

V3080

**RAPPORT D'ESSAI - TEST REPORT**

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

**VEHICULE D'ESSAI / TEST VEHICLE  
HYUNDAI ACCENT 1999 TC # 99-211**

**FACE DÉFORMABLE / DEFORMABLE FACE  
ÉTUDE DE BLESSURES AVEC COUSSINS GONFLABLES  
AIR BAG AGGRESSIVENESS STUDY  
PHASE II**

Préparé par :  
PMG TECHNOLOGIES  
CENTRE D'ESSAIS ET DE RECHERCHE  
100, rue du Landais  
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N° de contrat : **99-5001**  
Rapport N°: **RR 99-149**

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

Prepared by :  
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Contract N° : **99-5001**  
Report N° : **RR 99-149**

For :  
TRANSPORT CANADA  
SAFETY AND SECURITY  
Research Engineering and  
Vehicle Testing  
Ottawa (Ontario)

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<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C.No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|

**VÉHICULE D'ESSAI - TEST VEHICLE**

|                                                                    |                                                                                       |                                                                          |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Année du modèle - Model Year<br><b>1999</b>                        | Fabricant - Manufacturer<br><b>HYUNDAI MOTOR COMPANY</b>                              | Modèle - Model<br><b>HYUNDAI ACCENT</b>                                  |
| Type de carrosserie - Body Style<br><b>HAYON 3P / 3D HATCHBACK</b> | Boîte de vitesse - Transmission Type<br><b>MANUEL / MANUAL</b>                        | Moteur - Engine<br><b>1.5 l</b>                                          |
| Date de fabrication - Date of Manufacture<br><b>SEP/9/98</b>       | Cylindres - Cylinders<br><b>4 cyl.</b>                                                | N° d'ident. du véhicule - Vehicle Ident. No.<br><b>KMHVD13NXXU422427</b> |
| Lecture de l'odomètre - Odometer Reading<br><b>29 km</b>           | Nombre de places assises désignées<br>Number of Designated Seating Positions <b>5</b> | Numéro d'ident. PMG - PMG Ident. Number<br><b>UN9-638</b>                |
| PNBV - GVWR<br><b>1455 kg</b>                                      | PNBE (Avant) - GAWR (Front)<br><b>790 kg</b>                                          | PNBE (Arrière) - GAWR (Rear)<br><b>770 kg</b>                            |

**CONFIGURATION D'ESSAI - TEST CONFIGURATION**

|                                                                                               |               |                                                   |                                     |                                                                                  |                                                                                                           |                                                   |  |                                                                                |                        |
|-----------------------------------------------------------------------------------------------|---------------|---------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------|--|--------------------------------------------------------------------------------|------------------------|
| Type d'essai - Test type                                                                      |               | Vitesse d'impact**<br>Impact velocity**           |                                     | Angle d'impact<br>Impact angle                                                   |                                                                                                           | Masse du véhicule d'essai<br>Test vehicle mass    |  | Pourcentage d'impact sur véhicule d'essai<br>Impact percentage on test vehicle |                        |
| Véh. vs barrière - Veh. vs barrier                                                            |               | 37.6 km/h                                         |                                     | 0 °                                                                              |                                                                                                           | 1144.1 kg                                         |  | 41.2 %                                                                         |                        |
| Coussins gonflables (Frontaux) – Air bags (Frontal)                                           |               |                                                   |                                     |                                                                                  | Coussins gonflables (Latéraux) – Air bags (Lateral)                                                       |                                                   |  |                                                                                |                        |
| Activés-Activated <input checked="" type="checkbox"/>                                         |               | Désactivés-Deactivated <input type="checkbox"/>   |                                     | Activés-Activated <input type="checkbox"/>                                       |                                                                                                           | Désactivés-Deactivated <input type="checkbox"/>   |  |                                                                                |                        |
| Normal <input type="checkbox"/>                                                               |               | Puiss. réduite-Depowered <input type="checkbox"/> |                                     | Normal <input type="checkbox"/>                                                  |                                                                                                           | Puiss. réduite-Depowered <input type="checkbox"/> |  |                                                                                |                        |
| Second or New Generation–Seconde ou Nouvelle Génération <input type="checkbox"/>              |               |                                                   |                                     | Second or New Generation–Seconde ou Nouvelle Génération <input type="checkbox"/> |                                                                                                           |                                                   |  |                                                                                |                        |
| Autre (spécifier) – Other (specify) _____                                                     |               | *** <input type="checkbox"/>                      |                                     | Autre (spécifier) – Other (specify) _____                                        |                                                                                                           | N/A <input checked="" type="checkbox"/>           |  |                                                                                |                        |
| Description et position du mannequin (Conducteur)<br>Dummy description and position (Driver)  |               |                                                   |                                     |                                                                                  | Description et position du mannequin (Passager avant)<br>Dummy description and position (Front Passenger) |                                                   |  |                                                                                |                        |
| DESCRIPTION                                                                                   |               |                                                   | POSITION                            |                                                                                  | DESCRIPTION                                                                                               |                                                   |  | POSITION                                                                       |                        |
| <input type="checkbox"/>                                                                      | 50%           |                                                   | <input checked="" type="checkbox"/> | avancée / near                                                                   | <input type="checkbox"/>                                                                                  | 50%                                               |  | <input checked="" type="checkbox"/>                                            | avancée / near         |
| <input checked="" type="checkbox"/>                                                           | 5%            |                                                   | <input type="checkbox"/>            | mi-course / mid-travel                                                           | <input checked="" type="checkbox"/>                                                                       | 5%                                                |  | <input type="checkbox"/>                                                       | mi-course / mid-travel |
| <input type="checkbox"/>                                                                      | autre / other |                                                   | <input type="checkbox"/>            | autre / other                                                                    | <input type="checkbox"/>                                                                                  | autre / other                                     |  | <input type="checkbox"/>                                                       | autre / other          |
| Description du mannequin (Passager arrière gauche)<br>Dummy description (Left Rear Passenger) |               |                                                   |                                     |                                                                                  | Description du mannequin (Passager arrière droit)<br>Dummy description (Right Rear Passenger)             |                                                   |  |                                                                                |                        |
| <input checked="" type="checkbox"/>                                                           |               |                                                   | N/A                                 |                                                                                  | <input checked="" type="checkbox"/>                                                                       |                                                   |  | N/A                                                                            |                        |
| <input type="checkbox"/>                                                                      | 50%           |                                                   | <input type="checkbox"/>            | 18 mois                                                                          | <input type="checkbox"/>                                                                                  | 50%                                               |  | <input type="checkbox"/>                                                       | 18 mois                |
| <input type="checkbox"/>                                                                      | 5%            |                                                   | <input type="checkbox"/>            | 3 ans                                                                            | <input type="checkbox"/>                                                                                  | 5%                                                |  | <input type="checkbox"/>                                                       | 3 ans                  |
| <input type="checkbox"/>                                                                      | 9 mois        |                                                   | <input type="checkbox"/>            | 6 ans                                                                            | <input type="checkbox"/>                                                                                  | 9 mois                                            |  | <input type="checkbox"/>                                                       | 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 muni d'un seul coussin gonflable pour le conducteur. / \*\*\* The vehicle is equipped with only one air bag for the driver.

