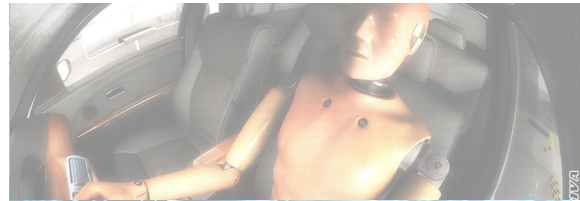


Humanetics Innovative Solutions, Inc.

BioRID II Rear Impact Male Dummy

ARA-001-H



Brand Harmonized Parts Catalog





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Background

The BioRID-II was originally developed by Chalmers University in Gothenburg, Sweden and has been produced by Humanetics. In fabricating the dummy, Humanetics has solicited user feedback from academia and industry, incorporating subtle improvements that improve dummy usability on top of Humanetics' high standards for calibration and production. Humanetics also incorporated the latest recommendations from global users, as well as ensuring that components met the latest anthropomorphic shell data.

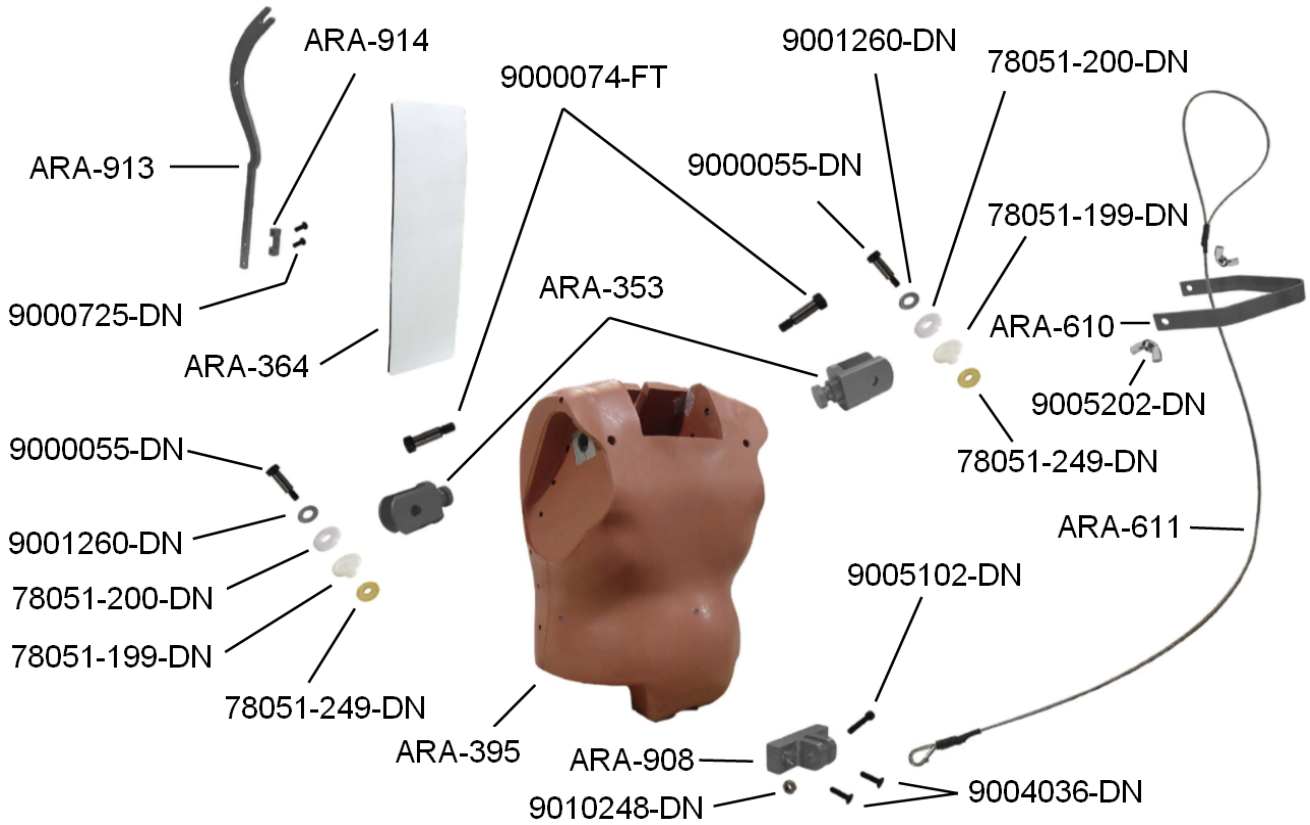
The BioRID-II was created to assess seat restraints in a rear impact scenario, after extensive testing on prior dummy models indicated a severe lack of biofidelity. The BioRID-II's distinguishing feature is its vertebral column, which consists of 24 separate vertebra: 5 lumbar, 12 thoracic, and 7 cervical. A combination of torsion washers, urethane bumpers, and muscle-simulating springs provide biofidelic performance. The vertebral column is installed inside a silicone jacket featuring pin linkages to the vertebra and a water filled bladder in the abdominal region.

Head Assembly – Harmonized



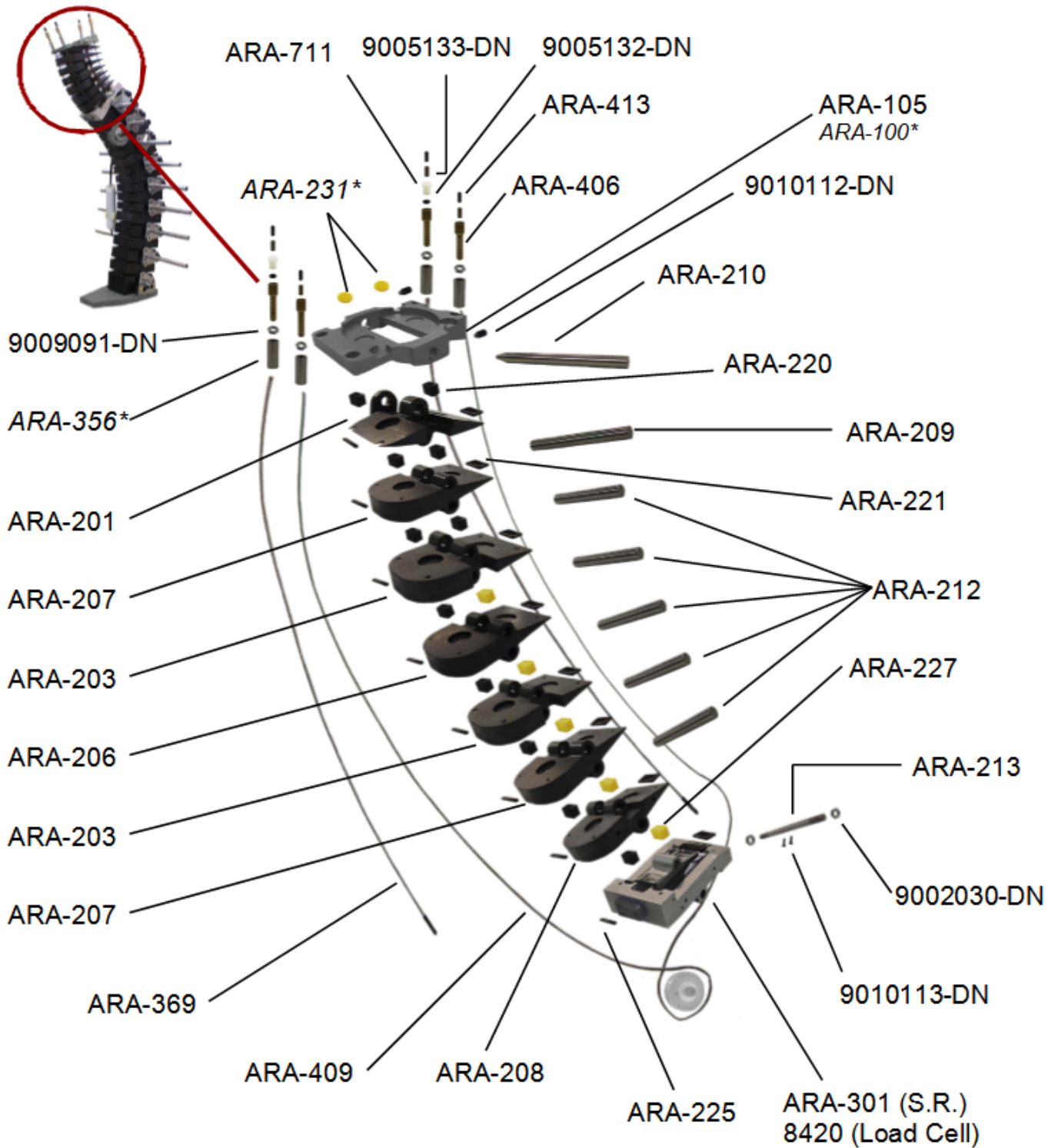
Part Number	Description	Qty. Req'd Per Dummy
ARA-103-H	Head Assembly	1
ARA-108-H	Headskin, BioRID	1
ARA-104	Skull, BioRID II	1
ARA-106	Skull Cap, BioRID II	1
ARA-110-H	Capskin, Molded, BiORID	1
4956	Structural Replacement, BioRID Necl LC	1
4947	Ring Ballast – BioRID II	1
9000144-DN	¼-20 5/8 LG. SHCS	2
9000220-FT	#8-32 X ½ LG. FHCS	3
9000677-DN	Washer - .250 ID X .375 OD X .06 THK	4
9000126-DN	Screw, SHCS 1/4-28 X 5/8	4

