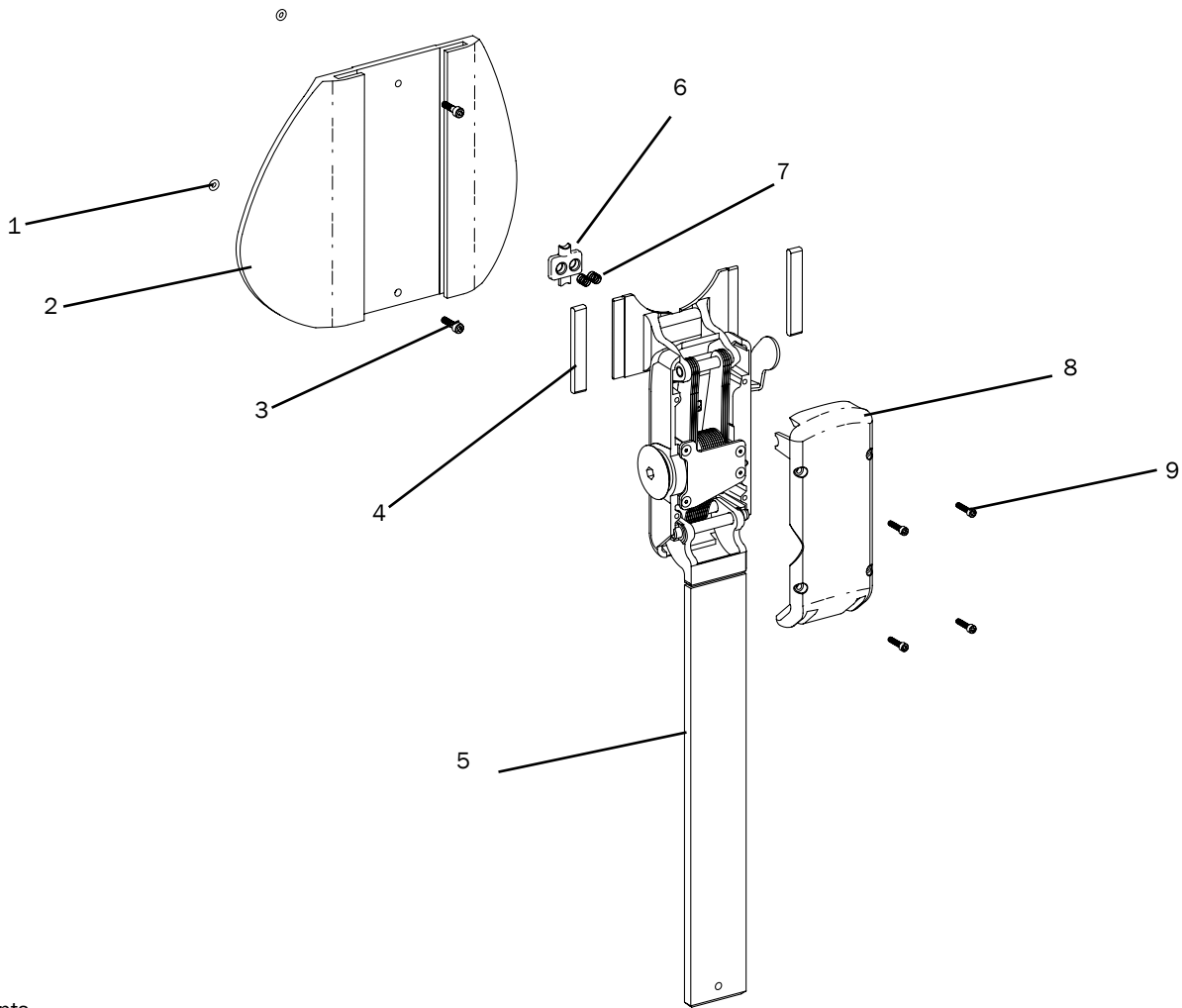


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411 Lever Release Headrest (411/511)



## 411 Lever Release Headrest (411/511)

Item	Part Number	Description	Replacement Kit
1	035.049.01	O-ring, E, .115 ID x .07 W, package of 10	
2	90.1092.01 90.1092.00	Cover, headrest cushion, white Cover, headrest cushion, surf	
3	001.042.01	Screw, socket head, 6-32 x 1/2", stainless steel, patch	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
4	62.0021.00	Bearing, slider, headrest cushion	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
5	90.1091.01 90.1091.00	Headrest assembly, white (includes items 3, 4, 6, 7 and 8) Headrest assembly, surf (includes items 3, 4, 6, 7 and 8)	
6	62.0094.00	Bearing, slider, brake, headrest	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
7	013.005.00	Spring	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
8	62.0141.01 62.0141.00	Cap, headrest, white Cap, headrest, surf	
9	001.021.00	Screw, socket head, 4-40 x 1/2", stainless steel	

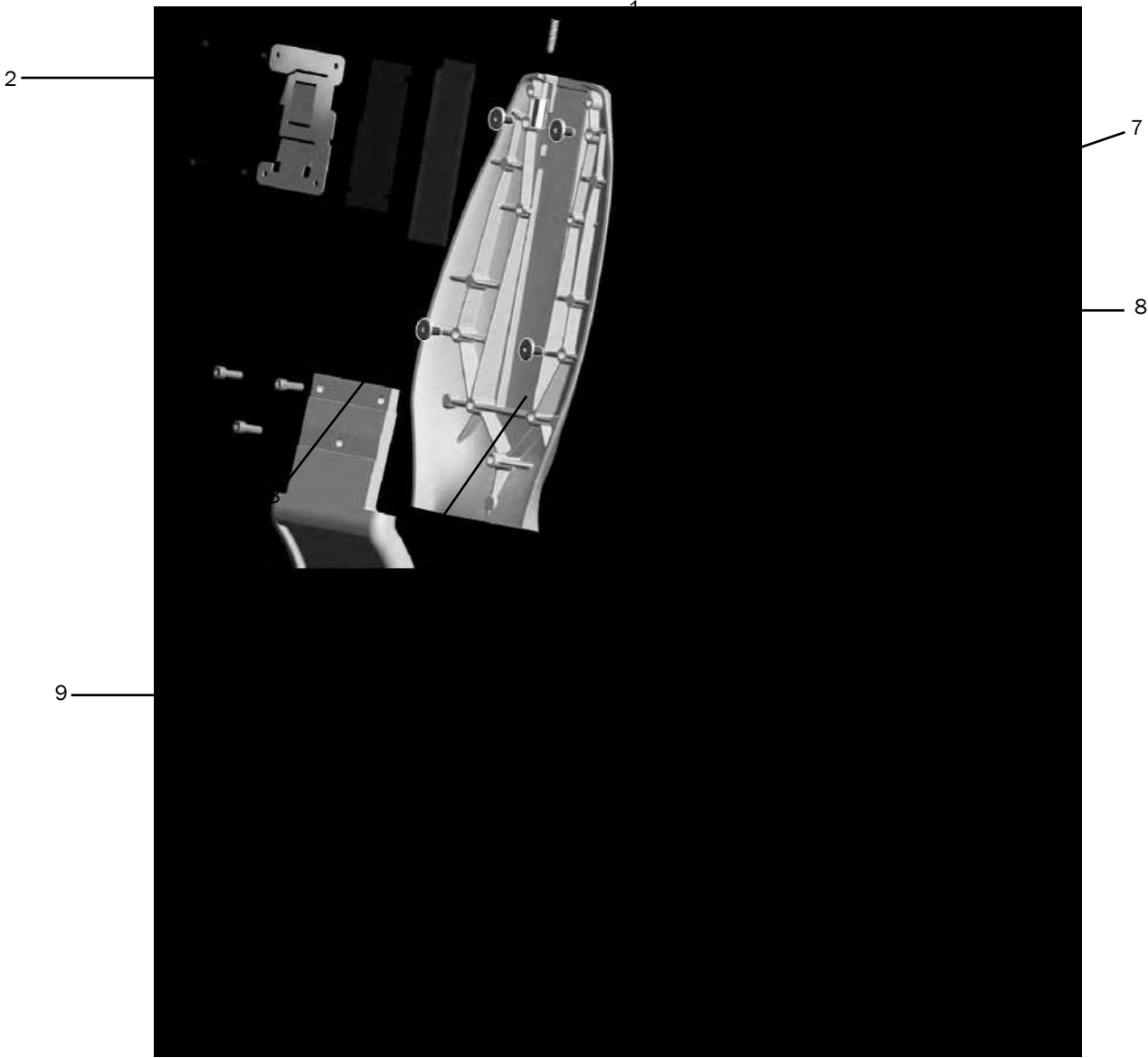


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411 Back Support (311/411/511)



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## 411 Back Support (311/411/511)

Item	Part Number	Description	Replacement Kit
1	001.244.00	JCB socket screw, 1/4-20 x 15 mm	
2	005.138.01	Button head socket path screw, 10-32 x 5/16	
3	62.0104.00 †	Bracket	90.0719.00 Glide bar brake kit
4	62.0103.00	Upper wear pad	
5	62.0102.00	Lower wear pad	
6	007.158.00	Set screw, 1/4-20 x 1	
7	006.144.00	Coupling	
8	62.0048.01 †	Back support, White	90.1099.01 01 Support back assembly
9	001.245.00	Screw	

† Indicates that the individual part is not available for sale

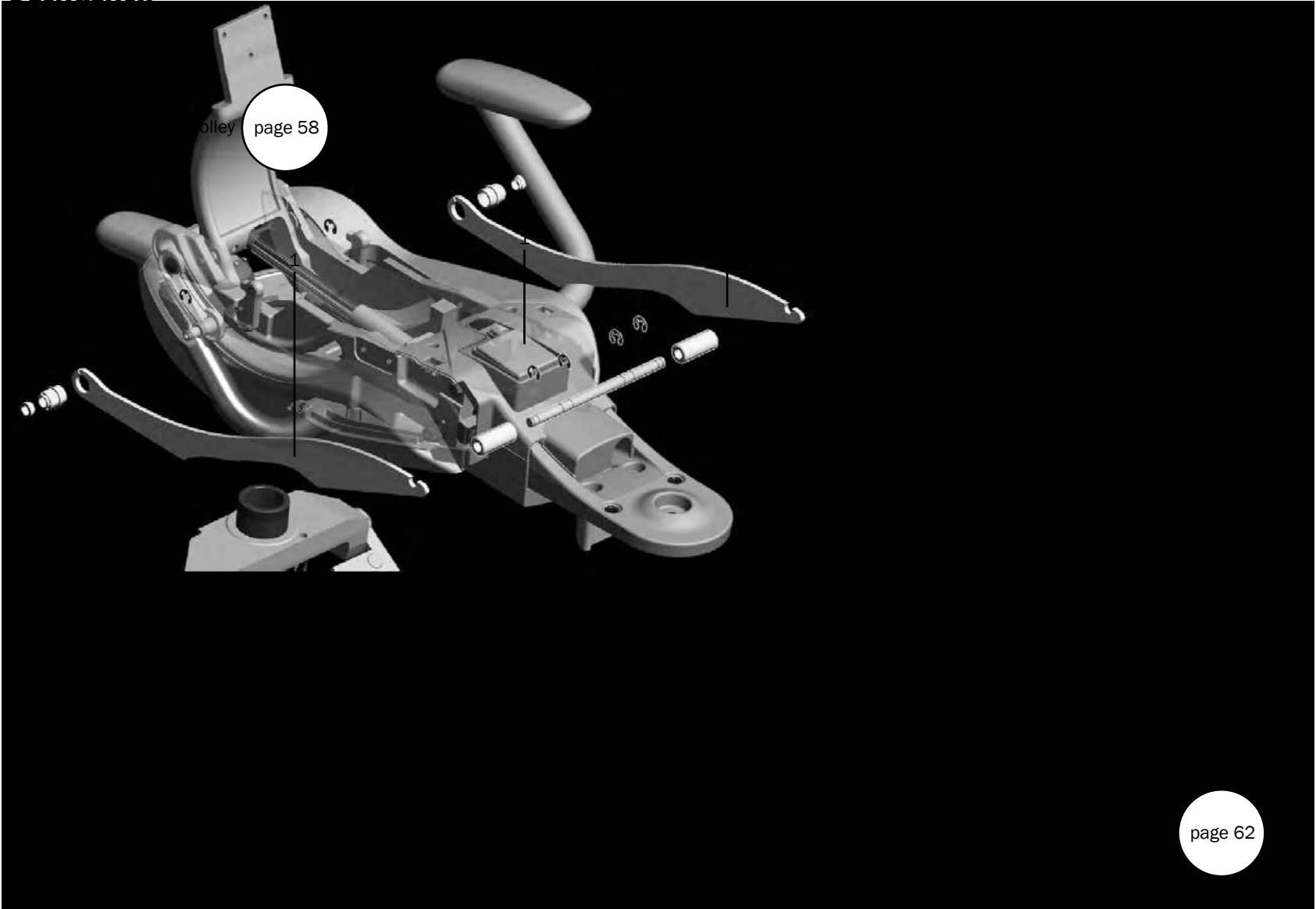


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411 Upper Structure



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## 411 Upper Chair Structure

Item	Part Number	Description
1	010.031.01	Retaining clip
2	62.0067.00	Roller
3	62.0728.00	Lift cam
4	62.0185.00	Spring support
5	62.0754.00	Roller
6	62.0069.00	Axle

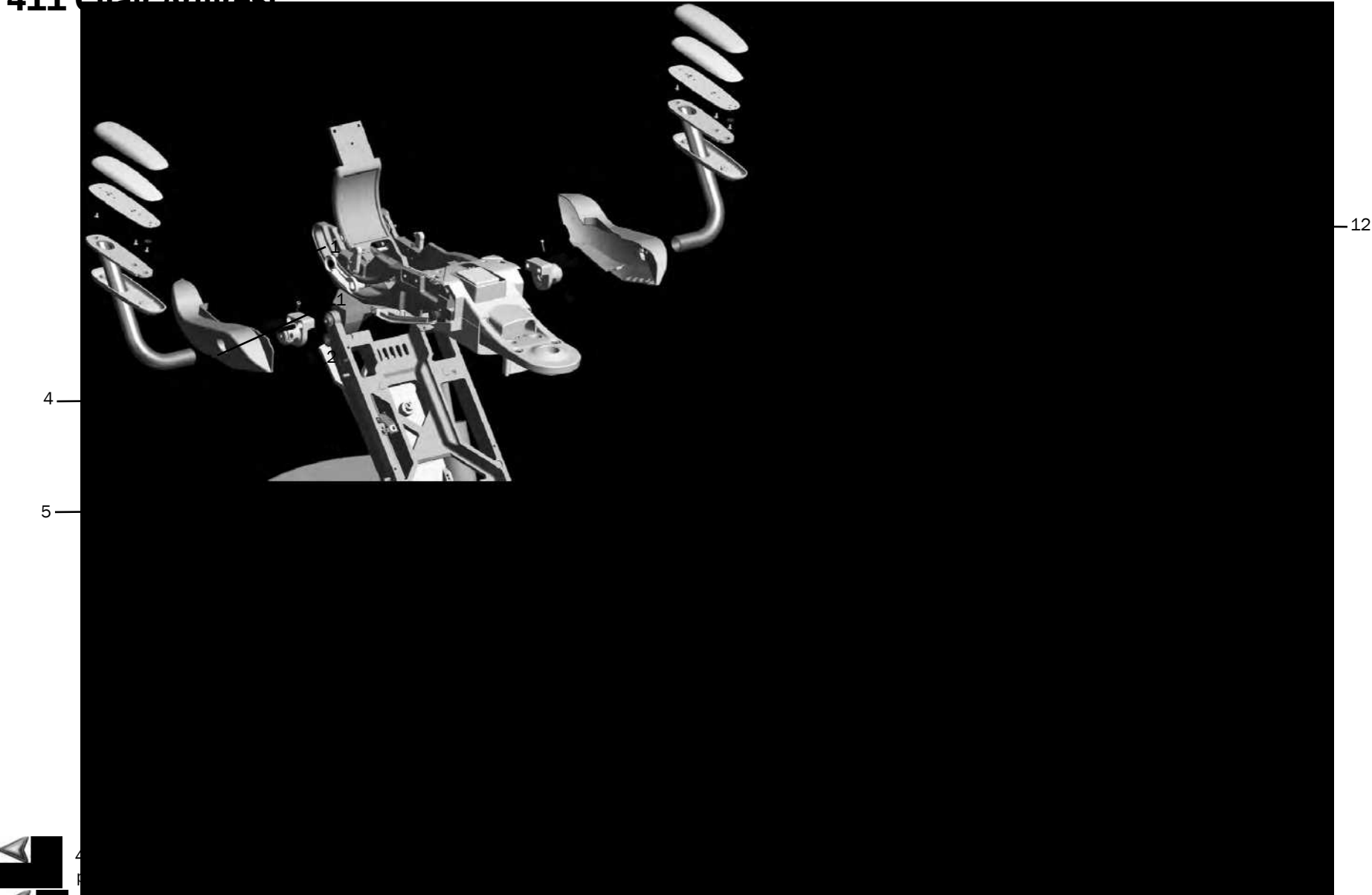


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411 Chair Armrest



## 411 Chair Armrest

Item	Part Number	Description	Replacement Kit
1	62.0828.00	Upper armrest cover	90.1401.00, Armrest cover kit
2	62.0830.00 †	Armature	90.1401.00, Armrest cover kit
3	62.0785.00 †	Armrest frame, left	90.1402.00 Left armrest kit
4	005.012.03	Button, socket head, patch screw, 10-32 x 3/8	90.1401.00, Armrest cover kit
5	62.0829.00	Lower armrest cover	90.1401.00, Armrest cover kit
6	005.181.00	Socket head cap screw, 7/16-14 x 1-1/2	
7	002.166.00	Socket head screw, 10-32 x 3/4 (black)	
8	62.0780.00 †	Mount	90.1400.00 Armrest mount kit
9	002.158.00	Socket head screw, 3/8-16 x 1/2, GR8	
10	62.0784.00	Armrest frame, right	90.1403.00 Right armrest kit
11	62.0831.00	Foam	
12	004.230.00	Washer	90.1401.00, Armrest cover kit
13	62.0768.00	Right hand upper side cover	90.1398.00 Kit, side cover, right
14	62.0767.00	Left hand upper side cover	90.1397.00 Kit, side cover, left

† Indicates that the individual part is not available for sale

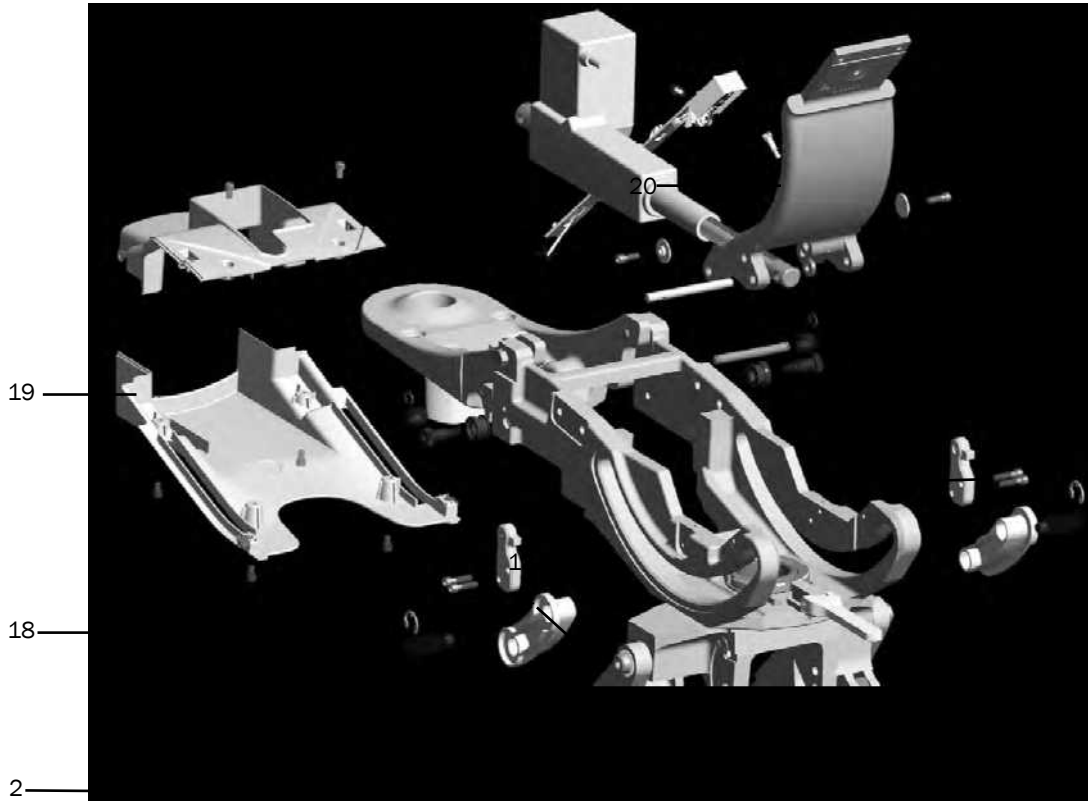


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411 Chair Trolley



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## 411 Chair Trolley

Item	Part Number	Description	Replacement Kit
1	001.138.00	1/4-20 X 1/2 Pan head Phillips screw	
2	002.010.00	1/4-20 X 3/8 Socket head patch screw	
3	62.0846.00	Chair trolley	
4	62.0070.00	Guide	
5	001.245.00	Socket head cap screw, 1/4-20 x 3/4	
6	62.0061.00	Guide	
7	62.0775.00 † 62.0774.00 †	Seat attach bracket kit (includes items 8 and 9)	90.1404.00 Seat attach bracket kit
8	002.120.00	Socket head patch screw, 1/4-20 x 1	90.1404.00 Seat attach bracket kit
9	010.083.00	E-ring	
10	62.0202.00	Slider shoulder bolt	
11	62.0189.00	Spacer	
12	62.0858.00	Pin	
13	010.040.00	E-ring	
14	62.0760.00	Compression spring	
15	62.0761.00	Pin	
16	001.277.00	Socket shoulder screw, 3/8-16 X 1/2 X 3/4	
17	62.0844.00 †	Flange bushing	
18	62.0771.00	Upper cover bottom	
19	62.0772.00	Upper cover top	
20	62.0726.00 †	Tilt actuator	90.1406.00 Tilt actuator assembly Kit

