ED\_leg1 =

L\_coxa\*cos(x[6]) + L\_tibia\*(cos(x[6])\*cos(x[7])\*sin(x[8]) + cos(x[6])\*cos(x[8])\*sin(x[7])) + L\_femur\*cos(x[6])\*cos(x[7]) + 111

L\_coxa\*sin(x[6]) + L\_tibia\*(cos(x[7])\*sin(x[6])\*sin(x[8]) + sin(x[6])\*cos(x[8])\*sin(x[7])) + L\_femur\*cos(x[7])\*sin(x[6]) + 194

L\_femur\*sin(x[7]) - L\_tibia\*(cos(x[7])\*cos(x[8]) - sin(x[7])\*sin(x[8]))

ED\_leg2 =

L\_coxa\*cos(x[9]) + L\_tibia\*(cos(x[9])\*cos(x[10])\*sin(x[11]) + cos(x[9])\*cos(x[11])\*sin(x[10])) + L\_femur\*cos(x[9])\*cos(x[10]) + 224

L\_coxa\*sin(x[9]) + L\_tibia\*(cos(x[10])\*sin(x[9])\*sin(x[11]) + sin(x[9])\*cos(x[11])\*sin(x[10])) + L\_femur\*cos(x[10])\*sin(x[9])

L\_femur\*sin(x[10]) - L\_tibia\*(cos(x[10])\*cos(x[11]) - sin(x[10])\*sin(x[11]))

ED\_leg3 =

L\_coxa\*cos(x[12]) + L\_tibia\*(cos(x[12])\*cos(x[13])\*sin(x[14]) + cos(x[12])\*cos(x[14])\*sin(x[13])) + L\_femur\*cos(x[12])\*cos(x[13]) + 111

L\_coxa\*sin(x[12]) + L\_tibia\*(cos(x[13])\*sin(x[12])\*sin(x[14]) + sin(x[12])\*cos(x[14])\*sin(x[13])) + L\_femur\*cos(x[13])\*sin(x[12]) - 194

L\_femur\*sin(x[13]) - L\_tibia\*(cos(x[13])\*cos(x[14]) - sin(x[13])\*sin(x[14]))

ED\_leg4 =

L\_coxa\*cos(x[15]) + L\_tibia\*(cos(x[15])\*cos(x[16])\*sin(x[17]) + cos(x[15])\*cos(x[17])\*sin(x[16])) + L\_femur\*cos(x[15])\*cos(x[16]) - 111

L\_coxa\*sin(x[15]) + L\_tibia\*(cos(x[16])\*sin(x[15])\*sin(x[17]) + sin(x[15])\*cos(x[17])\*sin(x[16])) + L\_femur\*cos(x[16])\*sin(x[15]) - 194

L\_femur\*sin(x[16]) - L\_tibia\*(cos(x[16])\*cos(x[17]) - sin(x[16])\*sin(x[17]))

ED\_leg5 =

L\_coxa\*cos(x[18]) + L\_tibia\*(cos(x[18])\*cos(x[19])\*sin(x[20]) + cos(x[18])\*cos(x[20])\*sin(x[19])) + L\_femur\*cos(x[18])\*cos(x[19]) - 224

L\_coxa\*sin(x[18]) + L\_tibia\*(cos(x[19])\*sin(x[18])\*sin(x[20]) + sin(x[18])\*cos(x[20])\*sin(x[19])) + L\_femur\*cos(x[19])\*sin(x[18])

L\_femur\*sin(x[19]) - L\_tibia\*(cos(x[19])\*cos(x[20]) - sin(x[19])\*sin(x[20]))

ED\_leg6 =

L\_coxa\*cos(x[21]) + L\_tibia\*(cos(x[21])\*cos(x[22])\*sin(x[23]) + cos(x[21])\*cos(x[23])\*sin(x[22])) + L\_femur\*cos(x[21])\*cos(x[22]) - 111

L\_coxa\*sin(x[21]) + L\_tibia\*(cos(x[22])\*sin(x[21])\*sin(x[23]) + sin(x[21])\*cos(x[23])\*sin(x[22])) + L\_femur\*cos(x[22])\*sin(x[21]) + 194