Torso Components

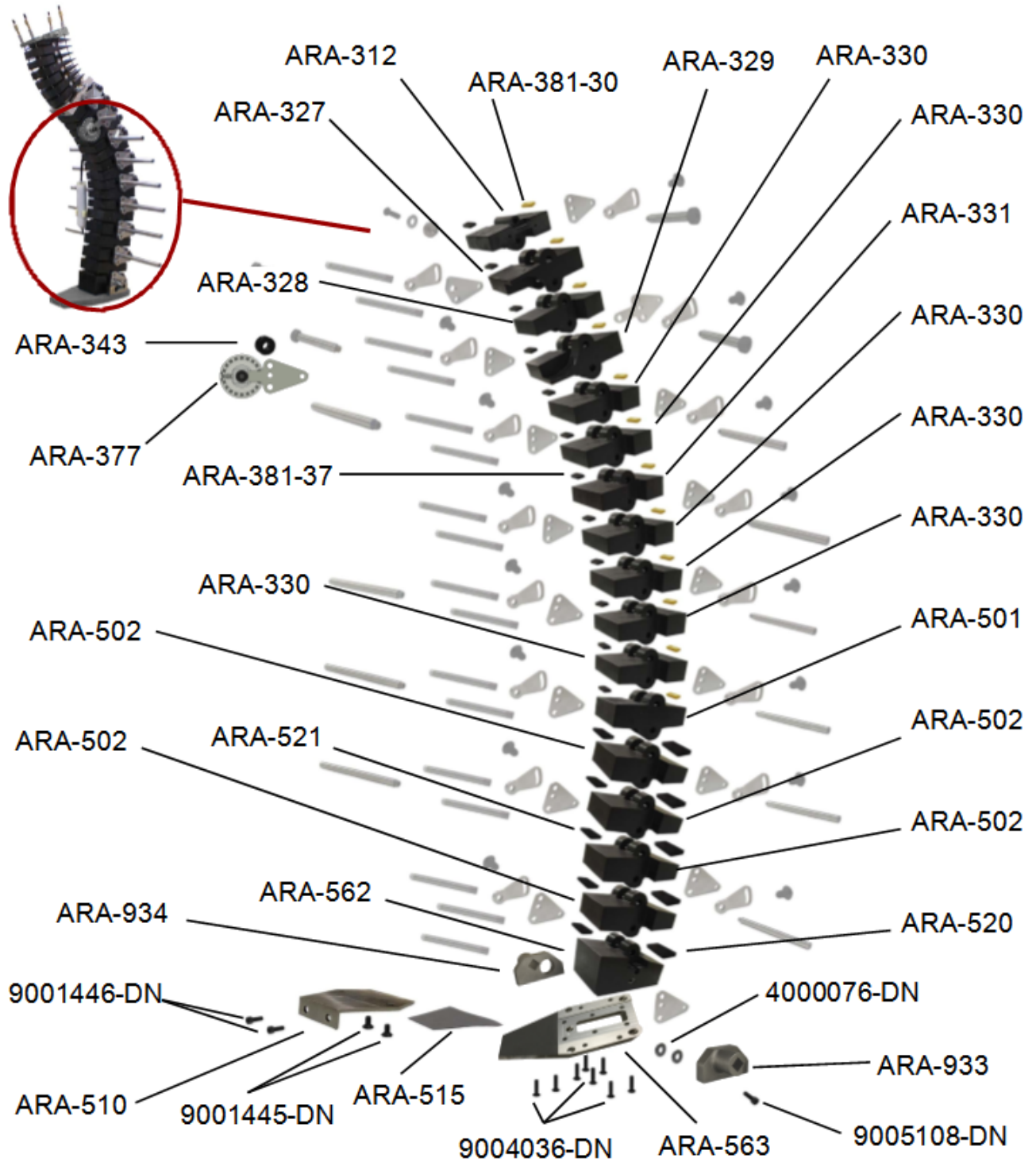


Part Number	Description	Qty. Req'd Per Dummy
ARA-001-H	Complete Assembly, BioRID II	1
9001260-DN	Washer, 1.06 OD x .53 ID x .06 THK.	2
9000055-DN	Screw, SHSS 1/2 x 1-1/4	2
9000074-FT	Screw, SHSS 3/8 X 1	2
78051-199-DN	Bushing, Upper Arm and elbow Pivot	2
78051-200-DN	Washer, Upper Arm 7 elbow Pivot	2
78051-249-DN	Washer-Shoulder Joint Spring	2
ARA-353	Shoulder Yoke	2
ARA-912	Head Locking Device, BioRID	1
ARA-913	Locking Arm	1
ARA-914	Bolt Bracket	1
9000725-DN	Screw, FHCS 10-32 X 5/8	2
ARA-610	Lift Bracket	1
9005202-DN	Nut, M8 X 1.25 Wing	2
ARA-611	Lift Cable	1
ARA-002-H	Head and Upper Torso Assembly	1
ARA-395	Torso Flesh Molded Assy	1
ARA-364	Spine Back Plate	1
ARA-908	Pelvis Lift Bracket, BioRID	1
9005102-DN	Screw, SHCS M6 X 30	1
9004036-DN	Screw, FHCS M6 X 25	2
9010248-DN	Nut, Hex M6 X 1.0 Zinc Plated	1