† Indicates that the individual part is not available for sale

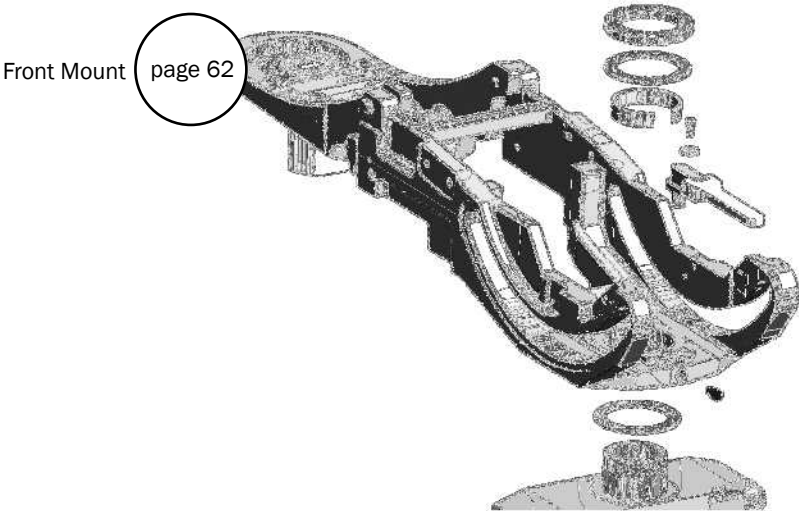


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411 Upper Structure



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- \_\_\_\_\_ 8
- \_\_\_\_\_ 2

## 411 Upper Structure

Item	Part Number	Description
1	61.2051.00	Spanner nut
2	016.033.00	Thrust needle bearing
3	62.0237.00	Wear ring
4	005.008.01	1/4-20 x 1/2 Socket head screw
5	004.170.00	Washer
6	62.0218.01	Brake handle assembly
7	62.0727.00 †	Upper structure casting
8	62.0042.00	Brake adjuster

† Indicates that the individual part is not available for sale

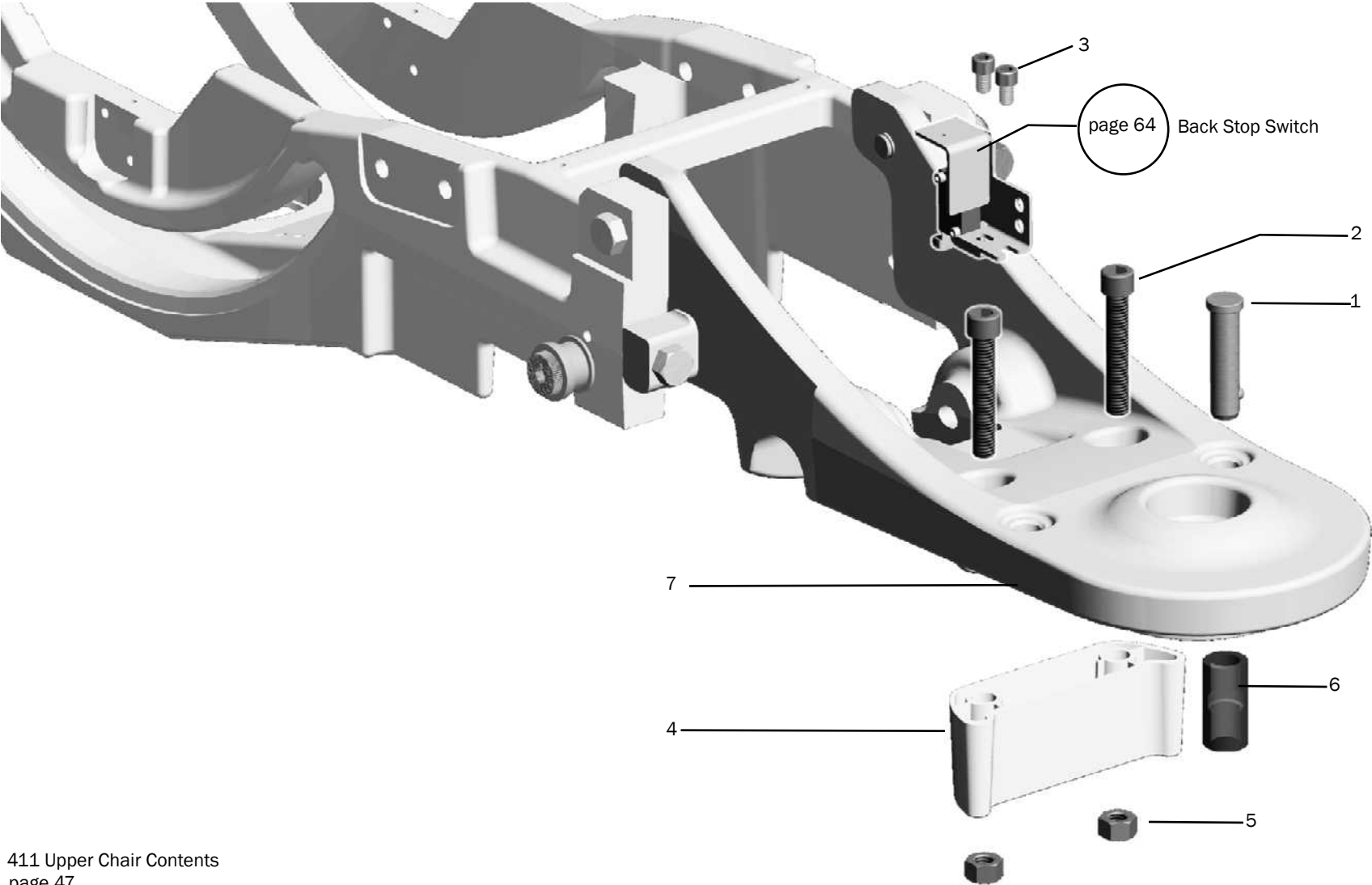


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411 Front Mount





## 411 Front Mount

Item	Part Number	Description	Replacement Kit
1	011.140.00	Detent pin	90.1388.00 Rotation stop Kit
2	005.154.00	Socket head cap screw, 3/8-16 x 2-1/4	
3	002.010.00	Socket head patch screw, 1/4-20 x 3/8 stainless steel	
4	77.1170.00	Stop	
5	006.130.00	Hex nut, 3/8-16 x 9/16 x 21/64	
6	77.1258.00	Rotation stop sleeve	90.1388.00 Rotation stop Kit
7	62.0764.00 † *	Front mount	

\* Item is factory installed and is not removable

† Indicates that the individual part is not available for sale

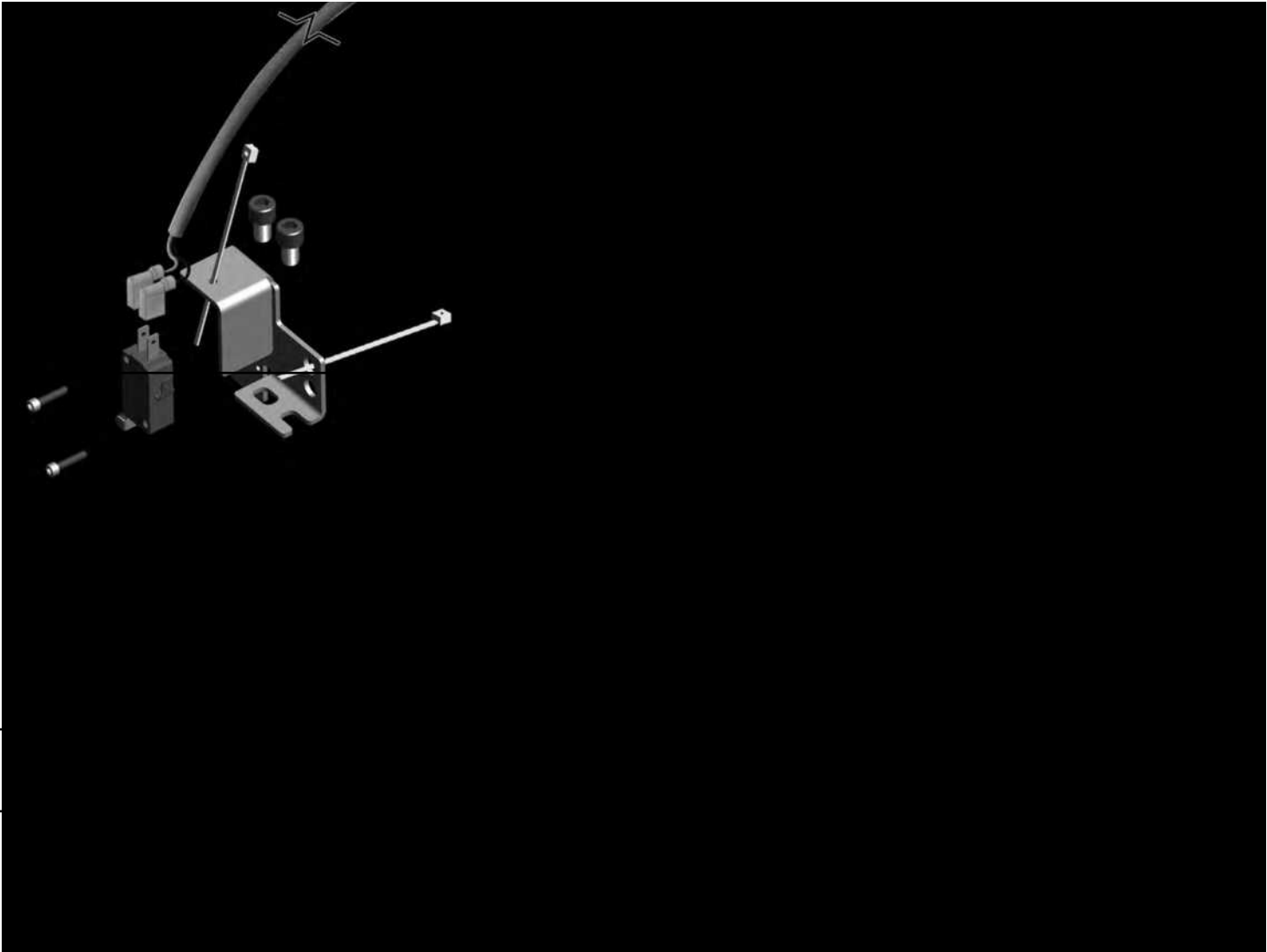


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411 Back Stop Switch



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## 411 Back Stop Switch

Item	Part Number	Description	Replacement Kit
1	002.010.00	Socket head patch screw, 1/4-20 x 3/8 stainless steel	90.1426.00 Back stop switch kit
2	62.0759.00 †	Bracket	
3	044.204.00 †	Micro-switch	90.1426.00 Back stop switch kit
4	001.021.00	Socket head screw, 4-40 x 1/2 stainless steel	90.1426.00 Back stop switch kit
5	025.036.01	Cable tie, package of 10	
6	025.002.01	Cable tie, package of 10	
7	43.0330.00	Electric cable	

† Indicates that the individual part is not available for sale

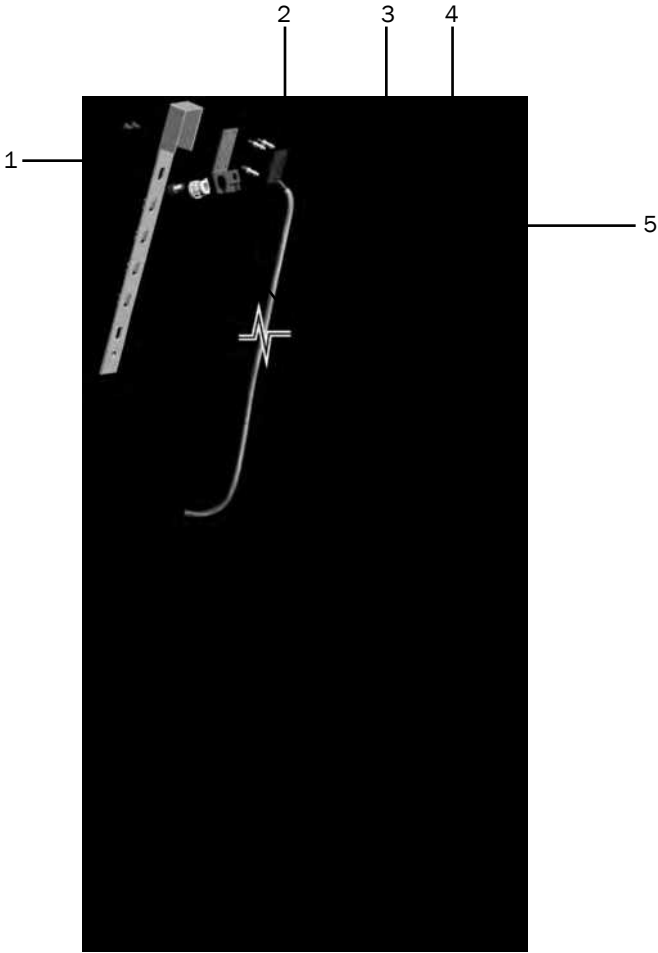


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411 Position Sensor



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## 411 Position Sensor

p/n 90.1399.00

Item	Part Number	Description	Replacement Kit
1	002.140.00	1/4-20 Special shoulder screw	90.1399.00 Tilt retain cable kit
2	62.0773.00 †	Cable retainer	90.1399.00 Tilt retain cable kit
3	62.0335.00 †	Bracket	
4	90.1082.00	Standoff, package of 5	Included in 90.1183.00 Lift Cylinder Kit
5	43.0102.00	Circuit board	Included in 90.1183.00 Lift Cylinder Kit
6	018.112.00 †	Bushing strain relief	Included in 90.1183.00 Lift Cylinder Kit
7	002.010.00	6-32 X 2-3/4 Socket head screw	Included in 90.1183.00 Lift Cylinder Kit

† Indicates that the individual part is not available for sale



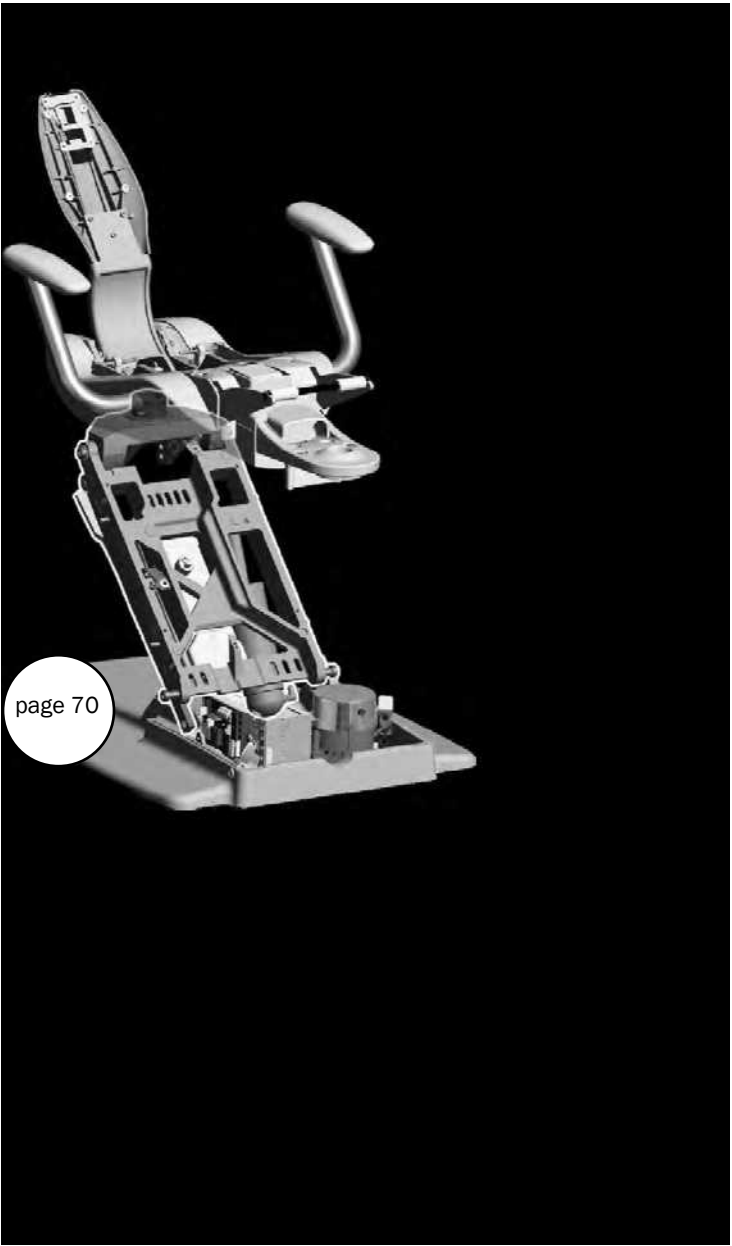
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411 Mid Chair



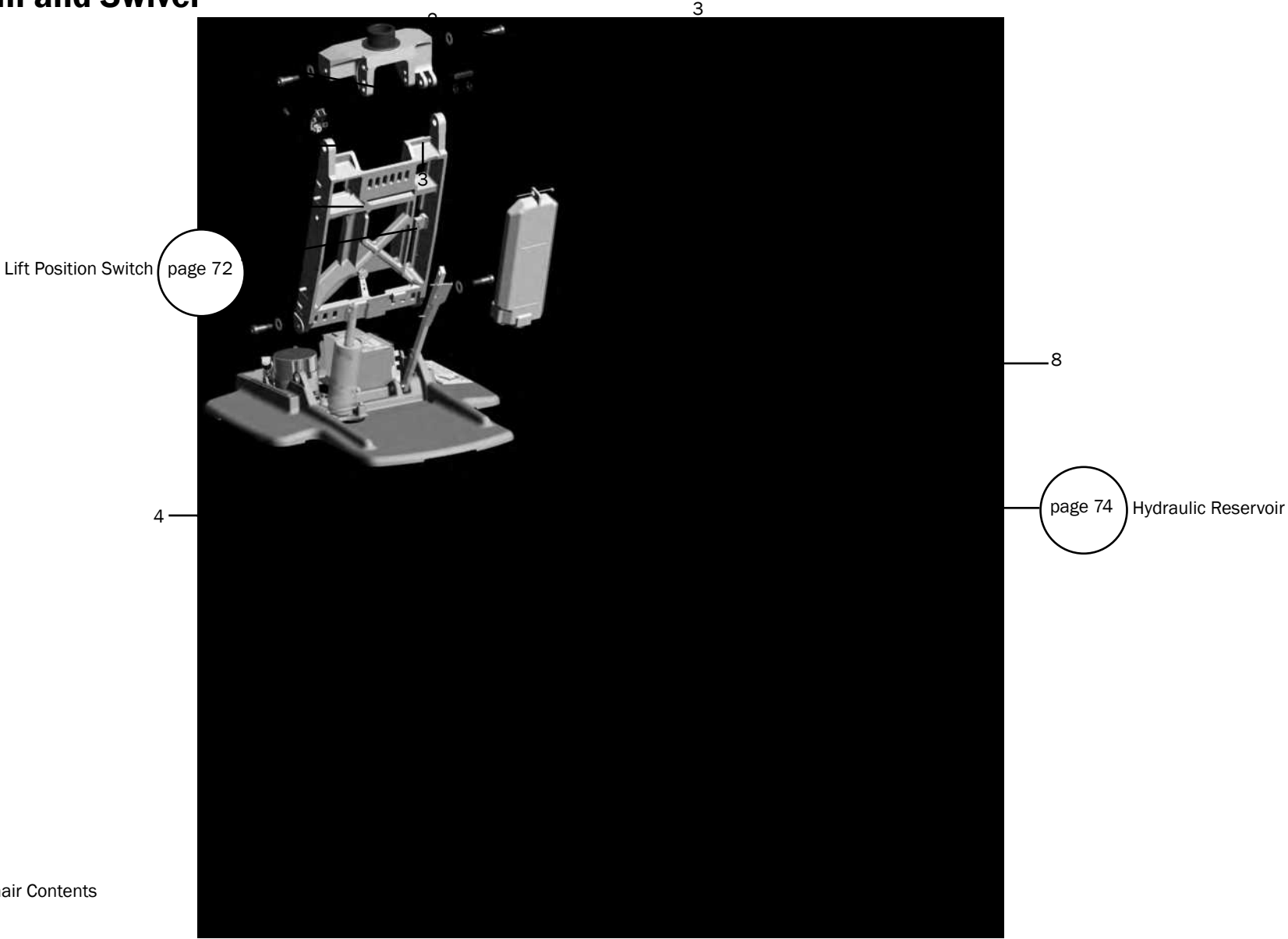
Lift Arm and Swivel

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411 Lift Arm and Swivel



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## 411 Lift Arm and Swivel

Item	Part Number	Description	Replacement Kit
1	62.0729.00 †	Swivel mount	
2	62.0045.00 †	Swivel	
3	004.148.00	Washer	
4	001.165.00	Socket shoulder screw	
5	62.0077.00	Link arm pin	
6	010.031.00	Retaining ring	
7	62.0089.01 †	Lift arm	
8	025.036.01	Cable tie, package of 10	
10	005.008.01	Socket head screw, 1/4-20 x 1/2	

