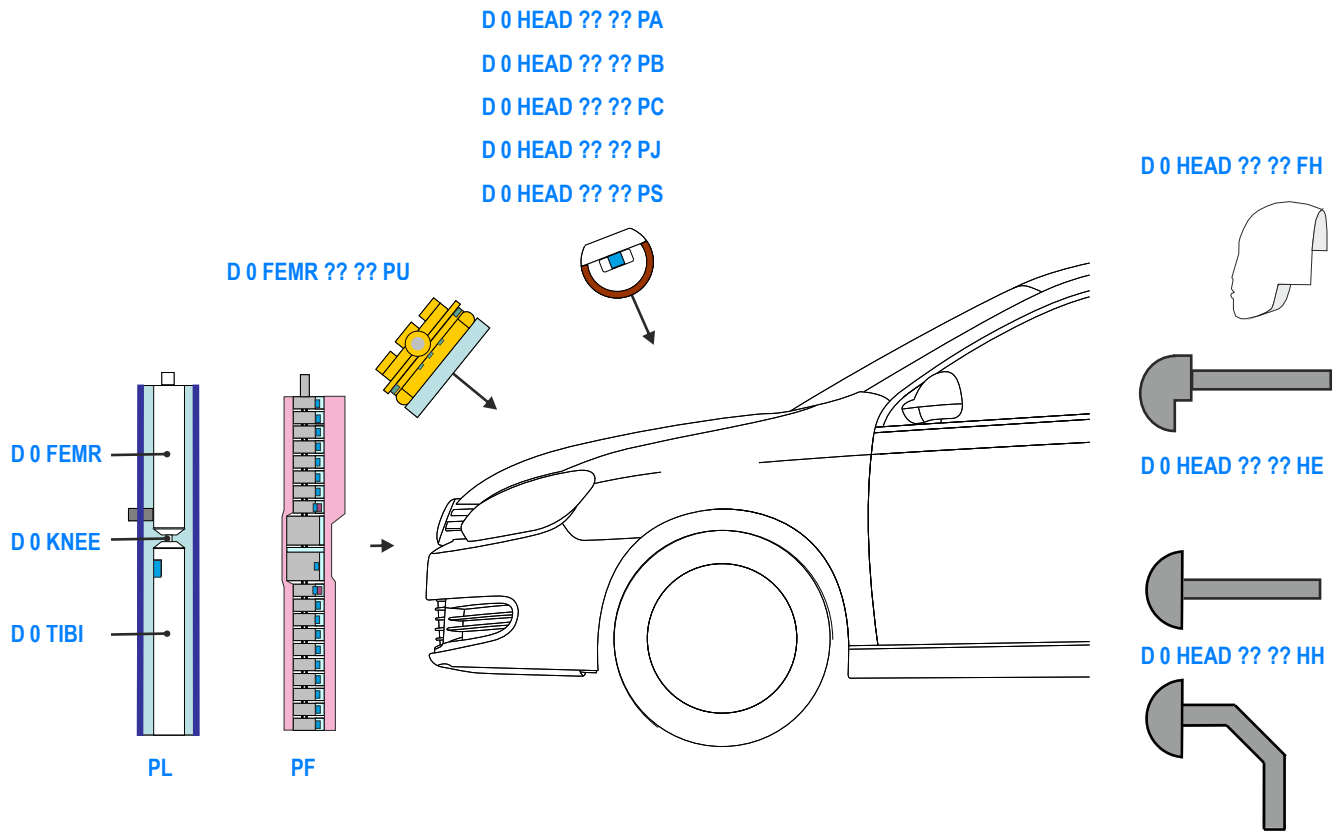
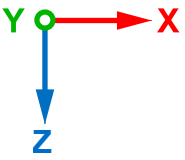