L\_femur\*sin(x[22]) - L\_tibia\*(cos(x[22])\*cos(x[23]) - sin(x[22])\*sin(x[23]))

dP1dx[6]\_1 =

- L\_coxa\*sin(x[6]) - L\_tibia\*(cos(x[7])\*sin(x[6])\*sin(x[8]) + sin(x[6])\*cos(x[8])\*sin(x[7])) - L\_femur\*cos(x[7])\*sin(x[6])

dP1dx[7]\_1 =

L\_tibia\*(cos(x[6])\*cos(x[7])\*cos(x[8]) - cos(x[6])\*sin(x[7])\*sin(x[8])) - L\_femur\*cos(x[6])\*sin(x[7])

dP1dx[8]\_1 =

L\_tibia\*(cos(x[6])\*cos(x[7])\*cos(x[8]) - cos(x[6])\*sin(x[7])\*sin(x[8]))

dP1dx[6]\_2 =

L\_coxa\*cos(x[6]) + L\_tibia\*(cos(x[6])\*cos(x[7])\*sin(x[8]) + cos(x[6])\*cos(x[8])\*sin(x[7])) + L\_femur\*cos(x[6])\*cos(x[7])

dP1dx[7]\_2 =

L\_tibia\*(cos(x[7])\*sin(x[6])\*cos(x[8]) - sin(x[6])\*sin(x[7])\*sin(x[8])) - L\_femur\*sin(x[6])\*sin(x[7])

dP1dx[8]\_2 =

L\_tibia\*(cos(x[7])\*sin(x[6])\*cos(x[8]) - sin(x[6])\*sin(x[7])\*sin(x[8]))

dP1dx[6]\_3 =

0

dP1dx[7]\_3 =

L\_tibia\*(cos(x[7])\*sin(x[8]) + cos(x[8])\*sin(x[7])) + L\_femur\*cos(x[7])

dP1dx[8]\_3 =

L\_tibia\*(cos(x[7])\*sin(x[8]) + cos(x[8])\*sin(x[7]))

dP2dx[9]\_1 =

- L\_coxa\*sin(x[9]) - L\_tibia\*(cos(x[10])\*sin(x[9])\*sin(x[11]) + sin(x[9])\*cos(x[11])\*sin(x[10])) - L\_femur\*cos(x[10])\*sin(x[9])

dP2dx[10]\_1 =

L\_tibia\*(cos(x[9])\*cos(x[10])\*cos(x[11]) - cos(x[9])\*sin(x[10])\*sin(x[11])) - L\_femur\*cos(x[9])\*sin(x[10])

dP2dx[11]\_1 =

L\_tibia\*(cos(x[9])\*cos(x[10])\*cos(x[11]) - cos(x[9])\*sin(x[10])\*sin(x[11]))

dP2dx[9]\_2 =

L\_coxa\*cos(x[9]) + L\_tibia\*(cos(x[9])\*cos(x[10])\*sin(x[11]) + cos(x[9])\*cos(x[11])\*sin(x[10])) + L\_femur\*cos(x[9])\*cos(x[10])

dP2dx[10]\_2 =

L\_tibia\*(cos(x[10])\*sin(x[9])\*cos(x[11]) - sin(x[9])\*sin(x[10])\*sin(x[11])) - L\_femur\*sin(x[9])\*sin(x[10])

dP2dx[11]\_2 =

L\_tibia\*(cos(x[10])\*sin(x[9])\*cos(x[11]) - sin(x[9])\*sin(x[10])\*sin(x[11]))

dP2dx[9]\_3 =

0

dP2dx[10]\_3 =

L\_tibia\*(cos(x[10])\*sin(x[11]) + cos(x[11])\*sin(x[10])) + L\_femur\*cos(x[10])

dP2dx[11]\_3 =

L\_tibia\*(cos(x[10])\*sin(x[11]) + cos(x[11])\*sin(x[10]))

dP3dx[12] =

- L\_coxa\*sin(x[12]) - L\_tibia\*(cos(x[13])\*sin(x[12])\*sin(x[14]) + sin(x[12])\*cos(x[14])\*sin(x[13])) - L\_femur\*cos(x[13])\*sin(x[12])

L\_coxa\*cos(x[12]) + L\_tibia\*(cos(x[12])\*cos(x[13])\*sin(x[14]) + cos(x[12])\*cos(x[14])\*sin(x[13])) + L\_femur\*cos(x[12])\*cos(x[13])

0

dP3dx[13] =

L\_tibia\*(cos(x[12])\*cos(x[13])\*cos(x[14]) - cos(x[12])\*sin(x[13])\*sin(x[14])) - L\_femur\*cos(x[12])\*sin(x[13])

