

V3181

RAPPORT D'ESSAI - TEST REPORT

**COLLISION FRONTALE DÉCALÉE DE RECHERCHE
RESEARCH OFFSET FRONTAL IMPACT**

**VEHICULE D'ESSAI / TEST VEHICLE
TOYOTA CAMRY CE 1999 TC # 99-239**

**FACE DÉFORMABLE / DEFORMABLE FACE
ESSAIS DE RECHERCHE CONJOINTS TC/NHTSA SUR
LES SACS GONFLABLES FRONTAUX
JOINT TC/NHTSA FRONTAL AIRBAG RESEARCH TESTS**

Préparé par :
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N° de contrat : 99-5001
Rapport N°: RR 00-005

Pour :
TRANSPORTS CANADA
SÉCURITÉ ET SÛRETÉ
Programmes de sécurité routière
Recherche et essais de véhicules
Ottawa (Ontario)

Prepared by :
PMG TECHNOLOGIES
TEST AND RESEARCH CENTRE
100, rue du Landais
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Contract N° : 99-5001
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For :
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SAFETY AND SECURITY
Research Engineering and
Vehicle Testing
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Les résultats des essais figurant dans ce compte-rendu ne représentent pas une décision officielle du Ministère des Transports quant à l'acceptation de la performance sécuritaire, de la consommation de carburant ou de la conformité d'un véhicule ou des composantes d'un véhicule aux normes de sécurité et d'antipollution. Le Ministère des Transports ne certifie, n'approuve ou n'endosse aucun produit de véhicule automobile.

The test results presented herein do not, in themselves, represent an official determination by the Department of Transport with fuel consumption or compliance with safety and emission standards of any motor vehicle or motor vehicle component. The Department of Transport does not certify, approve or endorse any motor vehicle product.

Date de collision Crash date	1999-04-21	Véhicule Vehicle	TOYOTA CAMRY CE 1999	T.C. N° T.C. No	99-239
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VÉHICULE D'ESSAI - TEST VEHICLE

Année du modèle - Model Year 1999	Fabricant - Manufacturer TOYOTA MOTOR CORP.	Modèle - Model Camry CE
Type de carrosserie - Body Style Berline 4P / 4D Sedan	Boîte de vitesse - Transmission Type Automatique / Automatic	Moteur - Engine 2.2 l
Date de fabrication - Date of Manufacture 10/98	Cylindres - Cylinders 4 cyl.	N° d'ident. du véhicule - Vehicle Ident. No. JT2BG22K3X0291384
Lecture de l'odomètre - Odometer Reading 5 km	Nombre de places assises désignées Number of Designated Seating Positions 5	Numéro d'ident. PMG - PMG Ident. Number UN0-005
PNBV - GVWR 1895 kg	PNBE (Avant) - GAWR (Front) 1090 kg	PNBE (Arrière) - GAWR (Rear) 1090 kg

CONFIGURATION D'ESSAI - TEST CONFIGURATION

Type d'essai - Test type		Vitesse d'impact** Impact velocity**	Angle d'impact Impact angle	Masse du véhicule d'essai Test vehicle mass	Pourcentage d'impact sur véhicule d'essai Impact percentage on test vehicle
Véh. vs barrière - Veh. vs barrier		39.8 km/h	0 °	1600.1 kg	41.1%
Coussins gonflables (Frontaux) – Air bags (Frontal)			Coussins gonflables (Latéraux) – Air bags (Lateral)		
Activés-Activated	☒	Désactivés-Deactivated	☐	Désactivés-Deactivated	☐
Normal	☐	Puiss. réduite-Depowered	☐	Puiss. réduite-Depowered	☐
Second or New Generation–Seconde ou Nouvelle Génération			Second or New Generation–Seconde ou Nouvelle Génération		
Autre (spécifier) – Other (specify)			Autre (spécifier) – Other (specify) N/A		
Description et position du mannequin (Conducteur) Dummy description and position (Driver)			Description et position du mannequin (Passager avant) Dummy description and position (Front Passenger)		
DESCRIPTION		POSITION	DESCRIPTION		POSITION
☐ 50%	☒	avancée / near	☐ 50%	☒	avancée / near
☒ 5%	☐	mi-course / mid-travel	☒ 5%	☐	mi-course / mid-travel
☐ autre / other	☐	autre / other	☐ autre / other	☐	autre / other
Description du mannequin (Passager arrière gauche) Dummy description (Left Rear Passenger)			Description du mannequin (Passager arrière droit) Dummy description (Right Rear Passenger)		
☐ 50%	☐	N/A	☒	☐	N/A
☐ 5%	☒	18 mois	☐ 50%	☐	18 mois
☐ 9 mois	☐	3 ans	☐ 5%	☐	3 ans
	☐	6 ans	☐ 9 mois	☐	6 ans

** Tel que mesuré durant les derniers 3.7 mètres de trajet. / ** As measured over final 3.7 meters of travel.

Ce véhicule est équipé de pré-tensionneur des ceintures de sécurité avant. / This vehicle is equipped with front belt tensioners.

DONNÉES DU VÉHICULE D'ESSAI / TEST VEHICLE DATA

Capacité du véhicule - Vehicle Capacity 410 kg	Masse des bagages - Cargo Load 60 kg	Type de sièges - Type of seats		Types de dossiers - Type of seat back	
			Avt - Fnt	Arr - Rr	
Nombre d'occupants (places assises désignées) Number of Occupants (Designated Seating Positions)		Banquette Bench	☐	☒	Dossier ajustable Adjustable Seat Back
Avant - Front 2 Arrière - Rear 3 Total 5		Baquet Bucket	☒	☐	Dossier non-ajustable Non-adjustable Seat Back
Pression à froid - Cold Tire Pressure				Dimension - Size	
Avant - Front 210 kPa Arrière - Rear 210 kPa Secours - Spare N/A				P195/70R14	

Essai réalisé selon la procédure de PMG : Collision frontale décalée de recherche, version 2, révision 21 décembre 1998.
Test performed according to PMG procedure: Research offset frontal impact, version 2, revised December 21th, 1998.

Préparé par : Prepared by : Jean Melançon	Date : 99-06-11
Vérifié par : Verified by : Alain Bussièrès	Date : 99-06-11
Rapport approuvé par : Report approved by : Alain Bussièrès	Date : 99-06-11
Rapport accepté par le client : Report accepted by the client :	Date :

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PREMIÈRE PESÉE : VÉHICULE TEL QUE LIVRÉ (AVEC LIQUIDES AU MAXIMUM)
FIRST WEIGHT : VEHICLE AS RECEIVED (WITH MAXIMUM FLUIDS)

Avant gauche - Left front 416.8 kg	Avant droit - Right front 418.8 kg	Masse avant totale - Total front weight 835.6 kg
Arrière gauche - Left rear 272.9 kg	Arrière droit - Right rear 274.5 kg	Masse arrière totale - Total rear weight 547.4 kg
Masse totale côté gauche - Total left side weight 689.7 kg	Masse totale côté droit - Total right side weight 693.3 kg	Masse totale - Total weight 1383.0 kg

TROISIÈME PESÉE : VÉHICULE PRÊT POUR L'ESSAI
THIRD WEIGHT : VEHICLE READY FOR TEST

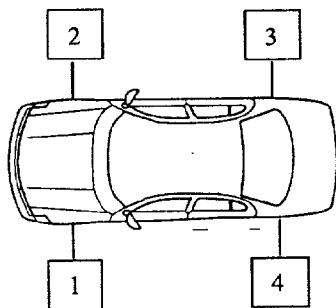
Avant gauche - Left front 460.1 kg	Avant droit - Right front 452.5 kg	Masse avant totale - Total front weight 912.6 kg
Arrière gauche - Left rear 347.6 kg	Arrière droit - Right rear 339.9 kg	Masse arrière totale - Total rear weight 687.5 kg
Masse totale côté gauche - Total left side weight 807.7 kg	Masse totale côté droit - Total right side weight 792.4 kg	Masse totale - Total weight 1600.1 kg

ATTITUDE DU VÉHICULE / VEHICLE ATTITUDE

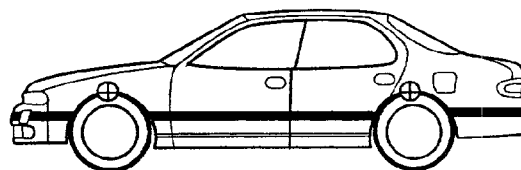
		Attitude tel que livré Attitude on delivery	Attitude chargé Attitude loaded	Attitude tel que testé Attitude as tested
1	Roue avant gauche* Left front wheel*	693 mm	683 mm	680 mm
2	Roue avant droite* Front right wheel*	700 mm	684 mm	684 mm
3	Roue arrière droite* Rear right wheel*	692 mm	651 mm	653 mm
4	Roue arrière gauche* Rear left wheel*	687 mm	648 mm	646 mm

* Mesures prises aux puits de roues. // *Measurements taken at wheel openings.

Vue de plan / Plan view



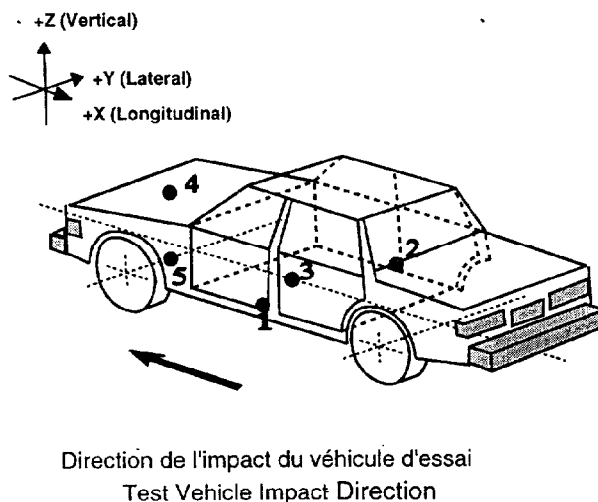
Vue de côté / Side view



⊕ **Points de mesure / Mesure points**

Date de collision Crash date	1999-04-21	Véhicule Vehicle	TOYOTA CAMRY CE 1999	T.C. N° T.C.No	99-239
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EMPLACEMENT DES ACCÉLÉROMÈTRES ACCELEROMETER LOCATIONS

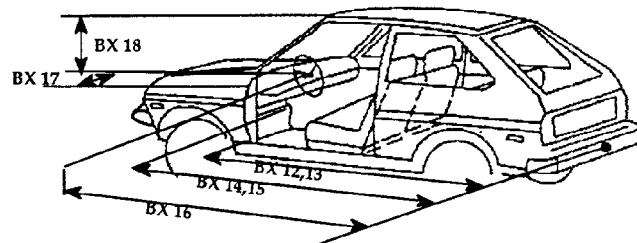
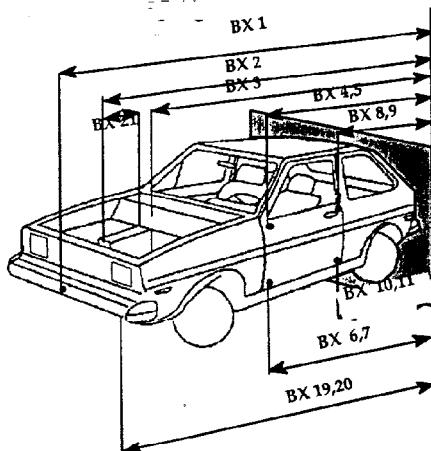


Point de référence : Centre transversal du véhicule, au point le plus avancé, au niveau du sol. Selon SAE J182a.
Reference point : Transversal center of the vehicle, at the foremost point and at ground level. As per SAE J182a.

EMPLACEMENT LOCATION	DESCRIPTIONS	COORDONNÉES / COORDINATES (mm)		
		X	Y	Z
#1	Seuil de la porte gauche @ pilier "B" Left door sill @ pillar "B"	2574	-608	204
#2	Seuil de la porte droite @ pilier "B" Right door sill @ pillar "B"	2555	594	216
#3	Centre de gravité Centre of gravity	2107	-12	328
#4	Le dessus du moteur Top of engine	993	89	813
#5	Le dessous du moteur Bottom of engine	637	278	176

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MESURES NHTSA / NHTSA MEASUREMENTS



- 1 - Longueur totale du véhicule
Total length of vehicle
- 2 - Surface arrière à l'avant du bloc moteur
Rear surface at front of engine block
- 3 - Surface arrière à la cloison pare-feu
Rear surface at fire-wall
- 4 - Surface arrière à la partie supérieur avant porte avant droite
Rear surface of front superior part of right front door
- 5 - Surface arrière à la partie supérieur avant porte avant gauche
Rear surface of front superior part of left front door
- 6 - Surface arrière à la partie inférieur avant porte avant droite
Rear surface of front inferior part of right front door
- 7 - Surface arrière à la partie inférieur avant porte avant gauche
Rear surface of front inferior part of left front door
- 8 - Surface arrière à la partie supérieur arrière porte avant droite
Rear surface of rear superior part of right rear door
- 9 - Surface arrière à la partie supérieur arrière porte avant gauche
Rear surface of rear superior part of left rear door
- 10 - Surface arrière à la partie inférieur arrière porte avant droite
Rear surface of rear inferior part of right rear door
- 11 - Surface arrière à la partie inférieur arrière porte avant gauche
Rear surface of rear inferior part of left rear door
- 12 - Surface arrière à la partie inférieur du pilier "A" droit
Rear surface of rear inferior part of right pillar "A"
- 13 - Surface arrière à la partie inférieur du pilier "A" gauche
Rear surface of rear inferior part of left pillar "A"
- 14 - Surface arrière à la cloison pare-feu côté droit
Rear surface of right side of fire-wall
- 15 - Surface arrière à la cloison pare-feu côté gauche
Rear surface of left side of fire-wall
- 16 - Surface arrière à la colonne de direction
Rear surface of steering column
- 17 - Centre de la colonne de direction au pilier "A"
Centre of steering column to pillar "A"
- 18 - Centre de la colonne de direction au toit
Centre of steering column to roof
- 19 - Surface arrière du véhicule au coin droit du pare-choc avant
Rear surface of vehicle to right corner of front bumper
- 20 - Surface arrière du véhicule au coin gauche du pare-choc avant
Rear surface of vehicle to left corner of front bumper
- 21 - Longueur du bloc moteur
Length of engine block

	BX*	AX**		BX*	AX**
1	4764	4643	12	3206	3205
2	4150	4154	13	3207	3208
3	3582	3580	14	3525	3525
4	3235	3236	15	3523	3515
5	3223	3223	16	2808	2806
6	3231	3232	17	405	405
7	3221	3221	18	452	458
8	2237	2236	19	4618	4626
9	2243	2241	20	4632	4382
10	2235	2235	21	428	428
11	2235	2236			

Mesures en mm / Measurements in mm

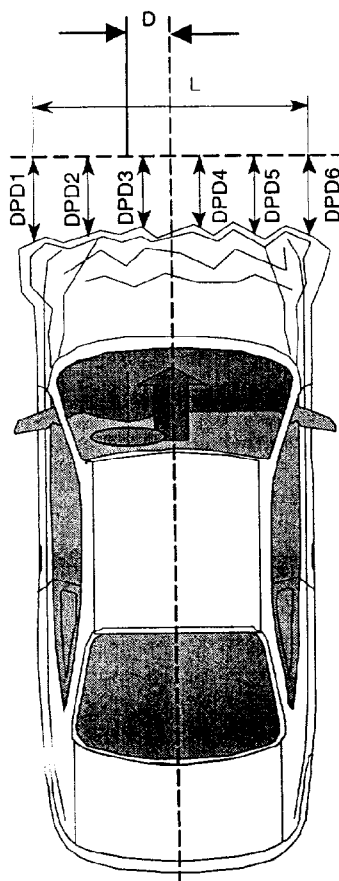
* BX : Mesures du véhicule avant-essai. / Pre-test vehicle measurements data.

* AX : Mesures du véhicule après-essai. / Post-test vehicle measurements data.

REMARQUES / COMMENTS :

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MESURES DES DPD / DPP'S MEASUREMENTS



	AVANT ESSAI PRE-TEST	APRÈS ESSAI POST-TEST
DPD 1:	215	470
DPD 2:	44	278
DPD 3:	4	158
DPD 4:	4	74
DPD 5:	43	63
DPD 6:	214	206
MESURE L:		1550
MESURE D:		0

Mesures en mm / Measurements in mm

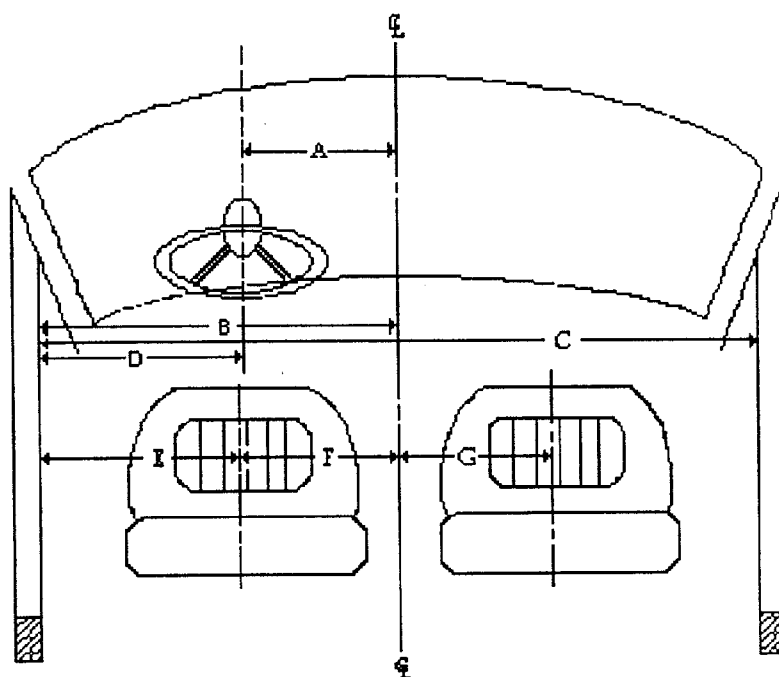
L : Longueur de la région endommagée
Length of damaged region

D : Distance du centre de déformation à la ligne de centre du véhicule
Midpoint of damage to Vehicle Longitudinal Centerline

REMARQUES / COMMENTS :

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POSITION DES SIÈGES AVANT
FRONT SEAT POSITION



Code	Description	mm	Code	Description	mm
A	Centre du volant à la ligne de centre du véhicule Steering wheel center to center line of vehicle	354	E	Seuil de la fenêtre au centre du siège (conducteur) Window edge to seat midline (driver)	449
B	Seuil de fenêtre à la ligne de centre du véhicule Window edge to center line of the vehicle	809	F	Centre du siège à la ligne de centre du véhicule (conducteur) Seat midline to center line of vehicle (driver)	360
C	Fenêtre à fenêtre Window to window	1617	G	Centre du siège à la ligne de centre du véhicule (passager) Seat midline to center line of vehicle (passenger)	357
D	Centre du volant au seuil de la fenêtre Steering wheel center to window edge	455			

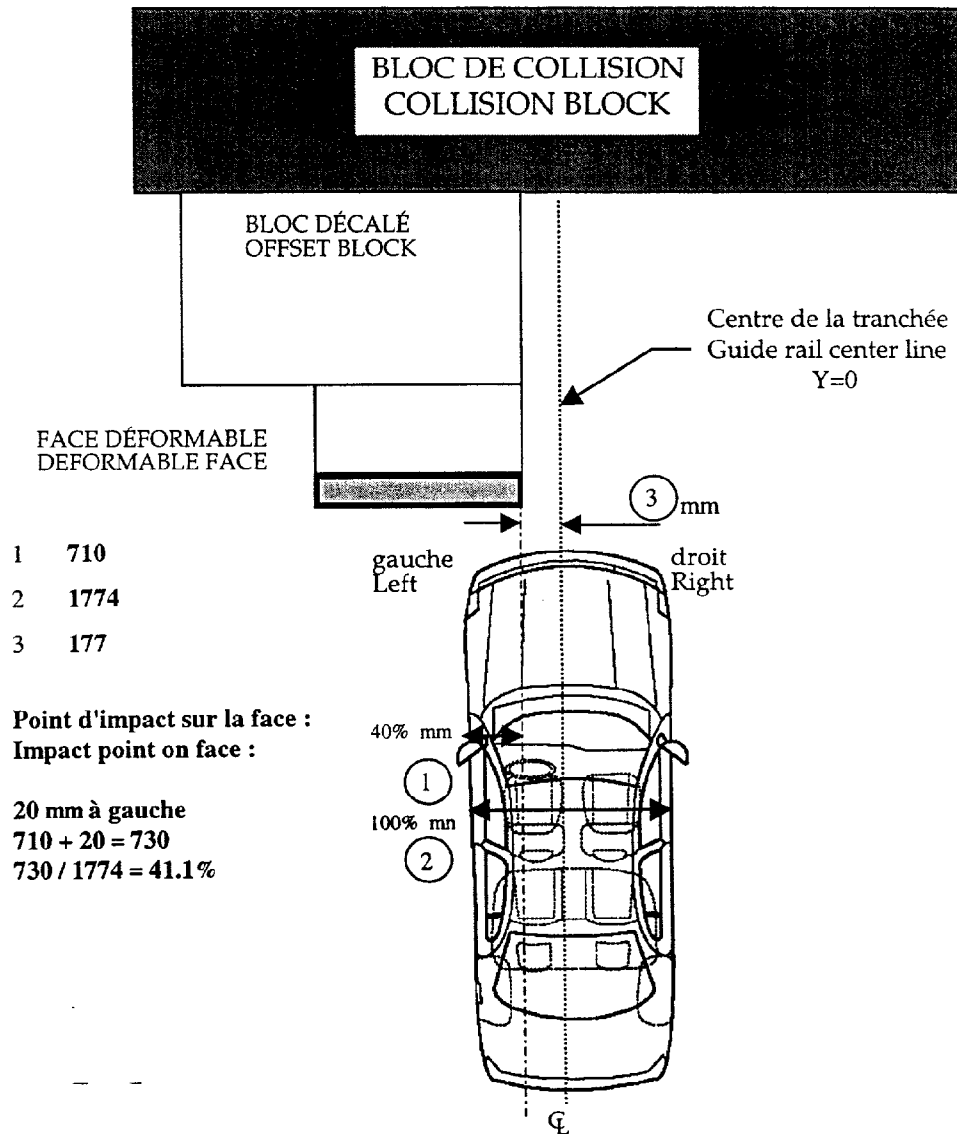
Point de référence : Centre transversal du véhicule, au point le plus avancé, au niveau du sol. Selon SAE J182a.
Reference point : Transversal center of the vehicle, at the foremost point and at ground level. As per SAE J182a.

Remarques - Comments: Sièges avec ajustement avant/arrière conventionnel. Dossier ajustable. Ceinture baudrier ajustable (5 crans). Appuie-tête ajustable et pivotant. Volant ajustable.

Seats with conventionnal fore/aft adjustment. Adjustable seat back. Adjustable upper torso belt (5 notches). Adjustable headrest with fore/aft adjustment . Adjustable steering wheel.

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POSITION INITIALE VÉHICULE/FACE DÉFORMABLE - VEHICLE INITIAL POSITION/DEFORMABLE FACE

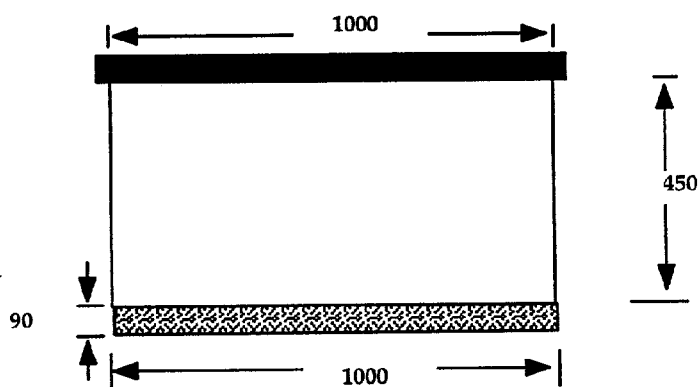
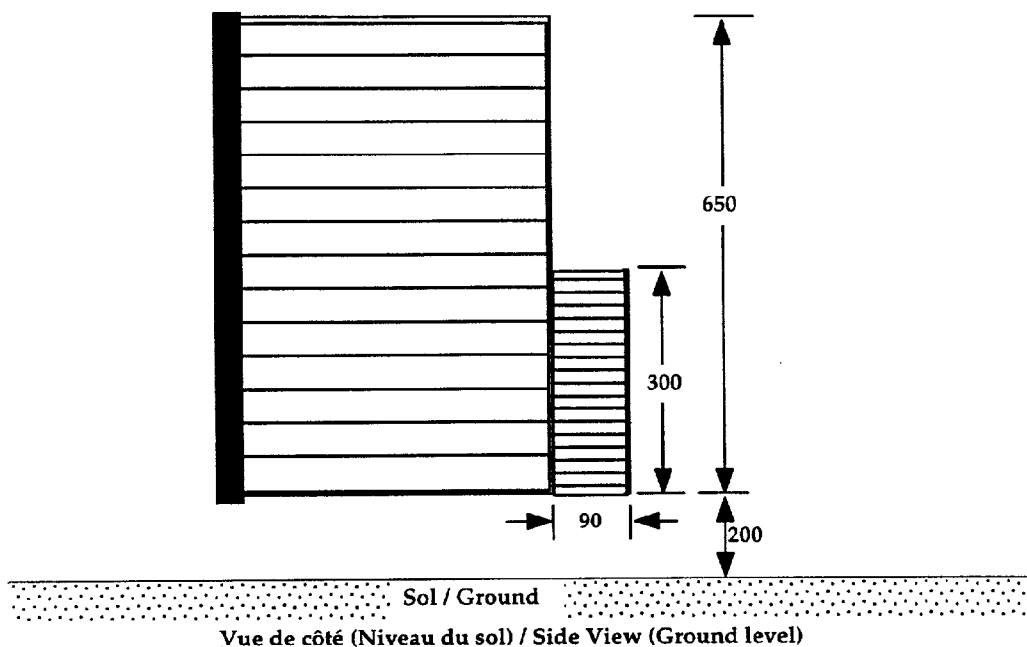


NOTE: La largeur maximale du véhicule est mesurée au pilier "B".
NOTE: The maximum width of the vehicle is measured at the "B" pillar.

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DIMENSIONS DE LA FACE DÉFORMABLE - DEFORMABLE FACE DIMENSIONS

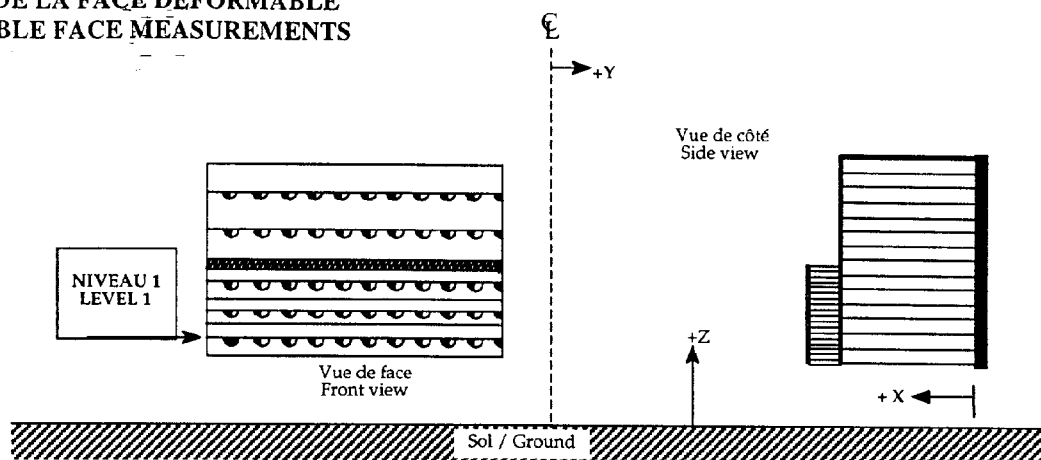
(Toutes les mesures sont en mm / All measurements are in mm)



Vue de dessus / Top View

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MESURES DE LA FACE DÉFORMABLE
DEFORMABLE FACE MEASUREMENTS

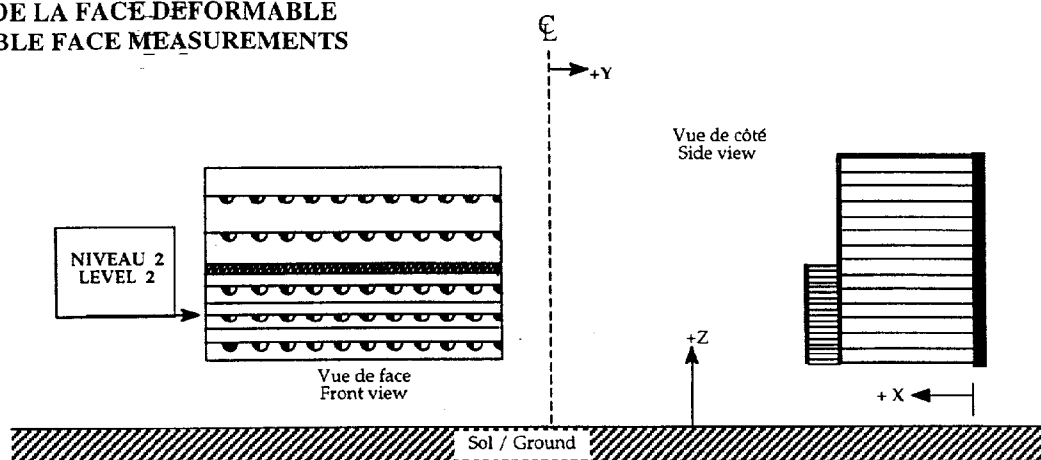


PRE-TEST			POST-TEST			Δ DIFFERENCE		
X	Y	Z	X	Y	Z	X	Y	Z
546	-1076	245	451	-1077	245	95	1	0
545	-976	245	617	-977	246	-72	1	-1
545	-876	245	530	-876	246	15	0	-1
545	-776	245	429	-778	245	116	2	0
545	-675	246	294	-677	245	251	2	1
545	-576	245	176	-577	246	369	1	-1
544	-476	246	167	-477	247	377	1	-1
545	-375	246	174	-375	246	371	0	0
545	-275	246	179	-274	245	366	-1	1
544	-174	246	135	-175	245	409	1	1

Point (0,0,0): Plan vertical avant du support de face en X, centre latéral du système de guidage ou centre du véhicule en Y et niveau du sol en Z.
Front vertical plane of face holder in X axis, lateral center of the guiding system or vehicle longitudinal centreline in the Y axis and ground level in the Z axis.

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MESURES DE LA FACE DÉFORMABLE
DEFORMABLE FACE MEASUREMENTS

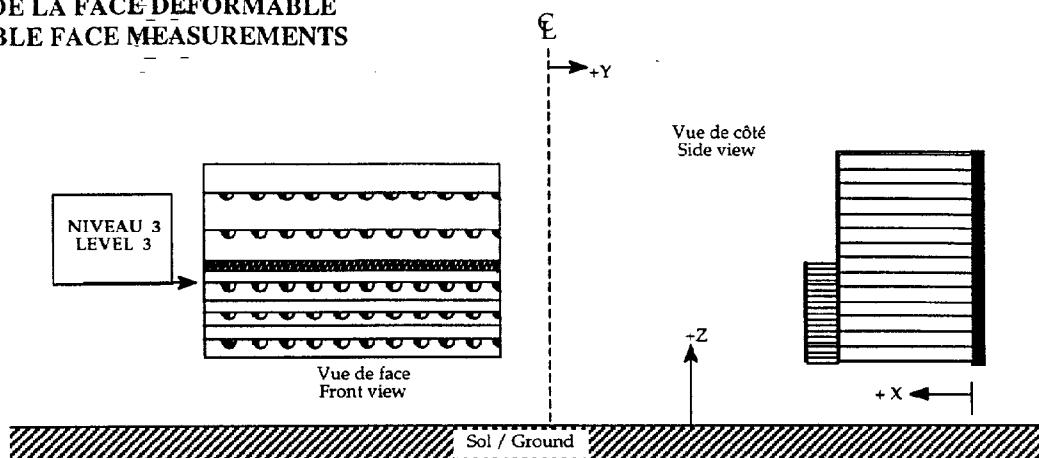


PRE-TEST			POST-TEST			Δ DIFFERENCE		
X	Y	Z	X	Y	Z	X	Y	Z
546	-1076	357	449	-1076	357	97	0	0
545	-976	358	572	-977	359	-27	1	-1
545	-876	357	535	-877	358	10	1	-1
545	-776	357	432	-777	358	113	1	-1
545	-676	357	336	-676	359	209	0	-2
544	-575	357	182	-574	357	362	-1	0
544	-475	357	168	-476	357	376	1	0
544	-375	358	141	-375	357	403	0	1
544	-274	358	116	-274	358	428	0	0
544	-175	357	55	-176	356	489	1	1

Point (0,0,0): Plan vertical avant du support de face en X, centre latéral du système de guidage ou centre du véhicule en Y et niveau du sol en Z.
Front vertical plane of face holder in X axis, lateral center of the guiding system or vehicle longitudinal centreline in the Y axis and ground level in the Z axis.

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MESURES DE LA FACE DÉFORMABLE
DEFORMABLE FACE MEASUREMENTS

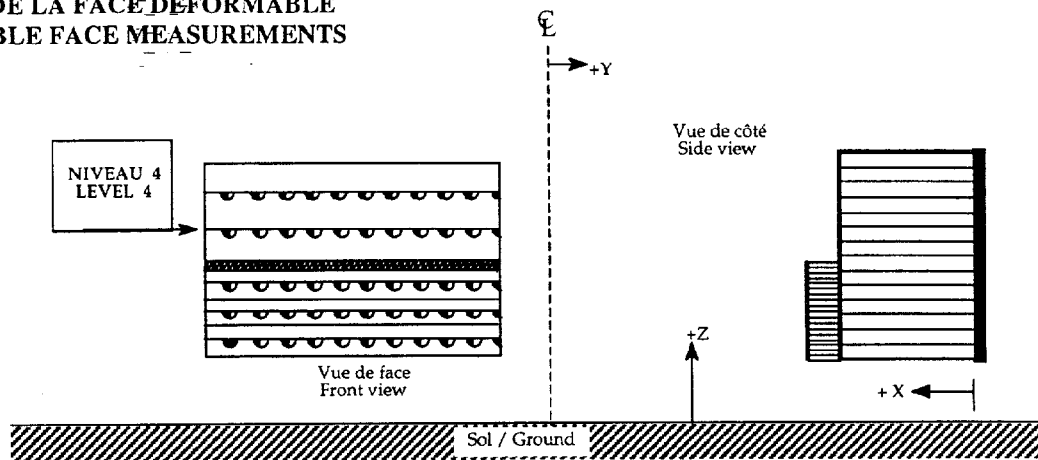


PRE-TEST			POST-TEST			Δ DIFFERENCE		
X	Y	Z	X	Y	Z	X	Y	Z
545	-1076	466	500	-1075	466	45	-1	0
545	-976	467	504	-977	468	41	1	-1
545	-876	467	465	-877	468	80	1	-1
545	-776	467	344	-777	467	201	1	0
545	-676	466	304	-676	466	241	0	0
544	-576	466	228	-575	468	316	-1	-2
544	-476	466	185	-477	466	359	1	0
544	-375	467	121	-377	468	423	2	-1
544	-275	467	88	-276	464	456	1	3
544	-175	467	29	-175	467	515	0	0

Point (0,0,0): Plan vertical avant du support de face en X, centre latéral du système de guidage ou centre du véhicule en Y et niveau du sol en Z.
Front vertical plane of face holder in X axis, lateral center of the guiding system or vehicle longitudinal centreline in the Y axis and ground level in the Z axis.

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MESURES DE LA FACE DÉFORMABLE
DEFORMABLE FACE MEASUREMENTS

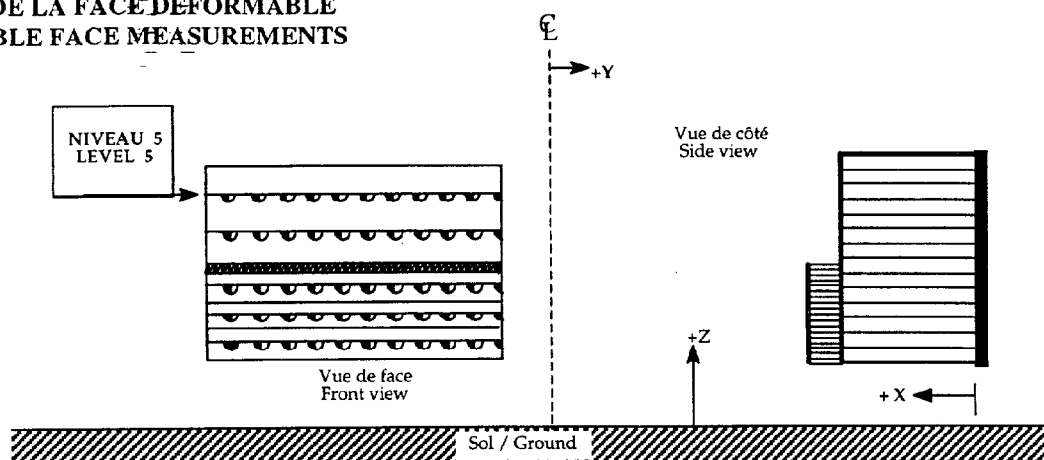


PRE-TEST			POST-TEST			Δ DIFFERENCE		
X	Y	Z	X	Y	Z	X	Y	Z
455	-1077	629	477	-1078	629	-22	1	0
455	-977	629	464	-977	629	-9	0	0
454	-877	629	453	-878	629	1	1	0
454	-777	629	328	-779	630	126	2	-1
454	-677	629	358	-677	629	96	0	0
454	-577	629	400	-577	629	54	0	0
454	-476	629	392	-475	629	62	-1	0
453	-376	629	370	-375	630	83	-1	-1
453	-275	629	333	-276	629	120	1	0
453	-176	629	254	-177	629	199	1	0

Point (0,0,0): Plan vertical avant du support de face en X, centre latéral du système de guidage ou centre du véhicule en Y et niveau du sol en Z.
Front vertical plane of face holder in X axis, lateral center of the guiding system or vehicle longitudinal centreline in the Y axis and ground level in the Z axis.

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MESURES DE LA FACE DÉFORMABLE
DEFORMABLE FACE MEASUREMENTS



PRE-TEST			POST-TEST			Δ DIFFERENCE		
X	Y	Z	X	Y	Z	X	Y	Z
454	-1077	737	275	-1077	737	179	0	0
454	-978	736	322	-977	736	132	-1	0
454	-878	736	358	-877	737	96	-1	-1
454	-778	736	389	-777	735	65	-1	1
453	-677	736	313	-677	736	140	0	0
453	-577	736	290	-577	735	163	0	1
453	-477	735	304	-477	736	149	0	-1
453	-376	736	270	-376	737	183	0	-1
453	-277	736	337	-279	736	116	2	0
453	-176	736	217	-177	736	236	1	0

Point (0,0,0): Plan vertical avant du support de face en X, centre latéral du système de guidage ou centre du véhicule en Y et niveau du sol en Z.
Front vertical plane of face holder in X axis, lateral center of the guiding system or vehicle longitudinal centreline in the Y axis and ground level in the Z axis.

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POINTS DE MESURES DES CEINTURES DE SÉCURITÉ EN UTILISANT L'APPAREIL (BTD)
PASSENGER CAR BELT-FIT MEASUREMENTS USING THE BELT DEPLOYMENT TEST DEVICE (BTD)

Type de siège baquet / bucket banquette / bench banquette 60-40 / bench 60-40
Seat type ☒ ☐ ☐

Type de ceinture 3 points passive active automatique / automatic motorisée / motorised
Belt system ☒ ☐ ☒ ☐ ☐

Localisation du siège Av-G / F-L Av-D / F-R Arr-G / R-L Arr-D / R-R
Seat location ☒ ☐ ☐ ☐

Espacement du genou gauche 104 mm Espacement du genou droit 104 mm
Left knee spacing 104 mm Right knee spacing 104 mm

Essai no: / Trial no:	1	2	3
Angle du dossier BTD Back pan angle	24.2 deg.	23.9 deg.	24.7 deg.
Angle de la cuvette BTD Seat pan angle	12.1 deg.	12.3 deg.	12.4 deg.
Angle du pied gauche / left Foot angle droit / right	121 deg. 124 deg.	121 deg. 124 deg.	121 deg. 123 deg.
Angle du genou gauche / left Knee angle droit / right	129 deg. 131 deg.	129 deg. 131 deg.	128 deg. 131 deg.
Mesure sous-abdominale gauche / left Lap belt score droit / right	43 mm / 0 mm 44 mm / 0 mm	43 mm / 0 mm 44 mm / 0 mm	42 mm / 0 mm 42 mm / 0 mm
Ceinture en contact gauche / left Belt in contact droit / right	oui/yes oui/yes	oui/yes oui/yes	oui/yes oui/yes
Mesure ceinture baudrier Sternum Upper torso belt score Clavicule	160 mm / - * 125 mm / 0 mm	159 mm / - * 123 mm / 0 mm	156 mm / - * 122 mm / 0 mm
Ceinture en contact Clavicule Belt in contact	oui/yes	oui/yes	oui/yes

Mesure Score	/	Jeu - Slack
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- * Mesure ceinture baudrier (jeu sternum) : (-) signifie un jeu causé par l'appareil BTD. Impossible à éliminer.
* Upper torso belt score (sternum slack) : (-) means a slack impossible to eliminate due to BTD machine.

Remarques – Comments : Selon le manuel d'opérations pour mesures géométriques des ceintures de sécurité, ébauche, Transports Canada, janvier 1993.
As per the operational manual for the belt deployment test device, draft, Transport Canada, January 1993.

Siège à la position mi-course. Ceinture baudrier à la position mi-hauteur.
Seat at mid-travel position. Upper torso belt at mid position.

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**POINTS DE MESURES DES CEINTURES DE SÉCURITÉ EN UTILISANT L'APPAREIL (BTD)
PASSENGER CAR BELT FIT MEASUREMENTS USING THE BELT DEPLOYMENT TEST DEVICE (BTD)**

Type de siège baquet / bucket banquette / bench banquette 60-40 / bench 60-40
Seat type ☒ ☐ ☐

Type de ceinture 3 points passive active automatique / automatic motorisée / motorised
Belt system ☒ ☐ ☒ ☐ ☐

Localisation du siège Av-G / F-L Av-D / F-R Arr-G / R-L Arr-D / R-R
Seat location ☐ ☒ ☐ ☐

Espacement du genou gauche Espacement du genou droit
Left knee spacing 102 mm Right knee spacing 106 mm

Essai no: / Trial no:	1	2	3
Angle du dossier BTD Back pan angle	23.4 deg.	22.8 deg.	23.5 deg.
Angle de la cuvette BTD Seat pan angle	11.2 deg.	12.5 deg.	11.9 deg.
Angle du pied gauche / left Foot angle droit / right	124 deg. 124 deg.	125 deg. 125 deg.	125 deg. 124 deg.
Angle du genou gauche / left Knee angle droit / right	128 deg. 128 deg.	128 deg. 129 deg.	129 deg. 130 deg.
Mesure sous-abdominale gauche / left Lap belt score droit / right	42 mm / 0 mm 44 mm / 0 mm	42 mm / 0 mm 44 mm / 0 mm	41 mm / 0 mm 43 mm / 0 mm
Ceinture en contact gauche / left Belt in contact droit / right	oui/yes oui/yes	oui/yes oui/yes	oui/yes oui/yes
Mesure ceinture baudrier Sternum Upper torso belt score Clavicule	158 mm / - * 124 mm / mm	158 mm / - * 122 mm / 0 mm	157 mm / - * 122 mm / 0 mm
Ceinture en contact Clavicule Belt in contact	oui/yes	oui/yes	oui/yes

Mesure Score	/	Jeu – Slack
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* Mesure ceinture baudrier (jeu sternum) : (-) signifie un jeu causé par l'appareil BTD. Impossible à éliminer.
* Upper torso belt score (sternum slack) : (-) means a slack impossible to eliminate due to BTD machine.

Remarques – Comments : Selon le manuel d'opérations pour mesures géométriques des ceintures de sécurité, ébauche, Transports Canada, janvier 1993.
As per the operational manual for the belt deployment test device, draft, Transport Canada, January 1993.

Siège à la position mi-course. Ceinture baudrier à la position mi-hauteur.
Seat at mid-travel position. Upper torso belt at mid position.

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DÉTERMINATION DU POINT "H" AVEC LE MANNEQUIN "3-D", MESURES PROVENANT DU BRAS ARTICULÉ MÉCANIQUE
SEAT "H" POINT DETERMINED WITH THE H-POINT MACHINE, MEASURES FROM AN ARTICULATED MECHANICAL ARM

DESCRIPTION / DESCRIPTION	CONDUCTEUR / DRIVER			PASSAGER / PASSENGER			PASSAGER ARRIÈRE REAR PASSENGER		
Type de siège / Seat type	BAQUET/BUCKET			BAQUET/BUCKET					
Nombre de crans d'ajustement du siège * Number of notches for adjustable seat *	16 de/of 16 crans/notches			16 de/of 16 crans/notches			de/of crans/notches		
Nombre de crans d'ajustement du dossier * Number of notches for adjustable seat back *	N/A crans/notches			N/A crans/notches			crans/notches		
Axes	X	Y	Z	X	Y	Z	X	Y	Z
Loquet de porte / Door latch	2475	-791	669	2470	788	670			
Point-H / H-Point	2363	-440	481	2354	445	493			
Rotule / Knee joint	1921	-589	598	1904	584	572			
PRS / SRP	2363	-440	481	2354	445	493			

* La position la plus avancée est au 1^{er} cran / * The foremost position is at the 1st notch.

Ajustement du 3D / 3D adjustment

MESURES DE RÉFÉRENCE DU MANNEQUIN "3-D"
REFERENCE MEASUREMENTS OF "3-D" MACHINE

95 %

95 %

2

DESCRIPTION / DESCRIPTION	CONDUCTEUR / DRIVER	PASSAGER / PASSENGER	PASSAGER ARRIÈRE REAR PASSENGER
Espacement du genou gauche Left knee spacing	198 mm	120 mm	
Espacement du genou droit Right knee spacing	170 mm	122 mm	
Cheville à cheville (c-c) Ankle to ankle (a-a)	370 mm	223 mm	
Angle du dossier du "3-D" Back pan angle	23.2 deg	24.5 deg	
Angle de la cuvette de siège du "3-D" Seat pan angle	14.1 deg	9.6 deg	
Angle du genou gauche Left knee angle	130 deg	141 deg	
Angle du genou droit Right knee angle	132 deg	143 deg	
Angle de la cheville gauche Left ankle angle	95 deg	122 deg	
Angle de la cheville droite Right ankle angle	91 deg	120 deg	

Remarques – Comments : Sièges du conducteur et du passager à la position la plus reculée.
Driver and passenger seats at the rearmost position.

Le mannequin 3D a été installé selon la procédure suivante :
"Anthropomorphic test dummy seating procedure for frontal impact test"
version 3, 10/23/85.
The 3D machine was installed as per the following procedure :
"Anthropomorphic test dummy seating procedure for frontal impact test"
version 3, 10/23/85.

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POSITIONNEMENT DES MANNEQUINS / MEASUREMENTS OF DUMMY POSITIONS

		MESURES / MEASUREMENTS :					
Conducteur/Driver : HYBRID III 5% Femelle/Female		Toutes les mesures sont en mm / All measurements are in mm					
Angle du pelvis - Pelvic angle :	21.5°						
Angle transversal - Transversal angle :	0.3°						
Angle de la tête - Head angle :	0.2°						
Seuil de porte - Door sill :	0.2°						
Angle du coussin - Skew angle :	-1.4°						
Passager avant/Front Passenger: HYBRID III 5% Femelle/Female							
Angle du pelvis - Pelvic angle :	19.7°						
Angle transversal - Transversal angle :	0.4°						
Angle de la tête - Head angle :	0°						
Seuil de porte - Door sill :	0°						
Angle du coussin - Skew angle :	0.6°						
Fenêtre à fenêtre / Window to window :			1617			1617	
Centre du véhicule / Vehicle center :			0			0	
Seuil de la portière au centre du loquet / Door sill to latch center :				280			279
Centre du volant / Steering wheel center :		1956	-354	860			
Mouvement du lacet / Yaw movement :		1			1		
Cible de tête / Head target :		2265	-426	1076	2239	425	1080
Point-H / H-Point :		2151	-503	510	2143	505	512
Rotule / Knee joint :		1814	-485	556	1803	474	555

Remarques – Comments : Les sièges du conducteur et du passager sont à la position la plus avancée. Ceinture baudrier à la position la plus basse. Appuie-tête à la position la plus avancée et la plus basse. Volant au 4e cran de la position la plus basse.
The driver and the passenger seats are at the foremost position. Upper torso belt at the lowest position. Headrest at the foremost and lowest position. Steering wheel at the 4th notch from the lowest position.

Selon la procédure de positionnement de mannequin 5^e percentile Hybrid III côté conducteur, Biokinetics, 29/11/98, rapport n° D98-15 et côté passager, Biokinetics, 20/11/98, rapport n° D98-17.

As per procedure for placement of a 5th percentile Hybrid III ATD driver's side, Biokinetics, 29/11/98, report no D98-15 and passenger's side, Biokinetics, 20/11/98, report no D98-17.

Point de référence : Centre transversal du véhicule, au point le plus avancé, au niveau du sol. Selon SAE J182a.
Reference point : Transversal center of the vehicle, at the foremost point and at ground level. As per SAE J182a.

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POSITIONNEMENT DES MANNEQUINS / MEASUREMENTS OF DUMMY POSITIONS

		MESURES / MEASUREMENTS :					
Passager arrière gauche : Rear left passenger : Angle du pelvis - Pelvic angle : Angle transversal - Transversal angle : Angle de la tête - Head angle : Angle du coussin - Skew angle :		Toutes les mesures sont en mm / All measurements are in mm					
Hybrid III 3 ans/year		Passager arrière gauche Rear left passenger			Passager arrière droit Rear right passenger		
		Ajustement du siège : Seat adjustment : N/A crans/notches			Ajustement du siège : Seat adjustment : crans/notches		
		Ajustement ceinture épaule : Shoulder belt adjustment : 3e cran/ 3 rd notch			Ajustement du dossier : Seat back adjustment : crans/notches		
		X	Y	Z	X	Y	Z
Passager arrière droit : Rear right passenger :							
Angle du pelvis - Pelvic angle : Angle transversal - Transversal angle : Angle de la tête - Head angle : Angle du coussin - Skew angle :							
Mouvement du lacet / Yaw movement :							
Cible de tête / Head target :		3358	-420	960			
Point-H / H-Point :							
Rotule / Knee joint :							

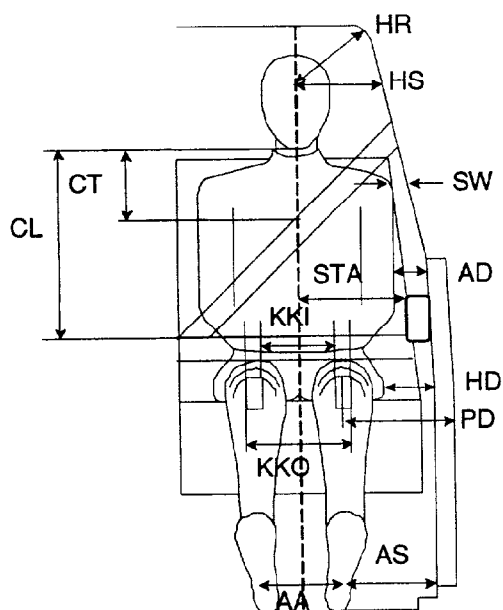
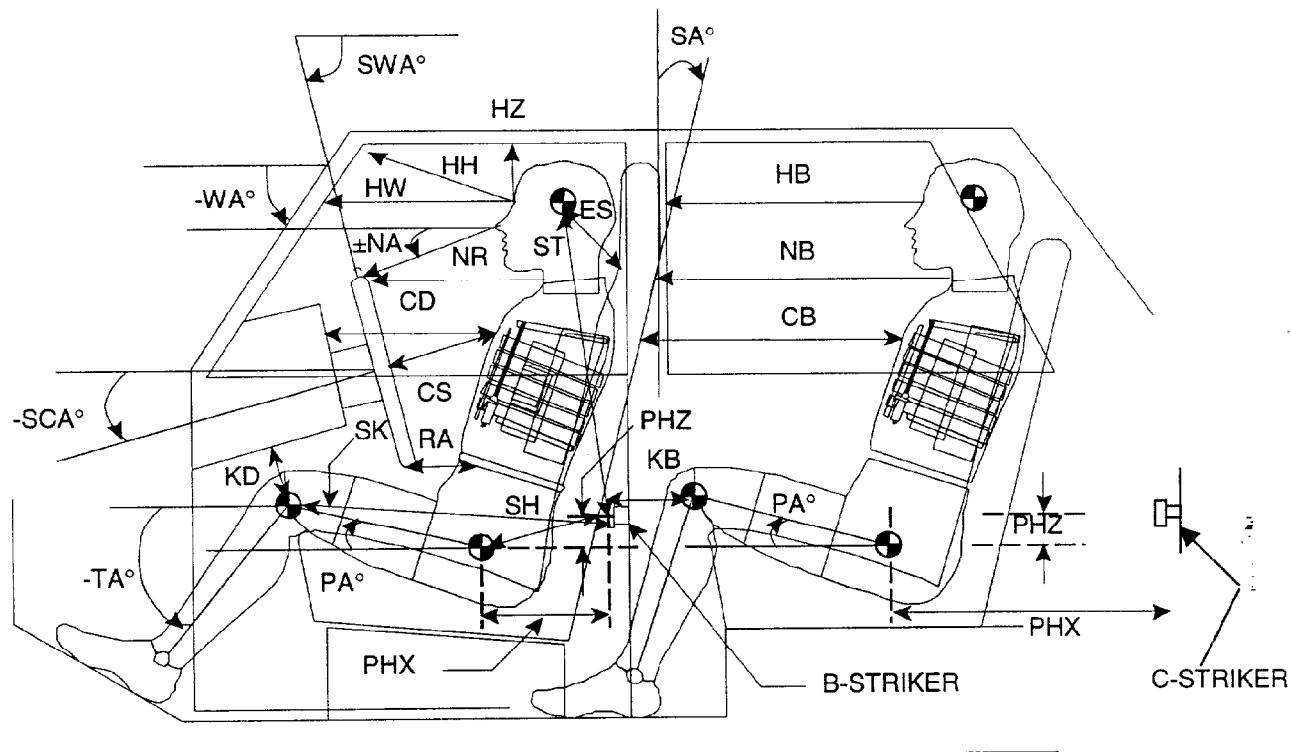
Point de référence : Centre transversal du véhicule, au point le plus avancé, au niveau du sol. Selon SAE J182a.

Reference point : Transversal center of the vehicle, at the foremost point and at ground level. As per SAE J182a.

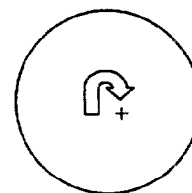
Passager arrière droit : Rear right passenger :	Hybrid III 3 ans, assis dans un siège pour enfant faisant face vers l'avant. Hybrid III 3 years, seated in a child's car seat facing front.	
	Manufacturier du siège : Seat manufacturer :	Fisher-Price
	Modèle du siège : Seat model :	Embrace
	No. de modèle du siège : Seat model number :	79700
	Date de fabrication du siège : Seat fabrication date :	30/01/98

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COTES DE LOCALISATION DES MANNEQUINS
DUMMY LOCATION DATA



référence :



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COTES DE LOCALISATION DES MANNEQUINS (suite)
DUMMY LOCATION DATA (continued)

(Mesures prises en mm / Measurements taken in mm)

DESCRIPTION	CODE	CONDUCTEUR DRIVER	PASSAGER Av. F. PASSENGER	PASSAGER Arr.G. L.R. PASSENGER	PASSAGER Arr.D. R.R. PASSENGER
De cheville à cheville (boulon extérieur) Ankle to ankle (exterior bolt)	AA	310	240		
Genou à genou (plaque) Intérieur / Interior Knee to knee (plate) Extérieur / Exterior	KKI	141	90		
	KKO	281	230		
De la cheville jusqu'au seuil de porte (horizontalement) Ankle to door sill (horizontal)	AS	156	166		
Centre du genou au tableau de bord ou siège horizontalement (minimum) Knees centre to dash or seat back horizontal (minimum)	KDL	50	78		
	KDR	60	84		
Sternum au tableau de bord (horizontalement) Chest to dash (horizontal)	CD		381		
Milieu du sternum au centre du moyeu du volant ou siège avant Mid sternum to steering hub center or front seat	CS/CB	210			
Milieu du front jusqu'au pare-brise (horizontalement) Mid forehead to windshield (horizontal)	HW	540	535		
Milieu du front jusqu'au haut du pare-brise Mid forehead to windshield header	HH	275	260		
Nez à la jante du volant de direction (haut) ou siège avant Nose to steering wheel rim (top) or front seat	NR/HB	281			
Milieu du front jusqu'au début du toit Mid forehead to edge roof	HR	231	231		
Haut de l'oreille au haut du siège avant Ear top to front seat top	ES	222	225		
Menton au haut de la ceinture sous-abdominale (verticalement) Chin to lap belt upper edge (vertical)	CL	356	355		
Menton au haut de la ceinture baudrier (verticalement) Chin to thorax belt upper edge (vertical)	CT	120	130		
Milieu du front à la fenêtre latérale (horizontalement) Mid forehead to side window (horizontal)	HS	355	345		
La rotule à la porte (horizontalement) Patella to door (horizontal)	PD	210	220		
Du point-H à la porte (horizontalement) H-point to door (horizontal)	HD	175	185		
Du milieu du bras à la porte (horizontalement) Mid upper arm to door (horizontal)	AD	148	152		
Cou jusqu'au volant ou tableau de bord (horizontalement) ou siège avant Neck to steering wheel or dash board (horizontal) or front seat	NB	376	503		
Épaule à la fenêtre de côté Shoulder to side window	SW	170	170		
Abdomen à l'appui-bras Abdomen to armrest	STA	175	175		
Milieu du front au toit (verticalement) Mid forehead to roof (vertical)	HZ	196	184		
Tête au loquet (plan (x,z)) Striker to head ((x,z) plan)	ST	458	471		
Abdomen à la jante du volant de direction (bas) Steering wheel rim to abdomen (bottom)	RA	97			
Genou au loquet (plan (x,z)) Striker to knee ((x,z) plan)	SK	671	677		
Point-H au loquet (plan (x,z)) Striker to H-Point ((x,z) plan)	SH	361	363		
Point-H au loquet en X (horizontalement) Striker to H-Point in X (horizontal)	PHX	375	345		
Point-H au loquet en Z (verticalement) Striker to H-Point in Z (vertical)	PHZ	160	170		

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COTES DE LOCALISATION DES MANNEQUINS (suite)

DUMMY LOCATION DATA (continued)

(Mesures prises en deg. / Measurements taken in deg.)

DESCRIPTION	CODE	CONDUCTEUR DRIVER	PASSAGER Av. F. PASSENGER	PASSAGER Arr.G. L.R. PASSENGER	PASSAGER Arr.D. R.R. PASSENGER
Angle du volant Steering wheel angle	+SWA	63.5°			
Angle du pare-brise Windshield angle	-WA	-29.2°			
Angle de la colonne de direction Steering column angle	-SCA	-28.5°			
Angle du tibia gauche Left tibial angle	-TA	-41.0°	-41.0°		
Angle du tibia droit Right tibial angle	-TA	-44.0°	-41.0°		
Angle pelvis Pelvic angle	+PA	21.5°	19.7°		
Angle du nez à la jante du volant Nose to steering wheel rim (top) angle	±NA	-3.8°			
Angle du dossier Seat back angle	+SA	21.7°	21.2°		
Angle ST (horizontalement) ST angle (horizontal)	+ST-A	62.7°	60.6°		
Angle SK (horizontalement) SK angle (horizontal)	±SK-A	-9.7°	-9.8°		
Angle SH (horizontalement) SH angle (horizontal)	-SH-A	-26.1°	-26.0°		

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MESURES DU VÉHICULE, POINT "H" (MANNEQUIN 3D) ET MANNEQUIN DAE
VEHICLE, H-POINT MANIKIN AND TEST DUMMY MEASUREMENTS
Mannequin 3D Point "H" - H-Point Manikin
Conducteur / Driver 95 %

DESCRIPTION	X(mm)	Y(mm)	Z(mm)
Point "H" extérieur mesure initiale - H-Point, outboard initial measurement	2363	-440	481
Point "H" extérieur mesure finale - H-Point, outboard final measurement	2363	-440	481
Rotule, extérieure - Knee pivot, outboard	1921	-589	598
Cheville, extérieure - Ankle pivot, outboard	1545	-564	333
Talon du pied en contact avec sol - Accomodation heel point (AHP)	1504	-554	210
Plante du pied en contact avec sol - Accomodation ball of foot point (ABFP)	1384	-602	384
Ligne médiane du véhicule - Vehicle centreline		0	
Centre du moyeu latéral - Lateral hub centre location (W20)		-354	
Support poids du sternum, extérieur - Torso weigh hanger, outboard	2508	-523	808
PRS / SRP	2363	-440	481
Ligne médiane du coussin du siège (avant/milieu/arr.) - Seat cushion centreline (front/mid/rear)		-359/-360/-352	
Ligne médiane du dossier du siège (avant/milieu/arr.) - Seat back centreline(front/mid/rear)		-358/-359/-359	
Hauteur Point "H" - H-Point height (H30 = Z _{H-POINT} - Z _{AHP})		271	
Position du siège vs sa position la plus reculée - Seat position vs its rearmost position		0	
Angle dossier du siège - Seat back angle (deg) (L40)		23.2°	
Angle du coussin du siège - Skew angle		-1.4°	
Diamètre extérieur du volant - Steering wheel dia., outside (W9)		379	

Véhicule et Mannequin - Vehicle and Dummy
Femelle 5^e percentile conducteur / 5th percentile female driver

DESCRIPTION	X(mm)	Y(mm)	Z(mm)
Boulon siège avant, extérieur - Front seat bolt, outboard	2035	-573	278
Jante du volant, centre haut - Steering wheel rim, top centre	1869	-355	1032
Jante du volant, centre bas - Steering wheel rim, bottom centre	2030	-351	690
Jante du volant, centre gauche - Steering wheel rim, left centre	1953	-544	859
Jante du volant, centre droit - Steering wheel rim, right centre	1944	-165	862
Moyeu du volant, centre haut - Steering wheel hub, top centre	1888	-356	901
Moyeu du volant, centre - Steering wheel hub, centre	1974	-354	825
Moyeu du volant, centre bas - Steering wheel hub, bottom centre	1966	-353	750
Position du siège vs sa position la plus reculée - Seat position vs its rearmost position		223	
Angle de dossier du siège - Seat back angle (deg)		21.7°	
Genou au tableau de bord, minimum - Knee to dash, minimum	G/L : 50		D/R : 60
Menton au haut du moyeu du volant - Chin to steering wheel hub top		300	

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MESURES DU VÉHICULE, POINT "H" (MANNEQUIN 3D) ET MANNEQUIN DAE (suite)
VEHICLE, H-POINT MANIKIN AND TEST DUMMY MEASUREMENTS (cont'd)

Description et emplacement du Mannequin
ATD description and location :

Femelle 5^e percentile conducteur / 5th percentile female driver

DESCRIPTION	X(mm)	Y(mm)	Z(mm)
Centre de gravité de la tête, extérieur - Head CG, outboard	2265	-426	1076
Base du nez - Glabella (root of nose)	2186	-353	1082
Menton - Chin (bottom)	2179	-357	978
Jonction menton et cou - Chin / neck junction	2250	-359	980
Thorax au niveau des côtes supérieures - Chest at upper rib level	2169	-359	819
Thorax au niveau des côtes inférieures - Chest at lower rib level	2141	-361	709
Boulon supérieur avant de l'épaule, ext. - Shoulder bolt, top front outboard	2305	-513	853
Boulon supérieur avant de l'épaule, int. - Shoulder bolt, top front inboard	2300	-201	842
Boulon du coude, extérieur - Elbow bolt, outboard	2164	-551	687
Boulon du coude, intérieur - Elbow bolt, inboard	2166	-133	680
Boulon du poignet, extérieur - Wrist bolt, outboard	2007	-567	835
Boulon du poignet, intérieur - Wrist bolt, inboard	2008	-142	834
Point d'articulation de la hanche, extérieur - Hip point, outboard	2237	-482	550
Boulon du genou gauche, côté gauche - Knee bolt, left leg, left side	1813	-484	555
Boulon de la cheville gauche, côté gauche - Ankle bolt, left leg, left side	1603	-463	396
Point du talon gauche - Heel point, left leg	1605	-474	211
Plante du pied gauche vs plancher - Ball of foot at toeboard contact, left leg	1479	-507	264
Boulon du genou droit, côté gauche - Knee bolt, right leg, left side	1803	-276	550
Boulon de la cheville droite, côté gauche - Ankle bolt, right leg, left side	1599	-232	391
Point du talon droit - Heel point, right leg	1548	-234	214
Plante du pied droit vs plancher - Ball of foot at toeboard contact, right leg	1457	-237	329
Espacement de genoux (centre) - Knee spacing (centre)		211	
Ajustement du support de cou - Neck bracket adjustment (deg.)			

Remarques – Comments :

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MESURES DU VÉHICULE, POINT "H" (MANNEQUIN 3D) ET MANNEQUIN DAE
VEHICLE, H-POINT MANIKIN AND TEST DUMMY MEASUREMENTS
Mannequin 3D Point "H" - H-Point
Passager avant /Front passenger 95%

DESCRIPTION	X(mm)	Y(mm)	Z(mm)
Point "H" extérieur mesure initiale - H-Point, outboard initial measurement	2354	445	493
Point "H" extérieur mesure finale - H-Point, outboard final measurement	2354	445	493
Rotule, extérieure - Knee pivot, outboard	1904	584	572
Cheville, extérieure - Ankle pivot, outboard	1503	468	347
Talon du pied en contact avec sol - Accomodation heel point (AHP)	1502	453	215
Plante du pied en contact avec sol - Accomodation ball of foot point (ABFP)	1331	493	345
Ligne médiane du véhicule - Vehicle centreline		0	
Support poids du sternum, extérieur - Torso weigh hanger, outboard	2505	523	816
PRS / SRP	2354	445	493
Ligne médiane du coussin du siège (avant/milieu/arr.) - Seat cushion centreline (front/mid/rear)		358/357/355	
Ligne médiane du dossier du siège (avant/milieu/arr.) - Seat back centreline (front/mid/rear)		355/356/356	
Hauteur Point "H" - H-Point height ($H_{30} = Z_{H-POINT} - Z_{AHP}$)		278	
Position du siège vs sa position la plus reculée - Seat position vs its rearmost position		0	
Angle dossier du siège - Seat back angle (deg) (L40)		24.5°	
Angle du coussin du siège - Skew angle		0.6°	

Véhicule et Mannequin - Vehicle and Dummy
Femelle 5e percentile passager avant / 5th percentile female front passenger

DESCRIPTION	X(mm)	Y(mm)	Z(mm)
Boulon siège avant, extérieur - Front seat bolt, outboard	2029	575	278
Position du siège vs sa position la plus reculée - Seat position vs its rearmost position		223	
Angle dossier du siège - Seat back angle		21.2°	
Genou au tableau de bord, minimum - Knee to dash, minimum	G/L : 78		D/R : 84
Menton au tableau de bord - Chin to dash		437	

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MESURES DU VÉHICULE, POINT "H" (MANNEQUIN 3D) ET MANNEQUIN DAE (suite)
VEHICLE, H-POINT MANIKIN AND TEST DUMMY MEASUREMENTS (cont'd)

Description et emplacement du Mannequin
ATD description and location:

Femelle 5^e percentile passager avant / 5th percentile female front passenger

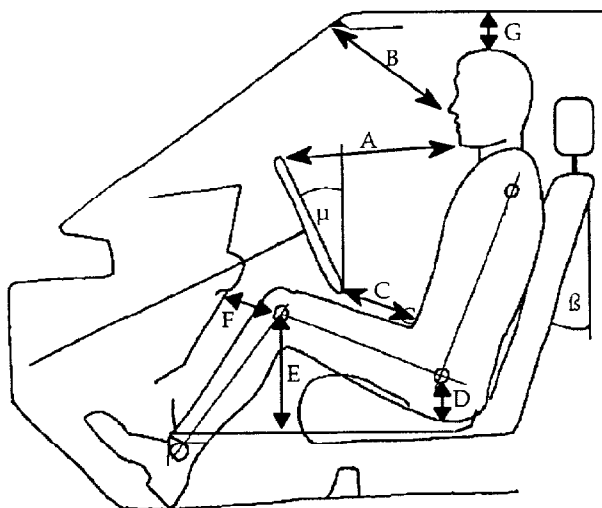
DESCRIPTION	X(mm)	Y(mm)	Z(mm)
Centre de gravité de la tête, extérieur - Head CG, outboard	2239	425	1080
Base du nez - Glabella (root of nose)	2151	361	1085
Menton - Chin (bottom)	2144	360	977
Jonction menton et cou - Chin / neck junction	2214	361	981
Thorax au niveau des côtes supérieures - Chest at upper rib level	2144	361	813
Thorax au niveau des côtes inférieures - Chest at lower rib level	2123	360	701
Boulon supérieur avant de l'épaule, ext. - Shoulder bolt, top front outboard	2274	512	846
Boulon supérieur avant de l'épaule, int. - Shoulder bolt, top front inboard	2266	201	847
Boulon du coude, extérieur - Elbow bolt, outboard	2200	569	641
Boulon du coude, intérieur - Elbow bolt, inboard	2196	156	646
Boulon du poignet, extérieur - Wrist bolt, outboard	1995	510	590
Boulon du poignet, intérieur - Wrist bolt, inboard	1989	200	600
Point d'articulation de la hanche, extérieur - Hip point, outboard	2227	482	555
Boulon du genou gauche, intérieur - Knee bolt, left leg, right side	1803	473	555
Boulon de la cheville gauche, intérieur - Ankle bolt, left leg, right side	1591	438	400
Point du talon gauche - Heel point, left leg	1597	449	213
Plante du pied gauche vs plancher - Ball of foot at toeboard contact, left leg	1465	487	261
Boulon du genou droit, intérieur - Knee bolt, right leg, right side	1802	311	564
Boulon de la cheville droite, intérieur - Ankle bolt, right leg, right side	1598	277	404
Point du talon droit - Heel point, right leg	1606	289	220
Plante du pied droit vs plancher - Ball of foot at toeboard contact, right leg	1474	313	258
Espacement de genoux (centre) - Knee spacing (centre)		160	
Ajustement du support de cou - Neck bracket adjustment (deg.)			