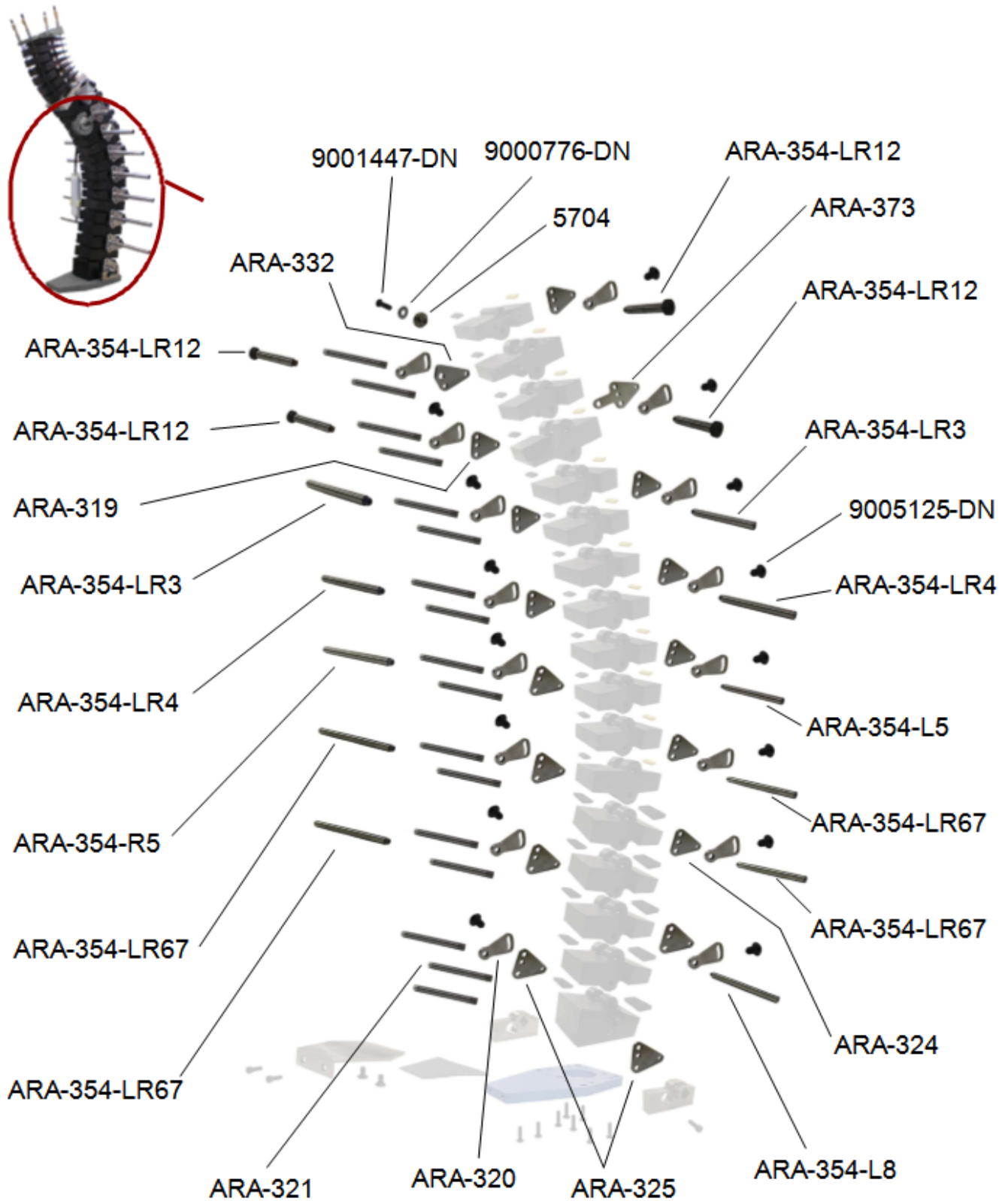
Neck Segment – Harmonized



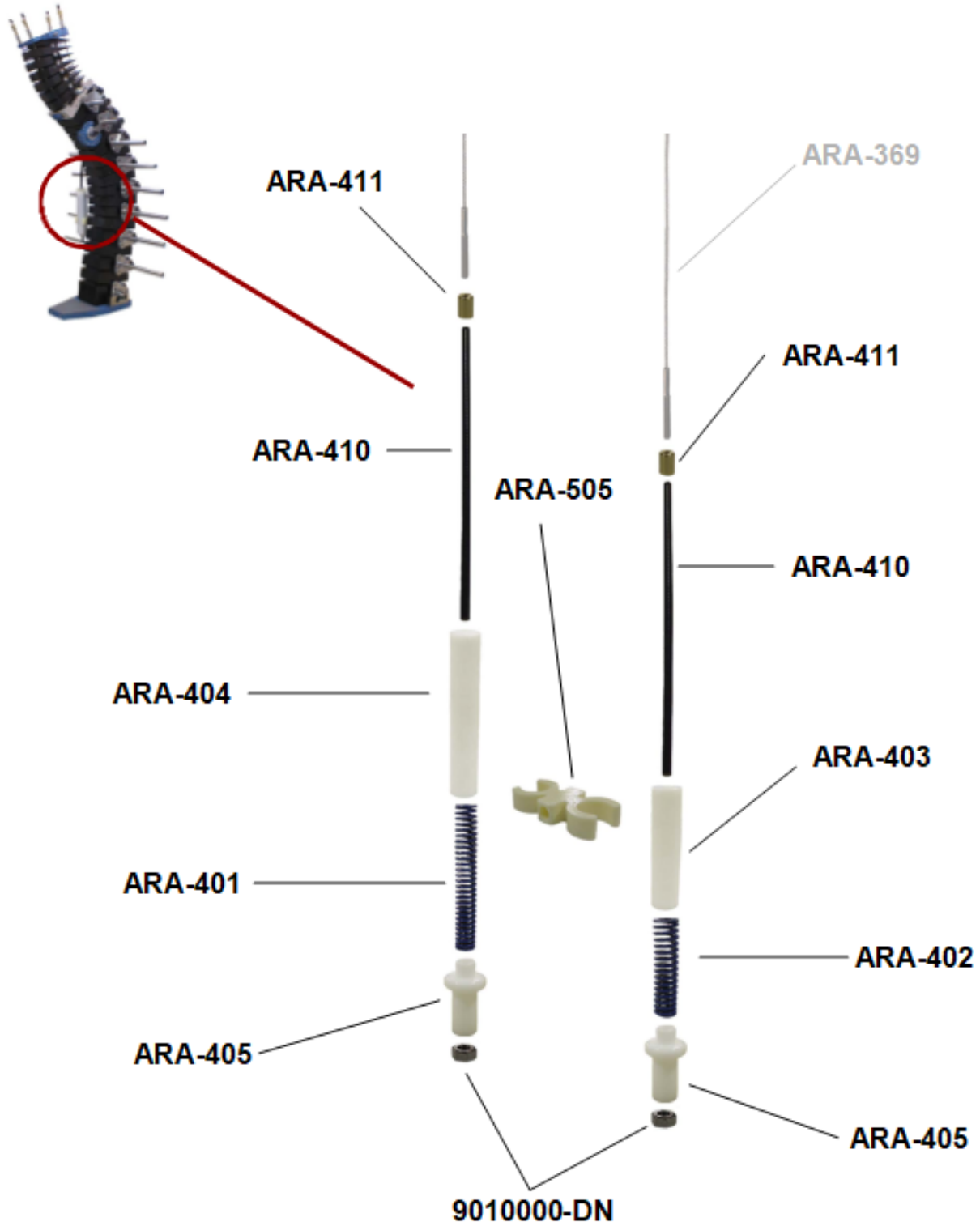
Spine Segment – Harmonized -1



Spine Segment – Harmonized-2



Spring Muscle Substitute

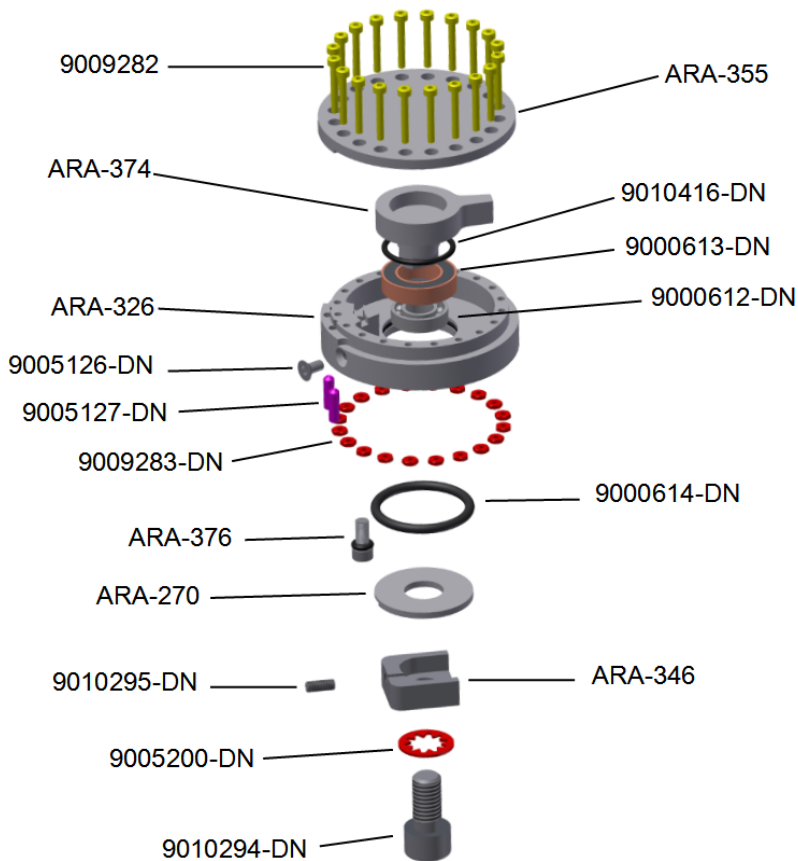


Part Number	Description	Qty. Req'd Per Dummy
ARA-002-H (Con't)	Head and Upper Torso Assembly	1
9004036-DN	Screw, FHCS M6 X 25	2
ARA-354-L5	Assembly-Spine Torso Interface Pin, L5	1
ARA-354-L8	Assembly-Spine Torso Interface Pin, L8	1
ARA-354-LR12	Assy – Interface Pin - L1, L2, R1, R2	4
ARA-354-LR3	Assembly – Interface Pin – L3, R3	2
ARA-354-LR4	Assembly – Interface Pin – L4, R4	2
ARA-354-LR67	Assy – Interface Pin – L6, L7, R6, R7	4
ARA-354-R5	Assy-Spine Torso Interface Pin, R5	1
4000076-DN	Washer, Flat USS 5/16 ID X 3/4 X .06 THK	2
5704	Spacer	1
6588	Pivot Block, L5 Segment	1
ARA-301	S.R. – T1 Load Cell Assy - BioRID	1
ARA-302	Structural Replacement – T1 Load Cell	1
8417	Split Bushing Front	4
8418	Split Bushing Rear	4
9005170-DN	Screw, SHCS M2.5 X 12	10
ARA-220	Bumper, Cervical Front & Rear (Black)	1
ARA-221	Stop-Cervical-Rear	1
ARA-225	Stop-Cervical-Front	1
ARA-227	Bumper, Cervical, Rear, (Yellow), 30A	1
8703	Structural Replacement	1
9000776-DN	Washer 9/32	1
9001447-DN	Screw SHCS M6 X 25	1
9002030-DN	Nut, Hex M8	2
9004036-DN	Screw, FHCS M6 X 25	4
9005108-DN	Screw, SHCS M8 X 25	1
9005125-DN	Screw SHCS M8 X 12	16
9005132-DN	O-Ring, Viton AS568A-004	2
9005133-DN	Cable Ferrule	4
9005170-DN	Screw, SHCS M2.5 X 12	10
9009091-DN	Nut Hex M6 X 1 BioRID	4
9009285-DN	Washer (5/16 X 3/4 X 1/16)	16
9010000-DN	Nut, Hex M5	2
9010051-DN	Screw, SHCS M4 X .7 X 10	6
9010112-DN	Screw, SSFP M4 X 6MM Nylon Tipped	2
9010113-DN	Screw, SHCS M2.5 X .45 X 8MM,	2
9010293-DN	Cable Cap, 2MM ID, Aluminum	4
9010443-DN	Tension Washer, 5/16	1
9010454-DN	Screw, SHCS, Low Head M6 X 1.0 X 12	6
ARA-105	Occipital Interface Assembly	1
ARA-100*	Occipital Interface Plate	1
ARA-356*	Cable Adjustment Attachment	4