L\_tibia\*(cos(x[13])\*sin(x[12])\*cos(x[14]) - sin(x[12])\*sin(x[13])\*sin(x[14])) - L\_femur\*sin(x[12])\*sin(x[13])

L\_tibia\*(cos(x[13])\*sin(x[14]) + cos(x[14])\*sin(x[13])) + L\_femur\*cos(x[13])

dP3dx[14] =

L\_tibia\*(cos(x[12])\*cos(x[13])\*cos(x[14]) - cos(x[12])\*sin(x[13])\*sin(x[14]))

L\_tibia\*(cos(x[13])\*sin(x[12])\*cos(x[14]) - sin(x[12])\*sin(x[13])\*sin(x[14]))

L\_tibia\*(cos(x[13])\*sin(x[14]) + cos(x[14])\*sin(x[13]))

dP3dx[12]\_1 =

- L\_coxa\*sin(x[12]) - L\_tibia\*(cos(x[13])\*sin(x[12])\*sin(x[14]) + sin(x[12])\*cos(x[14])\*sin(x[13])) - L\_femur\*cos(x[13])\*sin(x[12])

dP3dx[13]\_1 =

L\_tibia\*(cos(x[12])\*cos(x[13])\*cos(x[14]) - cos(x[12])\*sin(x[13])\*sin(x[14])) - L\_femur\*cos(x[12])\*sin(x[13])

dP3dx[14]\_1 =

L\_tibia\*(cos(x[12])\*cos(x[13])\*cos(x[14]) - cos(x[12])\*sin(x[13])\*sin(x[14]))

dP3dx[12]\_2 =

L\_coxa\*cos(x[12]) + L\_tibia\*(cos(x[12])\*cos(x[13])\*sin(x[14]) + cos(x[12])\*cos(x[14])\*sin(x[13])) + L\_femur\*cos(x[12])\*cos(x[13])

dP3dx[13]\_2 =

L\_tibia\*(cos(x[13])\*sin(x[12])\*cos(x[14]) - sin(x[12])\*sin(x[13])\*sin(x[14])) - L\_femur\*sin(x[12])\*sin(x[13])

dP3dx[14]\_2 =

L\_tibia\*(cos(x[13])\*sin(x[12])\*cos(x[14]) - sin(x[12])\*sin(x[13])\*sin(x[14]))

dP3dx[12]\_3 =

0

dP3dx[13]\_3 =

L\_tibia\*(cos(x[13])\*sin(x[14]) + cos(x[14])\*sin(x[13])) + L\_femur\*cos(x[13])

dP3dx[14]\_3 =

L\_tibia\*(cos(x[13])\*sin(x[14]) + cos(x[14])\*sin(x[13]))

dP4dx[15] =

- L\_coxa\*sin(x[15]) - L\_tibia\*(cos(x[16])\*sin(x[15])\*sin(x[17]) + sin(x[15])\*cos(x[17])\*sin(x[16])) - L\_femur\*cos(x[16])\*sin(x[15])

L\_coxa\*cos(x[15]) + L\_tibia\*(cos(x[15])\*cos(x[16])\*sin(x[17]) + cos(x[15])\*cos(x[17])\*sin(x[16])) + L\_femur\*cos(x[15])\*cos(x[16])

0

dP4dx[16] =

L\_tibia\*(cos(x[15])\*cos(x[16])\*cos(x[17]) - cos(x[15])\*sin(x[16])\*sin(x[17])) - L\_femur\*cos(x[15])\*sin(x[16])

L\_tibia\*(cos(x[16])\*sin(x[15])\*cos(x[17]) - sin(x[15])\*sin(x[16])\*sin(x[17])) - L\_femur\*sin(x[15])\*sin(x[16])

L\_tibia\*(cos(x[16])\*sin(x[17]) + cos(x[17])\*sin(x[16])) + L\_femur\*cos(x[16])

dP4dx[17] =

L\_tibia\*(cos(x[15])\*cos(x[16])\*cos(x[17]) - cos(x[15])\*sin(x[16])\*sin(x[17]))

L\_tibia\*(cos(x[16])\*sin(x[15])\*cos(x[17]) - sin(x[15])\*sin(x[16])\*sin(x[17]))