Remarques – Comments :

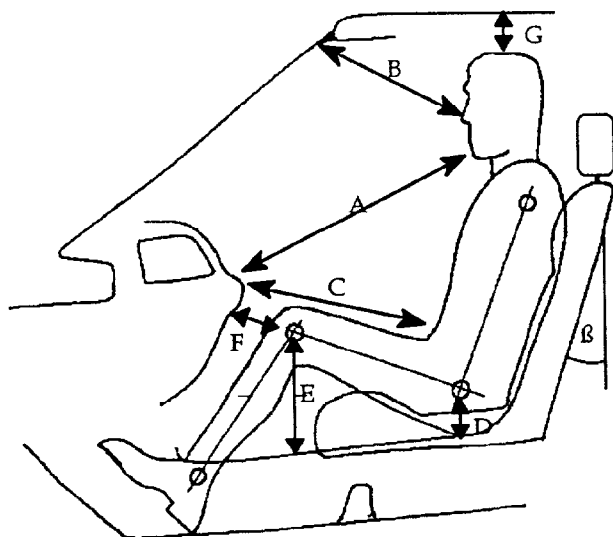
Date de collision Crash date	1999-04-21	Véhicule Vehicle	TOYOTA CAMRY CE 1999	T.C. N° T.C.No	99-239
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EUROPEAN EXPERIMENTAL VEHICLES COMMITTEE:

MESURES DE POSITIONNEMENT DES MANNEQUINS /
DUMMY POSITIONING MEASUREMENTS



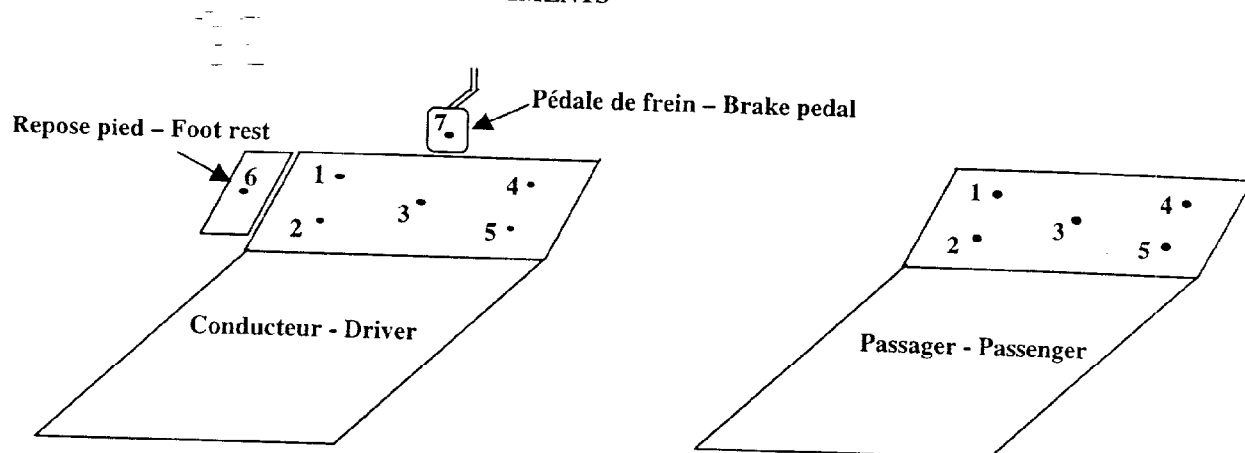
CONDUCTEUR DRIVER	mm
A	296
B	285
C	160
D	230
E	276
F	55
G	125
β	1.5°
μ	26.5°



PASSAGER PASSENGER	mm
A	276
B	437
C	345
D	233
E	276
F	81
G	125
β	3.3°

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MESURES PLANCHER / FOOTWELL MEASUREMENTS

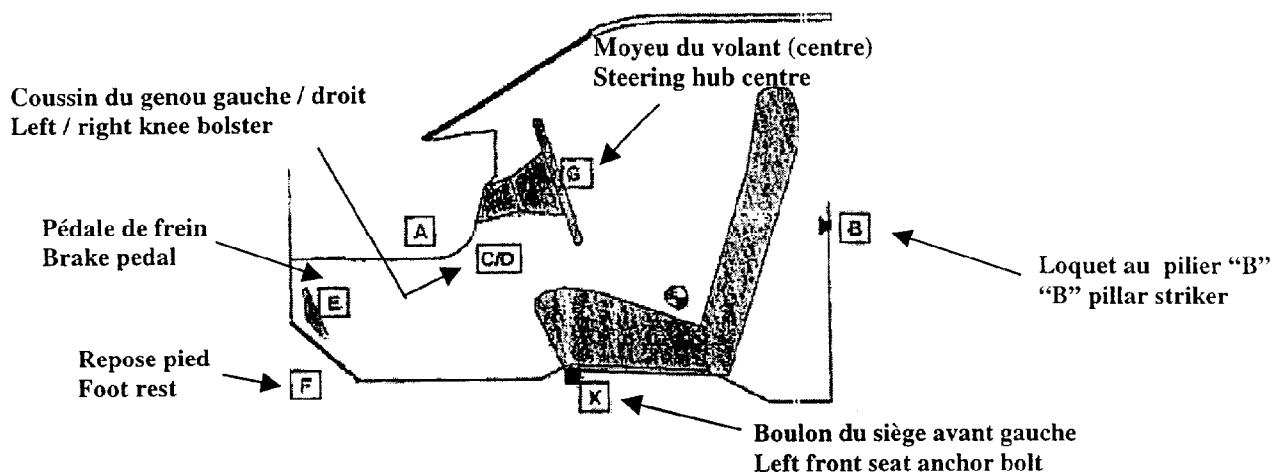


N° Cible		AVANT ESSAI	APRÈS ESSAI	
Target No.		PRE- TEST	POST- TEST	Δ mm
1	x	1294	1300	-6
	y	-475	-476	1
	z	348	356	-8
2	x	1449	1450	-1
	y	-462	-462	0
	z	226	228	-2
3	x	1386	1389	-3
	y	-338	-339	1
	z	270	274	-4
4	x	1302	1306	-4
	y	-218	-221	3
	z	350	351	-1
5	x	1444	1444	0
	y	-213	-213	0
	z	221	224	-3
6	x	1411	1414	-3
	y	-582	-584	2
	z	344	346	-2
7	x	1450	1454	-4
	y	-359	-355	-4
	z	412	413	-1

N° Cible		AVANT ESSAI	APRÈS ESSAI	
Target No.		PRE- TEST	POST- TEST	Δ mm
1	x	1268	1268	0
	y	257	257	0
	z	363	361	2
2	x	1405	1405	0
	y	245	246	-1
	z	252	250	2
3	x	1350	1350	0
	y	352	353	-1
	z	296	294	2
4	x	1280	1280	0
	y	476	477	-1
	z	361	360	1
5	x	1417	1417	0
	y	489	491	-2
	z	242	240	2

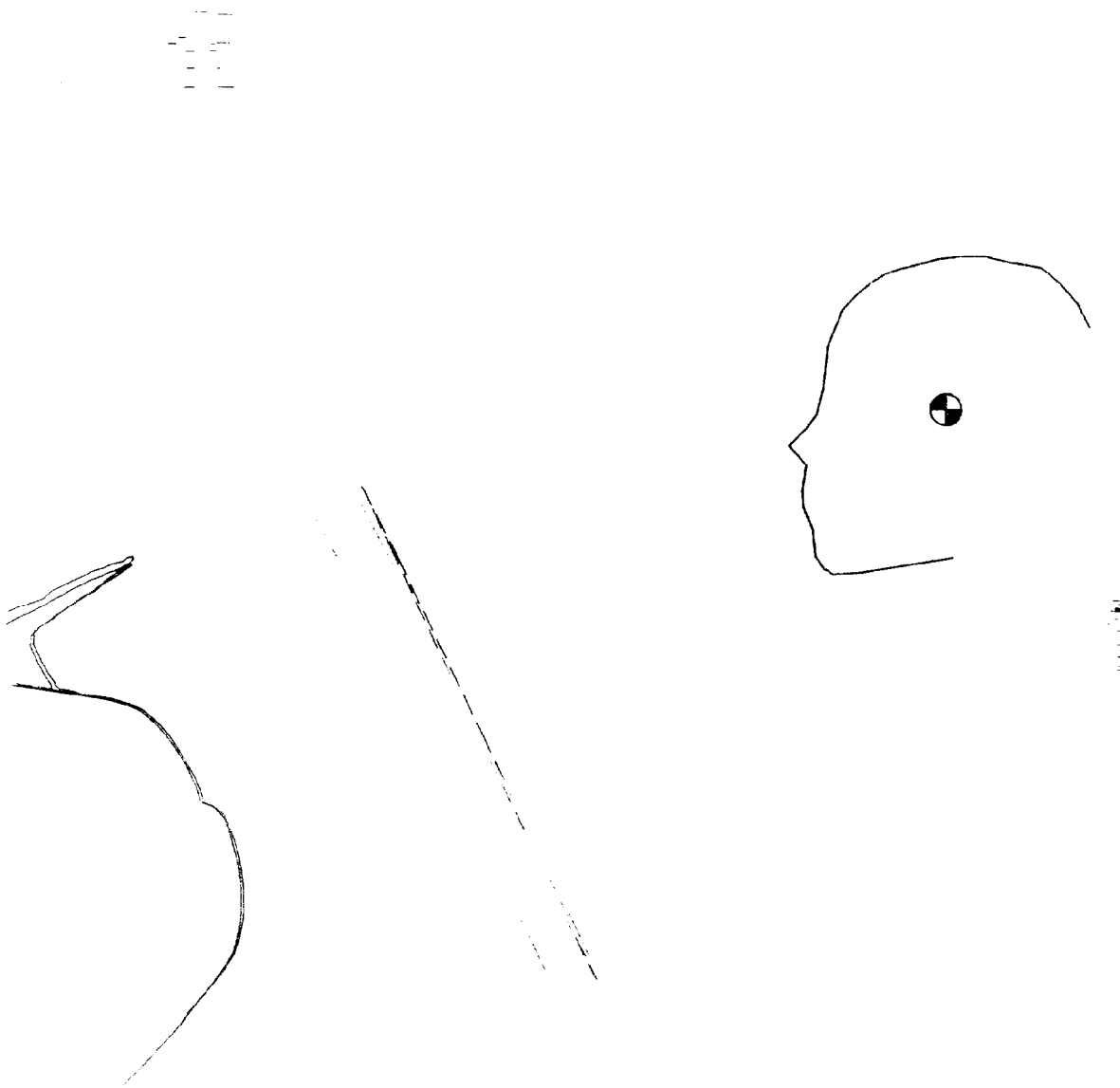
Date de collision Crash date	1999-04-21	Véhicule Vehicle	TOYOTA CAMRY CE 1999	T.C. N° T.C.No	99-239
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PÉNÉTRATION DE L'HABITACLE DU CONDUCTEUR (Distances en mm)
DRIVER COMPARTMENT INTRUSION (Distances in mm)



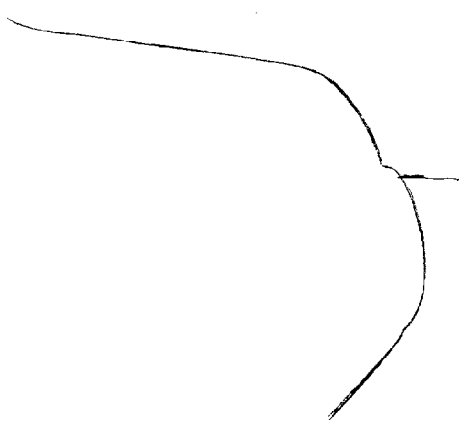
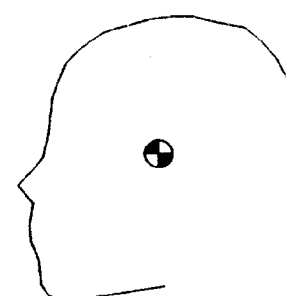
Habitacle du conducteur
Driver's compartment

	DESCRIPTION	Avant essai / Pre-test			Après essai / Post-test		
		X	Y	Z	X	Y	Z
A	Ouverture de porte Door opening	1719	-801	904	1719	-806	906
B	Loquet au pilier "B" "B" pillar striker	2475	-791	669	2474	-791	668
C	Coussin du genou gauche Left knee bolster	1686	-449	621	1684	-454	624
D	Coussin du genou droit Right knee bolster	1672	-256	611	1670	-263	617
E	Pédale de frein Break pedal	1450	-359	412	1454	-355	413
F	Repose pied Foot rest	1411	-582	344	1414	-584	346
G	Moyeu du volant (centre) Steering hub (centre)	1974	-354	825	1975	-360	824
X	Boulon du siège avant gauche Left front seat anchor bolt	2035	-573	278	2034	-573	278



DASHBOARD / TABLEAU DE BORD MODULE STEERING WHEEL / VOLANT AIRBAG / COUSSIN GONFLABLE	PRE-TEST	POST-TEST	No. TC. : 99-239
	_____	_____	TOYOTA CAMRY
	_____	_____	DRIVER'S SIDE / COTÉ CONDUCTEUR
	_____	_____	Project / Projet : 00-5001

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	PRE-TEST	POST-TEST	No. TC. : 99-239
DASHBOARD / TABLEAU DE BORD	_____	_____	TOYOTA CAMRY
MODULE	_____	_____	PASSENGER'S SIDE / COTÉ CONDUCTEUR
STEERING WHEEL / VOLANT	_____	_____	Project / Projet : 00-5001
AIRBAG / COUSSIN GONFLABLE	_____	_____	

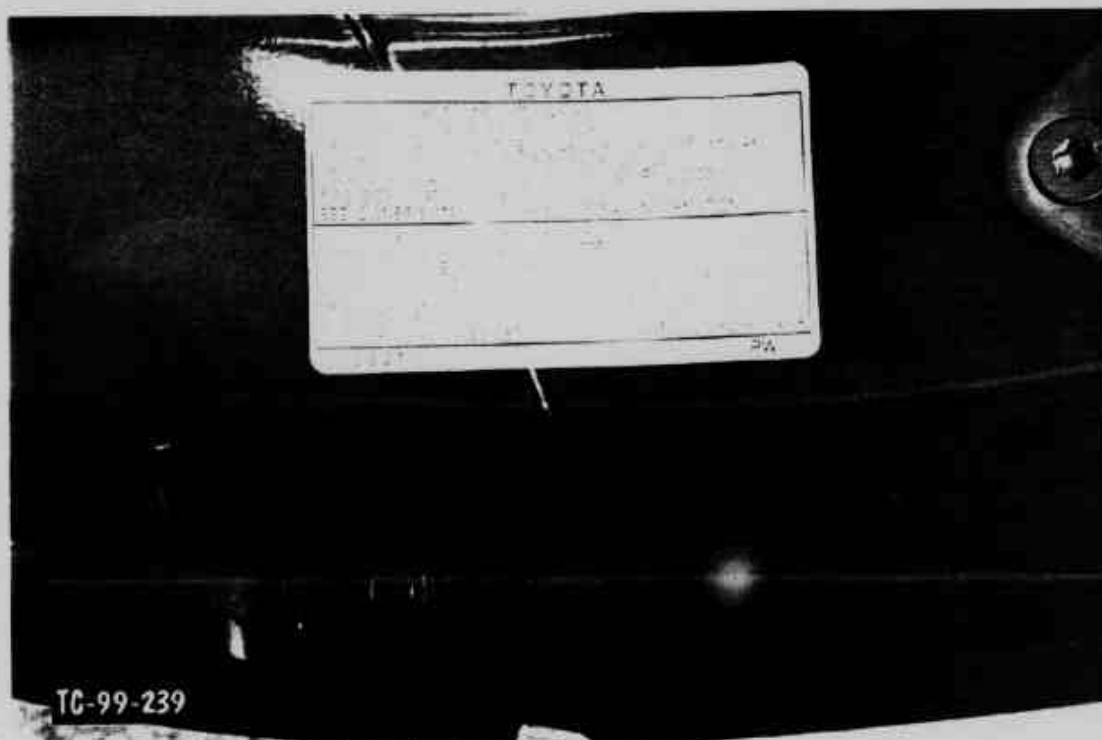
APPENDICE / APPENDIX A

**PHOTOGRAPHIES DE L'ESSAI
TEST PHOTOGRAPHS**

Date de collision Crash date	1999-04-21	Véhicule Vehicle	TOYOTA CAMRY CE 1999	T.C.N T.C.N.	99-239
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1. Étiquette de déclaration de conformité du véhicule d'essai.
Statement of compliance label of the test vehicle.



2. Étiquette d'information des pneus.
Tire information label.

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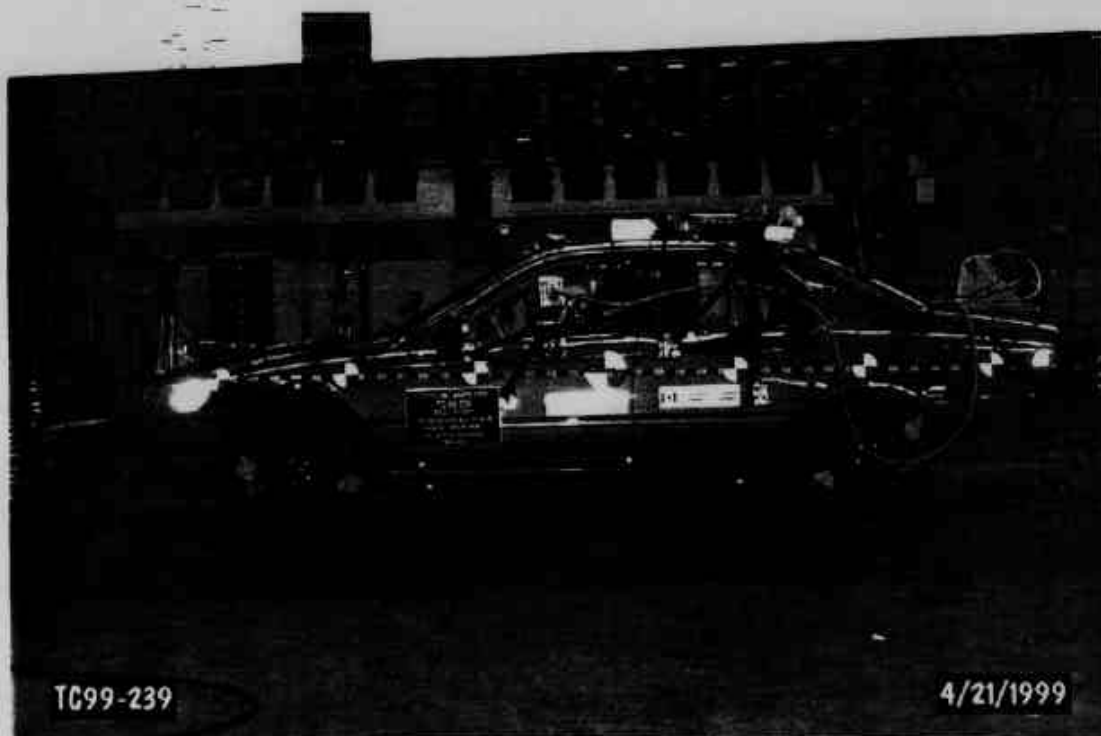


3. Vue $\frac{3}{4}$ avant du véhicule d'essai.
 $\frac{3}{4}$ front view of the test vehicle.

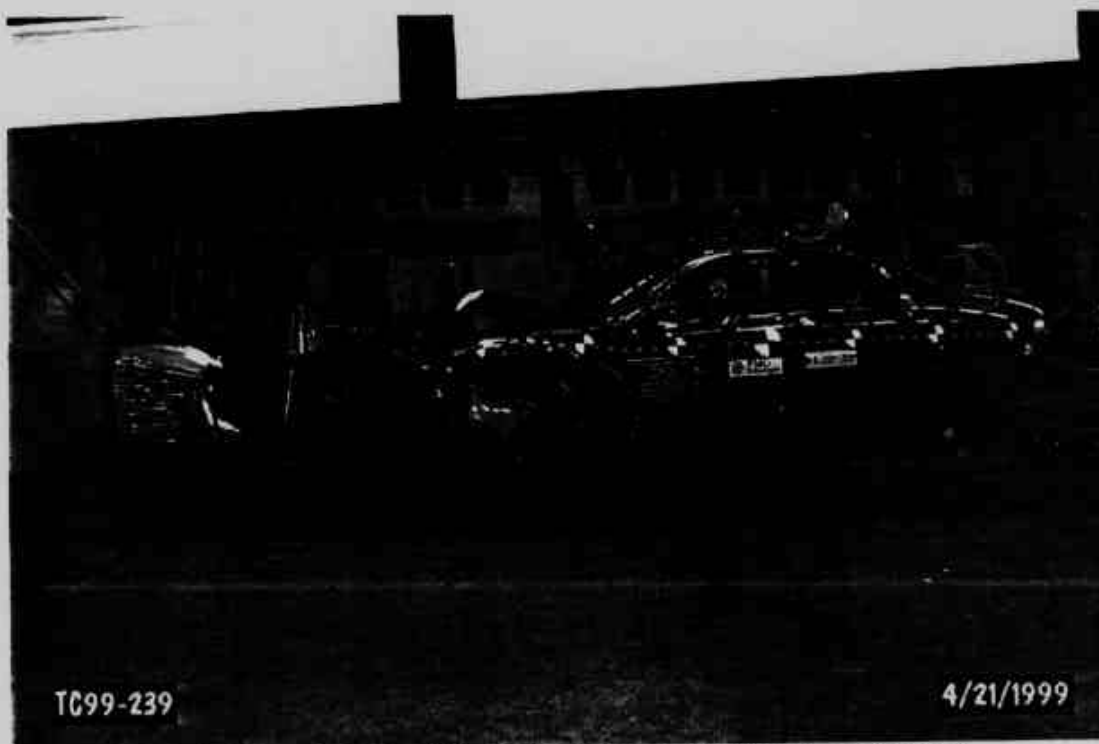


4. Vue $\frac{3}{4}$ arrière du véhicule d'essai.
 $\frac{3}{4}$ rear view of the test vehicle.

Date de collision Crash date	1999-04-21	Véhicule Vehicle	TOYOTA CAMRY CE 1999	T.C. N° T.C.N.	99-239
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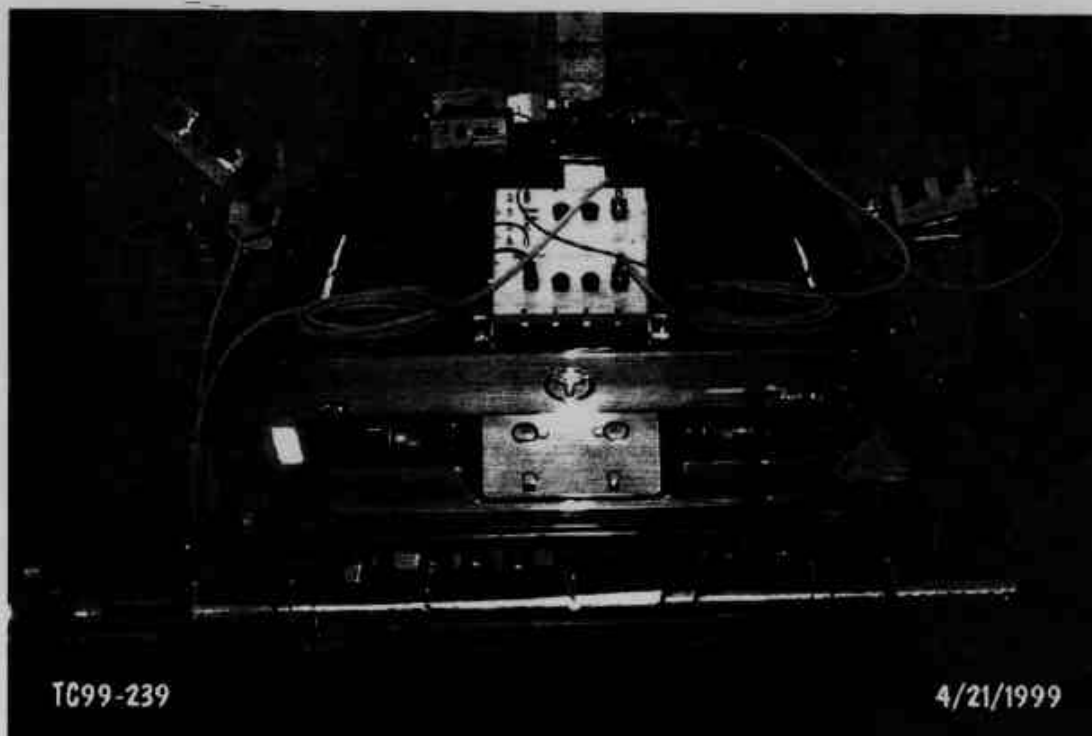


5. Vue générale côté gauche du véhicule d'essai, avant essai.
Left side view of the test vehicle, pre-test.

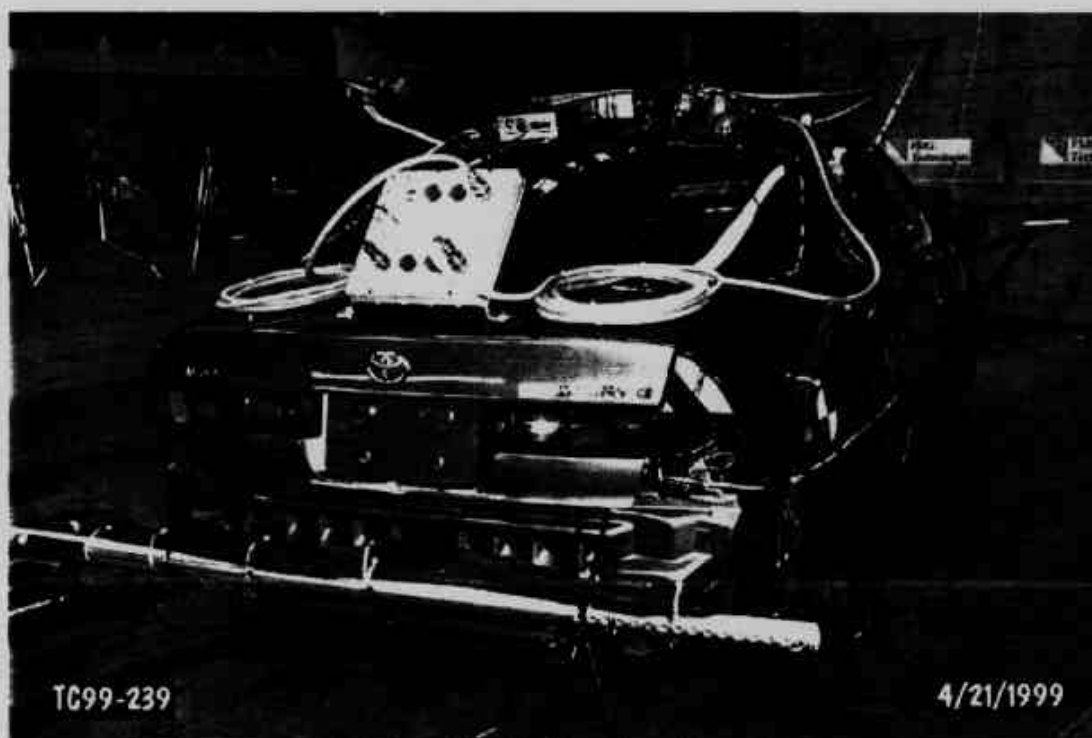


6. Vue générale côté gauche du véhicule d'essai, après essai.
Left side view of the test vehicle, post-test.

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7. Vue arrière du véhicule d'essai, avant essai.
Rear view of the test vehicle, pre-test.

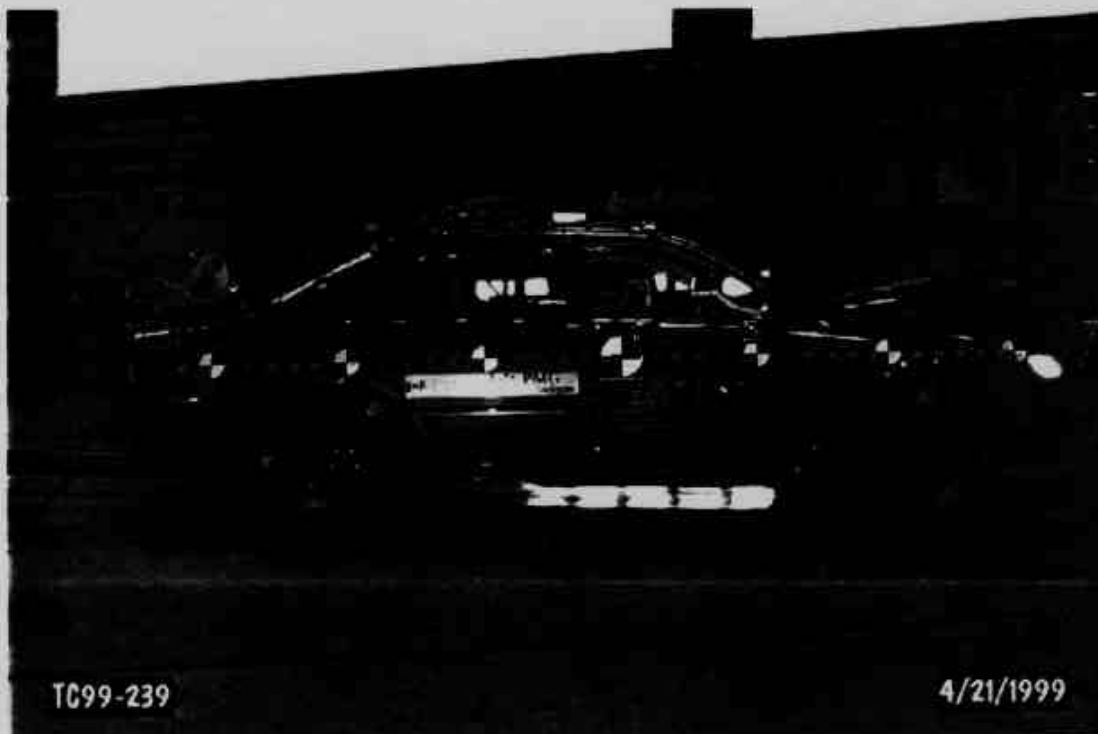


8. Vue arrière du véhicule d'essai, après essai.
Rear view of the test vehicle, post-test.

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9. Vue générale côté droit du véhicule d'essai, avant essai.
General right side view of the test vehicle, pre-test.



10. Vue générale côté droit du véhicule d'essai, après essai.
General right side view of the test vehicle, post-test.

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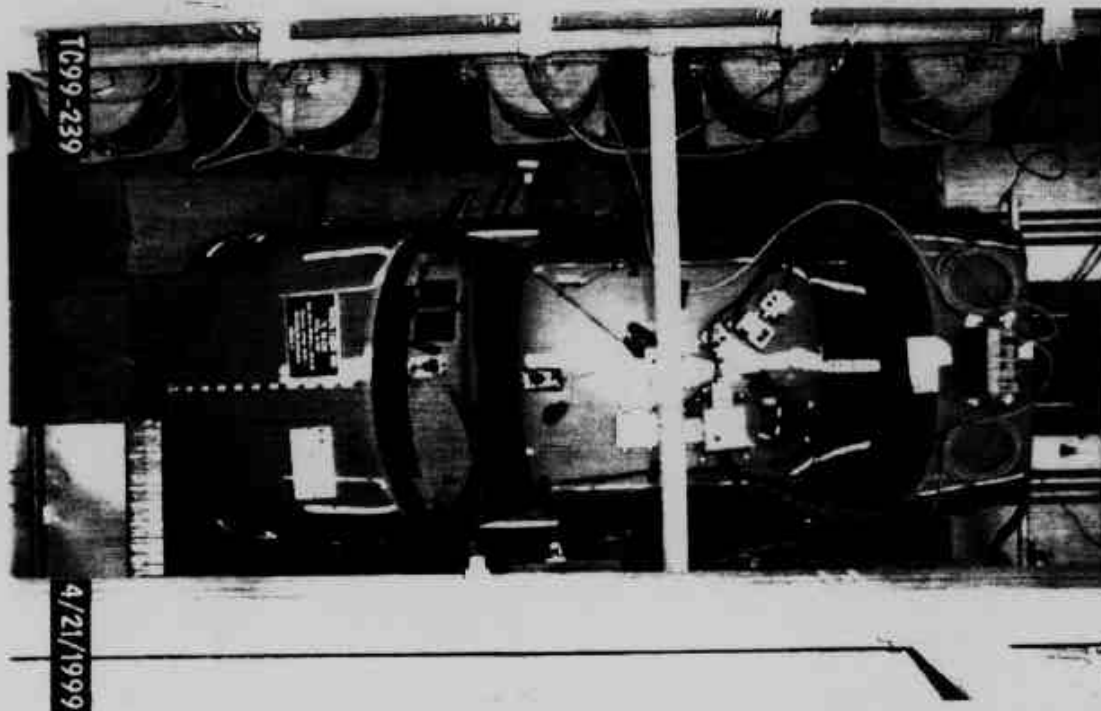


11. Vue avant du véhicule d'essai, avant essai.
Front view of the test vehicle, pre-test.

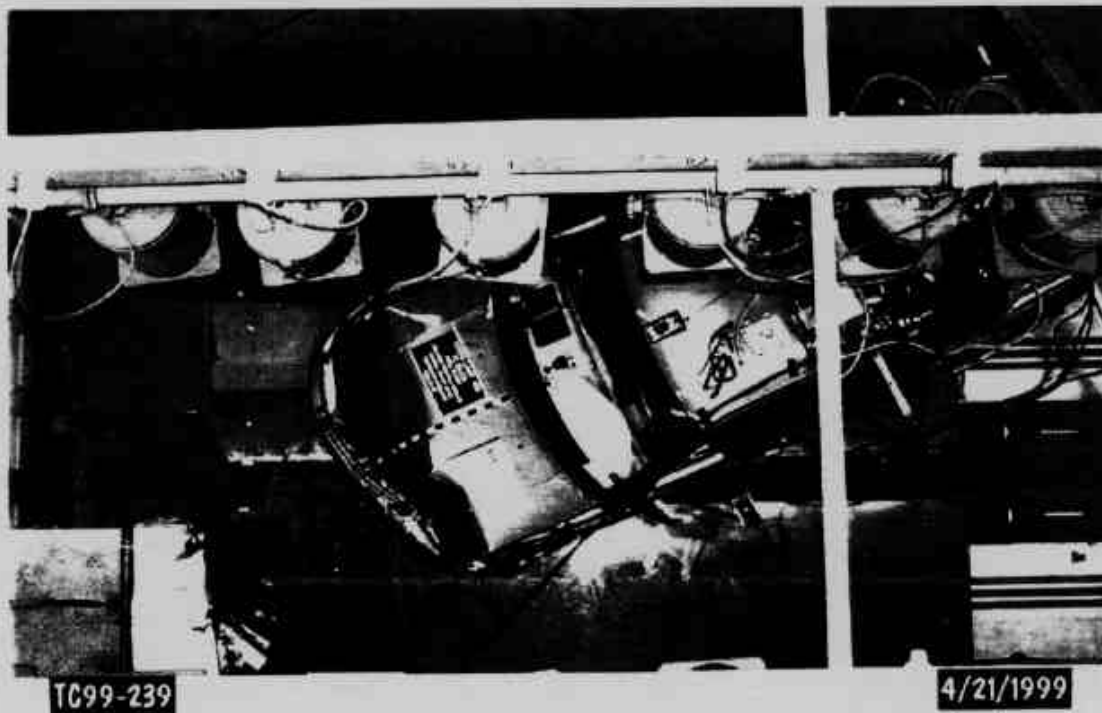


12. Vue avant du véhicule d'essai, après essai.
Front view of the test vehicle, post-test.

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13. Vue de plan du véhicule d'essai, avant essai.
Over view of the test vehicle, pre-test.



14. Vue de plan du véhicule d'essai, après essai.
Over view of the test vehicle, post-test.

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15. Vue de plan du devant du véhicule d'essai, avant essai.
Over view of the front part of the test vehicle, pre-test.

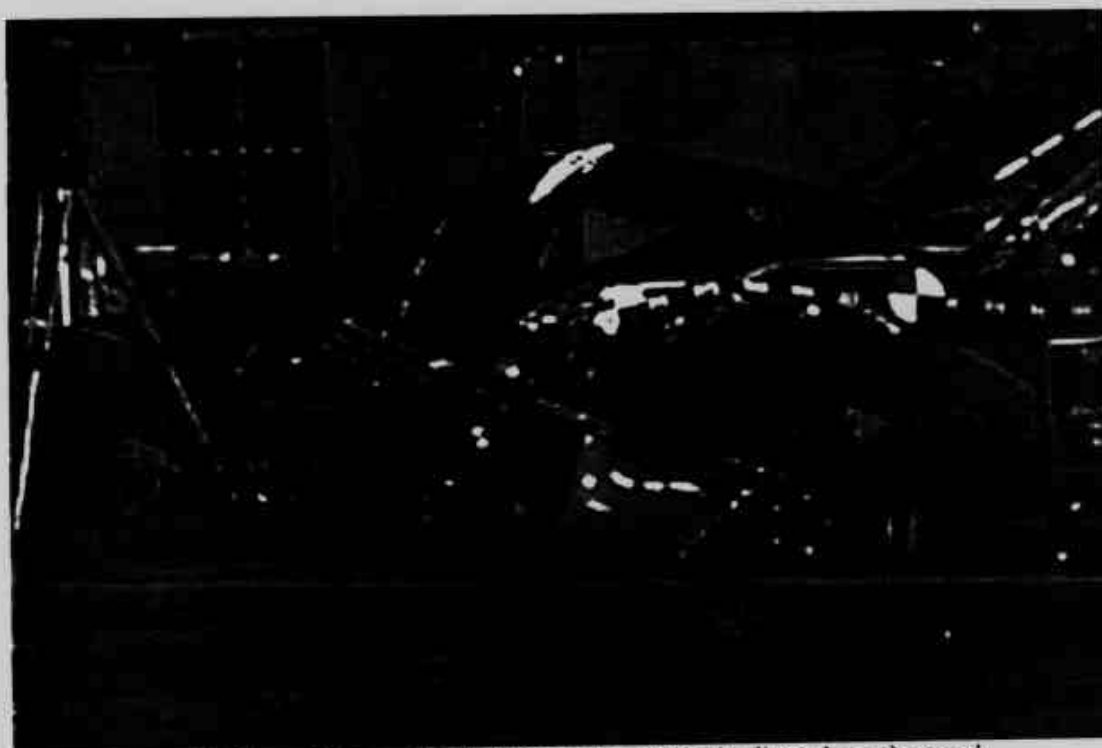


16. Vue de plan du devant du véhicule d'essai, après essai.
Over view of the front part of the test vehicle, post-test.

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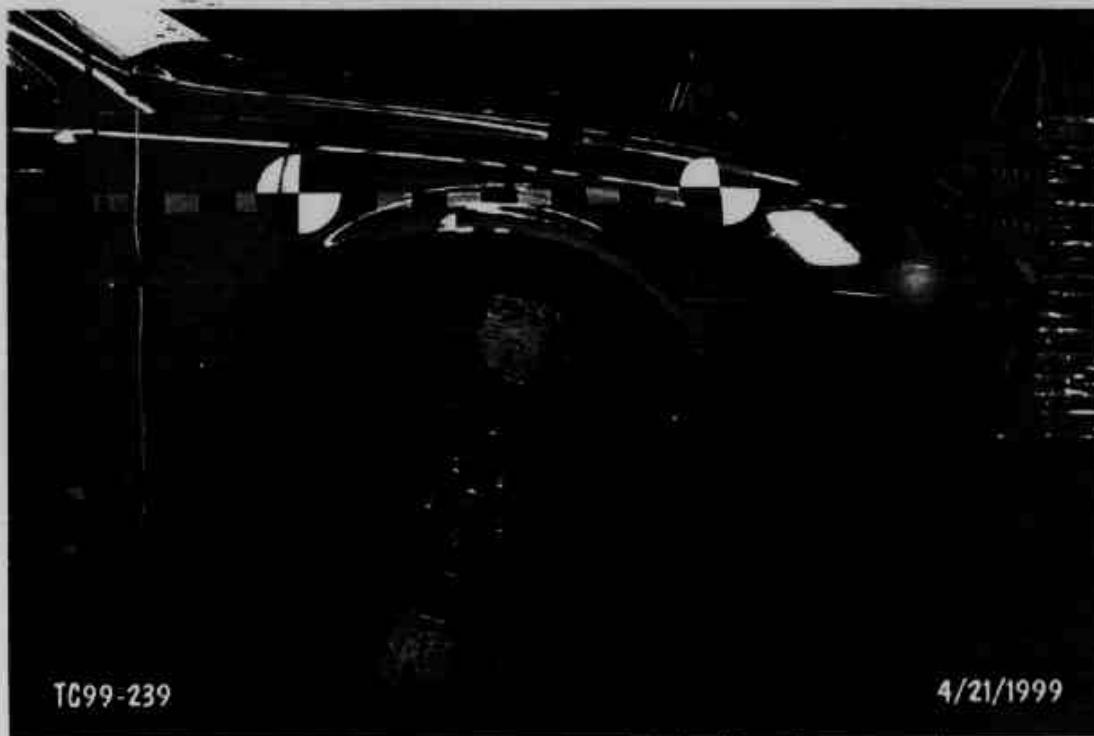


17. Vue côté gauche de l'avant du véhicule d'essai, avant essai.
Left side view of front of test vehicle, pre-test.

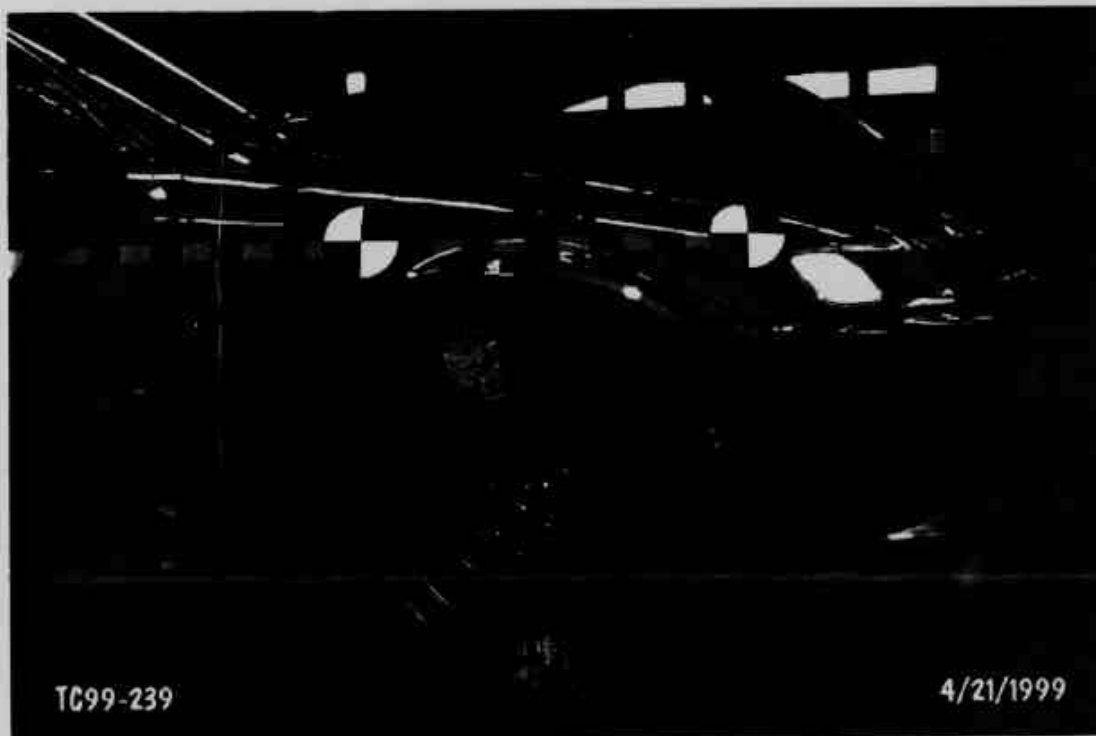


18. Vue côté gauche de l'avant du véhicule d'essai, après essai.
Left side view of front of test vehicle, post-test.

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19. Vue côté droit de l'avant du véhicule d'essai, avant essai.
Right side view of front of test vehicle, pre-test.

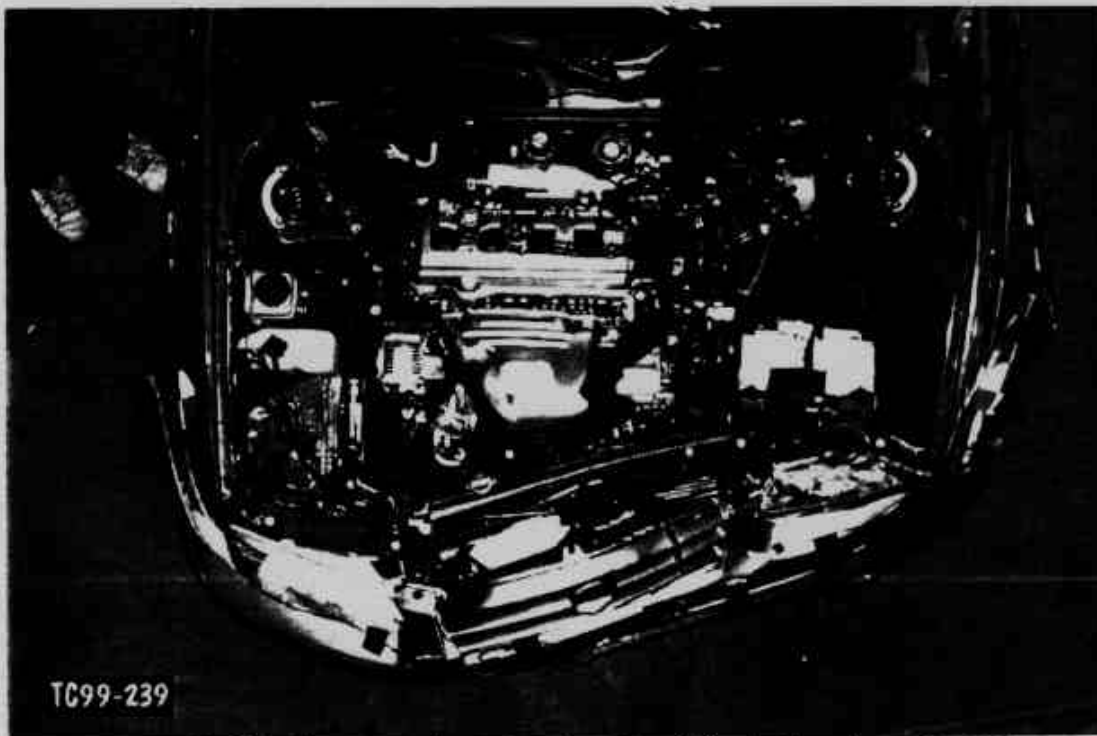


20. Vue côté droit de l'avant du véhicule d'essai, après essai.
Right side view of front of test vehicle, post-test.

Date de collision Crash date	1999-04-21	Véhicule Vehicle	TOYOTA CAMRY CE 1999	T.C. N° T.C. No	99-239
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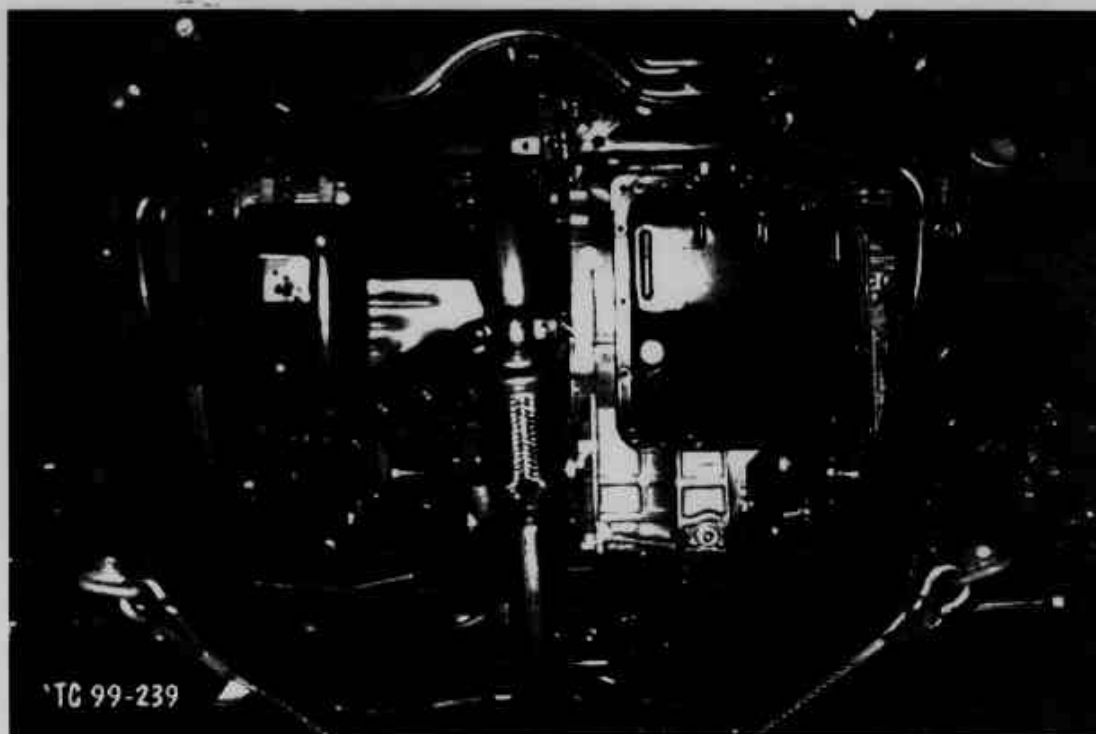


21. Vue du compartiment moteur du véhicule d'essai, avant essai.
Engine compartment view of the test vehicle, pre-test.

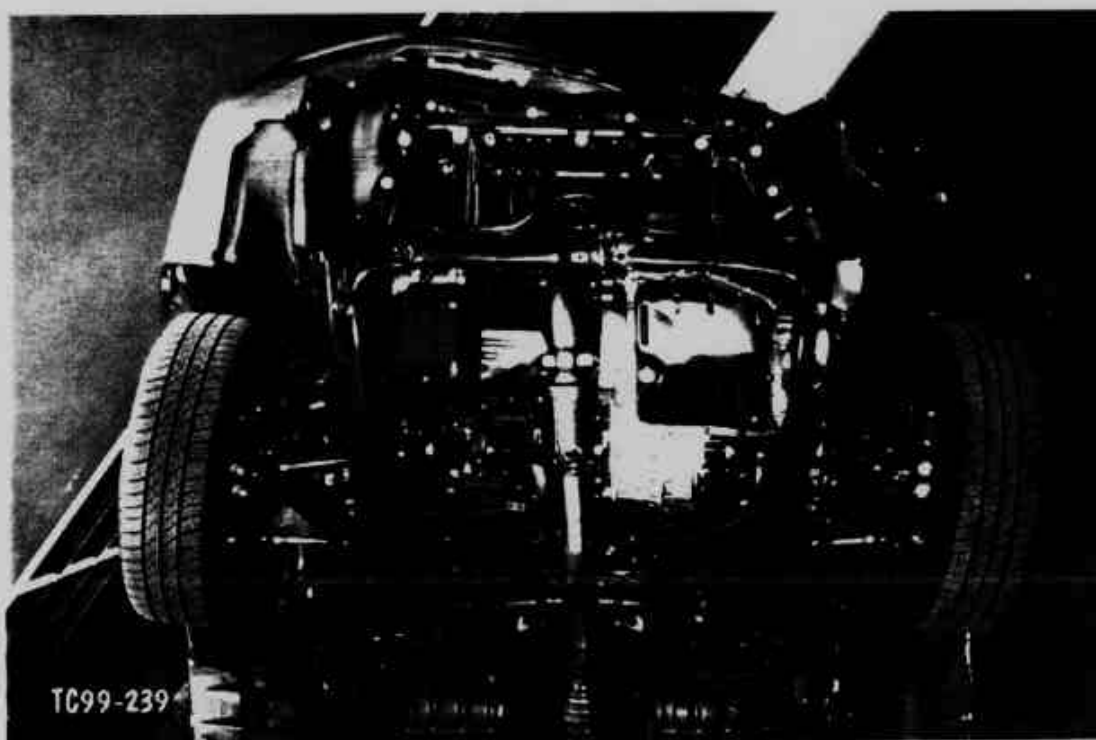


22. Vue du compartiment moteur du véhicule d'essai, après essai.
Engine compartment view of the test vehicle, post-test.

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23. Vue du dessous du compartiment moteur, avant essai.
Front underbody view of the test vehicle, pre-test.

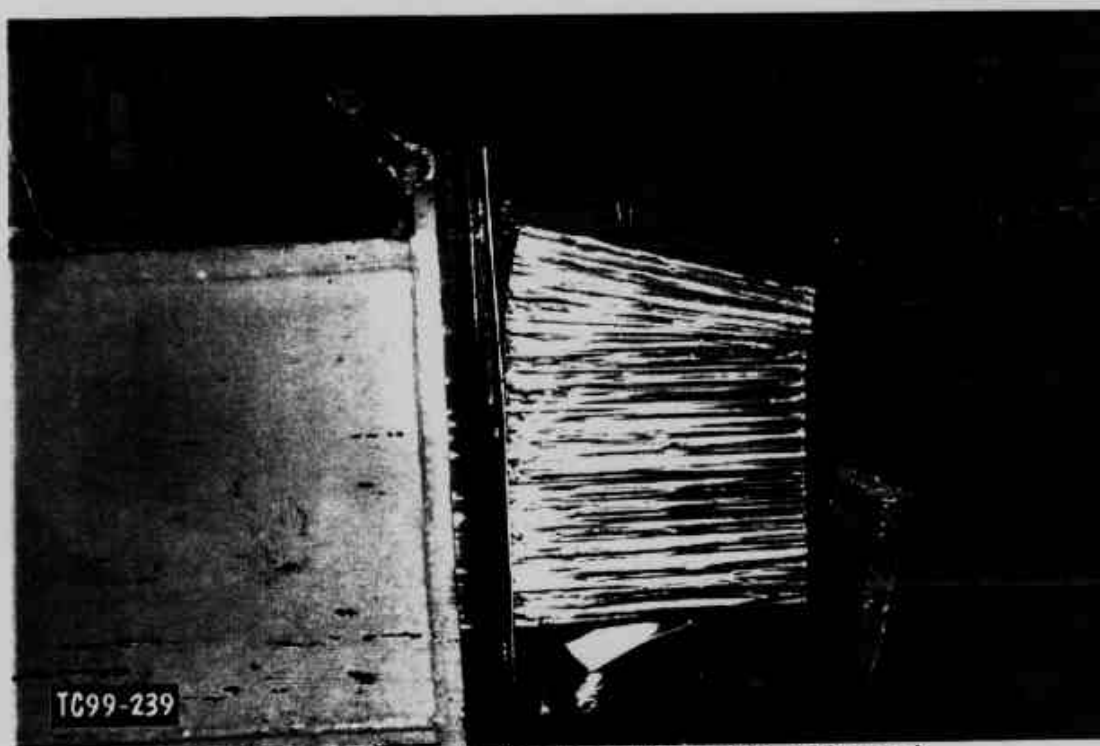


24. Vue du dessous du compartiment moteur, après essai.
Front underbody view of the test vehicle, post-test.

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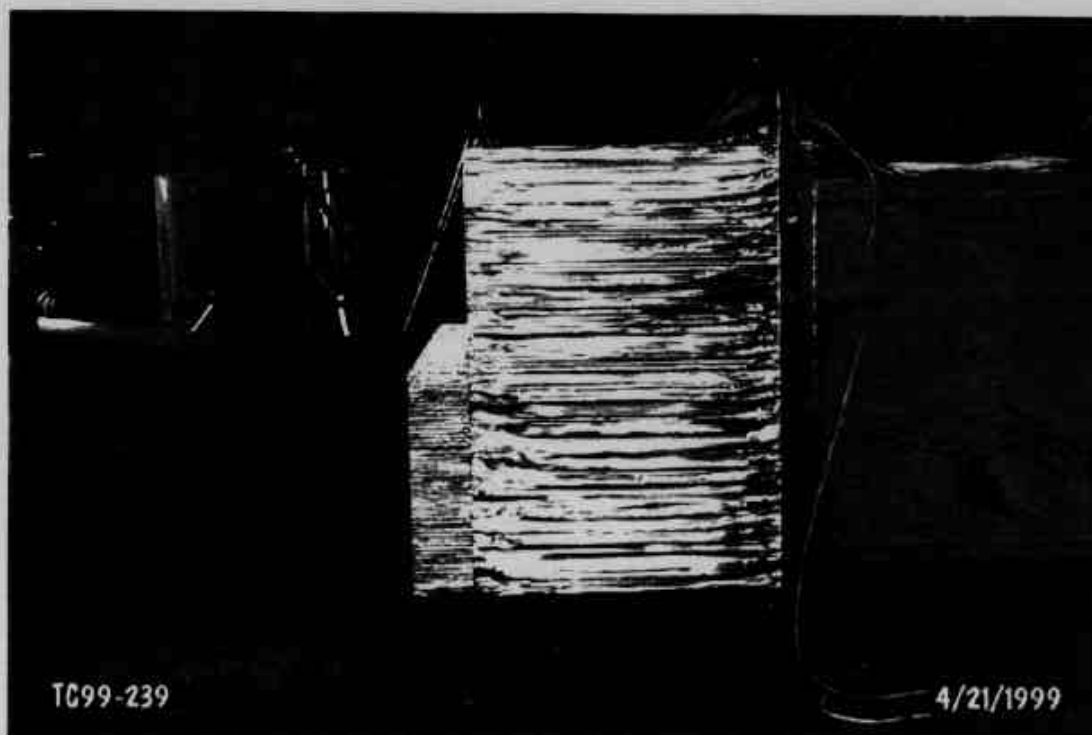


25. Vue du côté gauche de la face déformable, avant essai.
Left side view of the deformable face, pre-test.

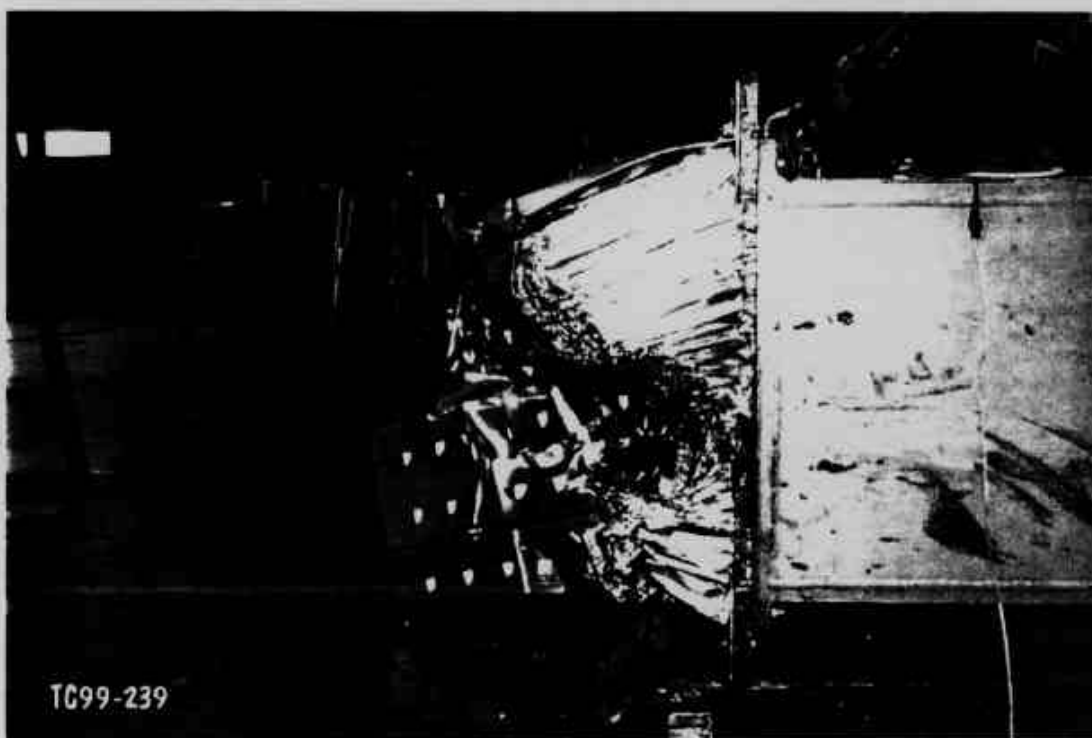


26. Vue du côté gauche de la face déformable, après essai.
Left side view of the deformable face, post-test.

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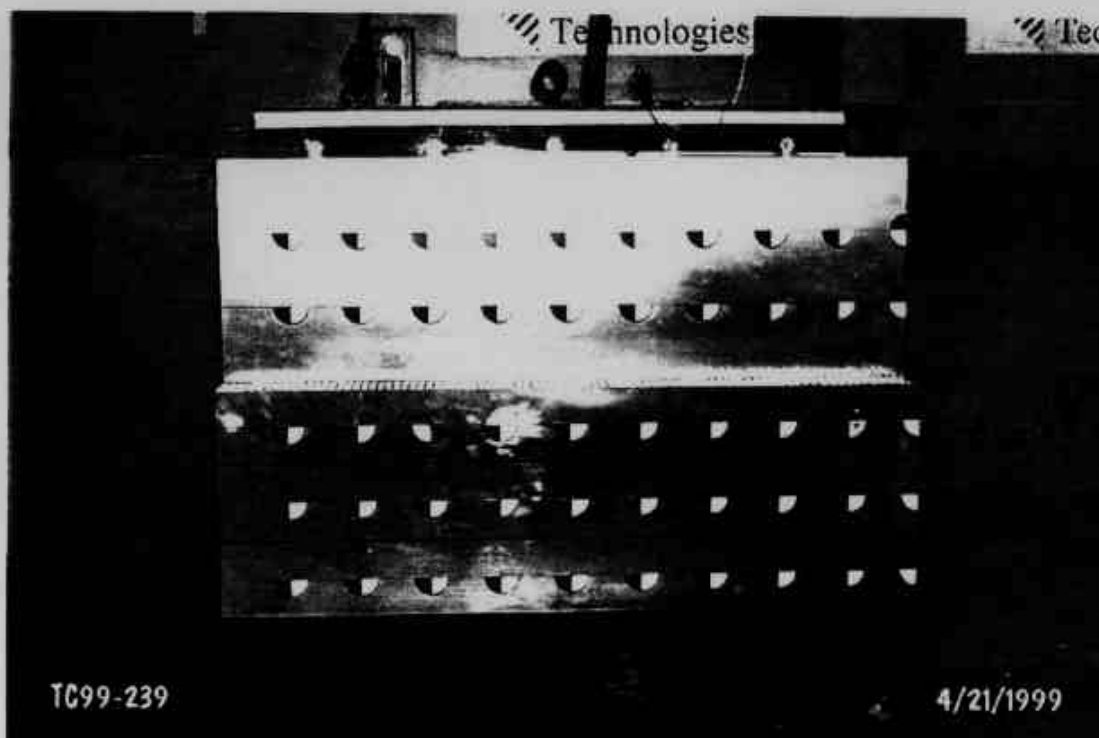


27. Vue du côté droit de la face déformable, avant essai.
Right side view of the deformable face, pre-test.



28. Vue du côté droit de la face déformable, après essai.
Right side view of the deformable face, post-test.

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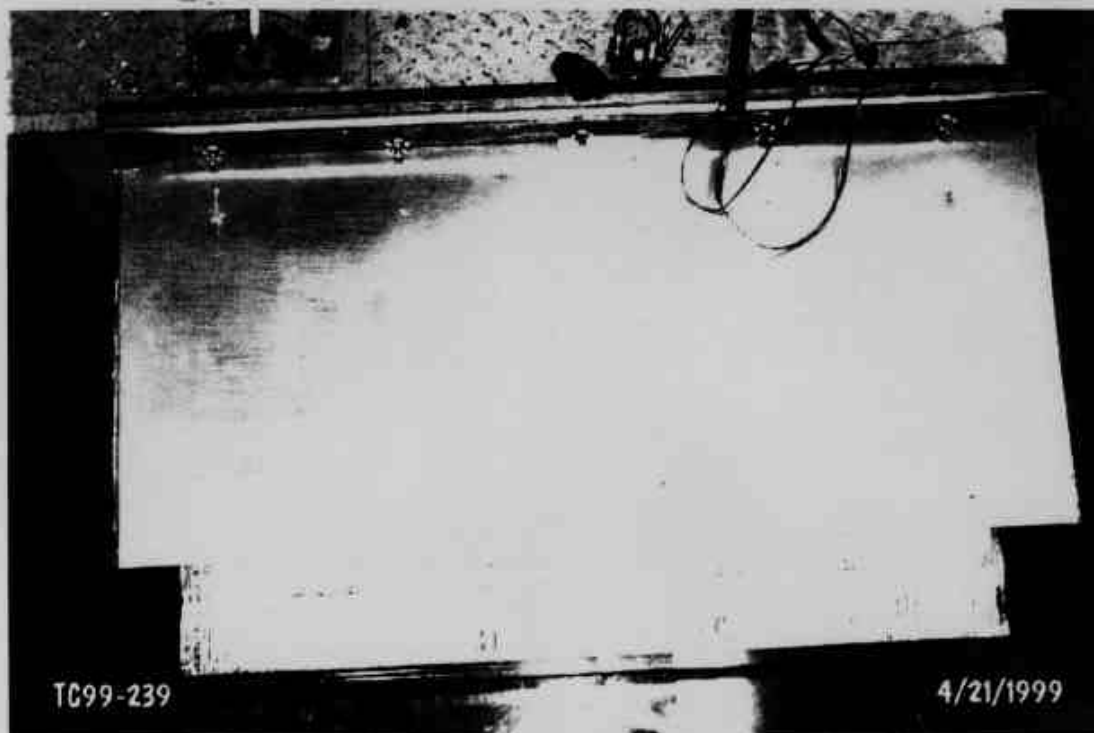


29. Vue de face de la face déformable, avant essai.
Front view of the deformable face, pre-test.

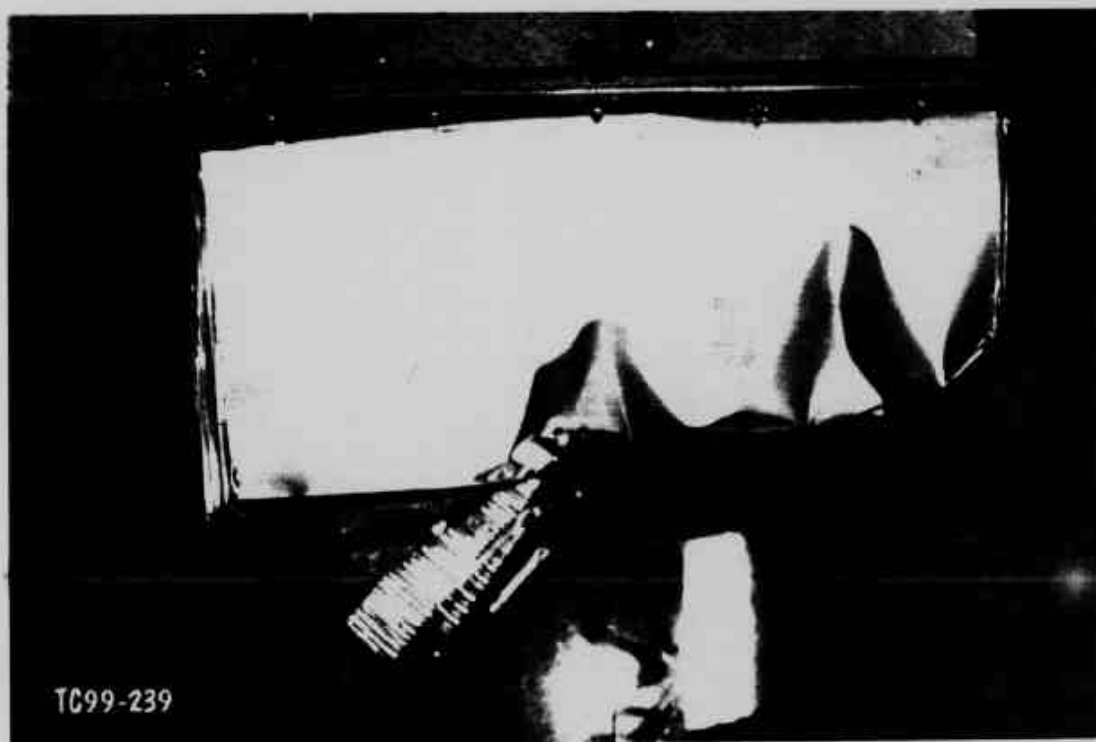


30. Vue de face de la face déformable, après essai.
Front view of the deformable face, post-test.

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31. Vue de plan de la face déformable, avant essai.
Plan view of the deformable face, pre-test.



32. Vue de plan de la face déformable, après essai.
Plan view of the deformable face, post-test.

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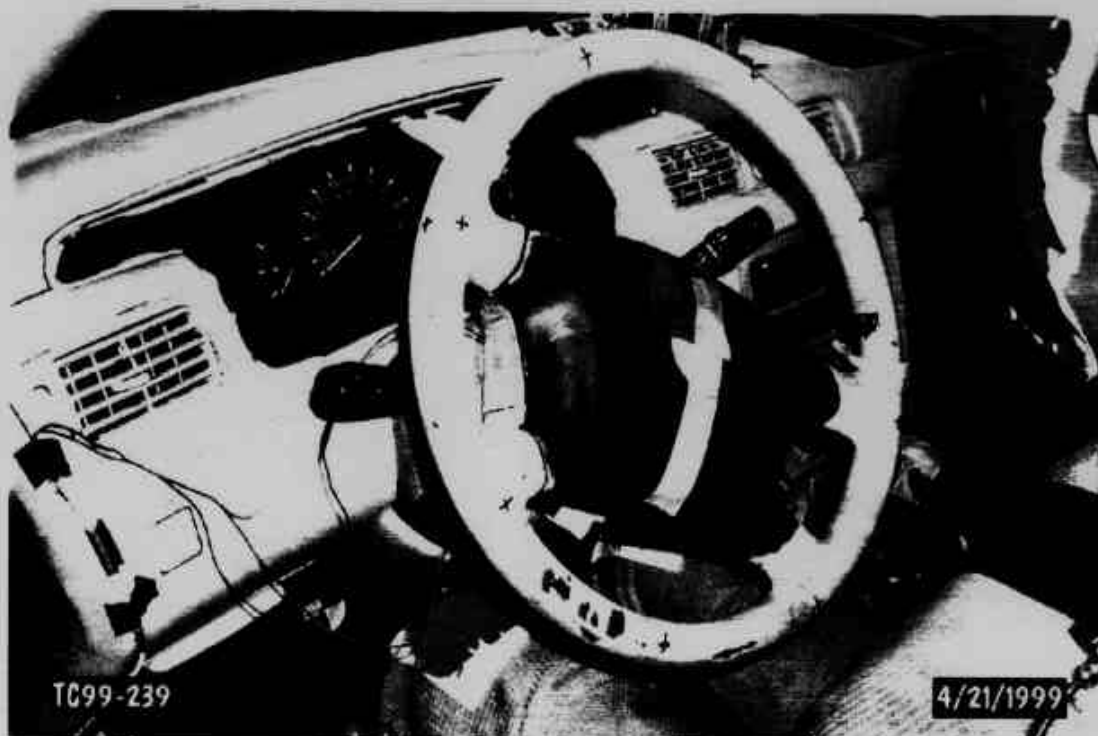


33. Position du conducteur, avant essai.
Driver's position, pre-test.



34. Position du conducteur, après essai.
Driver's position, post-test.

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35. Point de contact de tête du conducteur, après essai.
Driver's head contact point, post-test.