**DONNÉES DU VÉHICULE D'ESSAI / TEST VEHICLE DATA**

| Capacité du véhicule - Vehicle Capacity                                                             |  | Masse des bagages - Cargo Load |  | Type de sièges - Type of seats |                                     | Types de dossiers - Type of seat back |                                                   |                                     |                                     |
|-----------------------------------------------------------------------------------------------------|--|--------------------------------|--|--------------------------------|-------------------------------------|---------------------------------------|---------------------------------------------------|-------------------------------------|-------------------------------------|
| 386 kg                                                                                              |  | 36 kg                          |  |                                | Avt - Frt                           | Arr - Rr                              |                                                   | Avt - Frt                           | Arr - Rr                            |
| Nombre d'occupants (places assises désignées)<br>Number of Occupants (Designated Seating Positions) |  |                                |  | Banquette<br>Bench             | <input type="checkbox"/>            | <input checked="" type="checkbox"/>   | Dossier ajustable<br>Adjustable Seat Back         | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Avant - Front 2      Arrière - Rear 3      Total 5                                                  |  |                                |  | Baquet<br>Bucket               | <input checked="" type="checkbox"/> | <input type="checkbox"/>              | Dossier non-ajustable<br>Non-adjustable Seat Back | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Pression à froid - Cold Tire Pressure                                                               |  |                                |  |                                |                                     | Dimension - Size                      |                                                   |                                     |                                     |
| Avant - Front 221 kPa                                                                               |  | Arrière - Rear 221 kPa         |  | Secours - Spare 414 kPa        |                                     | P155/80 R13                           |                                                   |                                     |                                     |

Essai réalisé selon la procédure PMG : Collision frontale décalée de recherche, version 2, révision 21 décembre 1998.

Test performed according to the PMG procedure : Research Offset frontal impact, version 2, revised Décembre 21<sup>st</sup>, 1998.

|                                                                       |                       |
|-----------------------------------------------------------------------|-----------------------|
| Préparé par :<br>Prepared by : <b>Jean Melançon</b>                   | Date : <b>25/2/99</b> |
| Vérifié par :<br>Verified by : <b>Alain Bussièrès</b>                 | Date : <b>25/2/99</b> |
| Rapport approuvé par :<br>Report approved by : <b>Alain Bussièrès</b> | Date : <b>25/2/99</b> |
| Rapport accepté par le client :<br>Report accepted by the client :    | Date :                |

|                                 |                   |                     |                            |                   |               |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C.No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|

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

|                                                                      |                                                                      |                                                             |
|----------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------|
| Avant gauche - Left front<br><b>294.3 kg</b>                         | Avant droit - Right front<br><b>287.7 kg</b>                         | Masse avant totale - Total front weight<br><b>582.0 kg</b>  |
| Arrière gauche - Left rear<br><b>198.8 kg</b>                        | Arrière droit - Right rear<br><b>189.6 kg</b>                        | Masse arrière totale - Total rear weight<br><b>388.4 kg</b> |
| Masse totale côté gauche - Total left side weight<br><b>493.1 kg</b> | Masse totale côté droit - Total right side weight<br><b>477.3 kg</b> | Masse totale - Total weight<br><b>970.4 kg</b>              |

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

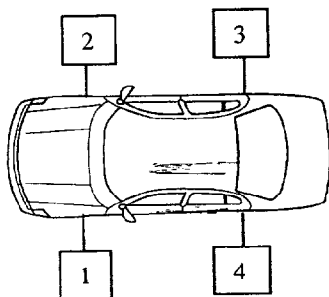
|                                                                      |                                                                      |                                                             |
|----------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------|
| Avant gauche - Left front<br><b>323.3 kg</b>                         | Avant droit - Right front<br><b>321.5 kg</b>                         | Masse avant totale - Total front weight<br><b>644.8 kg</b>  |
| Arrière gauche - Left rear<br><b>254.9 kg</b>                        | Arrière droit - Right rear<br><b>244.4 kg</b>                        | Masse arrière totale - Total rear weight<br><b>499.3 kg</b> |
| Masse totale côté gauche - Total left side weight<br><b>578.2 kg</b> | Masse totale côté droit - Total right side weight<br><b>565.9 kg</b> | Masse totale - Total weight<br><b>1144.1 kg</b>             |

**ATTITUDE DU VÉHICULE / VEHICLE ATTITUDE**

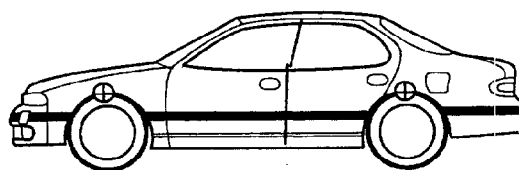
|   |                                           | Attitude tel que livré<br>Attitude as delivered | Attitude chargé<br>Attitude loaded | Attitude tel que testé<br>Attitude as tested |
|---|-------------------------------------------|-------------------------------------------------|------------------------------------|----------------------------------------------|
| 1 | Roue avant gauche*<br>Left front wheel*   | <b>648 mm</b>                                   | <b>630 mm</b>                      | <b>637 mm</b>                                |
| 2 | Roue avant droite*<br>Front right wheel*  | <b>652 mm</b>                                   | <b>635 mm</b>                      | <b>638 mm</b>                                |
| 3 | Roue arrière droite*<br>Rear right wheel* | <b>633 mm</b>                                   | <b>605 mm</b>                      | <b>608 mm</b>                                |
| 4 | Roue arrière gauche*<br>Rear left wheel*  | <b>633 mm</b>                                   | <b>605 mm</b>                      | <b>608 mm</b>                                |

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

**Vue de plan / Plan view**



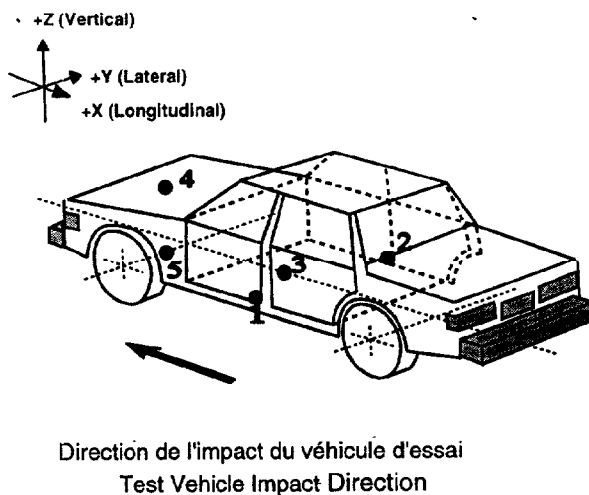
**Vue de côté / Side view**



⊕ Points de mesure / Mesure points

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

## EMPLACEMENT DES ACCÉLÉROMÈTRES ACCELEROMETER LOCATIONS



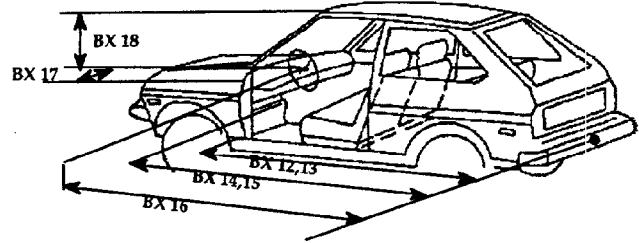
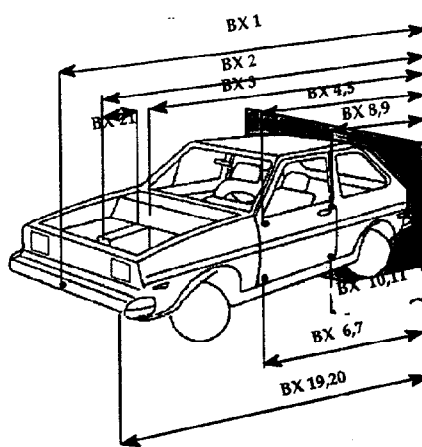
Point de référence : Centre transversal du véhicule, au point le plus avancé, au niveau du sol. Selon SAE J182a.