L\_tibia\*(cos(x[16])\*sin(x[17]) + cos(x[17])\*sin(x[16]))

dP4dx[15]\_1 =

- L\_coxa\*sin(x[15]) - L\_tibia\*(cos(x[16])\*sin(x[15])\*sin(x[17]) + sin(x[15])\*cos(x[17])\*sin(x[16])) - L\_femur\*cos(x[16])\*sin(x[15])

dP4dx[16]\_1 =

L\_tibia\*(cos(x[15])\*cos(x[16])\*cos(x[17]) - cos(x[15])\*sin(x[16])\*sin(x[17])) - L\_femur\*cos(x[15])\*sin(x[16])

dP4dx[17]\_1 =

L\_tibia\*(cos(x[15])\*cos(x[16])\*cos(x[17]) - cos(x[15])\*sin(x[16])\*sin(x[17]))

dP4dx[15]\_2 =

L\_coxa\*cos(x[15]) + L\_tibia\*(cos(x[15])\*cos(x[16])\*sin(x[17]) + cos(x[15])\*cos(x[17])\*sin(x[16])) + L\_femur\*cos(x[15])\*cos(x[16])

dP4dx[16]\_2 =

L\_tibia\*(cos(x[16])\*sin(x[15])\*cos(x[17]) - sin(x[15])\*sin(x[16])\*sin(x[17])) - L\_femur\*sin(x[15])\*sin(x[16])

dP4dx[17]\_2 =

L\_tibia\*(cos(x[16])\*sin(x[15])\*cos(x[17]) - sin(x[15])\*sin(x[16])\*sin(x[17]))

dP4dx[15]\_3 =

0

dP4dx[16]\_3 =

L\_tibia\*(cos(x[16])\*sin(x[17]) + cos(x[17])\*sin(x[16])) + L\_femur\*cos(x[16])

dP4dx[17]\_3 =

L\_tibia\*(cos(x[16])\*sin(x[17]) + cos(x[17])\*sin(x[16]))

dP5dx[18] =

- L\_coxa\*sin(x[18]) - L\_tibia\*(cos(x[19])\*sin(x[18])\*sin(x[20]) + sin(x[18])\*cos(x[20])\*sin(x[19])) - L\_femur\*cos(x[19])\*sin(x[18])

L\_coxa\*cos(x[18]) + L\_tibia\*(cos(x[18])\*cos(x[19])\*sin(x[20]) + cos(x[18])\*cos(x[20])\*sin(x[19])) + L\_femur\*cos(x[18])\*cos(x[19])

0

dP5dx[19] =

L\_tibia\*(cos(x[18])\*cos(x[19])\*cos(x[20]) - cos(x[18])\*sin(x[19])\*sin(x[20])) - L\_femur\*cos(x[18])\*sin(x[19])

L\_tibia\*(cos(x[19])\*sin(x[18])\*cos(x[20]) - sin(x[18])\*sin(x[19])\*sin(x[20])) - L\_femur\*sin(x[18])\*sin(x[19])

L\_tibia\*(cos(x[19])\*sin(x[20]) + cos(x[20])\*sin(x[19])) + L\_femur\*cos(x[19])

dP5dx[20] =

L\_tibia\*(cos(x[18])\*cos(x[19])\*cos(x[20]) - cos(x[18])\*sin(x[19])\*sin(x[20]))

L\_tibia\*(cos(x[19])\*sin(x[18])\*cos(x[20]) - sin(x[18])\*sin(x[19])\*sin(x[20]))

L\_tibia\*(cos(x[19])\*sin(x[20]) + cos(x[20])\*sin(x[19]))

dP5dx[18]\_1 =

- L\_coxa\*sin(x[18]) - L\_tibia\*(cos(x[19])\*sin(x[18])\*sin(x[20]) + sin(x[18])\*cos(x[20])\*sin(x[19])) - L\_femur\*cos(x[19])\*sin(x[18])

dP5dx[19]\_1 =

L\_tibia\*(cos(x[18])\*cos(x[19])\*cos(x[20]) - cos(x[18])\*sin(x[19])\*sin(x[20])) - L\_femur\*cos(x[18])\*sin(x[19])

dP5dx[20]\_1 =

L\_tibia\*(cos(x[18])\*cos(x[19])\*cos(x[20]) - cos(x[18])\*sin(x[19])\*sin(x[20]))

dP5dx[18]\_2 =

L\_coxa\*cos(x[18]) + L\_tibia\*(cos(x[18])\*cos(x[19])\*sin(x[20]) + cos(x[18])\*cos(x[20])\*sin(x[19])) + L\_femur\*cos(x[18])\*cos(x[19])

