

THOR-50M U.S. NCAP SBL-A Update

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Upgrade Components

The following component list describes the latest parts needed to bring THOR-50M ATDs from the March 2016 design* up to SBL-A (U.S.).




Components are divided into 2 kits - one for the main body and one for the new molded shoes.

**See also March 2016 Design Change History bulletin for previously updated components.*

Humanetics now offers the THOR-50M Standard Build Level A (SBL-A) which is intended to meet the drawings and qualification specifications defined in the National Highway Traffic Safety Administration (NHTSA) NCAP Request for Comments (Docket ID 2015-0119). SBL-A follows the August 2016 drawing package with some minor part upgrades. The Testing Summary section of this bulletin documents the current Qualifications standards and accord.





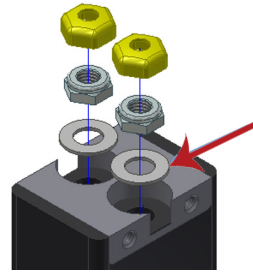
Humanetics is now shipping all ATDs for use in the U.S. NCAP at SBL-A and also offers upgrade kits for previously delivered dummies.

472-KIT-A - UPGRADE KIT FROM MARCH 2016 DESIGN TO SBL-A, U.S.
(Includes the following parts) *Molded Shoe Kit is separate

Part Number	Description	Qty Req'd	Comments	
472-2150-A	FRONT CABLE ASSEMBLY, NECK	1	Longer cable <i>Affects head and neck certification</i>	
472-2108	CENTER CABLE, LOWER BUSHING 2, NECK	1	Added to replace center cable washer to reduce chance of rattling of the cable.	
472-4627-A	UPPER ABDOMEN BAG	1	Zipper on top to avoid interaction with ITRACC.	

(Con't)

THOR-50M U.S. NCAP SBL-A Update (Con't)

Part Number	Description	Qty Req'd	Comments	
472-4763-A	LOWER ABDOMEN BAG ASSY	1	More relaxed fit and repositioned IRTACC holes upward. <i>May affect abdomen impact results</i>	
6004781	TAPE, DOUBLE SIDED	1	Tape used to attach lower abdomen front and rear foam pads together.	
11442	A.S.I.S COVER	2	A.S.I.S. load cell cover with rounded corners to reduce risk of pelvis flesh and seat belt tearing.	
472-3410-A	MID-STERNUM BONDING ASSEMBLY WITH STRAPS	1	Added straps around foam layer assembly to prevent tearing of foam.	
9003938	WASHER, LUMBAR SPINE FLEX JOINT ASSEMBLY	4	Update PTFE washers on Lumbar Spine Flex Joint Assembly (472-3646) and Upper Thoracic Spine Flex Joint Assembly (472-3746) to be zinc which improves the durability. <i>Updated on production dummies 9/9/2016</i>	

THOR-50M U.S. NCAP SBL-A Update (Con't)

Part Number	Description	Qty Req'd	Comments	
472-3713-A	LUMBAR SPINE PITCH CHANGE INDICATOR	1	Update part to accommodate the addition of FHCS to mount.	
5000116	FHCS M3 X 0.5 X 8	2	Replace BHCS with FHCS. This results in a more repeatable mounting location of the lumbar spine pitch change indicator.	
472-4761-A	REAR ATTACHMENT PLATE	1	Update mounting hole locations and tolerance to remove potential interference with the iliac wings.	
472-8110	UNIVERSAL JOINT, MOD THOR-M	4	More robust solution using shoulder as retainer instead of a snap ring. <i>Updated on production dummies 8/25/2016</i>	
472-3530	IR-TRACC CONNECTING BOLT, LOWER THORAX	2	Added a stub at the back and a 3 hex hole to facilitate the installation of the lower thorax IRTACCs. <i>Updated on production dummies 9/20/2016</i>	

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THOR-50M U.S. NCAP SBL-A Update (Con't)

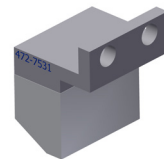
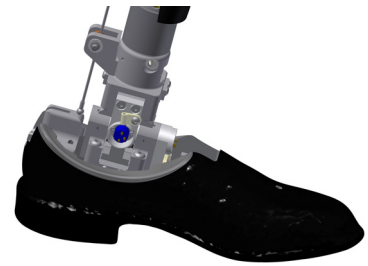
472-7800-KIT-A[†] - NEW MOLDED SHOE KIT*

*Reference New Molded Shoe Bulletin for details

[†]Not included in the 472-KIT-A

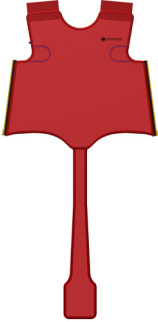
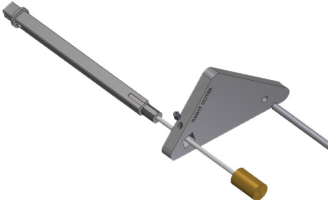
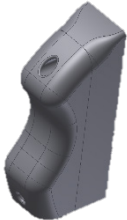
(Includes the following parts)

Part Number	Description	Qty Req'd	Comments
472-7800-1	MOLDED SHOE ASSY - LEFT	1	Dimensions and weight of new molded shoe based on foam foot and Mil-spec shoe with improved durability.
472-7800-2	MOLDED SHOE ASSY - RIGHT	1	
472-7315-A	TIBIA COMPLIANT BUSHING ASSY	2	Stiffness of this bushing assembly in the leg has an effect on the heel of foot performance.
472-7530-DN	DORSI-PLANTER STOP ASSY	2	Better controlled stiffness which has an effect on the ball of foot performance.