ARA-231*	Bumper – Occipital –Neck Load Cell	2
ARA-201	Cervical Vertebrae C1	1
ARA-203	Cervical Vertebrae C3, C5	2
ARA-206	Cervical Vertebrae - C4	1
ARA-207	Cervical Vertebrae C2, C6	2

ARA-208	Cervical Vertebrae – C7, Mod for Load Cell	1
ARA-209	Neck Pin - C1-C2	1
ARA-210	Neck Pin – Occipital - C1	1
ARA-212	Neck Pin – C2-C7	5
ARA-213	Neck Pin, W/ Flats, C7-T1	1
ARA-220	Bumper, Cervical Front & Rear (Black)	12
ARA-221	Stop –Cervical-Rear	9
ARA-225	Stop –Cervical-Front	9
ARA-227	Bumper, Cervical, Rear (Yellow), 30A	6
ARA-312	Thoracic Vertebrae, T2, modified for L/C	1
ARA-319	Washer, Thoracic-Torsion, Modified	1
ARA-320	Torsion Adjustment Washer	17
ARA-321	Torsion Bar	17
ARA-324	Torsion Thoracic Washer	9
ARA-325	Torsion Lumbar Washer	6
ARA-327	Thoracic Vertebrae T3	1
ARA-328	Thoracic Vertebrae T4	1
ARA-329	Thoracic Vertebrae T5	1
ARA-330	Thoracic Vertebrae T6, T7, T9-T12	6
ARA-331	Thoracic Vertebrae T8	1
ARA-332	Torsion Washer	1
ARA-343	Cable Guide Wheel	1
ARA-369	Cable, Spring with Terminal	2
ARA-373	Washer, Torsion – T4, BioRID	1
ARA-381-30	Thoracic Bumper, Yellow, 30A Durometer	12
ARA-381-37	Thoracic Bumper, Black, 37A Durometer	12
ARA-401	Spring – Anterior – Muscle Substitute	1
ARA-402	Spring – Posterior – Muscle Substitute	1
ARA-403	Spring Tube – Posterior – Muscle Substitute	1
ARA-404	Spring Tube – Anterior – Muscle Substitute	1
ARA-405	Piston – Muscle Substitute	2
ARA-406	Cable Adjuster	4
ARA-409	Damper Cable	1
ARA-410	Flexible Cable Sleeve	2
ARA-411	Cable Terminal	2
ARA-413	Vinyl Cable Boot	4
ARA-501	Lumbar Vertebrae L1	1
ARA-502	Lumbar Vertebrae (L2 – L5)	4
ARA-505	Spring Tube Retainer	1
ARA-510	Pelvis Interface Abdominal Attachment	1
ARA-520	Bumper – Lumbar - Rear	5
ARA-521	Bumper – Lumbar - Front	5
ARA-563	Pelvis/Spine Interface Plate Assy	1
ARA-711	Sleeve – Cable Post Lead-In	2
ARA-933	H-Point Attachment – Left, BioRID	1
ARA-934	H-Point Attachment – Right, BioRID	1