† Indicates that the individual part is not available for sale

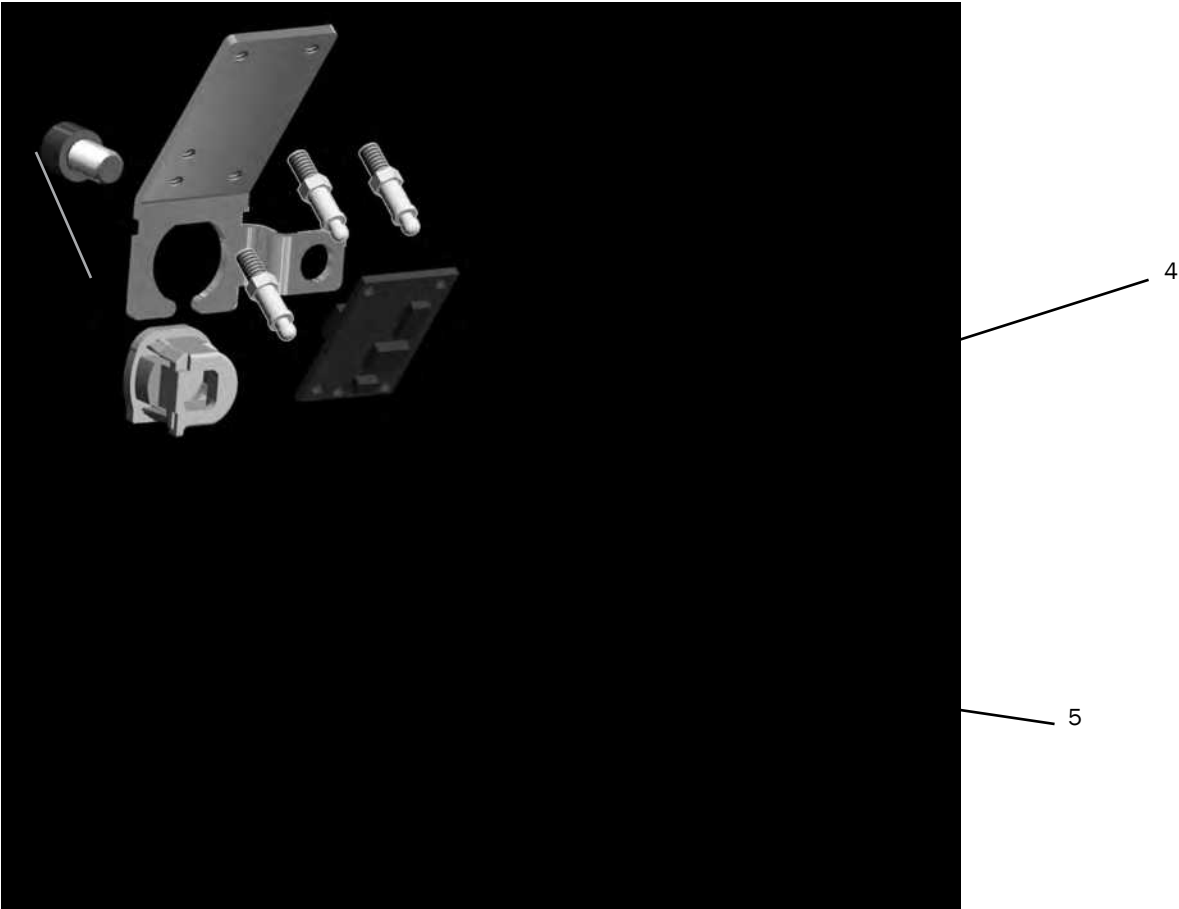


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411 Lift Position Switch



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## 411 Lift Position Switch

Item	Part Number	Description	Replacement Kit
1	62.0335.00 †	Bracket	
2	018.112.00 †	Strain relief	90.1183.00 Position sensor
3	002.010.00	Screw, socket head patch, 1/4 - 20 x 3/8	
4	041.662.00 †	Standoff	
5	43.0102.00 †	Position sensor circuit board	90.1183.00 Position sensor

† Indicates that the individual part is not available for sale

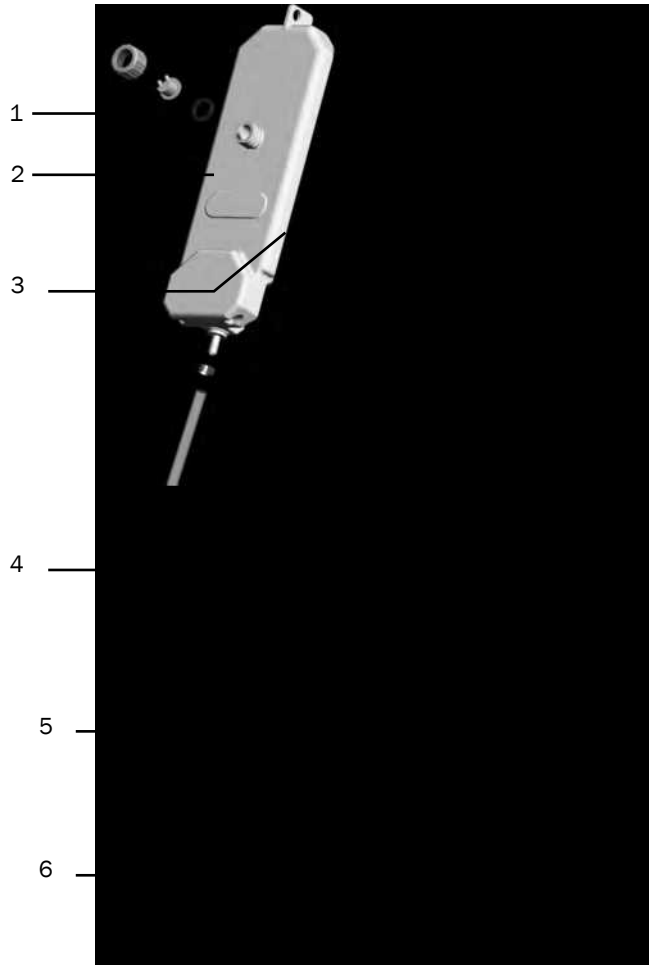


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411 Hydraulic Reservoir



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411 Hydraulic Reservoir

p/n 90.1393.00

Item	Part Number	Description
1	006.112.00	Reservoir cap
2	62.0195.00	Vent barb
3	004.161.00	Washer
4	62.0030.00 †	Hydraulic oil reservoir
5	025.111.00 †	Hose clamp
6	036.117.00 †	Clear tubing, 27"

† Indicates that the individual part is not available for sale



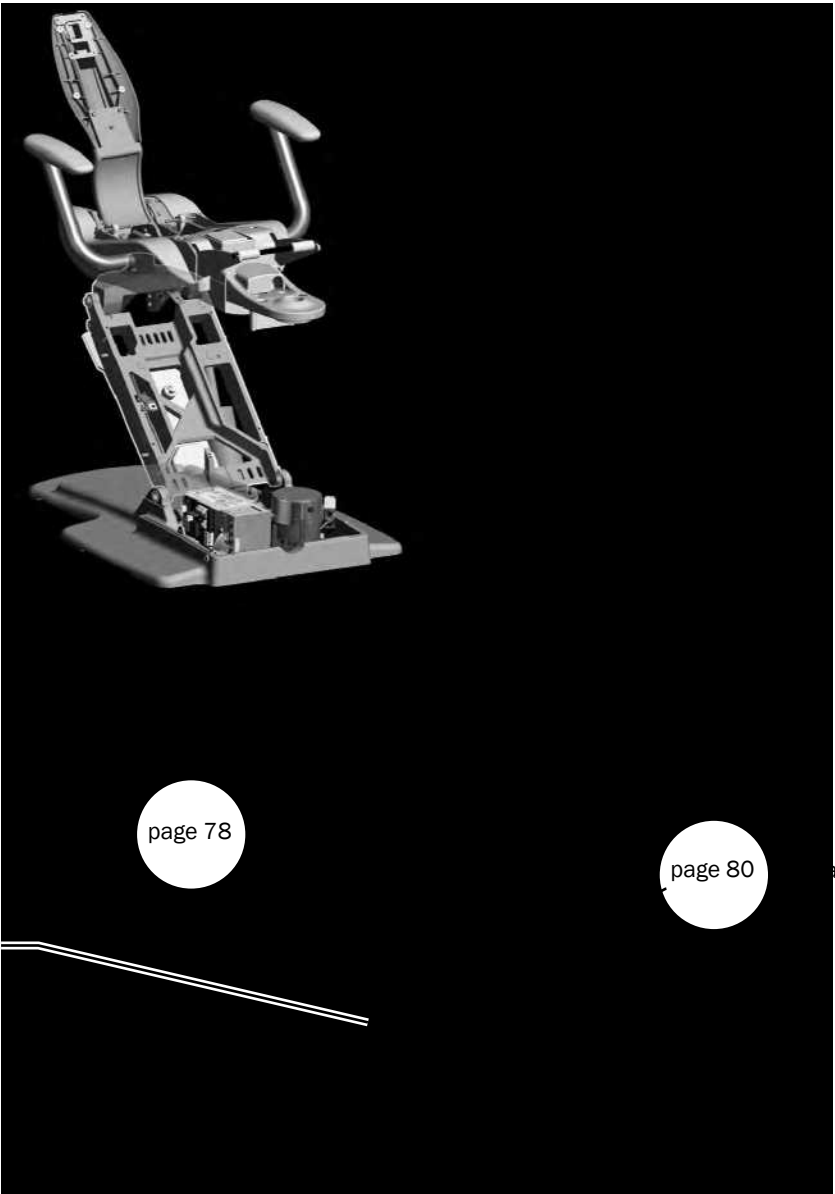
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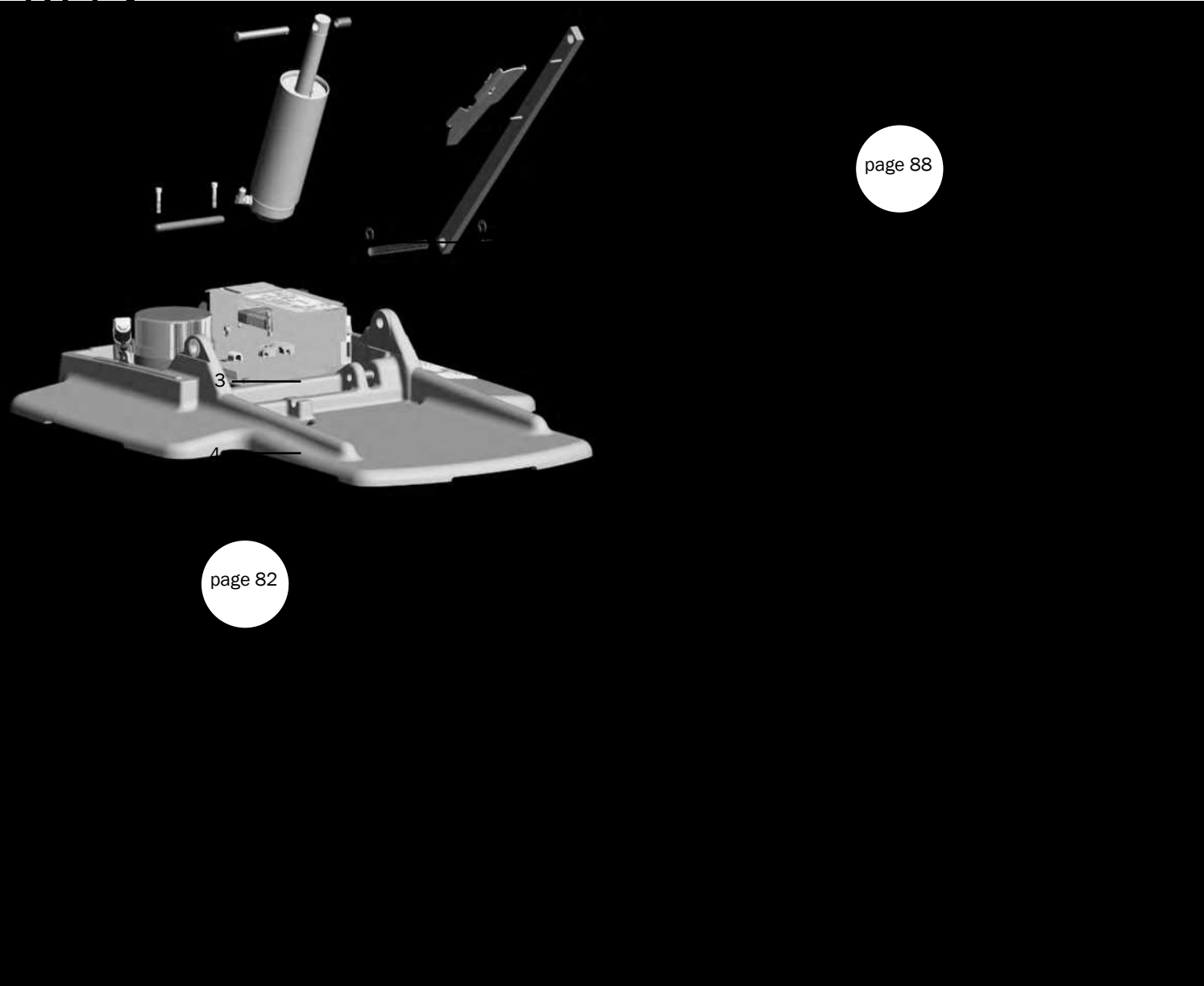


411 Lower Chair



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411 Cylinder and Mounting



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411 Lower Chair Component  
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## 411 Cylinder and Link Arm

Item	Part Number	Description	Replacement Kit
1	016.135.00 †	Bearing	
2	62.0078.00 †	Link arm	62.0078.01
3	001.093.01	Socket head screw, 1/4-20 x 1/4	
4	62.0135.00	Pin	
5	010.031.00	Retaining clip	
6	62.0134.00	Pin	
7	62.0131.00	Strain relief	
8	025.112.00	Half clamp	
9	002.010.00	Socket head patch screw, 1/4 x 3/8	
10	62.0085.03 †	Lift cylinder	90.1083.01
11	011.124.00 †	Pin	90.1083.01

† Indicates that the individual part is not available for sale

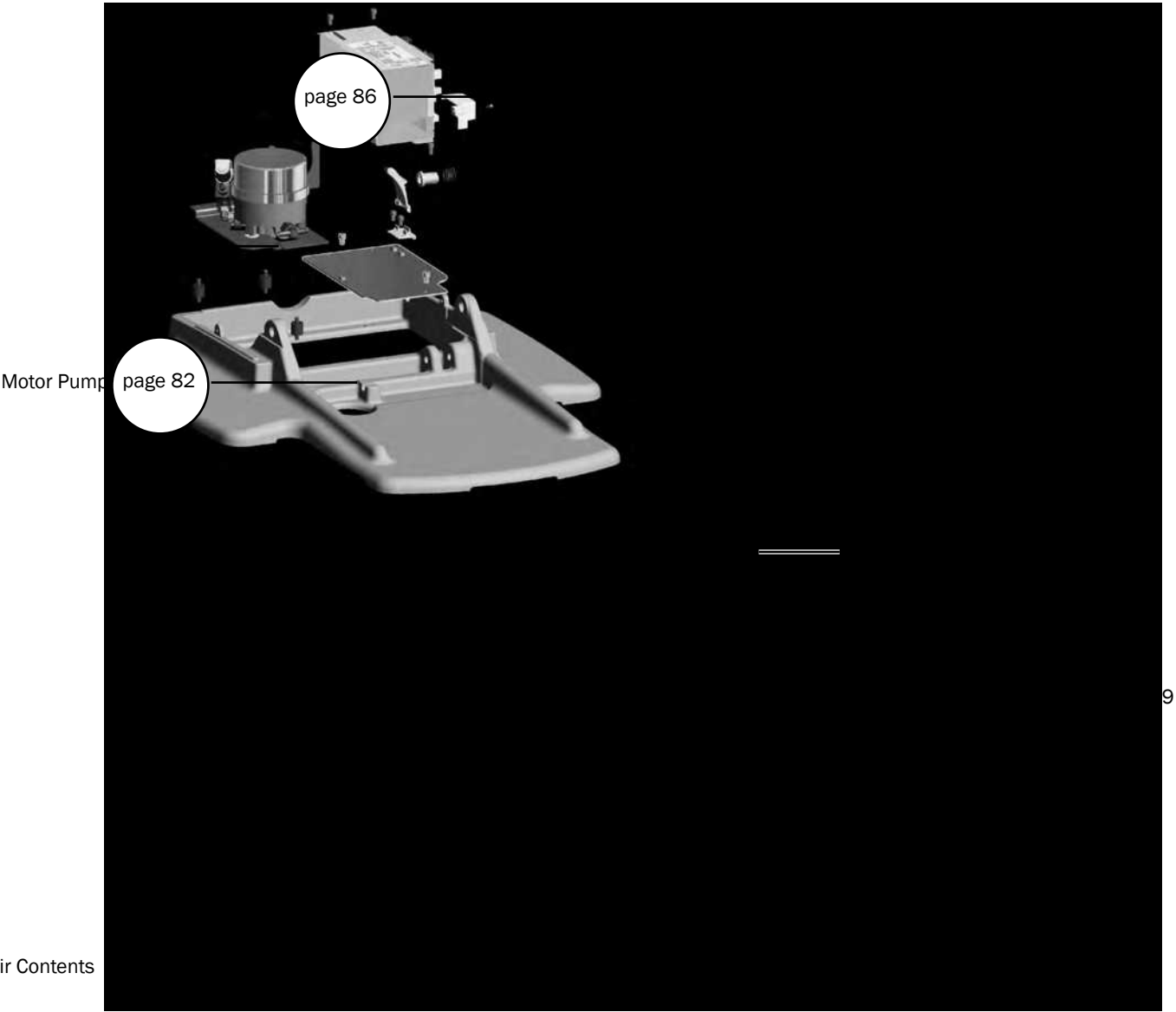


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411 Hydraulic Pump and Chair Base



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## 411 Hydraulic Pump and Chair Base

Item	Part Number	Description	Replacement Kit
1	62.0148.01 †	On/Off power button	90.1405.00 Main on/off switch kit
2	62.0753.00 †	Button adaptor	90.1405.00 Main on/off switch kit
3	005.008.01	Screw	90.1405.00 Main on/off switch kit
4	013.124.00	Spring	90.1405.00 Main on/off switch kit
5	62.0827.00	Cover	
6	002.010.00	Screw	
7	62.0832.00 †	Bracket	90.1405.00 Main on/off switch kit
8	62.0742.00	Mounting pan	
9	62.0029.01 †	Baseplate	
10	001.034.00	Socket head 6-32 x 1/4 screw	
11	037.040.00	Rubber isolator	
12	006.141.00	Hex KEPS nut, 1/4-20	

† Indicates that the individual part is not available for sale



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411 Hydraulic Pump

Chair Lift Manifold

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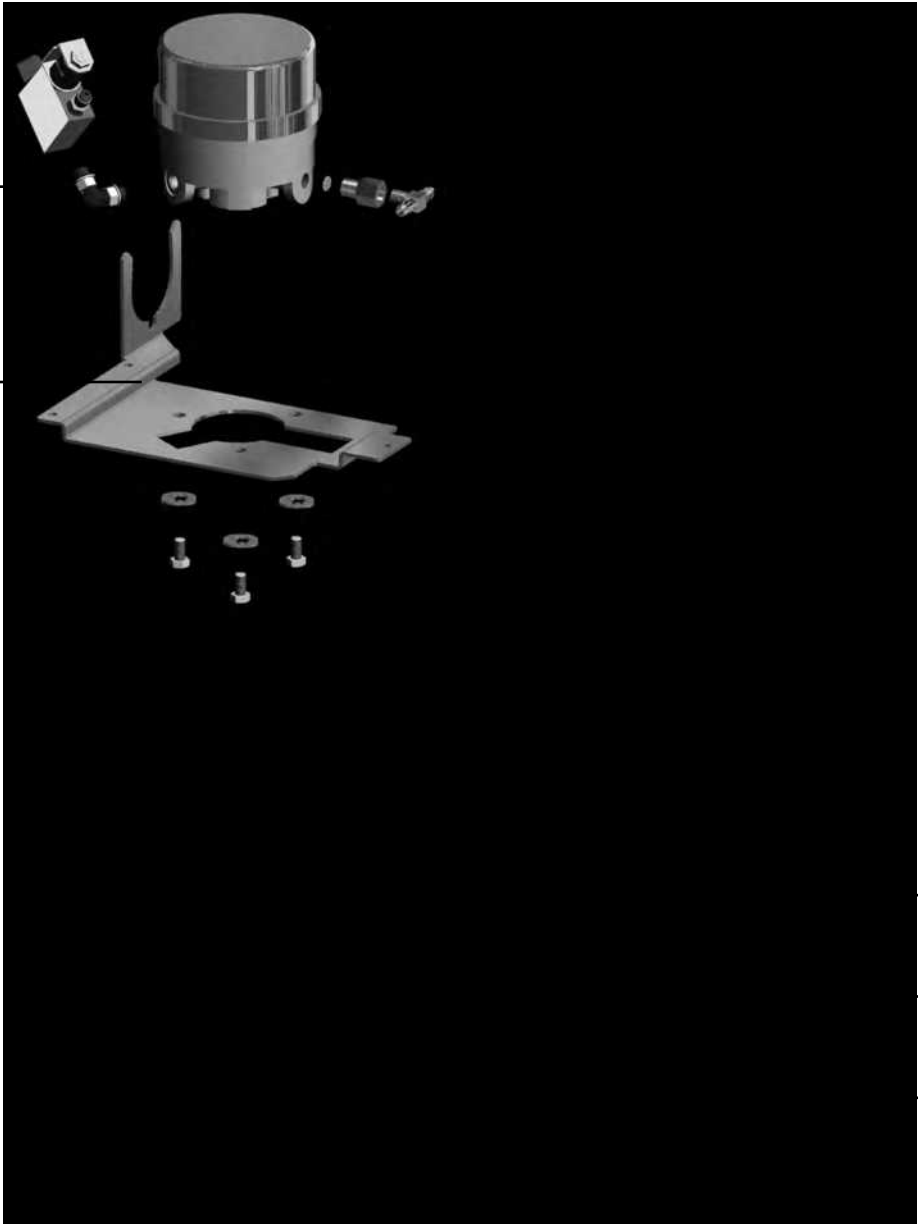
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## 411 Hydraulic Pump

p/n 90.1427.00, 90.1428.00

Item	Part Number	Description
2	021.111.00 †	Elbow assembly
3	61.3126.00 † 61.3127.00 †	Hydraulic motor pump, 100/110-115 VAC Hydraulic motor pump, 240 VAC
4	61.3869.00 †	Screen
5	022.110.00	Adaptor
6	022.109.00	Tee barb
7	004.091.00	Internal tooth lock washer
8	62.0733.00 †	Mounting pan
9	005.179.00	Screw, 8 x 1.25 16 mm