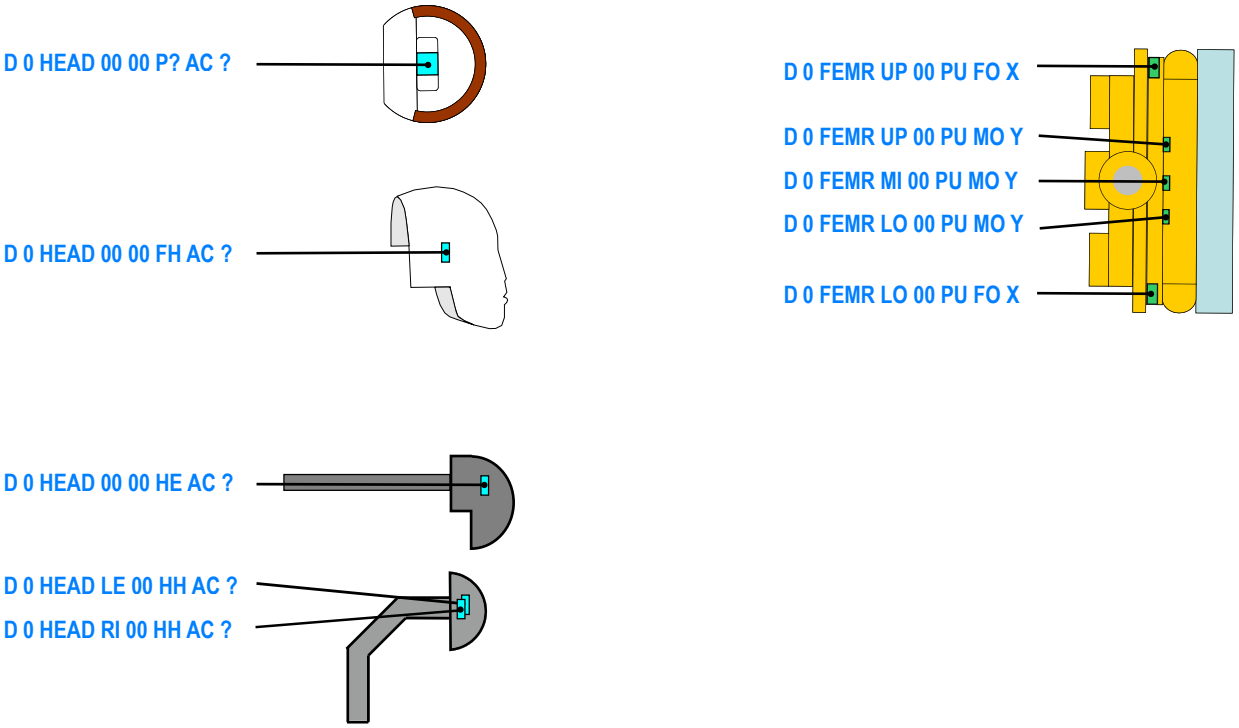
ISO/TS 13499 - RED C : 2020
Impactors
Overview
2020-11-25