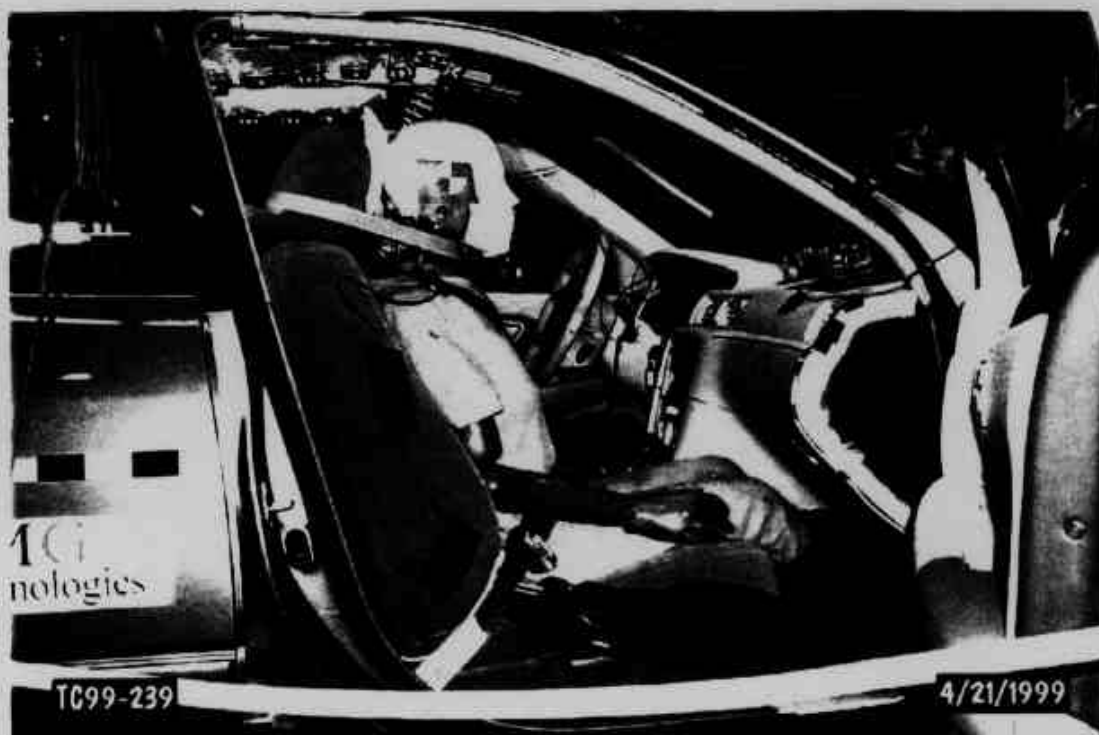
36. Point de contact de tête du conducteur, après essai.
Driver's head contact point, post-test.

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37. Point de contact des genoux du conducteur, après essai.
Driver's knee contact points, post-test.

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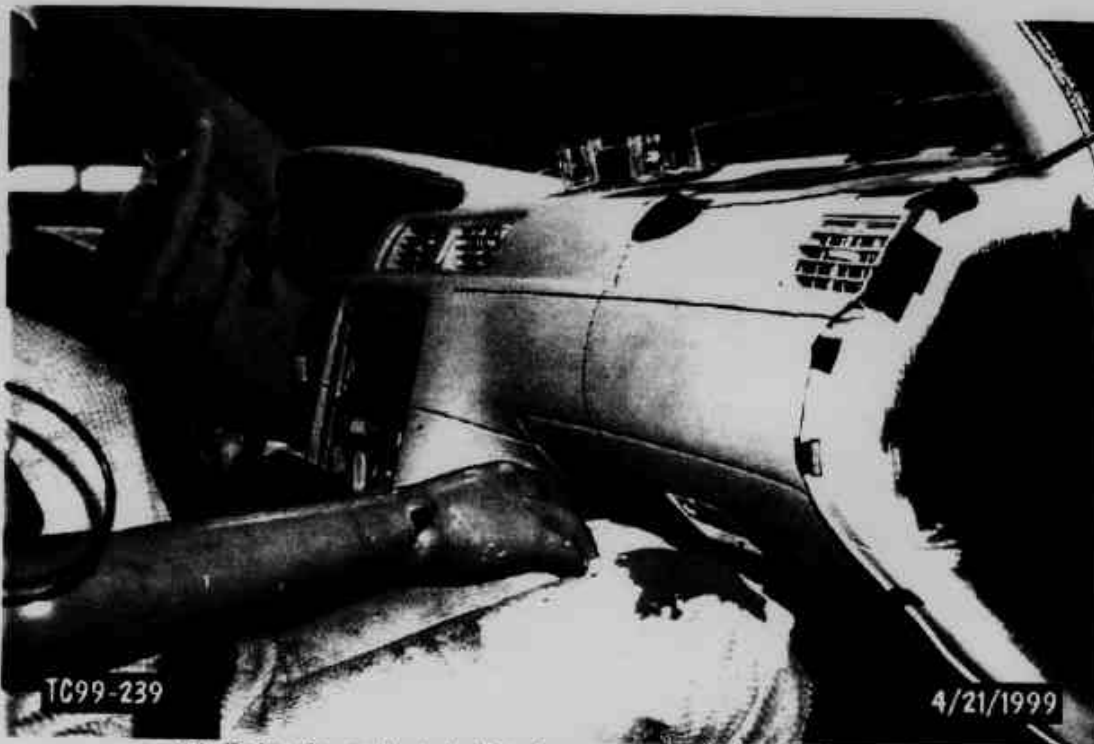


38. Position du passager, avant essai.
Passenger's position, pre-test.



39. Position du passager, après essai.
Passenger's position, post-test.

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40. Point de contact de tête du passager, après essai.
Passenger's head contact point, post-test.



41. Point de contact de tête du passager, après essai.
Passenger's head contact point, post-test.

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42. Point de contact des genoux du passager, après essai.
Passenger's knee contact points, post-test.

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43. Position du passager arrière gauche, avant essai.
Left rear passenger's position, pre-test.



44. Position du passager arrière gauche, après essai.
Left rear passenger's position, post-test.

Date de collision Crash date	1999-04-21	Véhicule Vehicle	TOYOTA CAMRY CE 1999	T.C. N° T.C. No	99-239
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45. Affichage du lecteur de vitesse.
Speed trap reading.

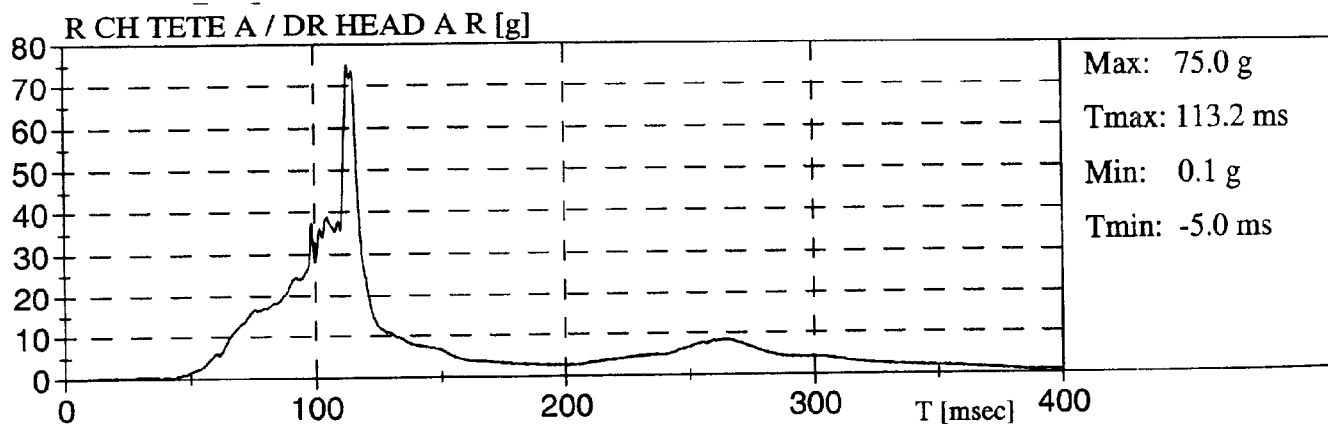
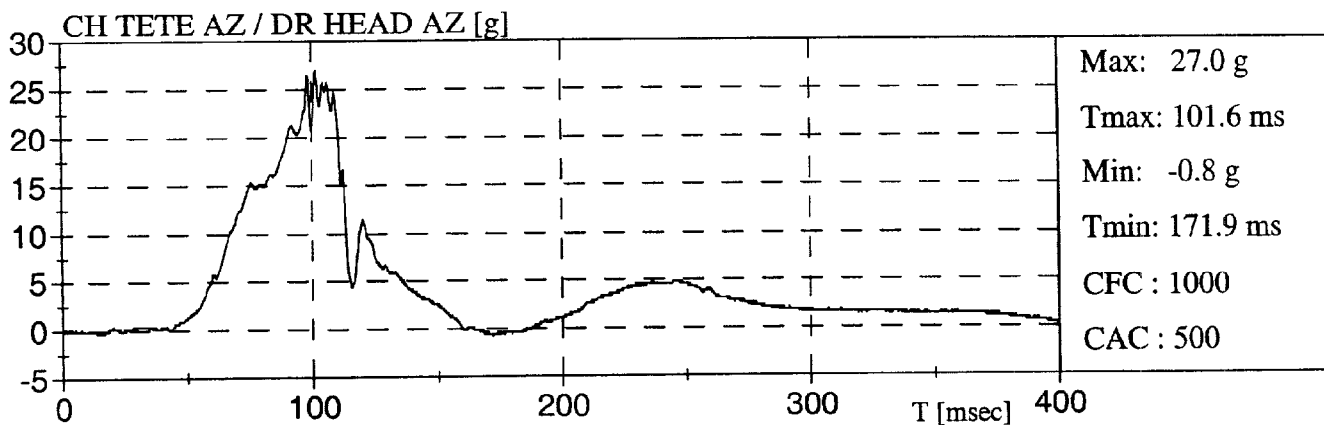
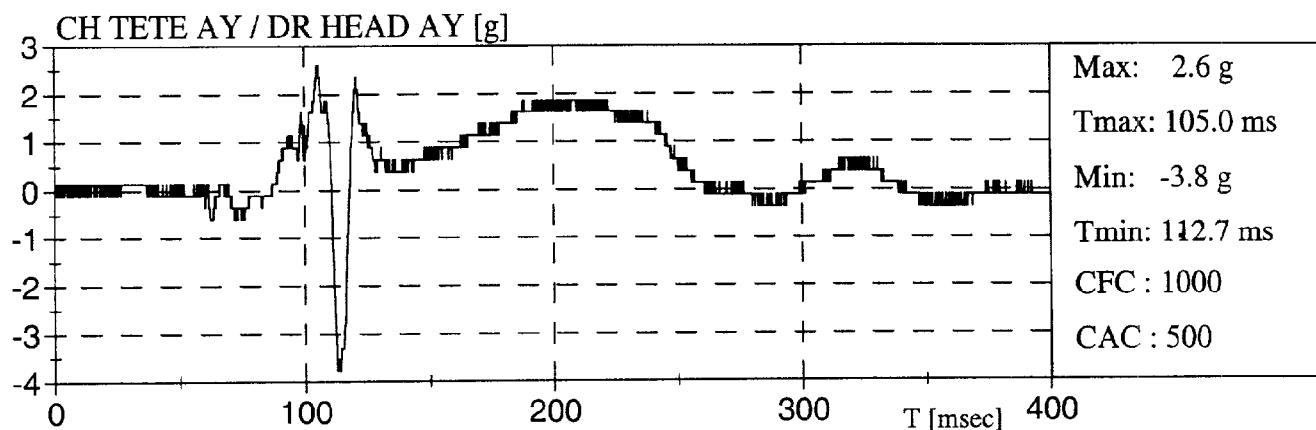
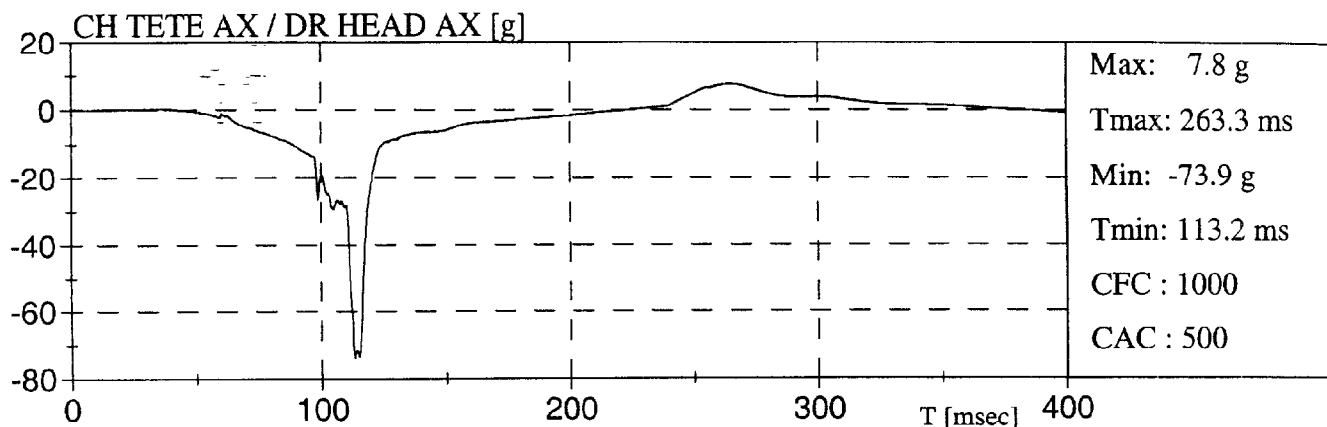


APPENDICE / APPENDIX B

DONNÉES GRAPHIQUES GRAPHICAL DATA

— — —

Nom du client**Client Name****TRANSPORTS CANADA****Type de véhicule****Type of Vehicle****TOYOTA CAMRY 99****Numéro de TC****Tc Number****TC99-239****Numéro de contrat****Contract No****00-5001****Acquisition de données selon****Data Acquisition according to****SAE J211/1 MAR 95****Date de l'essai****Test date****1999-04-21****Titre du projet****Project Title****COLLISIONS DE RECHERCHE CONJOINTE TC/NHTSA 98/99
FRONTALE DÉCALÉE 40 KM/H - 40% GAUCHE****98/99 TC/NHTSA JOINT RESEARCH COLLISION TESTS
OFFSET FRONTAL 40 KM/H - 40% LEFT****MANNEQUIN / DUMMY****Chauffeur****Driver****HYBRID III 5% Femelle / Female****Passager****Passenger****HYBRID III 5% Femelle / Female****Passager 1 (arrière gauche)****Passenger 1 (rear left)****HYBRID III 3Y**





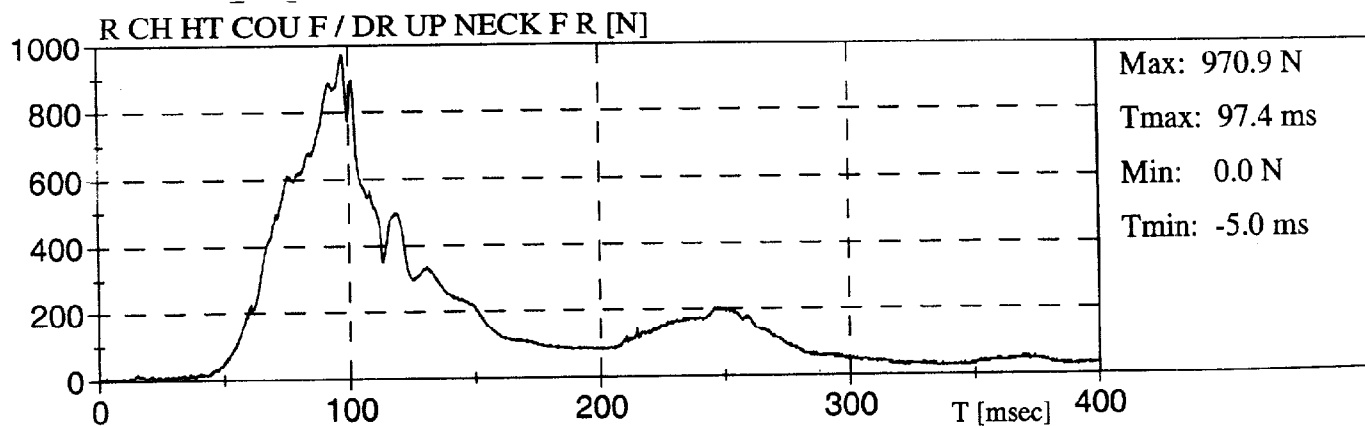
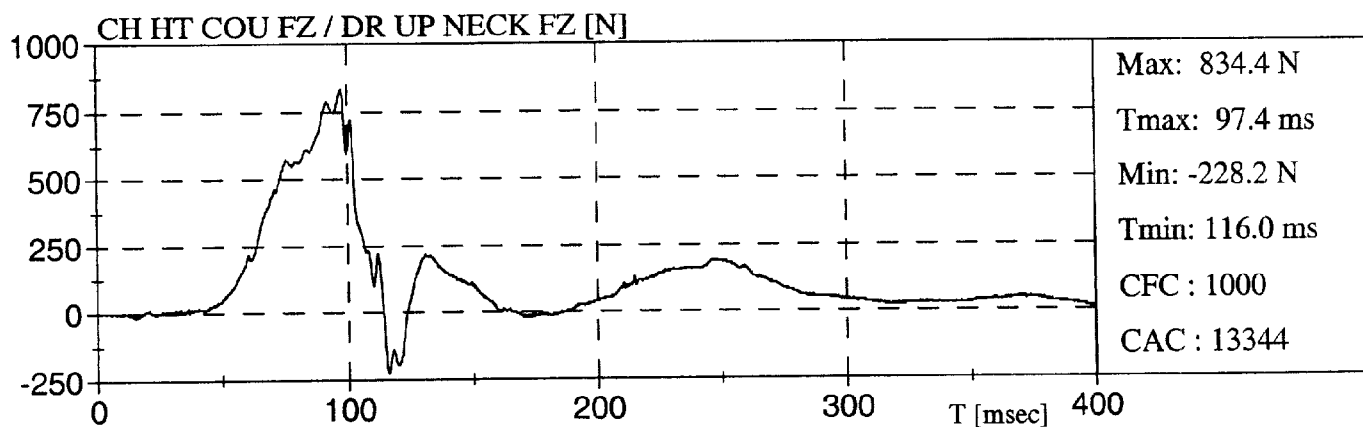
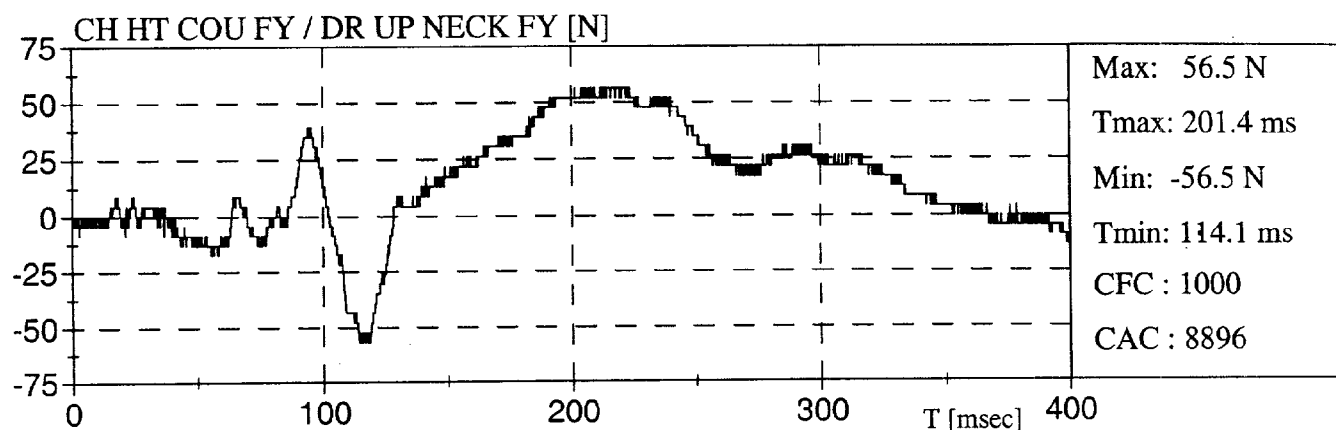
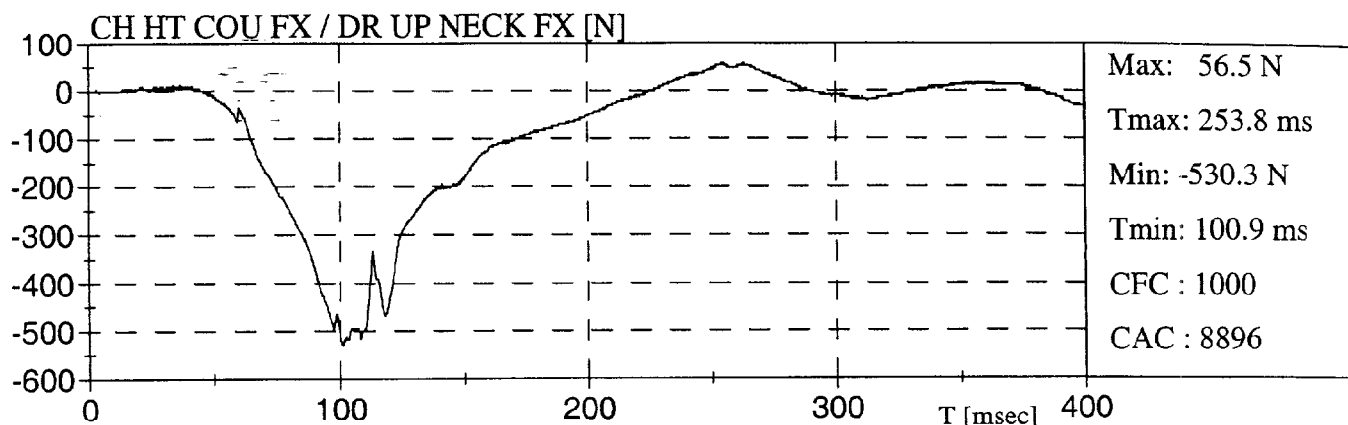
PMG
Technologies

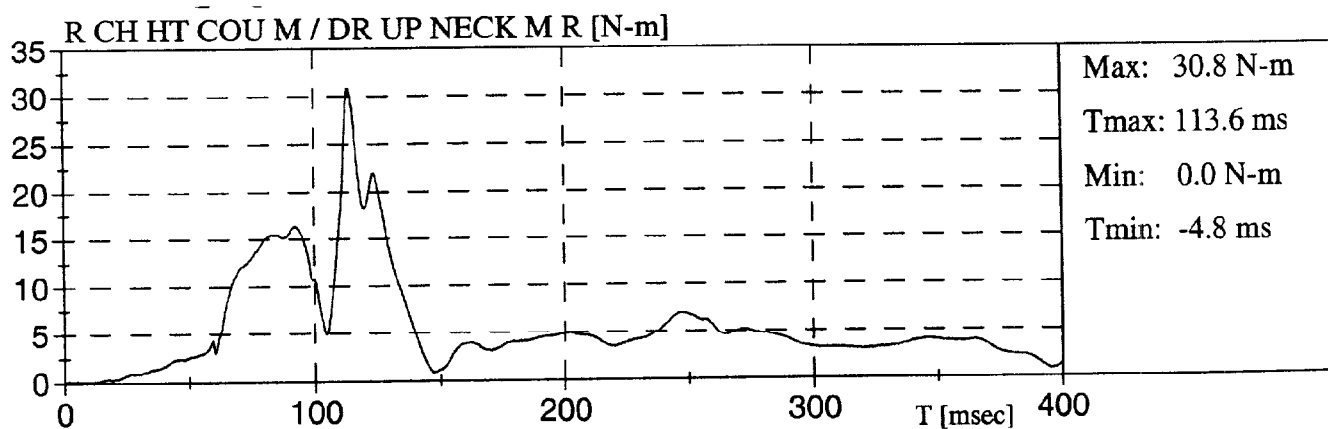
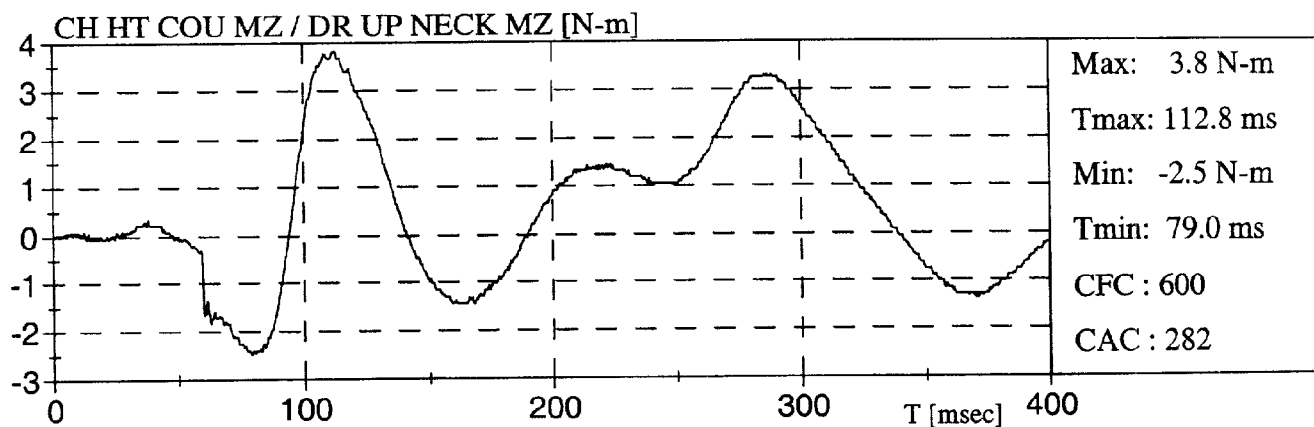
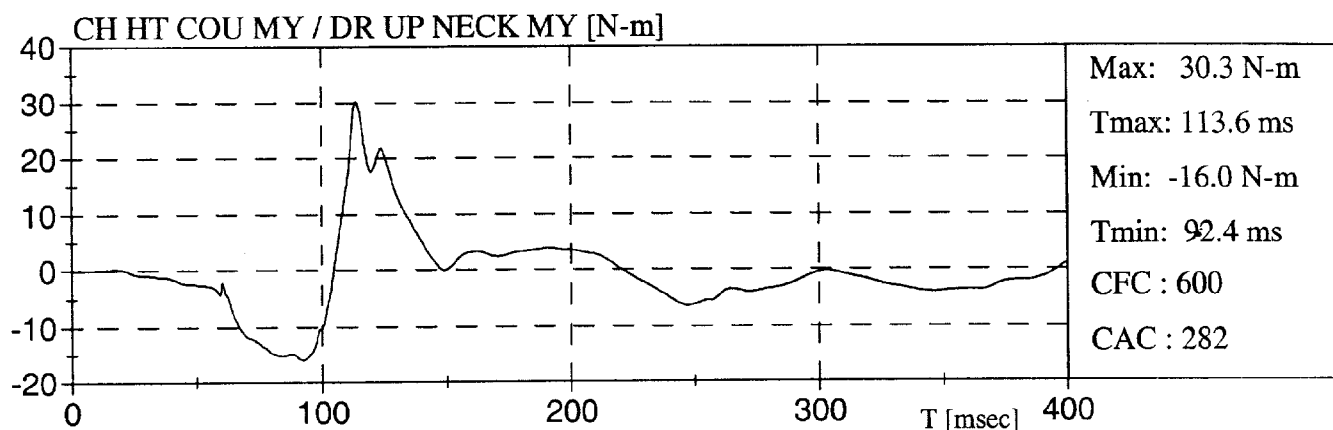
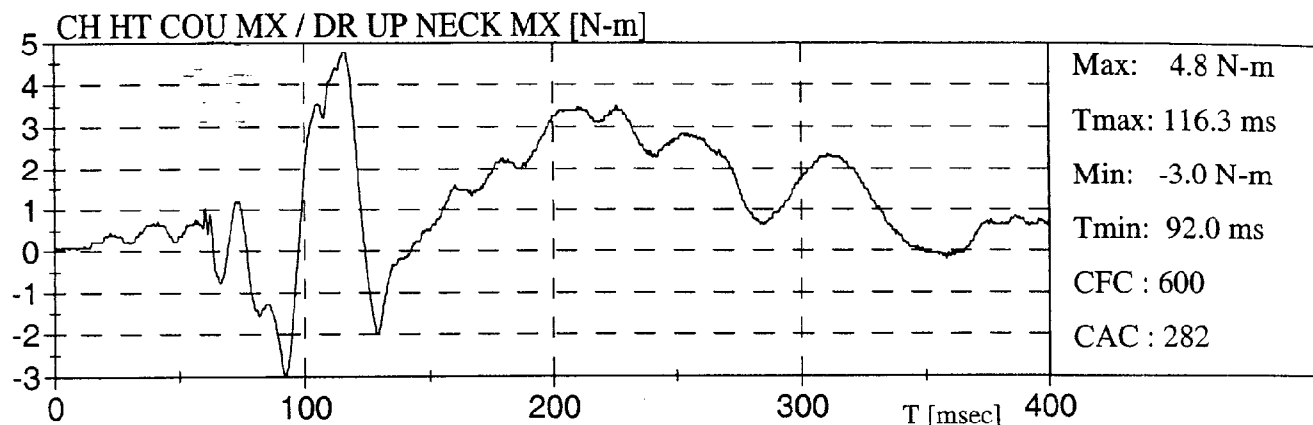
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OFFSET FRONTAL 40 KM/H - 40% LEFT

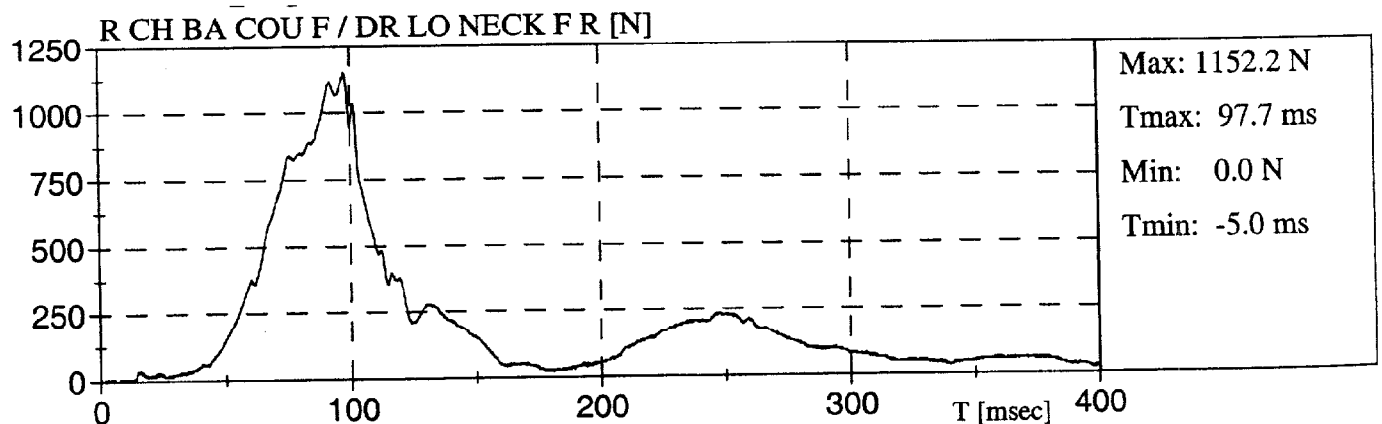
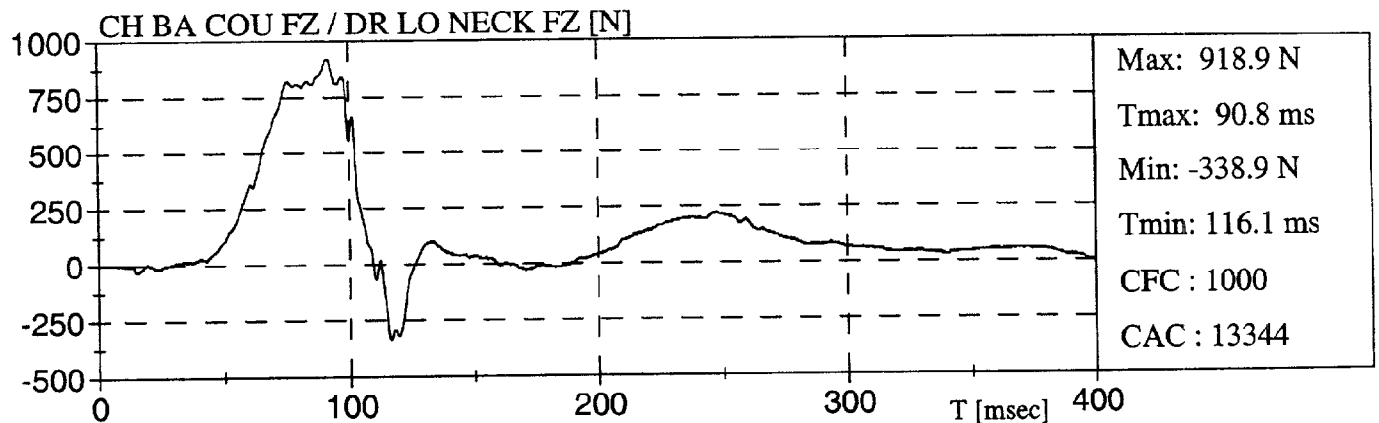
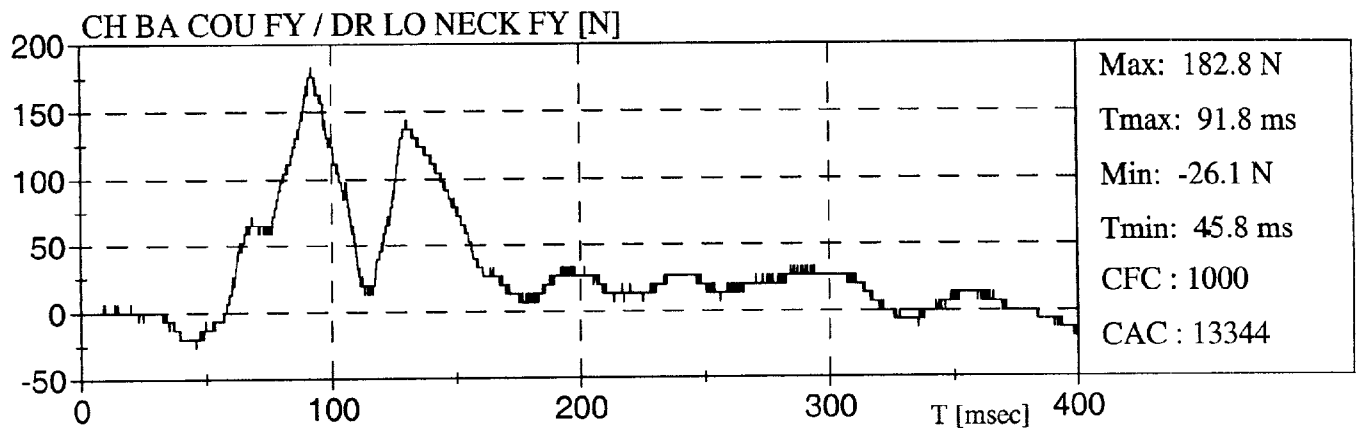
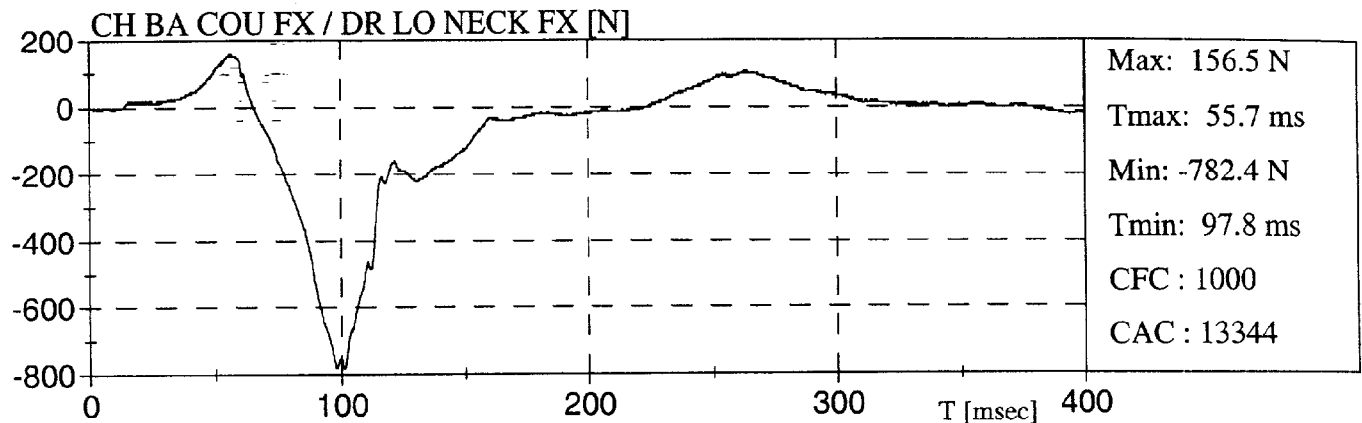
TOYOTA CAMRY 99

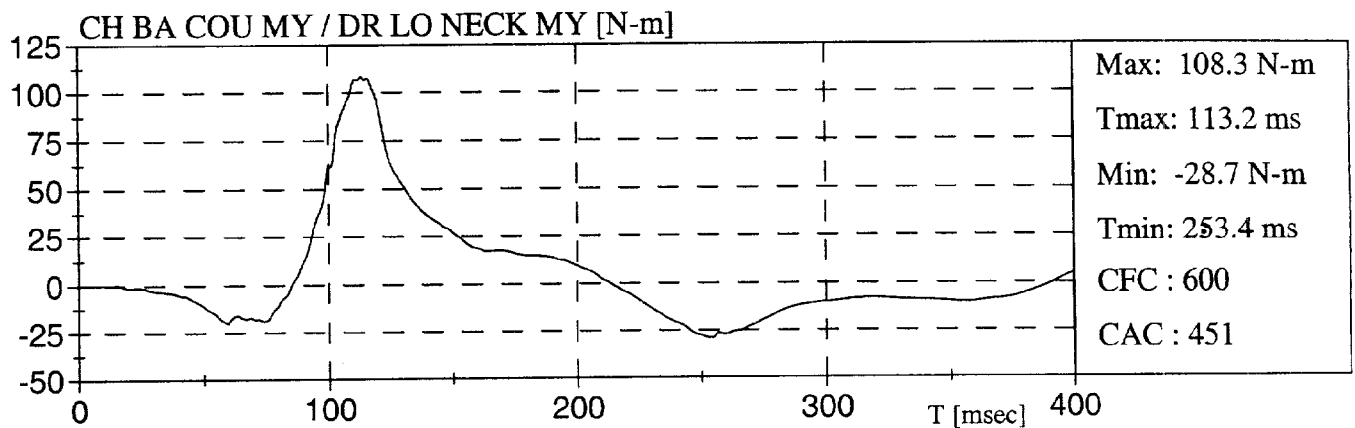
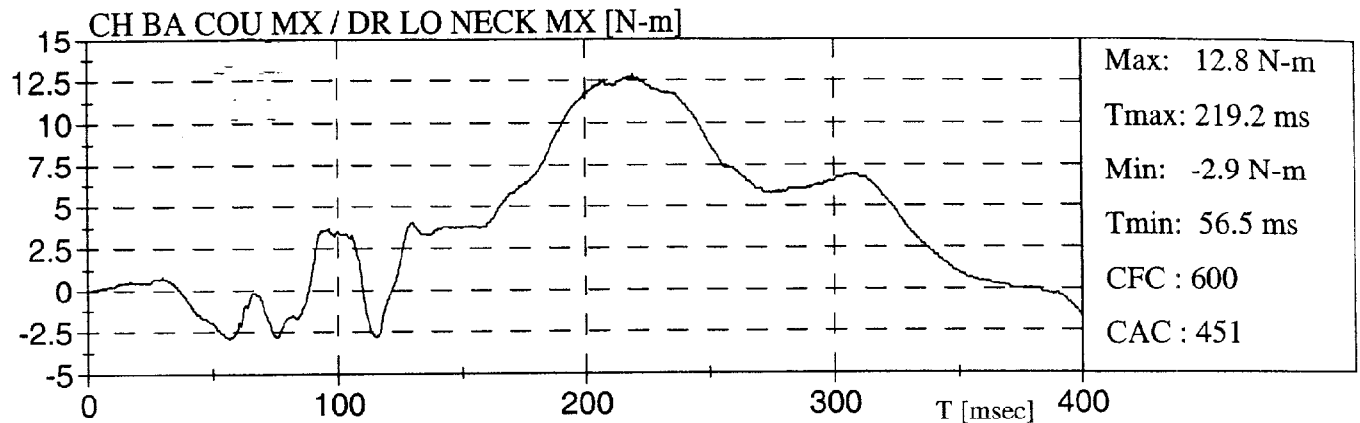
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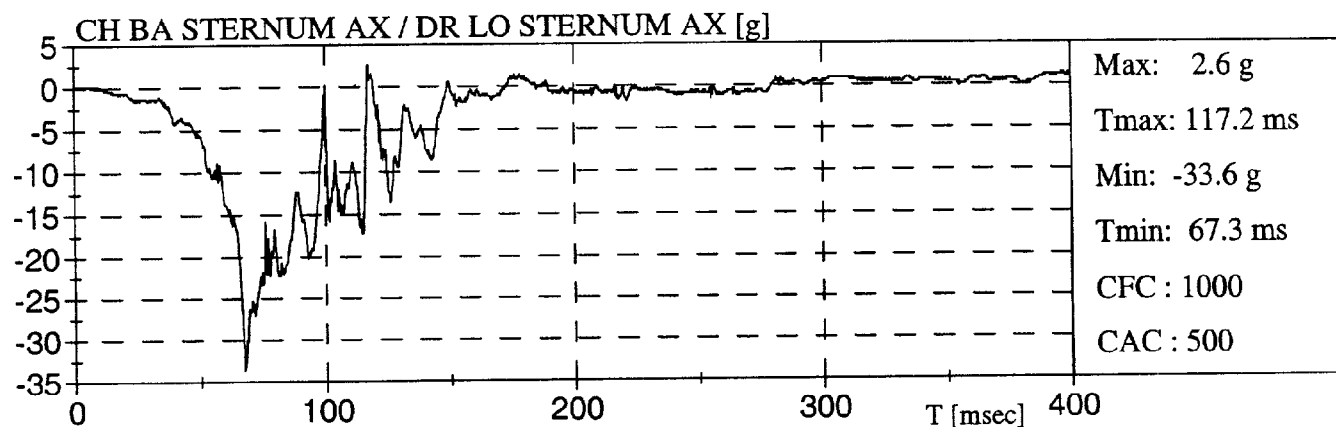
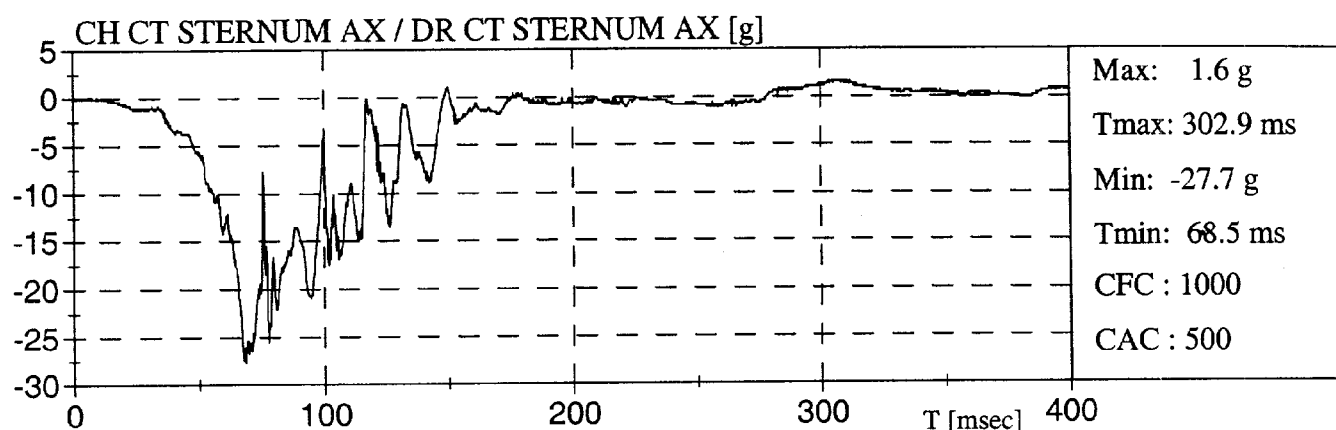
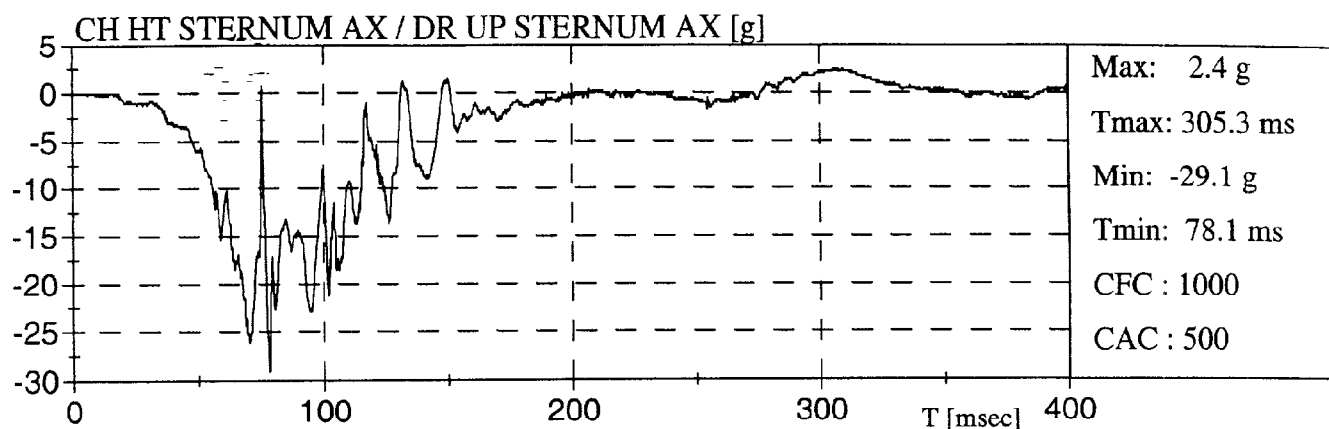
N° TC / TC No.: TC99-239

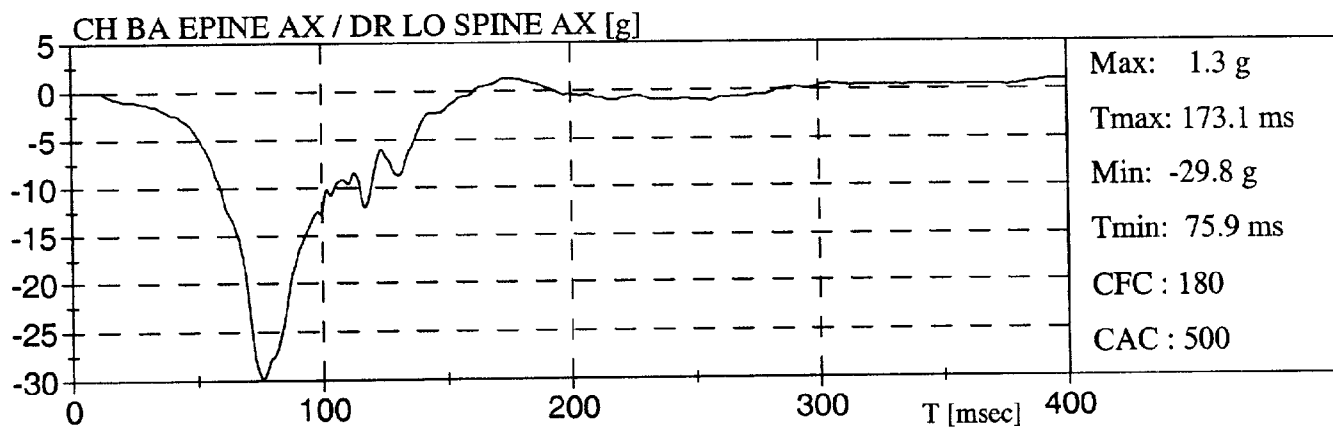
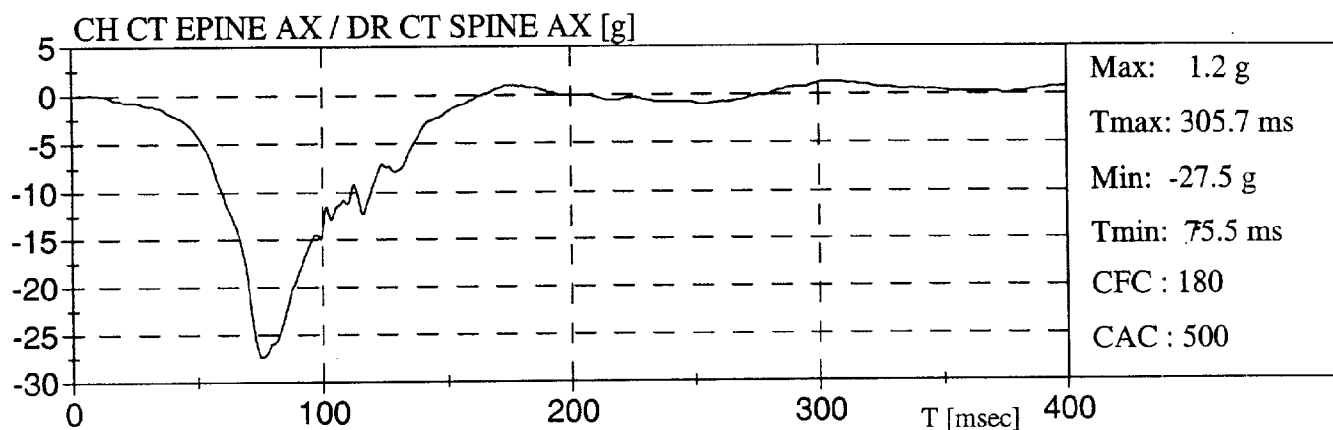
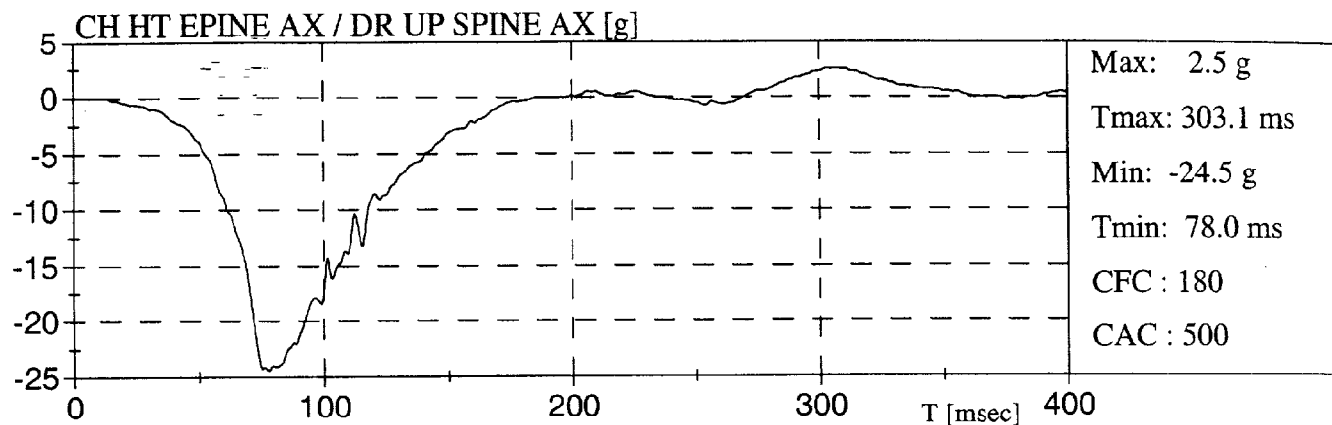














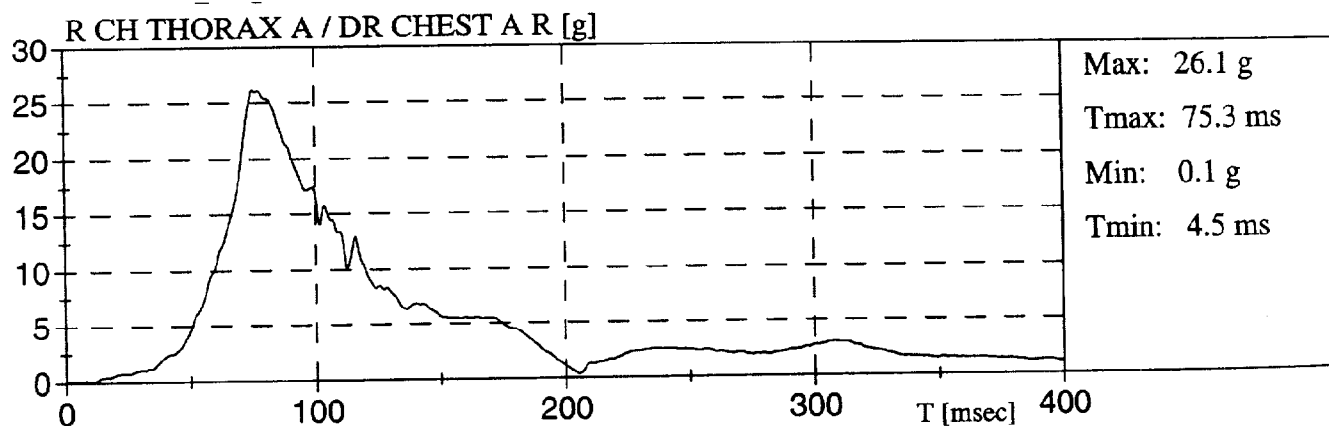
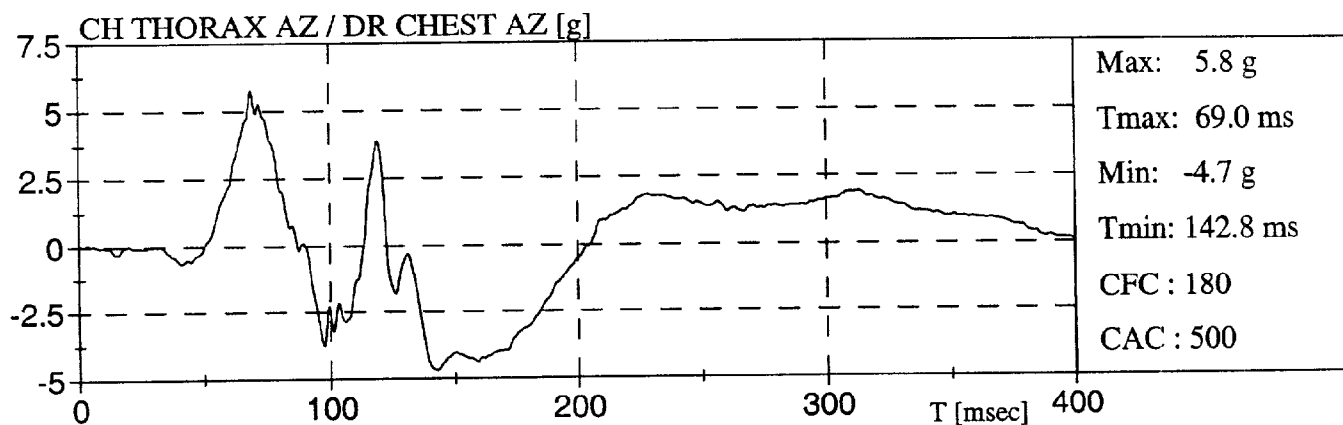
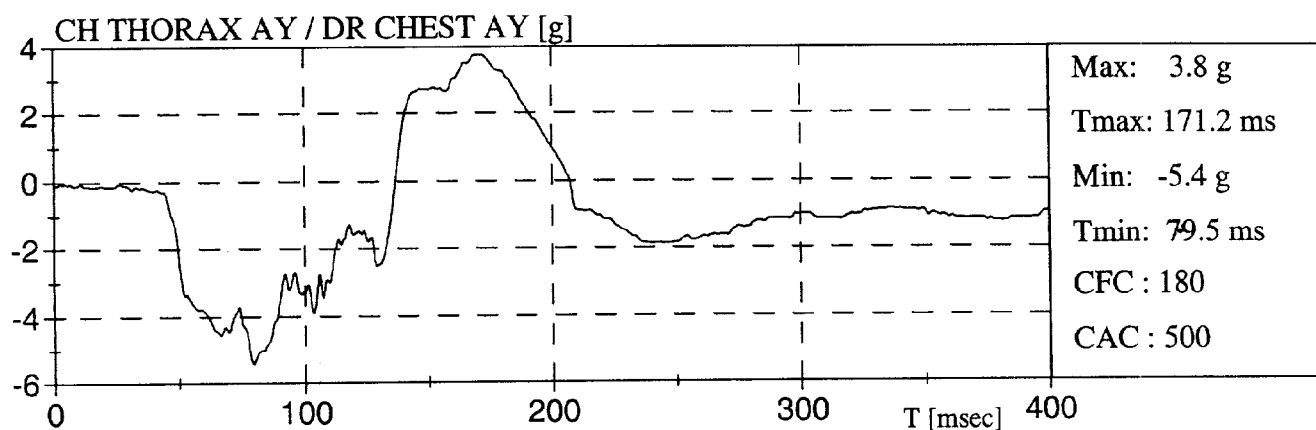
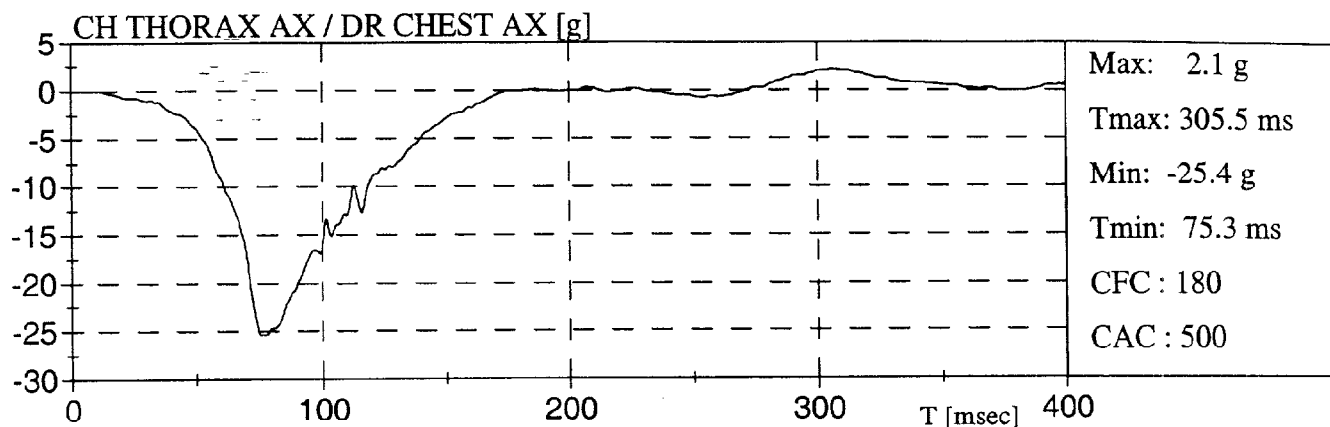
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FRONTALE DÉCALÉE 40 KM/H - 40% GAUCHE
OFFSET FRONTAL 40 KM/H - 40% LEFT

TOYOTA CAMRY 99

Date: 1999-04-21

N° TC / TC No.: TC99-239





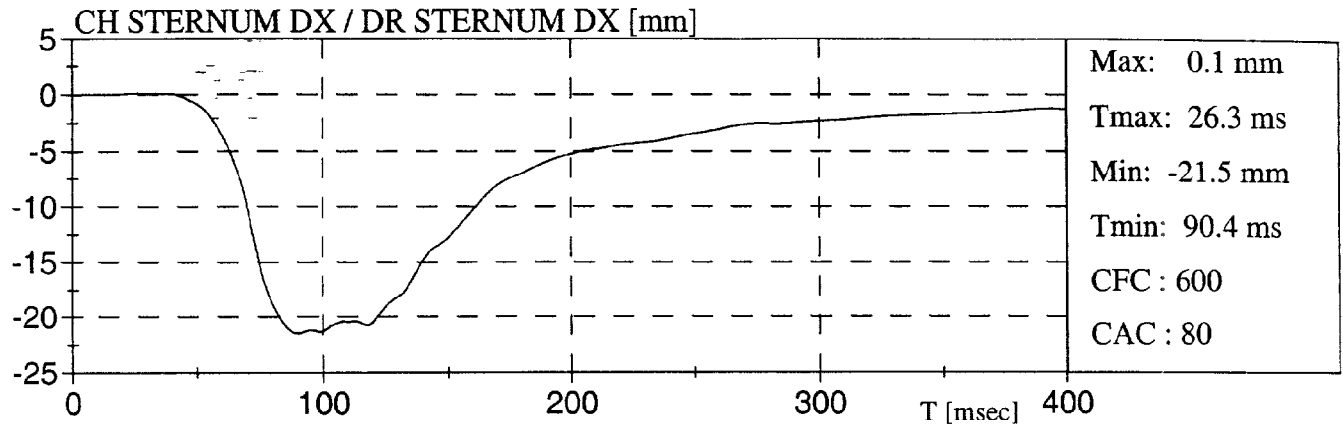
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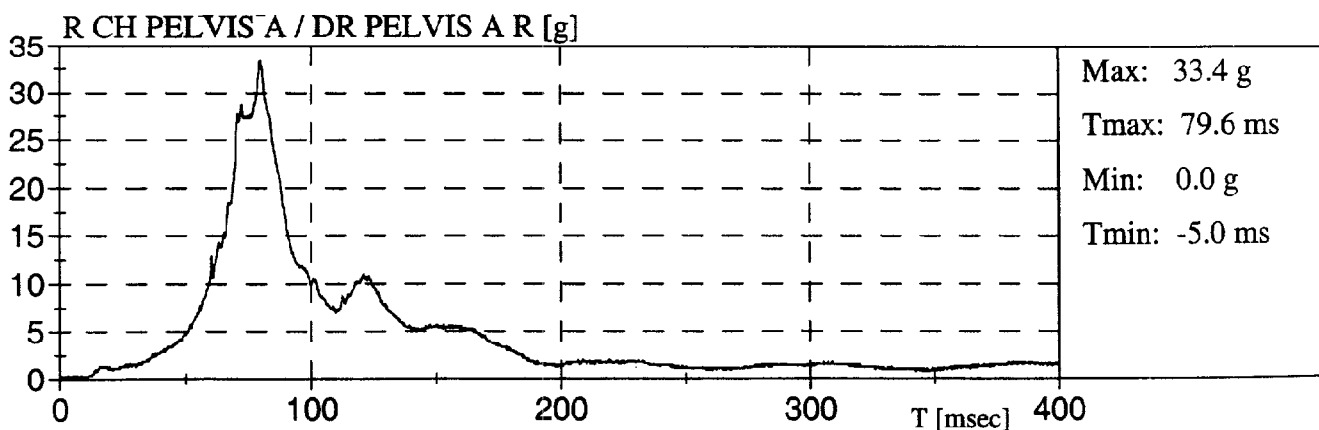
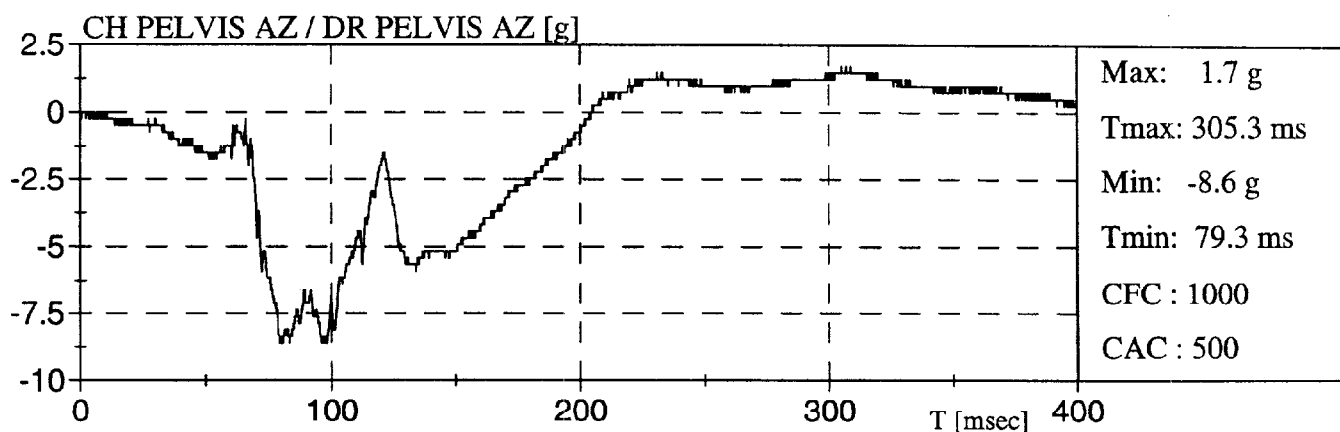
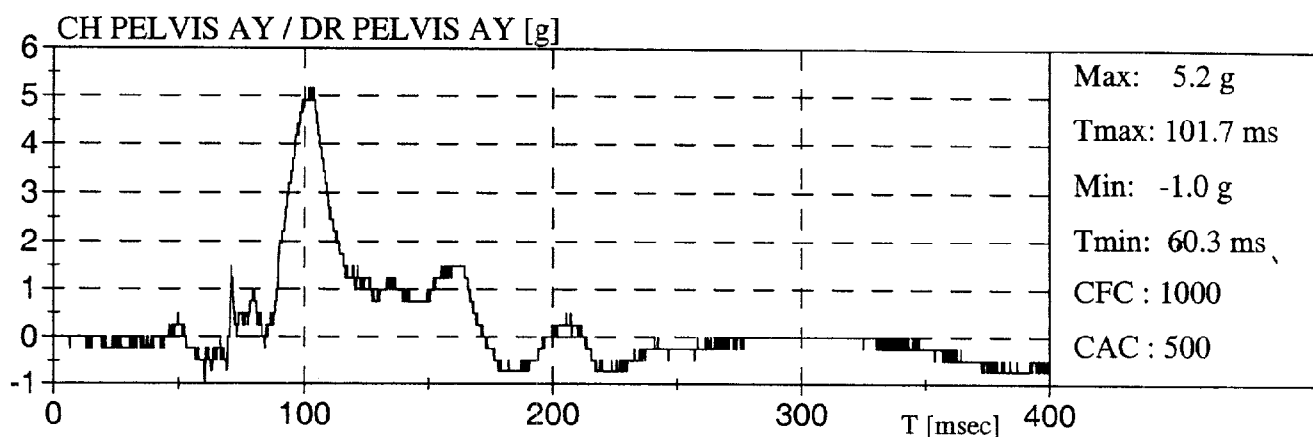
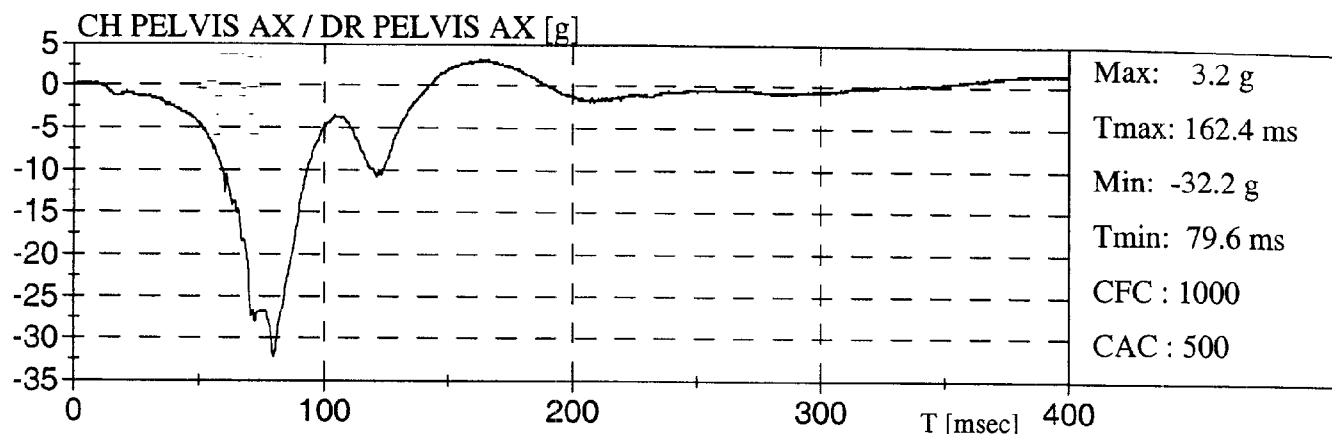
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Date: 1999-04-21