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

| EMPLACEMENT<br>LOCATION | DESCRIPTIONS                                                          | COORDONNÉES / COORDINATES |      |     |
|-------------------------|-----------------------------------------------------------------------|---------------------------|------|-----|
|                         |                                                                       | X                         | Y    | Z   |
| #1                      | Seuil de la porte gauche @ pilier "B"<br>Left door sill @ pillar "B"  | 2390                      | -584 | 242 |
| #2                      | Seuil de la porte droite @ pilier "B"<br>Right door sill @ pillar "B" | 2383                      | 581  | 238 |
| #3                      | Centre de gravité<br>Centre of gravity                                | 1849                      | -8   | 335 |
| #4                      | Le dessus du moteur<br>Top of engine                                  | 768                       | 171  | 814 |
| #5                      | Le dessous du moteur<br>Bottom of engine                              | 542                       | 152  | 221 |

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
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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  | 4095 | 3986 | 12 | 2782 | 2767 |
| 2  | 3653 | 3614 | 13 | 2767 | 2768 |
| 3  | 3133 | 3130 | 14 | 3098 | 3098 |
| 4  | 2762 | 2760 | 15 | 3106 | 3072 |
| 5  | 3296 | 2760 | 16 | 2414 | 2426 |
| 6  | 2795 | 2792 | 17 | 381  | 380  |
| 7  | 2780 | 2769 | 18 | 451  | 472  |
| 8  | 1654 | 1652 | 19 | 4006 | 4054 |
| 9  | 1656 | 1645 | 20 | 4003 | 3737 |
| 10 | 1689 | 1689 | 21 | 196  | 195  |
| 11 | 1687 | 1678 |    |      |      |

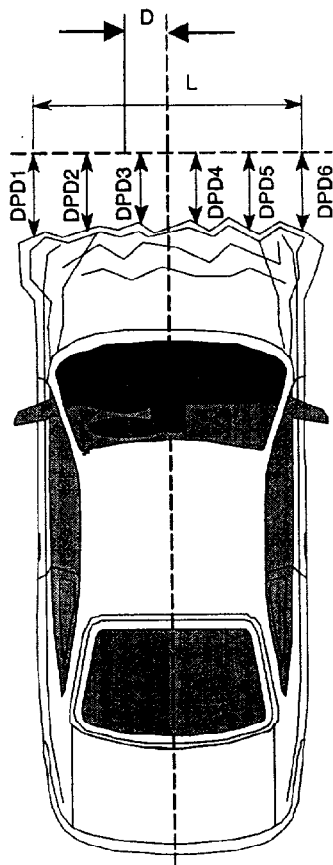
\* BX : Mesures du véhicule avant-essai. / Pre-test vehicle measurements data.

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

REMARQUES / COMMENTS :

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

## MESURES DES DPD / DPP'S MEASUREMENTS



DPD 1:

DPD 2:

DPD 3:

DPD 4:

DPD 5:

DPD 6:

MESURE L:

MESURE D:

| AVANT ESSAI<br>PRE-TEST | APRÈS ESSAI<br>POST-TEST |
|-------------------------|--------------------------|
| 135                     | 431                      |
| 27                      | 359                      |
| 2                       | 160                      |
| 3                       | 74                       |
| 26                      | 31                       |
| 125                     | 94                       |
|                         | 1349                     |
|                         | 0                        |

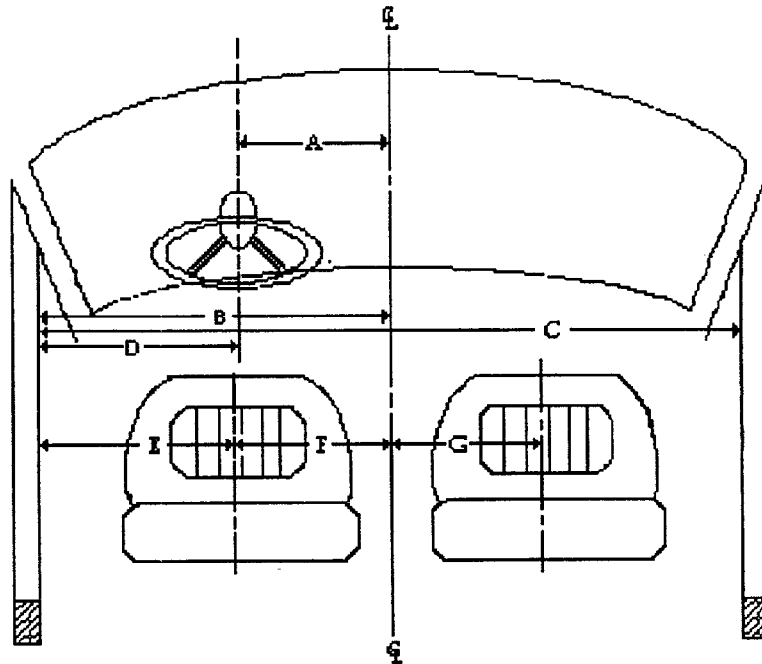
**L : Longueur de la région endommagée**  
Length of damaged region

**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<br>Steering wheel center to center line of car | 318  | E    | Seuil de la fenêtre au centre du siège (conducteur)<br>Window edge to seat midline (driver)                       | 416 |
| B    | Seuil de fenêtre à la ligne de centre du véhicule<br>Window edge to center line of the vehicle   | 733  | F    | Centre du siège à la ligne de centre du véhicule (conducteur)<br>Seat midline to center line of vehicle (driver)  | 317 |
| C    | Fenêtre à fenêtre<br>Window to window                                                            | 1461 | G    | Centre du siège à la ligne de centre du véhicule (passager)<br>Seat midline to center line of vehicle (passenger) | 314 |
| D    | Centre du volant au seuil de la fenêtre<br>Steering wheel center to window edge                  | 415  |      |                                                                                                                   |     |

**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.

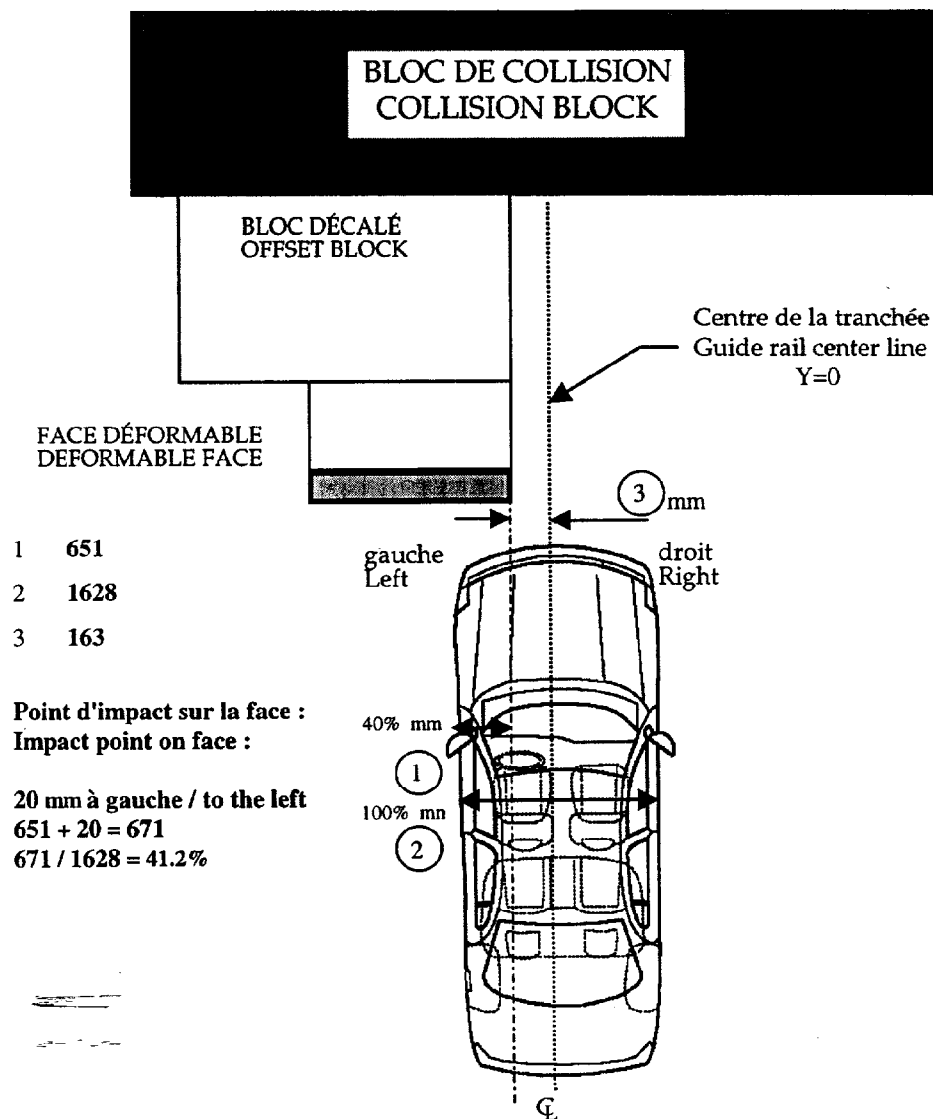
**Remarques - Comments:** Sièges avec ajustement avant/arrière. Dossier ajustable. Ceinture baudrier ajustable. Appui-tête ajustable. Ajustement lombaire (cond. seul.). Volant non ajustable. Pas d'ajustement du coussin de siège.