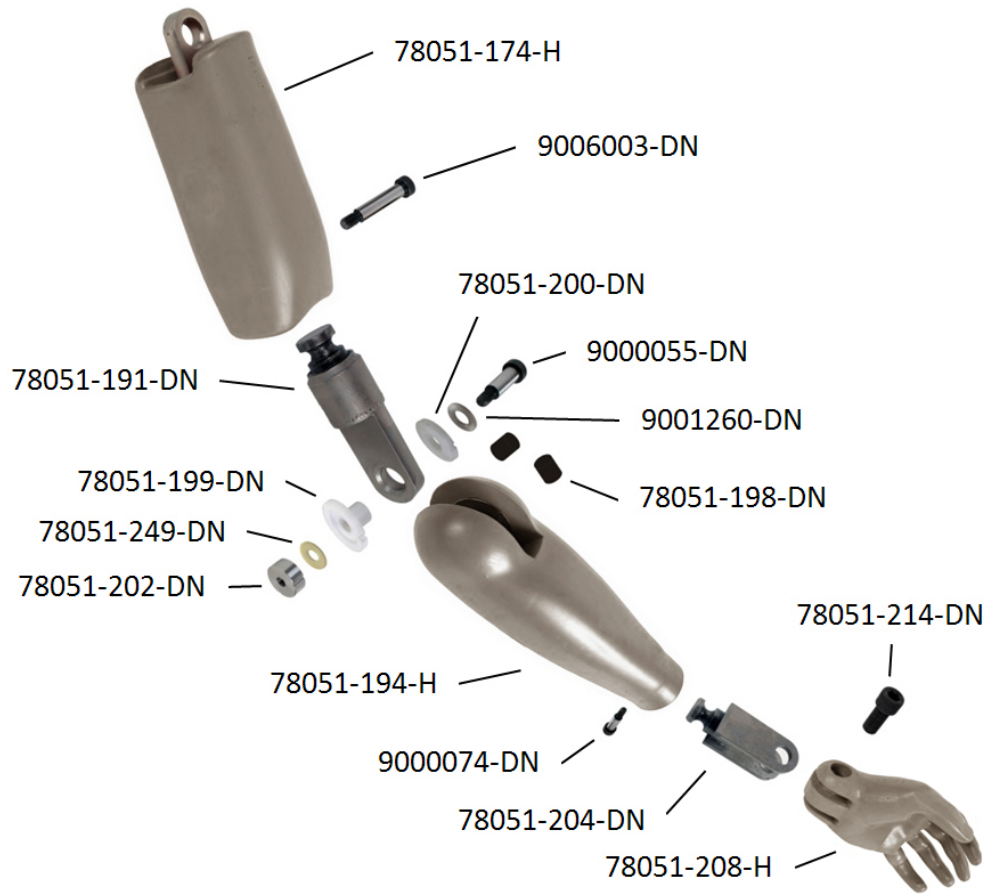
*Non-sellable as spares – must be purchased as an assembly

Damper Assembly



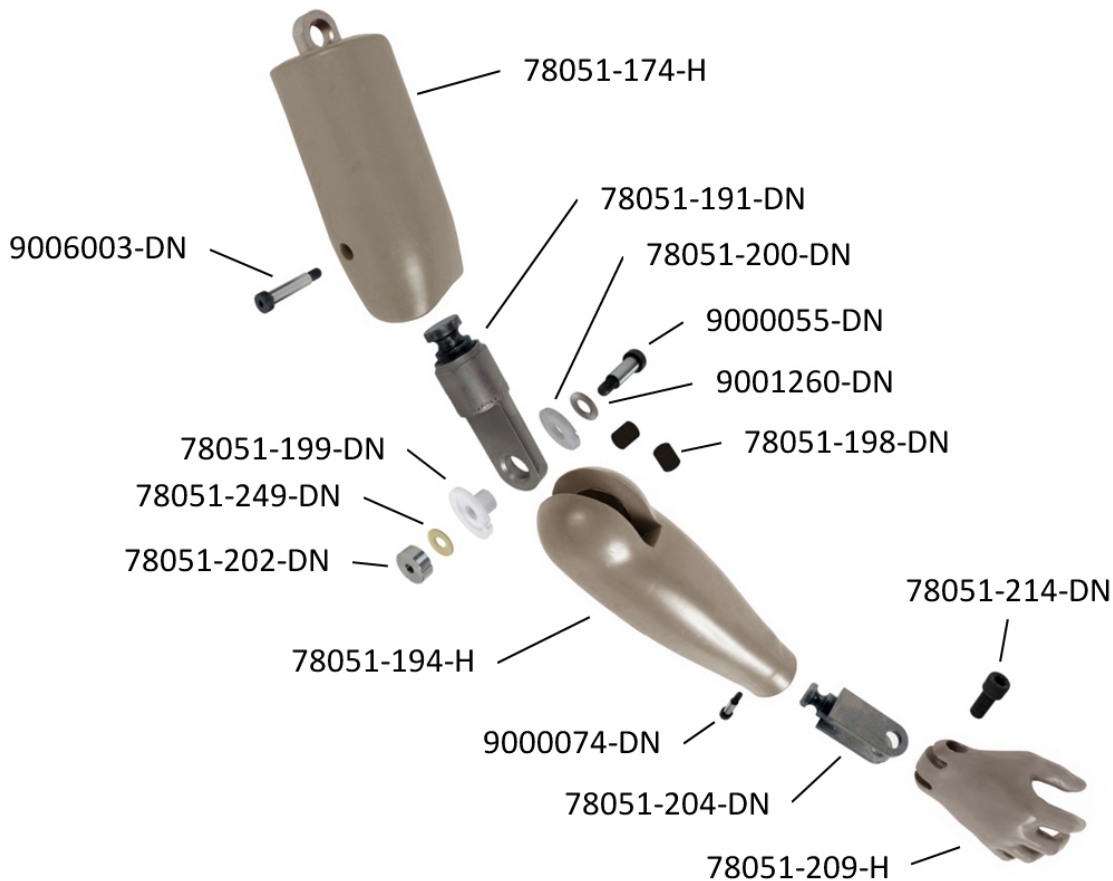
Part Number	Description	Qty. Req'd Per Dummy
ARA-375	Assembly, Rotary Damper, BioRID	1
ARA-270	Seal Washer, Damper	1
ARA-326	Damper Body	1
ARA-346	Clamp Bracket, Damper Paddle, BioRID	1
ARA-355	Damper Cover	1
ARA-374	Damper Paddel Wheel, BioRID	1
ARA-376	Calibration Screw Assembly	1
9000612-DN	Bearing, Lateral, Roller	1
9000613-DN	Bearing, Lateral, Roller	1
9000614-DN	Rubber Seal, ORX O-Ring	1
9005126-DN	Screw, FHCS M3 X 6	1
9005127-DN	Screw, SSCP M3 X 10	1
9005200-DN	Washer Internal Tooth	1
9009282-DN	Screw, SHCS, M2 X 14	20
9009283-DN	M2 Nut, Hex	20
9010294-DN	Screw, SHCS M8-1.25 X 16,	1
9010295-DN	Screw, SSFP M3-.5 X 8,	1
9010416-DN	O-Ring	1
9010419-DN	O-Ring	1