TOYOTA CAMRY 99

N° TC / TC No.: TC99-239







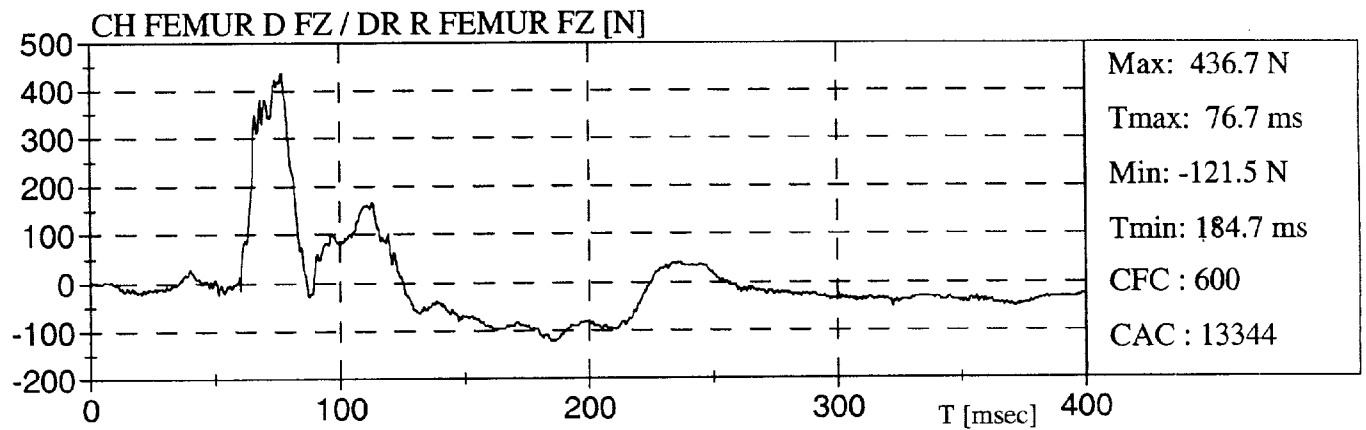
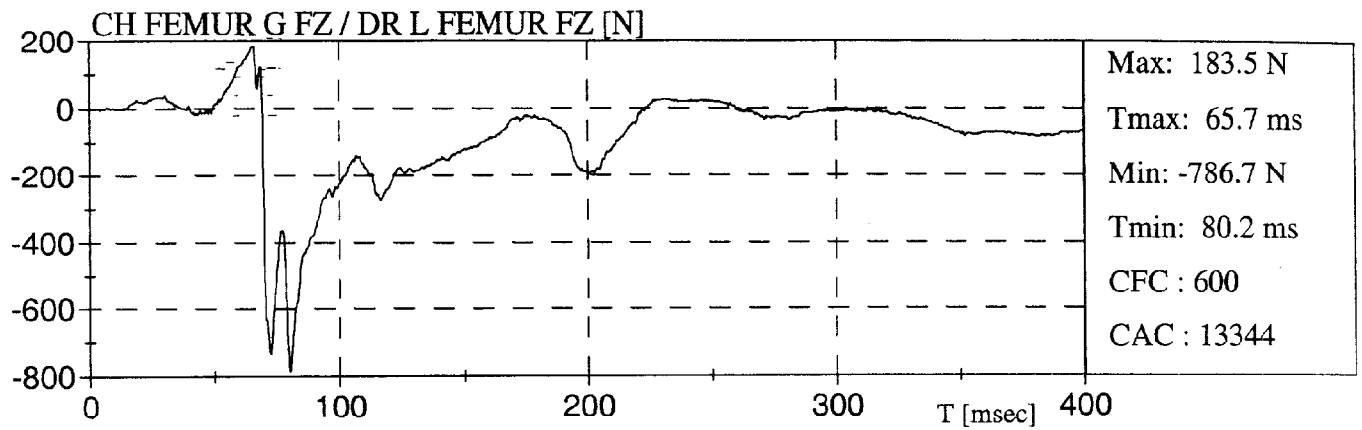
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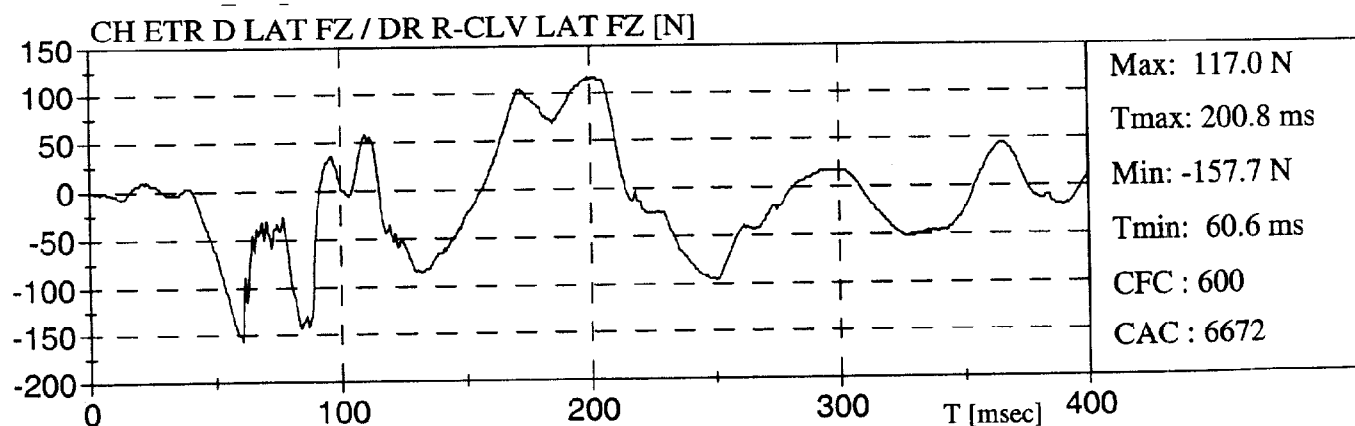
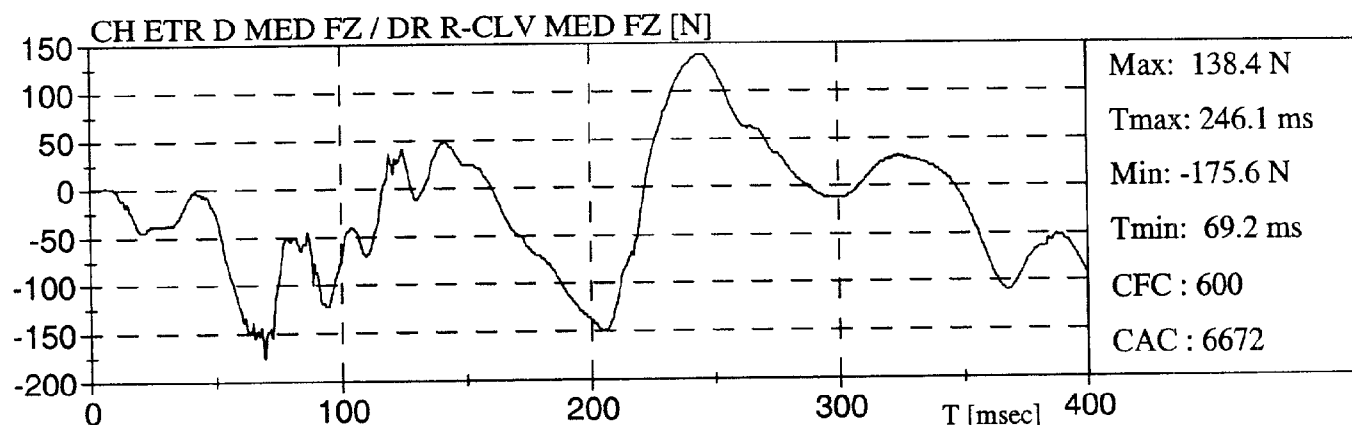
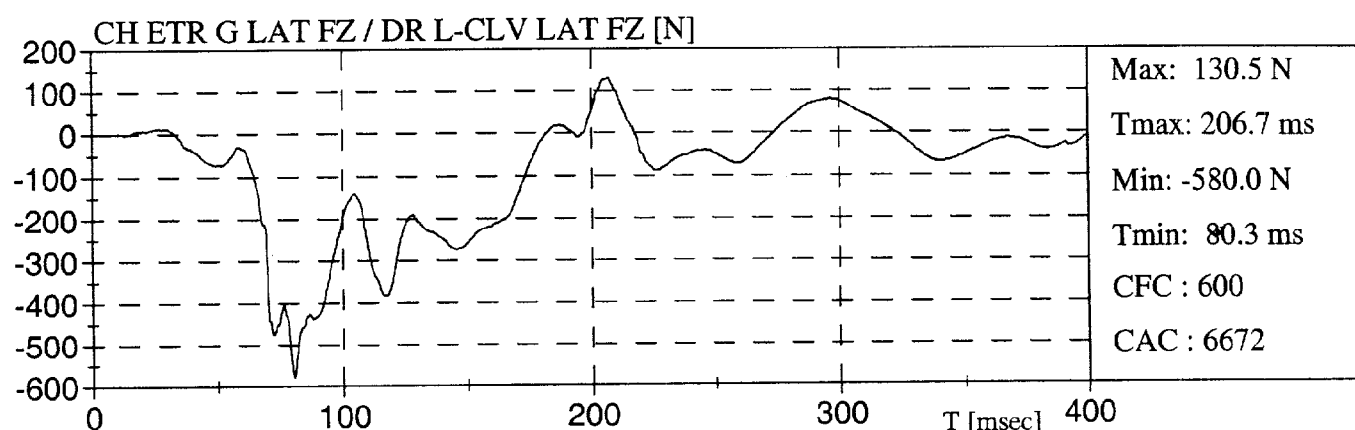
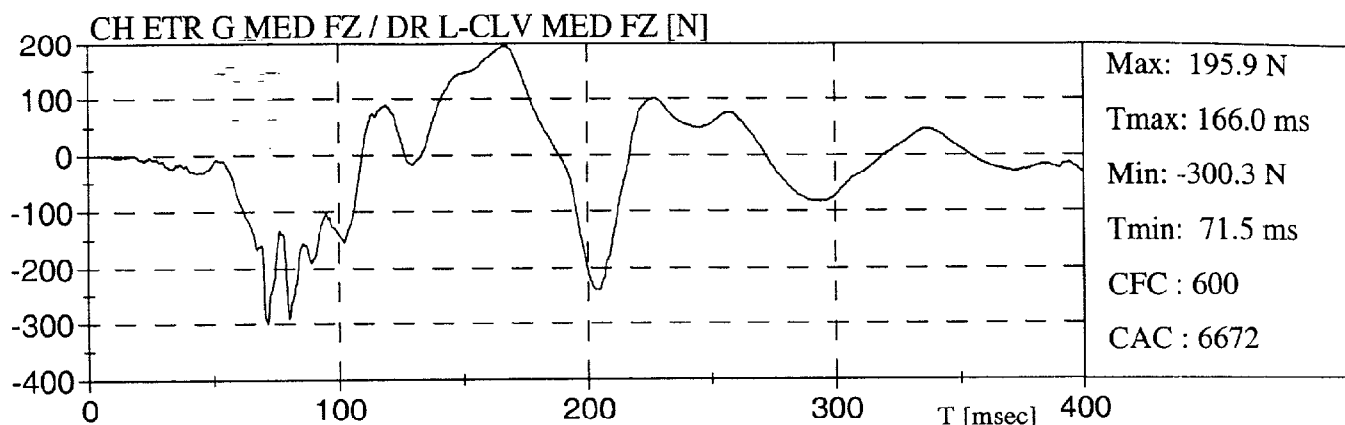
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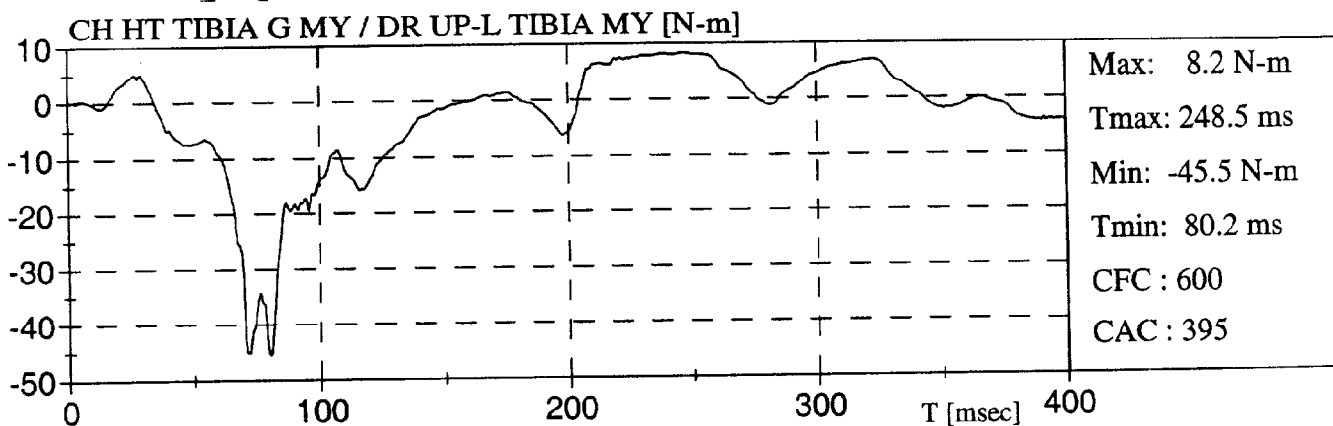
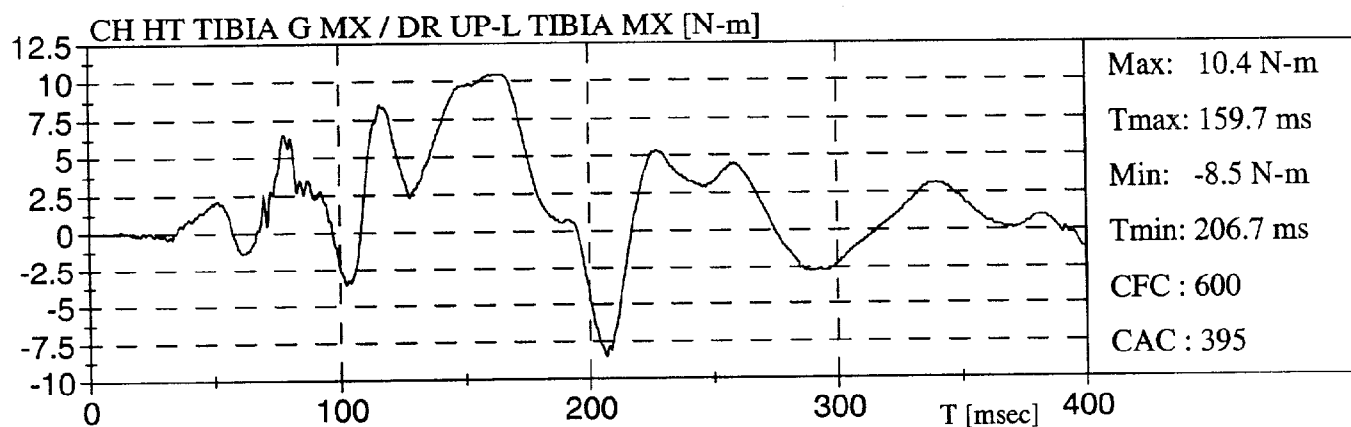
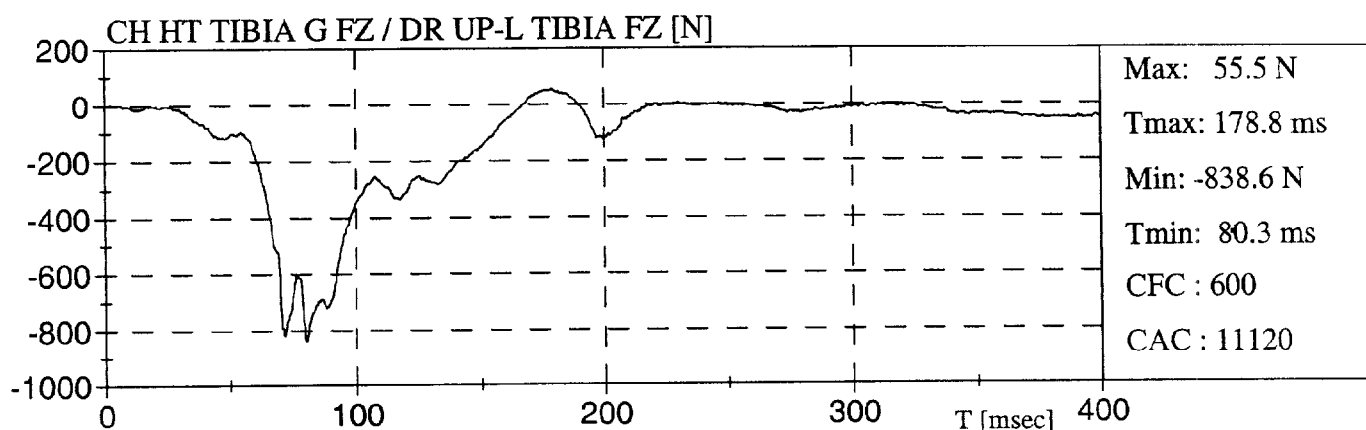
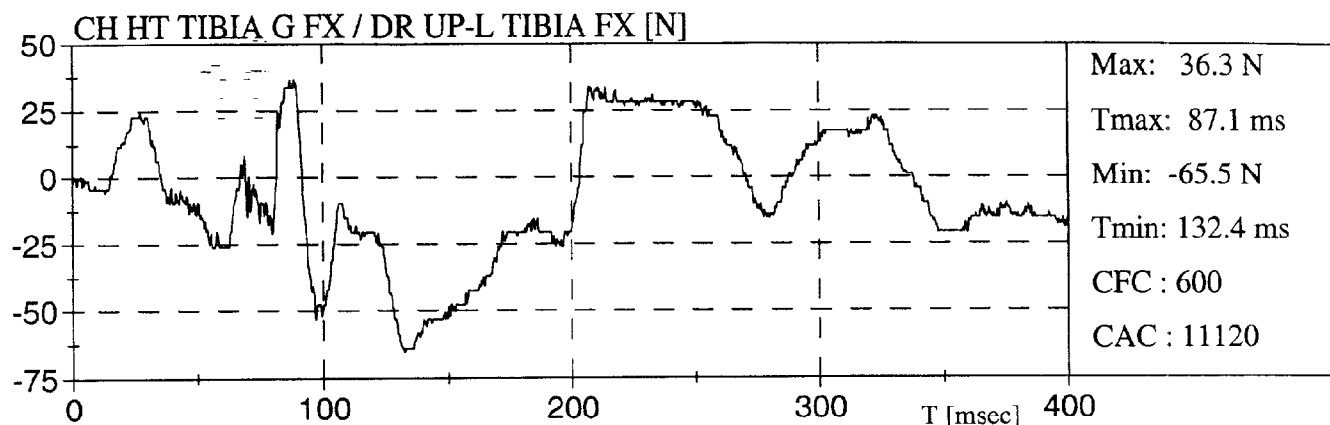
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Date: 1999-04-21

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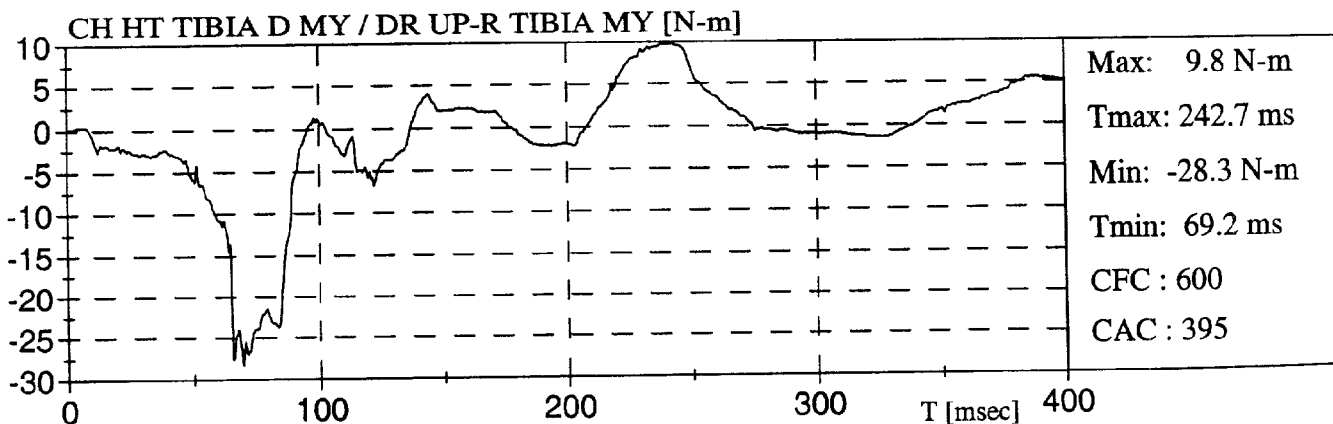
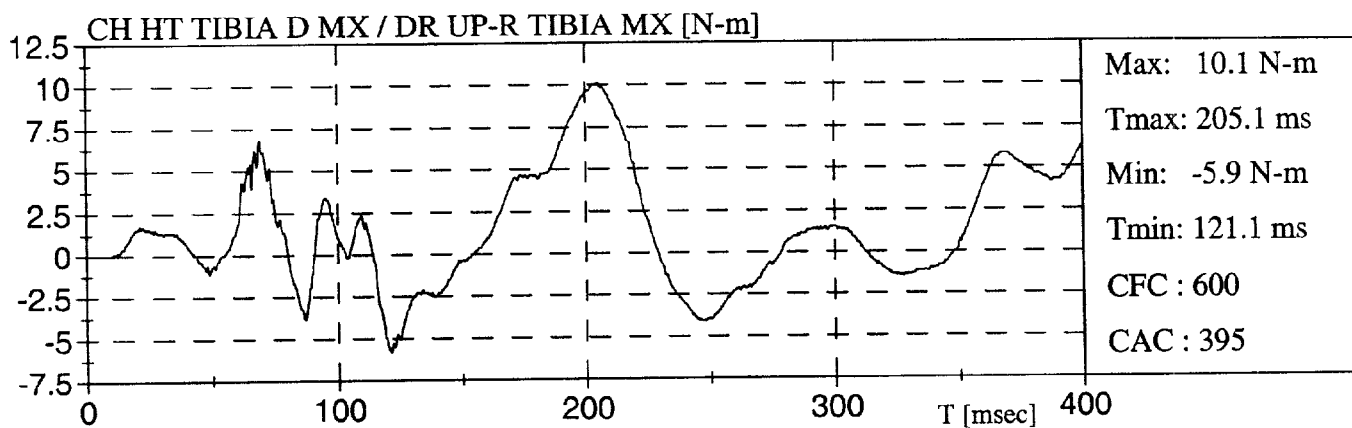
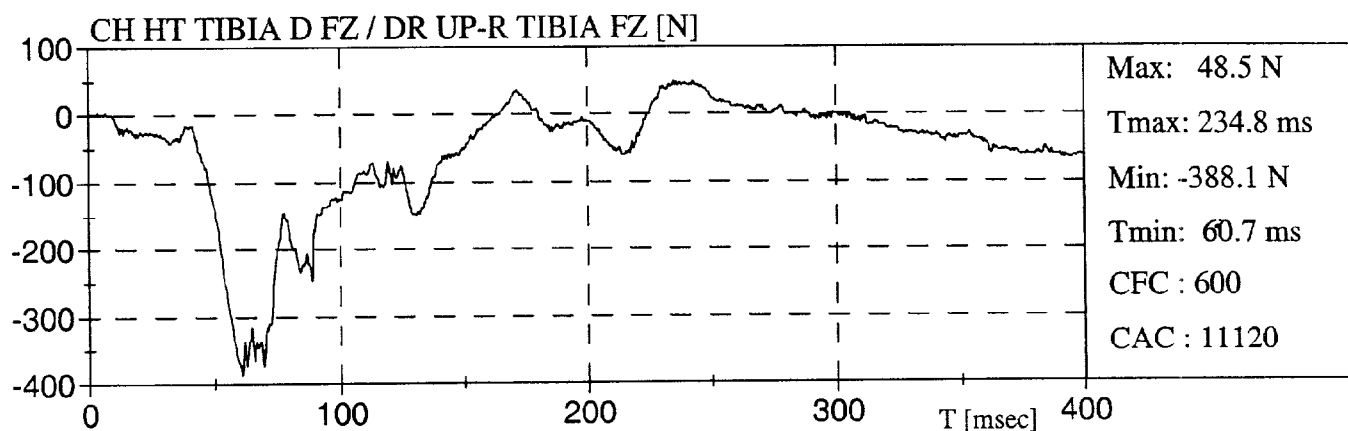
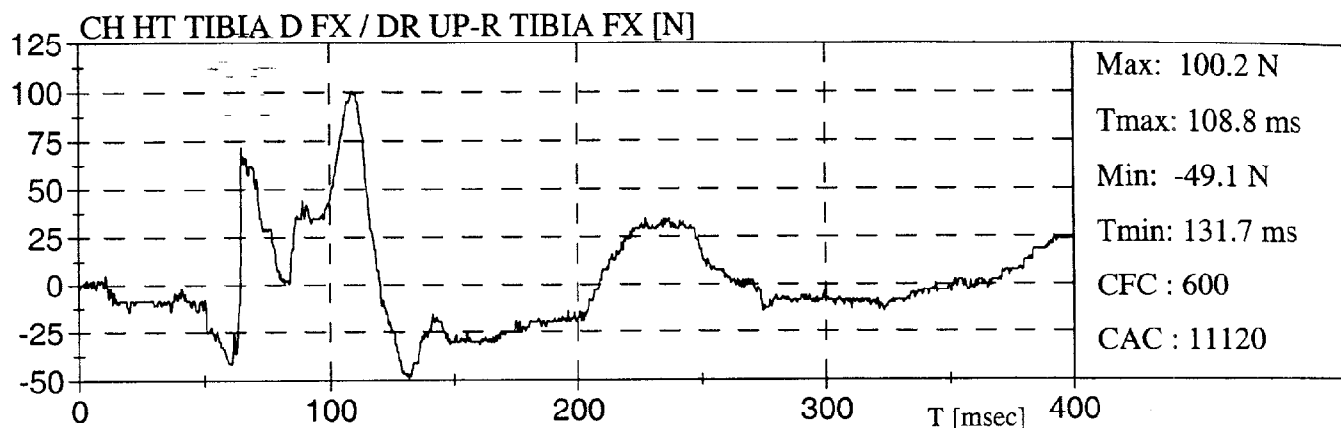
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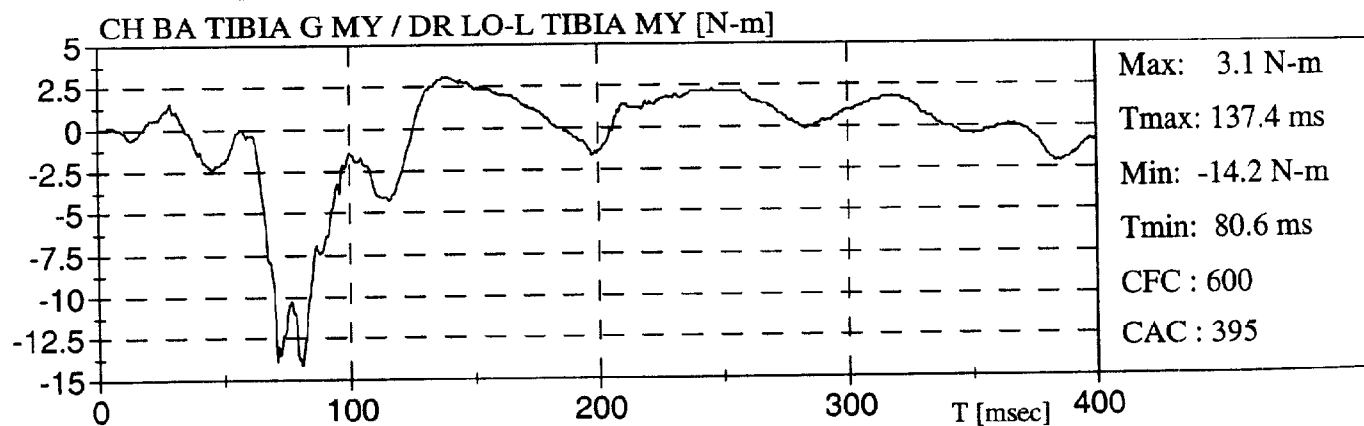
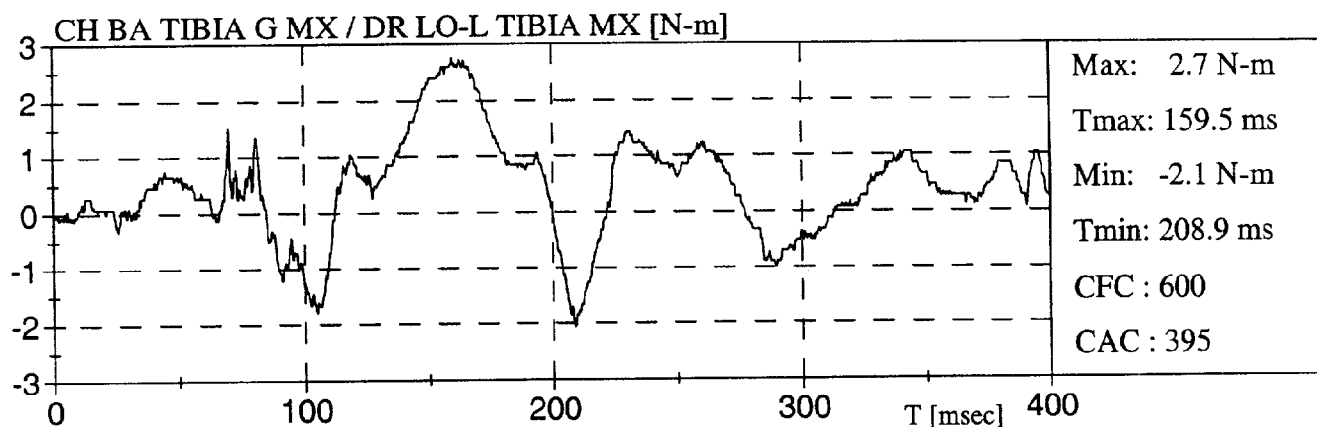
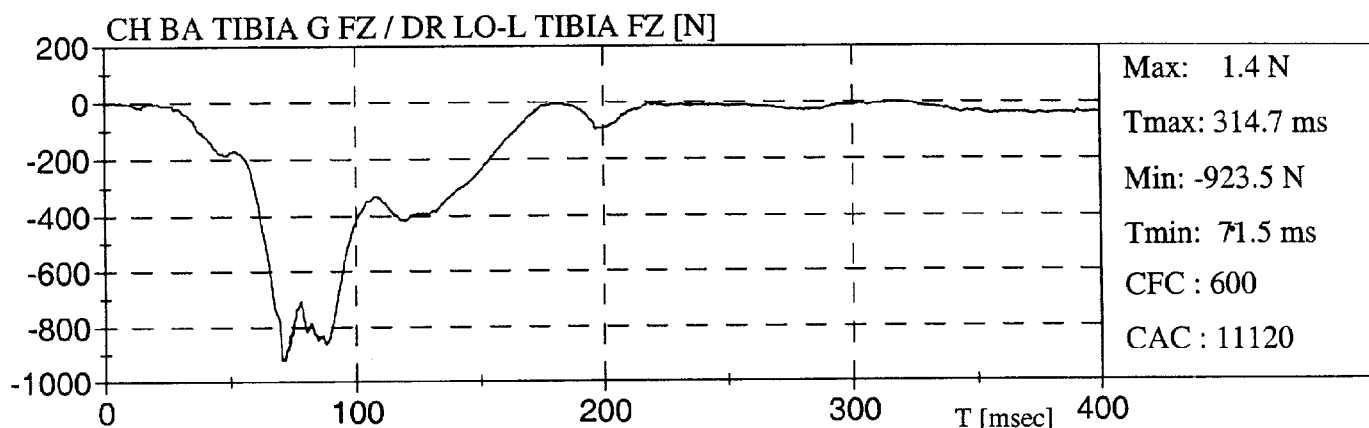
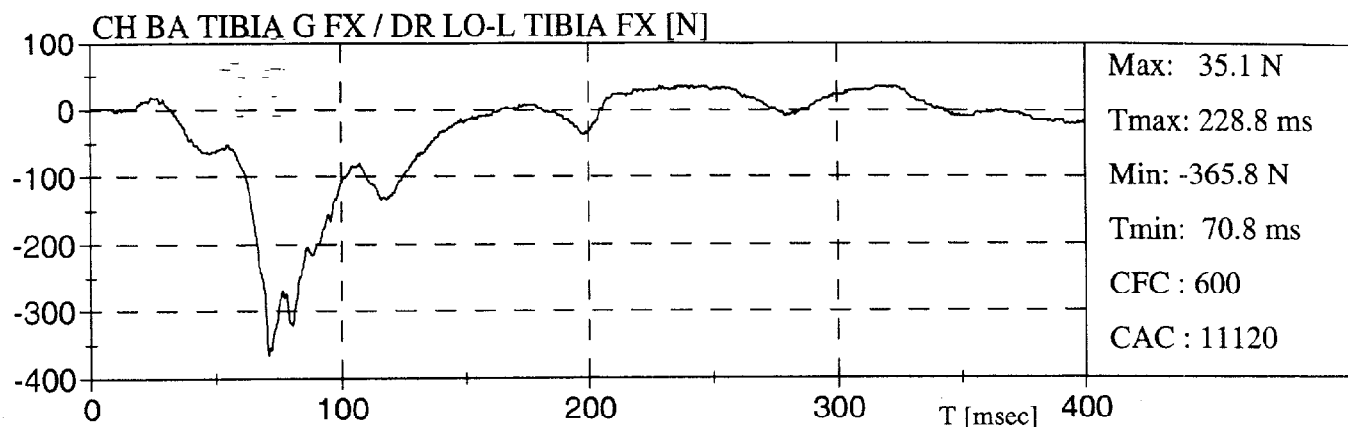
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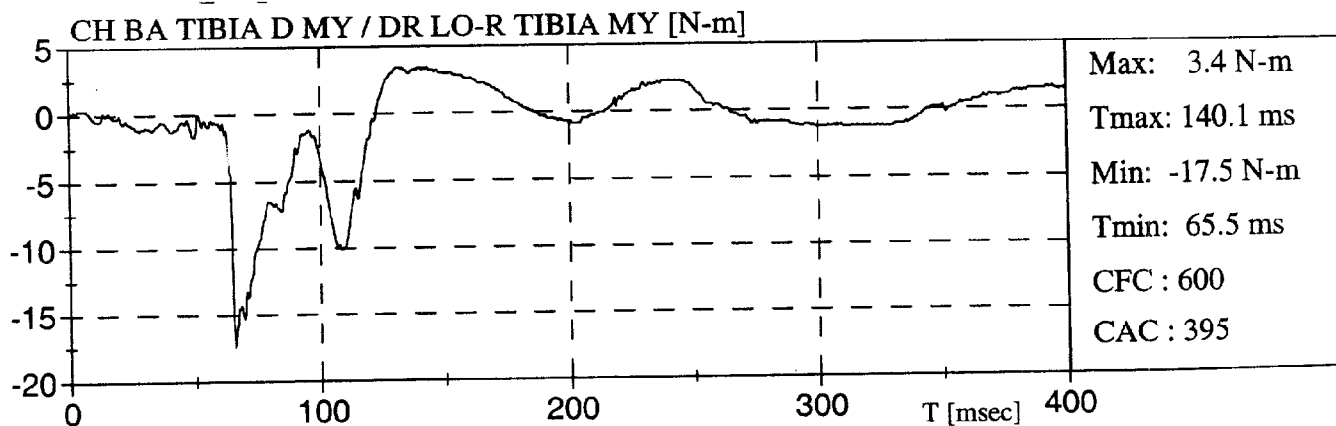
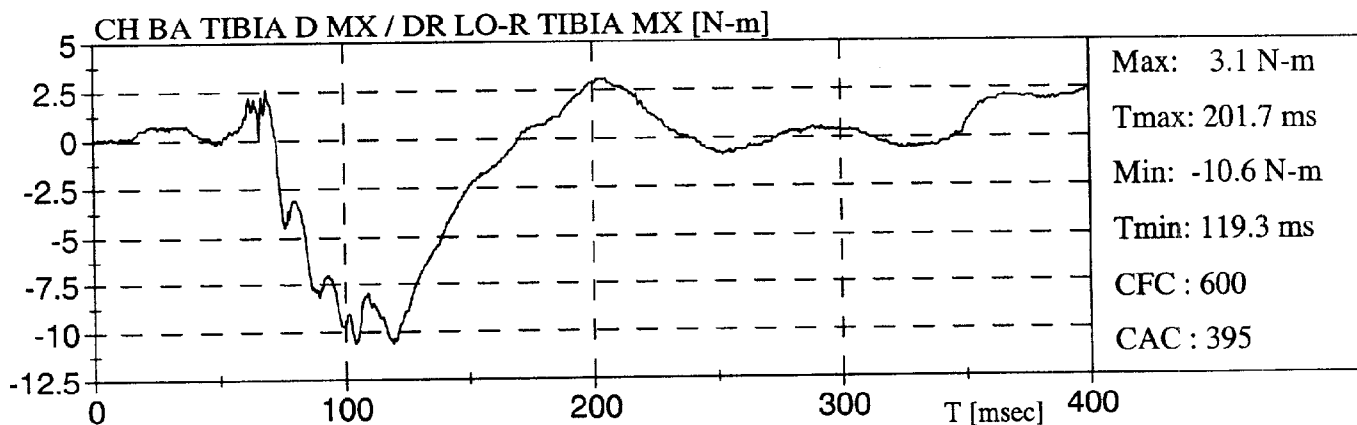
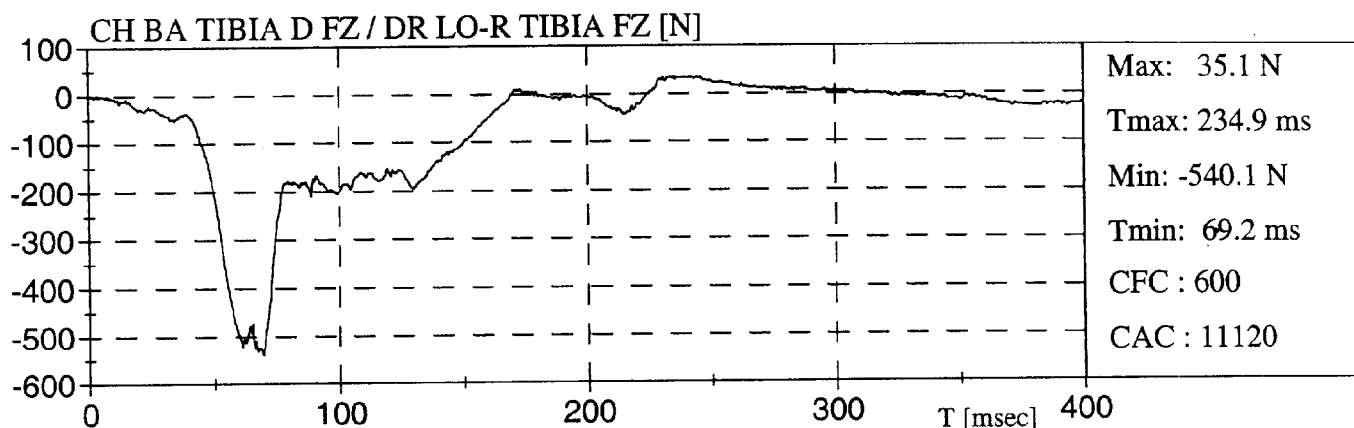
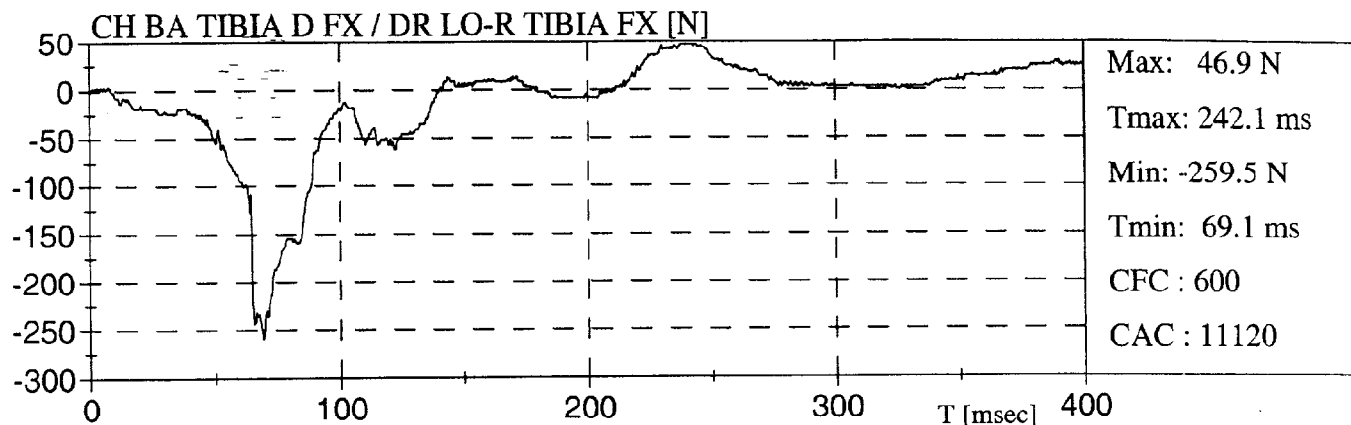
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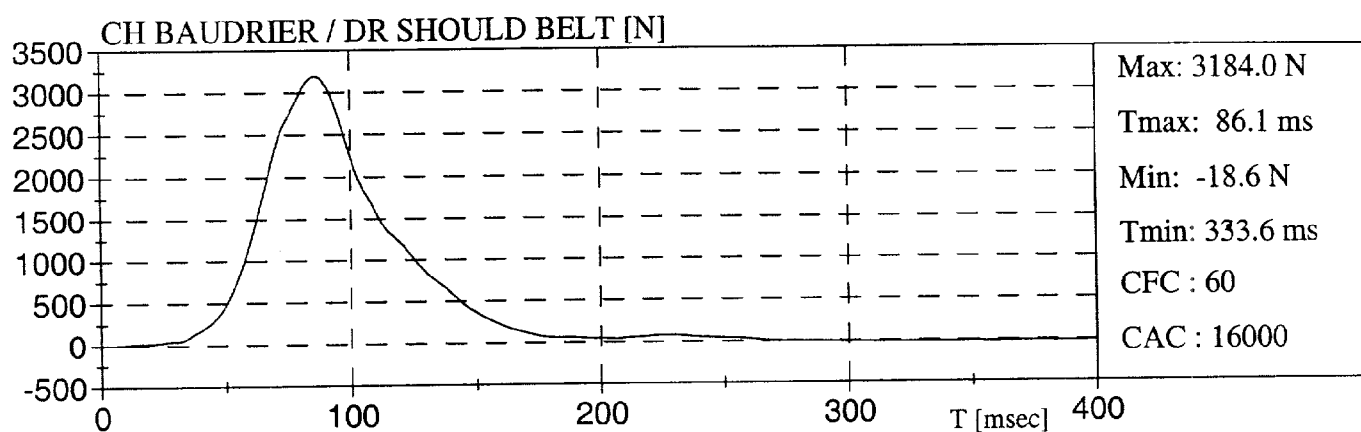
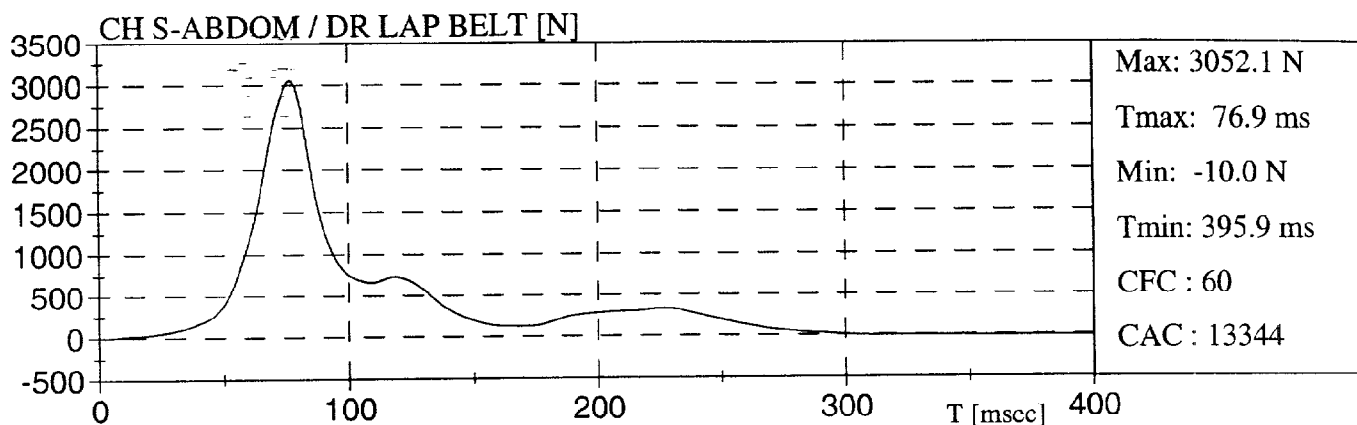
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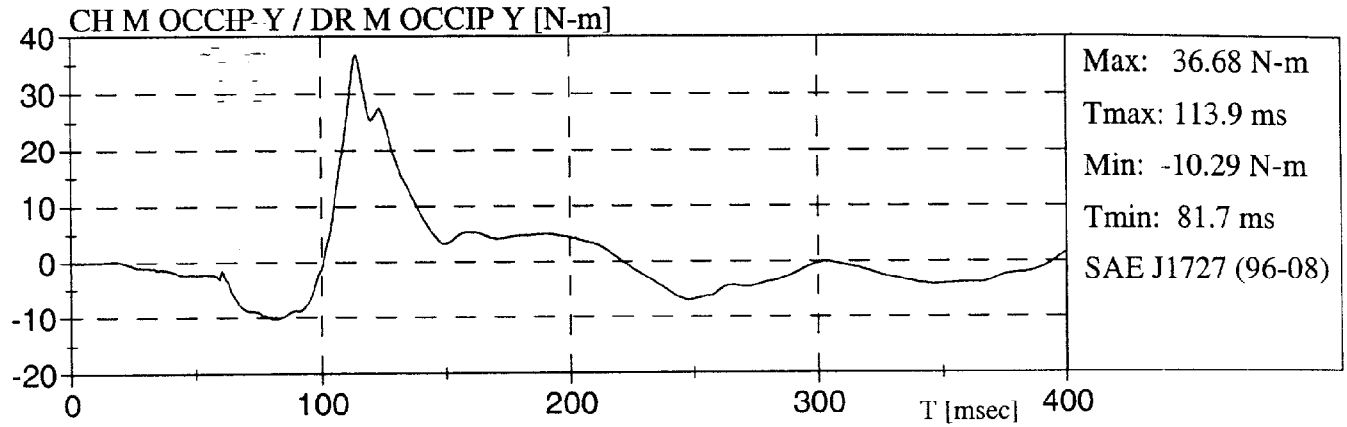
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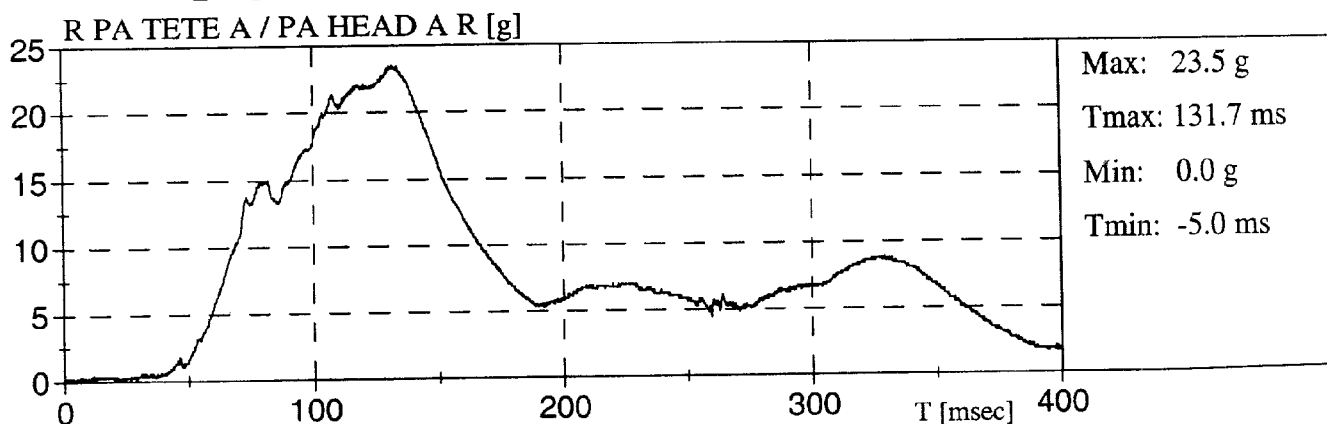
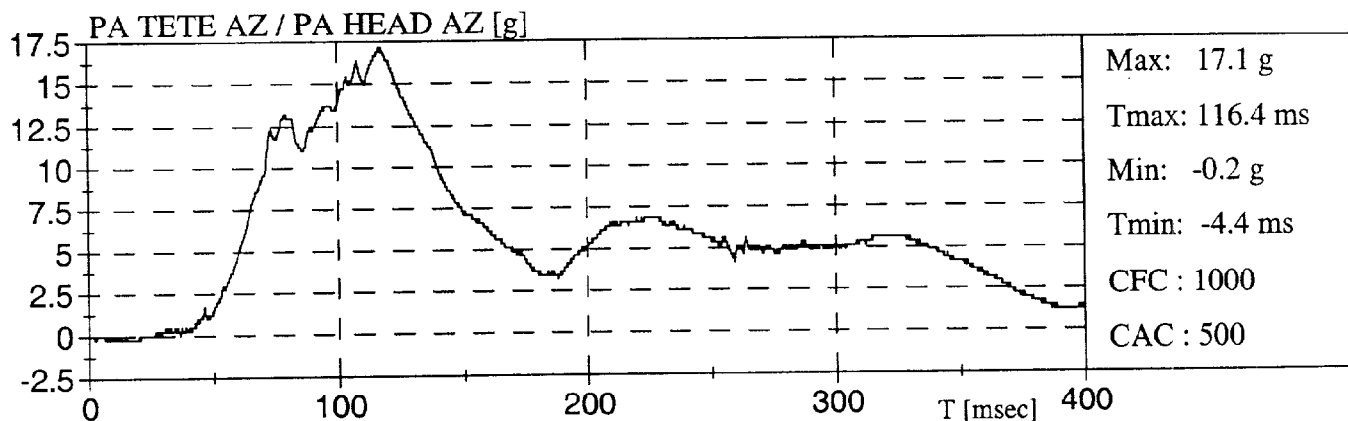
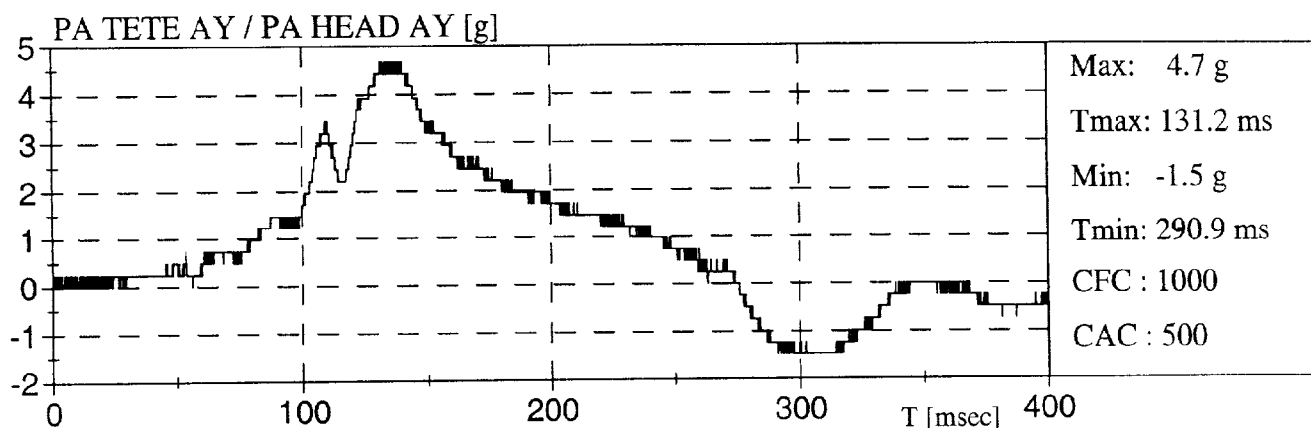
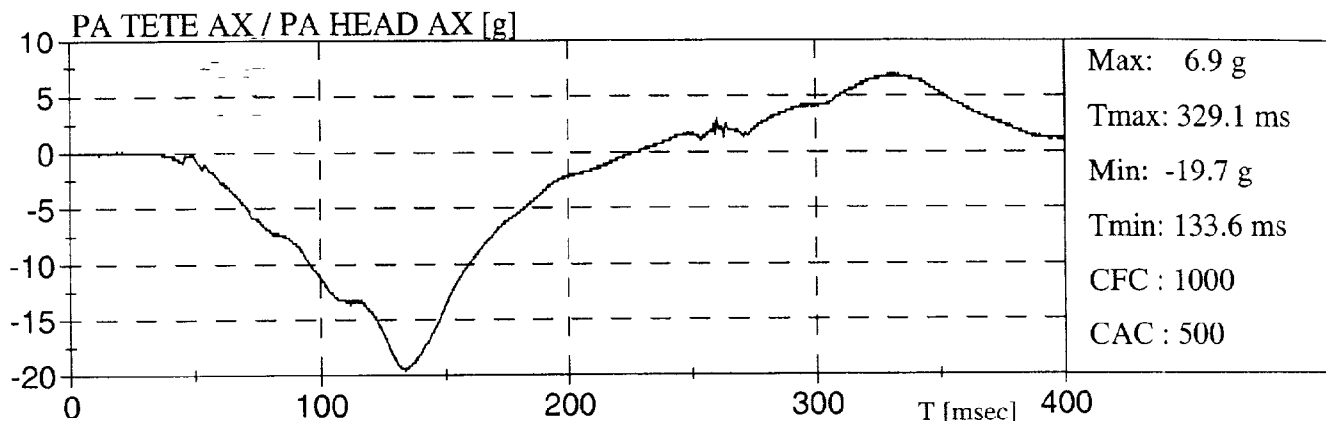
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OFFSET FRONTAL 40 KM/H - 40% LEFT

Date: 1999-04-21

TOYOTA CAMRY 99

N° TC / TC No.: TC99-239







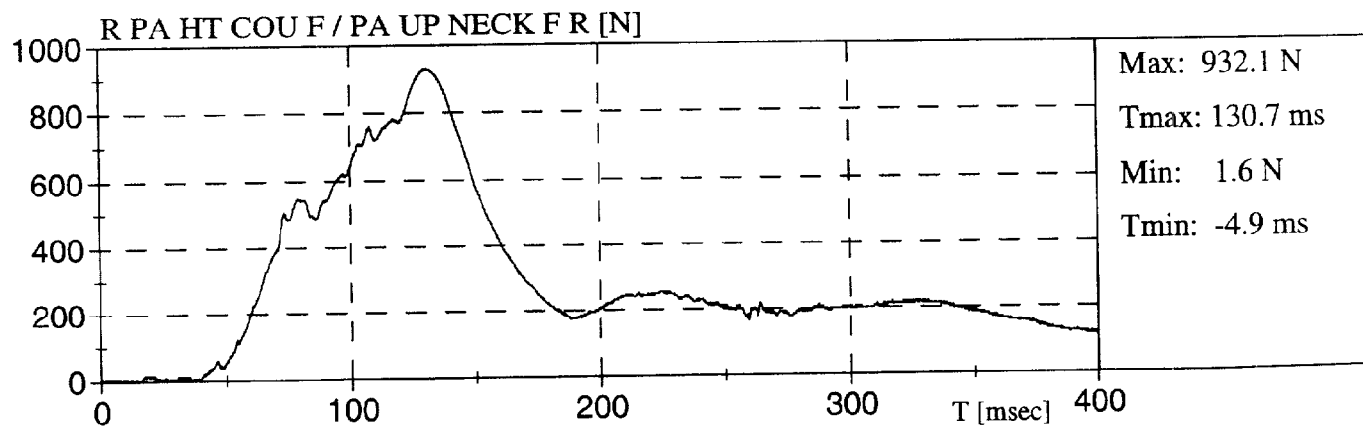
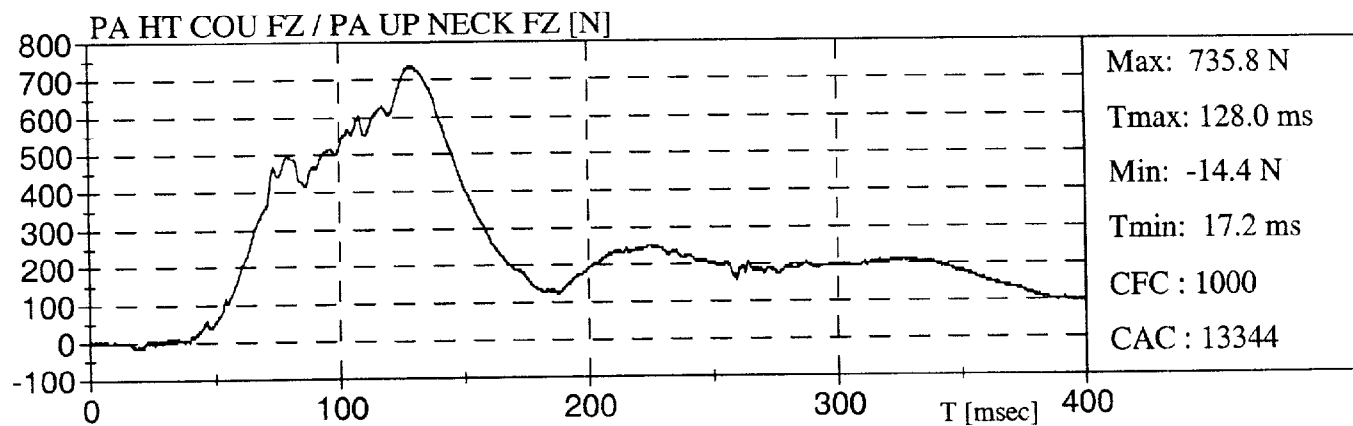
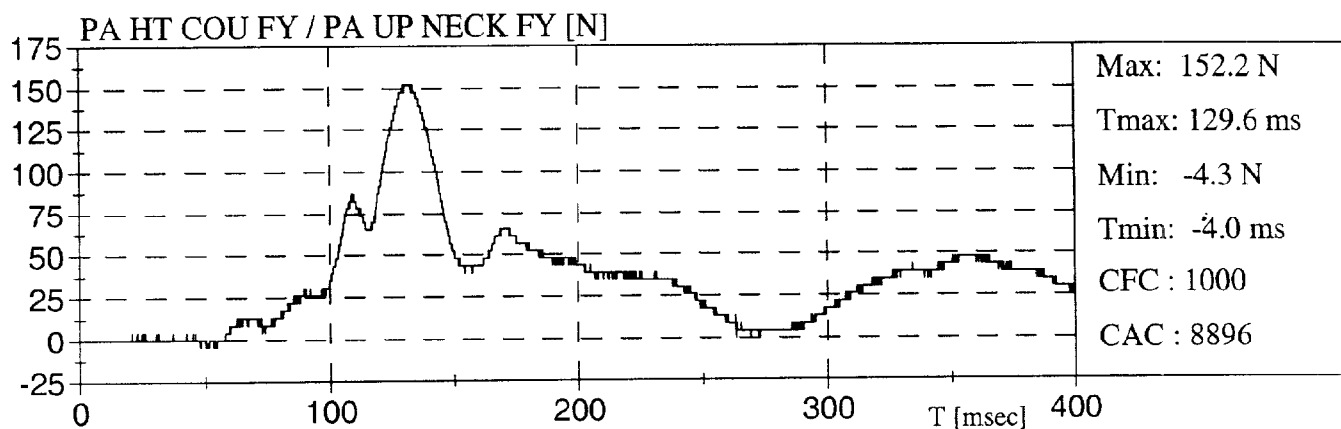
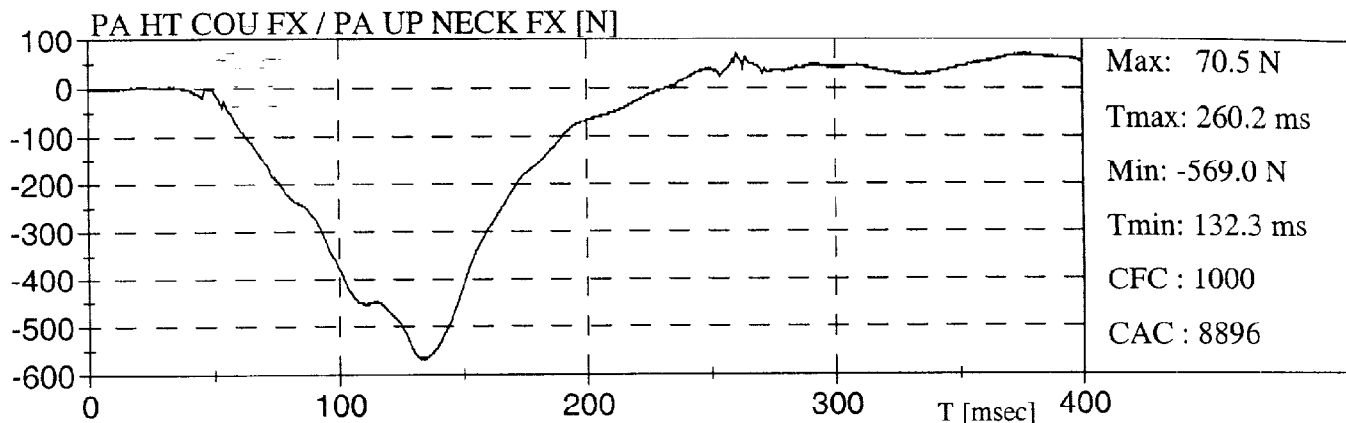
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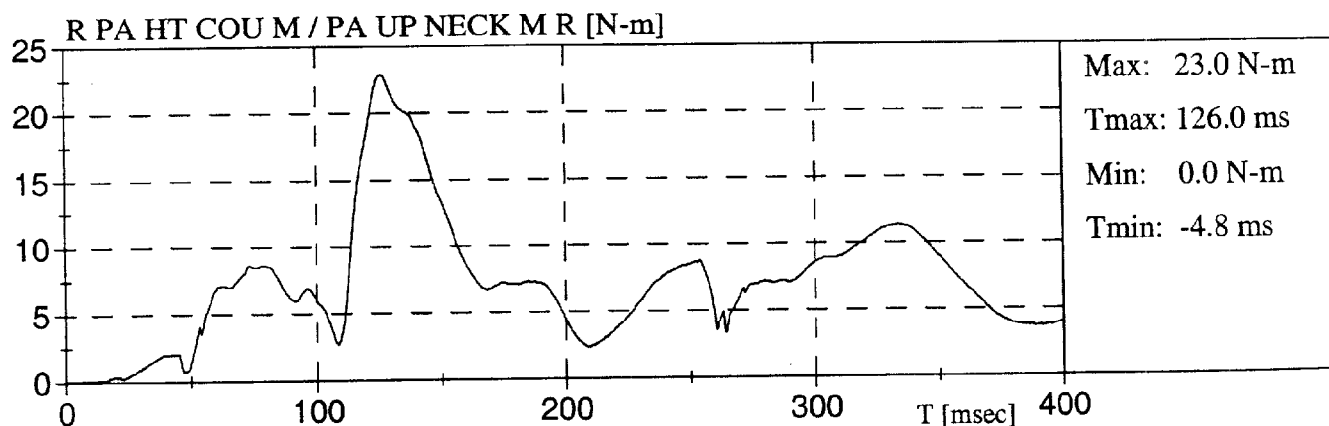
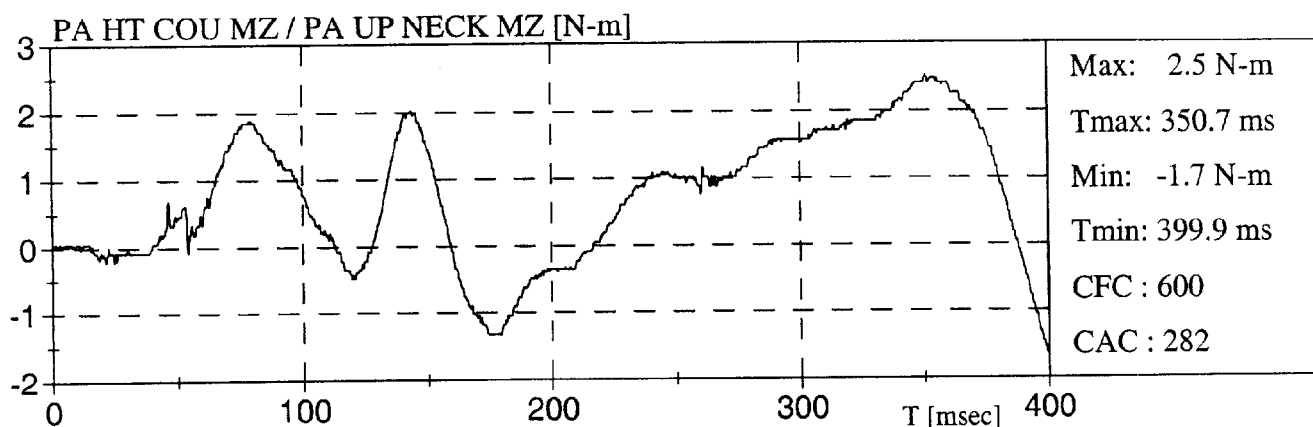
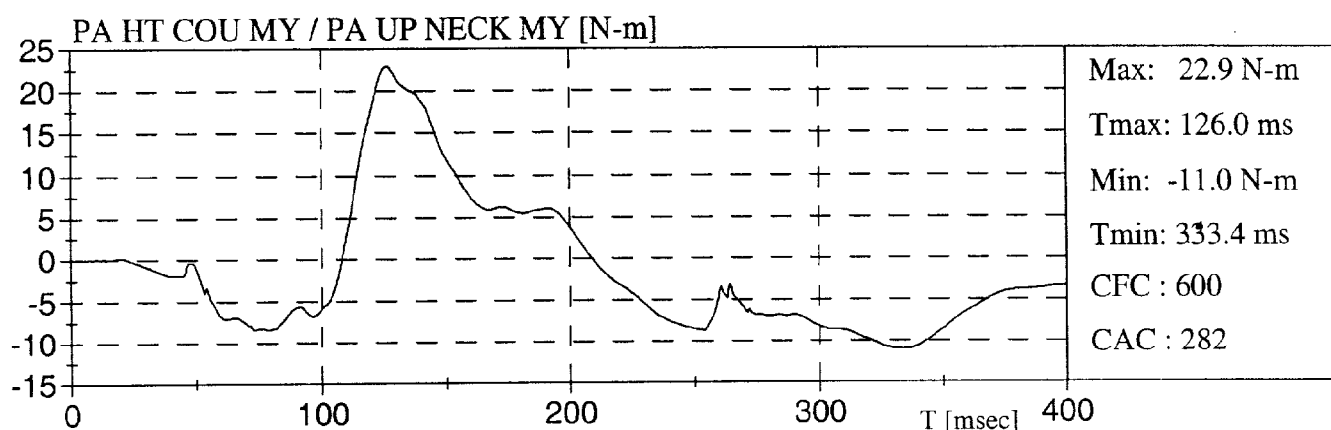
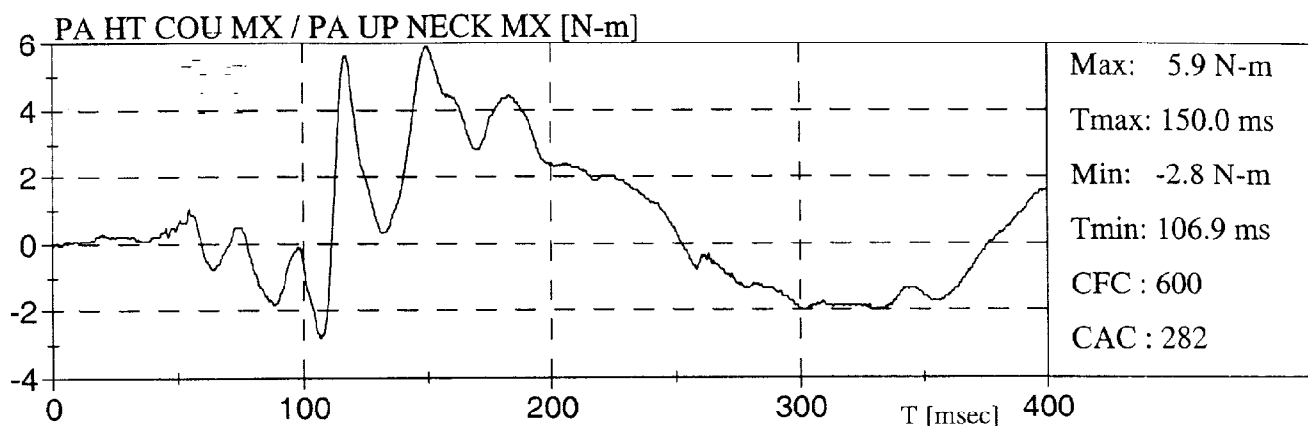
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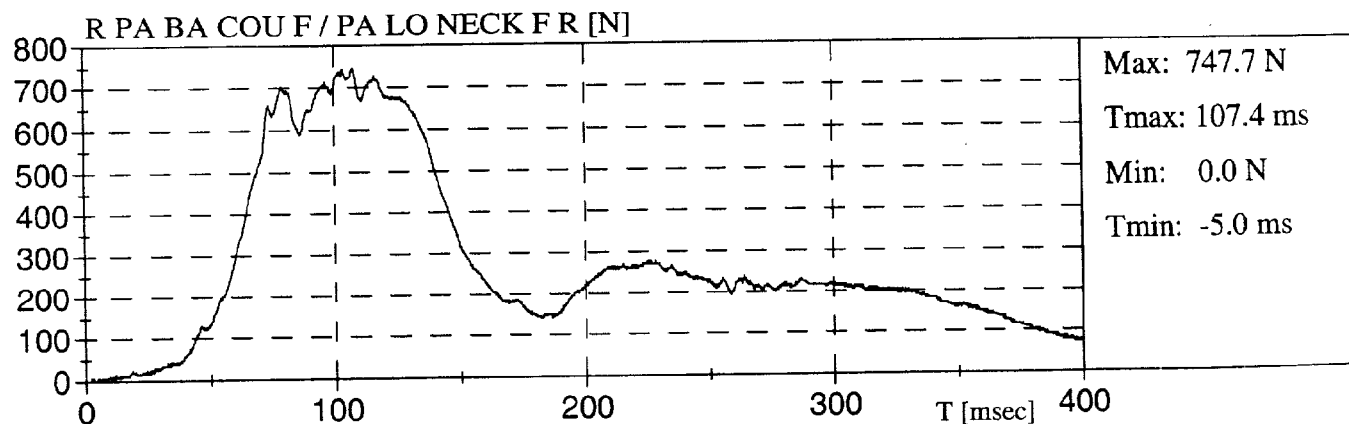
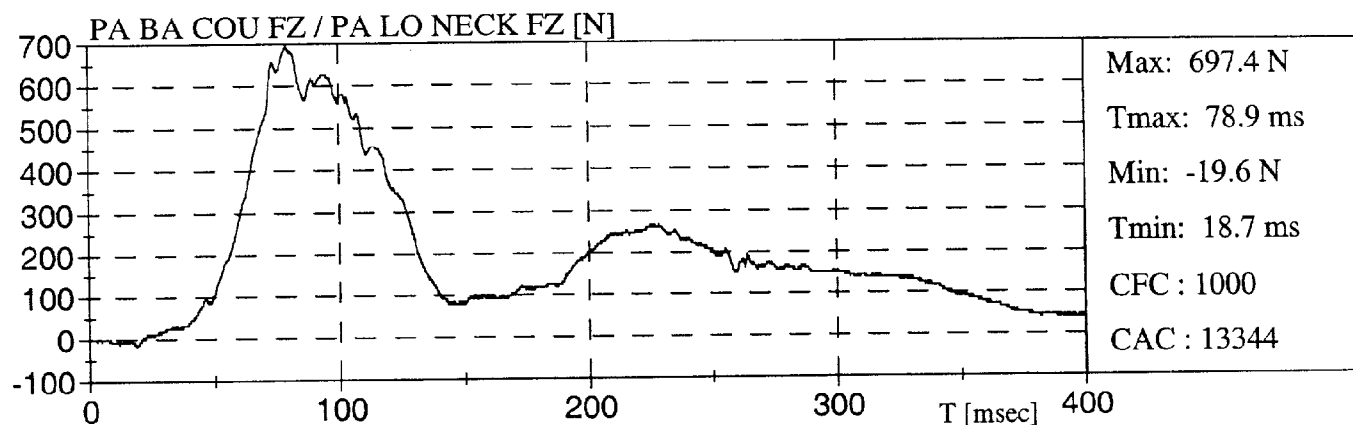
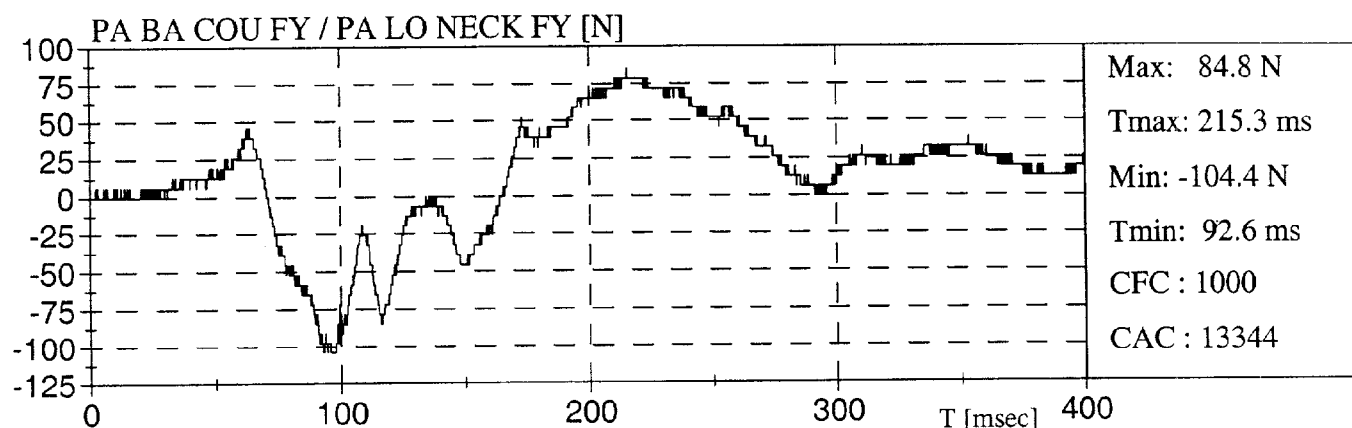
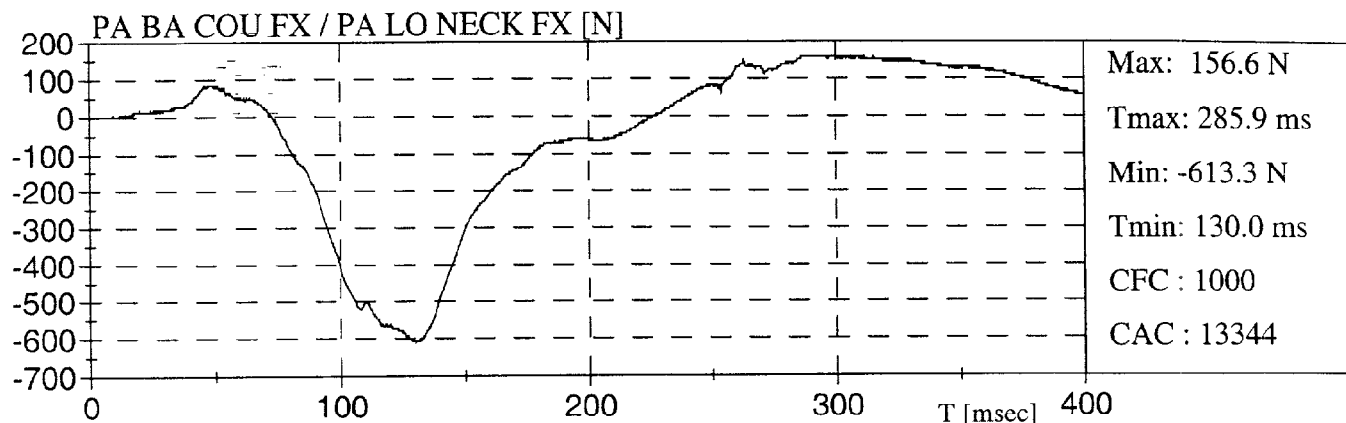
TOYOTA CAMRY 99