† Indicates that the individual part is not available for sale

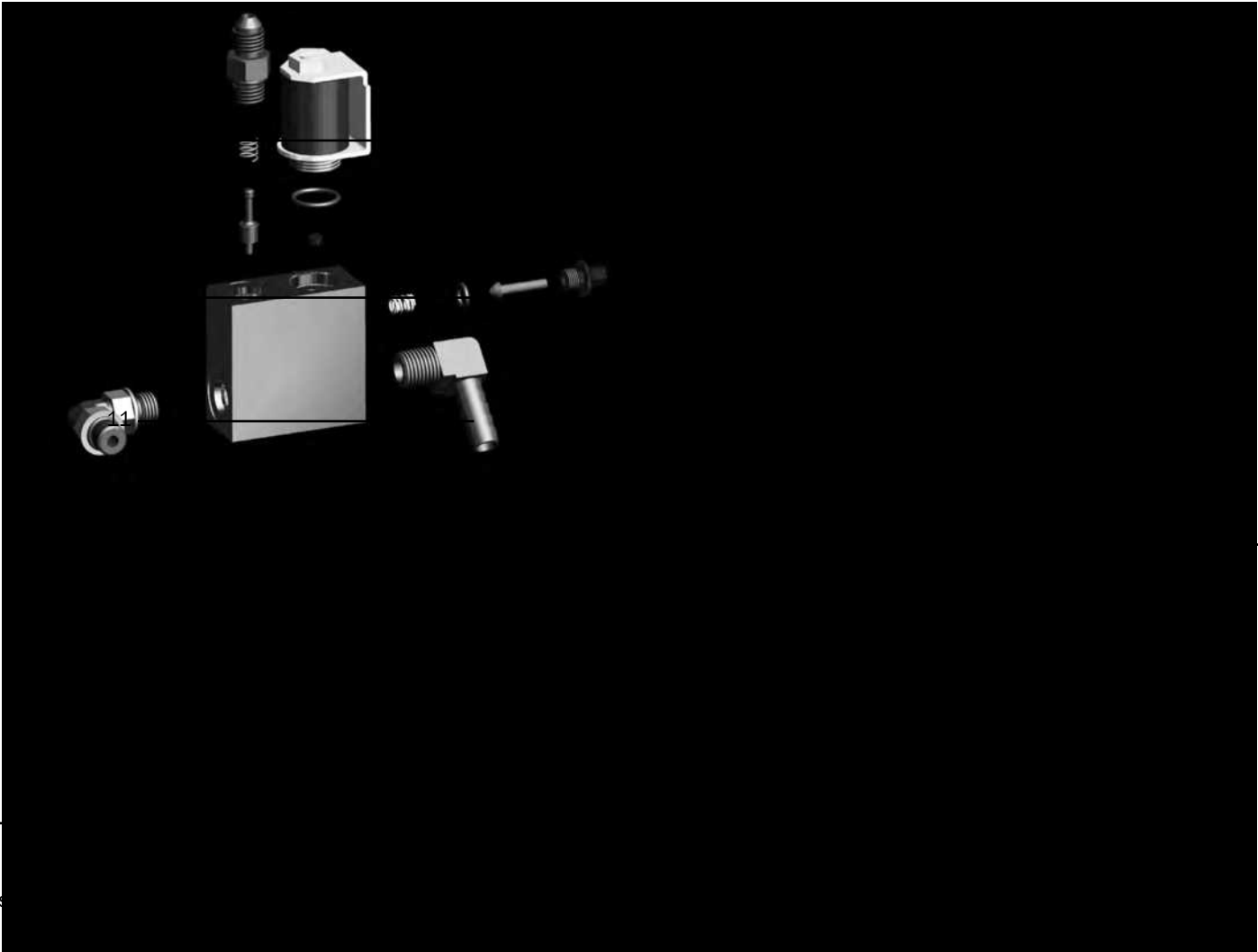


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411 Chair Lift Hydraulic Manifold



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## 411 Chair Lift Hydraulic Manifold

p/n 62.0776.00 (part of 90.1427.00 100 - 120 V/90.1428.00 240 V hydraulic pump kit)

Item	Part Number	Description	Replacement Kit
1	62.0317.00	Solenoid assembly	90.1392.00 -- Hydraulic Manifold Rebuild kit
2	030.015.02 †	O-ring, package of 10	90.1392.00 -- Hydraulic Manifold Rebuild kit
3	026.192.00 †	Press-in orifice	
4	013.136.00 †	Lock release spring	90.1392.00 -- Hydraulic Manifold Rebuild kit
5	030.010.02 †	O-ring, package of 10	90.1392.00 -- Hydraulic Manifold Rebuild kit
6	62.0757.00 †	Poppet	90.1392.00 -- Hydraulic Manifold Rebuild kit
7	62.0758.00 †	Lock release retainer	
8	022.106.00	90 Degree brass adaptor	
9	021.111.00 †	90 Degree elbow	
10	62.0748.00 †	Hydraulic manifold block	
11	61.0461.00	Check valve stem	90.1392.00 -- Hydraulic Manifold Rebuild kit
12	013.044.00	Conical compression spring	90.1392.00 -- Hydraulic Manifold Rebuild kit
13	022.049.00	Fitting with O-ring	

† Indicates that the individual part is not available for sale

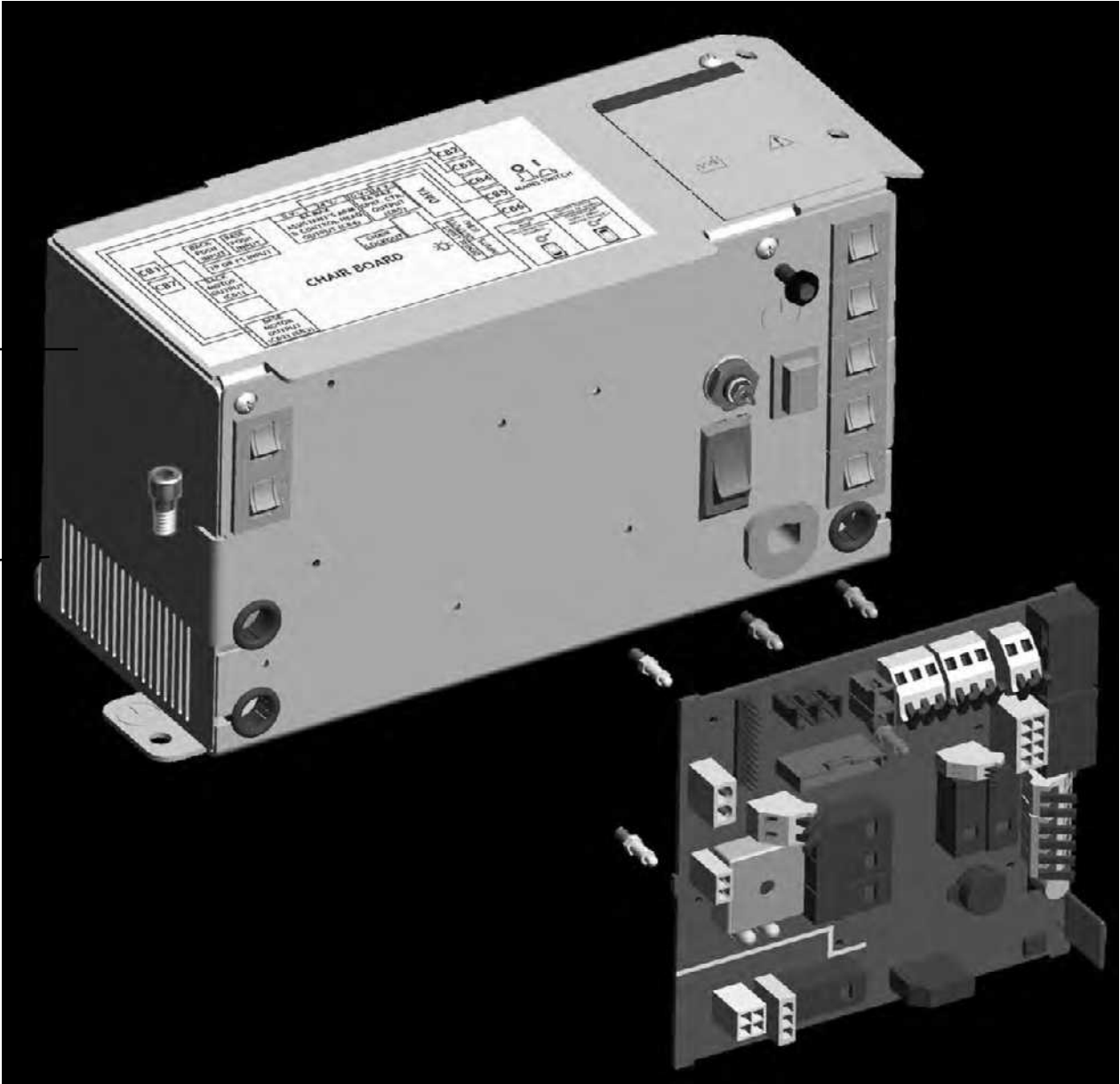
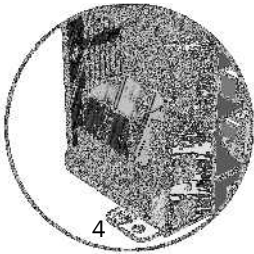


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411 Power Supply (311/411)



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## 411 Power Supply (311/411)

p/n 90.1178.00 100 V / 90.1179.00 110-120 V / 90.1180.00 220-240 V

Item	Part Number	Description	Replacement Kit
1	43.0265.00 † 43.0266.00 † 43.0267.00 †	300 W 100 V Power supply assembly 300 W 120 V Power supply assembly 300 W 240 V Power supply assembly	90.1178.00 - 100 V Power supply kit 90.1179.00 - 120 V Power supply kit 90.1080.00 - 240 V Power supply kit
2	90.1082.00	Standoff, package of 5	
3	90.1177.00	Chair circuit board kit	
4	90.1198.00 90.1199.00 90.1200.00	Motor capacitor, 100 V kit Motor capacitor, 110-120 V kit Motor capacitor, 220-240 V kit	
5	002.010.00	Socket head patch screw, 1/4-20 X 3/8	

† Indicates that the individual part is not available for sale



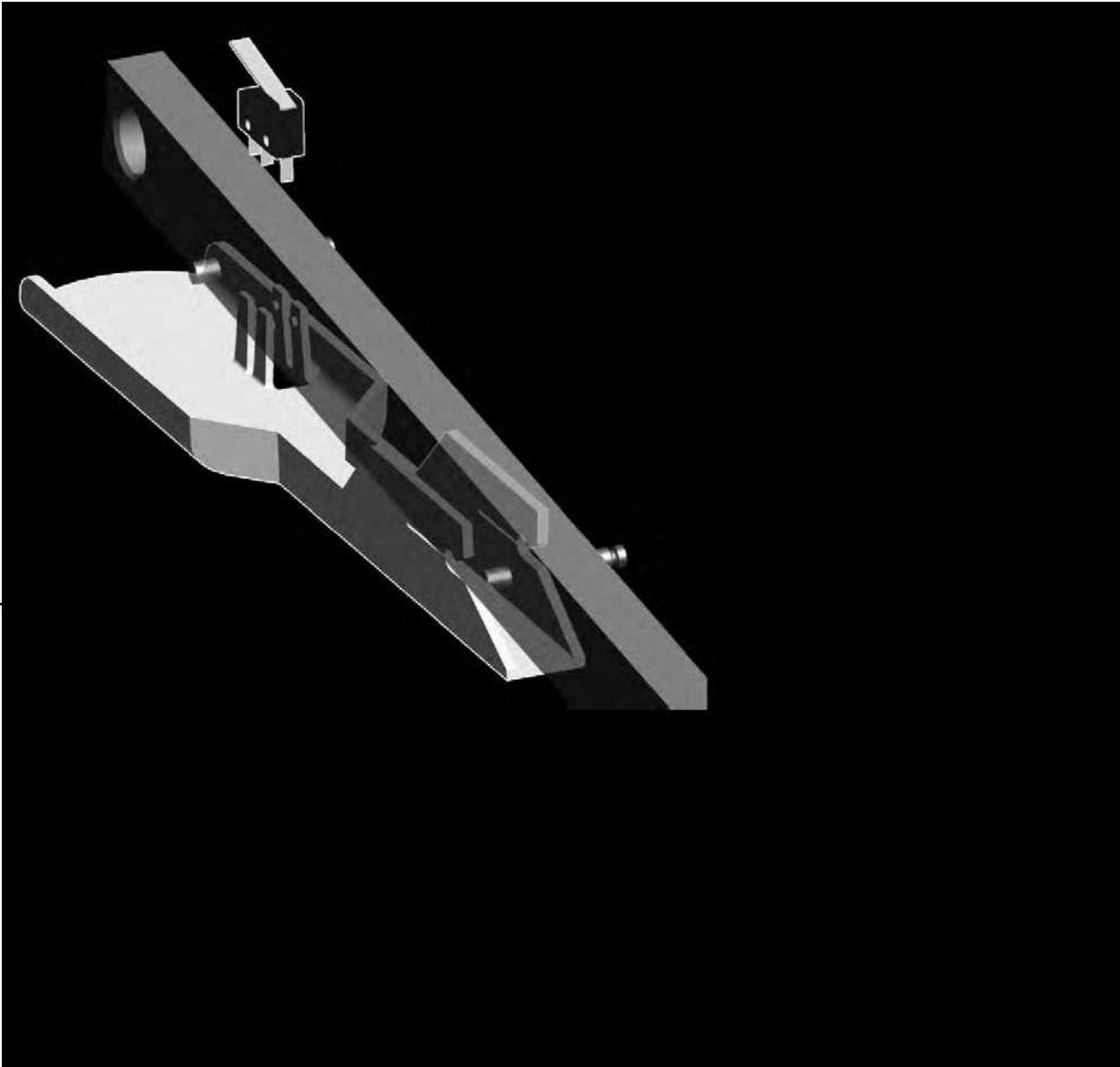
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411 Stop Switch

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**411 Stop Switch**  
**p/n 90.1095.01**

Item	Part Number	Description	Replacement Kit
1	43.0041.00 †	Stop Switch	90.1095.01
2	62.0146.01	Stop plate swivel knuckle	90.1095.01

† Indicates that the individual part is not available for sale



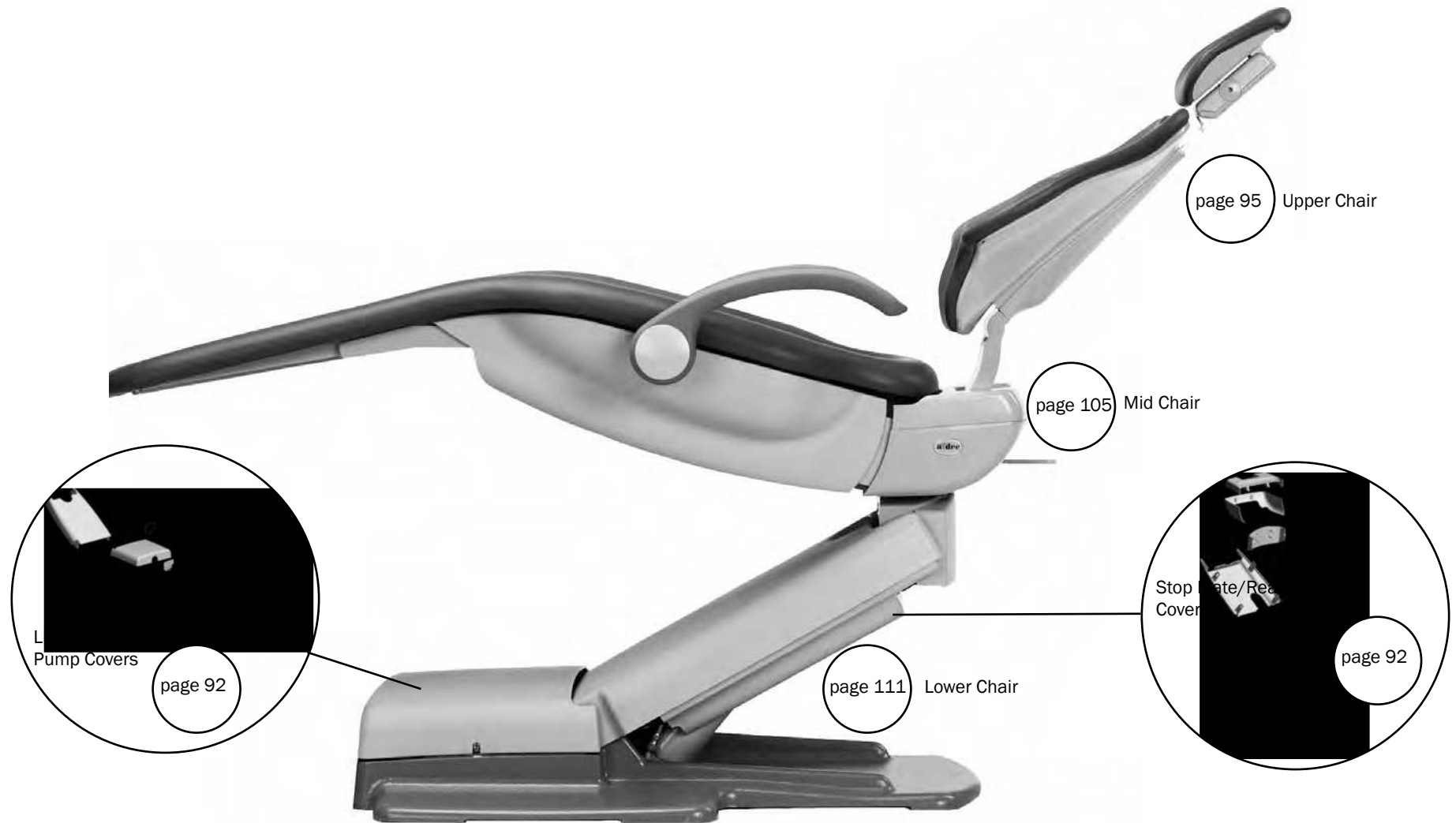
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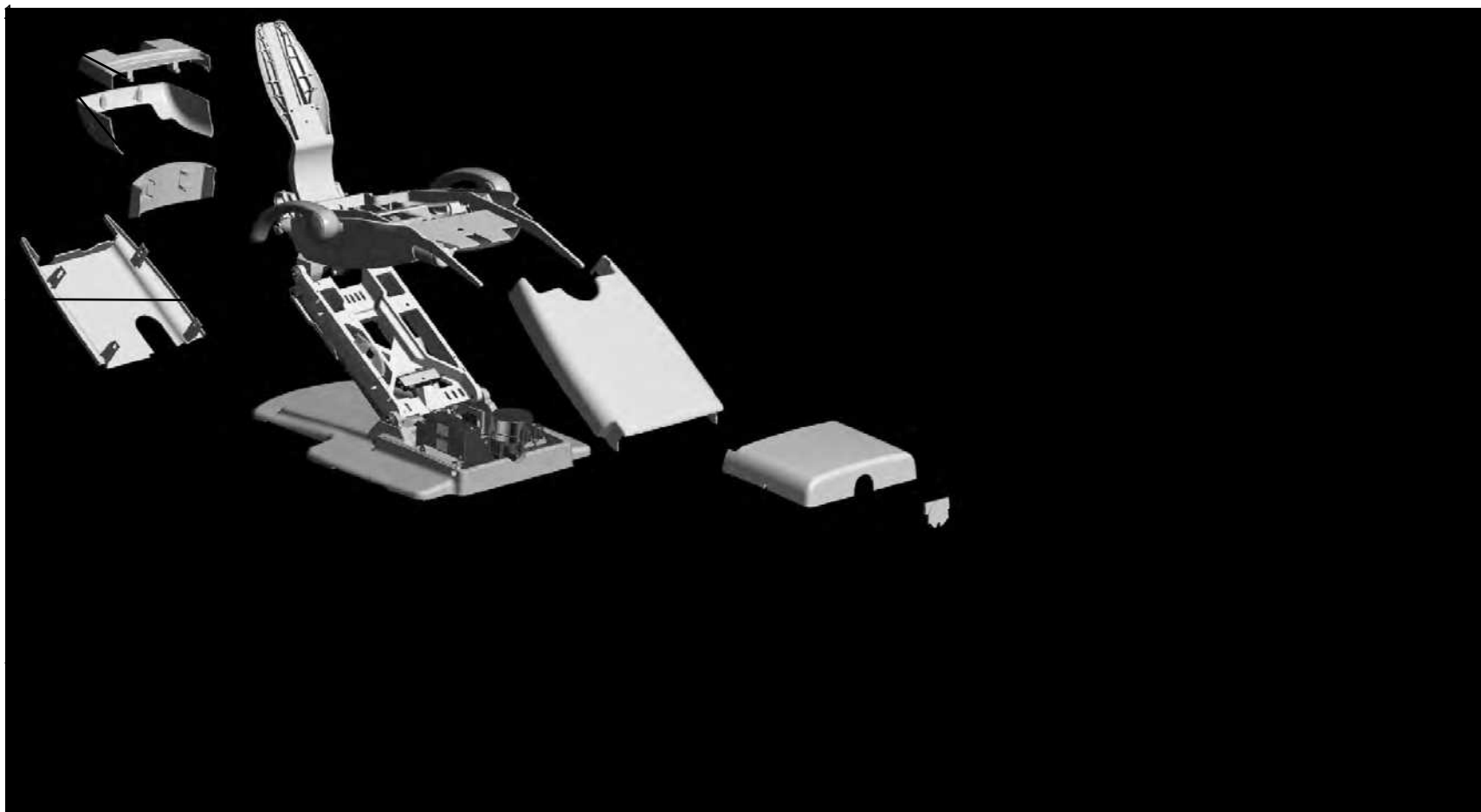
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# Illustrated Parts Breakdown – 511 Chair