Arm Assembly Left – Harmonized



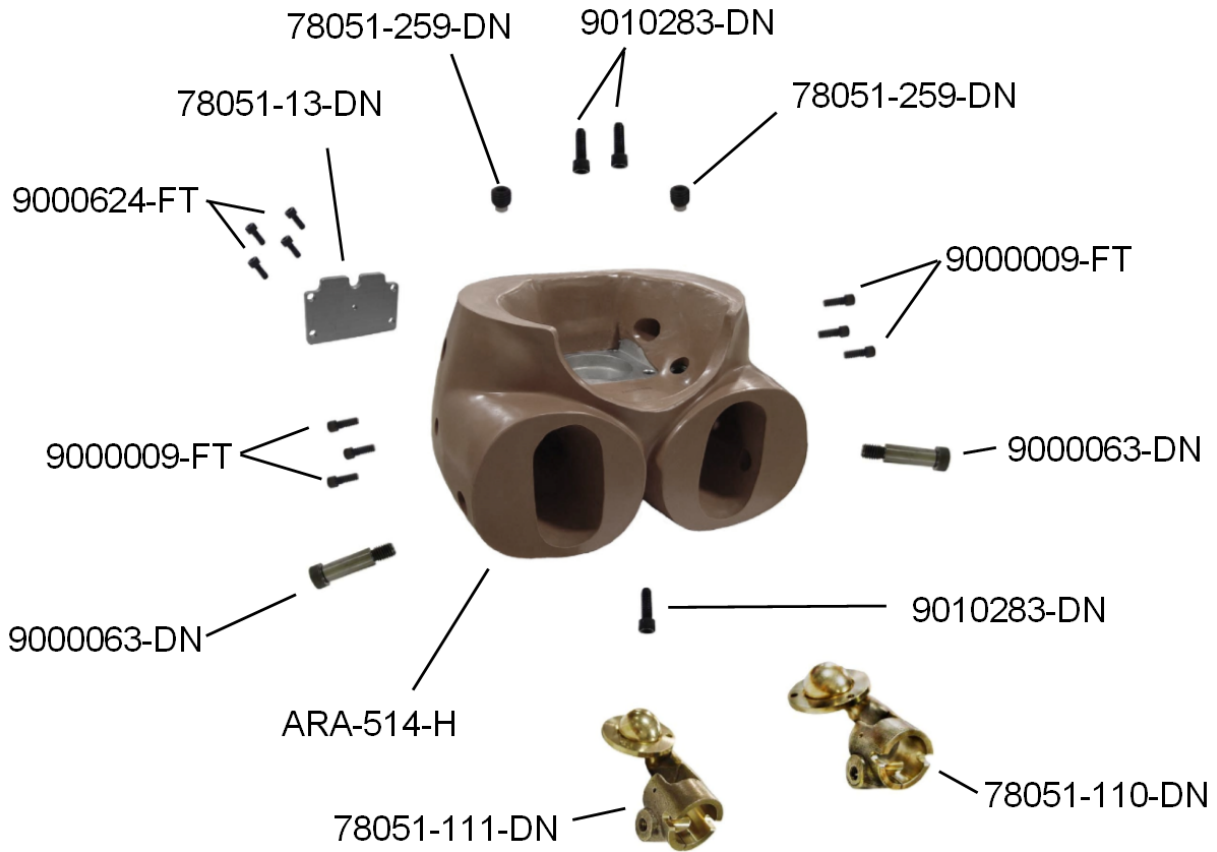
Part Number	Description	Qty. Req'd Per Dummy
78051-123-H	Arm Assembly Complete, Left	1
78051-174-H	Upper Arm Assembly, Molded, with Flesh	1
9006003-DN	Screw, SHSS 3/8 x 1-1/2	1
9001260-DN	Washer, Flat, (Stainless Steel)	1
78051-191-DN	Upper Arm, Lower Part Weldment	1
9000055-DN	Screw, SHSS 1/2 x 1-1/4	1
78051-249-DN	Washer, Spring	1
78051-199-DN	Bushing, Upper Arm/Elbow Pivot	1
78051-200-DN	Washer, Upper Arm/Elbow Pivot	1
78051-202-DN	Nut, Upper Arm Pivot	1
78051-194-H	Lower Arm Assembly, Molded, with Flesh	1
78051-198-DN	Stop, Lower Arm, Molded	2
9000074-DN	Screw, SHSS 3/8 x 1	1
78051-204-DN	Lower Arm, Lower Part Weldment	1
78051-214-DN	Pivot Screw, Wrist	1
78051-208-H	Hand Assembly, Left	1

Arm Assembly Right – Harmonized



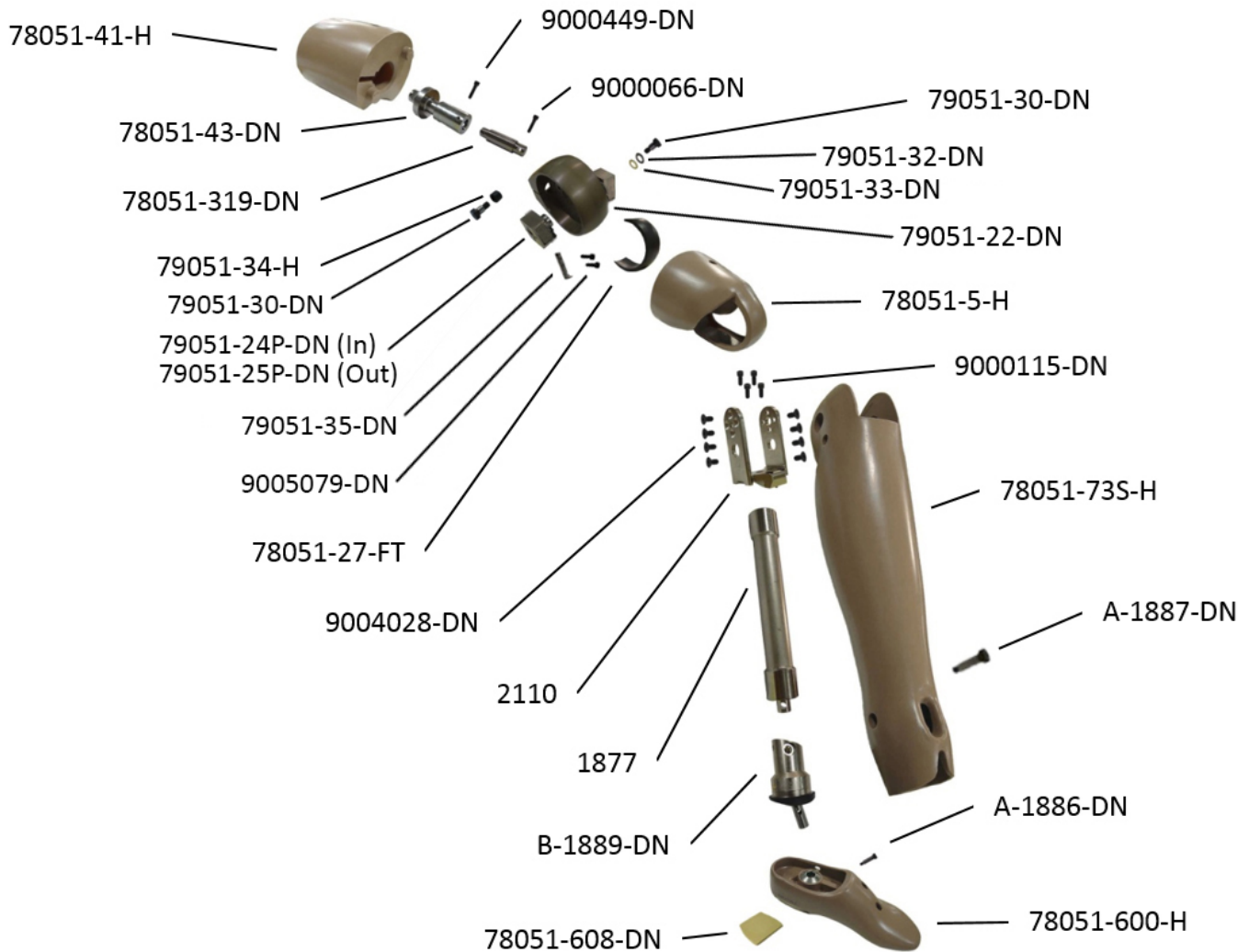
Part Number	Description	Qty. Req'd Per Dummy
78051-124-H	Arm Assembly Complete, Right	1
78051-174-H	Upper Arm Assembly, Molded, with Flesh	1
9006003-DN	Screw, SHSS 3/8 x 1-1/2	1
9001260-DN	Washer, Flat, (Stainless Steel)	1
78051-191-DN	Upper Arm, Lower Part Weldment	1
9000055-DN	Screw, SHSS 1/2 x 1-1/4	1
78051-249-DN	Washer, Spring	1
78051-199-DN	Bushing, Upper Arm/Elbow Pivot	1
78051-200-DN	Washer, Upper Arm/Elbow Pivot	1
78051-202-DN	Nut, Upper Arm Pivot	1
78051-194-H	Lower Arm Assembly, Molded, with Flesh	1
78051-198-DN	Stop, Lower Arm, Molded	2
9000074-DN	Screw, SHSS 3/8 x 1	1
78051-204-DN	Lower Arm, Lower Part Weldment	1
78051-214-DN	Pivot Screw, Wrist	1
78051-209-H	Hand Assembly, Right	1