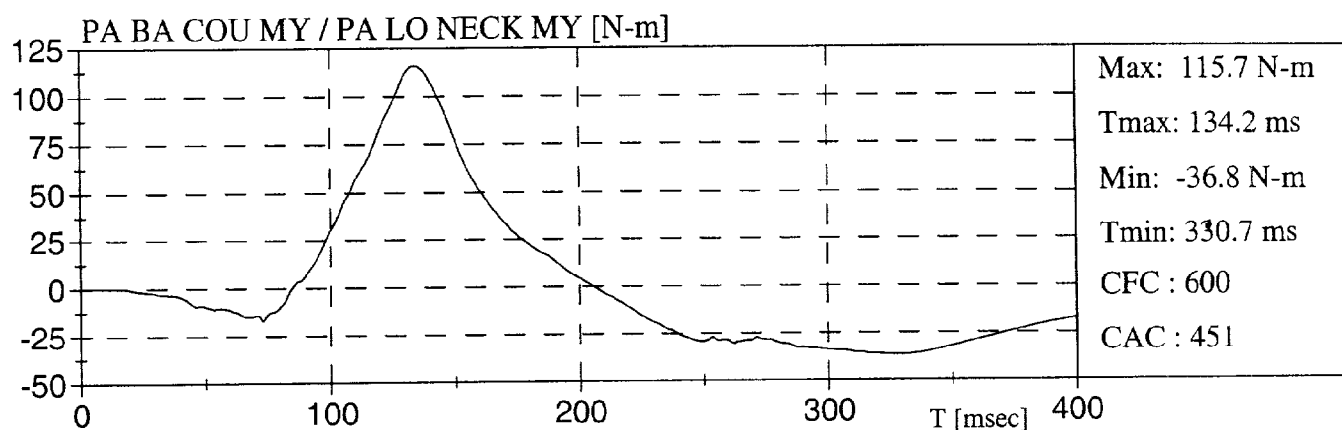
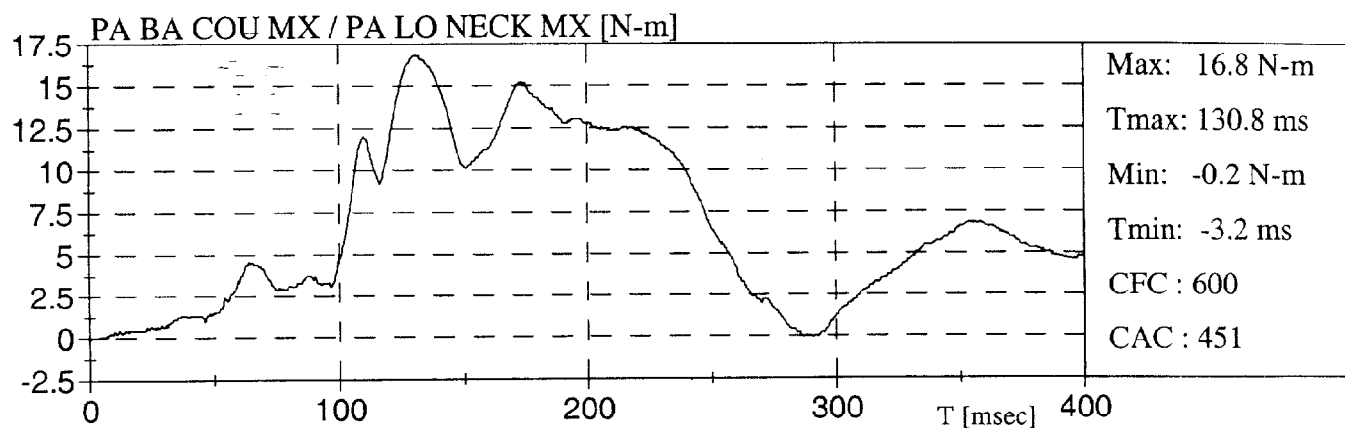
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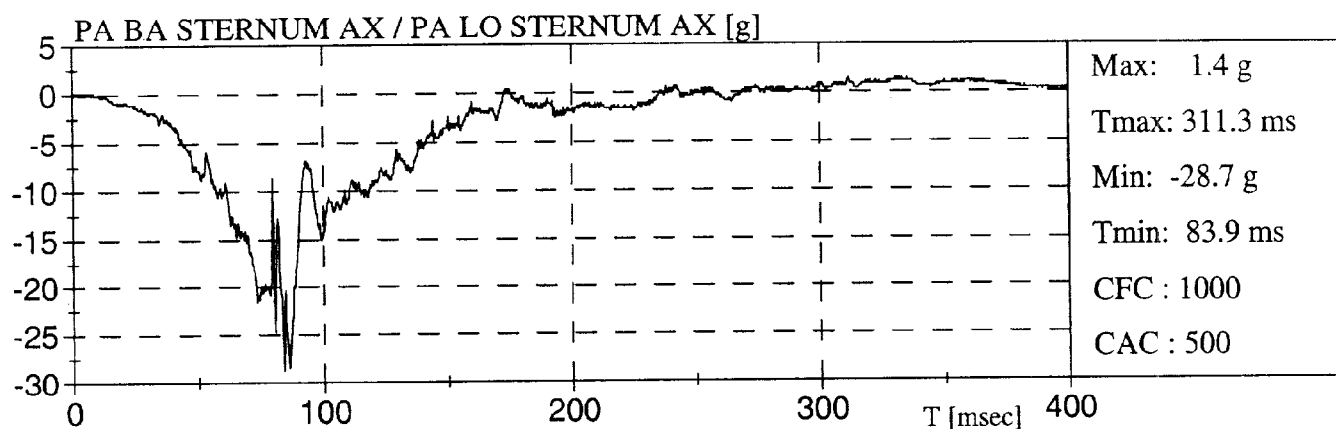
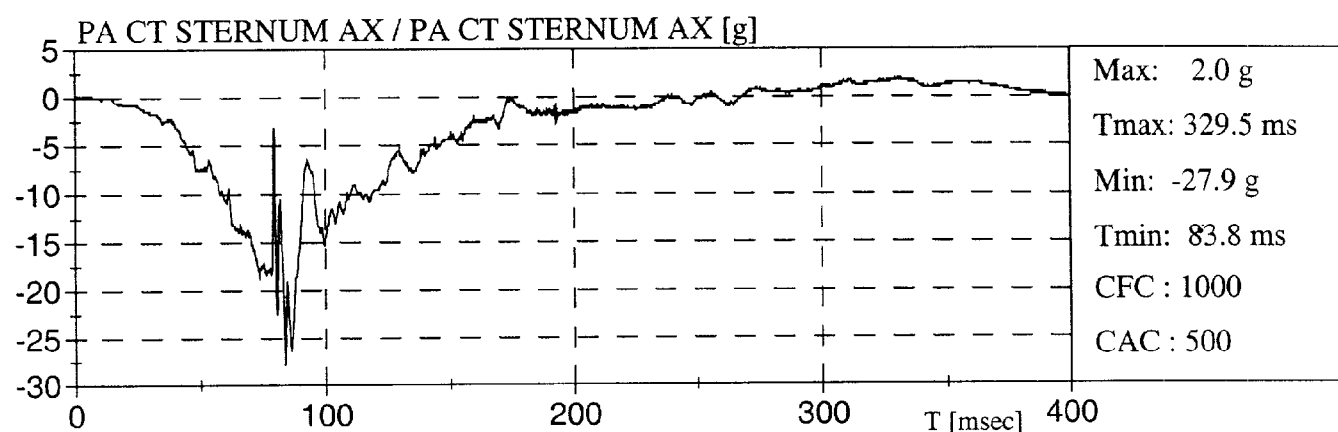
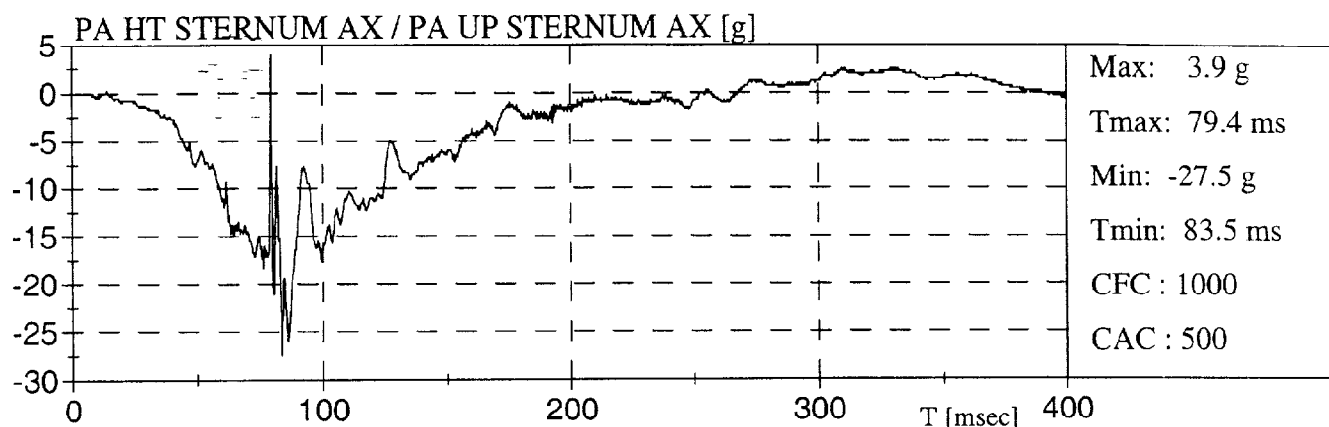
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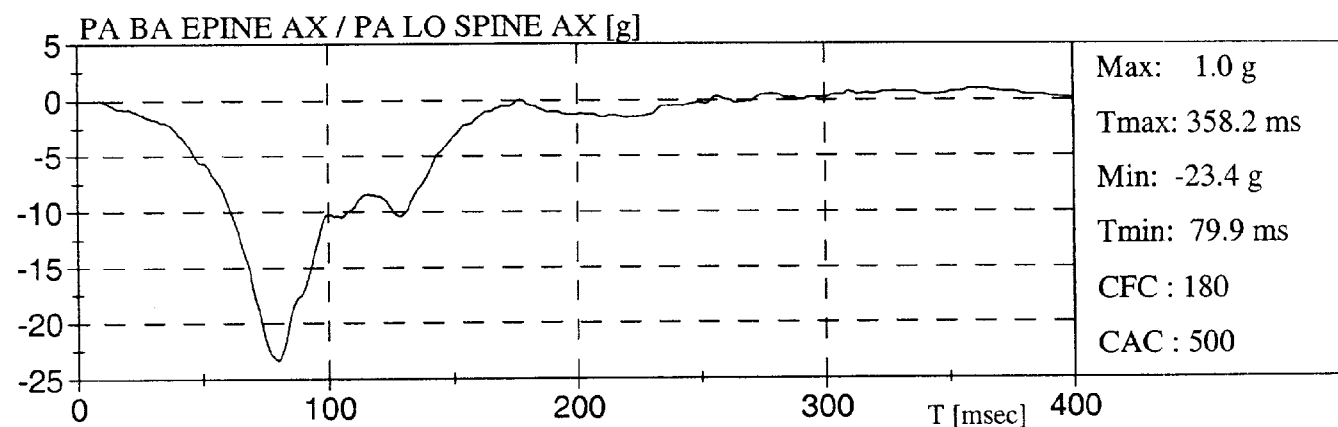
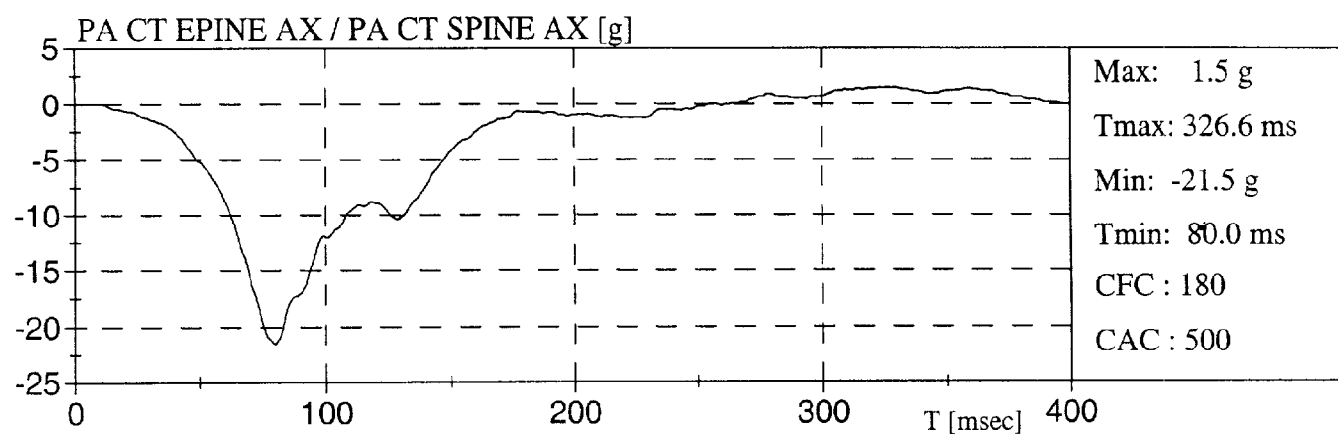
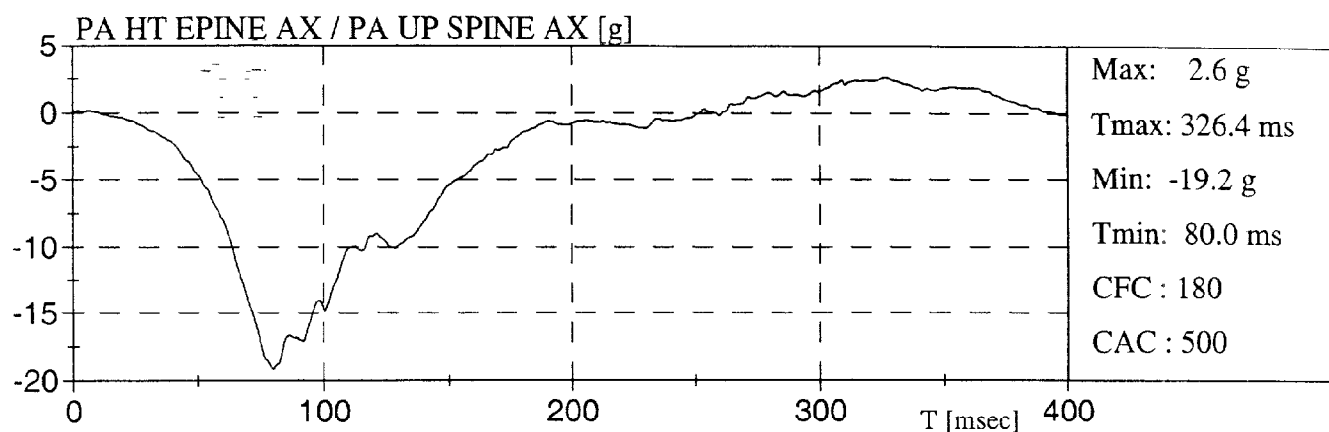


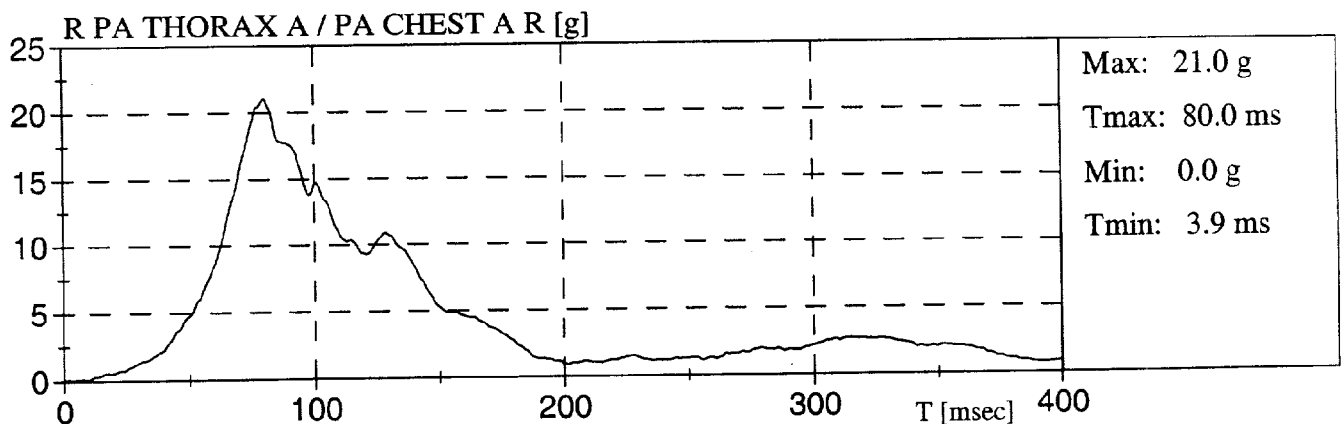
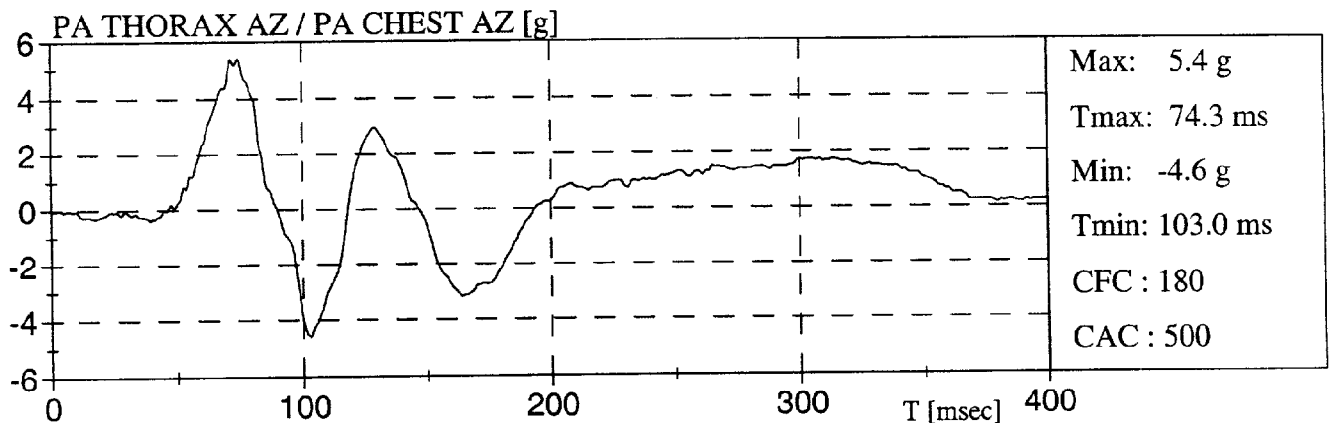
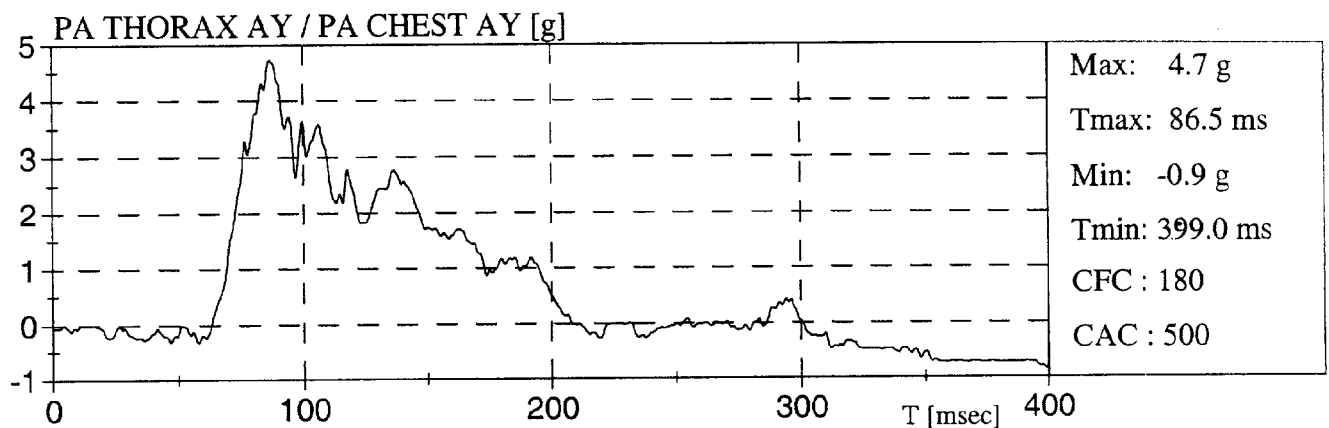
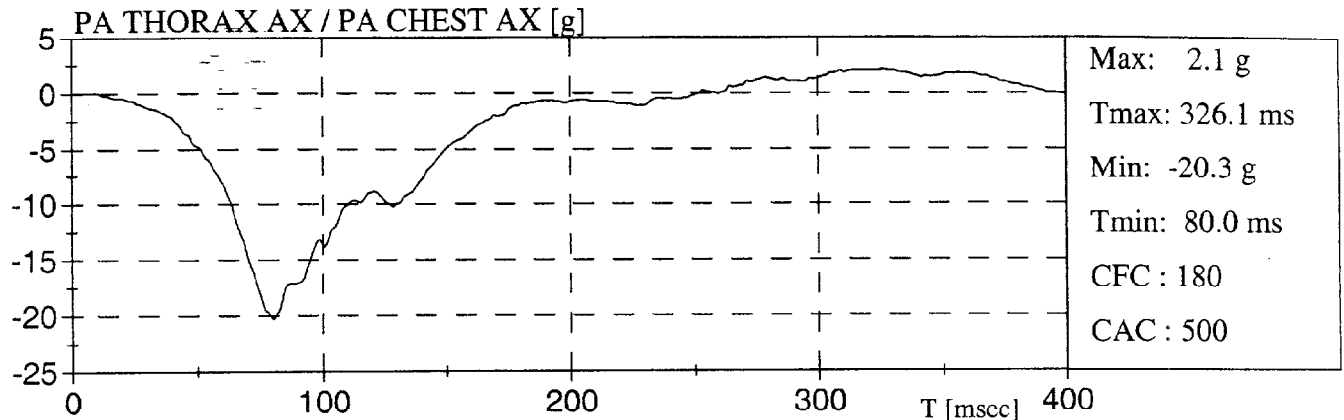














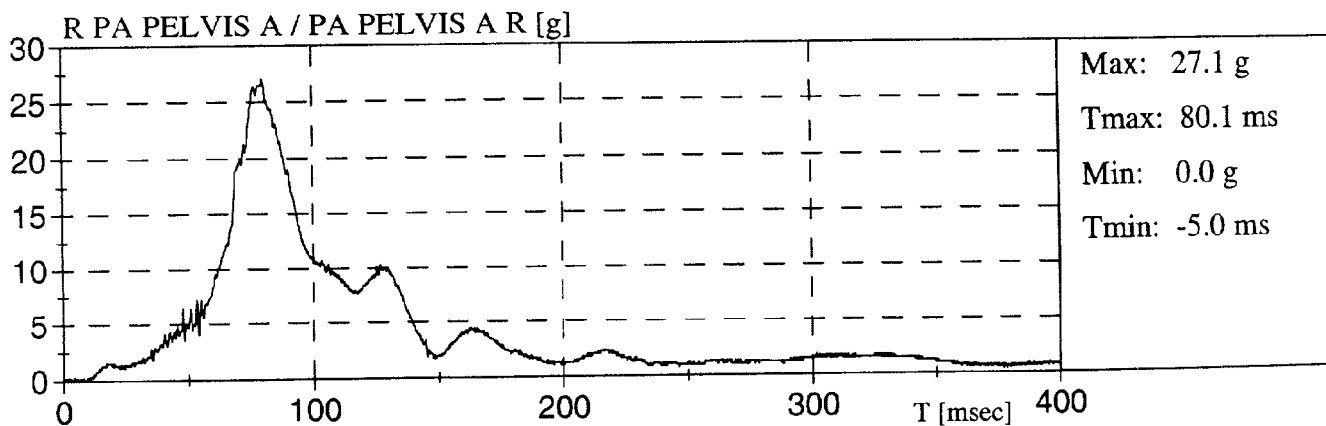
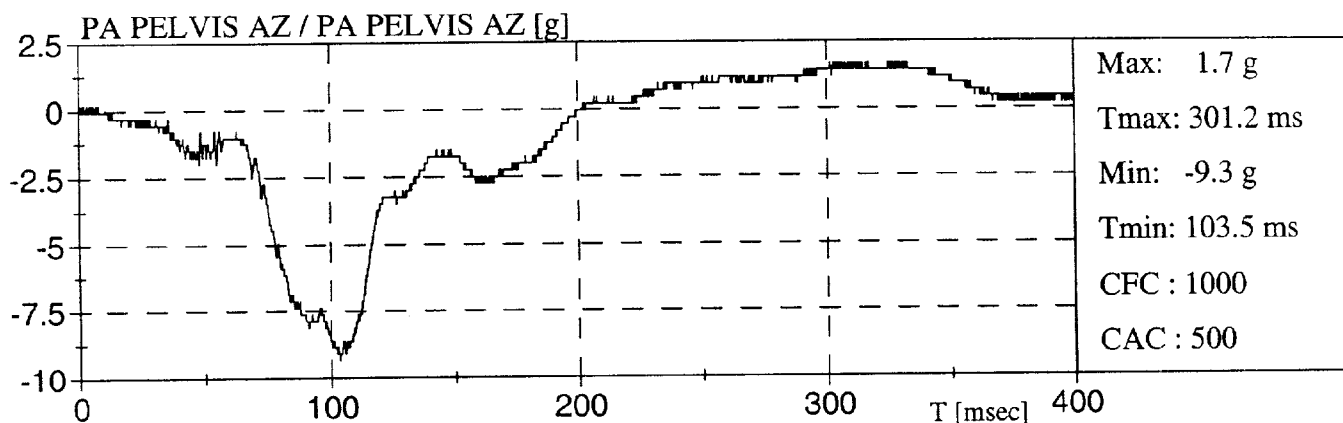
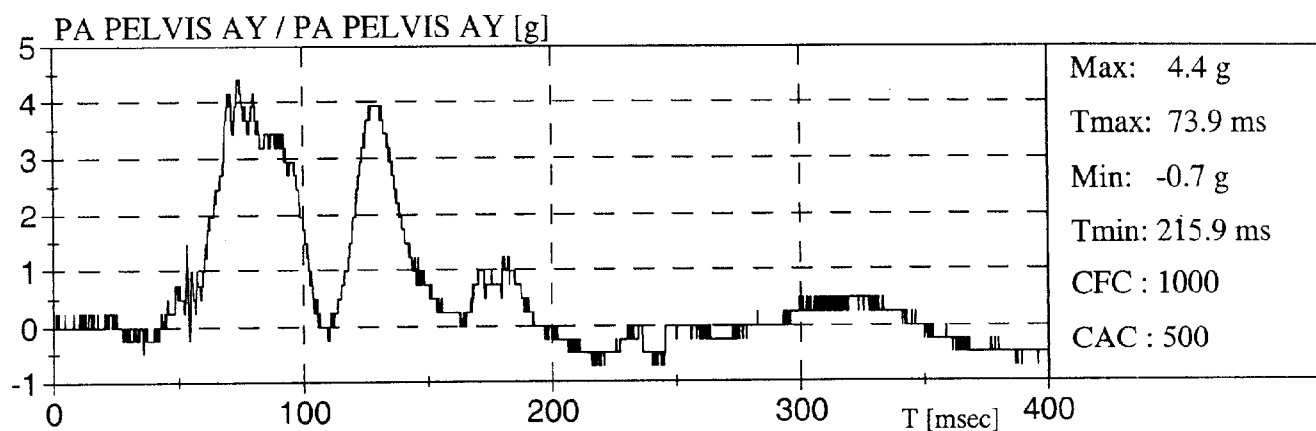
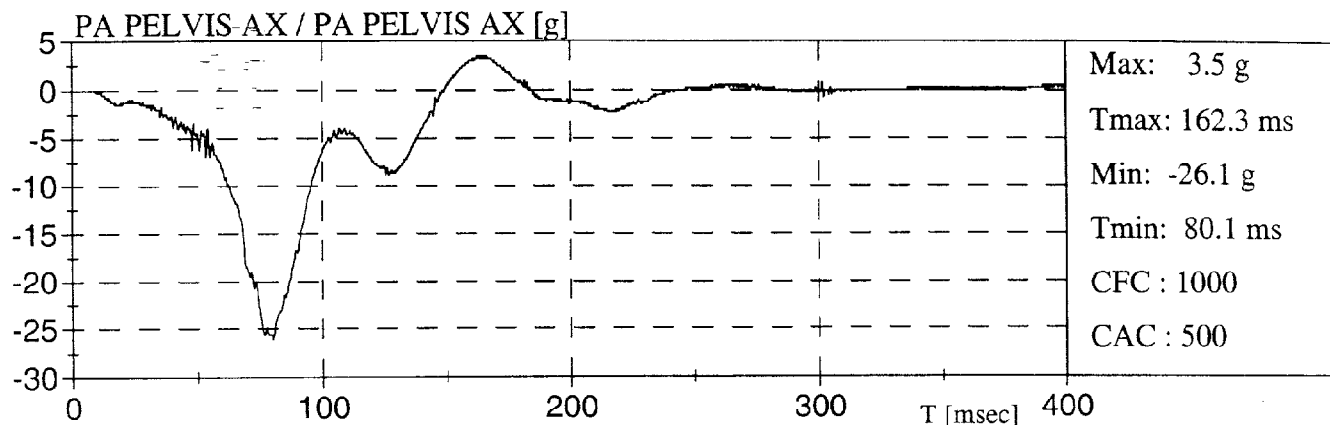
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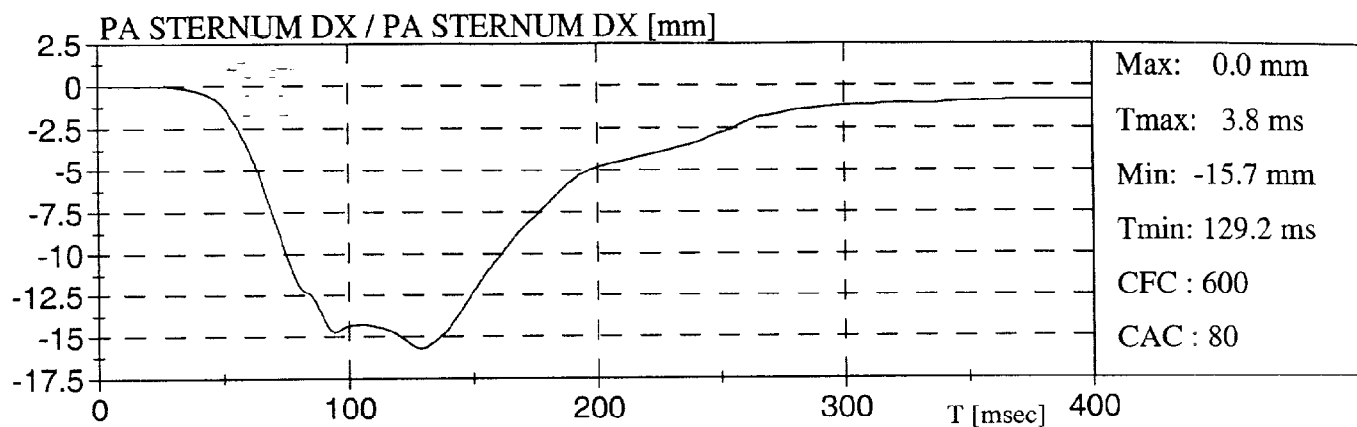
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OFFSET FRONTAL 40 KM/H - 40% LEFT

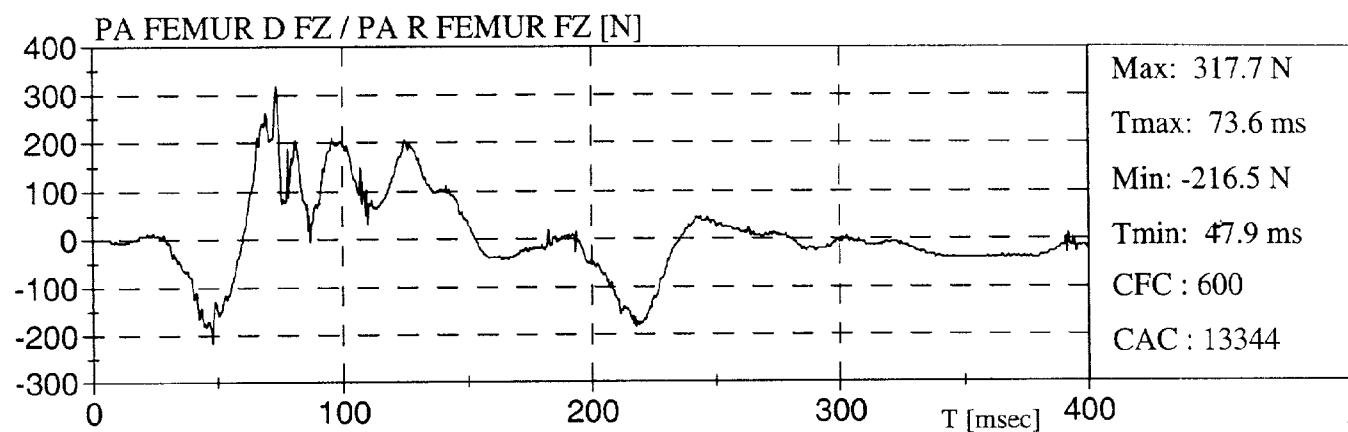
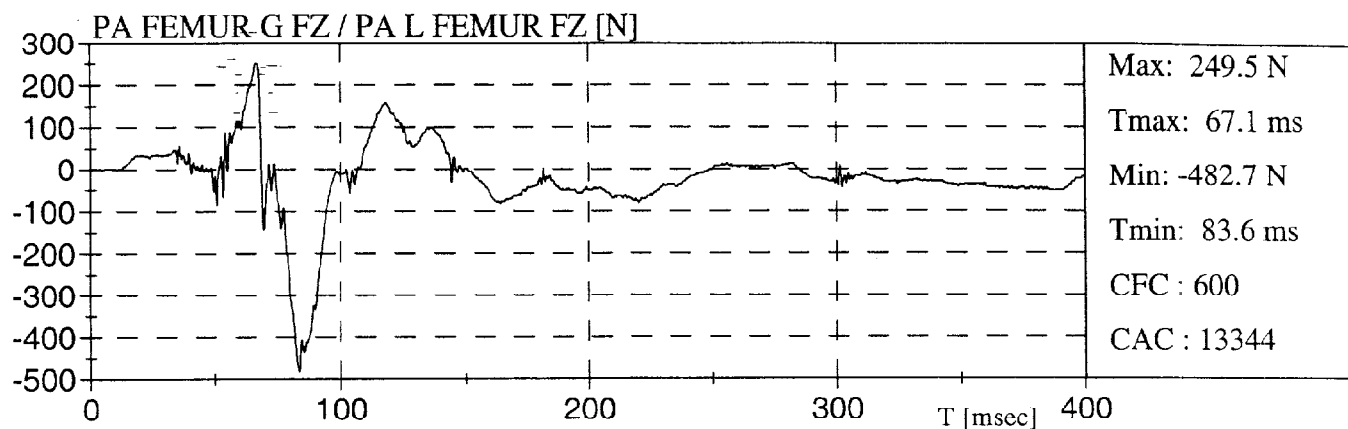
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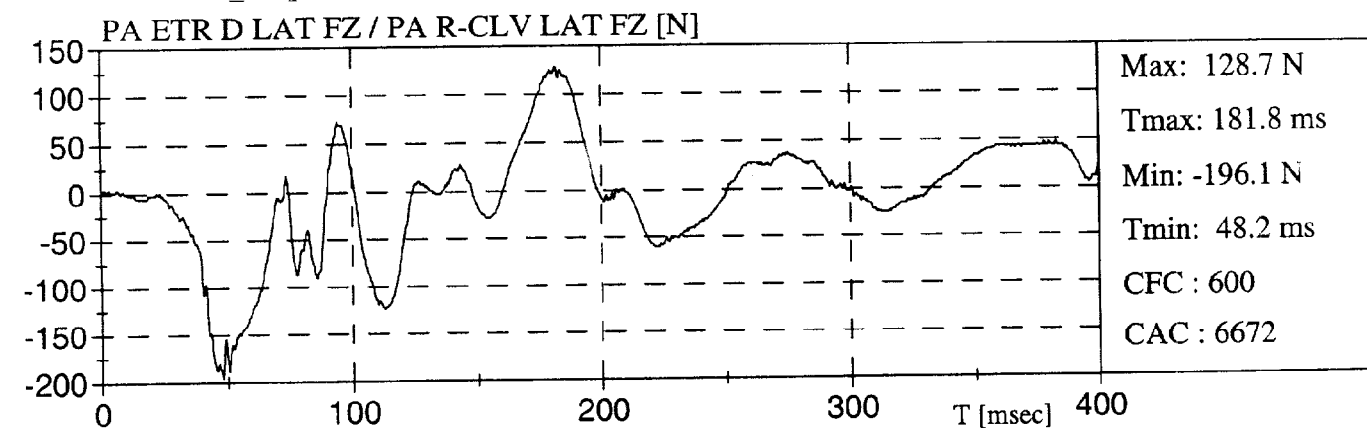
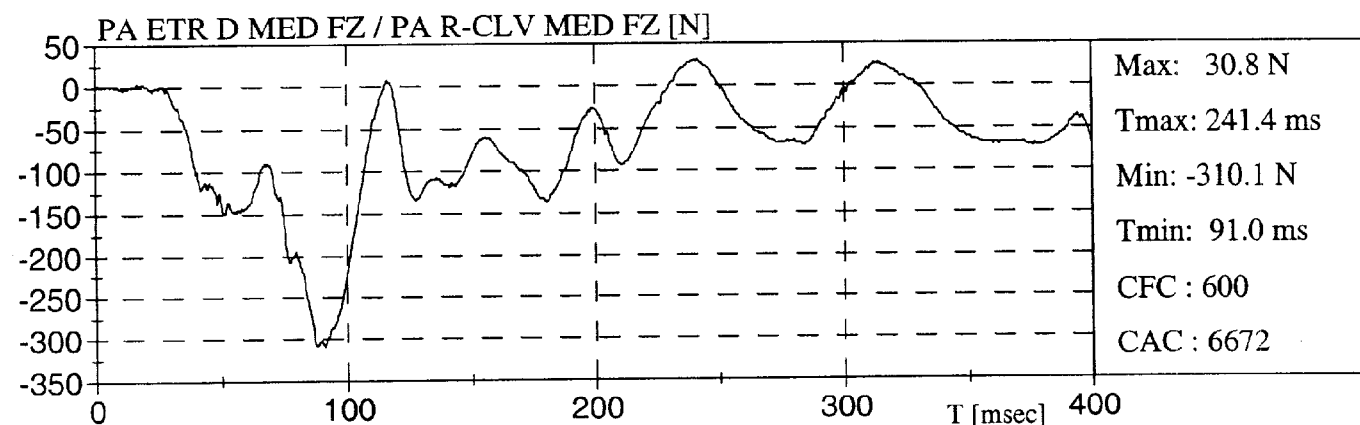
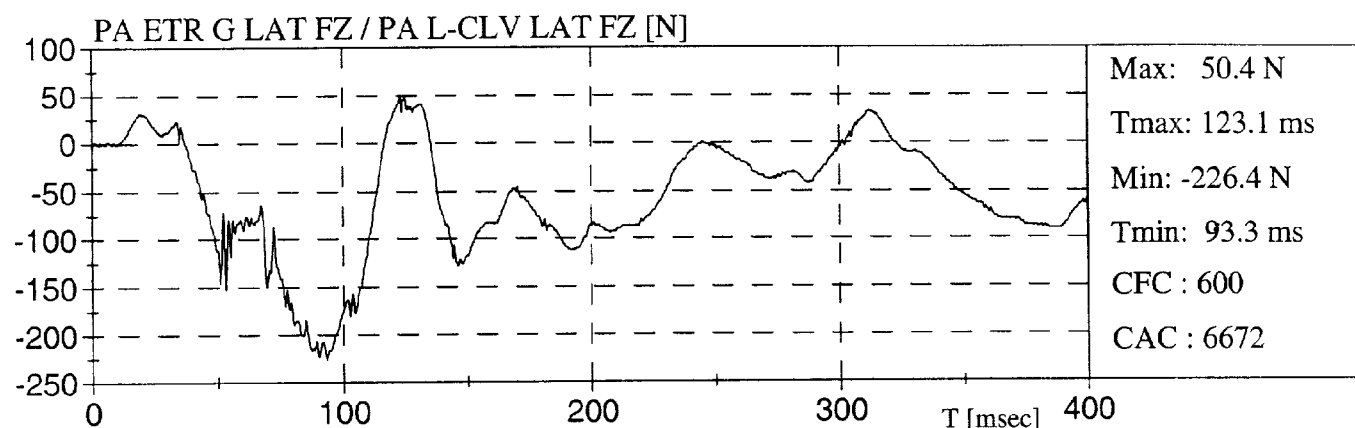
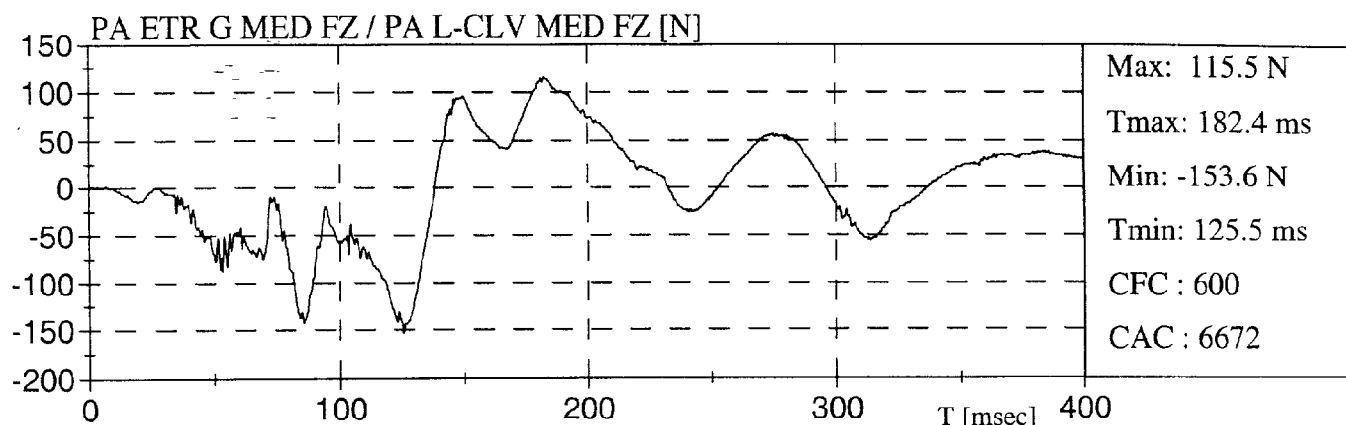
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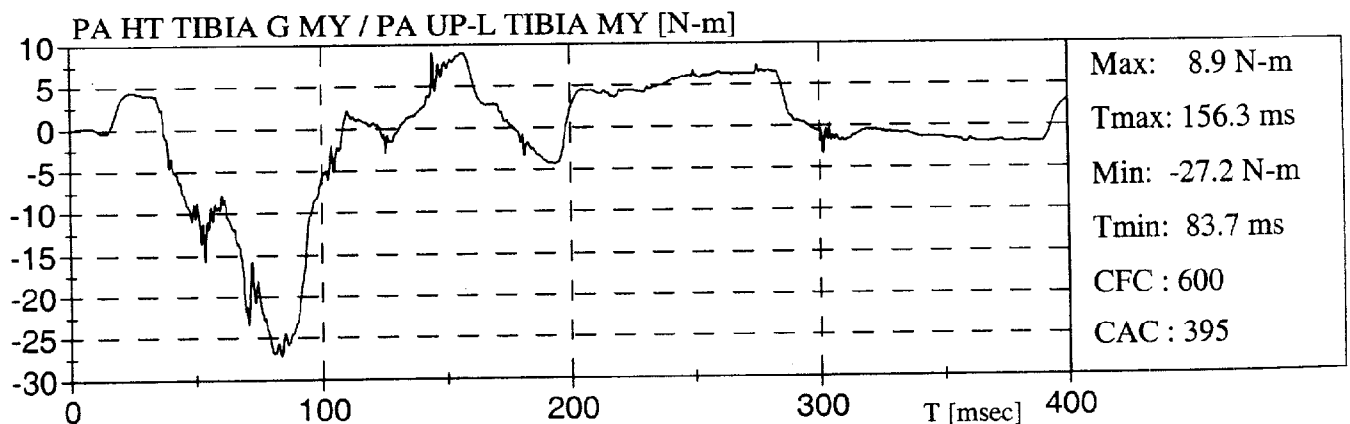
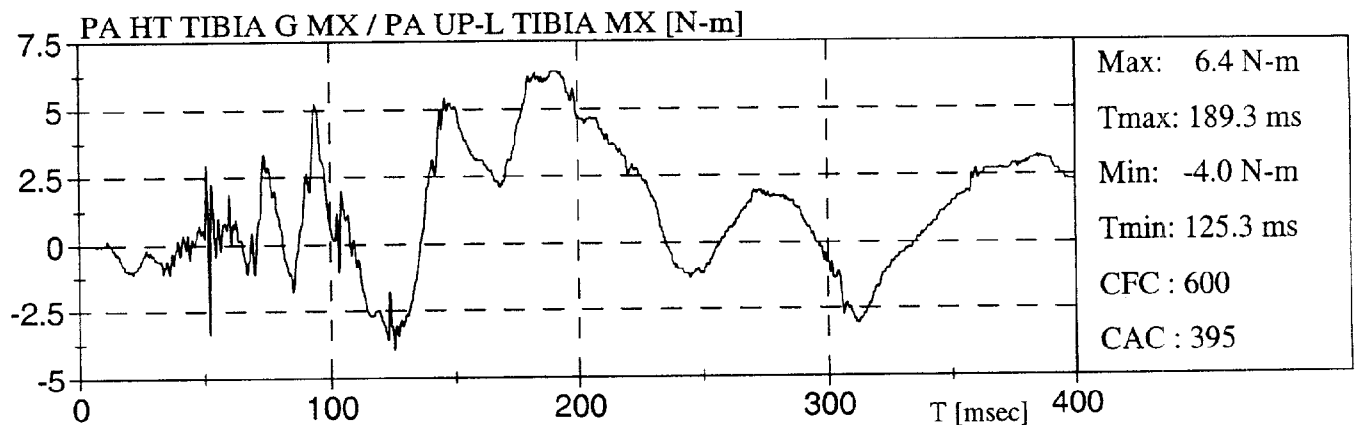
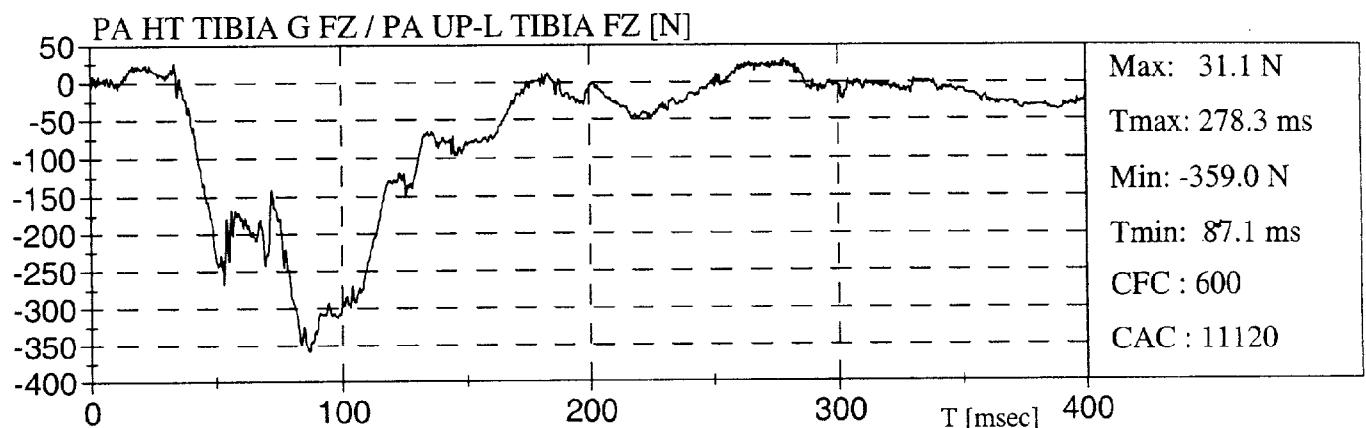
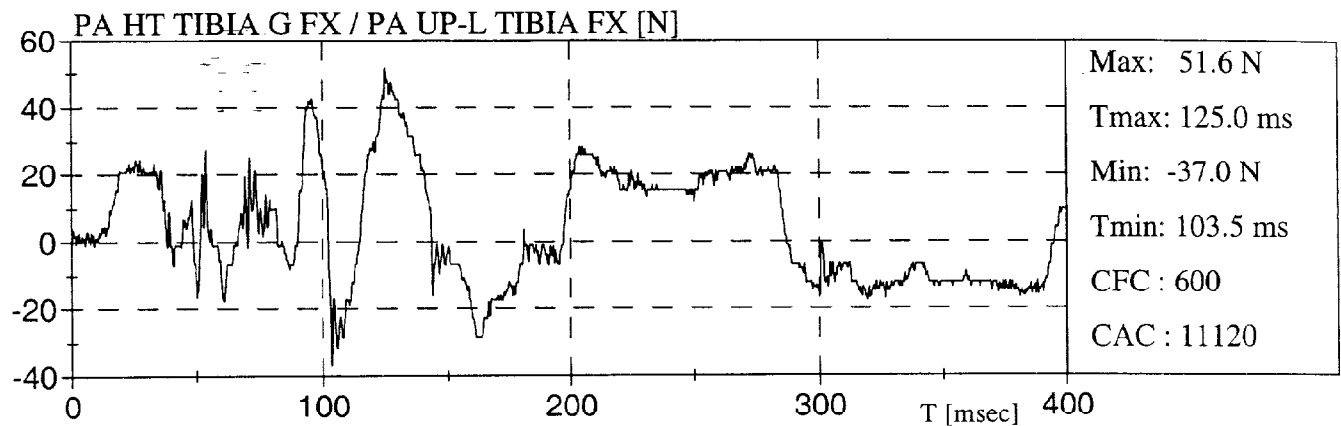
N° TC / TC No.: TC99-239

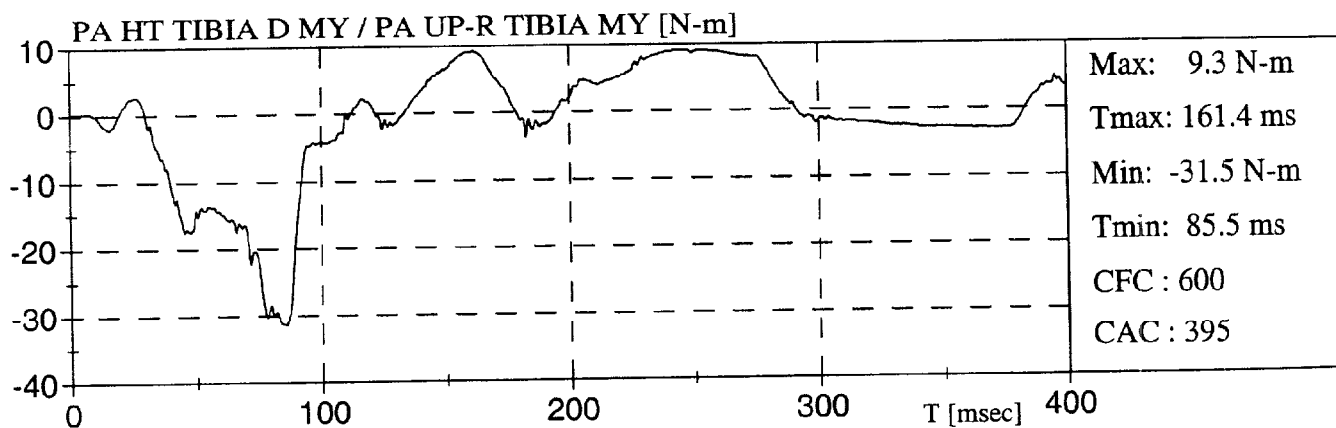
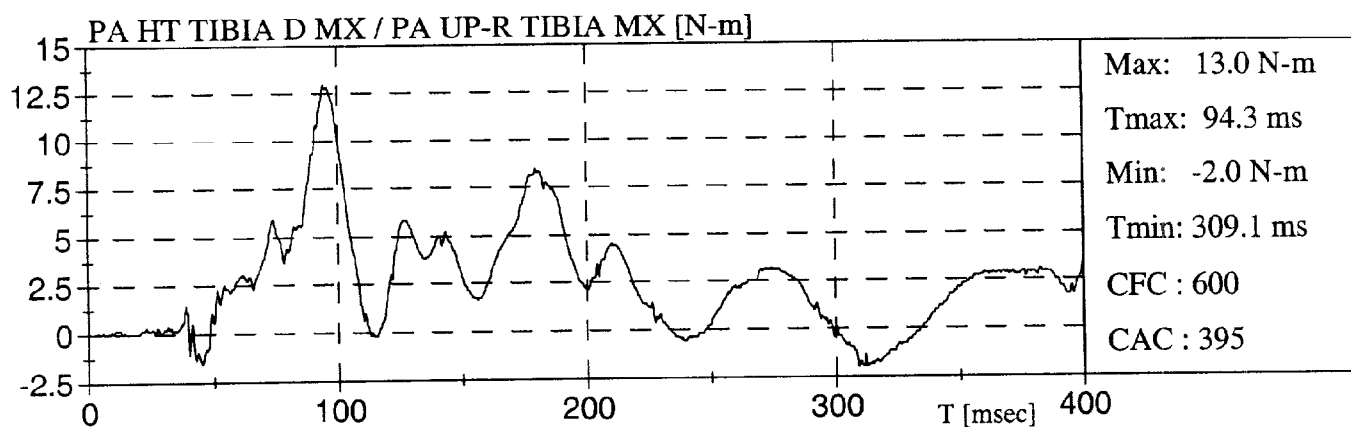
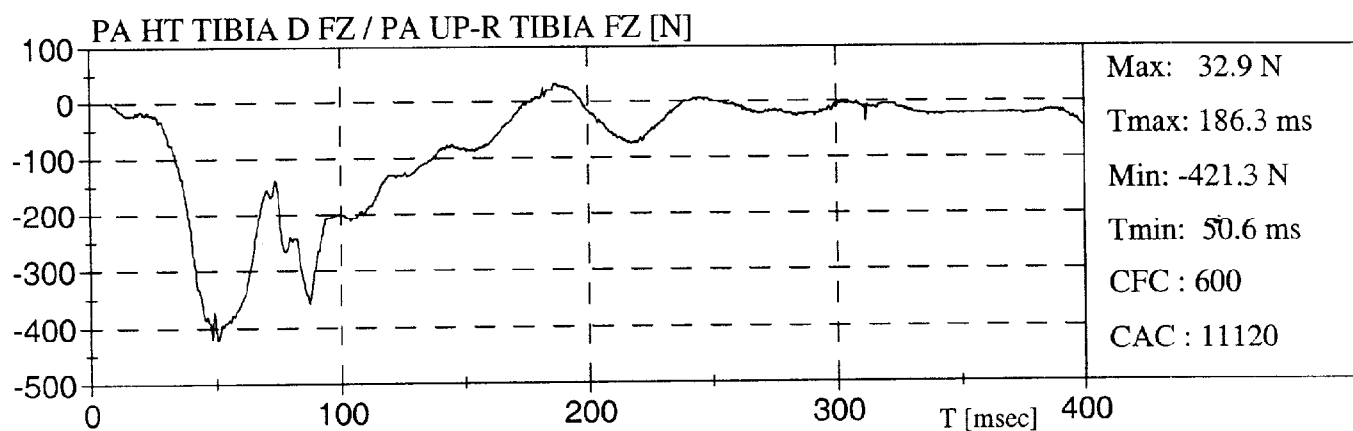
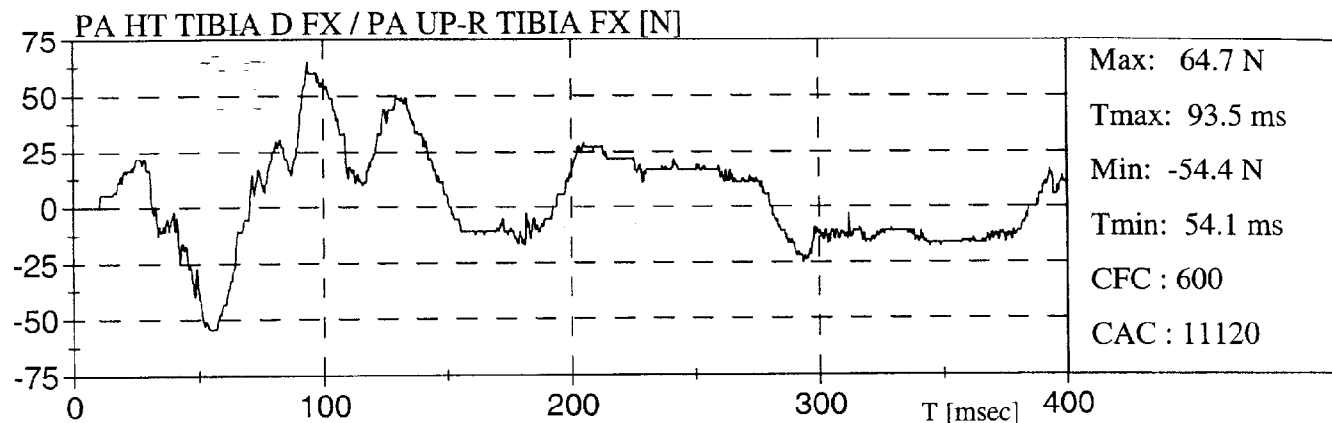














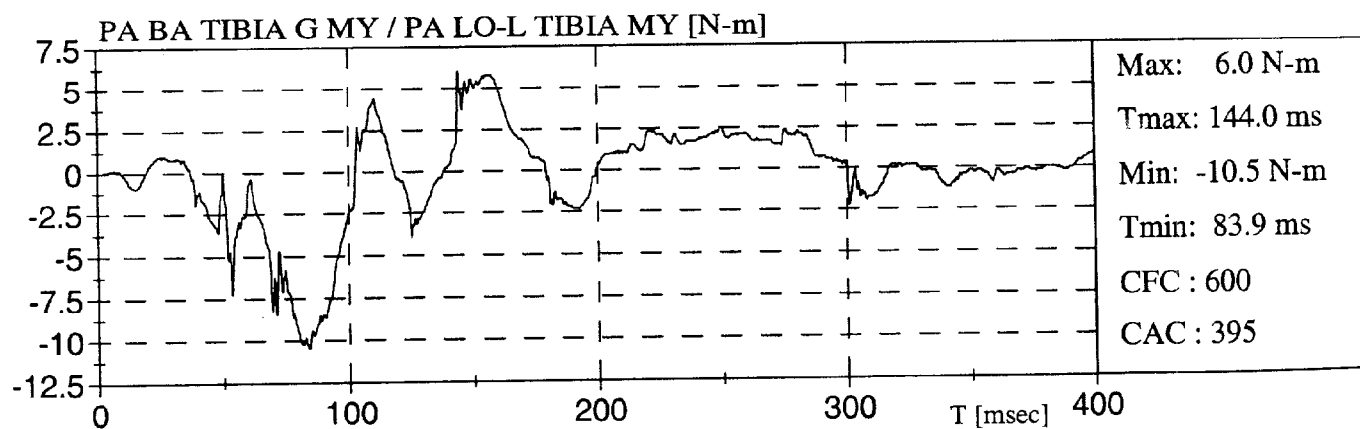
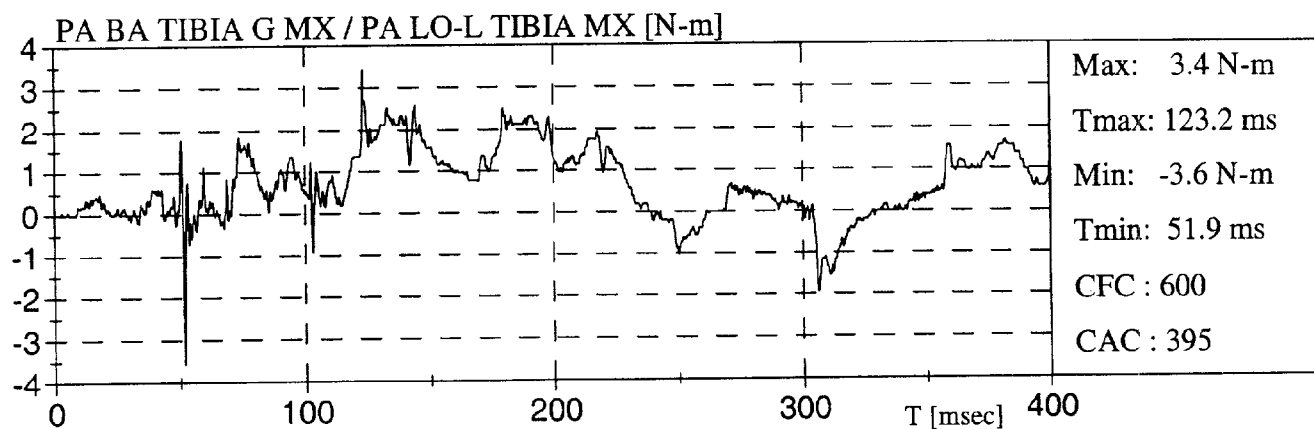
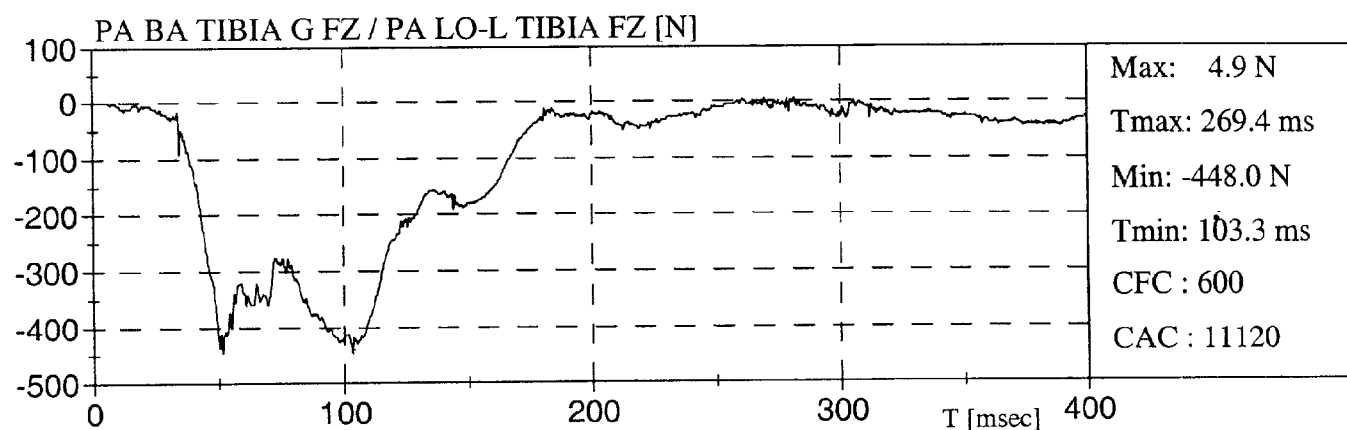
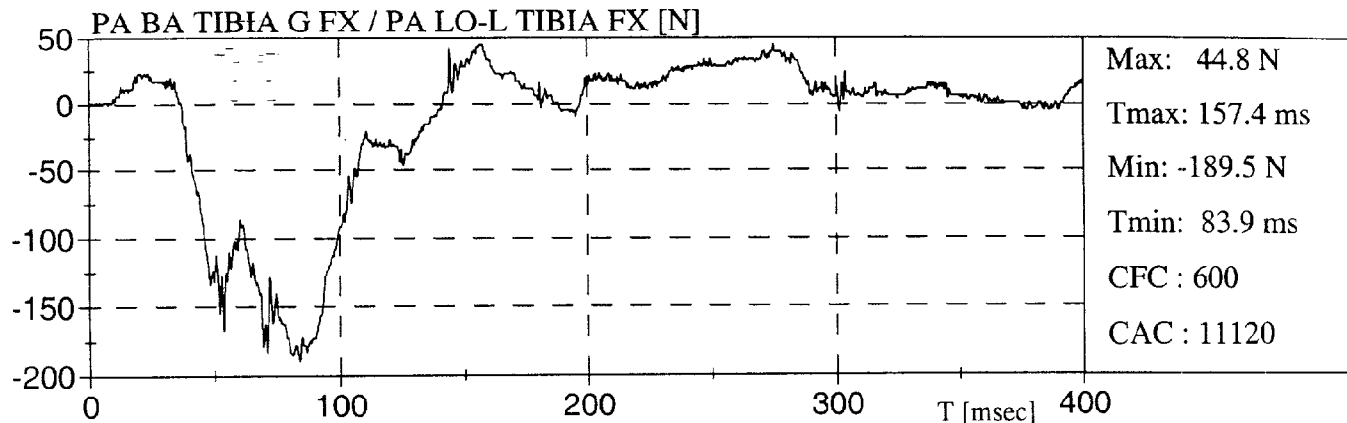
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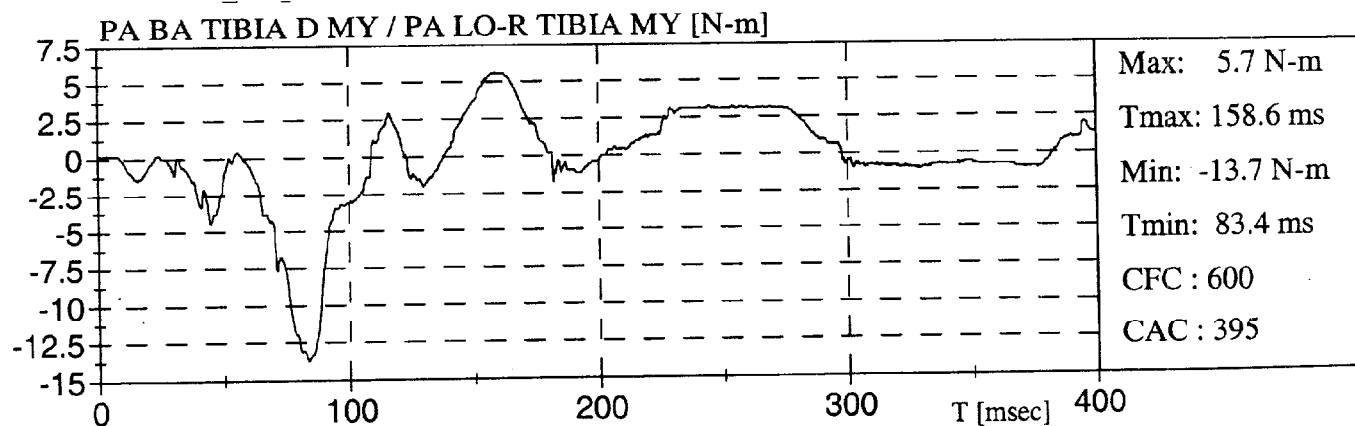
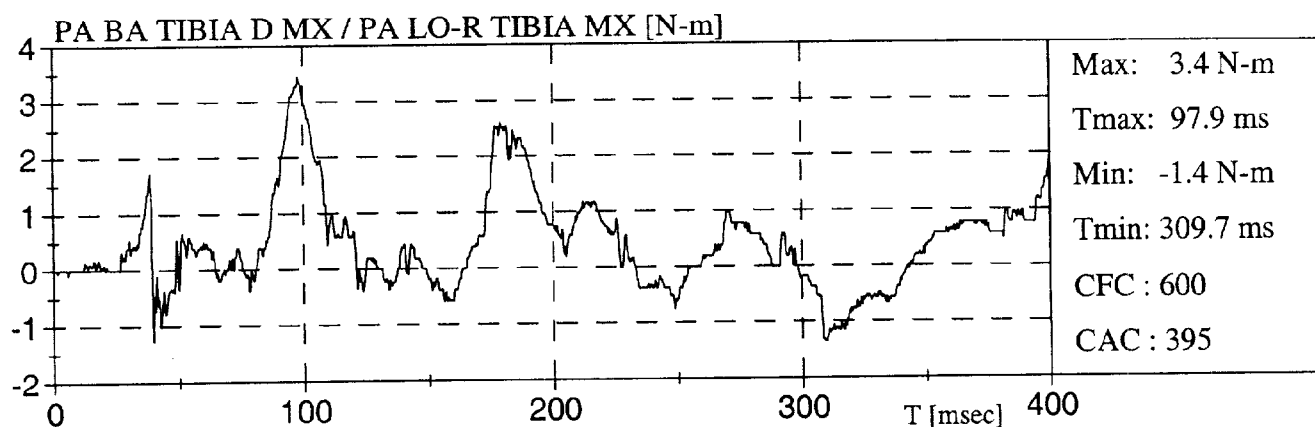
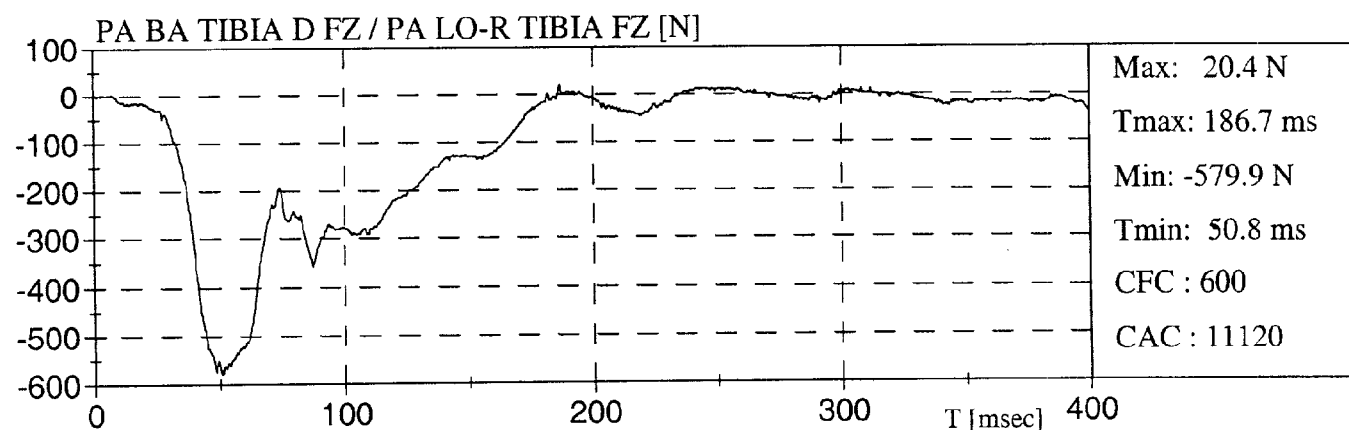
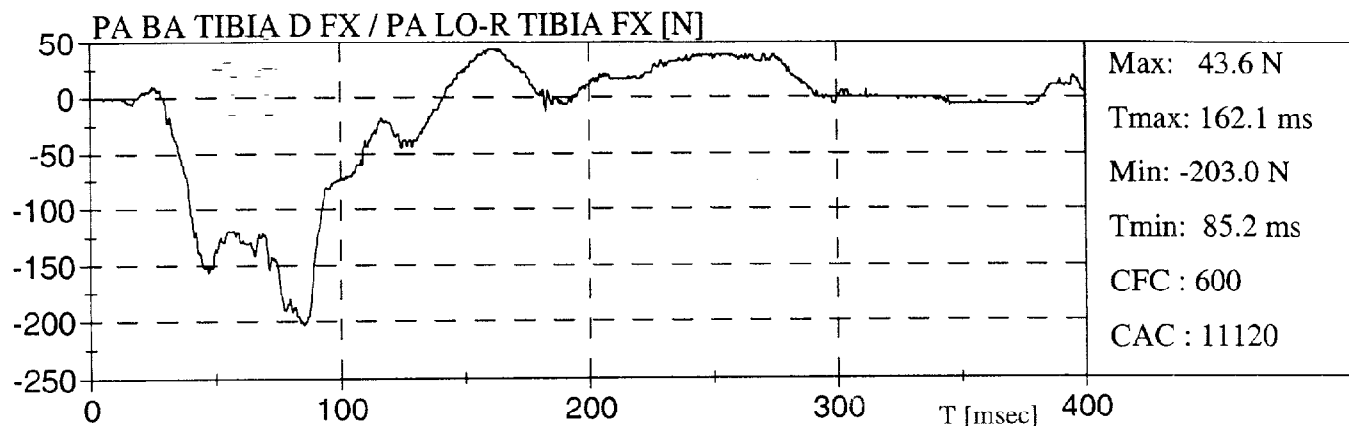
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OFFSET FRONTAL 40 KM/H - 40% LEFT