## 511 Covers



## 511 Covers

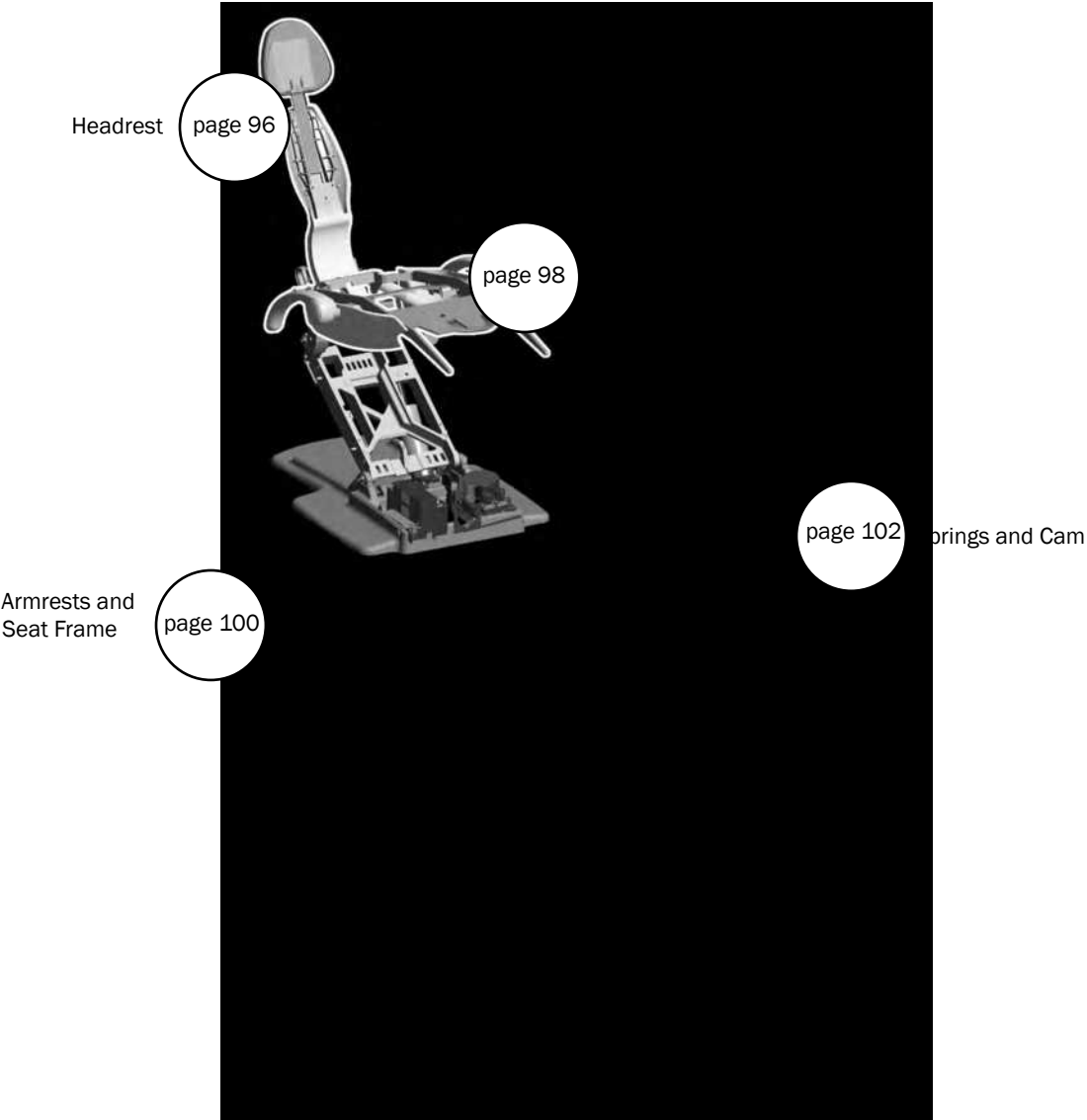
Item	Part Number	Description
1	62.0122.01 62.0122.00	Rear cover assembly, white Rear cover assembly, surf
2	62.0133.01 62.0133.00	Swivel cover, surf Swivel cover, white
3	62.0084.01 62.0084.00	Stop plate cover, white Stop plate cover, surf
4	62.0081.01 62.0081.00	Lift arm cover, white Lift arm cover, surf
5	62.0080.01 62.0080.00	Motor pump cover, white Motor pump cover, surf
6	62.0101.01 62.0101.00	Pump cover plug, white Pump cover plug, surf



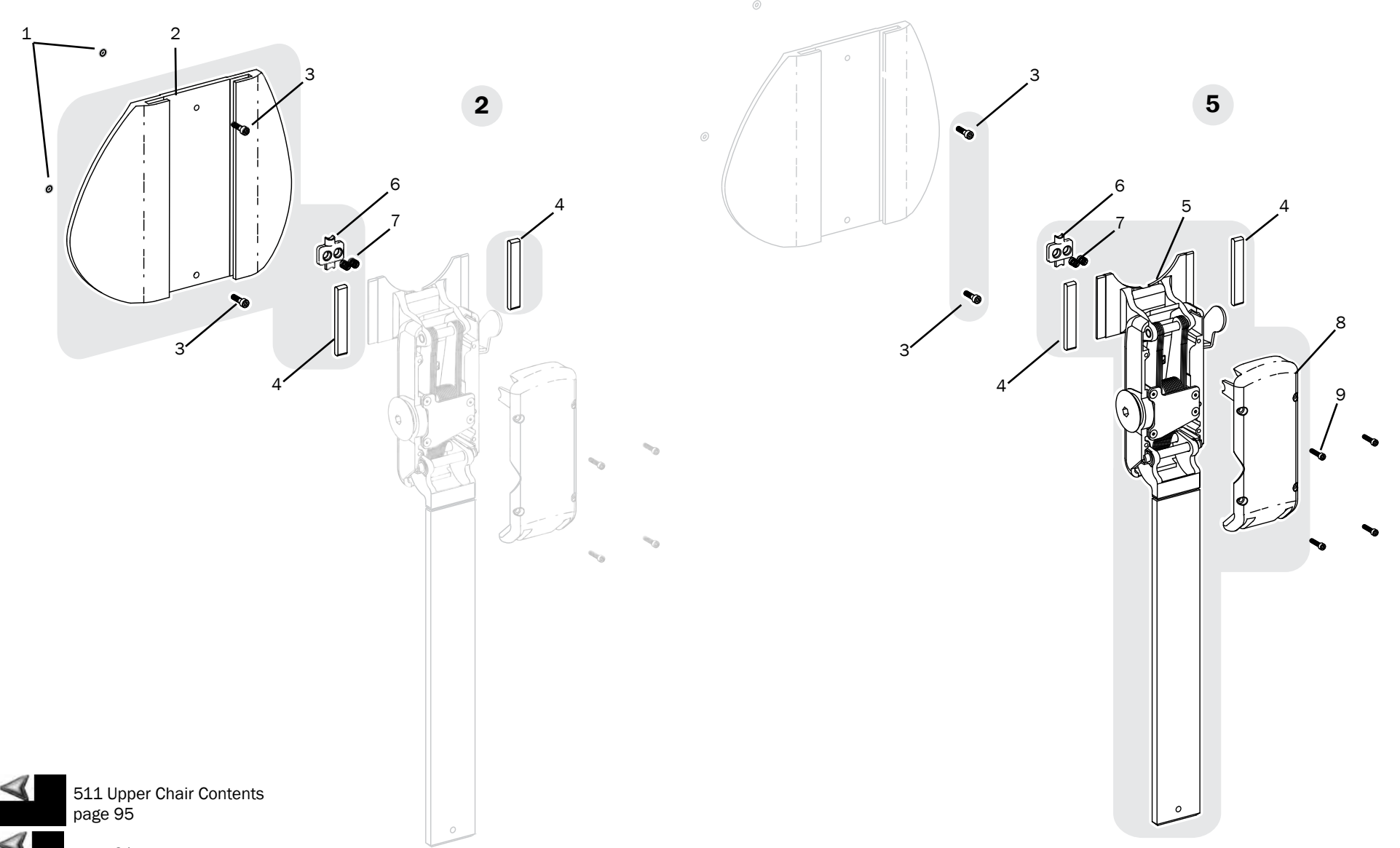




511 Upper Chair



511 Lever Headrest (411/511)



## 511 Lever Headrest (411/511)

Item	Part Number	Description	Replacement Kit
1	035.049.01	O-ring, E, .115 ID x .07 W, package of 10	
2	62.0023.01 † 62.0023.00 †	Cover, headrest cushion, white Cover, headrest cushion, surf	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
3	001.042.01	Screw, socket head, 6-32 x 1/2", stainless steel, patch	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
4	62.0021.00	Bearing, slider, headrest cushion	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
5	90.1091.01 90.1091.00	Headrest assembly, white (includes items 3, 4, 6, 7 and 8) Headrest assembly, surf (includes items 3, 4, 6, 7 and 8)	
6	62.0094.00	Bearing, slider, brake, headrest	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
7	013.005.00	Spring	90.1092.01 Headrest cushion cover, white 90.1092.00 Headrest cushion cover, surf
8	62.0404.01 62.0404.00	Cap, headrest, white Cap, headrest, surf	
9	001.021.00	Screw, socket head, 4-40 x 1/2", stainless steel	

† Indicates that the individual part is not available for sale

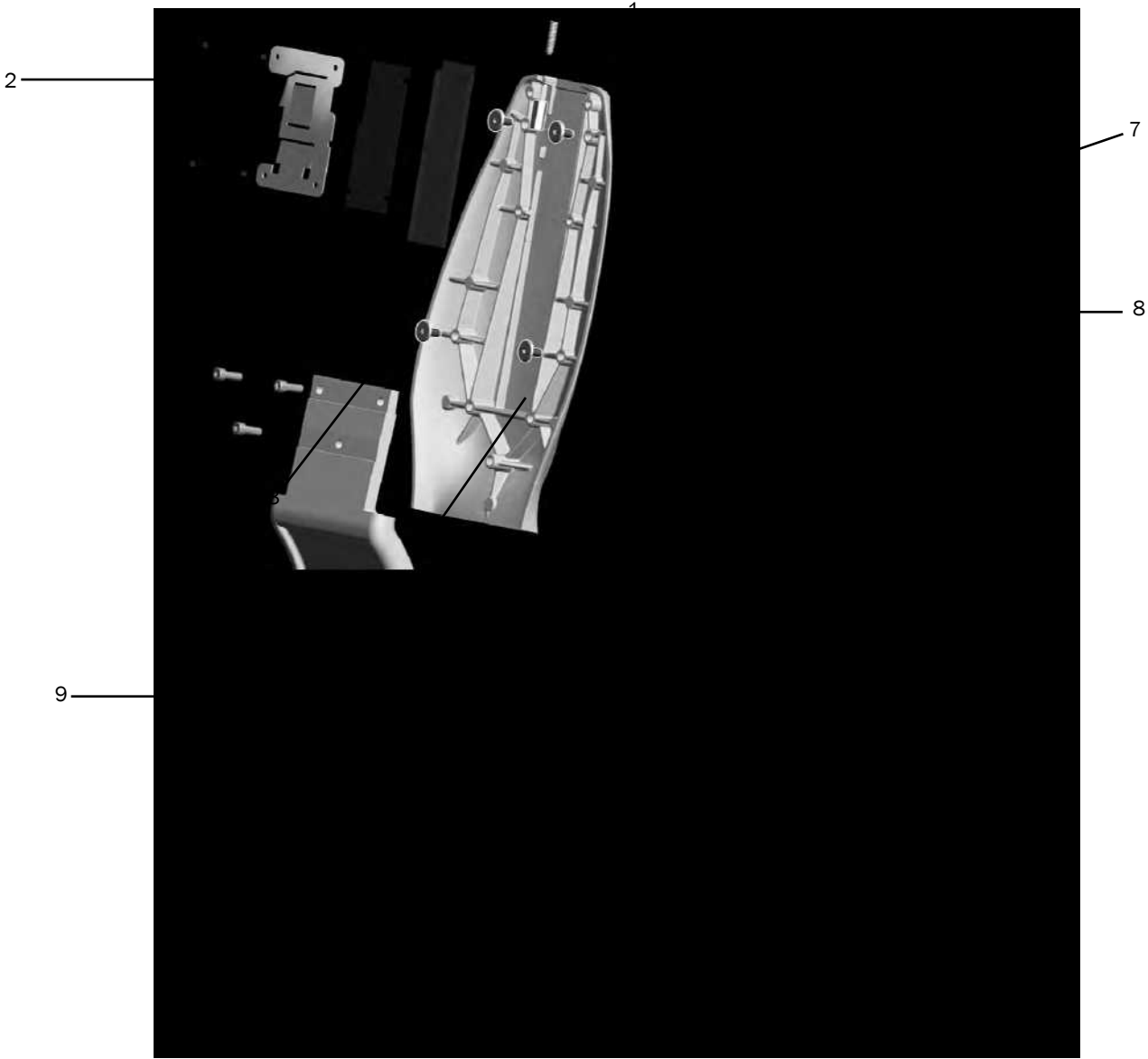


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511 Back Support (311/411/511)



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## 511 Back Support (311/411/511)

Item	Part Number	Description	Replacement Kit
1	001.244.00	JCB socket screw, 1/4-20 x 15 mm	
2	005.138.01	Button head socket path screw, 10-32 x 5/16	
3	62.0104.00 †	Bracket	90.0719.00 Glide bar brake kit
4	62.0103.00	Upper wear pad	
5	62.0102.00	Lower wear pad	
6	007.158.00	Set screw, 1/4-20 x 1	
7	006.144.00	Coupling	
8	62.0048.01 †	Back support, White	90.1099.01 00 Support back assembly
9	001.245.00	Screw	

† Indicates that the individual part is not available for sale

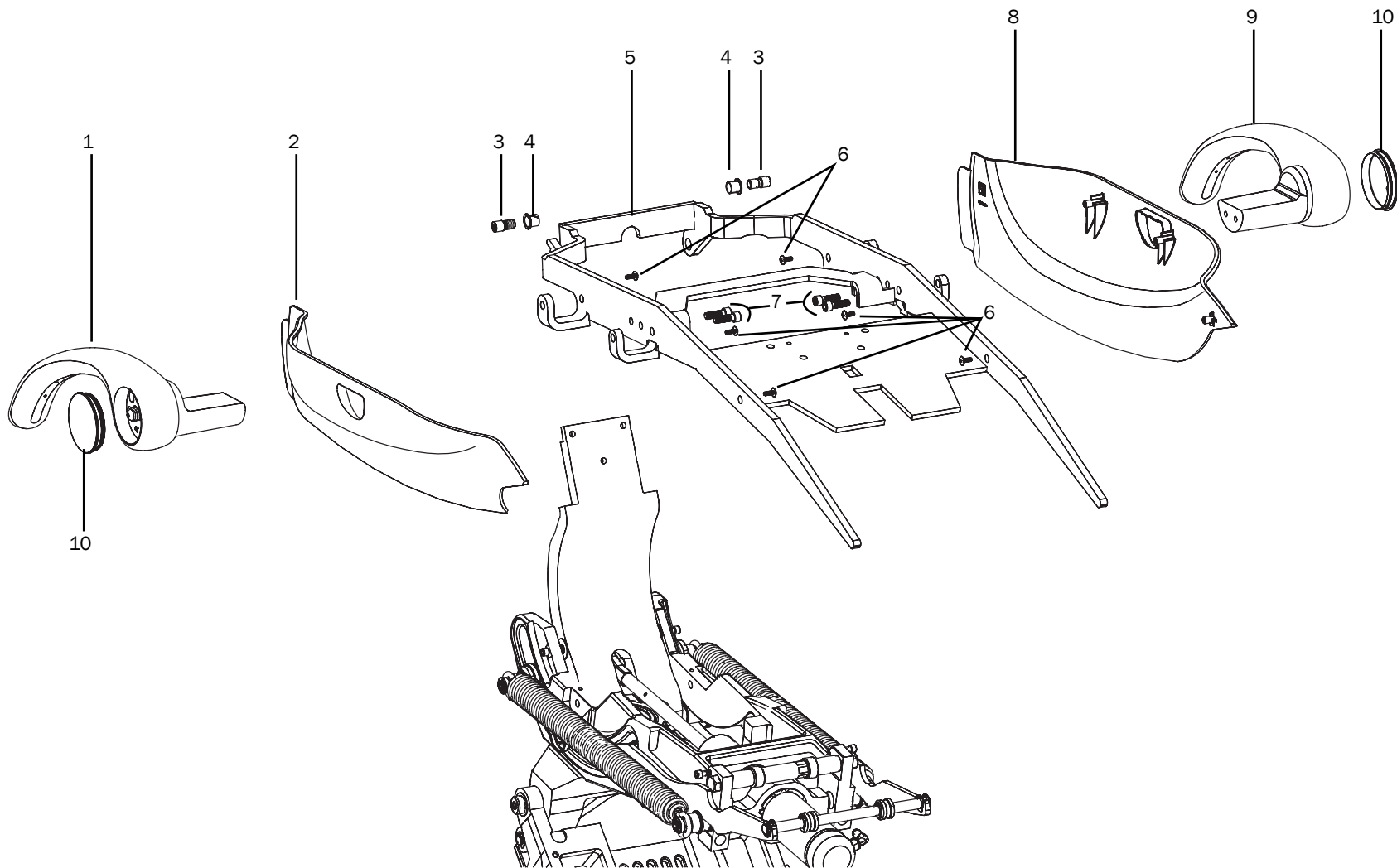


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511 Armrest and Seat Frame Assemblies