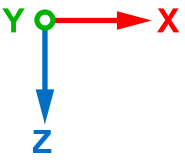


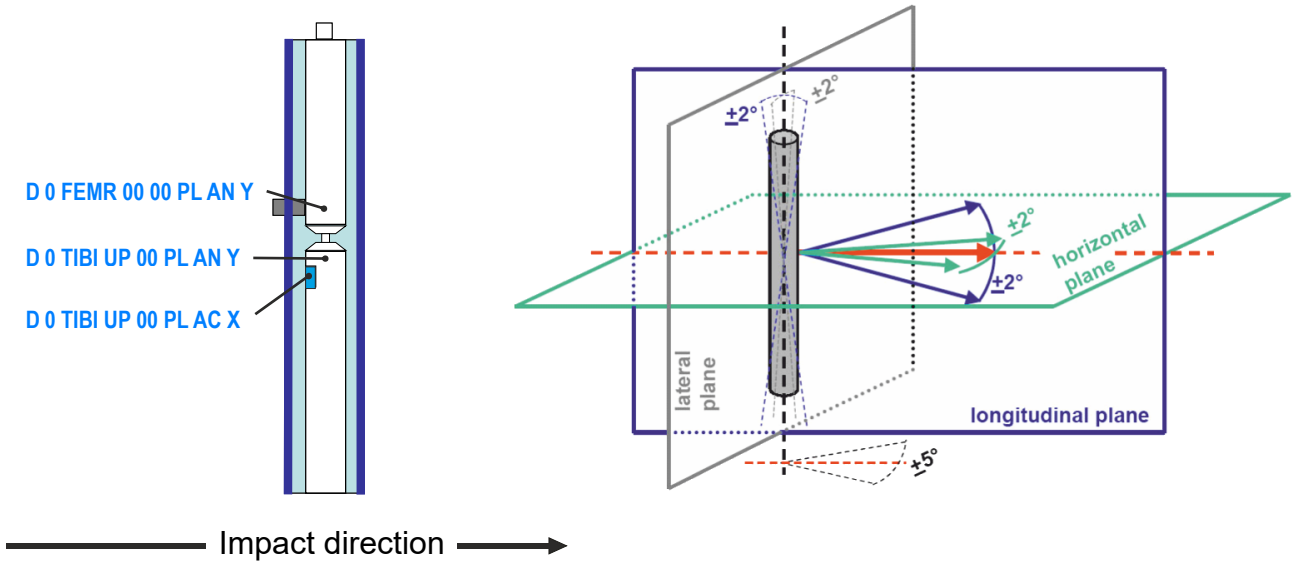
D 0 HEAD ?? ?? FH	Free Motion Headform
D 0 HEAD ?? ?? HE	Headform (e.g. Ejection Mitigation)
D 0 HEAD ?? ?? HH	Hemisphere Headform (e.g. FMVSS201,FMVSS202a,ECE-R17,ECE-R21,GTR7)
D 0 HEAD ?? ?? PA	Adult Headform
D 0 HEAD ?? ?? PB	ACEA Headform
D 0 HEAD ?? ?? PC	Child Headform
D 0 HEAD ?? ?? PJ	JARI Headform
D 0 HEAD ?? ?? PS	JARI Child Headform
D 0 FEMR ?? ?? PU	Upper Legform Pedestrian Impactor
D 0 FEMR ?? ?? PL	Legform Pedestrian Impactor (upper leg)
D 0 KNEE ?? ?? PL	Legform Pedestrian Impactor (knee region)
D 0 TIBI ?? ?? PL	Legform Pedestrian Impactor (lower leg)
D 0 FEMR ?? ?? PF	Flexible Legform Impactor (upper leg)
D 0 KNEE ?? ?? PF	Flexible Legform Impactor (knee region)
D 0 TIBI ?? ?? PF	Flexible Legform Impactor (lower leg)





D 0 HEAD 00 00 FH AC X ?	Free Motion Headform Acceleration X	transducer
D 0 HEAD 00 00 FH AC Y ?	Free Motion Headform Acceleration Y	transducer
D 0 HEAD 00 00 FH AC Z ?	Free Motion Headform Acceleration Z	transducer
D 0 HEAD ?? 00 H? AC X ?	(Hemisphere) Headform Acceleration X	transducer
D 0 HEAD ?? 00 H? AC Y ?	(Hemisphere) Headform Acceleration Y	transducer
D 0 HEAD ?? 00 H? AC Z ?	(Hemisphere) Headform Acceleration Z	transducer
D 0 HEAD 00 00 P? AC X ?	Pedestrian Headform Acceleration X	transducer
D 0 HEAD 00 00 P? AC Y ?	Pedestrian Headform Acceleration Y	transducer
D 0 HEAD 00 00 P? AC Z ?	Pedestrian Headform Acceleration Z	transducer
D 0 HEAD 00 ?? ?? DS X V	Position X	filmanalysis
D 0 HEAD 00 ?? ?? DS Y V	Position Y	filmanalysis
D 0 HEAD 00 ?? ?? DS Z V	Position Z	filmanalysis
D 0 HEAD 00 ?? ?? AN X V	Rotation around X Axis	filmanalysis
D 0 HEAD 00 ?? ?? AN Y V	Rotation around Y Axis	filmanalysis
D 0 HEAD 00 ?? ?? AN Z V	Rotation around Z Axis	filmanalysis
D 0 FEMR UP 00 PU FO X ?	Upper Shear Force X	transducer
D 0 FEMR LO 00 PU FO X ?	Lower Shear Force X	transducer
D 0 FEMR UP 00 PU MO Y ?	Upper Bending Moment Y	transducer
D 0 FEMR MI 00 PU MO Y ?	Middle Bending Moment Y	transducer
D 0 FEMR LO 00 PU MO Y ?	Lower Bending Moment Y	transducer