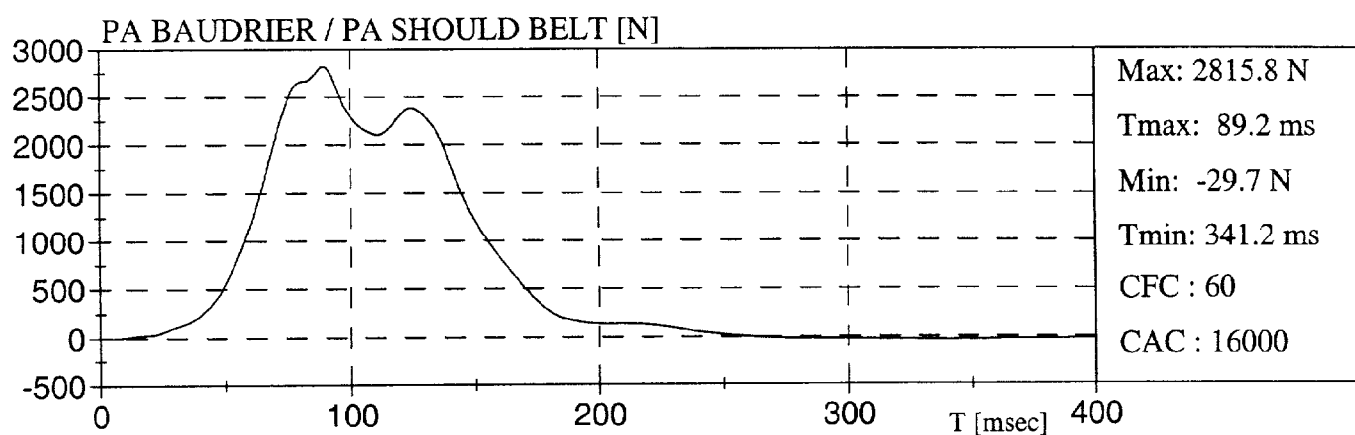
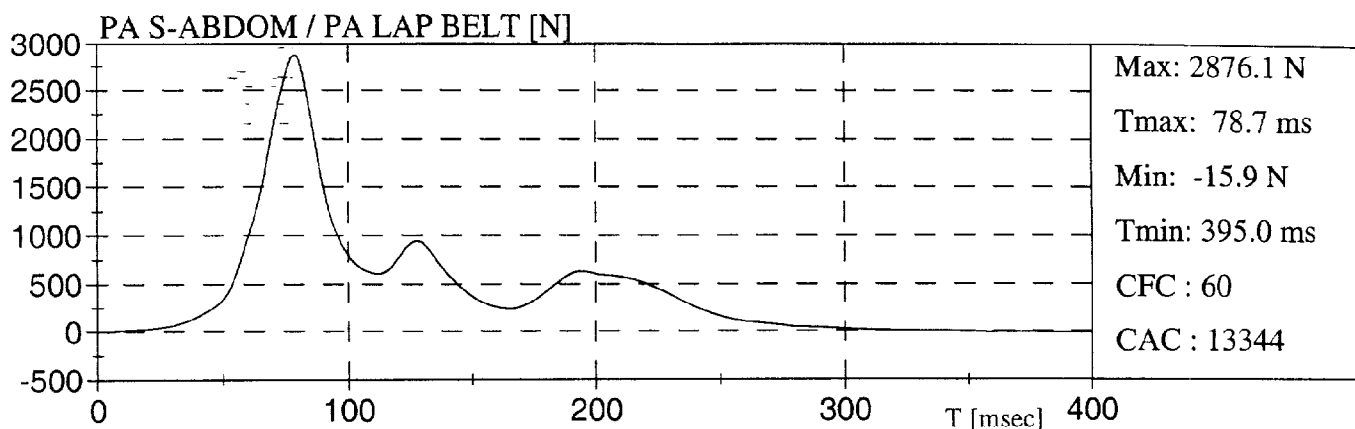
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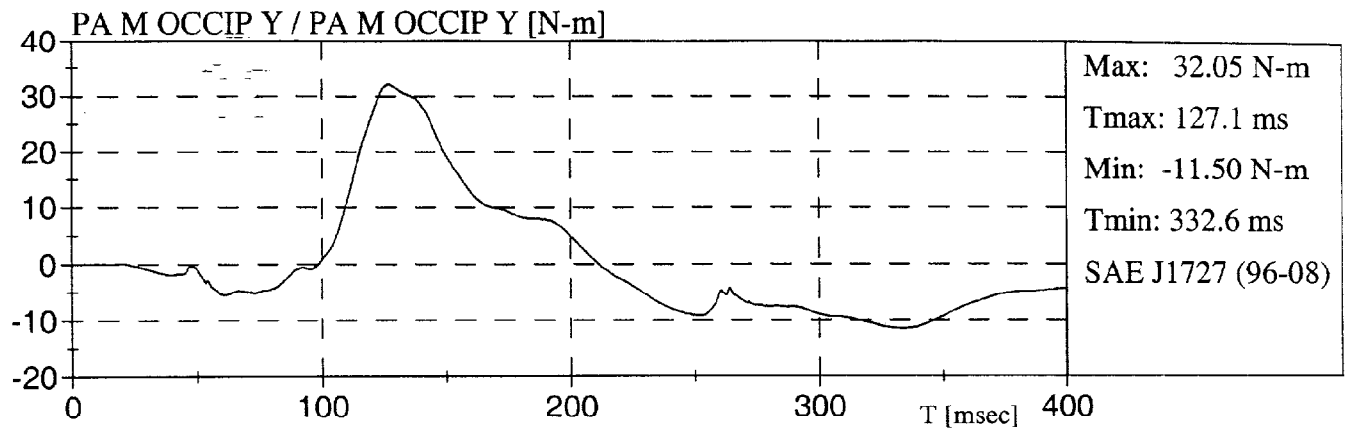
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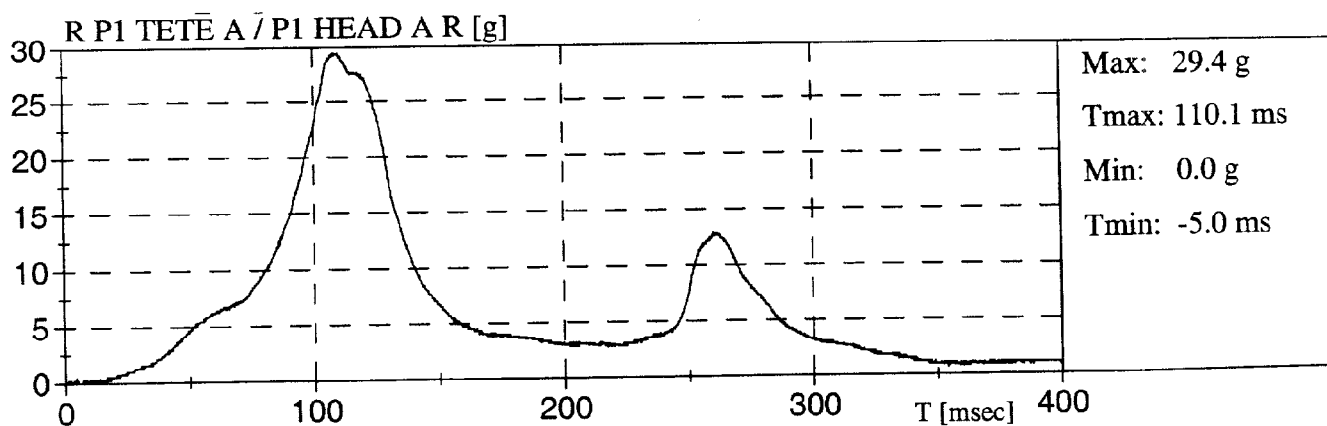
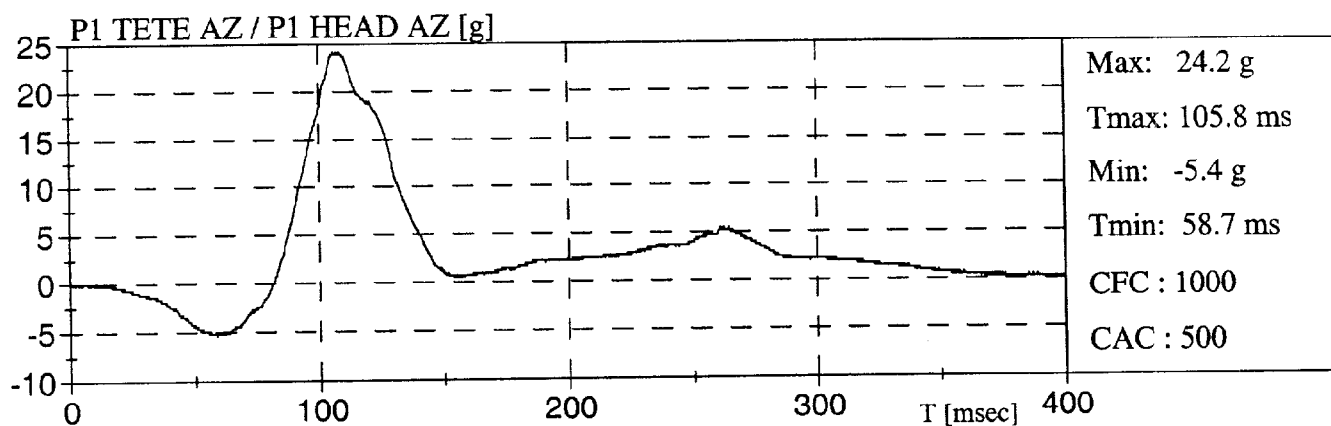
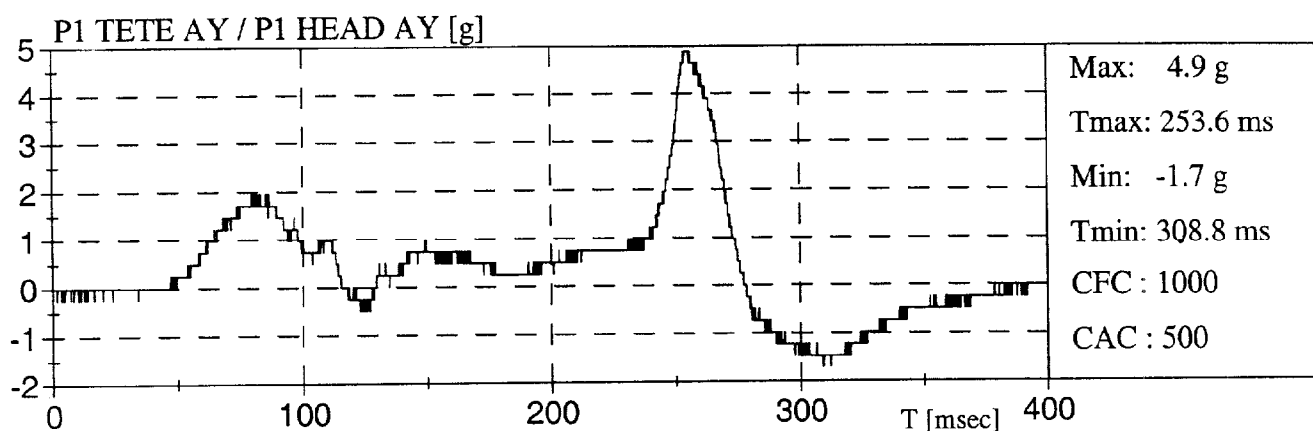
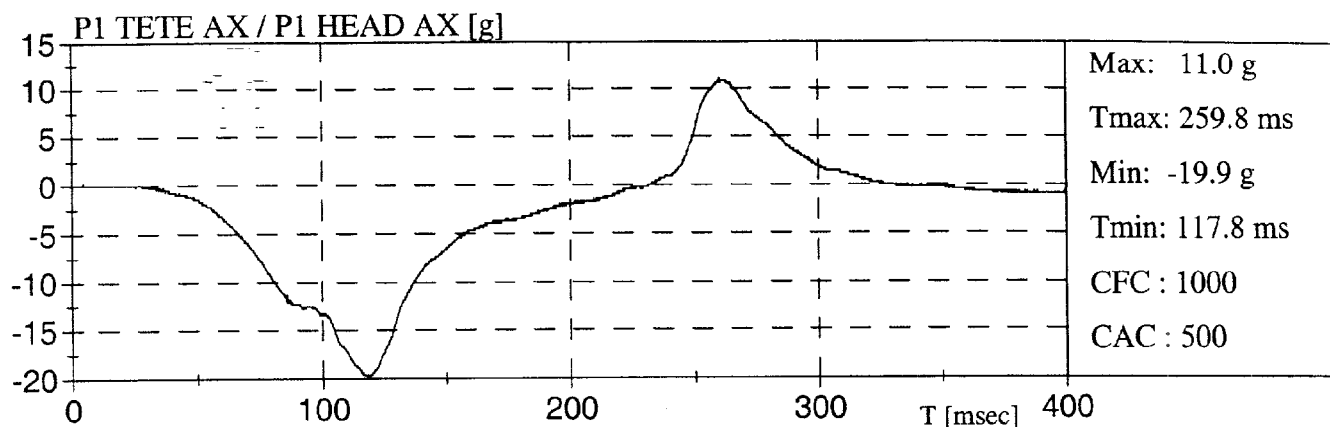
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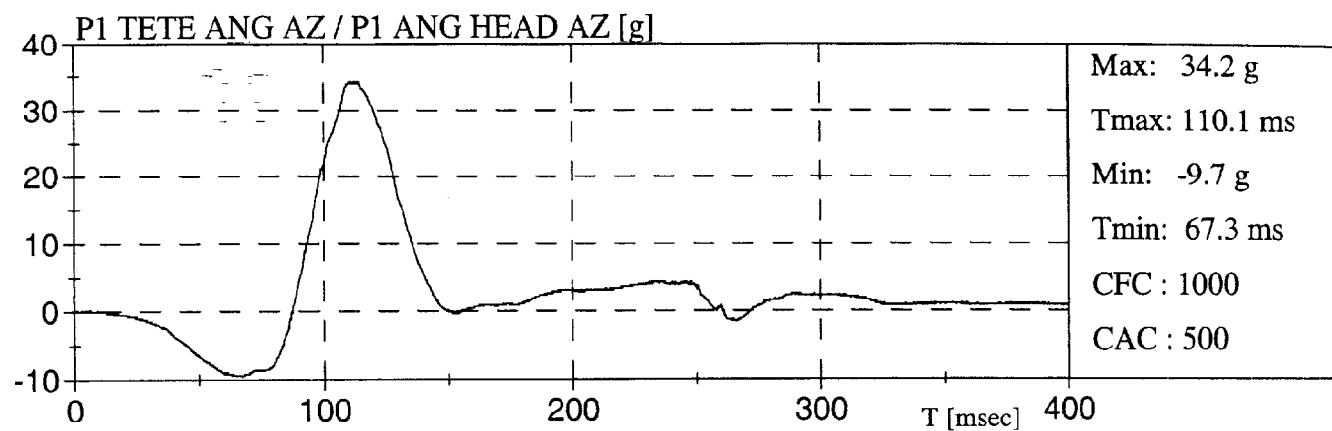


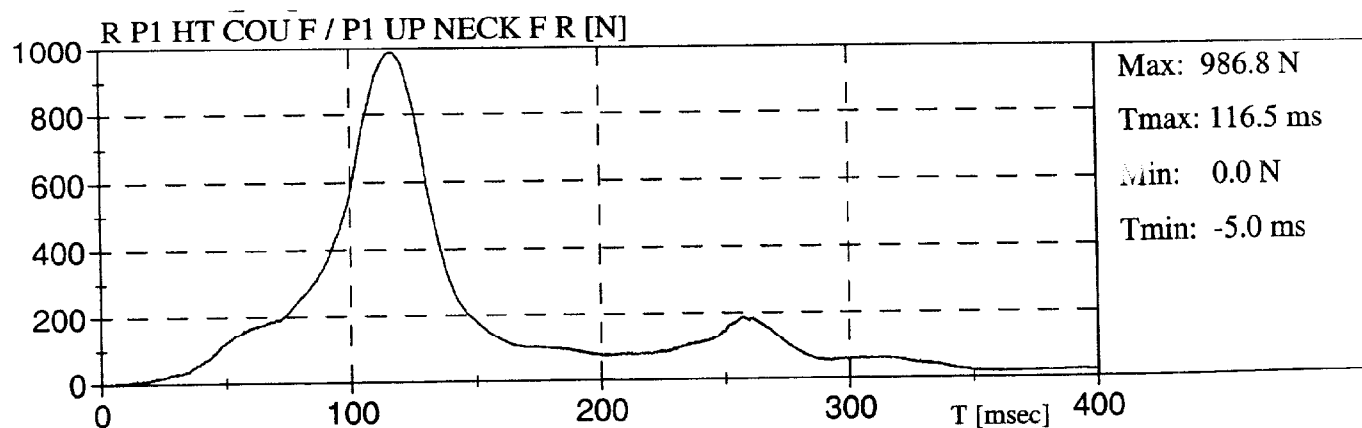
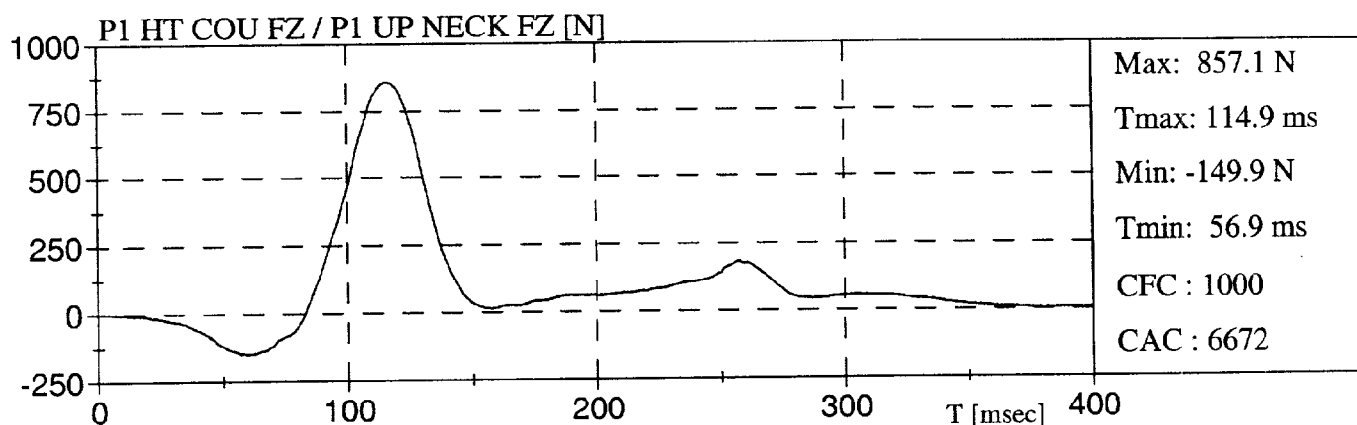
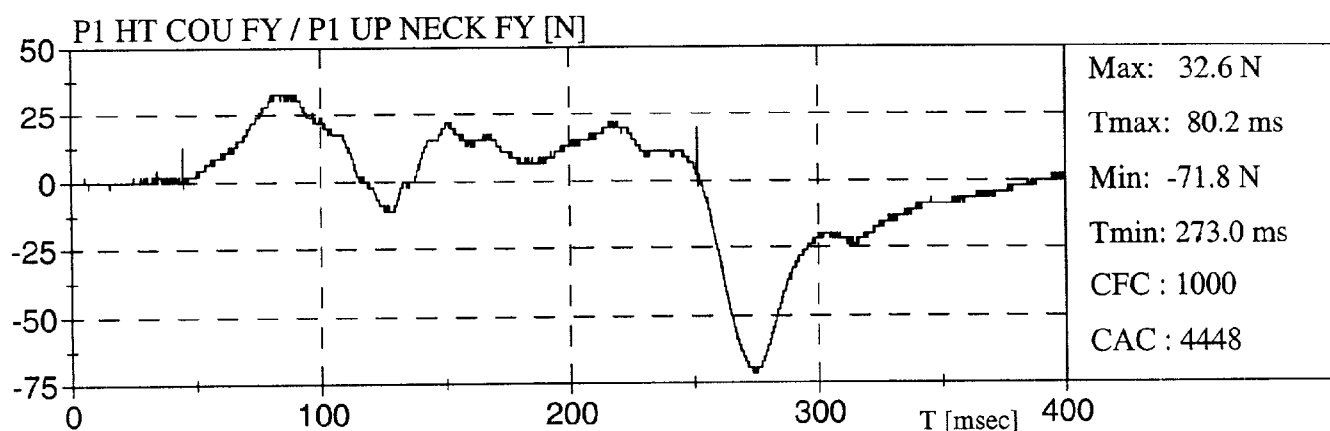
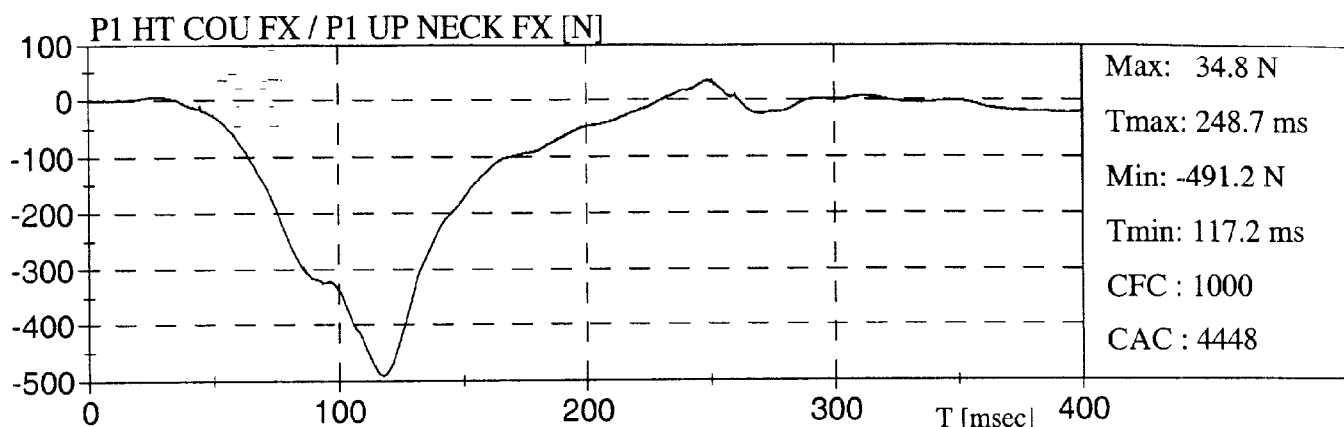


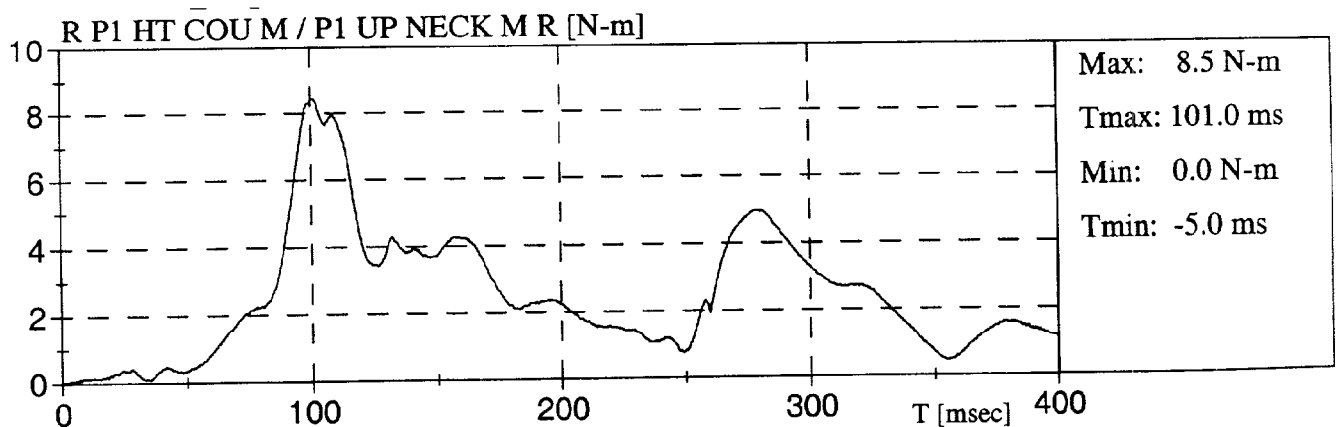
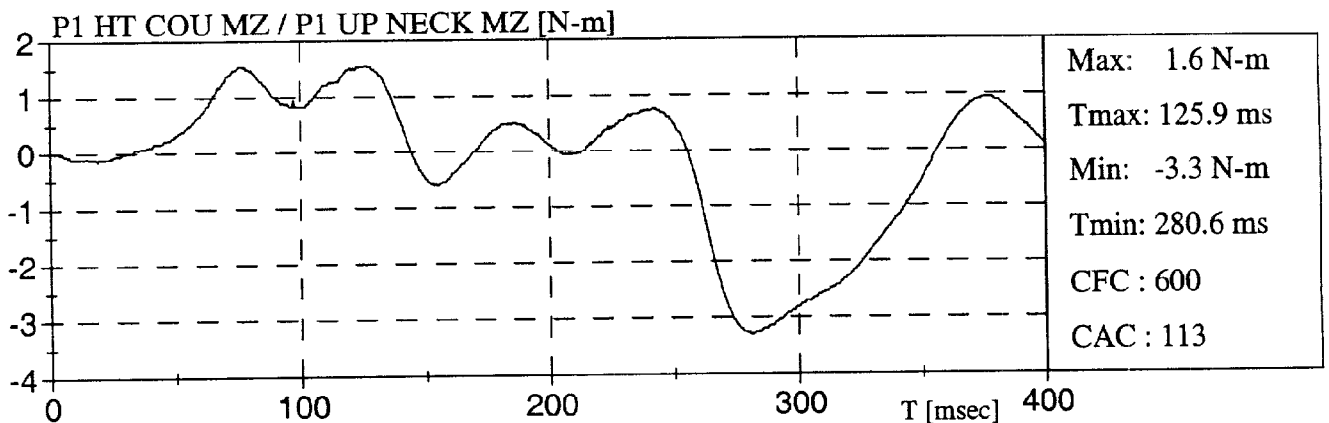
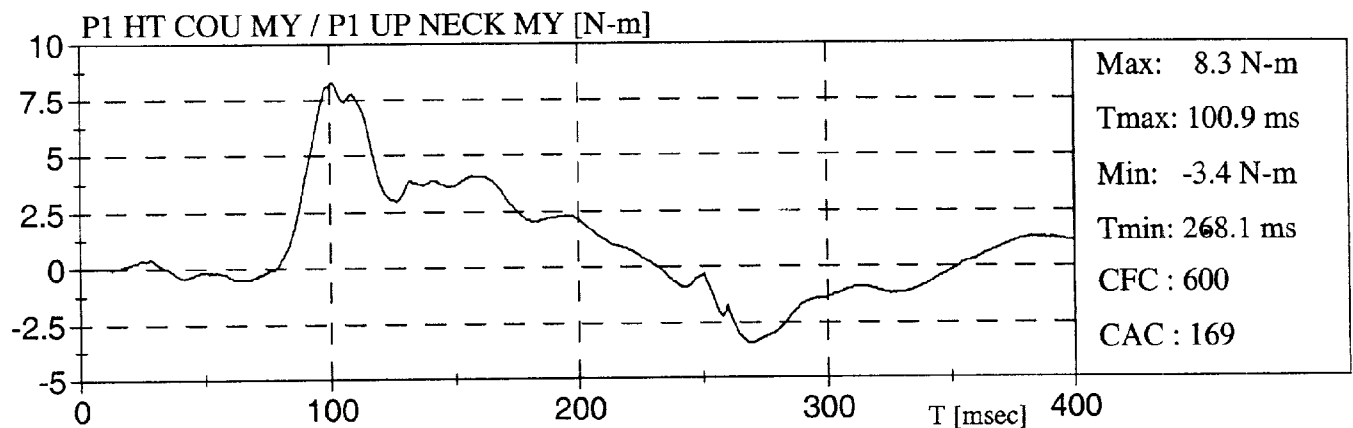
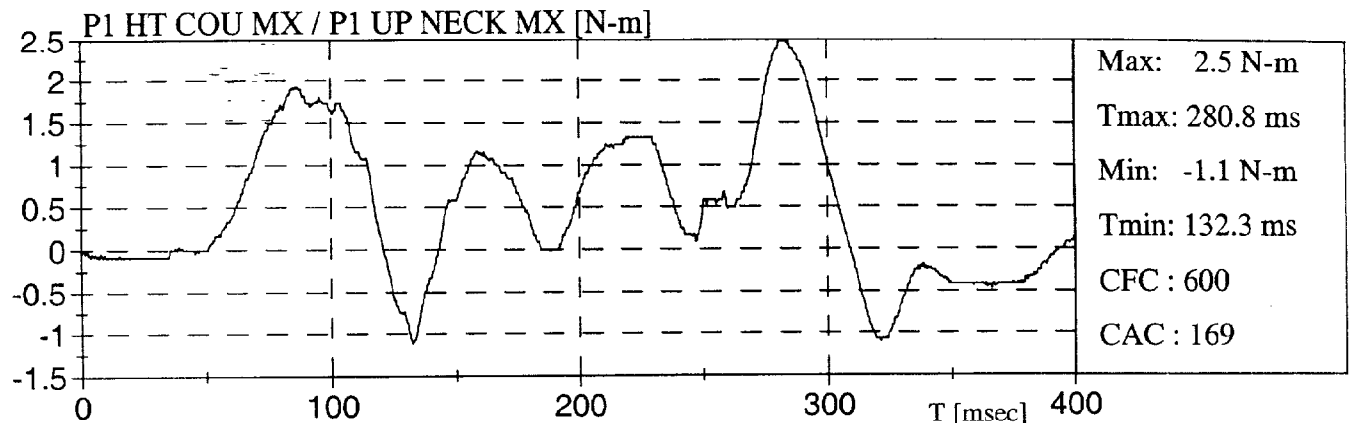


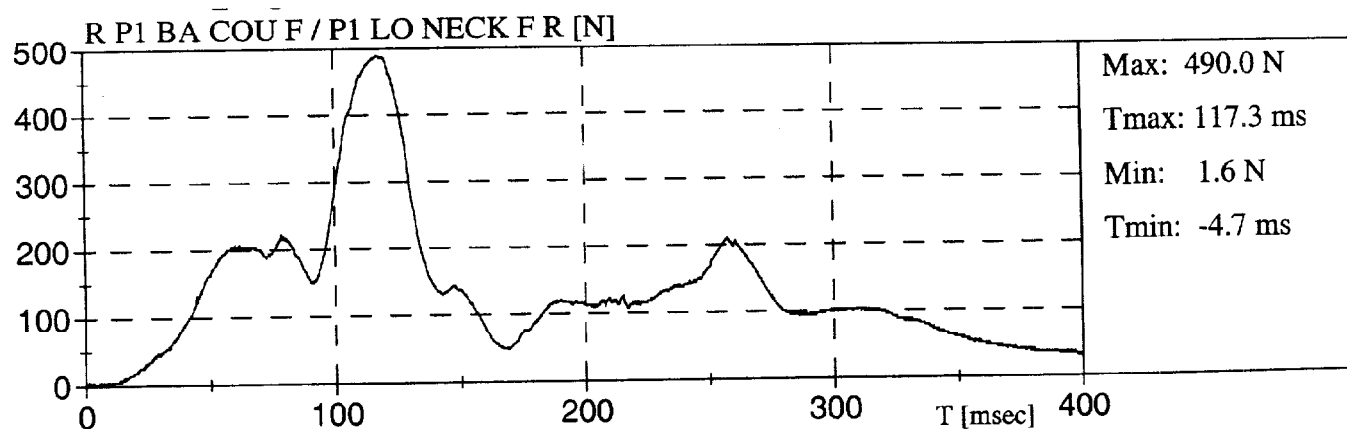
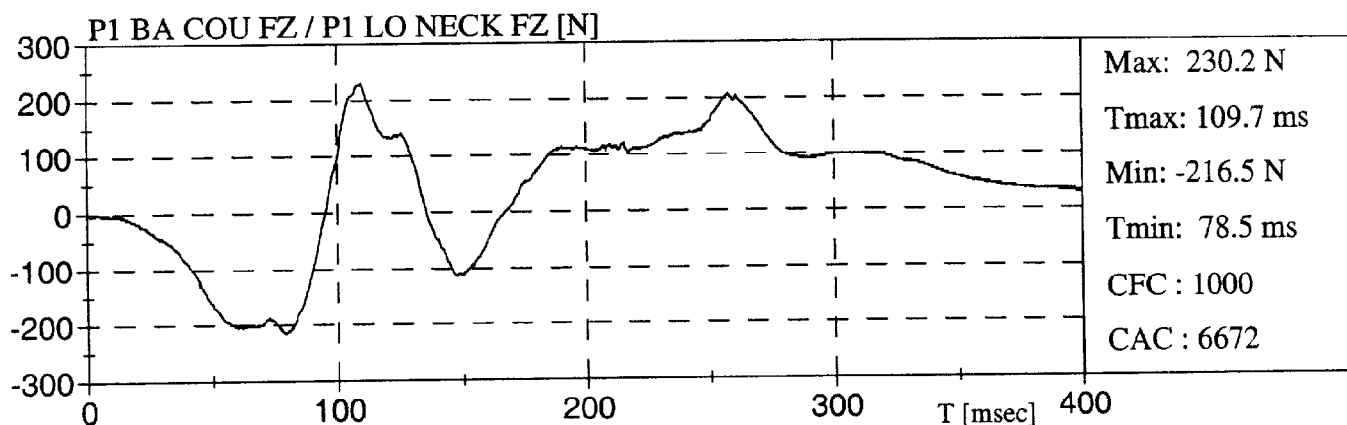
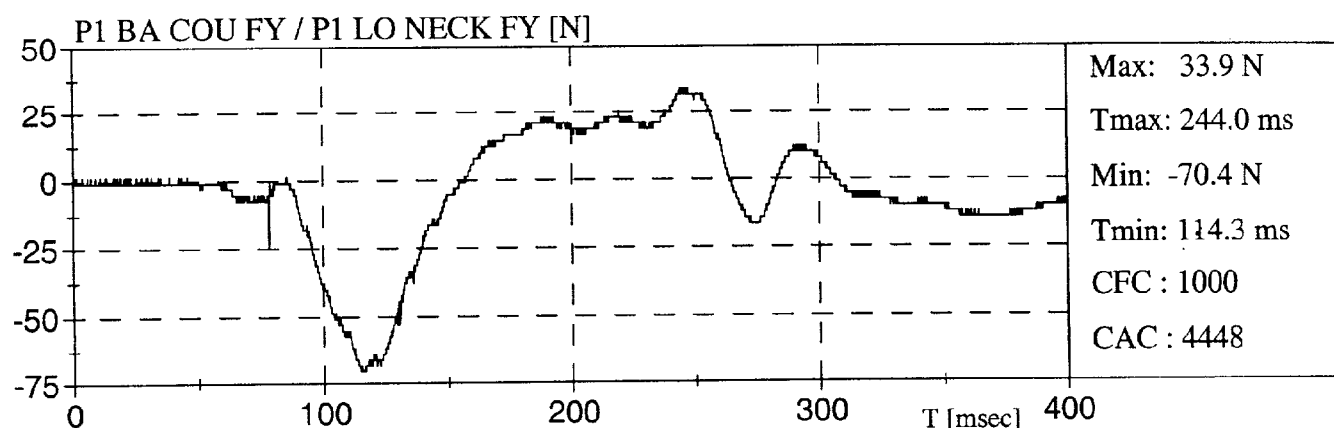
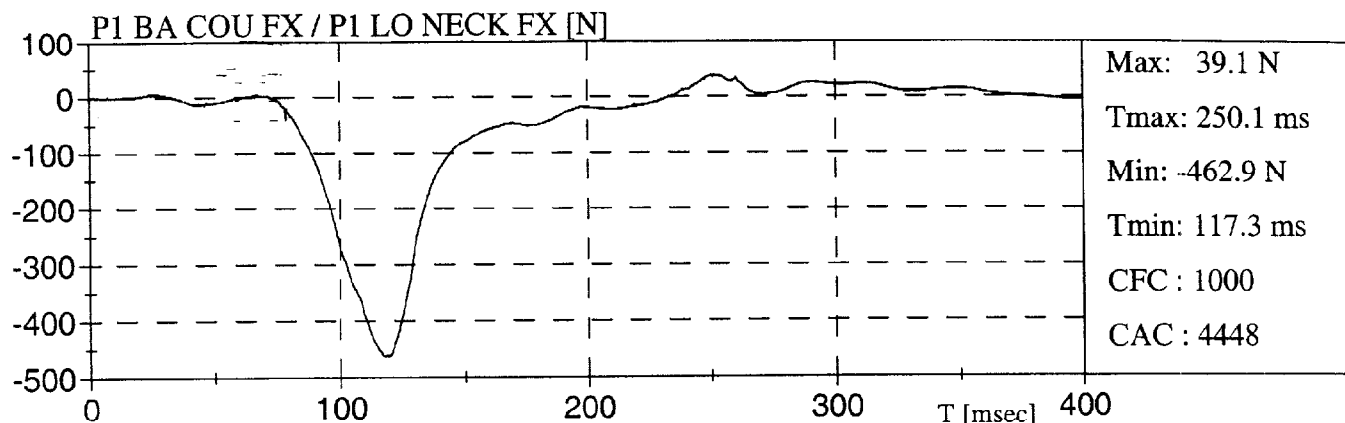


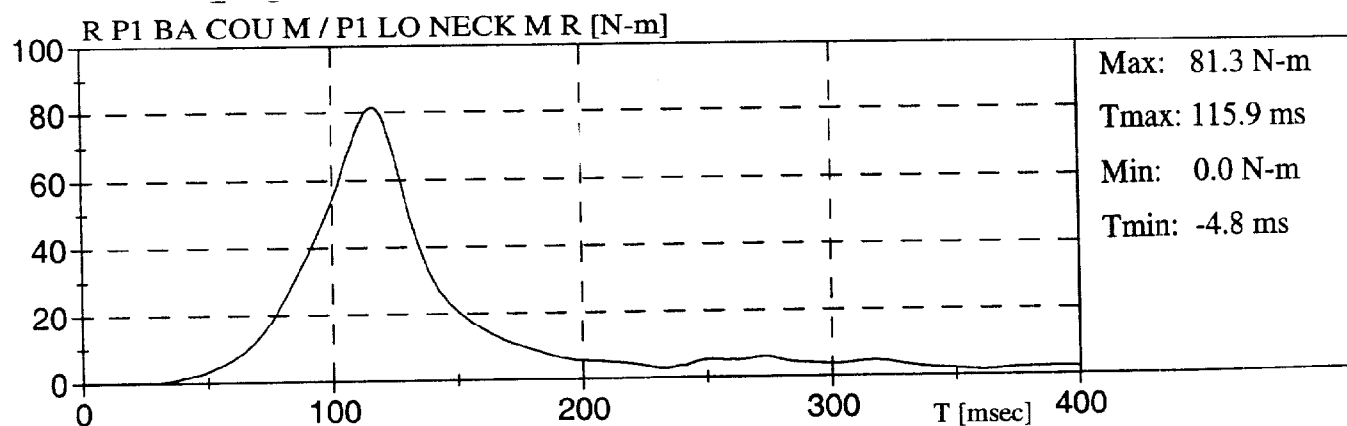
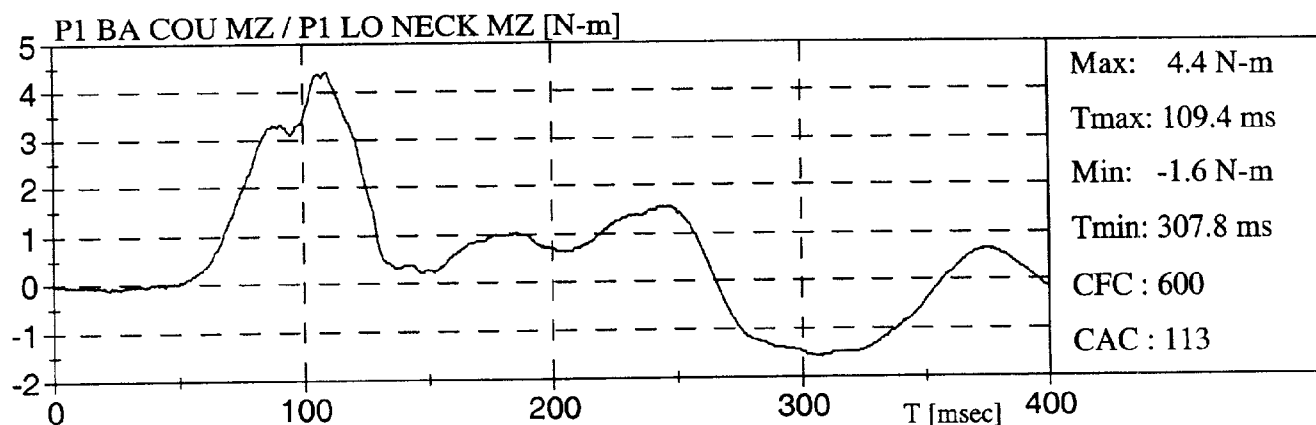
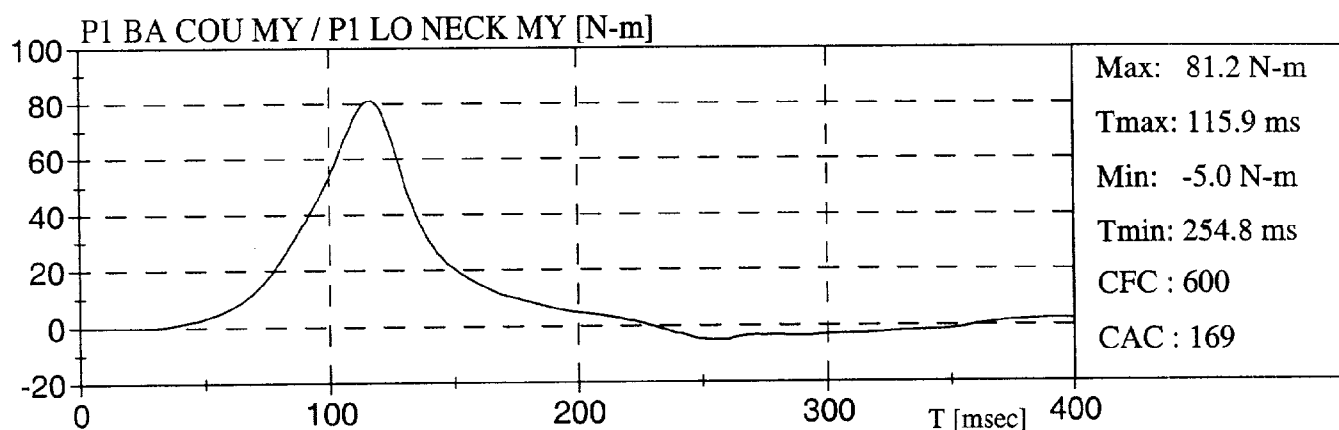
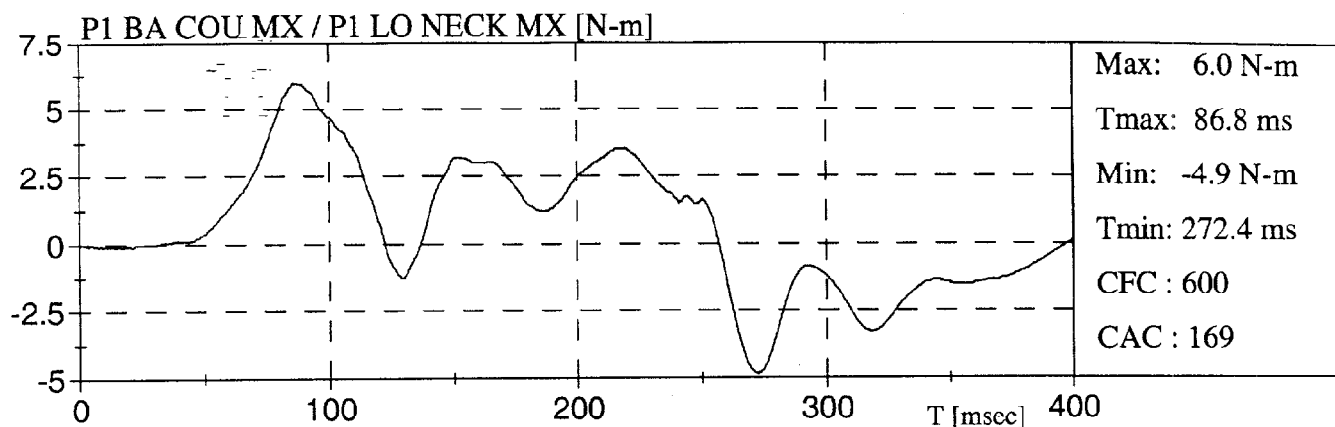


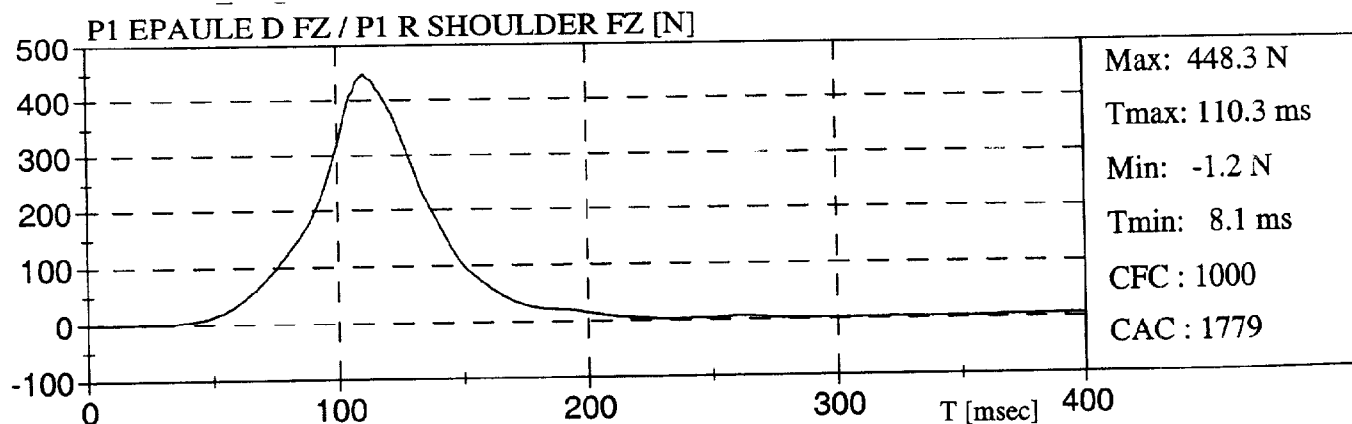
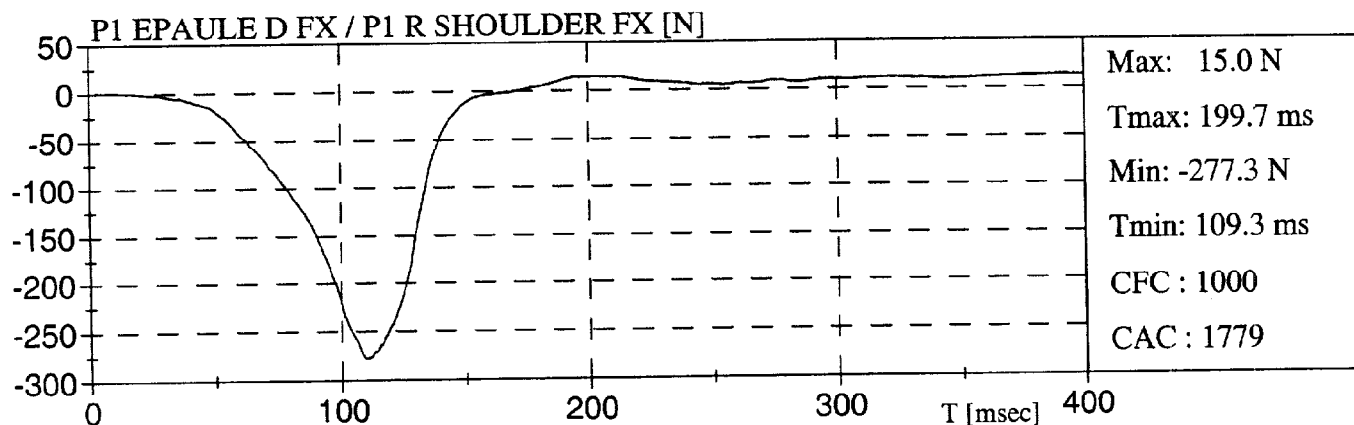
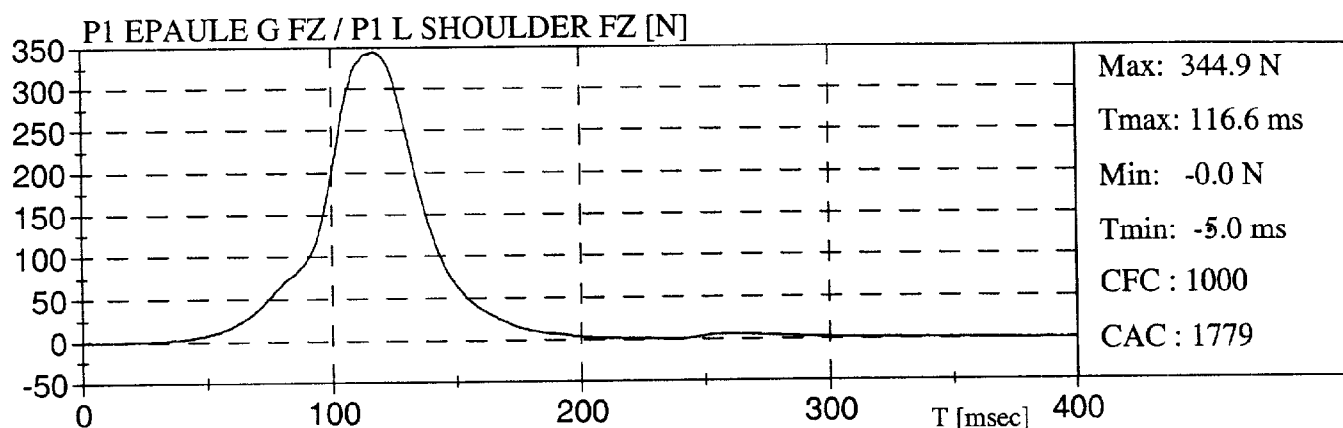
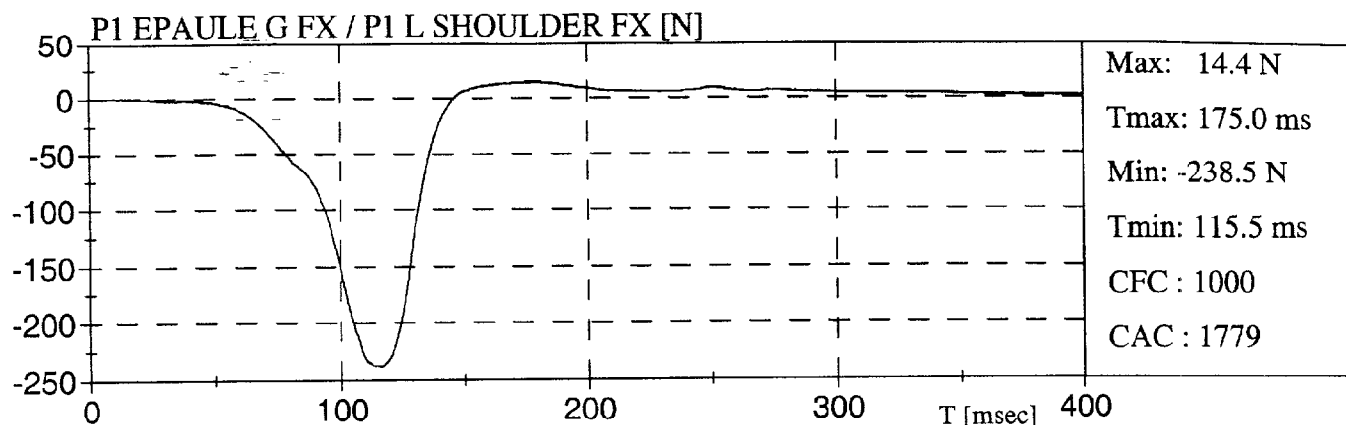


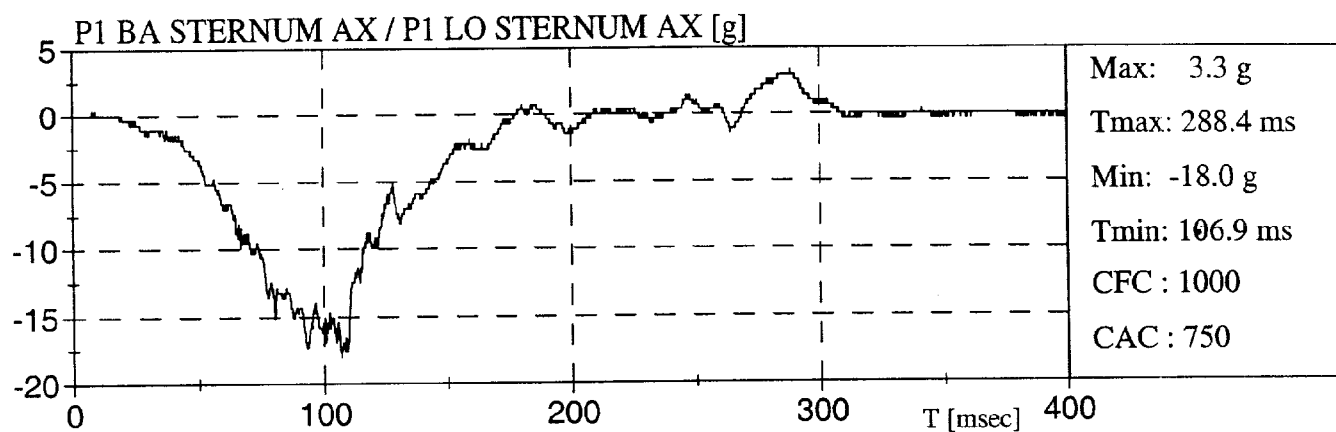
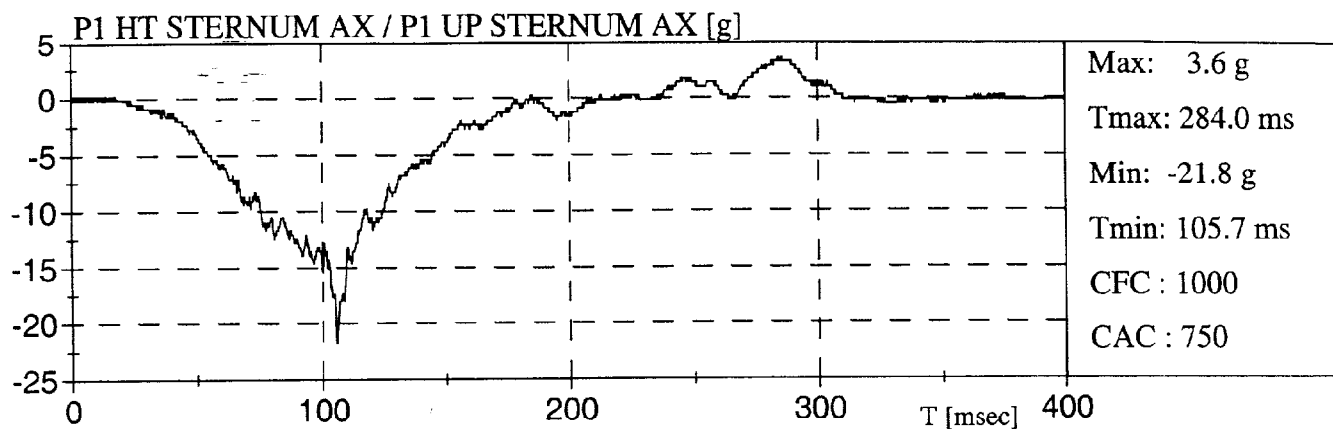


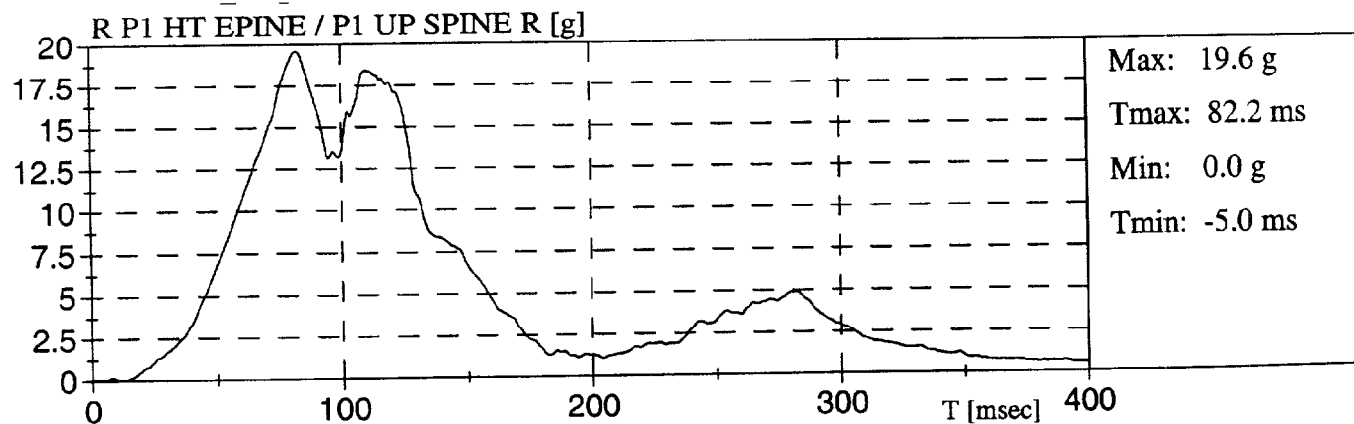
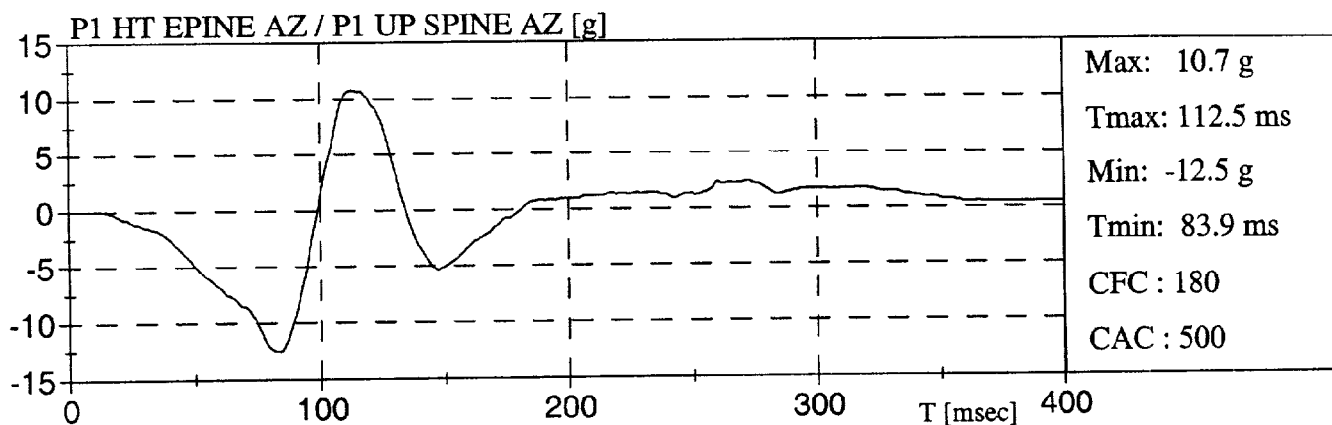
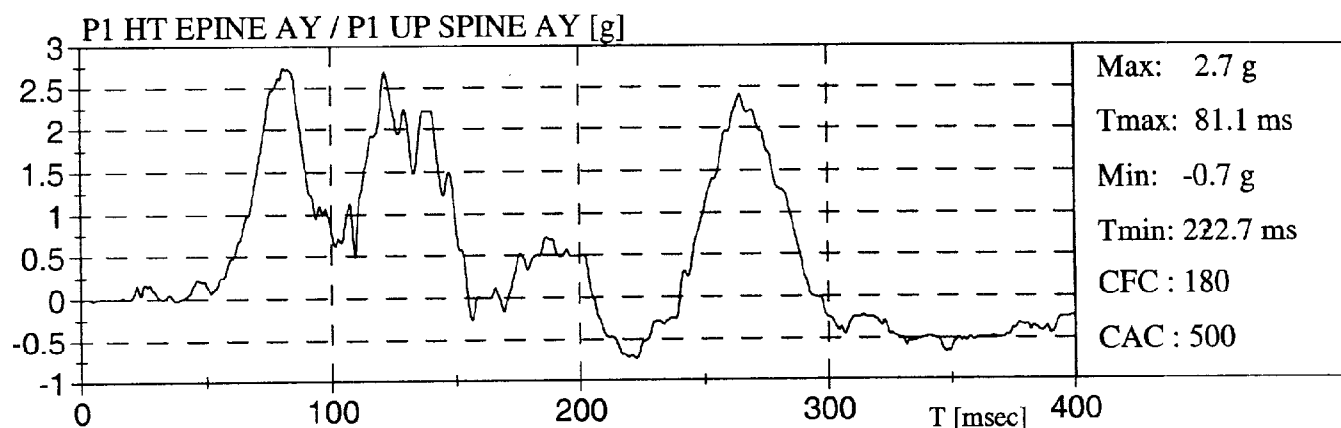
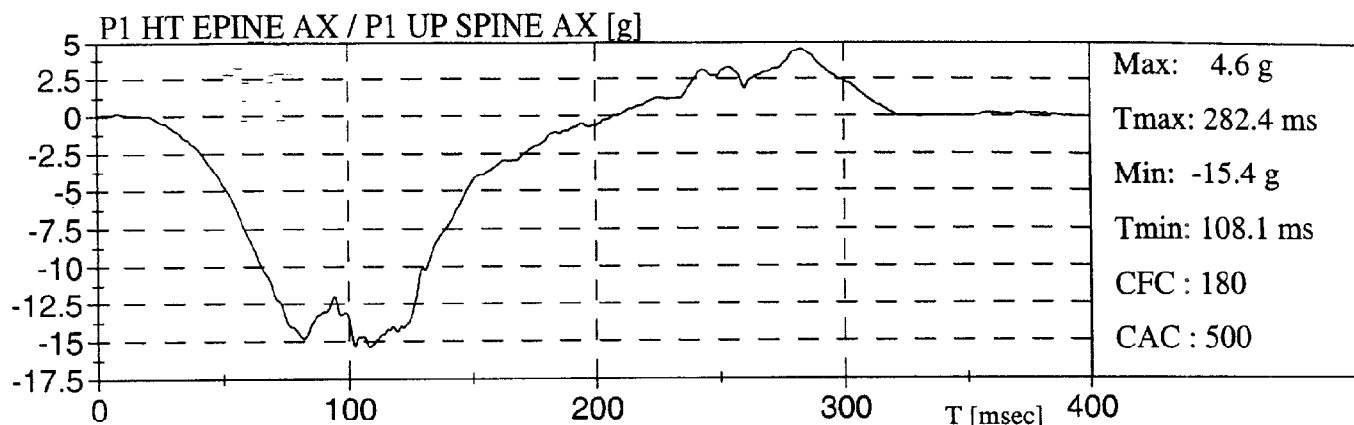