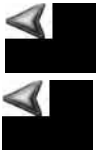
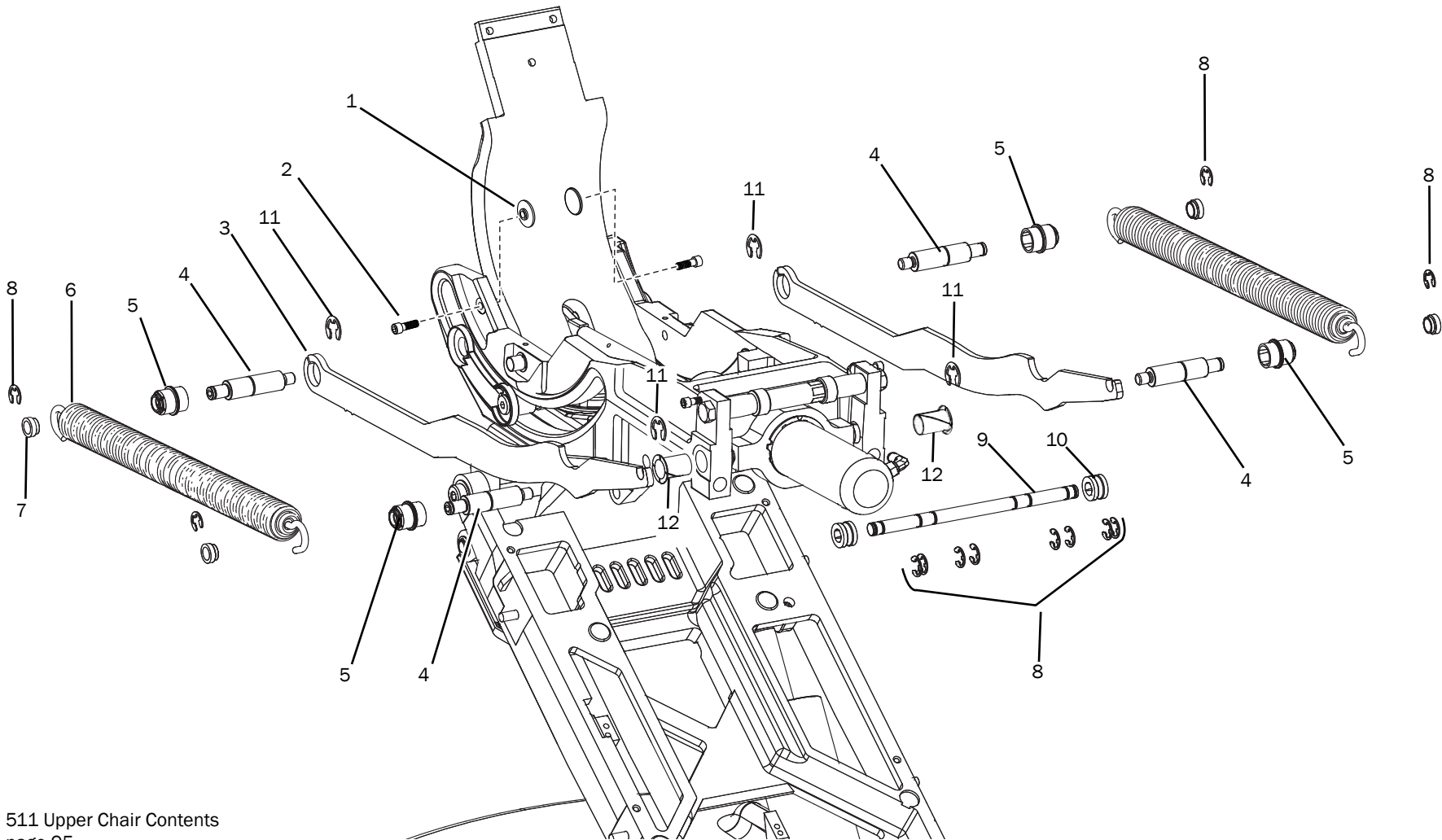


## 511 Armrest and Seat Frame

Item	Part Number	Description	Replacement Kit
1	62.0107.01 62.0107.00	Right armrest assembly, gray Right armrest assembly, surf	Part of 90.1181.00 Armrest kit, gray Part of 90.1181.00 Armrest kit, surf
2	62.0106.01 62.0106.00	Right seat frame cover, white Right seat frame cover, surf	
3	62.0196.00	Mounting stud	62.0039.01, Seat frame, white 62.0039.00, Seat frame, surf
4	016.065.00	Flanged bearing	62.0039.01, Seat frame, white 62.0039.00, Seat frame, surf
5	62.0039.01 † 62.0039.00 †	Seat frame assembly, white Seat frame assembly, surf	90.1103.01 Seat frame replacement kit, white 90.1103.00 Seat frame replacement kit, surf
6	003.116.00	Phillips truss head screw, 10 x 1/2	
7	002.149.00 †	Socket head screw, 3/8-24 x 1-3/4	
8	62.0105.00	Left seat frame cover	
9	62.0108.01 62.0108.00	Left armrest assembly, gray Left armrest assembly, surf	Part of 90.1181.01 Armrest kit, gray Part of 90.1181.00 Armrest kit, surf
10	62.0110.01 62.0110.00	Armrest cover, white Armrest cover, surf	

† Indicates that the individual part is not available for sale

511 Springs and Cam



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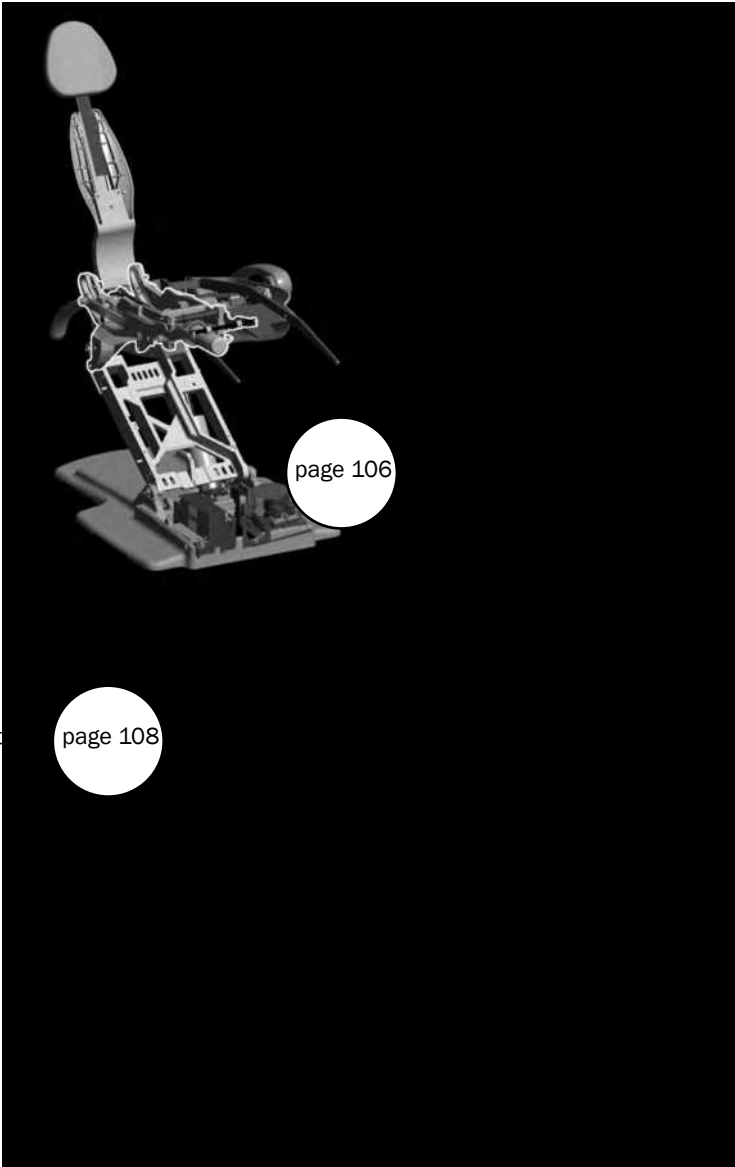
## 511 Springs and Cam

Item	Part Number	Description	Replacement Kit
1	62.0070.00	Guide, lateral	
2	001.245.00	Screw, socket head, cap, 1/4-20 x 3/4"	
3	62.0062.00	Seat lift cam	
4	62.0201.00	Spring support bolt	
5	62.0067.00	Roller, cam, natural	
6	013.114.00 †	Spring	90.1187.00 Replacement spring kit
7	62.0185.00	Spring, support	
8	010.031.01	Retaining e-ring	
9	62.0069.00	Lift bar	
10	62.0065.00	Seat frame roller	
11	010.083.00	Retaining e-ring	
12	016.145.00	Flanged bearing	

† Indicates that the individual part is not available for sale



511 Mid Chair



Upper Structure  
Swivel

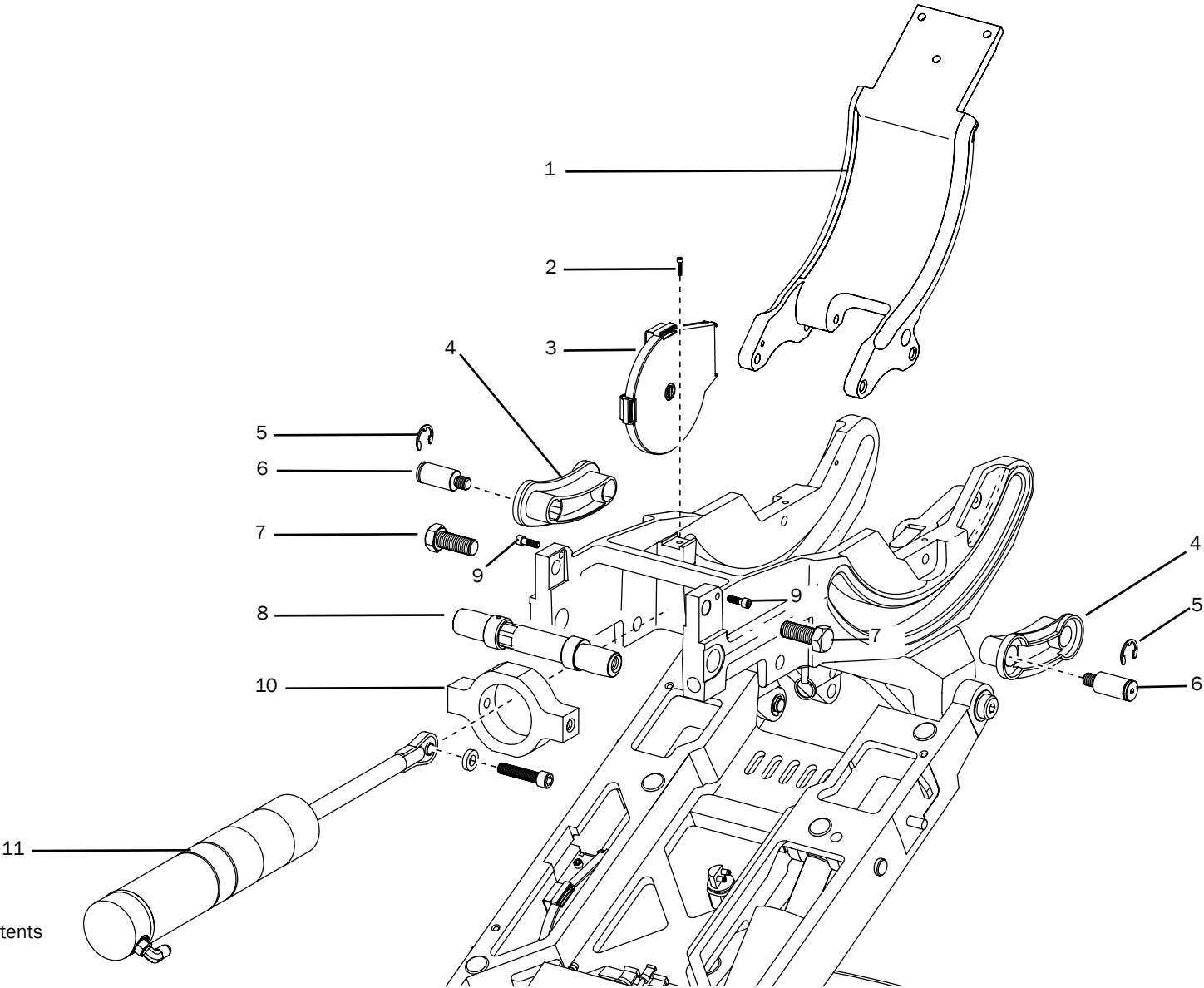
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511 Back and Tilt Cylinder



## 511 Back and Tilt Cylinder

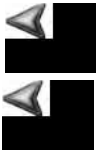
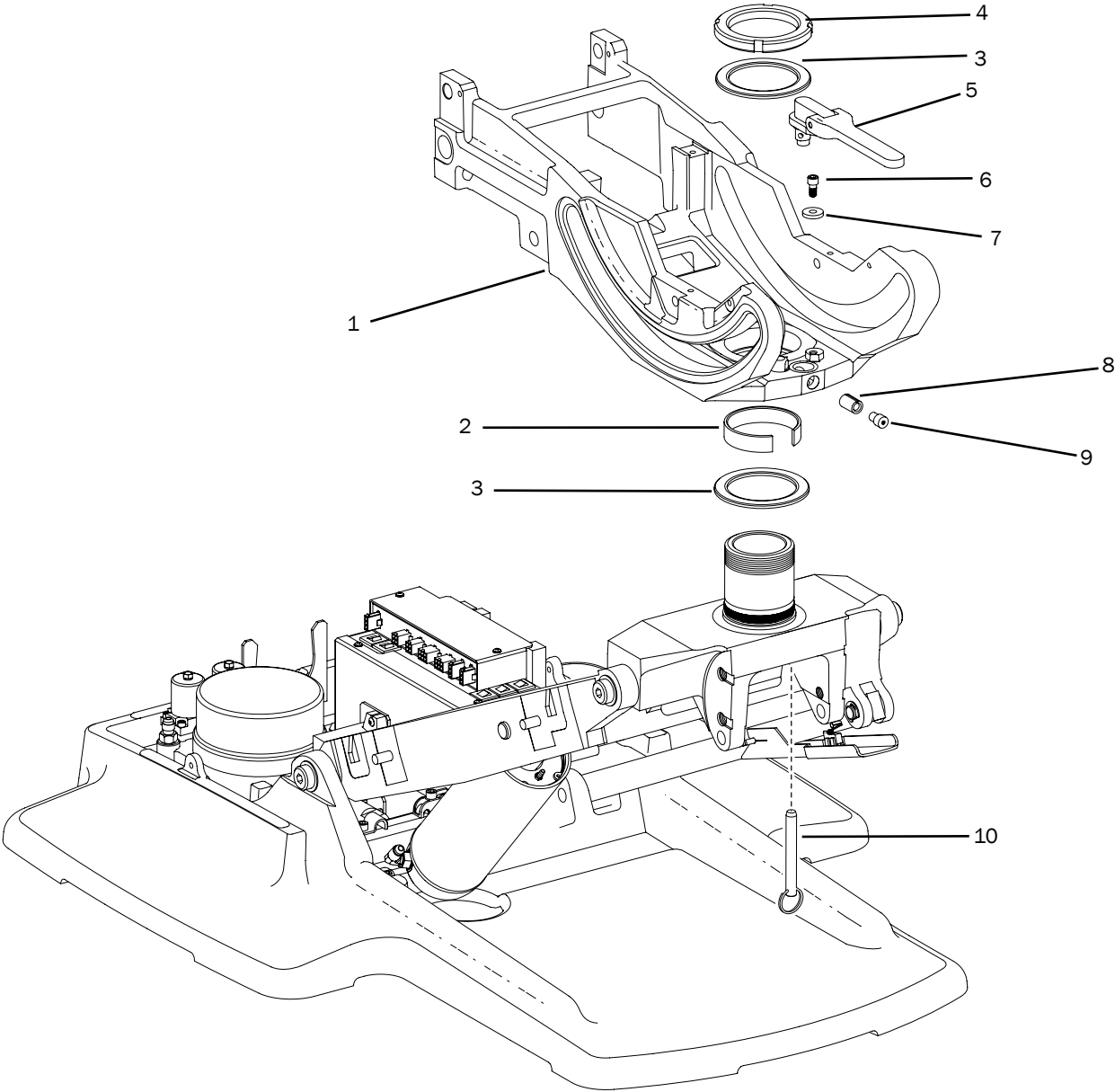
Item	Part Number	Description
1	62.0404.01	Trolley, chair back, white
	62.0404.00	Trolley, chair back, surf
2	002.010.00	Screw, socket head patch, 1/4-20 x 3/8" stainless steel
3	90.1069.00	Potentiometer
4	62.0061.00	Back track slider
5	010.083.00	Retaining ring
6	62.0202.00	Bolt, slider, shoulder
7	001.163.00	Hex head cap screw, 1/2-13 x 1-1/4
8	77.0206.00	Dual cam
9	002.120.00	Socket head patch screw, 1/4-20 x 1
10	62.0200.00	Trunnion
11	90.1085.00	Tilt cylinder assembly

† Indicates that the individual part is not for sale

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511 Upper Structure Swivel



## 511 Upper Structure Swivel

Item	Part Number	Description
1	62.0050.01 † 62.0701.00 †	Upper structure, white (before April 2011) Upper structure, white (effective April 2011)
2	62.0237.00	Wear ring, 2-3/4 OD x 5/8"
3	016.133.00	Thrust bearing
4	61.2051.00	Locknut, spanner
5	62.0218.01 62.0218.00	Brake handle assembly, white Brake handle assembly, surf
6	005.008.01	Screw, 1/4-20 x 1/2" socket head
7	004.170.00	Washer, flat, nylon
8	62.0043.00	Plunger, brake
9	62.0042.00	Adjuster, brake
10	011.097.00	Ship pin

† Indicates that the individual part is not for sale



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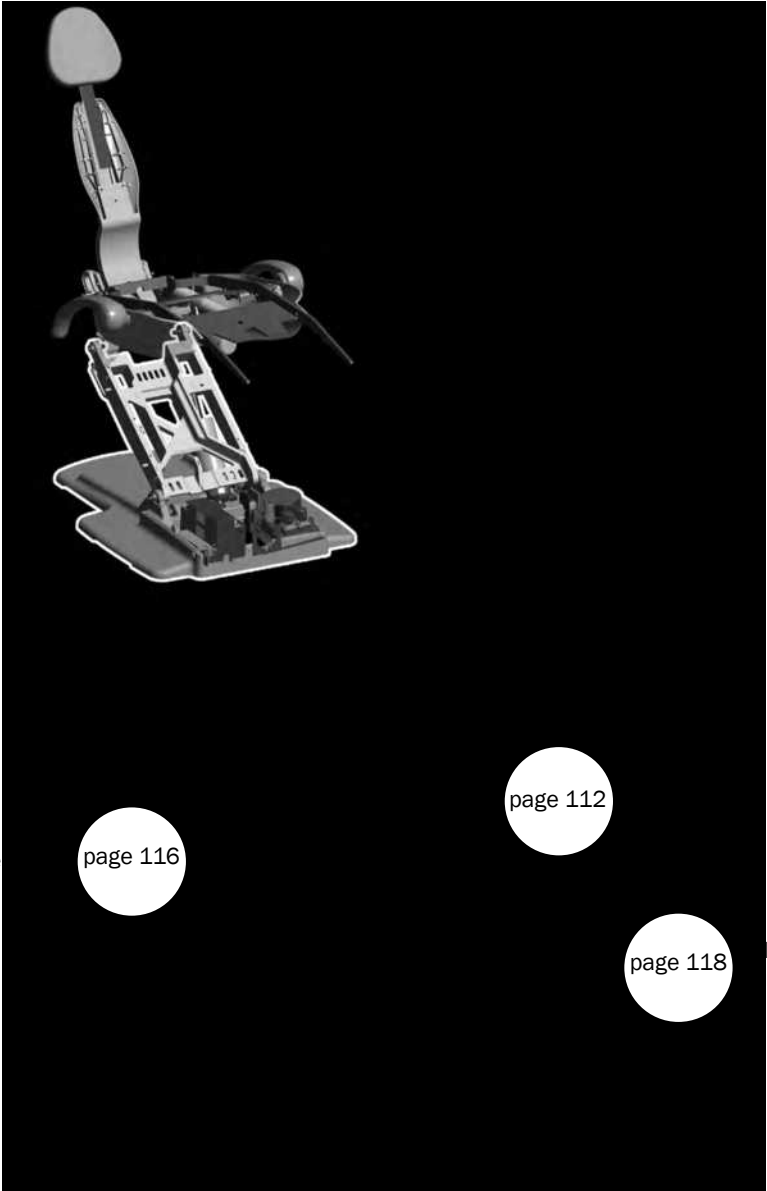


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511 Lower Chair



Lift Cylinder  
Link Arm

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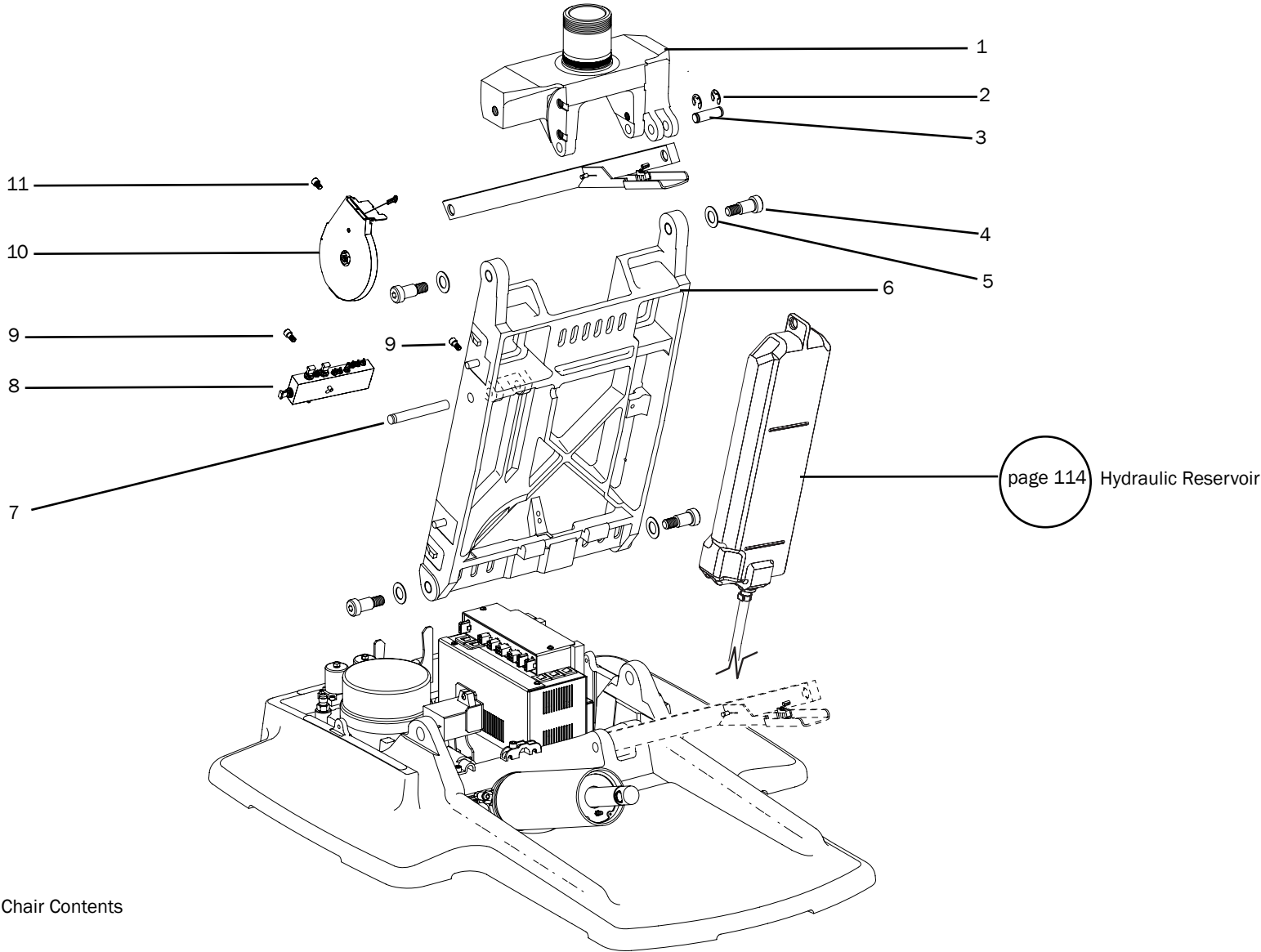
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Hydraulic Motor Pump  
and Chair Base