Seats with fore/aft adjustment. Adjustable seat back. Adjustable upper torso belt. Head rest adjustable. Lumbar adjustment (driver only). Steering wheel not adjustable. No seat cushion height adjustment.



|                                 |            |                     |                     |                   |        |
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|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

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

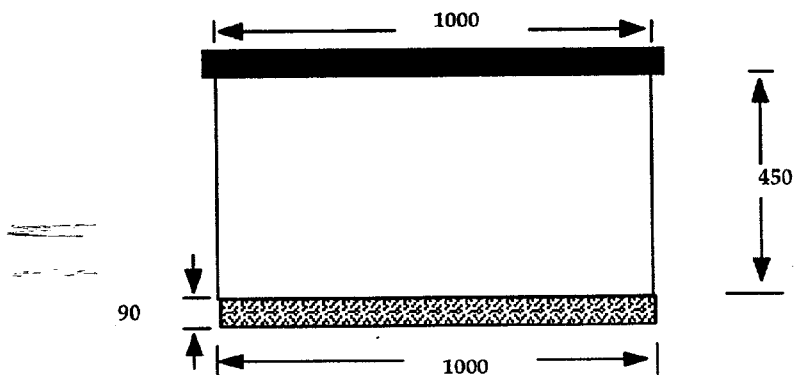
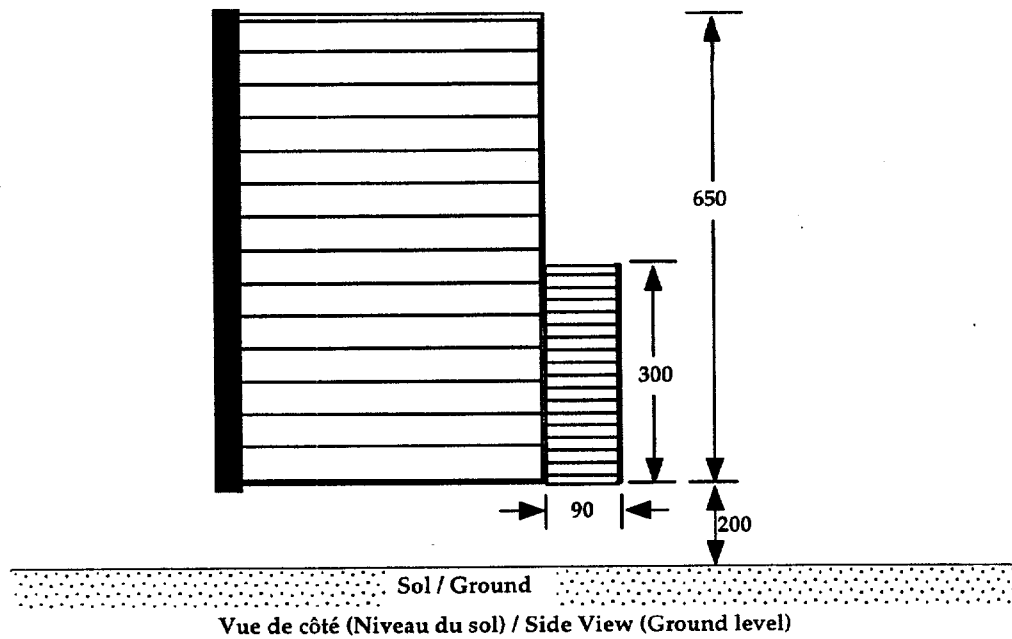


NOTE: La largeur maximale du véhicule est mesurée au pilier "B".  
NOTE: The maximum width of the vehicle is measured at the "B" pillar.

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
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|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

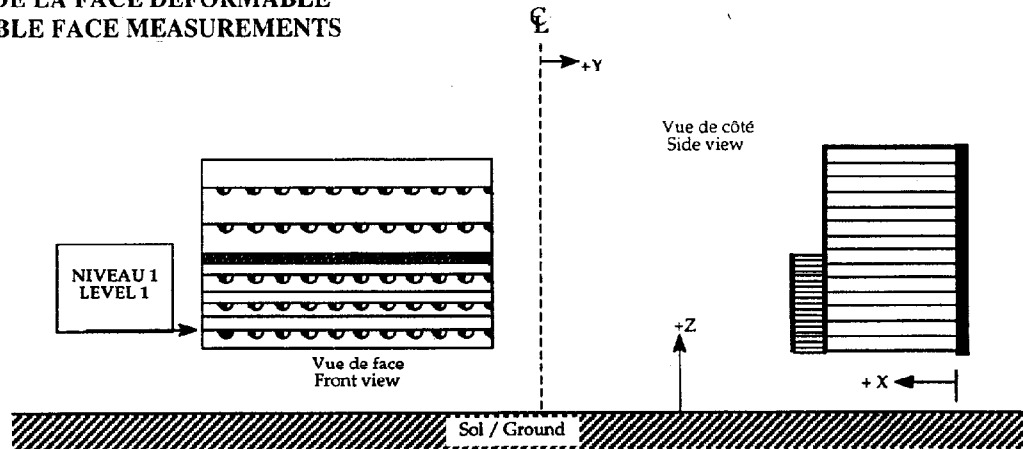
## DIMENSIONS DE LA FACE DÉFORMABLE - DEFORMABLE FACE DIMENSIONS

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



|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

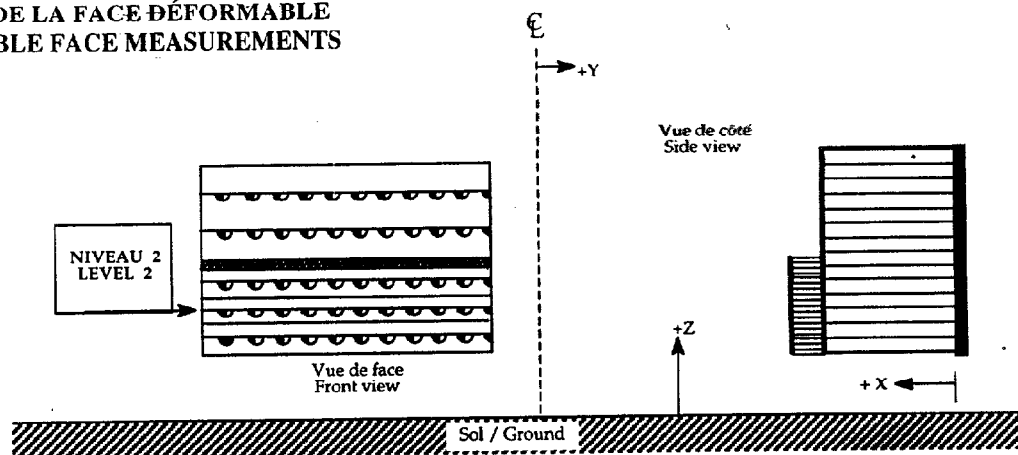
MESURES DE LA FACE DÉFORMABLE  
DEFORMABLE FACE MEASUREMENTS



| PRE-TEST |       |     | POST-TEST |       |     | Δ DIFFERENCE |    |    |
|----------|-------|-----|-----------|-------|-----|--------------|----|----|
| X        | Y     | Z   | X         | Y     | Z   | X            | Y  | Z  |
| 545      | -1115 | 244 | 685       | -1114 | 242 | -140         | -1 | 2  |
| 546      | -1017 | 245 | 617       | -1016 | 244 | -71          | -1 | 1  |
| 545      | -916  | 245 | 550       | -917  | 246 | -5           | 1  | -1 |
| 545      | -816  | 246 | 483       | -817  | 245 | 62           | 1  | 1  |
| 545      | -718  | 247 | 438       | -718  | 246 | 107          | 0  | 1  |
| 545      | -616  | 246 | 365       | -617  | 246 | 180          | 1  | 0  |
| 545      | -516  | 247 | 298       | -517  | 247 | 247          | 1  | 0  |
| 545      | -418  | 247 | 223       | -419  | 248 | 322          | 1  | -1 |
| 545      | -316  | 249 | 153       | -317  | 248 | 392          | 1  | 1  |
| 545      | -216  | 249 | 151       | -217  | 250 | 394          | 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.