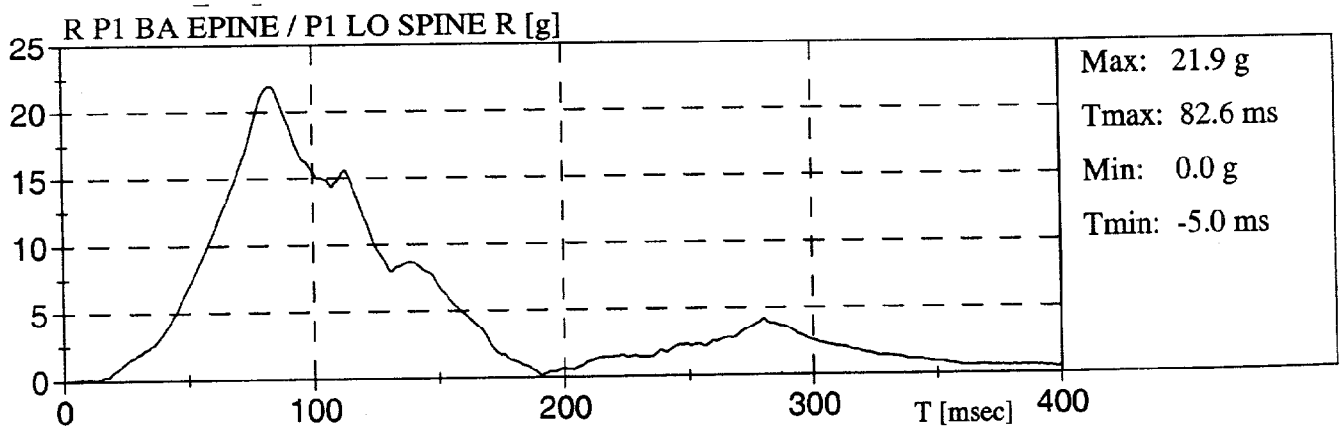
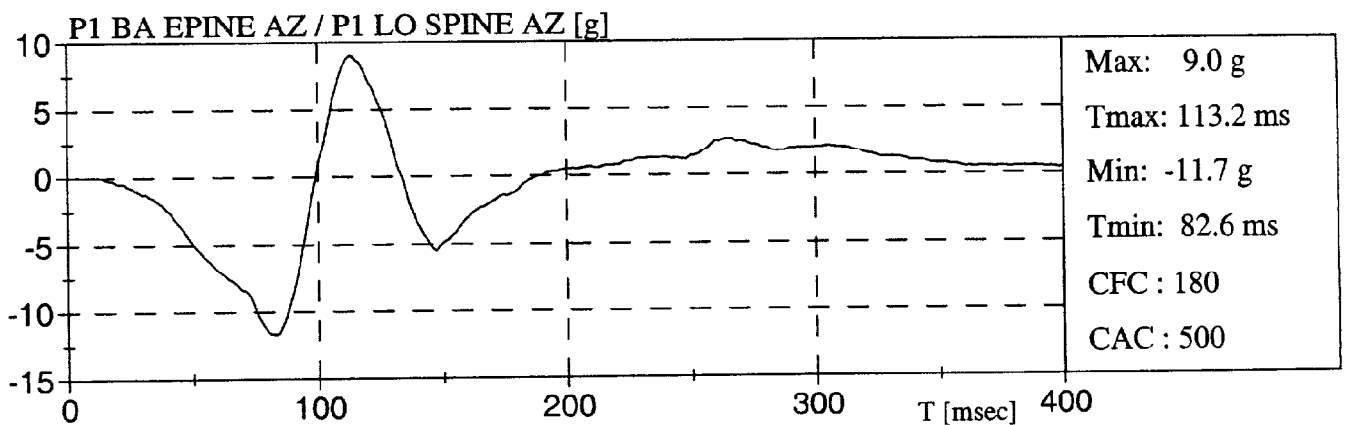
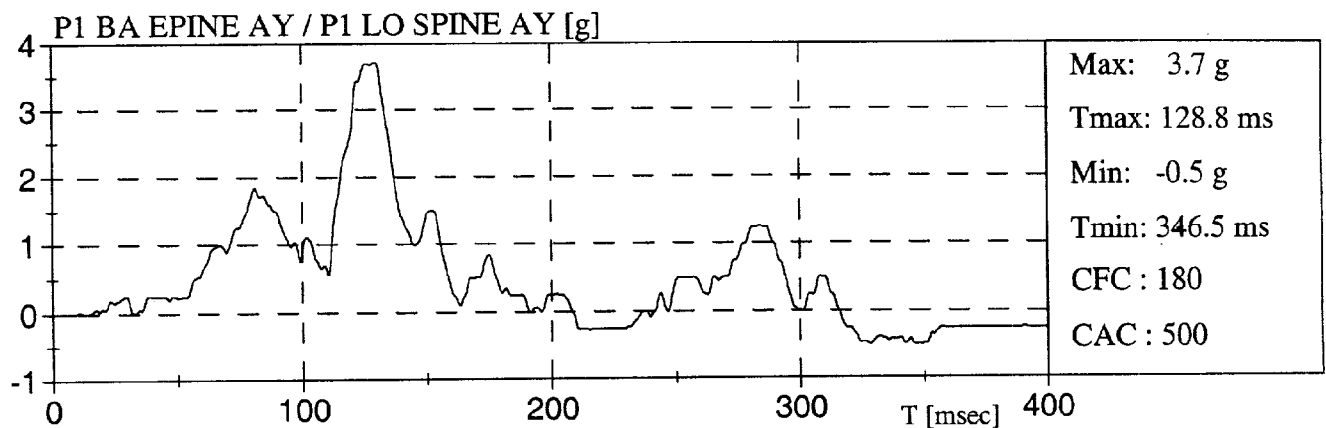
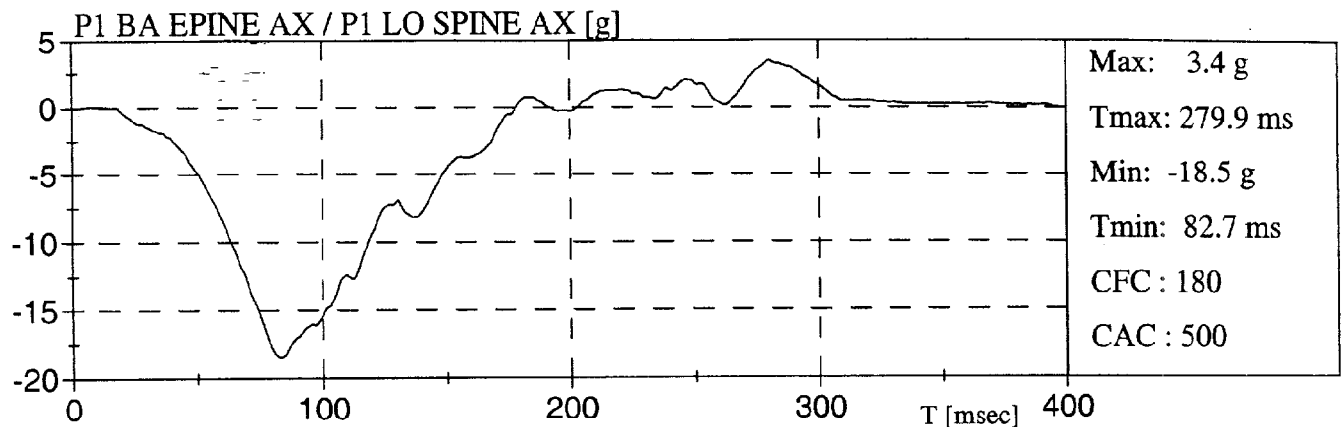


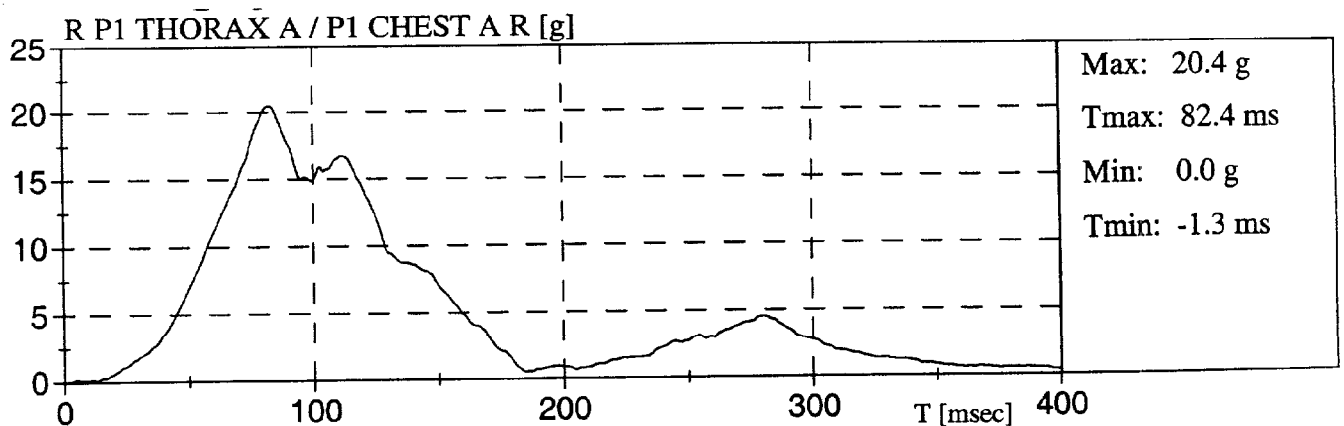
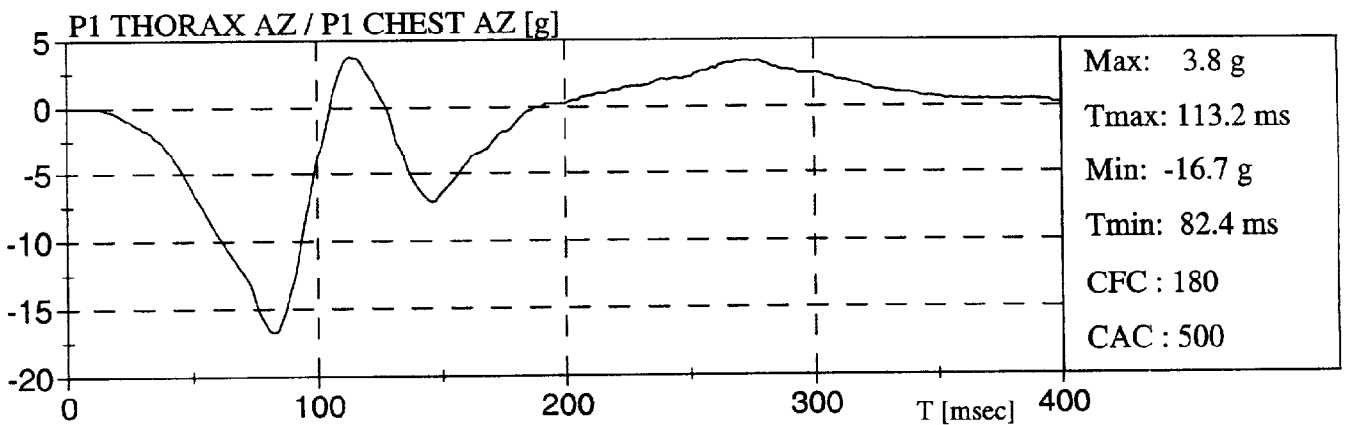
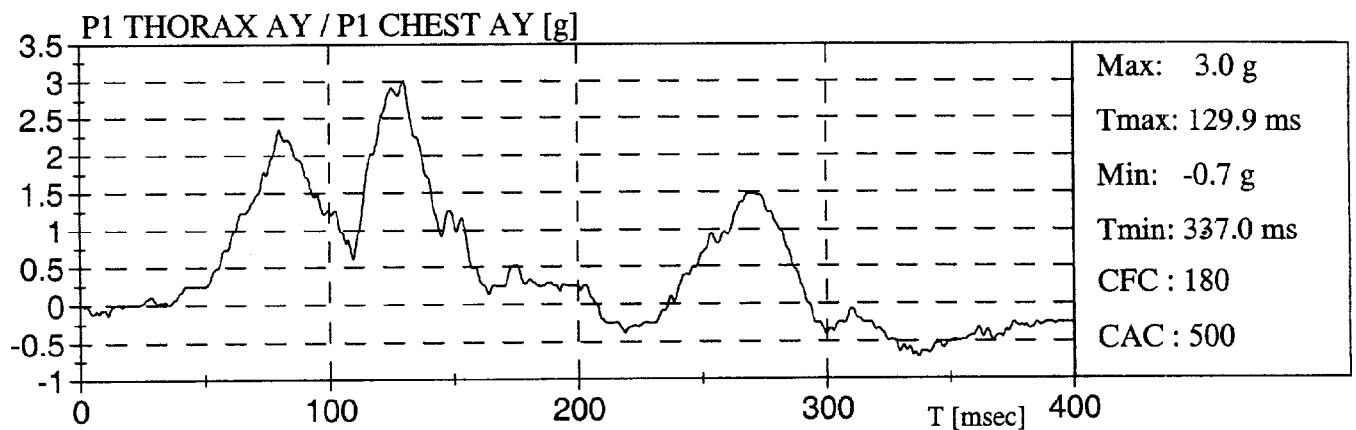
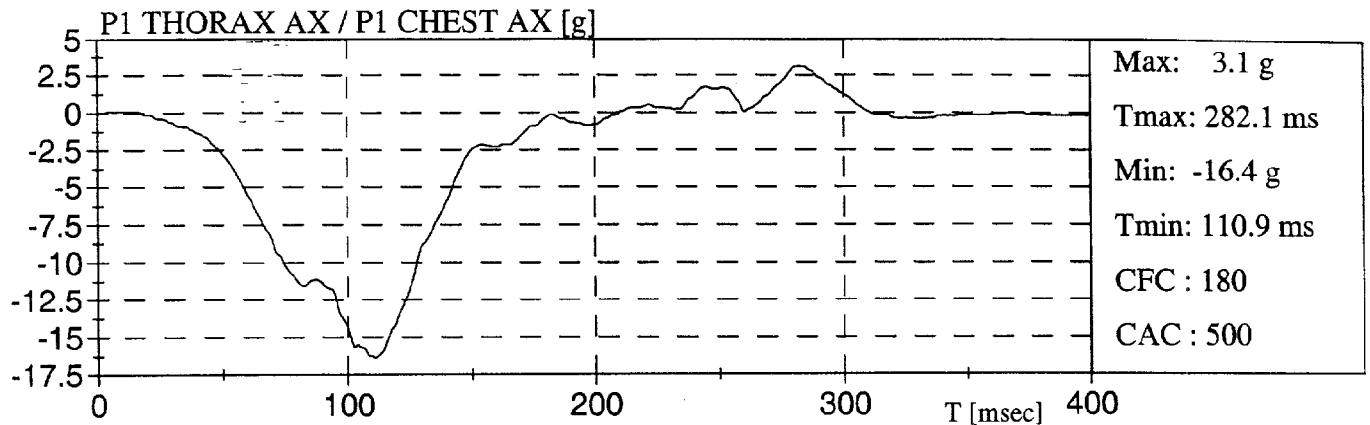


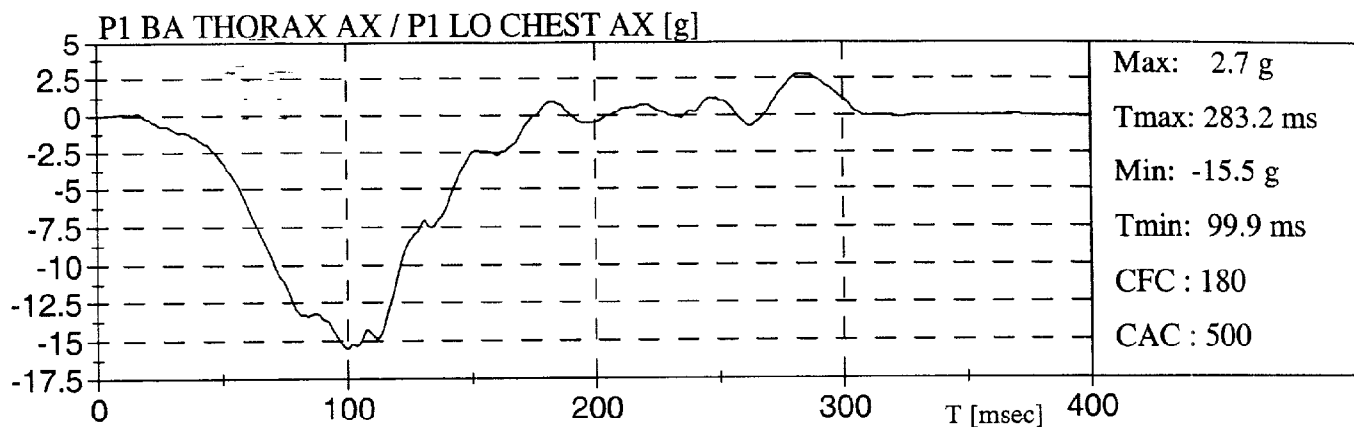














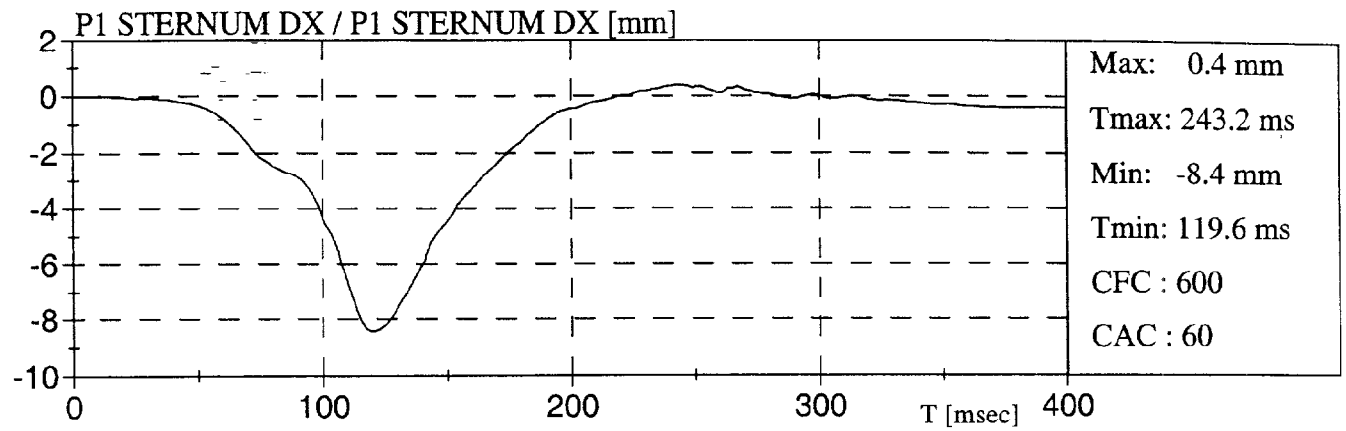
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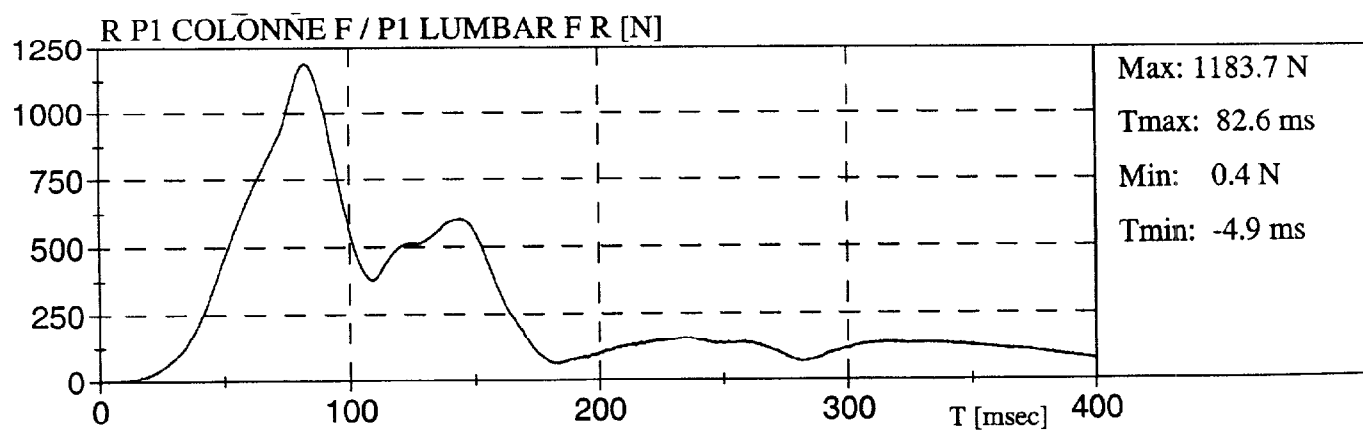
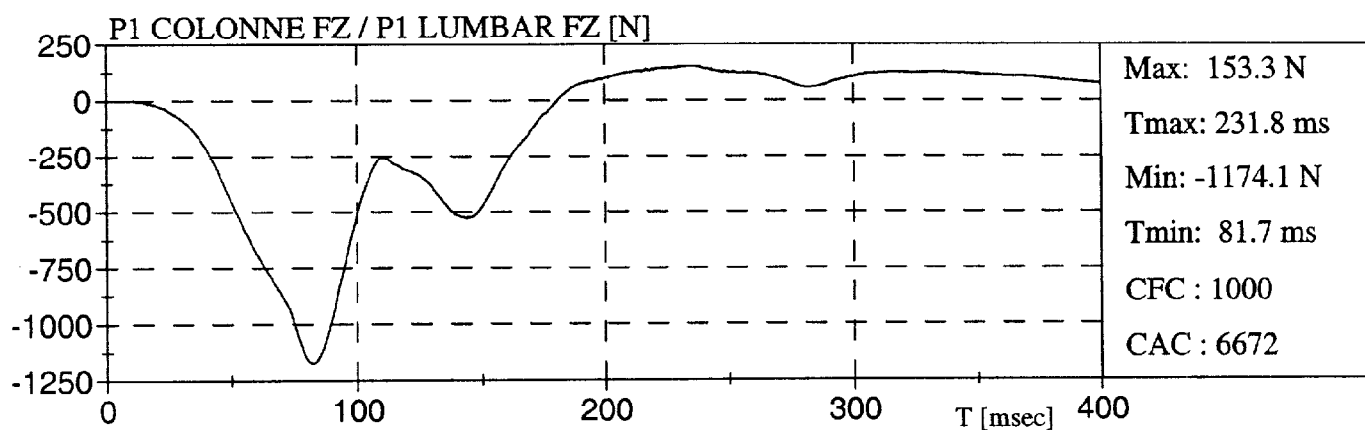
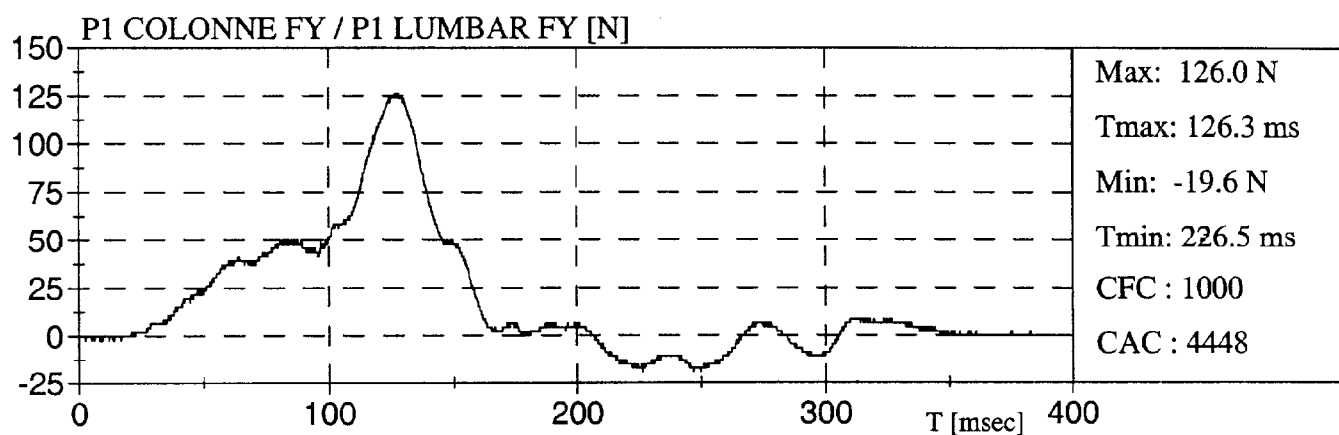
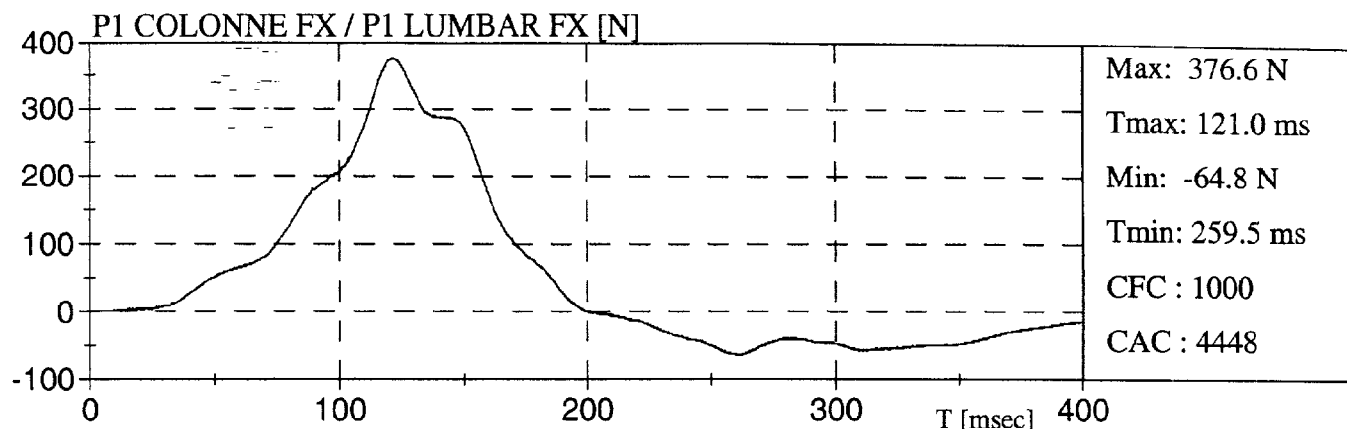
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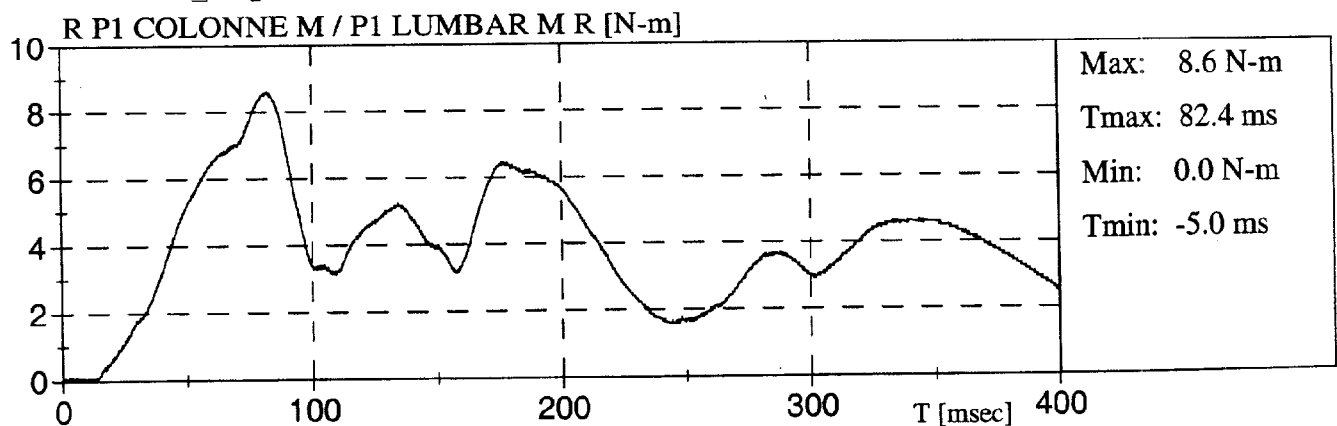
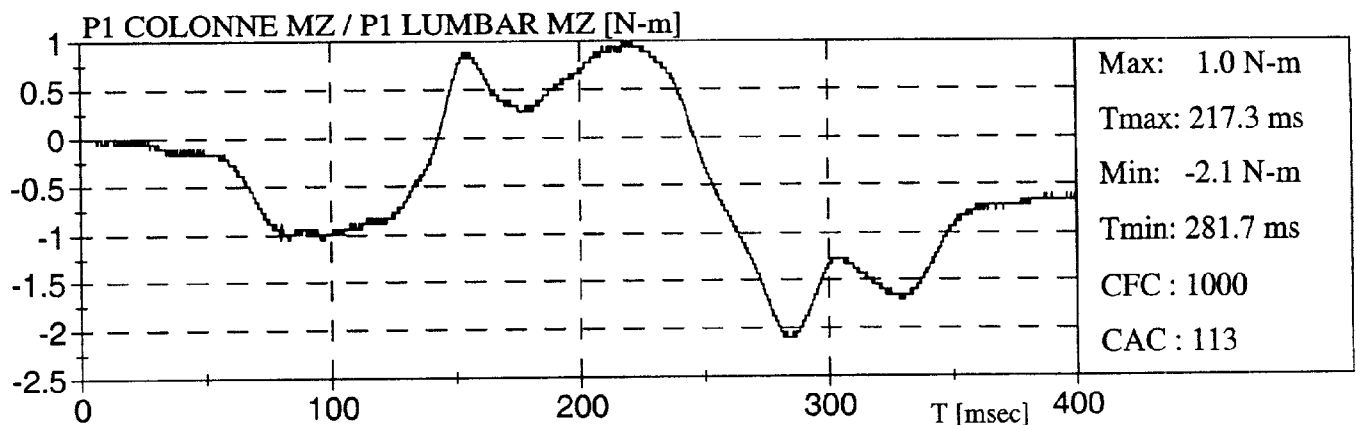
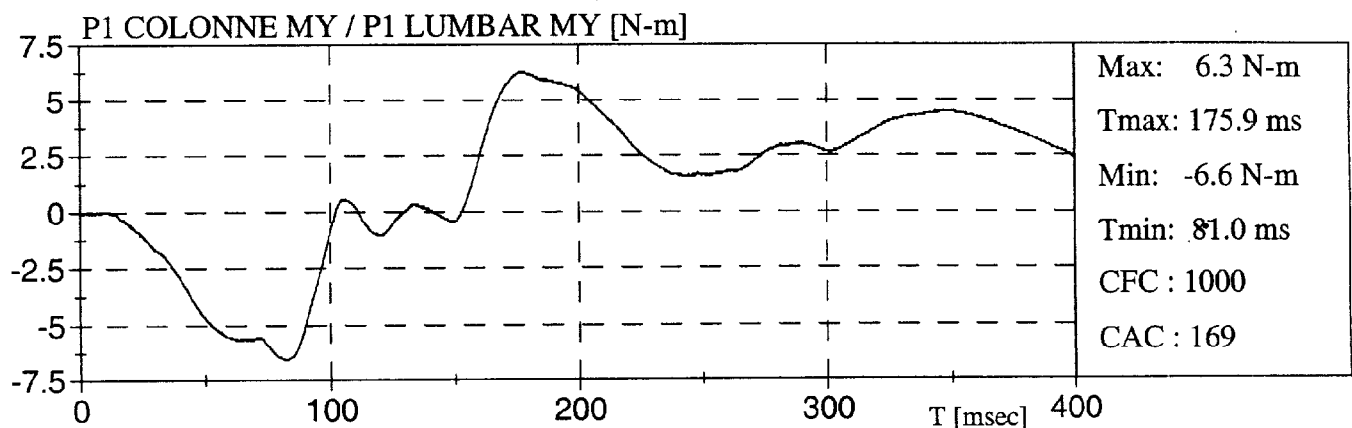
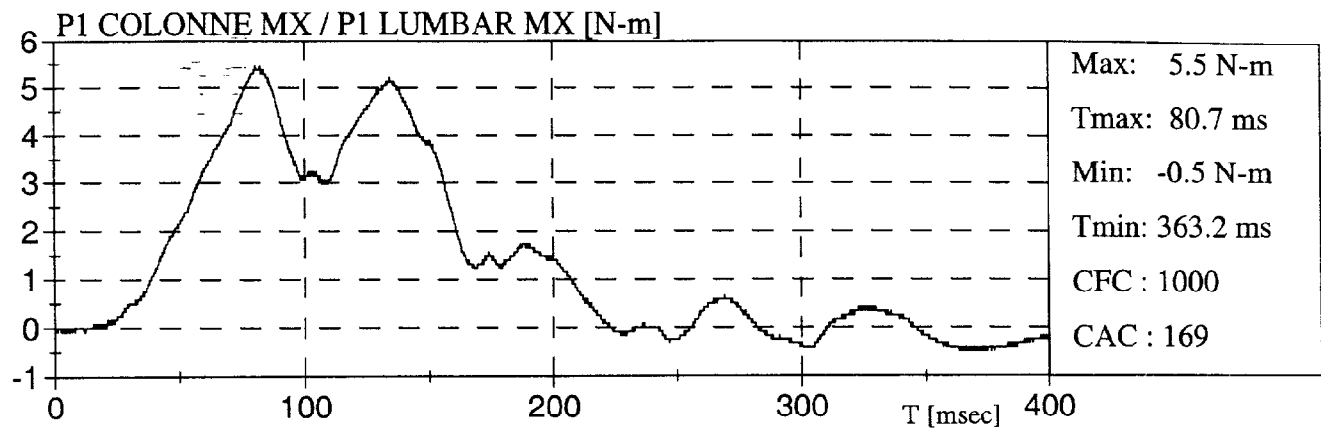
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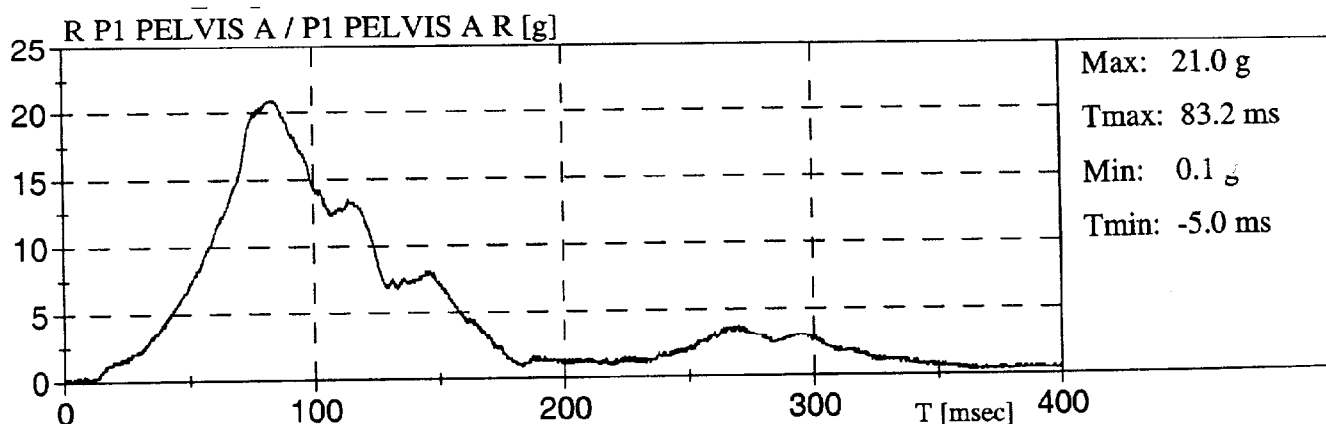
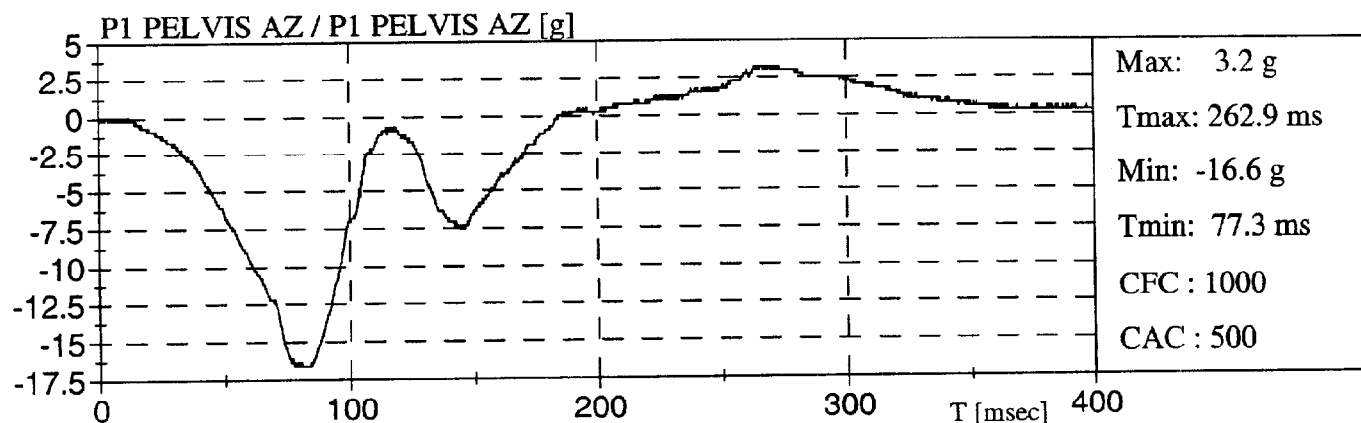
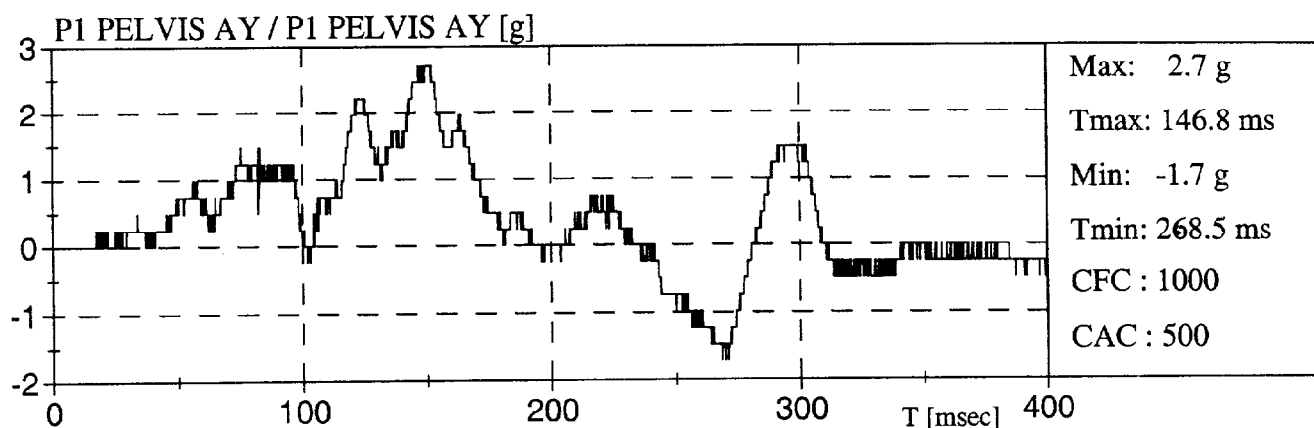
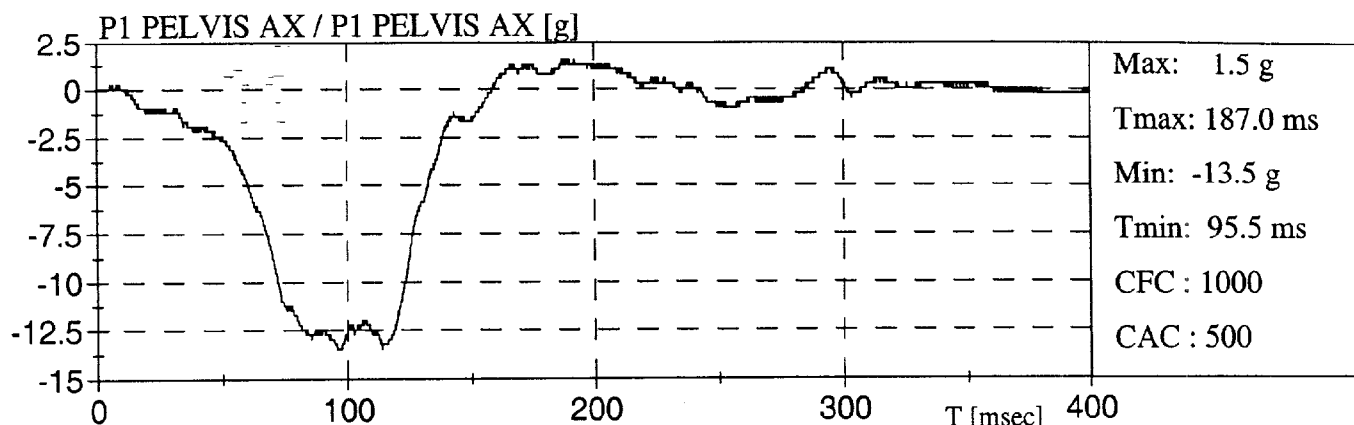
Date: 1999-04-21

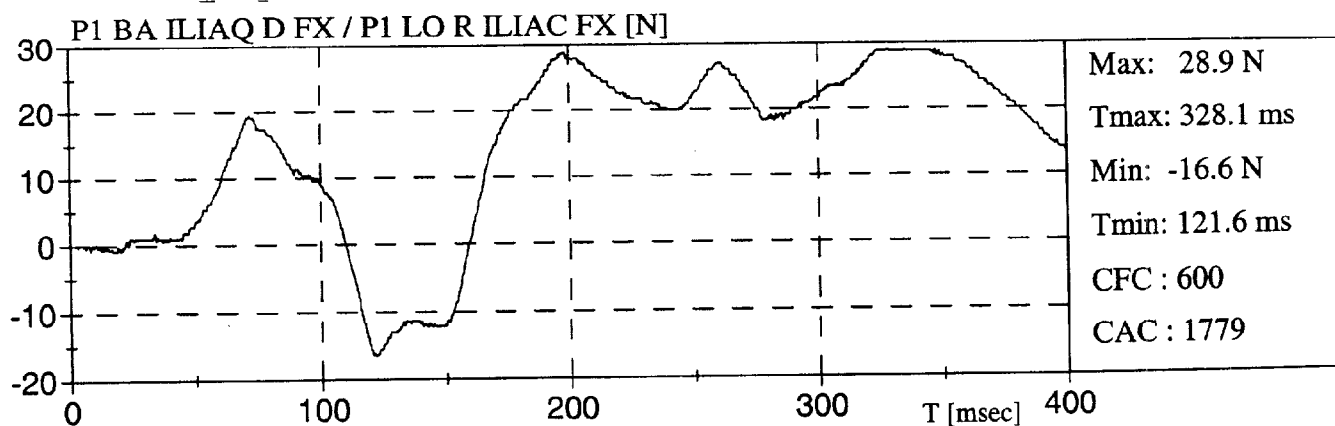
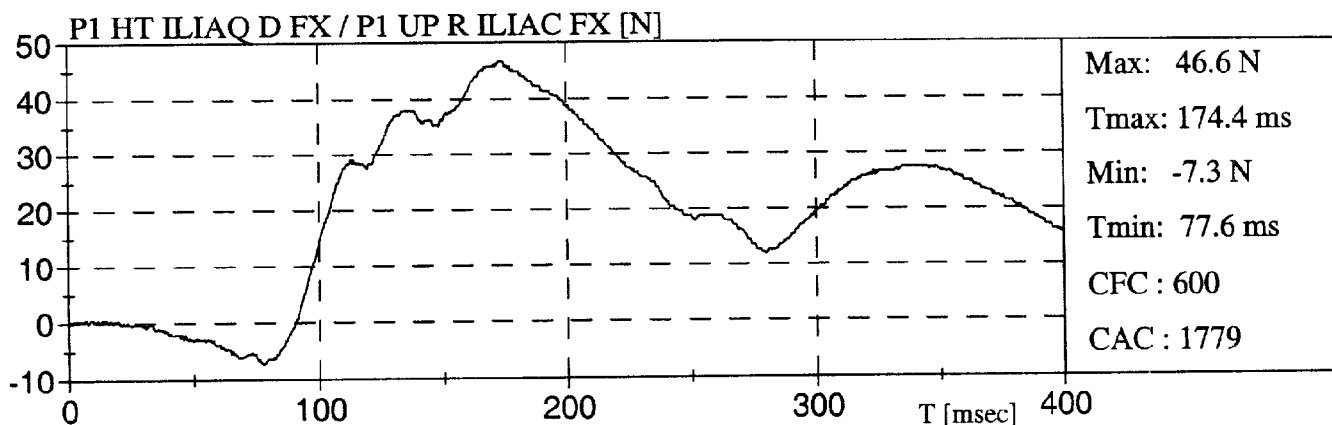
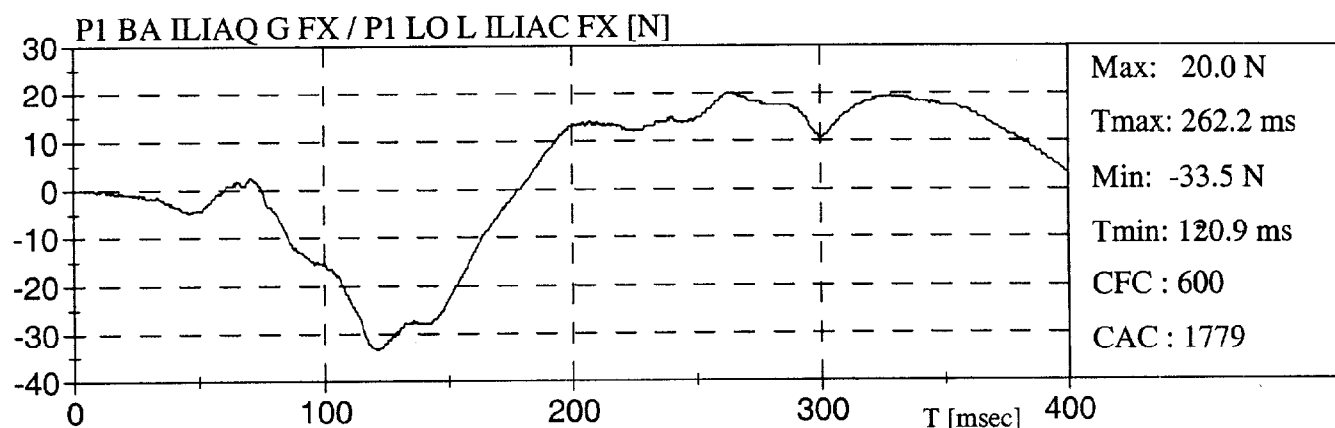
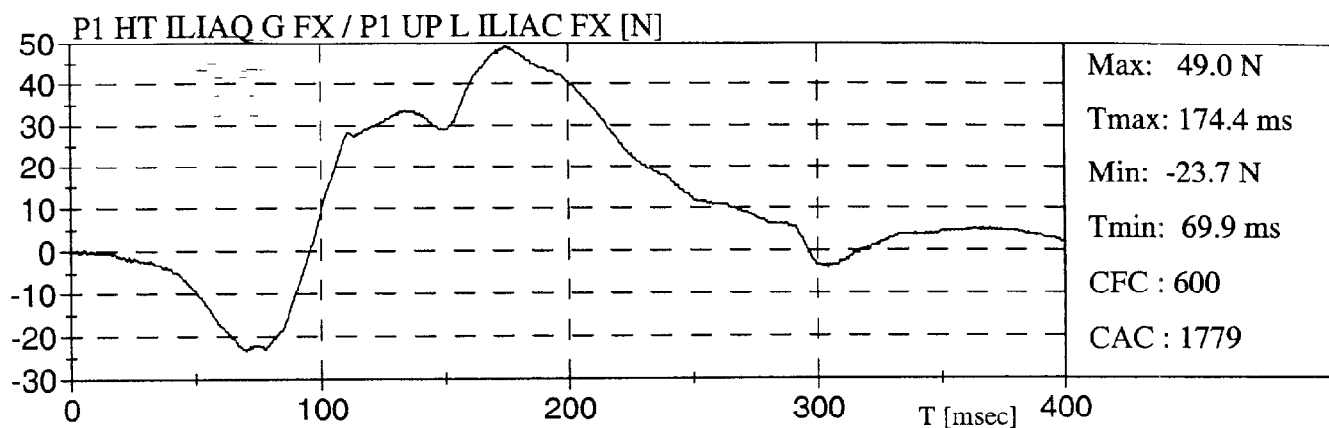
N° TC / TC No.: TC99-239

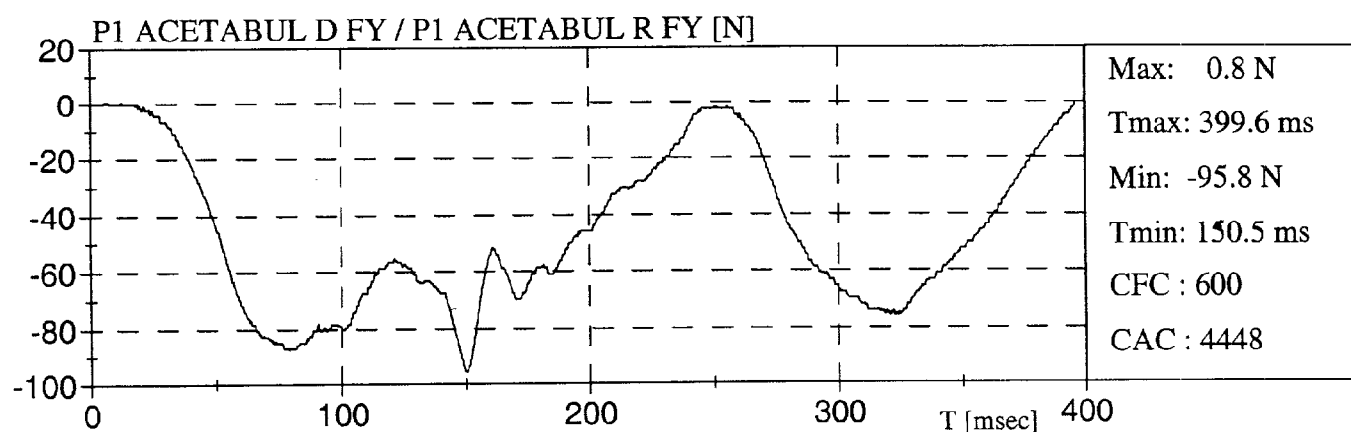
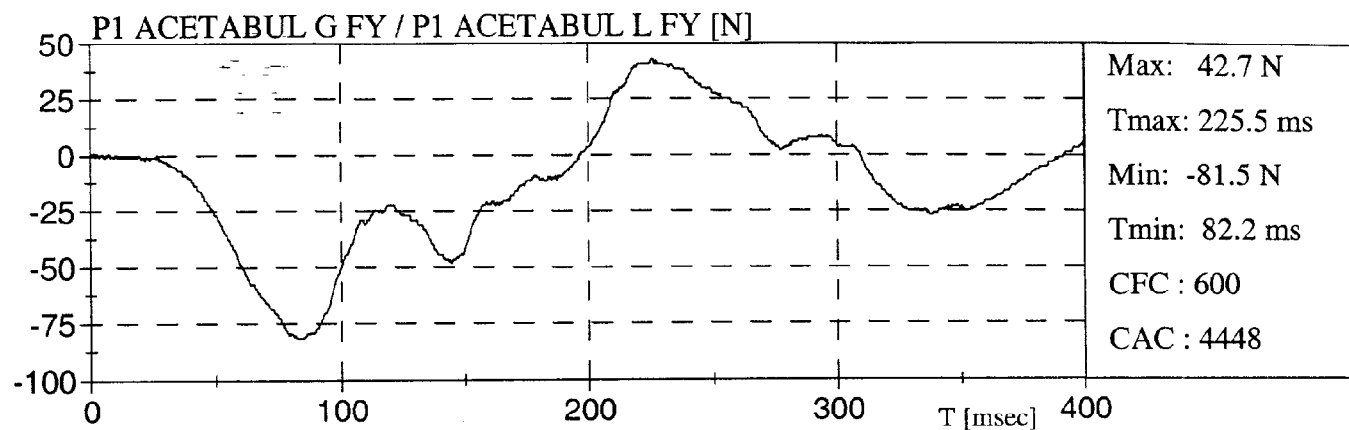


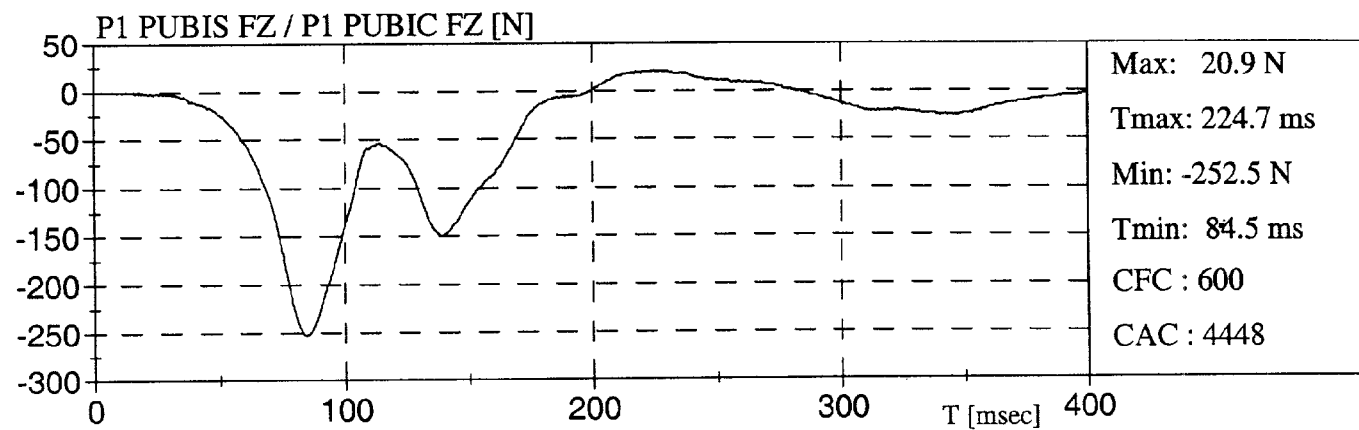
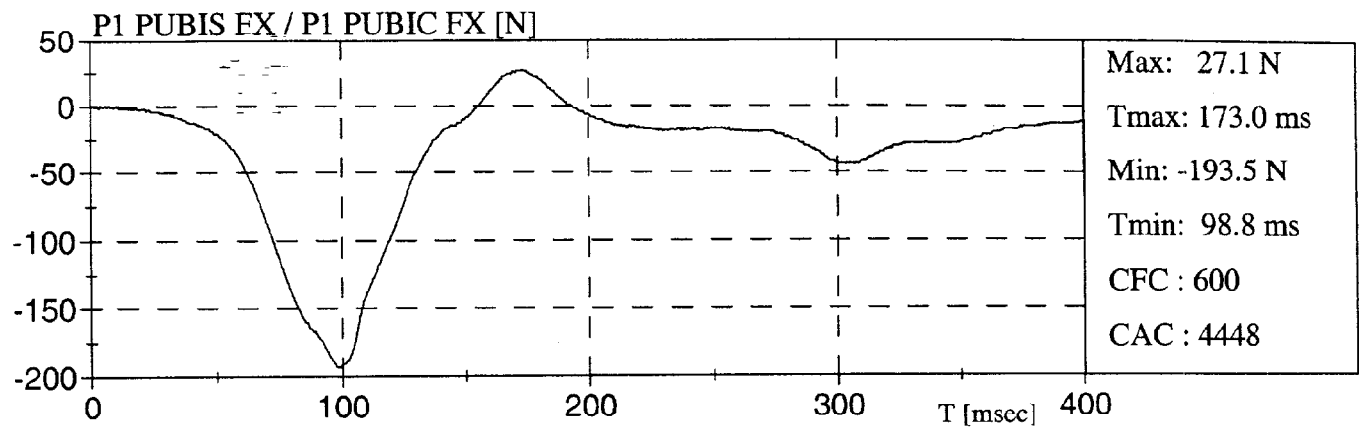














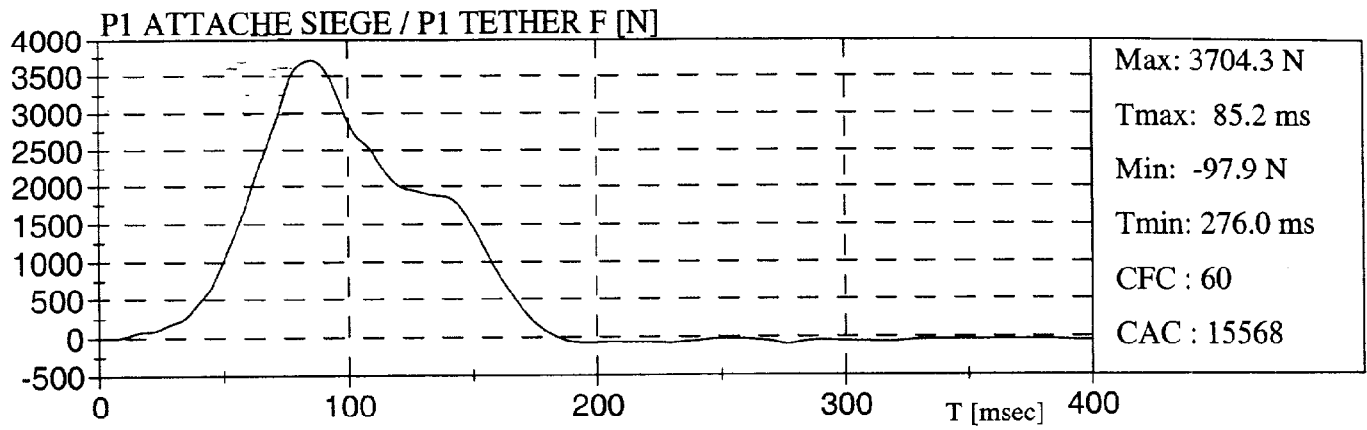
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Technologies

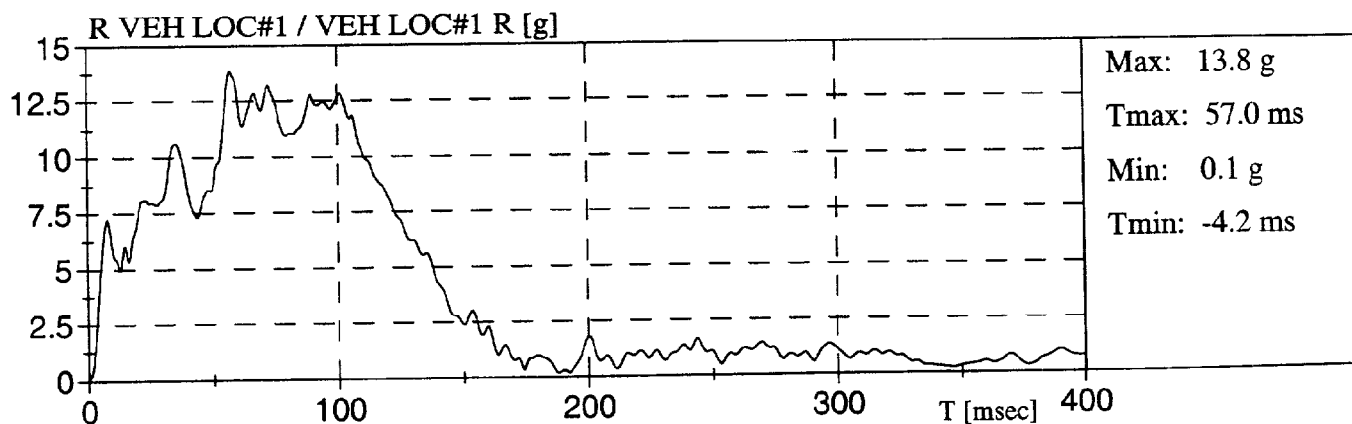
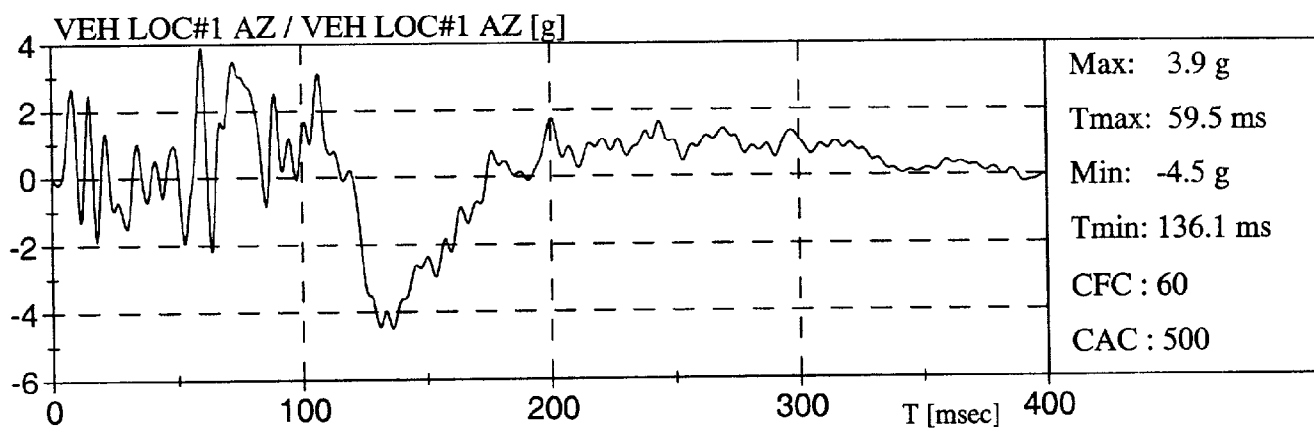
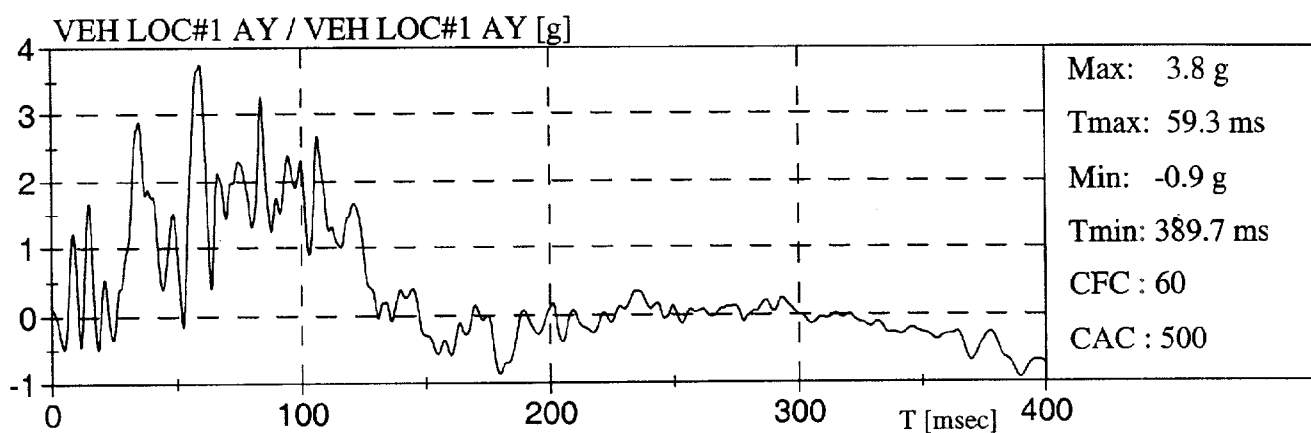
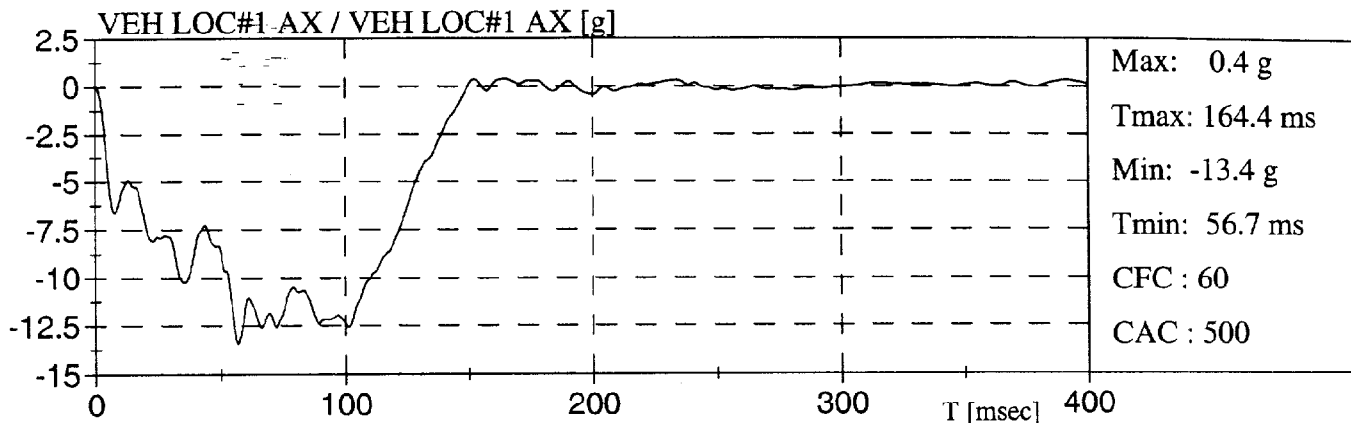
FRONTALE DÉCALÉE 40 KM/H - 40% GAUCHE
OFFSET FRONTAL 40 KM/H - 40% LEFT

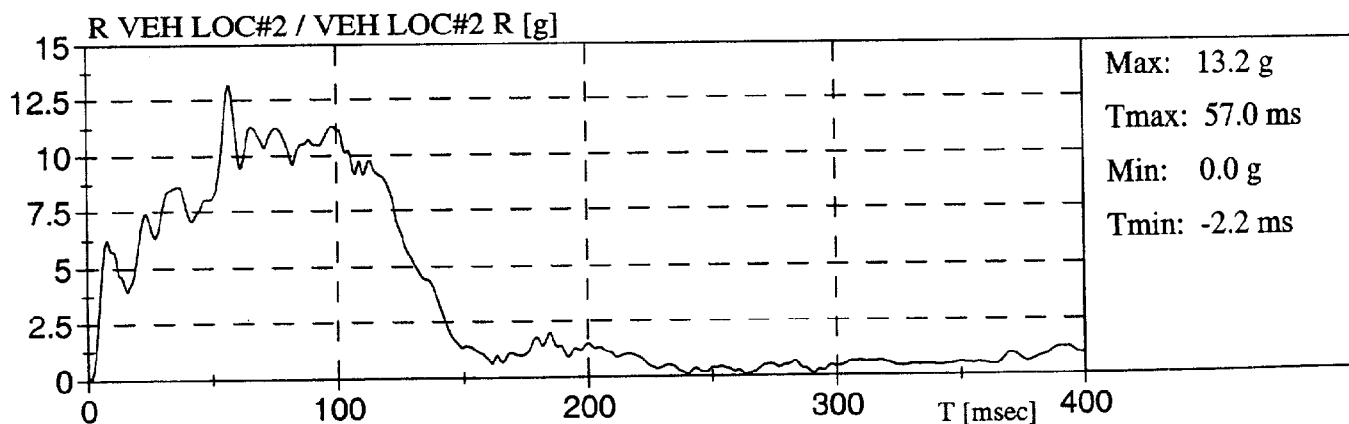
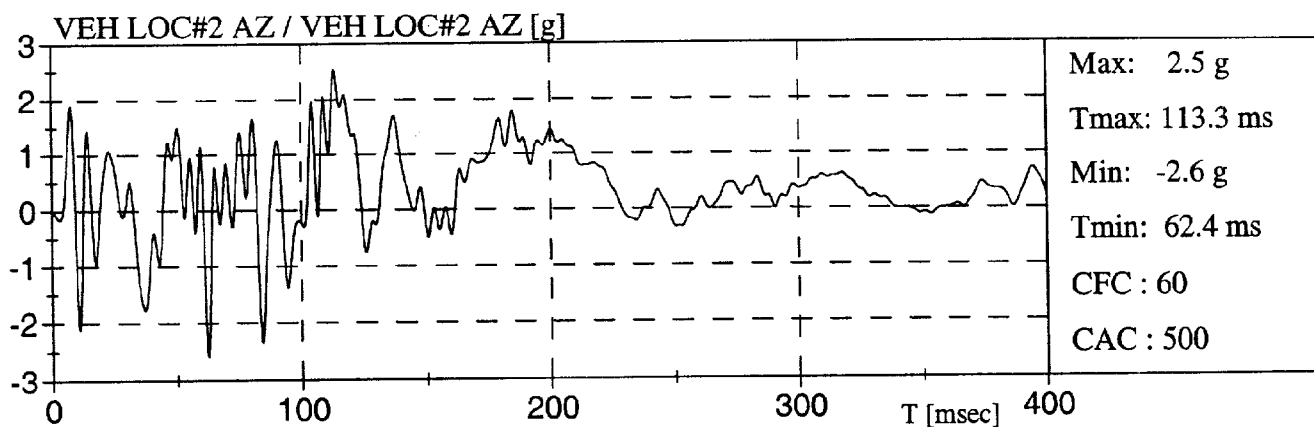
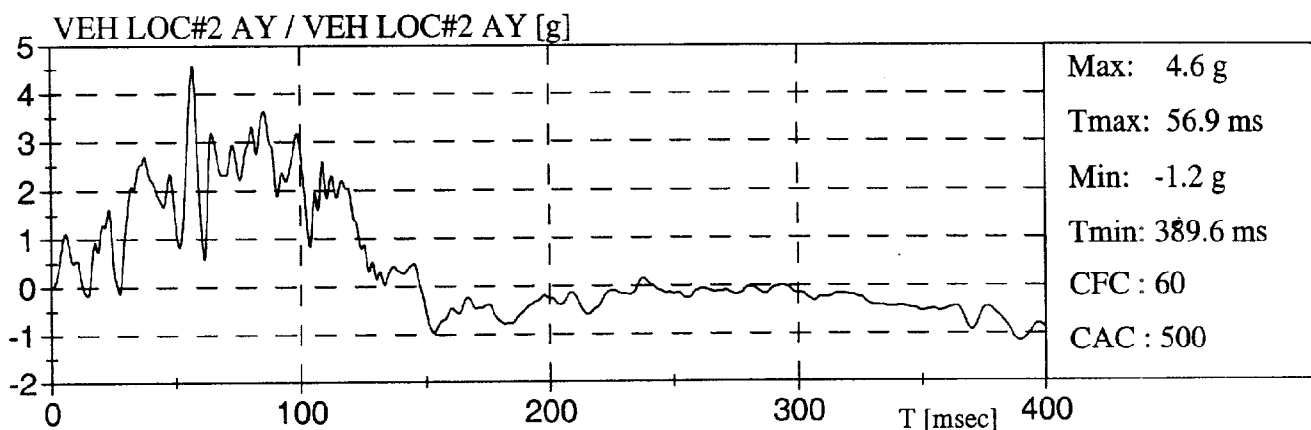
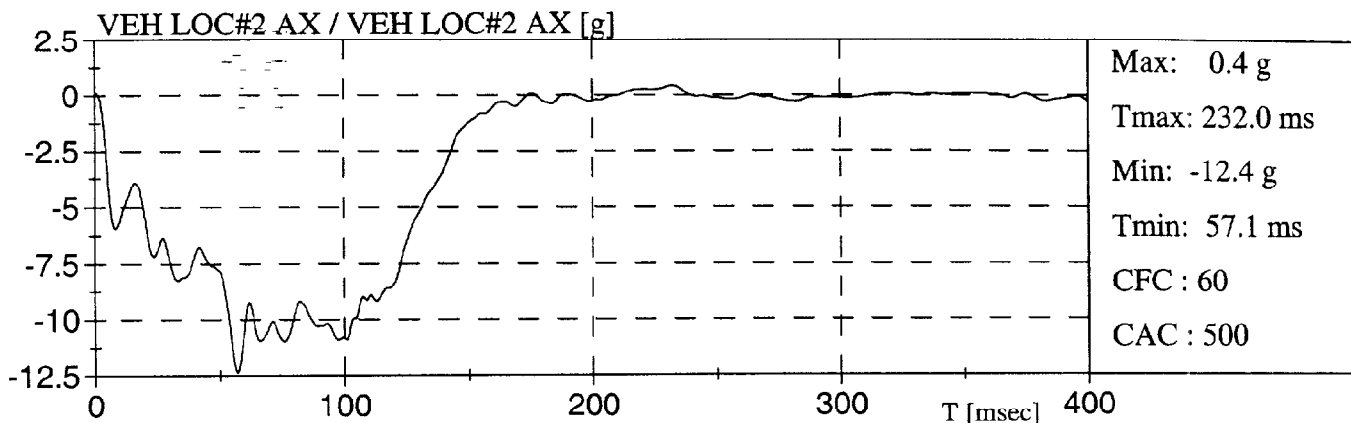
TOYOTA CAMRY 99