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511 Lift Arm

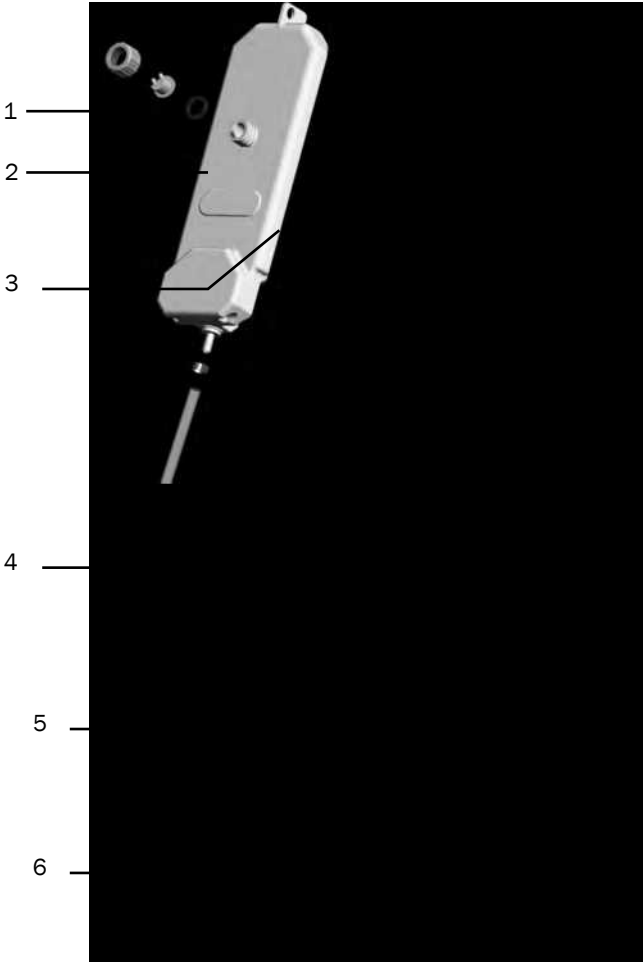


## 511 Lift Arm

Item	Part Number	Description	Replacement Kit
1	62.0091.00 † 62.0091.01 †	Swivel mount, white Swivel mount, surf	
2	010.031.01	Retaining e-ring, external 1/2" ID stainless steel	
3	62.0077.00	Pin, link arm	
4	001.165.00	Screw, socket shoulder, 1/2-13 x 5/8 x 7/8	
5	004.148.00	Washer, flat nylatron	
6	62.0089.01 † 62.0089.00 †	Lift arm, white Lift arm, surf	
7	011.124.00 †	Pin, clevis	90.1083.01 Lift cylinder kit, white 90.1083.00 Lift cylinder kit, surf
8	38.1804.00	Manifold assembly	
9	005.008.01	Screw, 1/4-20 x 1/2"	
10	90.1069.00	Potentiometer	
11	002.010.00	Screw, socket head patch, 1/4-20 x 3/8" stainless steel	

† Indicates that the individual part is not for sale

511 Hydraulic Reservoir



## 511 Hydraulic Reservoir

p/n 90.1394.00

Item	Part Number	Description
1	006.112.00	Reservoir cap
2	62.0195.00	Vent barb
3	004.161.00	Washer
4	62.0030.00 †	Hydraulic oil reservoir
5	025.111.00 †	Hose clamp
6	036.117.00 †	Clear tubing, 10"

† Indicates that the individual part is not for sale

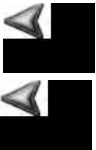
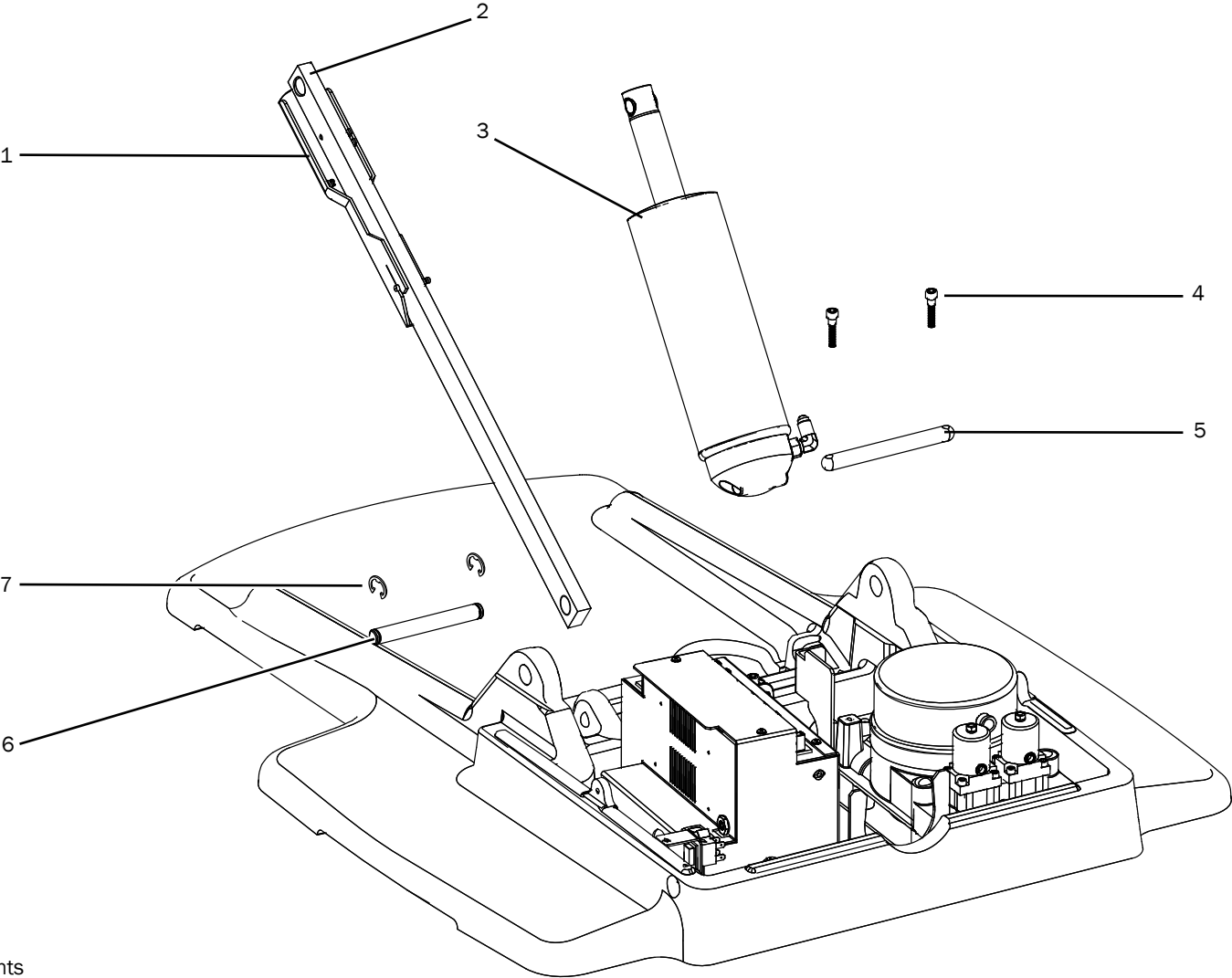


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511 Lift Cylinder and Link Arm



## 511 Lift Cylinder and Link Arm

Item	Part Number	Description	Replacement Kit
1	62.0146.01 62.0146.00	Stop plate swivel knuckle, white Stop plate swivel knuckle, surf	90.1095.01 Kit, Stop switch replacement, white 90.1095.00 Kit, Stop switch replacement, surf
2	62.0078.01	Link arm	
3	90.1083.01 90.1083.00	Lift cylinder assembly, white Lift cylinder assembly, surf	
4	002.120.00	Screw, socket head patch, 1/4-20 x 1" stainless steel	
5	62.0135.00	Pin	
6	62.0134.00 †	Pin, link arm	
7	010.031.01	Retaining e-ring, external 1/2" ID, stainless steel	

† Indicates that the individual part is not for sale

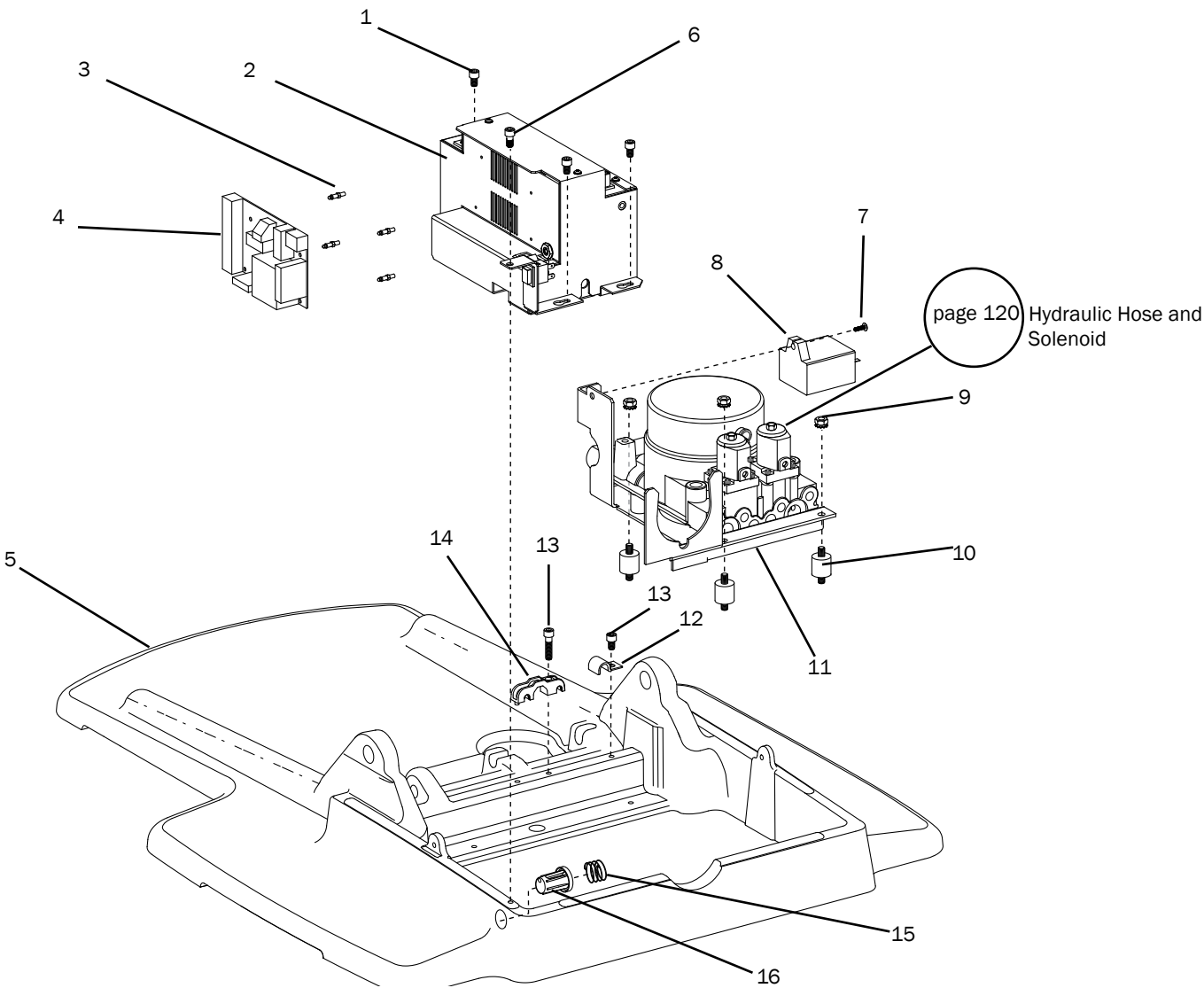


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511 Hydraulic Pump and Chair Base





## 511 Hydraulic Pump and Chair Base

Item	Part Number	Description
1	002.010.00	Screw, socket head, patch, 1/4-20 x 3/8" stainless steel
2	90.1073.00 90.1074.00 90.1075.00	Power supply, 100 V Power supply, 120 V Power supply, 240 V
3	90.1082.00	Stand-off, package of 5
4	90.1072.00	Chair PCB (includes item #3 stand-offs)
5	62.0029.01 † 62.0029.00 †	Baseplate, gray Baseplate, surf
6	005.008.01	Screw, 1/4-20 x 1/2"
7	001.229.00	Screw, truss head, Phillips, 6-32 x 1/2", stainless steel
8	041.642.00 041.643.00 041.644.00	Capacitor, 100 V Capacitor, 110-120 V Capacitor, 220-240 V
9	006.141.00	Nut, hex, KEPs 1/4-20
10	037.040.00	Isolator
11	90.1094.00 90.1094.01 90.1094.02	Hydraulic motor pump assembly, 100 V Hydraulic motor pump assembly, 120 V Hydraulic motor pump assembly, 240 V
12	025.112.00	Clamp, half type
13	002.120.00	Screw, socket head, patch, 1/4-20 x 1" stainless steel
14	62.0131.00	Strain relief
15	90.1068.01 90.1068.00	Mains on/off switch kit, gray (includes button 62.0148.01 and spring 013.024.00) Mains on/off Switch Kit, surf 6 (Includes button 62.0148.00 and spring 013.024.00)
16	041.640.00	Push switch (can be part of item #2)

† Indicates that the individual part is not for sale

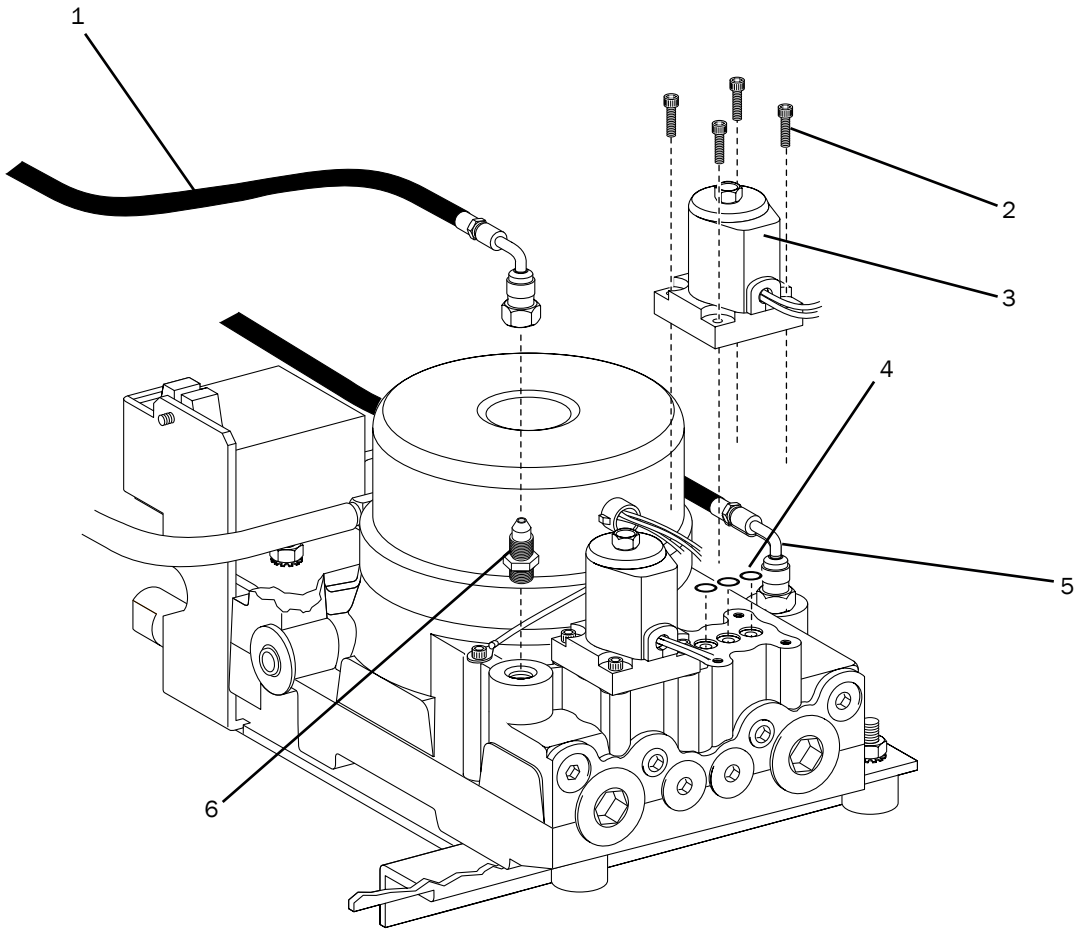


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511 Hydraulic Hose and Solenoid



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## 511 Hydraulic Hose and Solenoid

Item	Part Number	Description
1	62.0046.00	Hydraulic hose, lift
2	001.250.00	Screw, socket head cap, 8-32 x 5/8", black
3	90.1070.00 90.1071.00	Solenoid, 110-120 V, kit Solenoid, 220-240 V, kit
4	035.055.00	O-ring, 5.8 mm ID x 1.9 W, Buna
5	62.0047.00	Hydraulic hose, tilt
6	022.049.00	Filling with O-ring JIC, 37 degree straight



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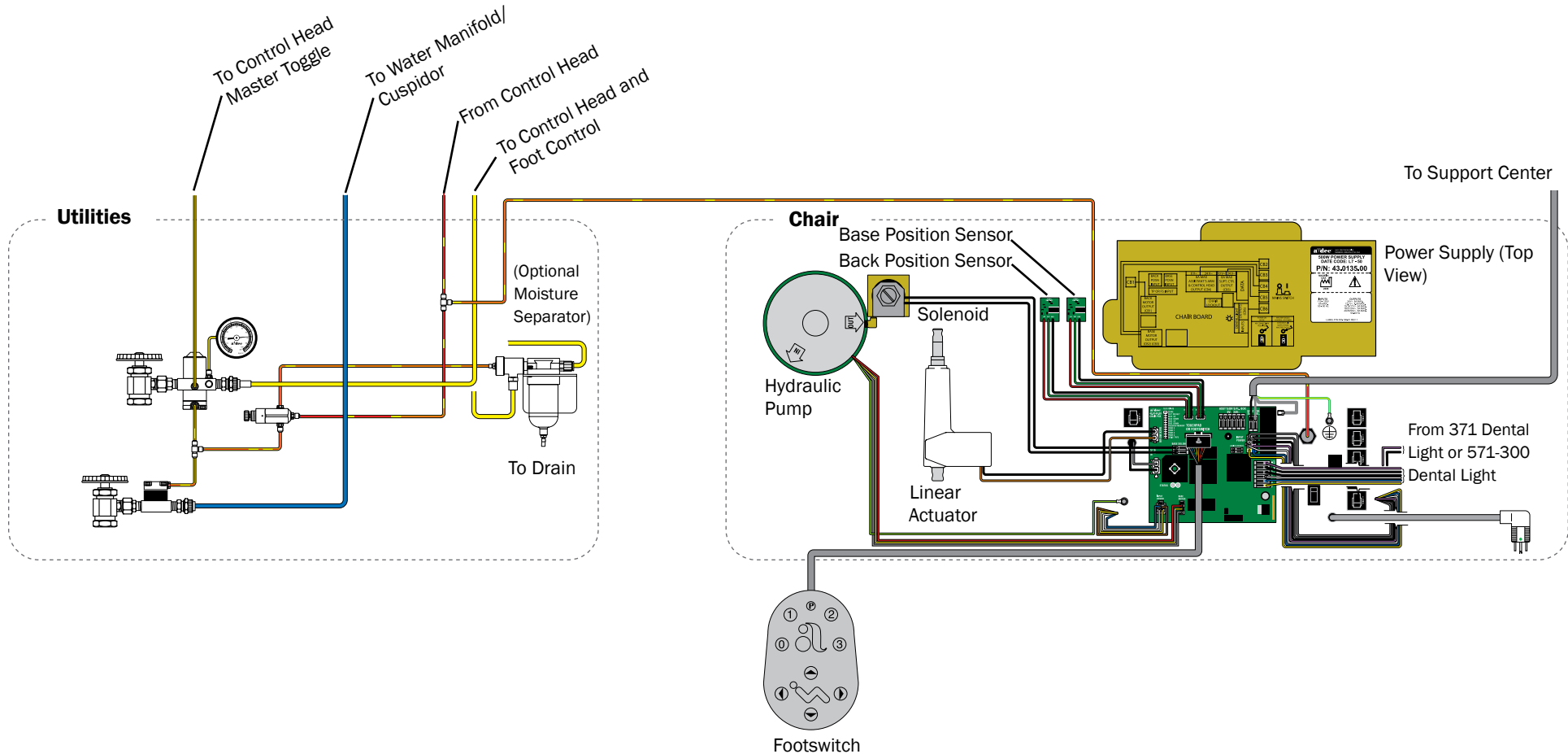