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

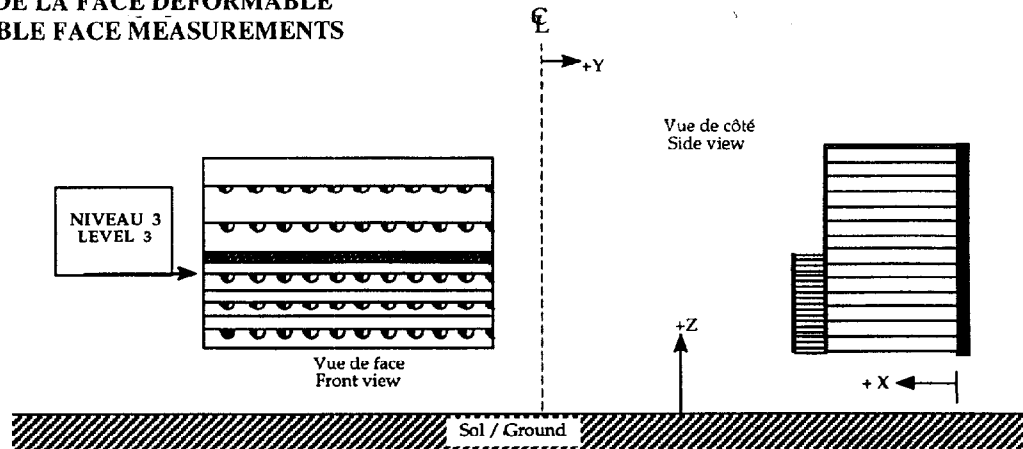
**MESURES DE LA FACE DÉFORMABLE  
DEFORMABLE FACE MEASUREMENTS**


| PRE-TEST |       |     | POST-TEST |       |     | Δ DIFFERENCE |    |    |
|----------|-------|-----|-----------|-------|-----|--------------|----|----|
| X        | Y     | Z   | X         | Y     | Z   | X            | Y  | Z  |
| 545      | -1116 | 355 | 713       | -1117 | 356 | -168         | 1  | -1 |
| 545      | -1016 | 356 | 642       | -1016 | 357 | -97          | 0  | -1 |
| 546      | -918  | 356 | 573       | -918  | 356 | -27          | 0  | 0  |
| 545      | -817  | 358 | 512       | -818  | 358 | 33           | 1  | 0  |
| 544      | -718  | 357 | 442       | -717  | 357 | 102          | -1 | 0  |
| 544      | -617  | 359 | 369       | -618  | 359 | 175          | 1  | 0  |
| 544      | -517  | 358 | 300       | -517  | 359 | 244          | 0  | -1 |
| 544      | -417  | 360 | 246       | -417  | 359 | 298          | 0  | 1  |
| 545      | -316  | 359 | 182       | -316  | 359 | 363          | 0  | 0  |
| 544      | -219  | 355 | 155       | -220  | 354 | 389          | 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.

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

MESURES DE LA FACE DÉFORMABLE  
DEFORMABLE FACE MEASUREMENTS

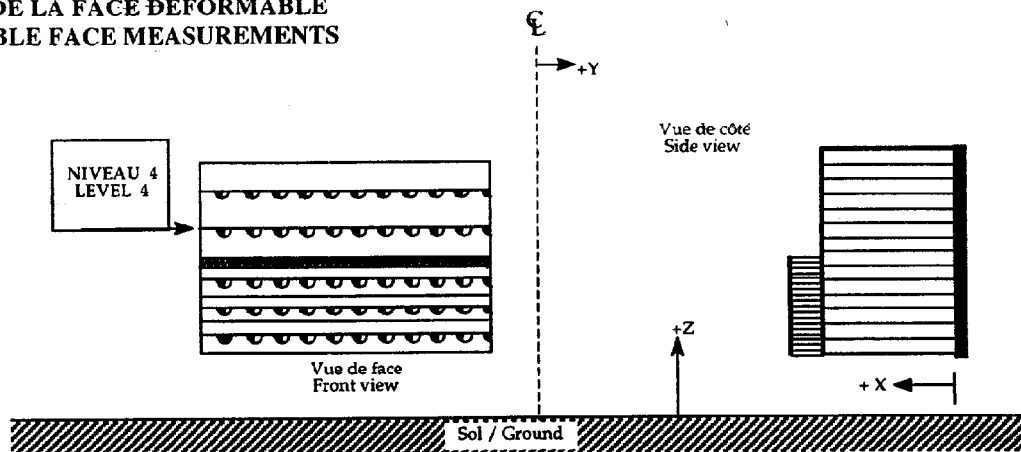


| PRE-TEST |       |     | POST-TEST |       |     | Δ DIFFERENCE |    |    |
|----------|-------|-----|-----------|-------|-----|--------------|----|----|
| X        | Y     | Z   | X         | Y     | Z   | X            | Y  | Z  |
| 544      | -1116 | 468 | 523       | -1117 | 468 | 21           | 1  | 0  |
| 544      | -1016 | 467 | 527       | -1017 | 469 | 17           | 1  | -2 |
| 544      | -916  | 468 | 525       | -916  | 469 | 19           | 0  | -1 |
| 544      | -817  | 468 | 480       | -817  | 468 | 64           | 0  | 0  |
| 544      | -717  | 470 | 407       | -718  | 470 | 137          | 1  | 0  |
| 544      | -616  | 469 | 389       | -616  | 469 | 155          | 0  | 0  |
| 544      | -517  | 470 | 343       | -516  | 470 | 201          | -1 | 0  |
| 543      | -418  | 471 | 288       | -418  | 472 | 255          | 0  | -1 |
| 545      | -316  | 471 | 226       | -316  | 472 | 319          | 0  | -1 |
| 543      | -217  | 472 | 91        | -218  | 472 | 452          | 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.