THOR-50M U.S. NCAP SBL-A Update (Con't)

Optional Spare Parts

Part Number	Description	Qty Req'd	Comments	
472-3901-A	FRONT/REAR PANEL, ASSY, JACKET	1	Longer strap and orientation of tapering changed for handling purposes.	
472-8510-A	H-POINT TOOL	1	Triangle outer shape similar to NHTSA design - Tighter fit in iliac to eliminate variability.	
472-4375-A	STRUCTURAL REPLACEMENT A.S.I.S LOAD CELL	2	A.S.I.S. load cell structural replacement with rounded corners to reduce risk of pelvis flesh and seat belt tearing.	

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THOR-50M U.S. NCAP SBL-A Update (Con't)

Testing Summary

Certification Test	SBL-A Procedure	SBL-A Corridor	Parameters that Differ from NQP	
Head Impact	NQP AUG16	NQP AUG16		
Face Impact	NQP AUG16	NHTSA Biofidelity	Probe Force Peak Resultant Acceleration	6.20 - 7.58 kN 119 - 145 g's
Neck Torsion*	NQP AUG16	HUM Internal	Peak Upper Neck Mz Peak Neck Fixture Rotation Decay Time to 0° from Peak Rotation Peak Upper Neck Angular Velocity	38.4 - 40.7 Nm 49.4 - 52.4 deg 56.3 - 59.2 msec 1441 - 1524 deg/s
Neck Flexion*	NQP AUG16	HUM Internal	Min Head Rotation (Peak Head Angle) Peak Force Fx Peak Moment My Rear Cable Force (before 60ms) Peak Force Fz Peak Head Angular Rate Decay Time to 0° from Peak Rotation	-69.6 - -61.5 deg -1262 - -1081 N 26.2 - 30.4 Nm 1003 - 1226 N 1027 - 1256 N -1933 - -1783 deg/s 81.8 - 92.1 msec
Neck Extension*	NQP AUG16	HUM Internal	Pendulum Velocity @ 10ms after T0 Pendulum Velocity @ 20ms after T0 Pendulum Velocity @ 30ms after T0 Max Head Rotation (Peak Head Angle) Peak Force Fx Peak Moment My Peak Force Fz Front Cable Force Peak Head Angular Rate Decay Time to 0° from Peak Rotation	1.72 - 1.95 m/s 3.41 - 3.84 m/s 4.74 - 5.34 m/s 55.5 - 67.9 deg 653 - 799 N -22.3 - -18.3 Nm -3229 - -2663 N 2366 - 2839 N 1867 - 2224 deg/s 69.2 - 82.0 msec
Neck Lateral*	NQP AUG16	HUM Internal	Pendulum Velocity @ 4ms after T0 Pendulum Velocity @ 8ms after T0 Pendulum Velocity @ 12ms after T0 Peak Head Rotation Peak Moment Mx (after 40ms) Peak Head Angular Rate Decay Time to 0° from Peak Rotation	0.90 - 1.07 m/s 2.00 - 2.40 m/s 3.03 - 3.64 m/s 40.7 - 44.1 deg 41.0 - 50.0 Nm 1343 - 1421 deg/s 75.0 - 84.8 msec
Upper Thorax	NQP AUG16	NQP AUG16		
Lower Thorax	NQP AUG16	NQP AUG16		
Abdomen Impact	NQP AUG16	NQP AUG16		
Upper Leg	NQP AUG16	NQP AUG16		
Knee Sliders	NQP AUG16	NQP AUG16		
THOR LX Eversion	NQP AUG16	NQP AUG16		
THOR LX Inversion	NQP AUG16	NHTSA†	X-Axis Rotation	32.7 - 36.2 deg
THOR LX Ball of Foot	NQP AUG16	NQP AUG16		
THOR LX Heel of Foot	NQP AUG16	NQP AUG16		

NQP = NHTSA Qualification Procedures | †Corridor agreed to change

*Due to the new longer neck cable, lab to lab variation, and frequency of testing, Humanetics is working with the NHTSA and the industry on establishing final neck corridors.

THOR-50M U.S. NCAP SBL-A Update (Con't)

RMA Re-certifications

All incoming THOR-Ms sent to Humanetics for re-certification must conform to a Standard Build Level A (SBL A) kit prior to testing. Dummies may require additional parts if ATD is not up to the March 2016 design.*

**See also March 2016 Design Change History bulletin for previously updated components.*