Lower Torso Assembly – Harmonized



Part Number	Description	Qty. Req'd Per Dummy
ARA-500-H	Pelvis and Lower Torso Assembly	1
ARA-514-H	Pelvis, Molded, RID	1
78051-110-DN	Femur Assembly W/O Bumper, Left, H3-50	1
78051-111-DN	Femur Assembly W/O Bumper, Right, H3-50	1
78051-13-DN	Cover, Pelvis Instrumentation Cavity	1
78051-259-DN	Set Screw Assembly	2
9000009-FT	Screw SHCS 1/4-20 X 3/4 NYLOK	6
9000063-DN	Screw SHSS 5/8 X 1 3/4	2
9000624-FT	Screw SHCS 10-24 X 1/2	4
9010283-DN	Screw SHCS M10 X 45	3

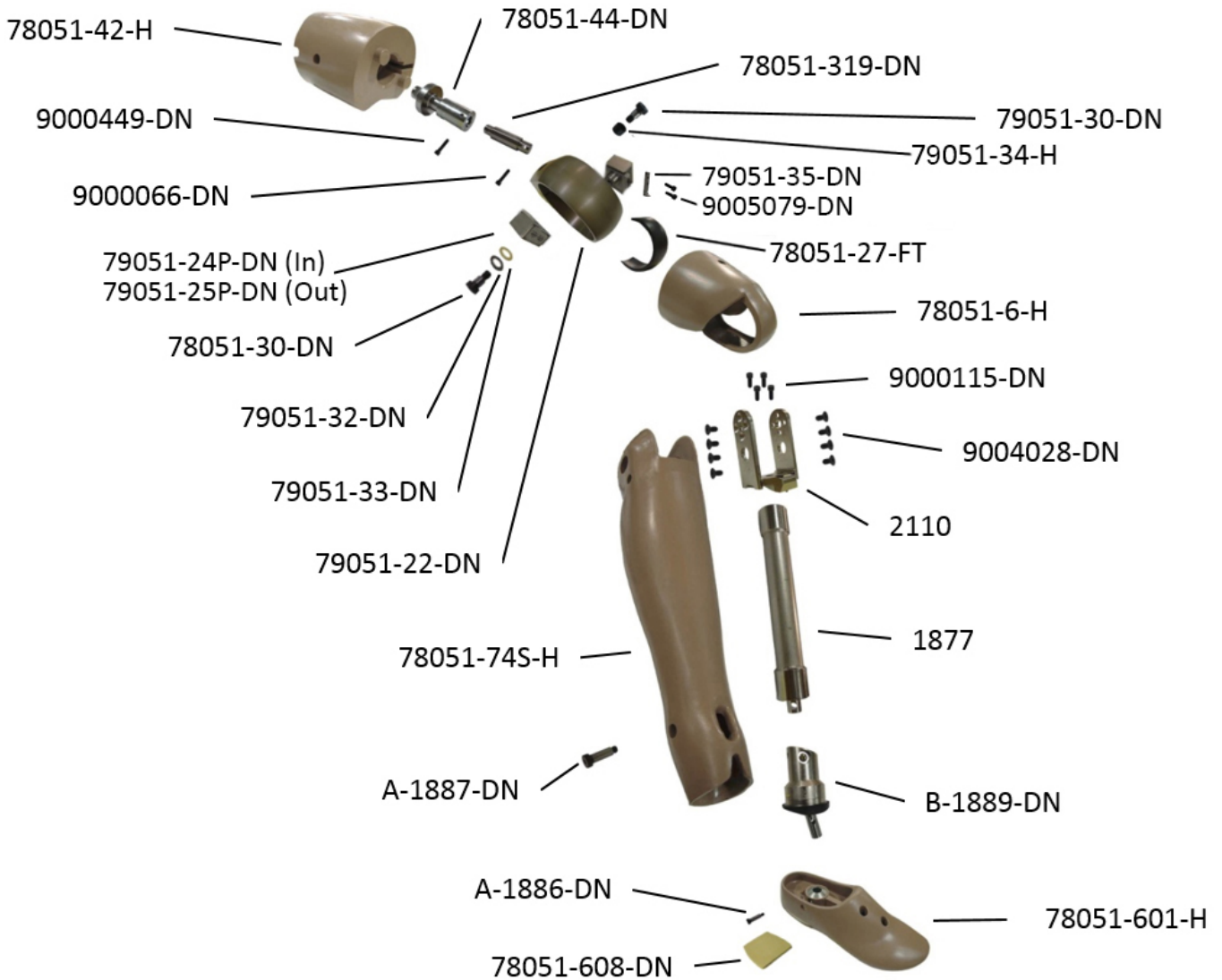
Leg Assembly Left – Harmonized



Part Number	Description	Qty. Req'd Per Dummy
86-5001-001BR-H	Leg Assembly, Complete, Left	1
78051-46-H	Upper Leg (Thigh) Assembly Complete, Left	1
78051-41-H	Thigh Flesh/Skin, Molded, Left	1
78051-43-DN	Upper Leg (Thigh) Bone Weldment, Left	1
78051-319-DN	Load Cell Simulator	1
9000449-DN	Screw, SHCS 3/8-16 x 1-3/4	1
9000066-DN	Screw, SHCS 3/8-16 x 2	1
79051-24P-DN	Pedestrian Knee Slider Repl., Inboard	1
79051-25P-DN	Pedestrian Knee Slider Repl., Outboard	1
79051-22-DN	Knee Cap, Machined Assembly	1
78051-5-H	Knee Flesh/Skin, Molded, Left	1
78051-27-FT	Knee Insert, Tested/Certified (Rubber)	1
79051-066-H	Knee Slider Assembly, Tested/Certified, Left	1

79051-34-H	Rotation Stop Cover	1
79051-30-DN	Screw, SHSS 3/8 x 3/8 Machined (used to hold stop cover in place)	2
9005079-DN	Screw, SHCS 8-32 x 1/2	4
9004028-DN	Screw, FHCS 1/4-28 x 3/8	8
79051-33-DN	Compression Washer	1
79051-32-DN	Washer, Sliding Knee	1
79051-35-DN	Rotation Stop Arm	1
78051-73-H	Lower Leg Assembly, Left	1
78051-73S-H	Lower Leg Flesh/Skin, Molded, Left	1
C-1877-DN	Non-instrumented Tibia, LH & RH	1
9000115-DN	Screw, SHCS 1/4-28 x 1/2	4
2110	Knee Clevis Weldment	1
1877	Lower Leg Structural Replacement	1
A-1887-DN	Leg Attachment Bolt	1
B-1889-DN	Ankle Rotation Assembly	1
	<i>See Detailed Assembly following Knee Slider Assembly</i>	
78051-600-H	Foot Molded 45 Degree, Tested/Certified, Left	1
78051-608-DN	Heel Pad Foam	1
A-1886-DN	Foot Attachment Bolt	1