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

MESURES DE LA FACE DÉFORMABLE  
DEFORMABLE FACE MEASUREMENTS

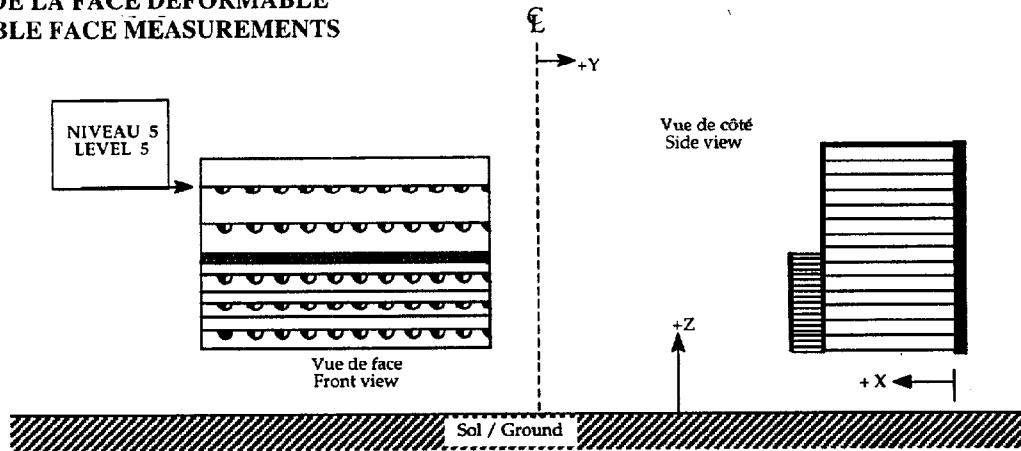


| PRE-TEST |       |     | POST-TEST |       |     | Δ DIFFERENCE |    |    |
|----------|-------|-----|-----------|-------|-----|--------------|----|----|
| X        | Y     | Z   | X         | Y     | Z   | X            | Y  | Z  |
| 453      | -1115 | 629 | 494       | -1115 | 628 | -41          | 0  | 1  |
| 454      | -1015 | 629 | 505       | -1016 | 629 | -51          | 1  | 0  |
| 453      | -914  | 630 | 484       | -913  | 630 | -31          | -1 | 0  |
| 454      | -815  | 630 | 438       | -816  | 631 | 16           | 1  | -1 |
| 453      | -716  | 630 | 351       | -715  | 629 | 102          | -1 | 1  |
| 454      | -615  | 631 | 406       | -615  | 631 | 48           | 0  | 0  |
| 453      | -516  | 633 | 408       | -515  | 634 | 45           | -1 | -1 |
| 454      | -415  | 633 | 398       | -416  | 633 | 56           | 1  | 0  |
| 454      | -315  | 633 | 349       | -314  | 633 | 105          | -1 | 0  |
| 454      | -216  | 634 | 248       | -218  | 636 | 206          | 2  | -2 |
|          |       |     |           |       |     |              |    |    |
|          |       |     |           |       |     |              |    |    |
|          |       |     |           |       |     |              |    |    |
|          |       |     |           |       |     |              |    |    |
|          |       |     |           |       |     |              |    |    |

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.

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

MESURES DE LA FACE DÉFORMABLE  
DEFORMABLE FACE MEASUREMENTS



| PRE-TEST |       |     | POST-TEST |       |     | Δ DIFFERENCE |    |    |
|----------|-------|-----|-----------|-------|-----|--------------|----|----|
| X        | Y     | Z   | X         | Y     | Z   | X            | Y  | Z  |
| 452      | -1116 | 737 | 470       | -1115 | 737 | -18          | -1 | 0  |
| 452      | -1016 | 737 | 474       | -1016 | 737 | -22          | 0  | 0  |
| 453      | -916  | 737 | 475       | -916  | 737 | -22          | 0  | 0  |
| 453      | -815  | 738 | 459       | -815  | 739 | -6           | 0  | -1 |
| 453      | -715  | 738 | 433       | -715  | 738 | 20           | 0  | 0  |
| 453      | -614  | 740 | 434       | -615  | 740 | 19           | 1  | 0  |
| 454      | -515  | 739 | 430       | -515  | 739 | 24           | 0  | 0  |
| 454      | -414  | 741 | 416       | -414  | 741 | 38           | 0  | 0  |
| 453      | -315  | 740 | 371       | -316  | 739 | 82           | 1  | 1  |
| 453      | -216  | 741 | 266       | -217  | 740 | 187          | 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.

|                                 |                   |                     |                            |                   |               |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C.No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|

**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                                      105 mm                                      Right knee spacing                                      101 mm

| Essai no: / Trial no:                                                                                                          | 1                            | 2                            | 3                            |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------|------------------------------|
| Angle du dossier BTD<br>Back pan angle                                                                                         | 24.7 deg.                    | 24.7 deg.                    | 25.0 deg.                    |
| Angle de la cuvette BTD<br>Seat pan angle                                                                                      | 12.2 deg.                    | 13.6 deg.                    | 12.8 deg.                    |
| Angle du pied                      gauche / left<br>Foot angle                                      droit / right              | 120 deg.<br>127 deg.         | 118 deg.<br>128 deg.         | 118 deg.<br>128 deg.         |
| Angle du genou                      gauche / left<br>Knee angle                                      droit / right             | 131 deg.<br>130 deg.         | 127 deg.<br>128 deg.         | 129 deg.<br>129 deg.         |
| Mesure sous-abdominale                      gauche / left<br>Lap belt score                                      droit / right | 34 mm / 0 mm<br>41 mm / 0 mm | 32 mm / 0 mm<br>41 mm / 0 mm | 32 mm / 0 mm<br>41 mm / 0 mm |
| Ceinture en contact                      gauche / left<br>Belt in contact                                      droit / right   | oui/yes<br>oui/yes           | oui/yes<br>oui/yes           | oui/yes<br>oui/yes           |
| Mesure ceinture baudrier                      Sternum<br>Upper torso belt score                                      Clavicule | 165 mm / - *<br>97 mm / 0 mm | 165 mm / - *<br>98 mm / 0 mm | 164 mm / - *<br>97 mm / 0 mm |
| Ceinture en contact                      Clavicule<br>Belt in contact                                                          | oui/yes                      | oui/yes                      | oui/yes                      |

|                 |   |              |
|-----------------|---|--------------|
| Mesure<br>Score | / | Jeu<br>Slack |
|-----------------|---|--------------|

\* 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.



|                                 |                   |                     |                            |                   |               |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C.No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|

**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                                      100 mm                                      Right knee spacing                                      102 mm

| Essai no: / Trial no:                                                                                                          | 1                             | 2                            | 3                            |
|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------|------------------------------|
| Angle du dossier BTD<br>Back pan angle                                                                                         | 23.8 deg.                     | 22.5 deg.                    | 24.0 deg.                    |
| Angle de la cuvette BTD<br>Seat pan angle                                                                                      | 12.7 deg.                     | 13.4 deg.                    | 12.4 deg.                    |
| Angle du pied                      gauche / left<br>Foot angle                                      droit / right              | 128 deg.<br>130 deg.          | 128 deg.<br>129 deg.         | 128 deg.<br>129 deg.         |
| Angle du genou                      gauche / left<br>Knee angle                                      droit / right             | 126 deg.<br>127 deg.          | 126 deg.<br>127 deg.         | 127 deg.<br>129 deg.         |
| Mesure sous-abdominale                      gauche / left<br>Lap belt score                                      droit / right | 42 mm / 0 mm<br>34 mm / 0 mm  | 42 mm / 0 mm<br>32 mm / 0 mm | 42 mm / 0 mm<br>34 mm / 0 mm |
| Ceinture en contact                      gauche / left<br>Belt in contact                                      droit / right   | oui/yes<br>oui/yes            | oui/yes<br>oui/yes           | oui/yes<br>oui/yes           |
| Mesure ceinture baudrier                      Sternum<br>Upper torso belt score                                      Clavicule | 166 mm / - *<br>101 mm / 0 mm | 160 mm / - *<br>95 mm / 0 mm | 164 mm / - *<br>99 mm / 0 mm |
| Ceinture en contact                      Clavicule<br>Belt in contact                                                          | oui/yes                       | oui/yes                      | oui/yes                      |

|                 |   |              |
|-----------------|---|--------------|
| Mesure<br>Score | / | Jeu<br>Slack |
|-----------------|---|--------------|

\* 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.

|                                 |                   |                     |                            |                   |               |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C.No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|

**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 ARRÈRE<br>REAR PASSENGER  |   |   |
|-------------------------------------------------------------------------------------------|----------------------------------|-------------|------------|----------------------------------|------------|------------|------------------------------------|---|---|
| Type de siège / Seat type                                                                 | <b>BAQUET/BUCKET</b>             |             |            | <b>BAQUET/BUCKET</b>             |            |            | <b>N/A</b>                         |   |   |
| Nombre de crans d'ajustement du siège *<br>Number of notches for adjustable seat *        | <b>16 de/of 16 crans/notches</b> |             |            | <b>16 de/of 16 crans/notches</b> |            |            | <b>n/a de/of n/a crans/notches</b> |   |   |
| Nombre de crans d'ajustement du dossier *<br>Number of notches for adjustable seat back * | <b>9ème/9th crans/notches</b>    |             |            | <b>7ème/7th crans/notches</b>    |            |            | <b>n/a crans/notches</b>           |   |   |
| Axes                                                                                      | X                                | Y           | Z          | X                                | Y          | Z          | X                                  | Y | Z |
| Loquet de porte / Door latch                                                              | <b>2434</b>                      | <b>-728</b> | <b>663</b> | <b>2433</b>                      | <b>726</b> | <b>659</b> |                                    |   |   |
| Point-H / H-Point                                                                         | <b>2102</b>                      | <b>-395</b> | <b>500</b> | <b>2096</b>                      | <b>400</b> | <b>505</b> |                                    |   |   |
| Rotule / Knee joint                                                                       | <b>1656</b>                      | <b>-546</b> | <b>603</b> | <b>1648</b>                      | <b>538</b> | <b>602</b> |                                    |   |   |
| PRS / SRP                                                                                 | <b>2102</b>                      | <b>-395</b> | <b>500</b> | <b>2097</b>                      | <b>401</b> | <b>505</b> |                                    |   |   |

\* La position la plus avancée est au 1<sup>er</sup> cran / \* The foremost position is at the 1<sup>st</sup> notch.