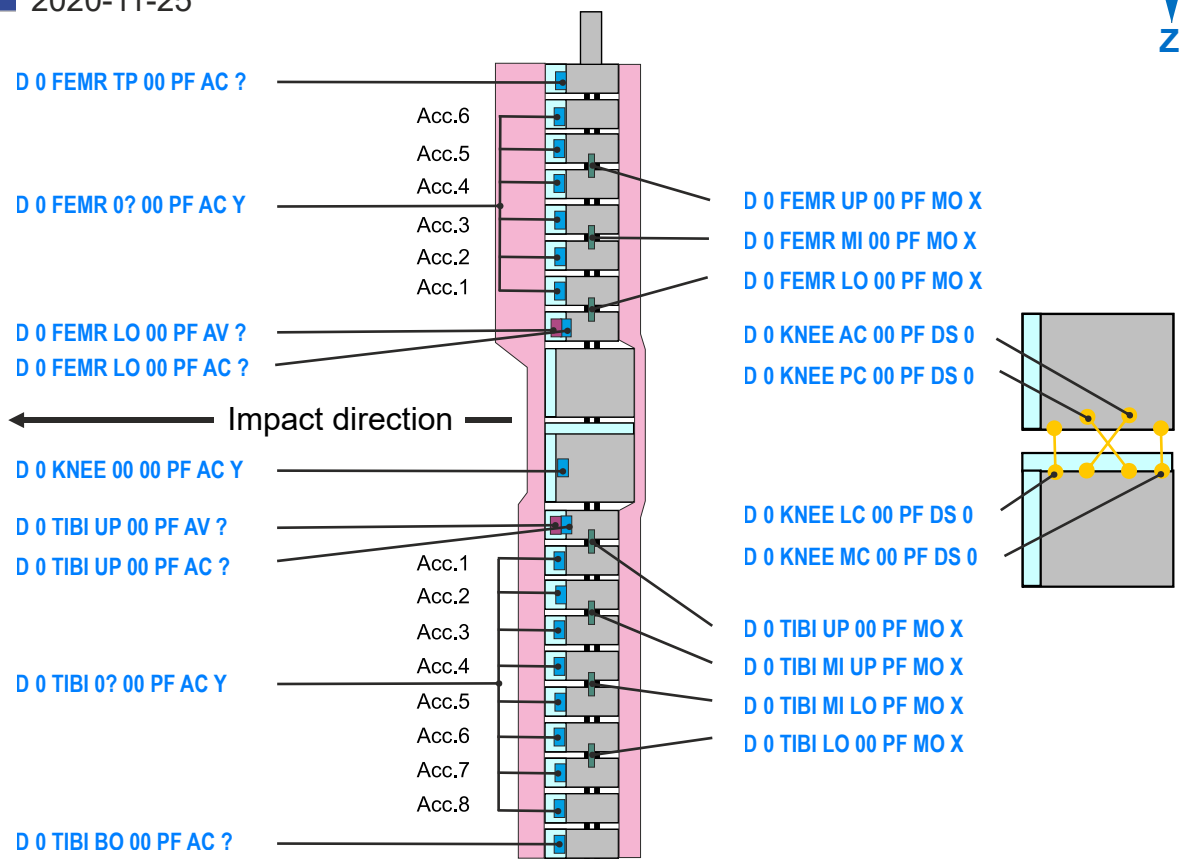
D 0 TIBI UP 00 PL AC X ?	Tibia Acceleration X	transducer
D 0 TIBI UP 00 PL AN Y ?	Bending Angle Tibia Y	transducer
D 0 FEMR 00 00 PL AN Y ?	Bending Angle Femur Y	transducer
D 0 KNEE 00 00 PL AN Y ?	Bending Angle effective Y	calculation
D 0 KNEE 00 00 PL DS X ?	Shear Displacement X	calculation