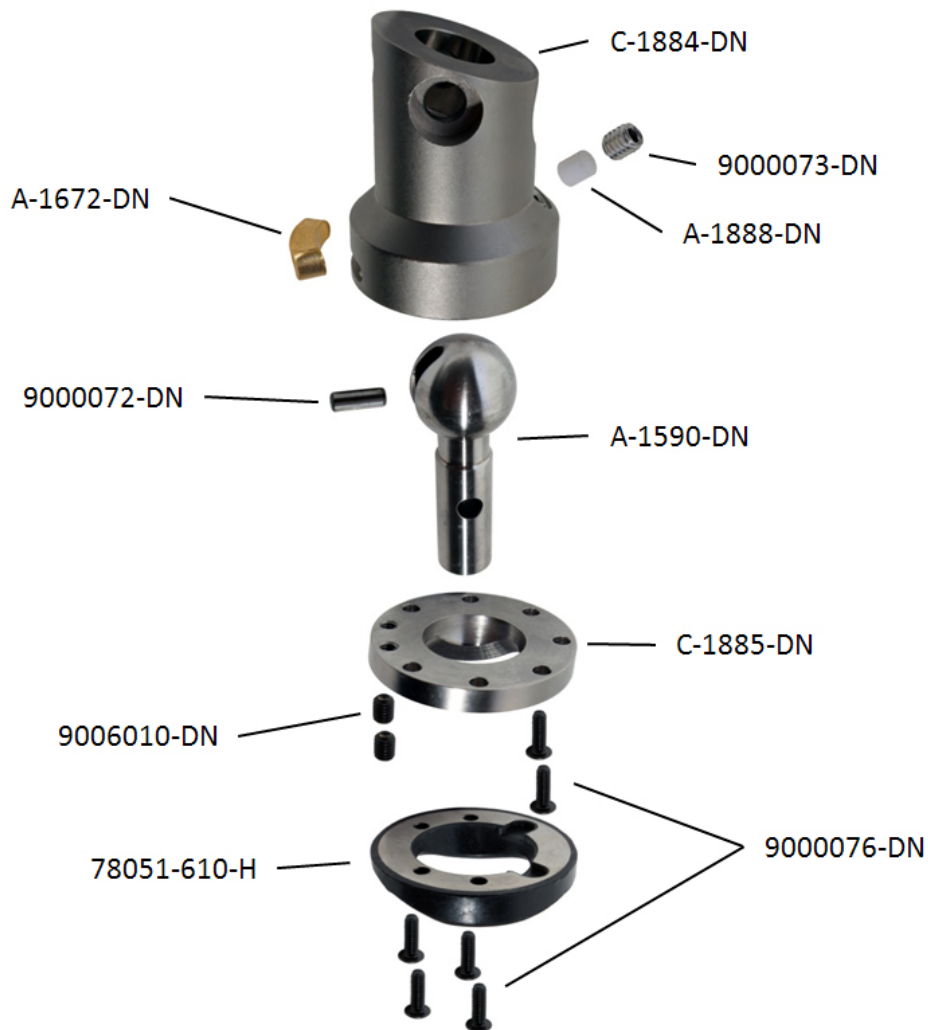
Leg Assembly Right – Harmonized



Part Number	Description	Qty. Req'd Per Dummy
86-5001-002BR-H	Leg Assembly, Complete, Right	1
78051-47-H	Upper Leg (Thigh) Assembly Complete, Right	1
78051-42-H	Thigh Flesh/Skin, Molded, Right	1
78051-44-DN	Upper Leg (Thigh) Bone Weldment, Right	1
78051-319-DN	Load Cell Simulator	1
9000449-DN	Screw, SHCS 3/8-16 x 1-3/4	1
9000066-DN	Screw, SHCS 3/8-16 x 2	1
79051-24P-DN	Pedestrian Knee Slider Repl., Inboard	1
79051-25P-DN	Pedestrian Knee Slider Repl., Outboard	1
79051-22-DN	Knee Cap, Machined Assembly	1
78051-6-H	Knee Flesh/Skin, Molded, Right	1
78051-27-FT	Knee Insert, Tested/Certified (Rubber)	1

79051-34-H	Rotation Stop Cover	1
79051-30-DN	Screw, SHSS 3/8 x 3/8 Machined (used to hold stop cover in place)	2
9005079-DN	Screw, SHCS 8-32 x 1/2	4
9004028-DN	Screw, FHCS 1/4-28 x 3/8	8
79051-33-DN	Compression Washer	1
79051-32-DN	Washer, Sliding Knee	1
79051-35-DN	Rotation Stop Arm	1
78051-74-H	Lower Leg Assembly, Right	1
78051-74S-H	Lower Leg Flesh/Skin, Molded, Right	1
C-1877-DN	Non-instrumented Tibia, LH & RH	1
9000115-DN	Screw, SHCS 1/4-28 x 1/2	4
2110	Knee Clevis Weldment	1
1877	Lower Leg Structural Replacement	1
A-1887-DN	Leg Attachment Bolt	1
B-1889-DN	Ankle Rotation Assembly	1
78051-601-H	Foot Molded 45 Degree, Tested/Certified, Right	1
78051-608-DN	Heel Pad Foam	1
A-1886-DN	Foot Attachment Bolt	1

Ankle Assembly – Harmonized



Part Number	Description	Qty. Req'd Per Dummy
B-1889-DN	Ankle Rotation Assembly	1
C-1884-DN	Ankle, Upper Shell	1
C-1885-DN	Ankle, Lower Shell	1
A-1590-DN	Ankle Shaft	1
78051-610-H	Ankle Bumper (Rubber)	1
9000072-DN	Pin, Dowel 3/16 x 1/2	1
A-1672-DN	Stop Pin Retainer	1
A-1888-DN	Ankle Friction Pad	1
9000073-DN	Screw, SSCP 5/16-18 x 3/8	1
9006010-DN	Screw, SSCP 10-32 x 1/4	2
9000076-DN	Screw, BHCS 8-32 x 1/2	6

Accelerometer Mounts

Accelerometer Type	Complete Dummy (ARA-001-H)	Components		
		ARA-002-H	ARA-002-H	ARA-500-H
		Head	Spine	Pelvis
Endevco 7264-200 7264-2000 7264C-2000	ARA-7264-200 ARA-7264-2000 ARA-7264C-2000	ARA-107-7264-200-ASSY ARA-107-7264 ARA-107-7264	7264-B-DN 7264-A-DN 7264-A-DN	78051-54C-ASSY-DN 78051-54C-DN 78051-54C-DN
Endevco 7264A-2000 7264B-2000 7264B-500	ARA-7264-2000 ARA-7264B-2000 ARA-7264B-500	ARA-107-7264A/B-ASSY ARA-107-7264A/B-ASSY ARA-107-7264A/B-ASSY	7264-B-DN 7264-B-DN 7264-B-DN	78051-54C-ASSY-DN 78051-54C-ASSY-DN 78051-54C-ASSY-DN
Endevco 7267A	ARA-7267A/7264B	ARA-107-7267A-ASSY	7264-B-DN	78051-54B-DN

Clothes

Part Number	Description	Qty. Req'd Per Dummy
ARA-920	PANTS, 2 PAIR (1 BLUE, 1 BLACK) - BIORID	1
ARA-921	SHIRTS (1 BLUE, 1 BLACK) - BIORID	1
78051-294-DN	SHOES MENS DRESS OXFORD BLACK 11XW, BIORID II	1

Misc.

Part Number	Description	Qty. Req'd Per Dummy
2000216	USERS MANUAL, BIORID II	1
DS-200-52D	SKIN PATCH MATERIAL, EURO BROWN	1
3023	H-POINT TOOL 10IN WITHOUT ADAPTORS	1
5643	H-POINT TOOL, BIORID	1
8004589	VALVE INSTALL/REMOVAL TOOL	1
8004590	NEEDLE DISPENSING .067 ID X 1 1/2 LG	1
8004591	SYRINGE BODY 3CC FLANGE REMOVED	1
8004592	TUBING CLEAR 1/2 OD X 3/8 ID	1
8004593	BOTTLE W SPIGOT 1 GALLON CARBOY	1
ARA-930	T1 ANGLE INDICATOR ASSEMBLY, BIORID	1
ARA-915	PELVIS ANGLE INDICATOR, BIORID	1
ARA-907	HEAD LEVELING TOOL, BIORID	1
ARA-922	DAMPER OIL, WITH SYRINGE, 8CC OF ISO 680	1
TRA-042	VERTEBRAE SPACING FIXTURE - BIORID SPINE	1