#### Ajustement du 3D / 3D adjustment

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

95 %

95 %

| DESCRIPTION / DESCRIPTION                               | CONDUCTEUR / DRIVER | PASSAGER / PASSENGER | PASSAGER ARRÈRE<br>REAR PASSENGER |
|---------------------------------------------------------|---------------------|----------------------|-----------------------------------|
| Espacement du genou gauche<br>Left knee spacing         | <b>146 mm</b>       | <b>116 mm</b>        | <b>mm</b>                         |
| Espacement du genou droit<br>Right knee spacing         | <b>120 mm</b>       | <b>72 mm</b>         | <b>mm</b>                         |
| Cheville à cheville (c-c)<br>Ankle to ankle (a-a)       | <b>238 mm</b>       | <b>162 mm</b>        | <b>mm</b>                         |
| Angle du dossier du "3-D"<br>Back pan angle             | <b>24.3 deg</b>     | <b>24.1 deg</b>      | <b>mm</b>                         |
| Angle de la cuvette de siège du "3-D"<br>Seat pan angle | <b>13.8 deg</b>     | <b>11.2 deg</b>      | <b>mm</b>                         |
| Angle du genou gauche<br>Left knee angle                | <b>133 deg</b>      | <b>136 deg</b>       | <b>deg</b>                        |
| Angle du genou droit<br>Right knee angle                | <b>135 deg</b>      | <b>137 deg</b>       | <b>deg</b>                        |
| Angle de la cheville gauche<br>Left ankle angle         | <b>123 deg</b>      | <b>128 deg</b>       | <b>deg</b>                        |
| Angle de la cheville droite<br>Right ankle angle        | <b>100 deg</b>      | <b>127 deg</b>       | <b>deg</b>                        |

**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.**

|                                 |                   |                     |                            |                   |               |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C.No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|-------------------|---------------|

**POSITIONNEMENT DES MANNEQUINS / MEASUREMENTS OF DUMMY POSITIONS**

| POSITIONNEMENT DES MANNEQUINS VIRTUELS                                                                                                                                                                    |  | 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 : 21.1°<br>Angle transversal - Transversal angle : 0.1°<br>Angle de la tête - Head angle : 0.3°<br>Seuil de porte - Door sill : 0.3°<br>Angle du coussin - Skew angle : 0° |  |                                                            |      |      |      |  |      |      |      |
| Passager avant/Front Passenger: HYBRID III 5 % Femelle/Female                                                                                                                                             |  |                                                            |      |      |      |  |      |      |      |
| Angle du pelvis - Pelvic angle : 19.8°<br>Angle transversal - Transversal angle : 0.2°<br>Angle de la tête - Head angle : 0.1°<br>Seuil de porte - Door sill : 0.2°<br>Angle du coussin - Skew angle : 0° |  |                                                            |      |      |      |  |      |      |      |
| Fenêtre à fenêtre / Window to window :                                                                                                                                                                    |  |                                                            | X    | Y    | Z    |  | X    | Y    | Z    |
| Centre du véhicule / Vehicle center :                                                                                                                                                                     |  |                                                            |      | 1461 |      |  |      | 1461 |      |
| Seuil de la portière au centre du loquet / Door sill to latch center :                                                                                                                                    |  |                                                            |      | 0    |      |  |      | 0    |      |
| Centre du volant / Steering wheel center :                                                                                                                                                                |  |                                                            |      |      | 310  |  |      |      | 312  |
| Mouvement du lacet / Yaw movement :                                                                                                                                                                       |  |                                                            | 1681 | -318 | 857  |  |      |      |      |
| Cible de tête / Head target :                                                                                                                                                                             |  |                                                            | 1.8  |      |      |  | 0.5  |      |      |
| Point-H / H-Point :                                                                                                                                                                                       |  |                                                            | 1942 | -393 | 1088 |  | 1963 | 385  | 1087 |
| Rotule / Knee joint :                                                                                                                                                                                     |  |                                                            | 1838 | -465 | 524  |  | 1858 | 470  | 507  |
|                                                                                                                                                                                                           |  |                                                            | 1500 | -435 | 561  |  | 1514 | 429  | 571  |

**Remarques – Comments :** Les sièges du conducteur et du passager sont à la position la plus avancée. Ceinture baudrier à la position la plus basse. Appui-tête au 2e cran de la position la plus basse. Lombaire relâché.

The driver and the passenger seats are at the foremost position. Upper torso belt at its lowest position. Headrest to its 2<sup>nd</sup> notch from the lowest position. Lumbar adjustment retracted.

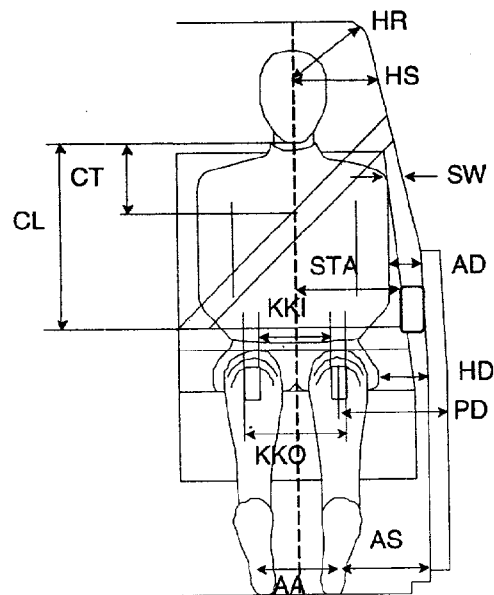
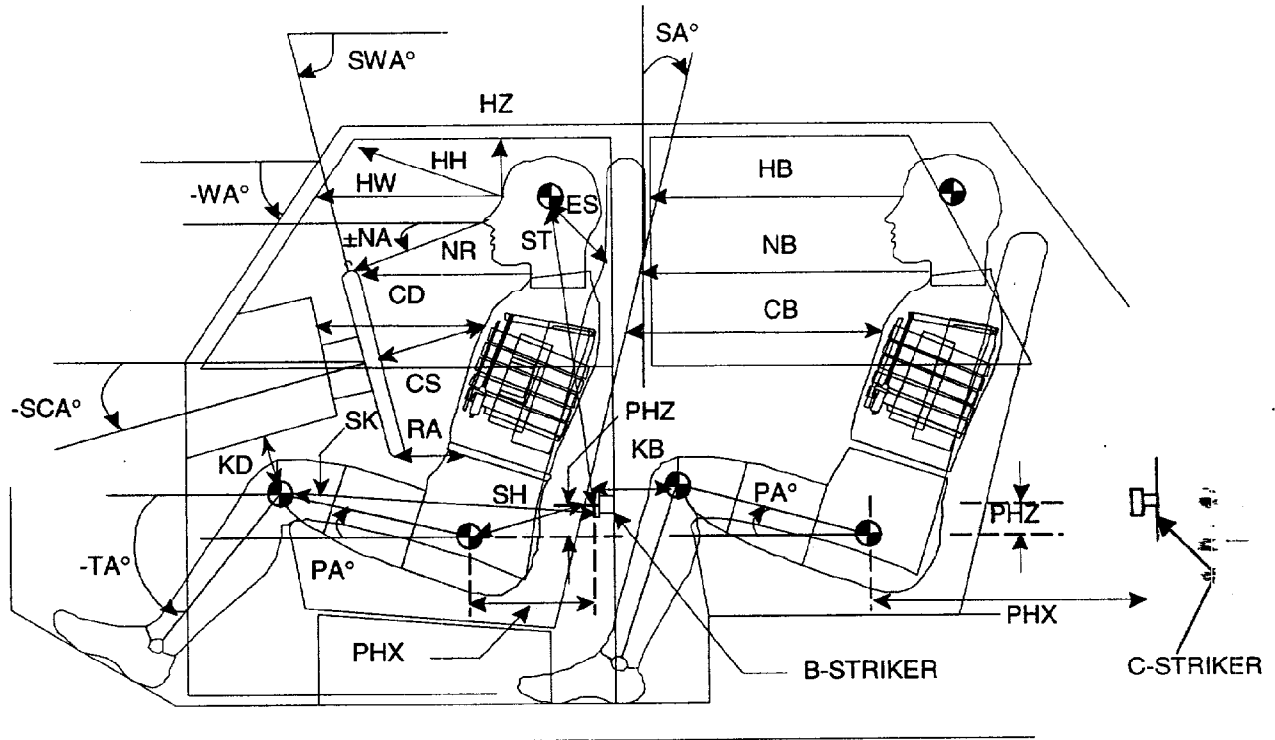
Selon la procédure de positionnement de mannequin 5<sup>e</sup> percentile Hybrid III côté conducteur, Biokinetics, 29/11/98, rapport n° D98-15 et côté passager, Biokinetics, 20/11/98, rapport n° D98-17.