dP5dx[19]\_2 =

L\_tibia\*(cos(x[19])\*sin(x[18])\*cos(x[20]) - sin(x[18])\*sin(x[19])\*sin(x[20])) - L\_femur\*sin(x[18])\*sin(x[19])

dP5dx[20]\_2 =

L\_tibia\*(cos(x[19])\*sin(x[18])\*cos(x[20]) - sin(x[18])\*sin(x[19])\*sin(x[20]))

dP5dx[18]\_3 =

0

dP5dx[19]\_3 =

L\_tibia\*(cos(x[19])\*sin(x[20]) + cos(x[20])\*sin(x[19])) + L\_femur\*cos(x[19])

dP5dx[20]\_3 =

L\_tibia\*(cos(x[19])\*sin(x[20]) + cos(x[20])\*sin(x[19]))

dP6dx[21] =

- L\_coxa\*sin(x[21]) - L\_tibia\*(cos(x[22])\*sin(x[21])\*sin(x[23]) + sin(x[21])\*cos(x[23])\*sin(x[22])) - L\_femur\*cos(x[22])\*sin(x[21])

L\_coxa\*cos(x[21]) + L\_tibia\*(cos(x[21])\*cos(x[22])\*sin(x[23]) + cos(x[21])\*cos(x[23])\*sin(x[22])) + L\_femur\*cos(x[21])\*cos(x[22])

0

dP6dx[22] =

L\_tibia\*(cos(x[21])\*cos(x[22])\*cos(x[23]) - cos(x[21])\*sin(x[22])\*sin(x[23])) - L\_femur\*cos(x[21])\*sin(x[22])

L\_tibia\*(cos(x[22])\*sin(x[21])\*cos(x[23]) - sin(x[21])\*sin(x[22])\*sin(x[23])) - L\_femur\*sin(x[21])\*sin(x[22])

L\_tibia\*(cos(x[22])\*sin(x[23]) + cos(x[23])\*sin(x[22])) + L\_femur\*cos(x[22])

dP6dx[23] =

L\_tibia\*(cos(x[21])\*cos(x[22])\*cos(x[23]) - cos(x[21])\*sin(x[22])\*sin(x[23]))

L\_tibia\*(cos(x[22])\*sin(x[21])\*cos(x[23]) - sin(x[21])\*sin(x[22])\*sin(x[23]))

L\_tibia\*(cos(x[22])\*sin(x[23]) + cos(x[23])\*sin(x[22]))

dP6dx[21]\_1 =

- L\_coxa\*sin(x[21]) - L\_tibia\*(cos(x[22])\*sin(x[21])\*sin(x[23]) + sin(x[21])\*cos(x[23])\*sin(x[22])) - L\_femur\*cos(x[22])\*sin(x[21])

dP6dx[22]\_1 =

L\_tibia\*(cos(x[21])\*cos(x[22])\*cos(x[23]) - cos(x[21])\*sin(x[22])\*sin(x[23])) - L\_femur\*cos(x[21])\*sin(x[22])

dP6dx[23]\_1 =

L\_tibia\*(cos(x[21])\*cos(x[22])\*cos(x[23]) - cos(x[21])\*sin(x[22])\*sin(x[23]))

dP6dx[21]\_2 =

L\_coxa\*cos(x[21]) + L\_tibia\*(cos(x[21])\*cos(x[22])\*sin(x[23]) + cos(x[21])\*cos(x[23])\*sin(x[22])) + L\_femur\*cos(x[21])\*cos(x[22])

dP6dx[22]\_2 =

L\_tibia\*(cos(x[22])\*sin(x[21])\*cos(x[23]) - sin(x[21])\*sin(x[22])\*sin(x[23])) - L\_femur\*sin(x[21])\*sin(x[22])

dP6dx[23]\_2 =

L\_tibia\*(cos(x[22])\*sin(x[21])\*cos(x[23]) - sin(x[21])\*sin(x[22])\*sin(x[23]))

dP6dx[21]\_3 =

0

dP6dx[22]\_3 =

L\_tibia\*(cos(x[22])\*sin(x[23]) + cos(x[23])\*sin(x[22])) + L\_femur\*cos(x[22])

dP6dx[23]\_3 =

L\_tibia\*(cos(x[22])\*sin(x[23]) + cos(x[23])\*sin(x[22]))