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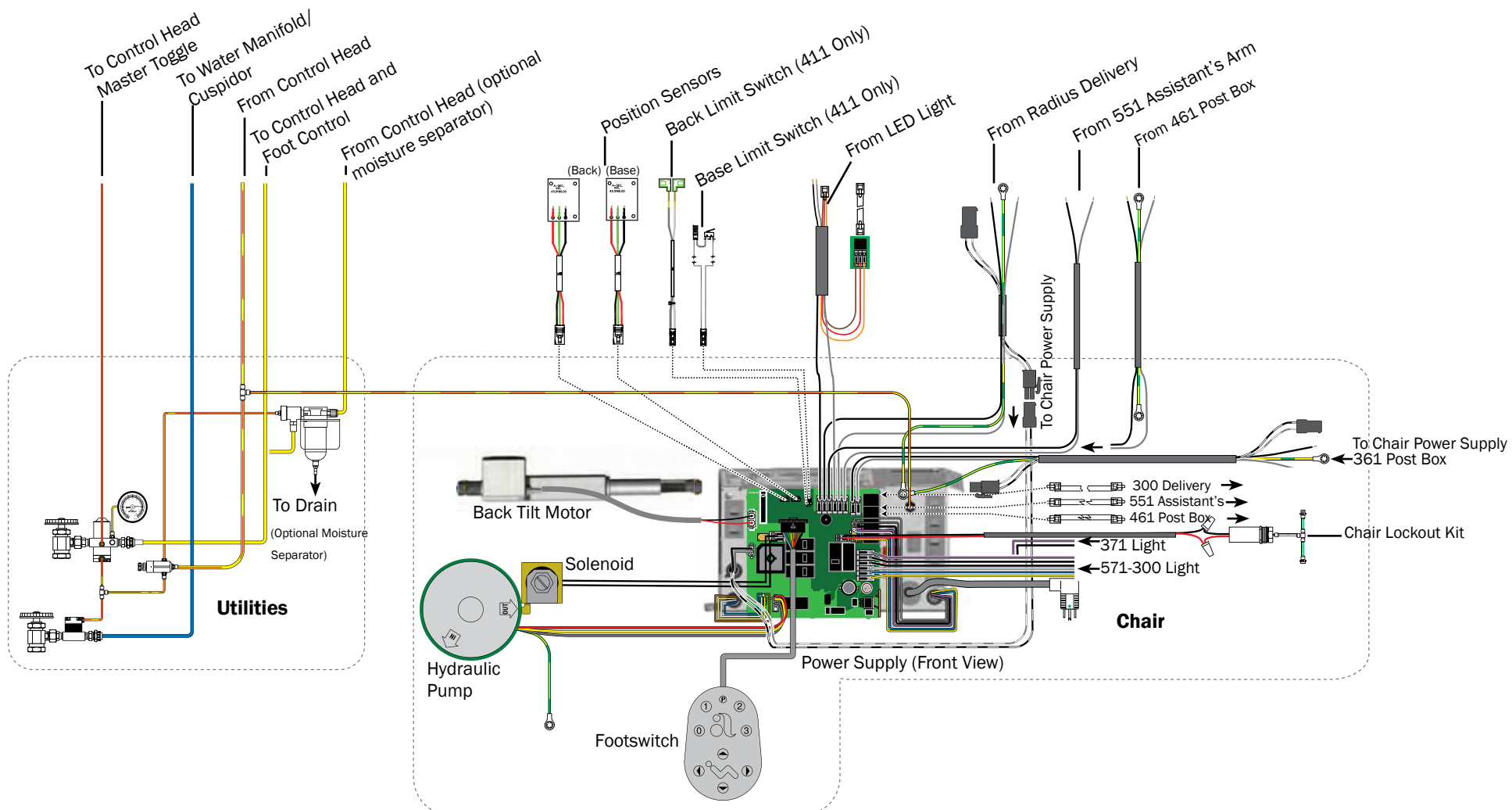


# Flow Diagrams

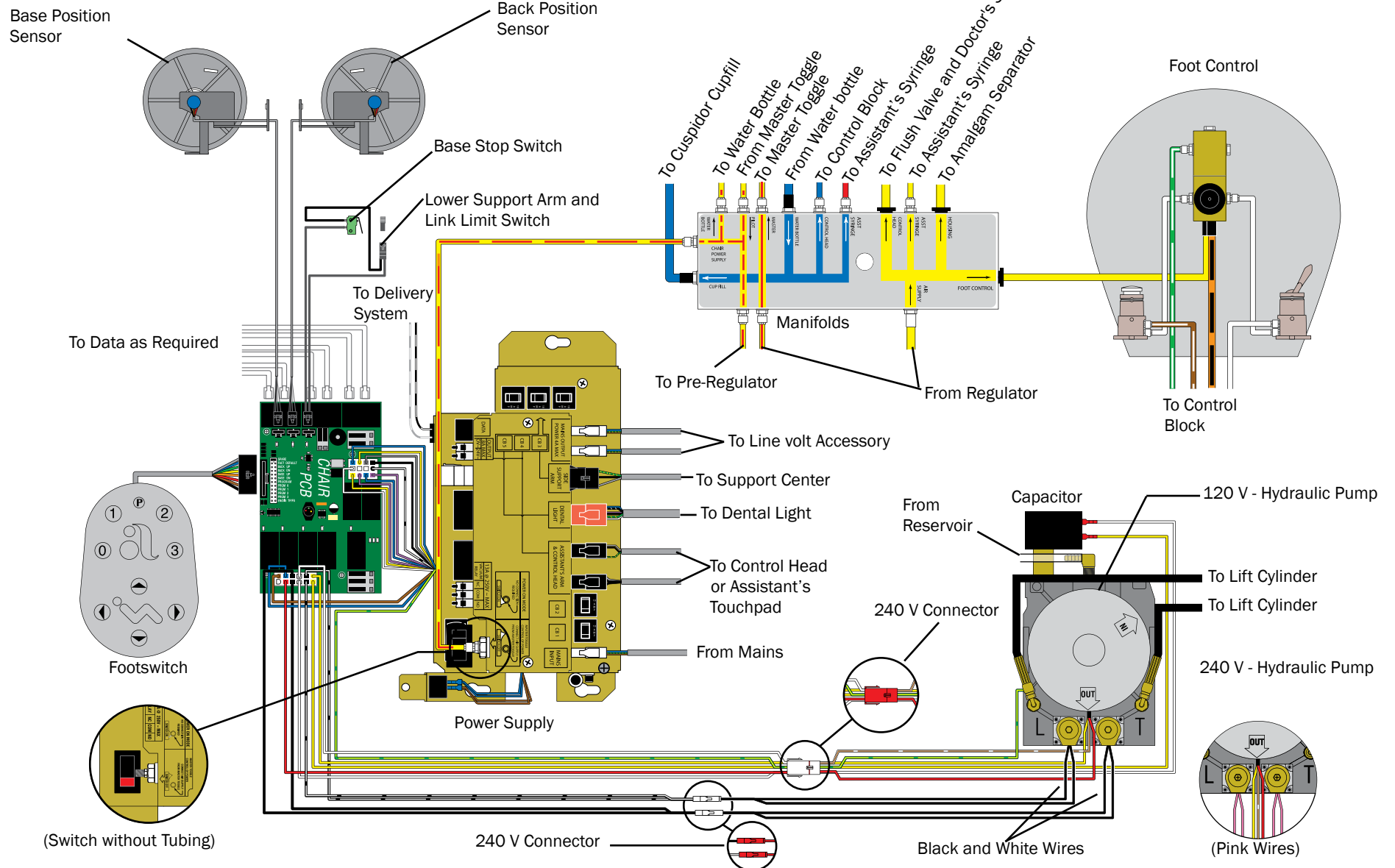
## 311 Chair Flow Diagram (Before 2013)



## 311/411 Chair Flow Diagram (Effective 2013)



# 511 Chair Flow Diagram

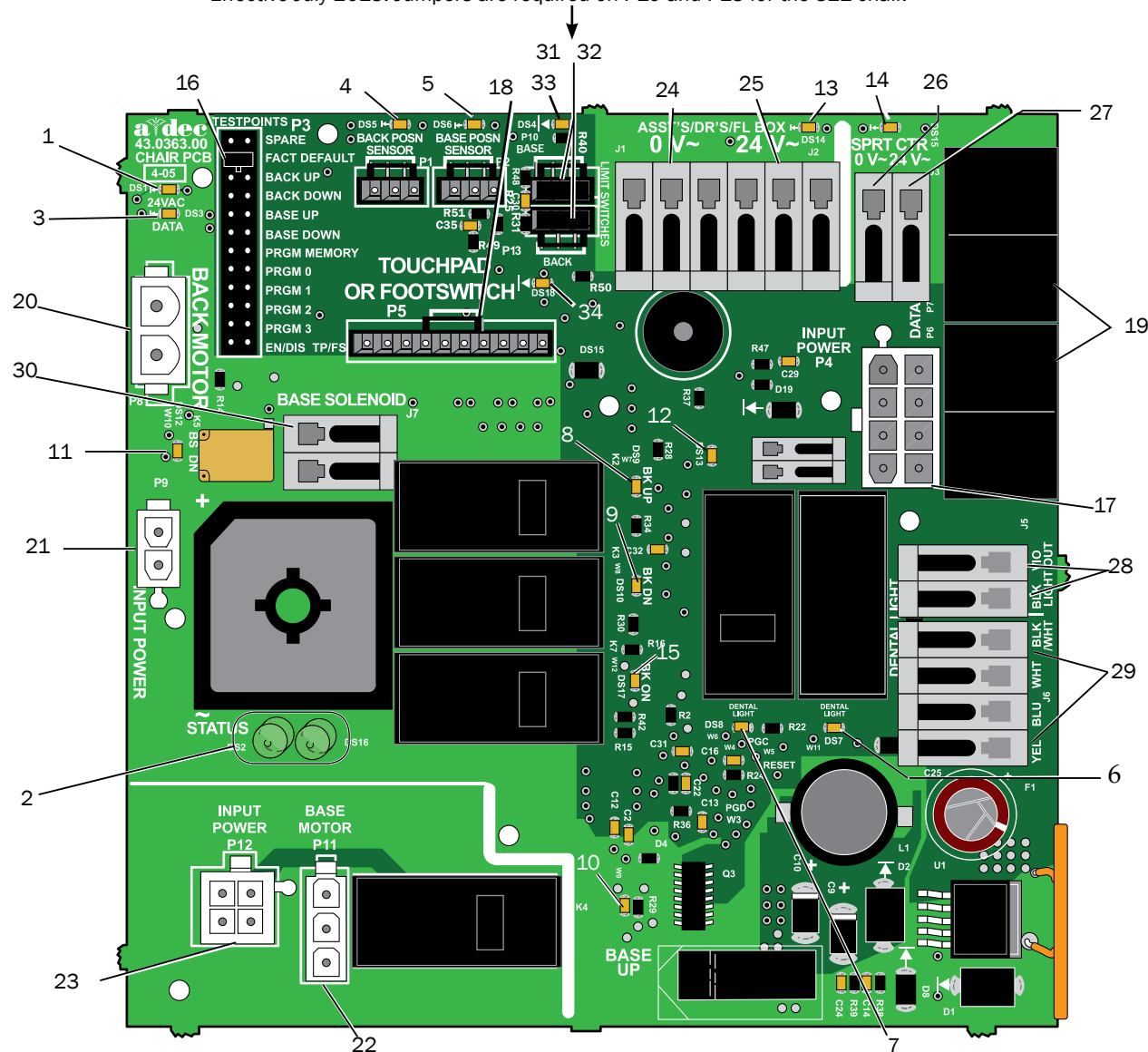


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# Circuit Board Components

## 311/411 Chair Circuit Board

Effective July 2013: Jumpers are required on P10 and P13 for the 311 chair.





## 311/411 Chair Circuit Board LED Identification

LED	Status	Description
DS1, DS14, and DS15 - AC power LED	Off	No 24 VAC power, tripped circuit breaker, power supply turned off
	Green, steady	24 VAC present
DS2 and DS16- Status LED	Off	System is not functioning, no power, or circuit board has failed
	Blue, steady	Normal operation
	Blue, single blink	Duty cycle limit of chair back has been exceeded
	Blue, double blink	Jumper is in factory mode
DS3 - Data LED	Off	No DCS communication, not connected to the DCS, or DCS has failed
	Green, steady	Detects active DCS
	Green, blinking	Valid DCS Message
DS13 - Chair lockout	Off	Open, (normal)
	Red, on	Closed, (activated)
DS18 Back stop	Off	Closed (normal)
	Red, on	Open (activated)
DS5, DS6 - Chair position sensors	Off	Position Sensor: not connected or bad connection; moving in wrong direction; limited range of motion
	Yellow, steady	Normal operation
	Yellow, fast blink	Upper end of travel
	Yellow, slow blink	Lower end of travel
DS9, DS10, DS11, DS12, DS17- Chair relay LEDs	Off	Relay is off
	On	Relay is on
DS7, DS8 - Dental light relay LEDs	Off	Relay is off
	On	Relay is on

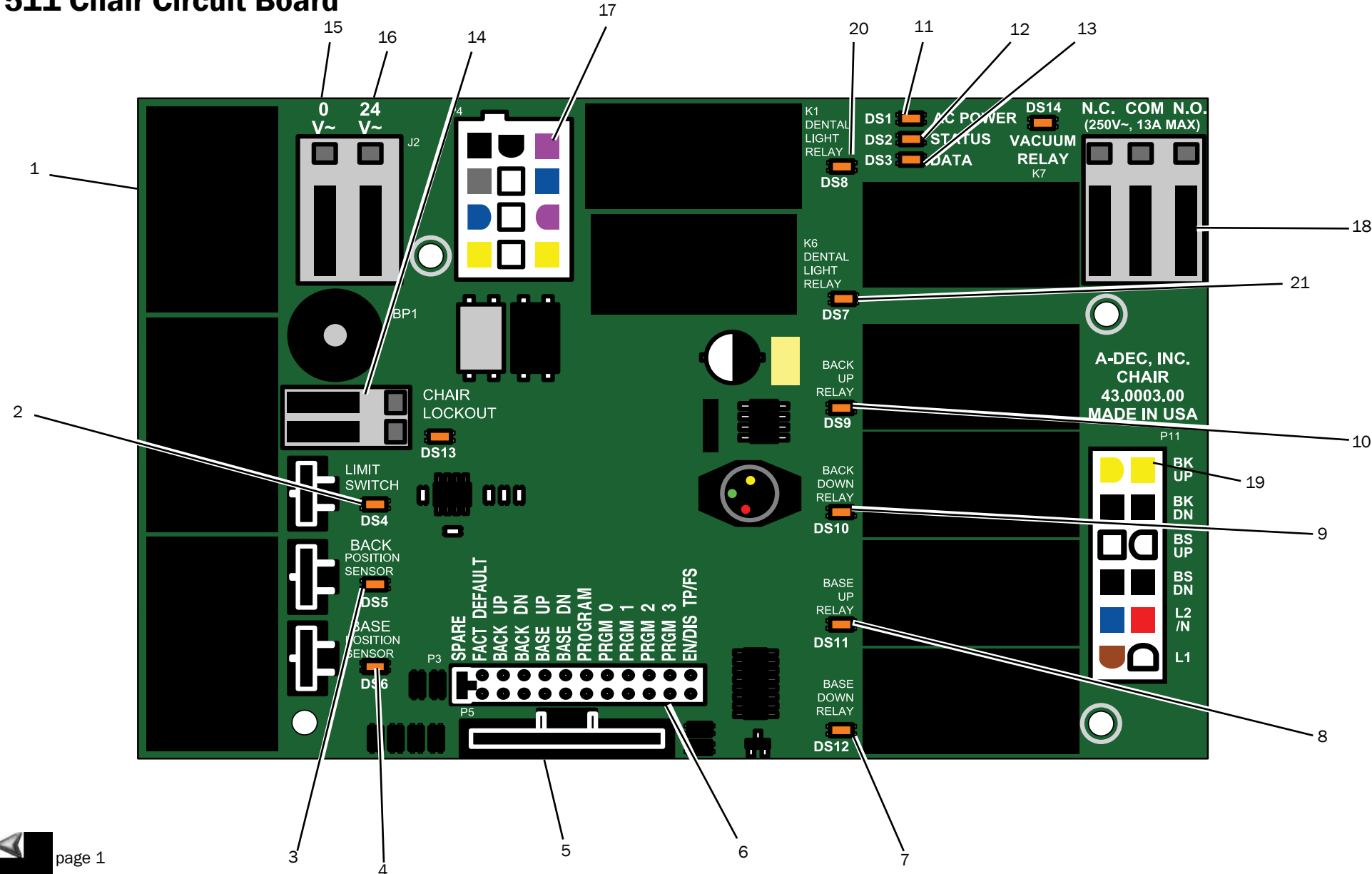
## 311/411 Chair Circuit Board Identification

Item	Description	Item	Description
1	DS1 - AC power LED (CB1)	18	P5 - touchpad or footswitch connector
2	DS2, DS16 - status LEDs	19	P6/P7 - data ports
3	DS3 - data LED	20	P8 - back motor connector
4	DS5 - back position sensor, LED/ P1 Connector	21	P9 - input power connector
5	DS6 - base position sensor LED/ P2 connector	22	P11 - base motor connector
6	DS7 - dental light LED/Relay K6	23	P12 - input power connector
7	DS8 - dental light LED/Relay K1	24	J1 - 0 VAC terminal strip (output) for Assistant's, doctor's, floor box
8	DS9 - back up LED/Relay K2	25	J2 - 24 VAC terminal strip (output) for assistant's, doctor's and floor box
9	DS10 - back down LED/relay K3	26	J3 - 0 VAC terminal strip (output) for support center
10	DS11 - base up LED/relay K4	27	J3 - 24 VAC terminal strip (output) for support center
11	DS12 - base down LED/relay K5	28	J5 - dental light output terminal strip
12	DS13 - chair lockout LED/ terminal strip J4	29	J6 - dental light input terminal strip
13	DS14 - AC power LED (CB4)	30	J7 - base solenoid terminal strip
14	DS15 - AC power LED (CB5)	31	P10 - Jumper - 311 chair only
15	DS17 - back on LED/Relay K7	32	P13 - Jumper - 311 chair only
16	P3 - testpoints header	33	DS4 - Base stop switch
17	P4 - input power connector	34	DS18 - Back stop switch



**CAUTION:** Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

511 Chair Circuit Board



## 511 Chair Circuit Board LED Identification

LED	Status	Description
DS1 - AC power LED	Off	No 24 VAC power, tripped circuit breaker, power supply turned off, no line voltage
	Green, steady	24 VAC at the terminal strip
DS2 - Status LED	Off	System is not functioning, no power or circuit board has failed
	Green, steady	Normal operation
DS3 - Data LED	Off	No DCS communication, not connected to the DCS, or DCS has failed
	Green, steady	Detects active DCS
	Green, blinking	Valid DCS message
DS4 - Chair limit switch	Off	Closed, (normal)
	Red	Open, (activated)
DS13 - Chair lockout	Off	Open, (normal)
	Red	Closed, (activated)
DS5 + DS6 - Chair position sensors	Off	Position Sensor: Not connected or bad connection; moving in wrong direction; limited range of motion; or cable is not on the pulley
	Yellow, steady	Normal operation
	Yellow, fast blink	Upper end of travel
	Yellow, slow blink	Lower end of travel
DS9, DS10, DS11, DS12 - Chair relay LEDs	Off	Relay is off
	On	Relay is on
DS7, DS8 - Dental light relay LEDs	Off	Relay is off
	On	Relay is on
DS14 - Vacuum relay LED	Off	Relay is off
	On	Relay is on

## 511 Chair Circuit Board Identification

Item	Description	Item	Description
1	P7, P8, P9 - data ports	11	DS1 - AC power LED
2	DS4 - stop switch LED (limit switch)/P10 connector	12	DS2 - status LED
3	DS5 - back position sensor LED/P1 connector	13	DS3 - data LED
4	DS6 - base position sensor LED/P2 connector	14	DS13 - chair lockout LED/terminal strip J1
5	P5 - footswitch connector	15	J2 - 0 VAC terminal strip (output)
6	P3 - testpoints header	16	J2 - 24 VAC terminal strip (output)
7	DS12 - base down LED/relay K5	17	P4 - Input power/dental light connector
8	DS11 - base up LED/relay K4	18	J3 - vacuum relay K7 output terminal strip
9	DS10 - back down LED/relay K3	19	P11 - pump motor/solenoid connector
10	DS9 - back up LED/relay K2	20	DS8 - dental light LED relay/K1
		21	DS7 - dental light LED relay/K6



**CAUTION:** Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

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