negative shear displacement values if tibia is retained against femur

D 0 FEMR 00 OR PL DS X V	Position X	filmanalysis
D 0 FEMR 00 OR PL DS Y V	Position Y	filmanalysis
D 0 FEMR 00 OR PL DS Z V	Position Z	filmanalysis
D 0 FEMR 00 OR PL AN X V	Orientation in lateral Plane YZ	filmanalysis
D 0 FEMR 00 OR PL AN Y V	Orientation in longitudinal Plane XZ	filmanalysis
D 0 FEMR 00 OR PL AN Z V	Orientation in horizontal Plane XY	filmanalysis

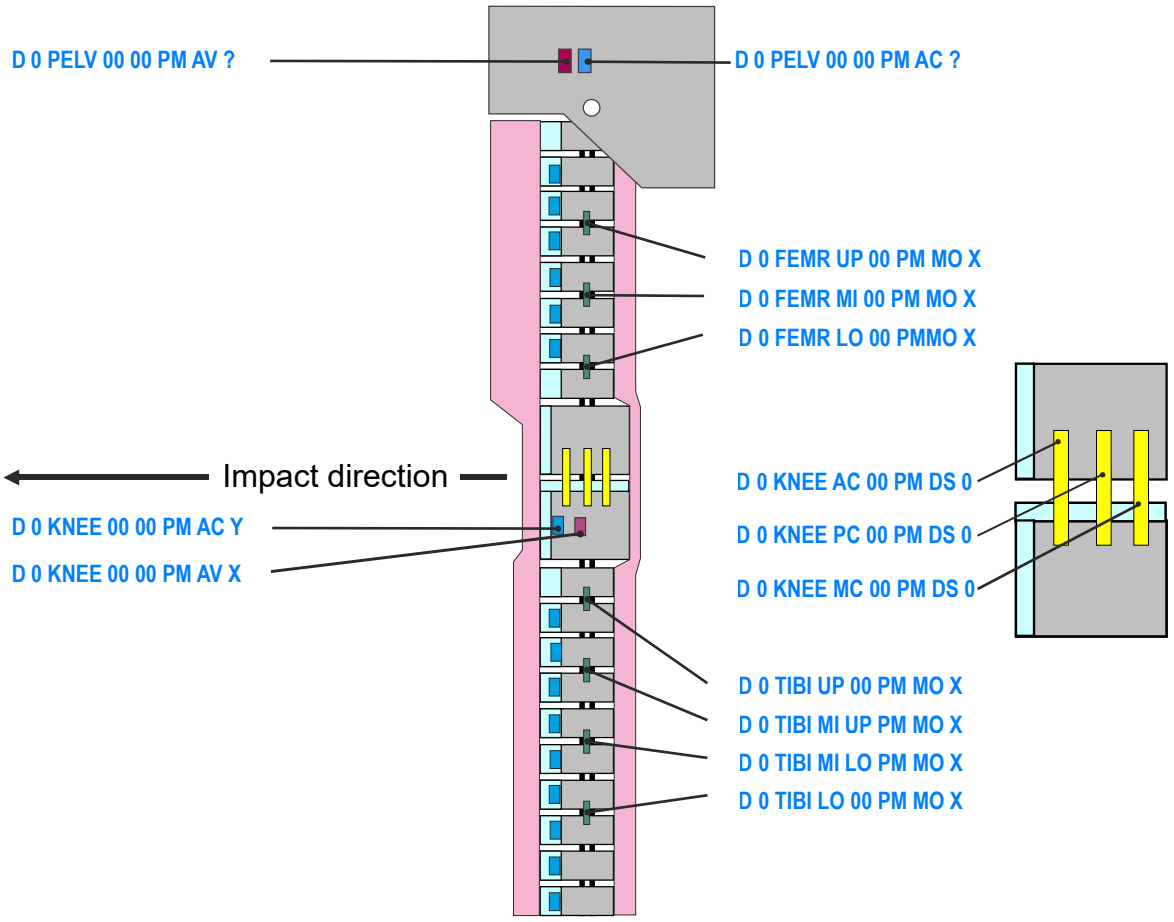
D 0 TIBI UP 00 PL DS X ?	Indentation at Hit Point X	calculation

For compatibility to existing data the impact direction for this impactor defines the X coordinate of the local system.