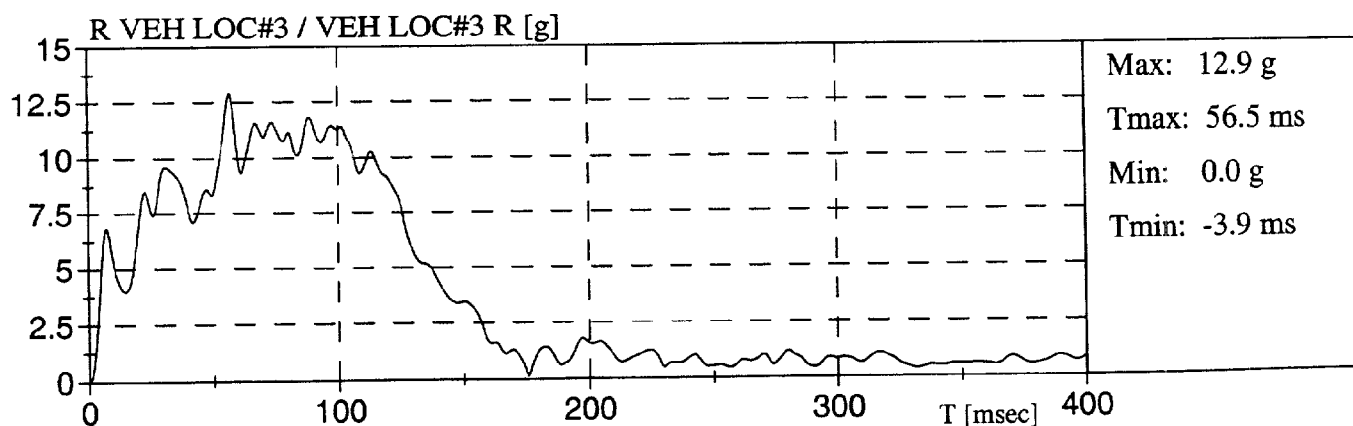
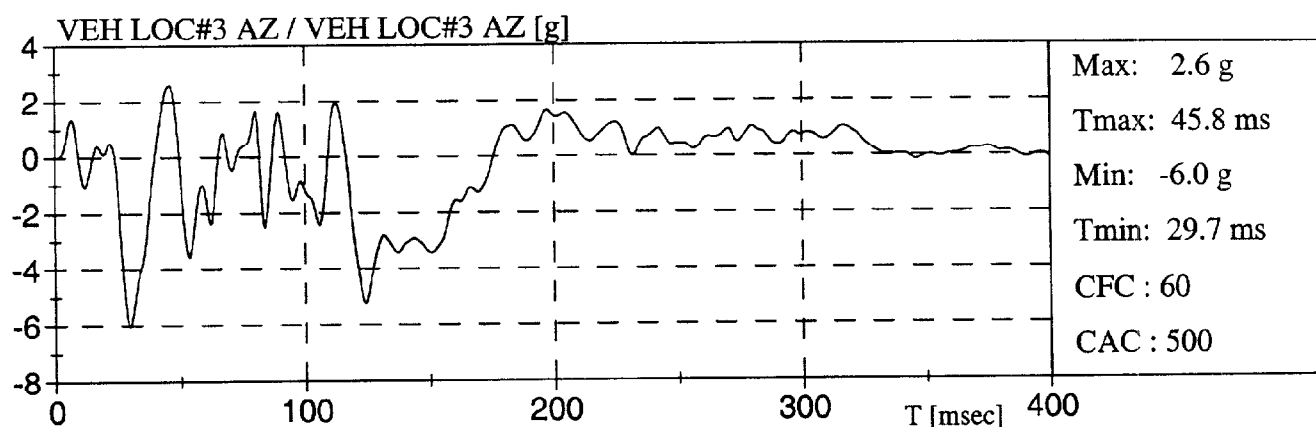
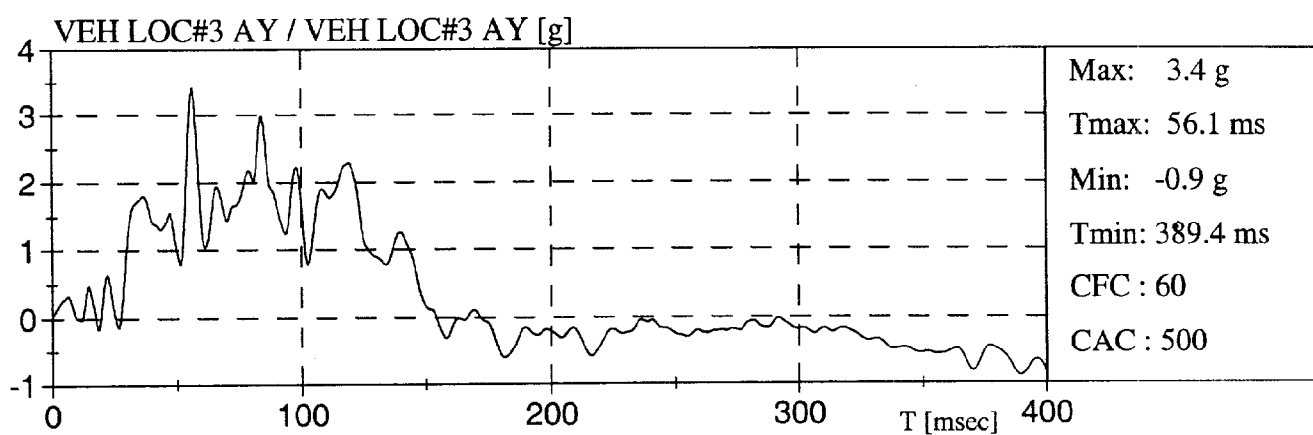
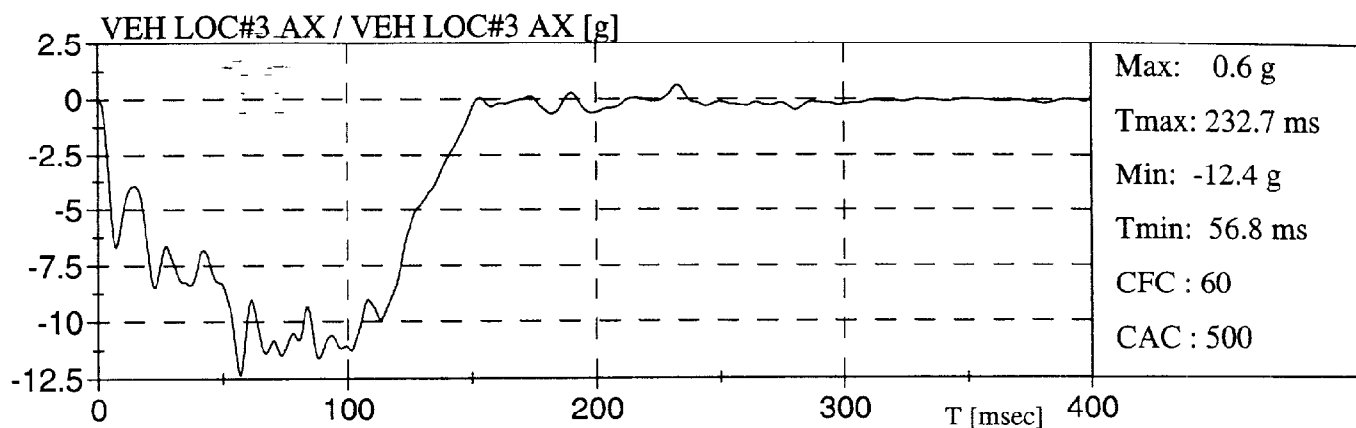
Date: 1999-04-21

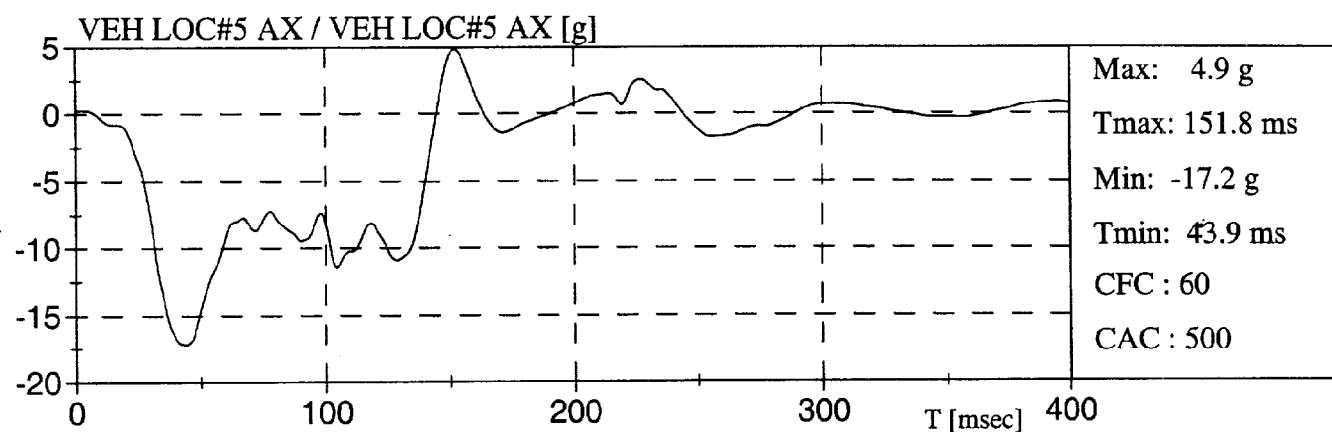
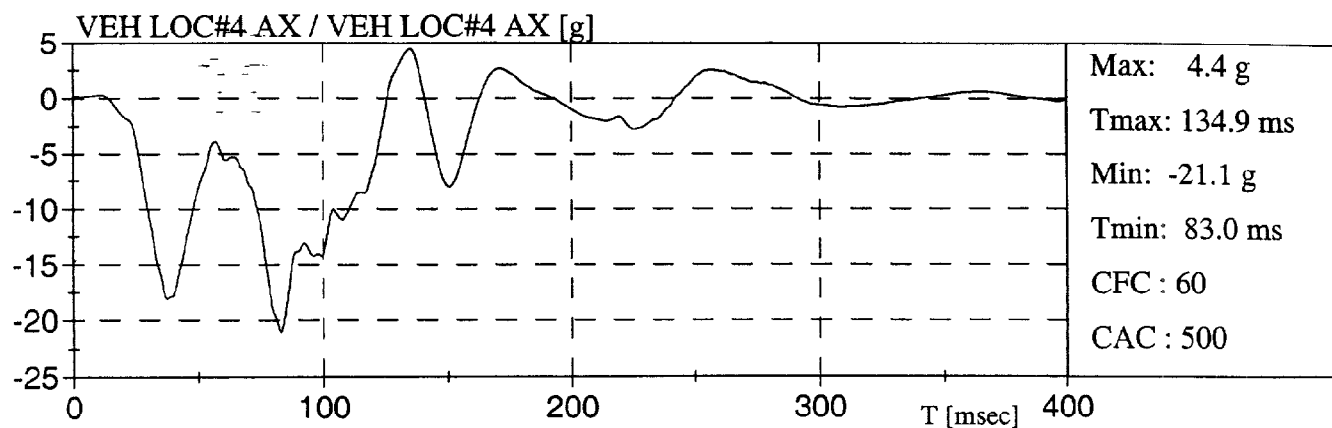
N° TC / TC No.: TC99-239

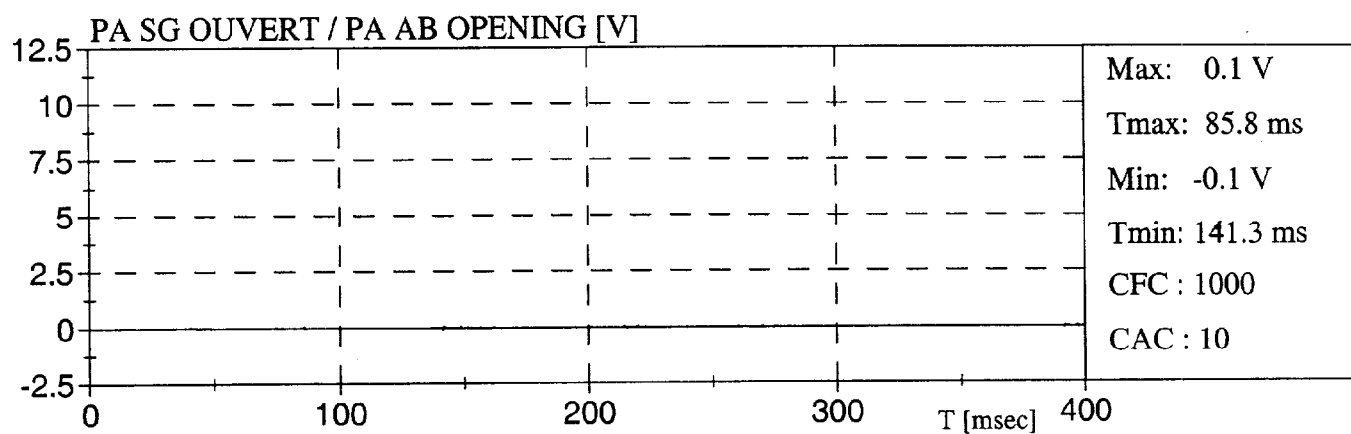
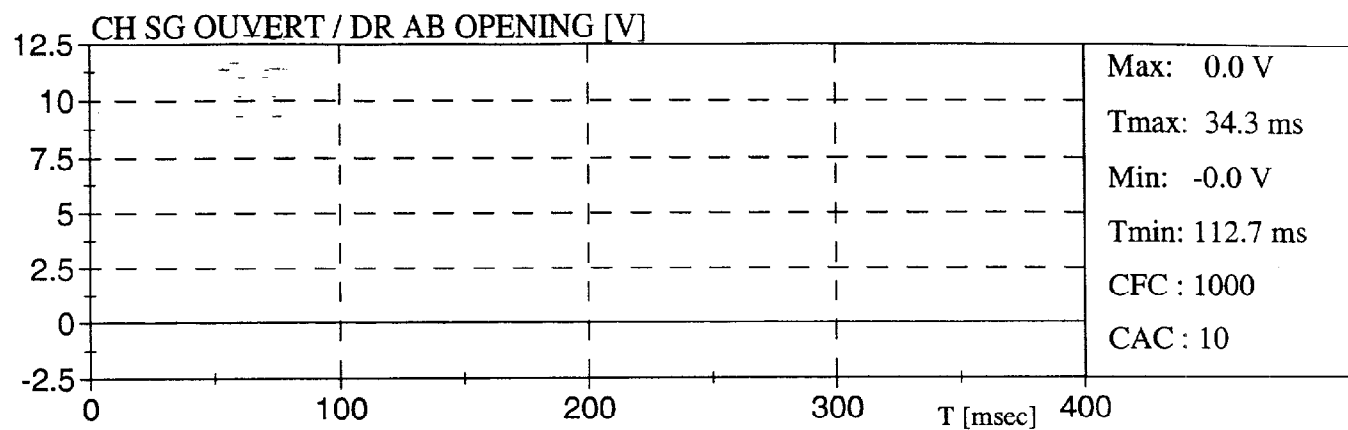


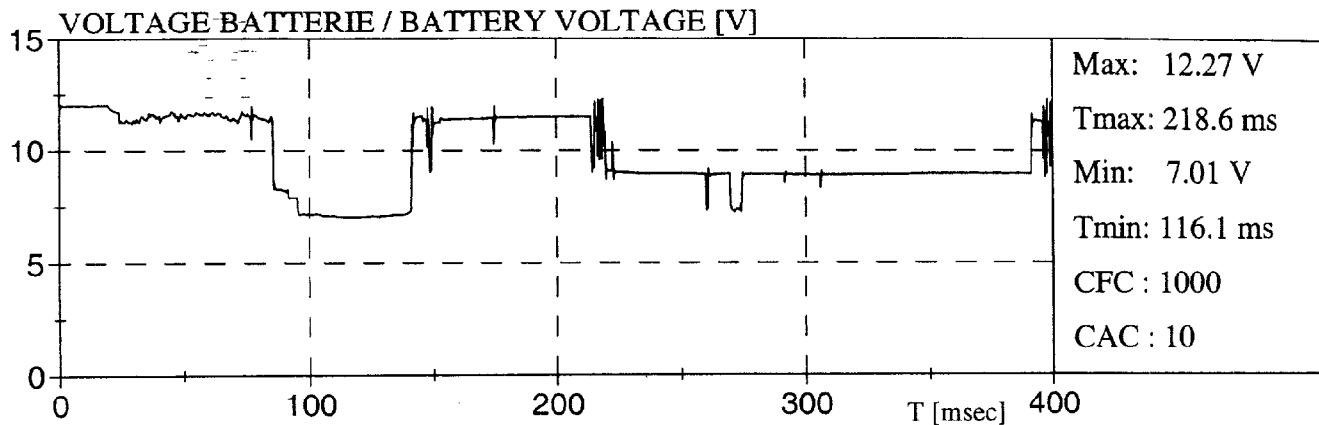


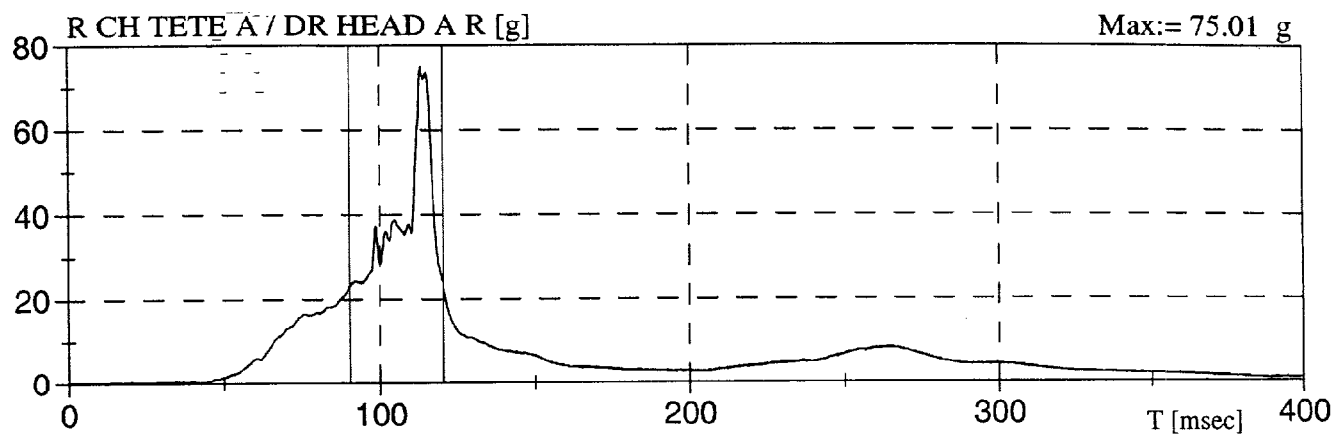








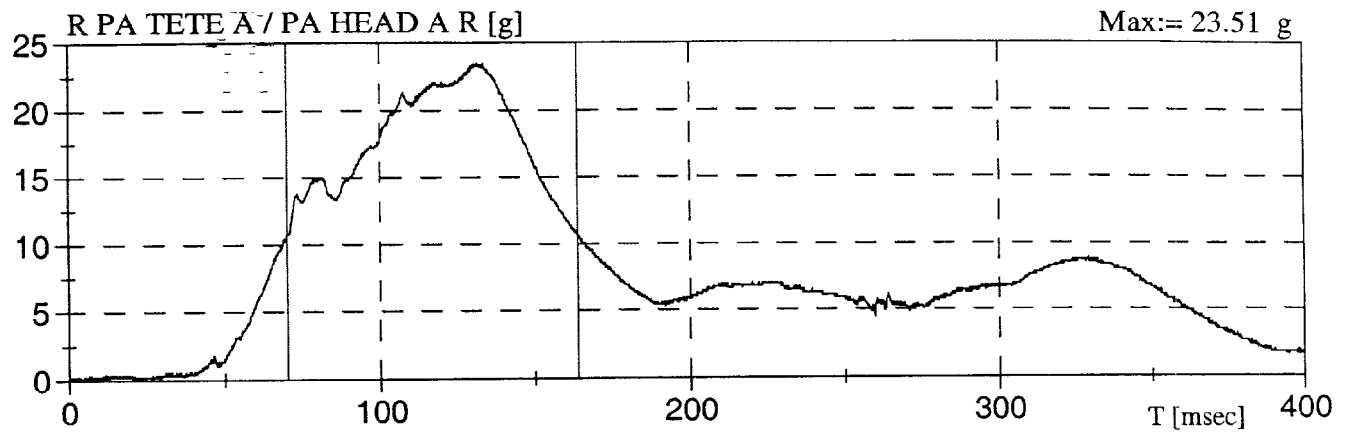




HEAD INJURY CRITERIA (HIC) *
CRITÈRE DE BLESSURE DE LA TÊTE

HIC:= 273	HIC(36ms):= 273	HIC(15ms):= 246
T1:= 90.4 ms	T1:= 90.4 ms	T1:= 103.1 ms
T2:= 120.4 ms	T2:= 120.4 ms	T2:= 118.1 ms

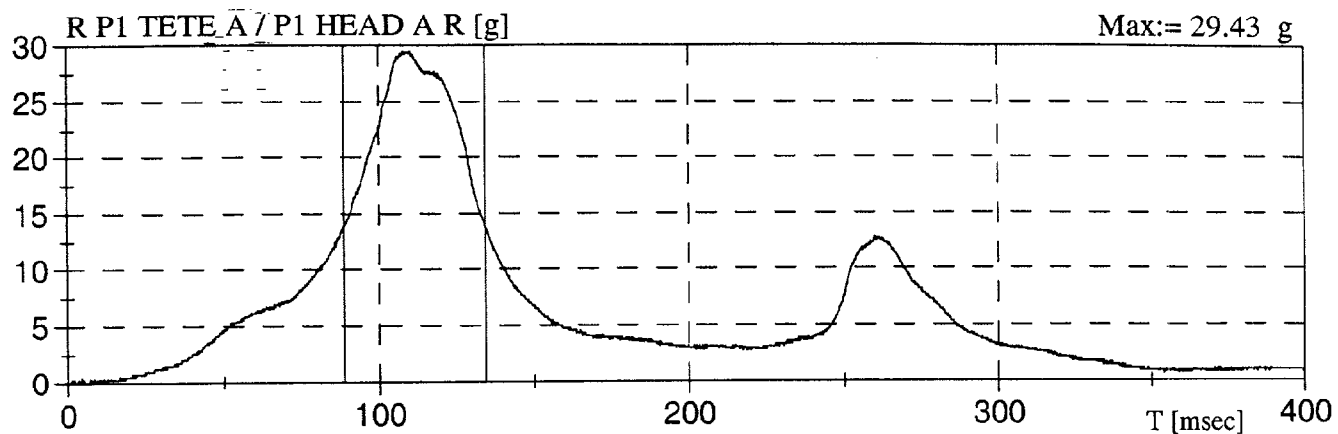
* Selon / According To: SAE J1727 96-08



HEAD INJURY CRITERIA (HIC) *
CRITÈRE DE BLESSURE DE LA TÊTE

HIC:= 125	HIC(36ms):= 81	HIC(15ms):= 37
T1:= 70.2 ms	T1:= 105.6 ms	T1:= 123.3 ms
T2:= 163.9 ms	T2:= 141.6 ms	T2:= 138.3 ms

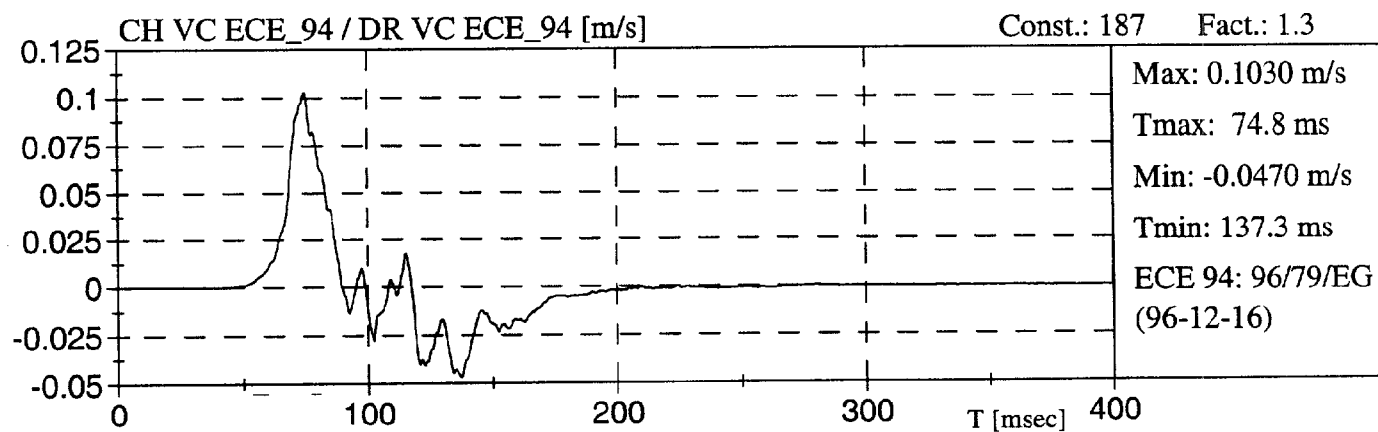
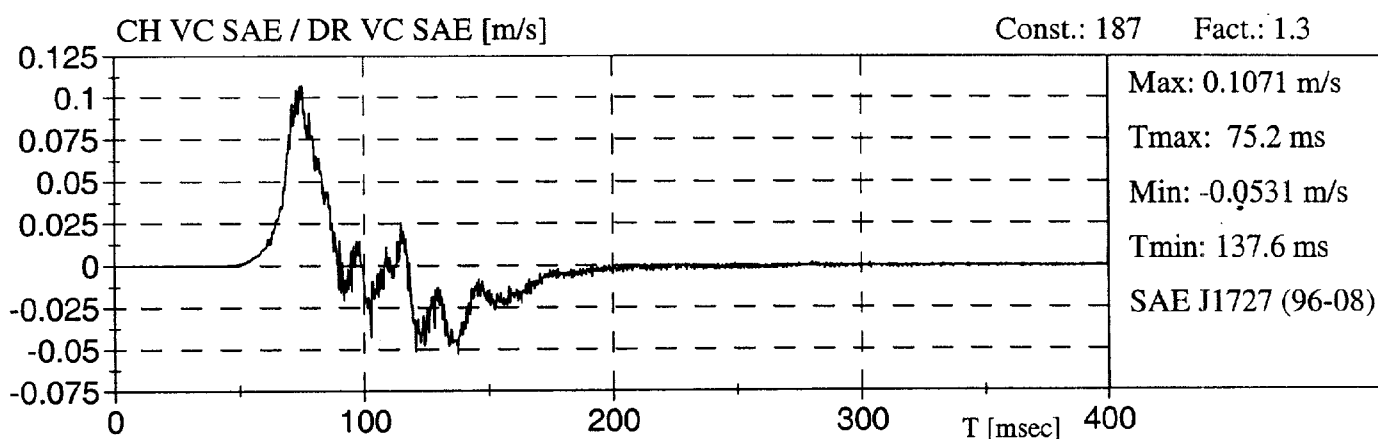
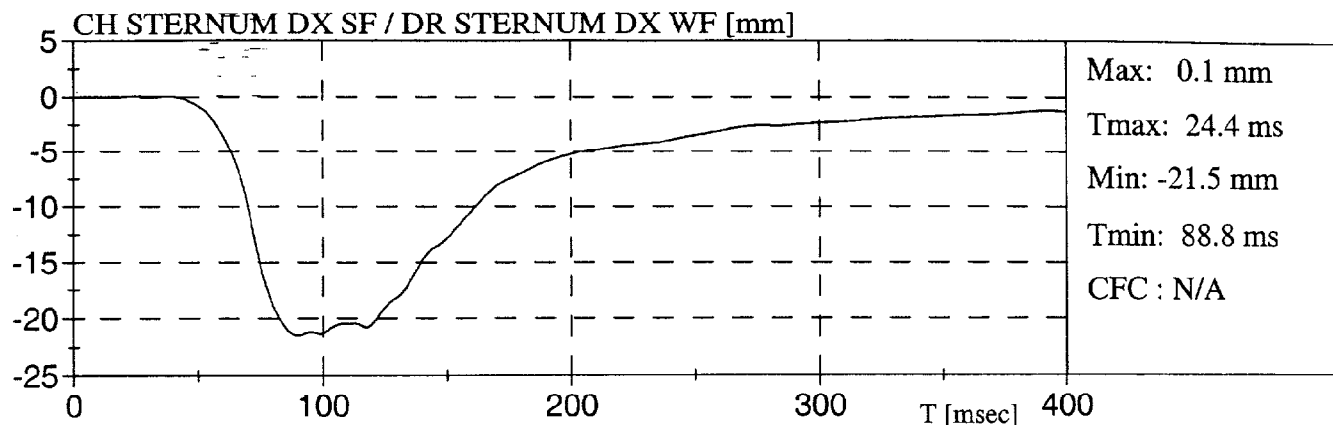
* Selon / According To: SAE J1727 96-08

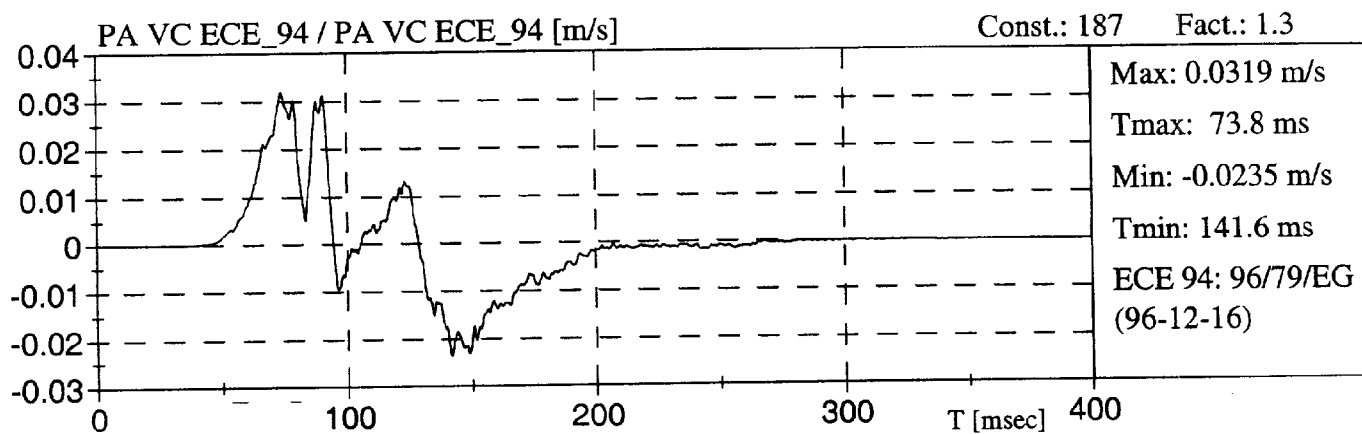
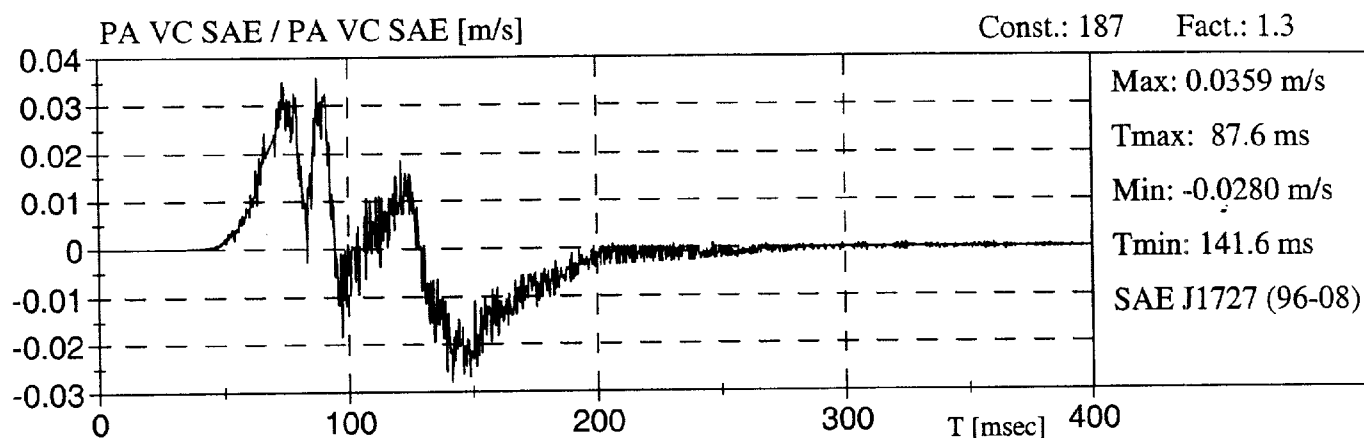
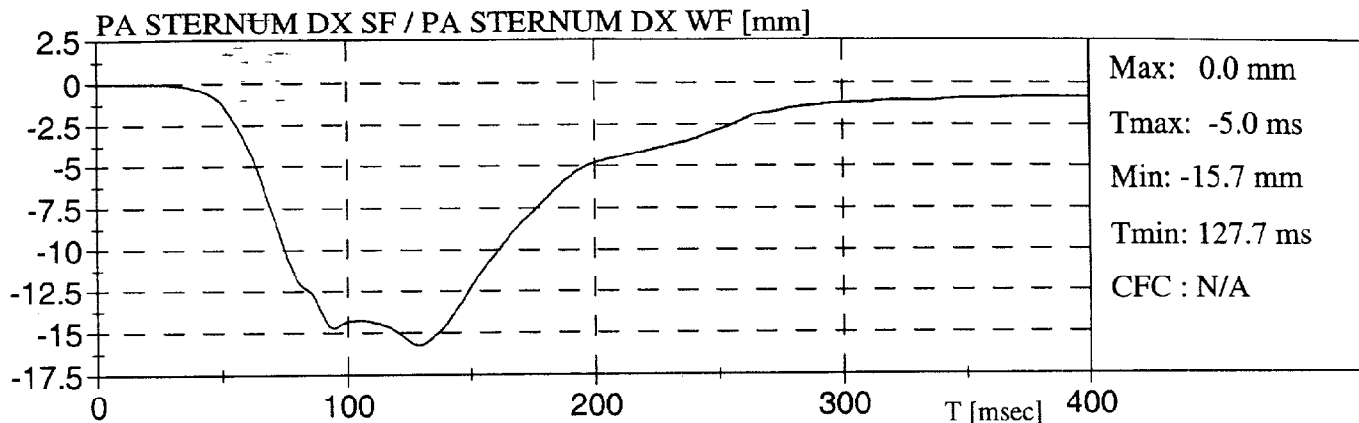


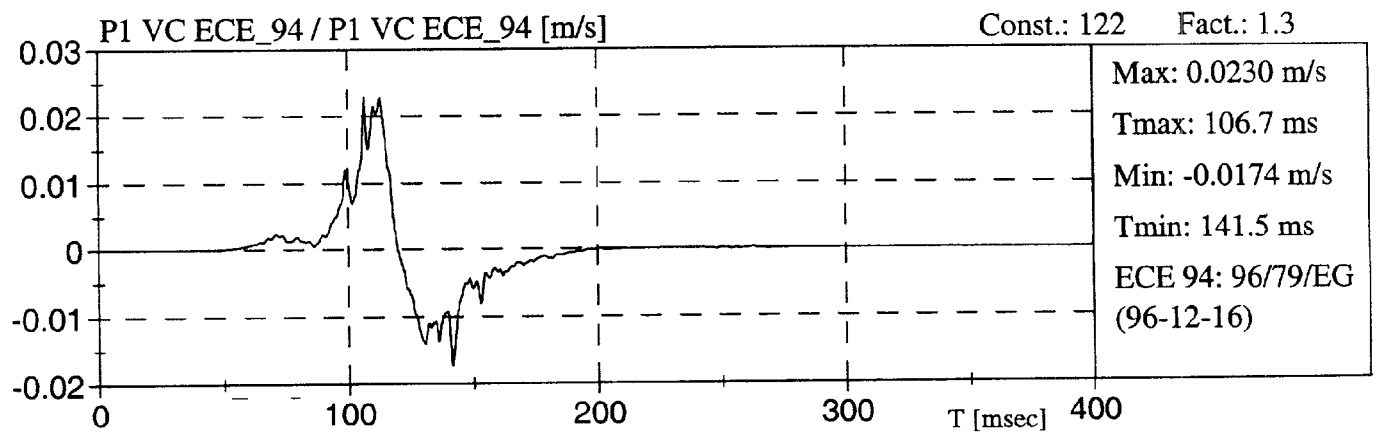
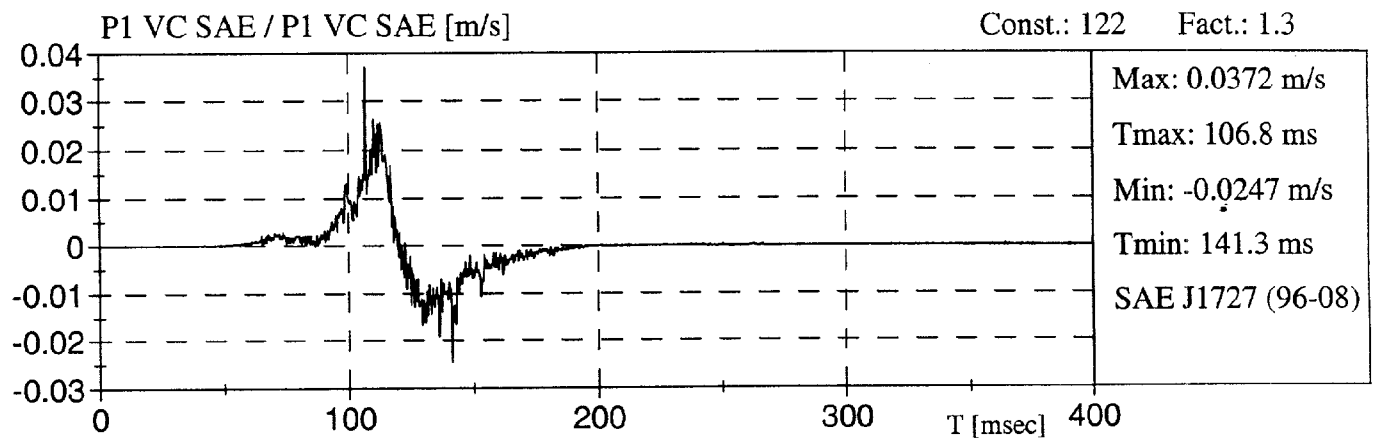
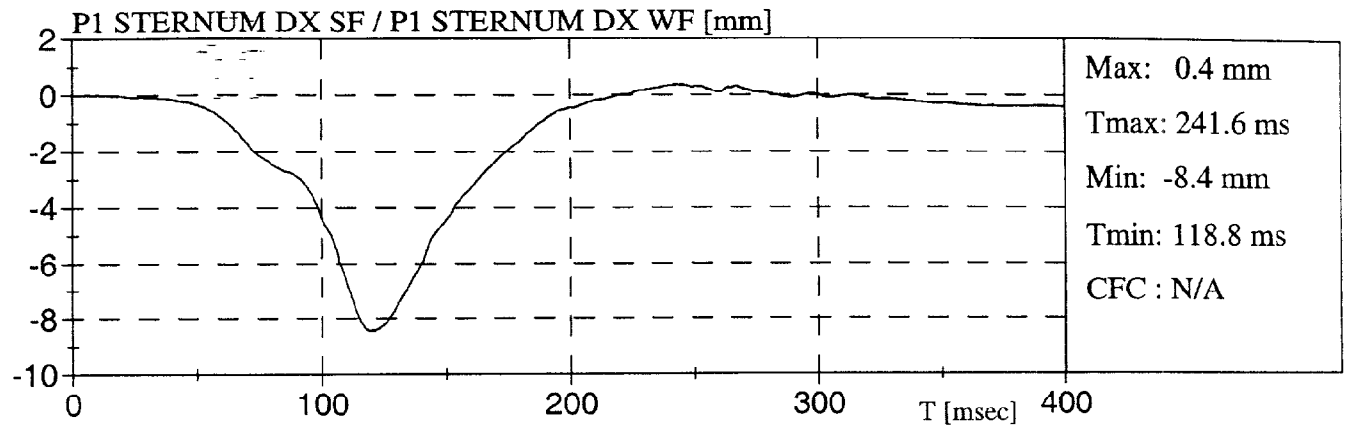
HEAD INJURY CRITERIA (HIC) *
CRITÈRE DE BLESSURE DE LA TÊTE

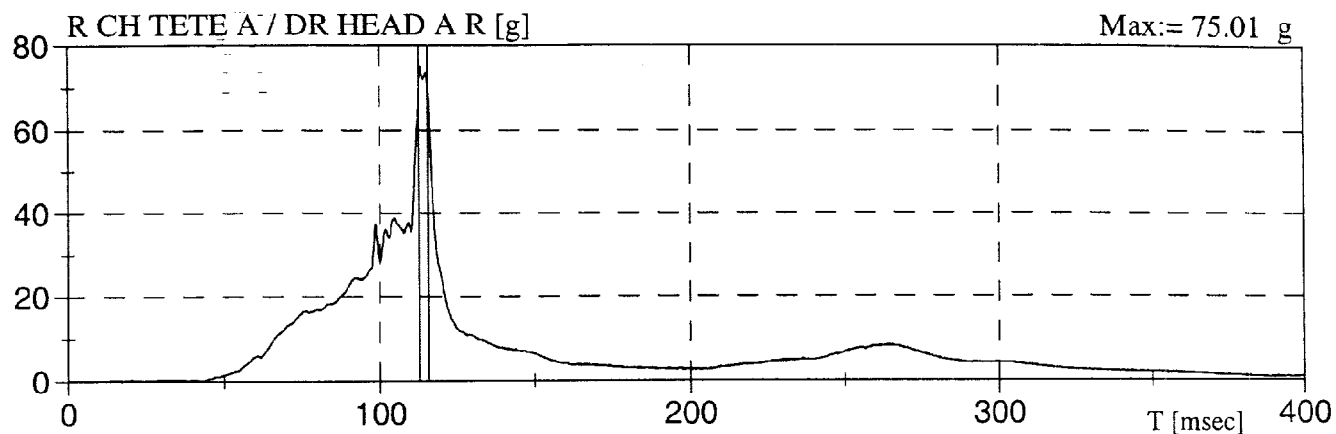
HIC:= 118	HIC(36ms):= 115	HIC(15ms):= 64
T1:= 88.7 ms	T1:= 94.1 ms	T1:= 104.2 ms
T2:= 134.2 ms	T2:= 130.1 ms	T2:= 119.2 ms

* Selon / According To: SAE J1727 96-08



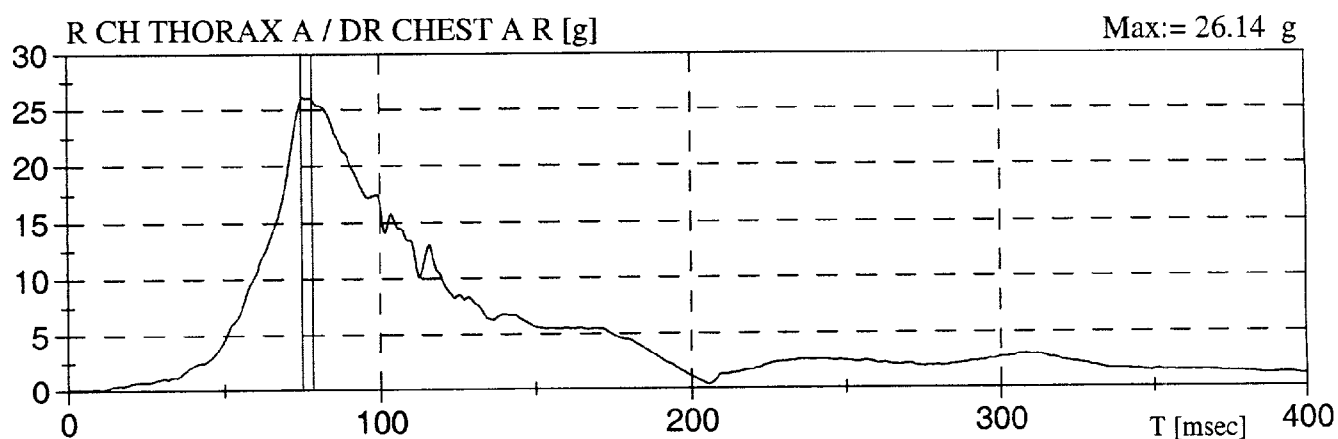






CLIP 3ms *

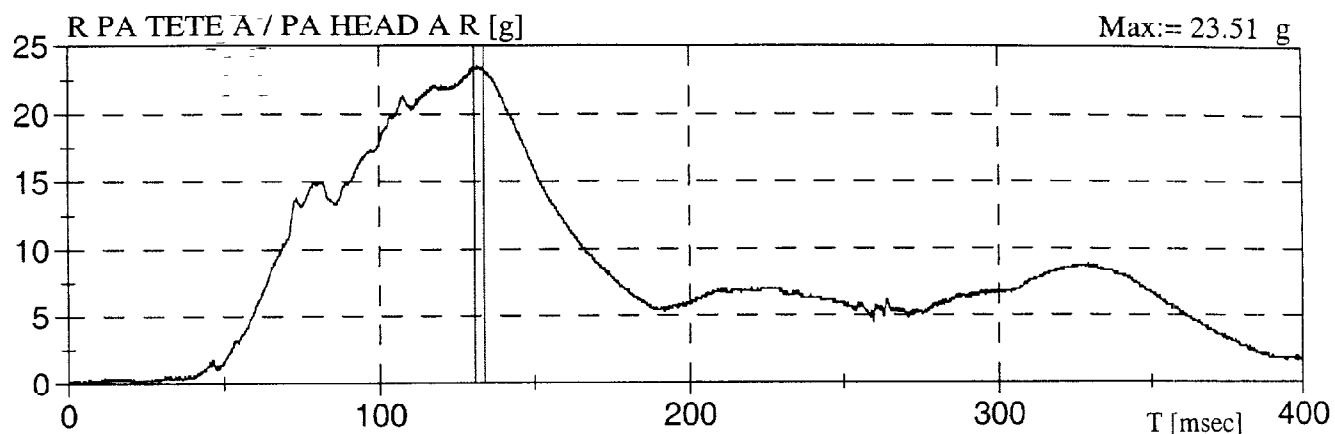
Acc. := 69.71 g	T1:= 112.7 ms	T2:= 115.7 ms
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CLIP 3ms *

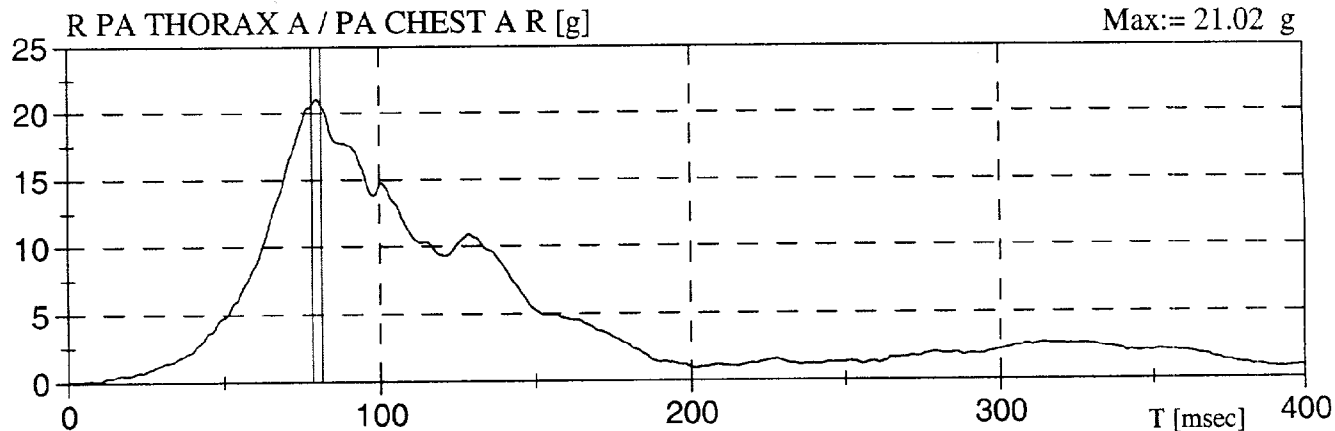
Acc. := 26.00 g	T1:= 74.9 ms	T2:= 78.2 ms
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* Selon / According To: NHTSA CLIP VERSION 2.1 5/95



CLIP 3ms *

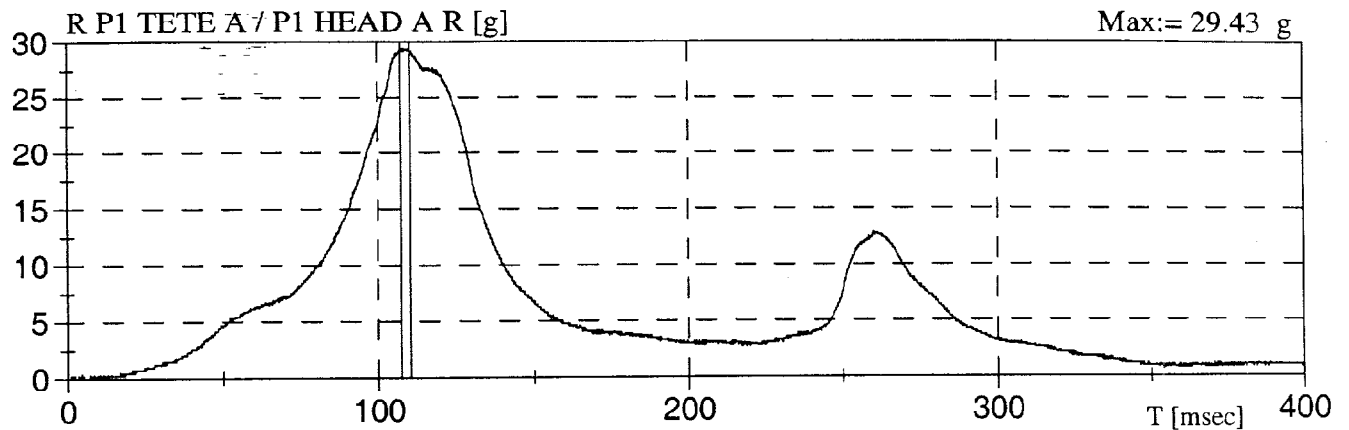
Acc. := 23.26 g	T1:= 130.7 ms	T2:= 133.8 ms
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CLIP 3ms *

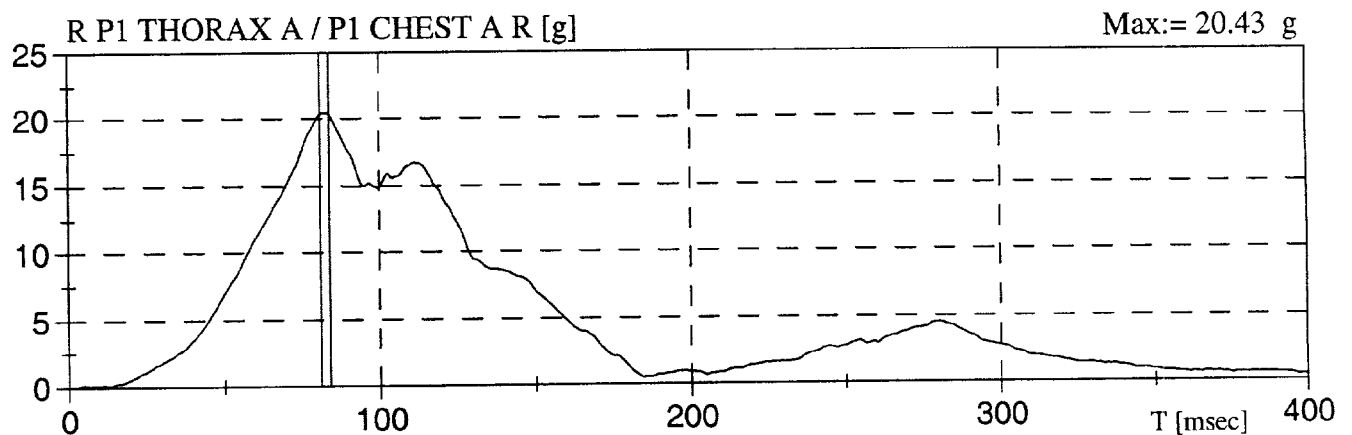
Acc. := 20.56 g	T1:= 78.3 ms	T2:= 81.3 ms
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* Selon / According To: NHTSA CLIP VERSION 2.1 5/95



CLIP 3ms *

Acc. := 29.13 g	T1:= 107.5 ms	T2:= 110.5 ms
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CLIP 3ms *

Acc. := 20.31 g	T1:= 80.9 ms	T2:= 83.9 ms
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* Selon / According To: NHTSA CLIP VERSION 2.1 5/95

INDEX DU TIBIA *

TIBIA INDEX *

TI Chauffeur / Driver

 $Mc := 115 \text{ N-m}$
 $Fc := 22.9 \text{ kN}$

TIBIA	GAUCHE / LEFT	DROIT / RIGHT
HAUT / UPPER	0.435	0.268
BAS / LOWER	0.161	0.175

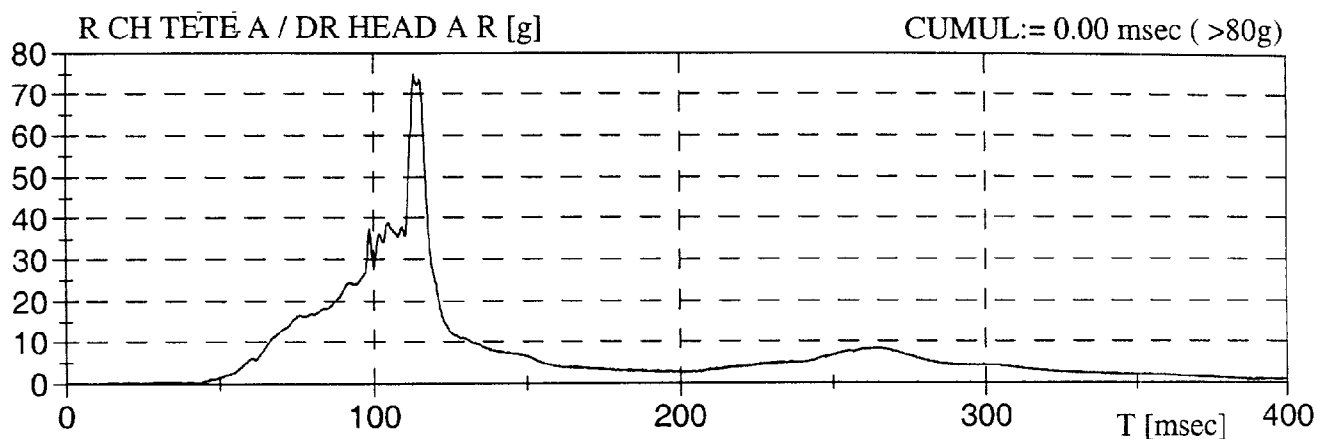
TI Passager / Passenger

 $Mc := 115 \text{ N-m}$
 $Fc := 22.9 \text{ kN}$

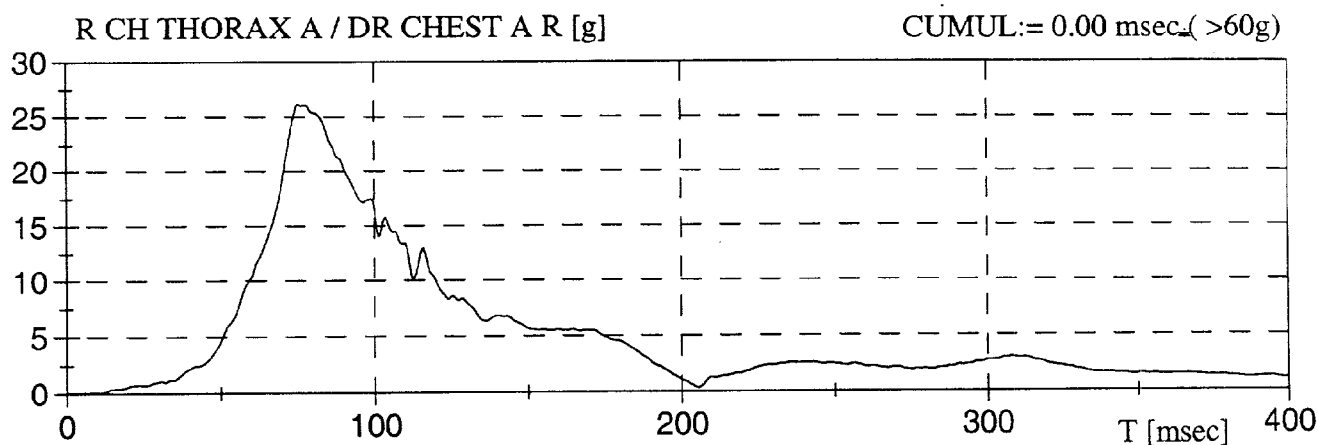
TIBIA	GAUCHE / LEFT	DROIT / RIGHT
HAUT / UPPER	0.252	0.292
BAS / LOWER	0.107	0.132

* Selon / According To: SAE J1727 AUG 96

ACCÉLÉRATION DE LA TÊTE >80 g / HEAD ACCELERATION > 80 g

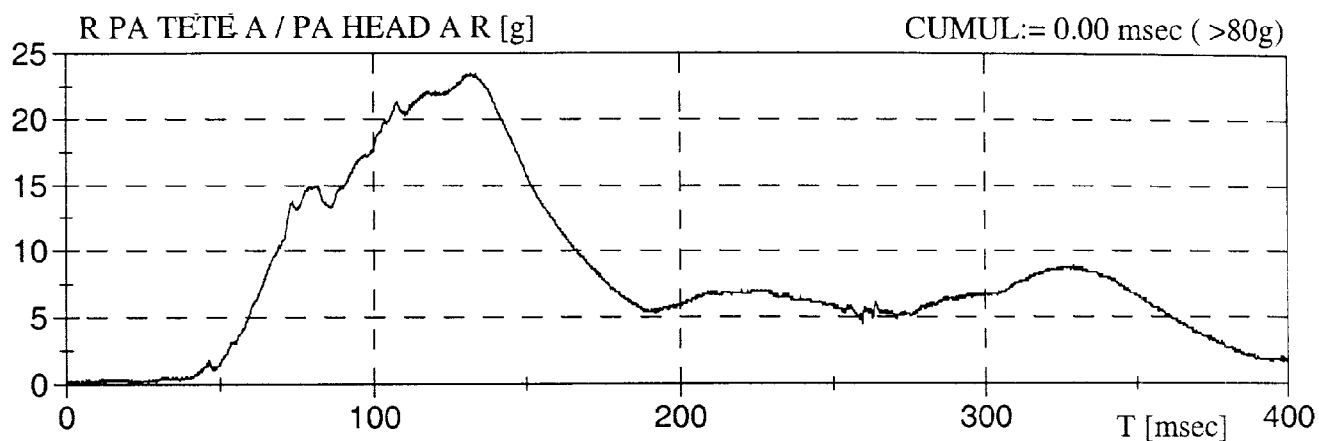


ACCÉLÉRATION DU THORAX >60 g / THORAX ACCELERATION > 60 g

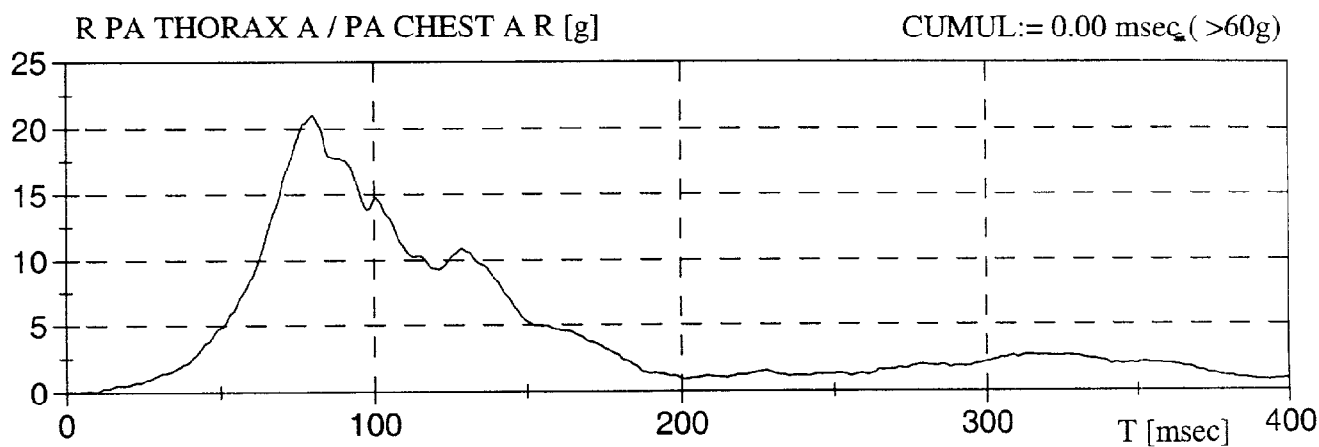




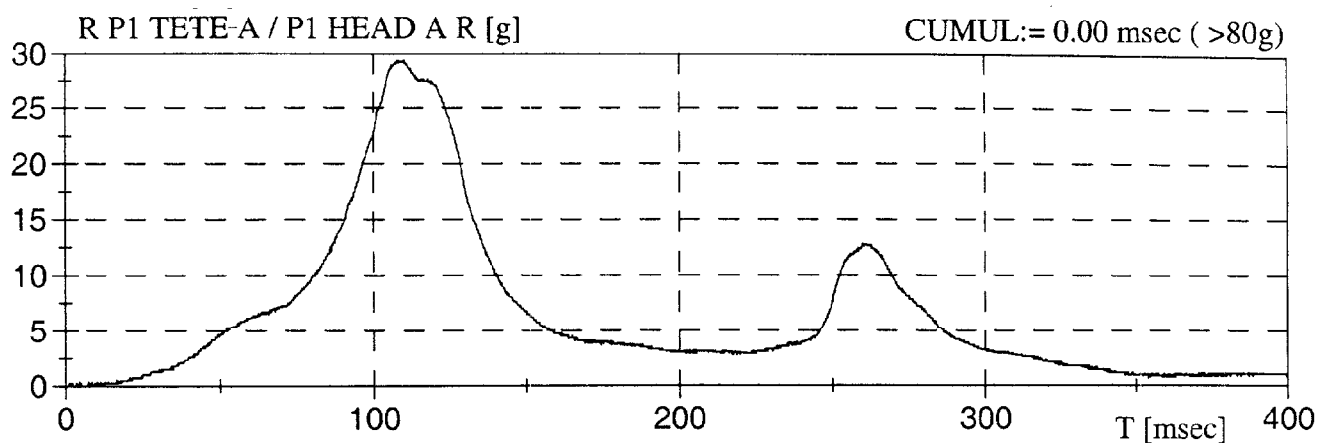
ACCÉLÉRATION DE LA TÊTE >80 g / HEAD ACCELERATION > 80 g



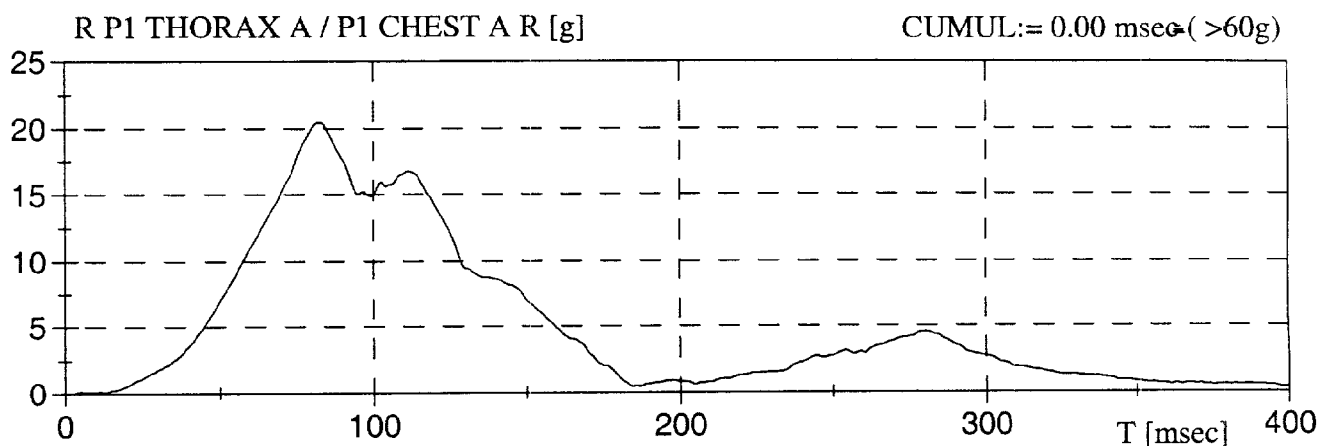
ACCÉLÉRATION DU THORAX >60 g / THORAX ACCELERATION > 60 g

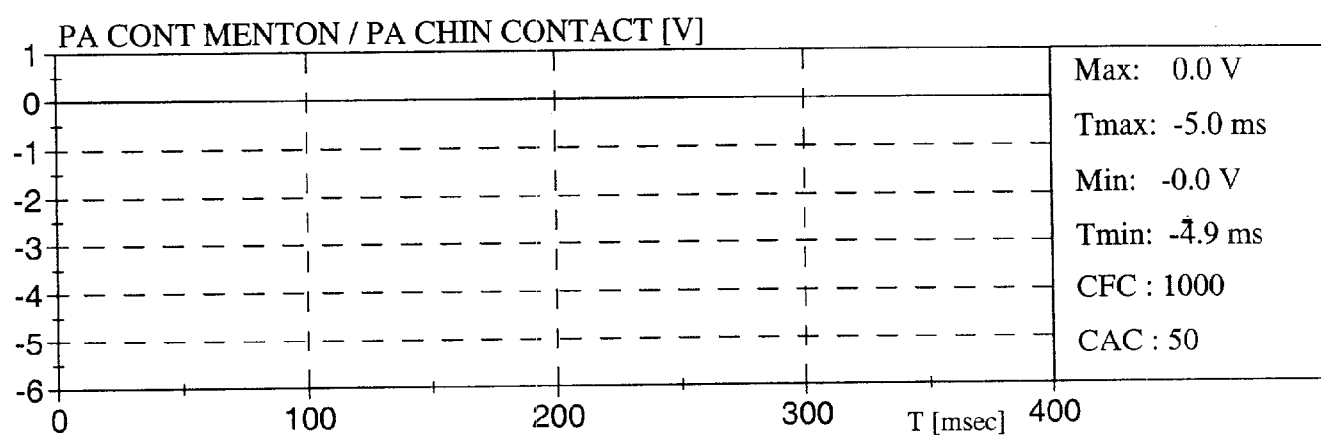
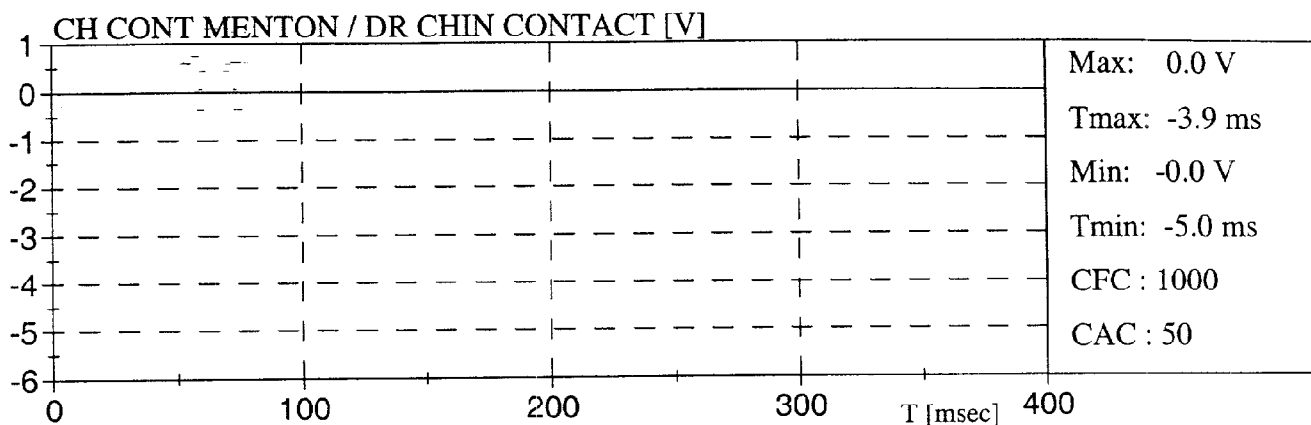


ACCÉLÉRATION DE LA TÊTE >80 g / HEAD ACCELERATION > 80 g



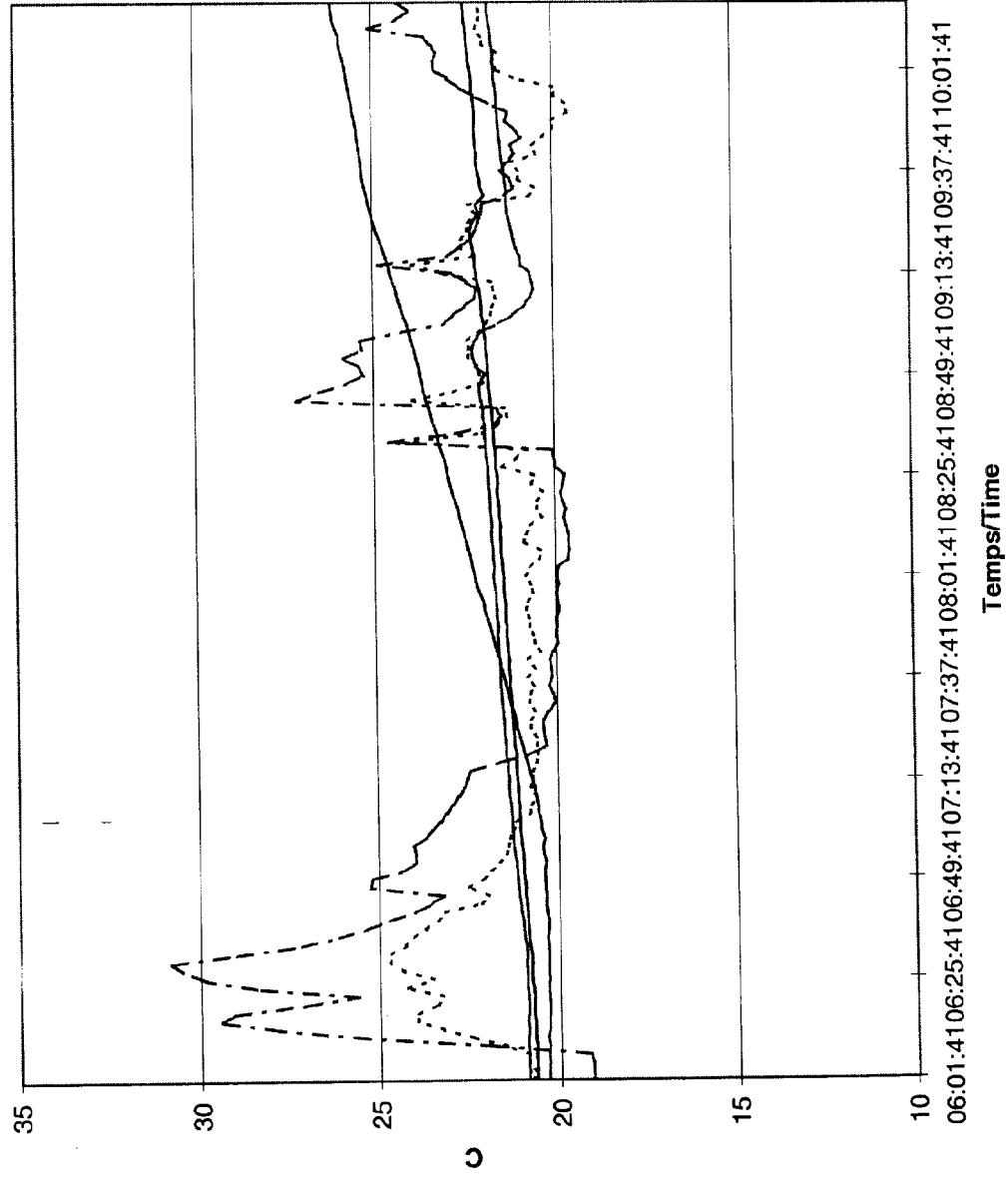
ACCÉLÉRATION DU THORAX >60 g / THORAX ACCELERATION > 60 g





APPENDICE /APPENDIX C
DONNÉES DES TEMPÉRATURES
TEMPERATURE DATA

Temperature TC99-239



99-04-21