D0FEMRUP00PFMOX	Femur Up Moment X
D0FEMRMI00PFMOX	Femur Mi Moment X
D0FEMRLO00PFMOX	Femur Lo Moment X
D0KNEELC00PFDS0	Knee LCL Elongation
D0KNEEAC00PFDS0	Knee ACL Elongation
D0KNEEPC00PFDS0	Knee PCL Elongation
D0KNEEMC00PFDS0	Knee MCL Elongation
D0TIBIUP00PFMOX	Tibia Up Moment X
D0TIBIMIUPPFMOX	Tibia Mi Up Mom X
D0TIBIMILOPFMOX	Tibia Mi Lo Mom X
D0TIBILO00PFMOX	Tibia Lo Moment X
D0FEMRTP00PFACX	Femur Top Acc X
D0FEMRTP00PFACY	Femur Top Acc Y
D0FEMRTP00PFACZ	Femur Top Acc Z
D0FEMR0600PFACY	Femur Seg 6 Acc Y
D0FEMR0500PFACY	Femur Seg 5 Acc Y
D0FEMR0400PFACY	Femur Seg 4 Acc Y
D0FEMR0300PFACY	Femur Seg 3 Acc Y
D0FEMR0200PFACY	Femur Seg 2 Acc Y
D0FEMR0100PFACY	Femur Seg 1 Acc Y

D0FEMRLO00PFACX	Femur Lo Acc X
D0FEMRLO00PFACY	Femur Lo Acc Y
D0FEMRLO00PFACZ	Femur Lo Acc Z
D0FEMRLO00PFAVX	Femur Lo Ang Vel X
D0FEMRLO00PFAVY	Femur Lo Ang Vel Y
D0FEMRLO00PFAVZ	Femur Lo Ang Vel Z
D0TIBIUP00PFACX	Tibia Up Acc X
D0TIBIUP00PFACY	Tibia Up Acc Y
D0TIBIUP00PFACZ	Tibia Up Acc Z
D0TIBIUP00PFAVX	Tibia Up Ang Vel X
D0TIBIUP00PFAVY	Tibia Up Ang Vel Y
D0TIBIUP00PFAVZ	Tibia Up Ang Vel Z
D0TIBI0100PFACY	Tibia Seg 1 Acc Y
D0TIBI0200PFACY	Tibia Seg 2 Acc Y
D0TIBI0300PFACY	Tibia Seg 3 Acc Y
D0TIBI0400PFACY	Tibia Seg 4 Acc Y
D0TIBI0500PFACY	Tibia Seg 5 Acc Y
D0TIBI0600PFACY	Tibia Seg 6 Acc Y
D0TIBI0700PFACY	Tibia Seg 7 Acc Y
D0TIBI0800PFACY	Tibia Seg 8 Acc Y
D0TIBIBO00PFACX	Tibia Bo Acc X
D0TIBIBO00PFACY	Tibia Bo Acc Y
D0TIBIBO00PFACZ	Tibia Bo Acc Z

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D0PELV0000PMAVX  Pelvis Angular Velocity X  (Upper Body)
D0PELV0000PMAVY  Pelvis Angular Velocity Y  (Upper Body)
D0PELV0000PMAVZ  Pelvis Angular Velocity Z  (Upper Body)
D0PELV0000PMACX  Pelvis Acceleration X      (Upper Body)
D0PELV0000PMACY  Pelvis Acceleration Y      (Upper Body)
D0PELV0000PMACZ  Pelvis Acceleration Z      (Upper Body)

D0FEMRUP00PMMOX  Femur Upper  Bending Moment X
D0FEMRMI00PMMOX  Femur Middle Bending Moment X
D0FEMRLO00PMMOX  Femur Lower  Bending Moment X

D0KNEE0000PMACY  Knee Acceleration Y
D0KNEE0000PMAVX  Knee Angular Velocity X
D0KNEEAC00PMDS0  Knee ACL Elongation
D0KNEEPC00PMDS0  Knee PCL Elongation
D0KNEEMC00PMDS0  Knee MCL Elongation

D0TIBIUP00PMMOX  Tibia Upper        Bending Moment X
D0TIBIMIUPPMMOX  Tibia Middle Upper Bending Moment X
D0TIBIMILOPMMOX  Tibia Middle Lower Bending Moment X
D0TIBILO00PMMOX  Tibia Lower        Bending Moment X
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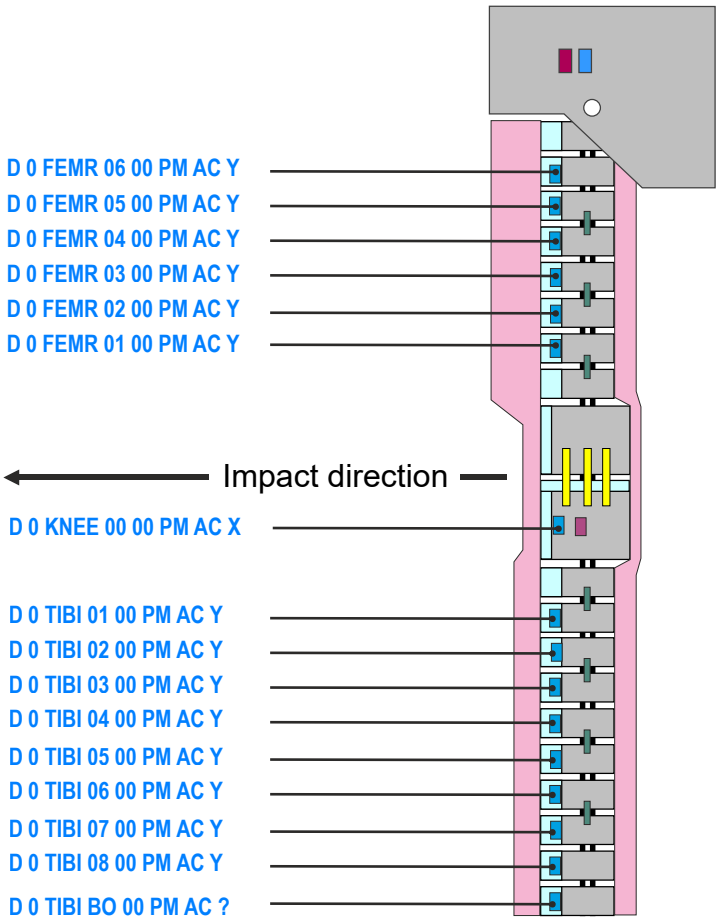

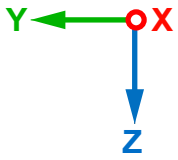

D0FEMR0600PMACY Femur Segment 6 Acceleration Y
D0FEMR0500PMACY Femur Segment 5 Acceleration Y
D0FEMR0400PMACY Femur Segment 4 Acceleration Y
D0FEMR0300PMACY Femur Segment 3 Acceleration Y
D0FEMR0200PMACY Femur Segment 2 Acceleration Y
D0FEMR0100PMACY Femur Segment 1 Acceleration Y

D0KNEE0000PMACX Knee Acceleration X

D0TIBI0100PMACY Tibia Segment 1 Acceleration Y
D0TIBI0200PMACY Tibia Segment 2 Acceleration Y
D0TIBI0300PMACY Tibia Segment 3 Acceleration Y
D0TIBI0400PMACY Tibia Segment 4 Acceleration Y
D0TIBI0500PMACY Tibia Segment 5 Acceleration Y
D0TIBI0600PMACY Tibia Segment 6 Acceleration Y
D0TIBI0700PMACY Tibia Segment 7 Acceleration Y
D0TIBI0800PMACY Tibia Segment 8 Acceleration Y

D0TIBIBO00PMACX Tibia Bottom Acceleration X
D0TIBIBO00PMACY Tibia Bottom Acceleration Y
D0TIBIBO00PMACZ Tibia Bottom Acceleration Z