As per procedure for placement of a 5<sup>th</sup> 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.

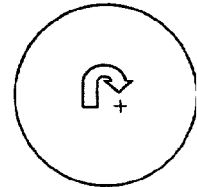
**Point de référence :** Centre transversal du véhicule, au point le plus avancé, au niveau du sol. Selon SAE J182a.  
**Reference point :** Transversal center of the vehicle, at the foremost point and at ground level. As per SAE J182a.

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

COTES DE LOCALISATION DES MANNEQUINS  
DUMMY LOCATION DATA



référence :



|                                 |                   |                     |                            |                    |               |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C. No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|

**COTES DE LOCALISATION DES MANNEQUINS (suite)**
**DUMMY LOCATION DATA (continued)**
**(Mesures prises en mm / Measurements taken in mm)**

| DESCRIPTION                                                                                                                                | CODE  | CONDUCTEUR<br>DRIVER | PASSAGER Av.<br>F. PASSENGER | PASSAGER Arr.G.<br>L.R. PASSENGER | PASSAGER Arr.D.<br>R.R. PASSENGER |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------|------------------------------|-----------------------------------|-----------------------------------|
| De cheville à cheville (boulon extérieur)<br>Ankle to ankle (exterior bolt)                                                                | AA    | 280                  | 227                          |                                   |                                   |
| Genou à genou (plaque) Intérieur / Interior<br>Knee to knee (plate) Extérieur / Exterior                                                   | KKI   | 122                  | 93                           |                                   |                                   |
|                                                                                                                                            | KKO   | 262                  | 233                          |                                   |                                   |
| De la cheville jusqu'au seuil de porte (horizontalement)<br>Ankle to door sill (horizontal)                                                | AS    | 150                  | 218                          |                                   |                                   |
| Centre du genou au tableau de bord ou siège horizontalement (minimum)<br>Knees centre to dash or seat back horizontal (minimum)            | KDL   | 40                   | 50                           |                                   |                                   |
|                                                                                                                                            | KDR   | 36                   | 60                           |                                   |                                   |
| Sternum au tableau de bord (horizontalement)<br>Chest to dash (horizontal)                                                                 | CD    |                      | 390                          |                                   |                                   |
| Milieu du sternum au centre du moyeu du volant ou siège avant<br>Mid sternum to steering hub center or front seat                          | CS/CB | 145                  |                              |                                   |                                   |
| Milieu du front jusqu'au pare-brise (horizontalement)<br>Mid forehead to windshield (horizontal)                                           | HW    | 435                  | 420                          |                                   |                                   |
| Milieu du front jusqu'au haut du pare-brise<br>Mid forehead to windshield header                                                           | HH    | 215                  | 210                          |                                   |                                   |
| Nez à la jante du volant de direction (haut) ou siège avant<br>Nose to steering wheel rim (top) or front seat                              | NR/HB | 240                  |                              |                                   |                                   |
| Milieu du front jusqu'au début du toit<br>Mid forehead to edge roof                                                                        | HR    | 238                  | 225                          |                                   |                                   |
| Haut de l'oreille au haut du siège avant<br>Ear top to front seat top                                                                      | ES    | 238                  | 234                          |                                   |                                   |
| Menton au haut de la ceinture sous-abdominale (verticalement)<br>Chin to lap belt upper edge (vertical)                                    | CL    | 342                  | 333                          |                                   |                                   |
| Menton au haut de la ceinture baudrier (verticalement)<br>Chin to thorax belt upper edge (vertical)                                        | CT    | 126                  | 126                          |                                   |                                   |
| Milieu du front à la fenêtre latérale (horizontalement)<br>Mid forehead to side window (horizontal)                                        | HS    | 303                  | 295                          |                                   |                                   |
| La rotule à la porte (horizontalement)<br>Patella to door (horizontal)                                                                     | PD    | 235                  | 234                          |                                   |                                   |
| Du point-H à la porte (horizontalement)<br>H-point to door (horizontal)                                                                    | HD    | 205                  | 200                          |                                   |                                   |
| Du milieu du bras à la porte (horizontalement)<br>Mid upper arm to door (horizontal)                                                       | AD    | 150                  | 145                          |                                   |                                   |
| Cou jusqu'au volant ou tableau de bord (horizontalement) ou siège avant<br>Neck to steering wheel or dash board (horizontal) or front seat | NB    | 332                  | 510                          |                                   |                                   |
| Épaule à la fenêtre de côté<br>Shoulder to side window                                                                                     | SW    | 162                  | 158                          |                                   |                                   |
| Abdomen à l'appui-bras<br>Abdomen to armrest                                                                                               | STA   | 165                  | 156                          |                                   |                                   |
| Milieu du front au toit (verticalement)<br>Mid forehead to roof (vertical)                                                                 | HZ    | 166                  | 160                          |                                   |                                   |
| Tête au loquet (plan (x,z))<br>Striker to head ( (x,z) plan)                                                                               | ST    | 650                  | 636                          |                                   |                                   |
| Abdomen à la jante du volant de direction (bas)<br>Steering wheel rim to abdomen (bottom)                                                  | RA    | 75                   |                              |                                   |                                   |
| Genou au loquet (plan (x,z))<br>Striker to knee ( (x,z) plan)                                                                              | SK    | 940                  | 923                          |                                   |                                   |
| Point-H au loquet (plan (x,z))<br>Striker to H-Point ( (x,z) plan)                                                                         | SH    | 612                  | 595                          |                                   |                                   |
| Point-H au loquet en X (horizontalement)<br>Striker to H-Point in X (horizontal)                                                           | PHX   | 596                  | 575                          |                                   |                                   |
| Point-H au loquet en Z (verticalement)<br>Striker to H-Point in Z (vertical)                                                               | PHZ   | 139                  | 152                          |                                   |                                   |

|                                 |                   |                     |                            |                    |               |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C. No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|

**COTES DE LOCALISATION DES MANNEQUINS (suite)**
**DUMMY LOCATION DATA (continued)**
**(Mesures prises en deg. / Measurements taken in deg.)**

| DESCRIPTION                                                                           | CODE  | CONDUCTEUR<br>DRIVER | PASSAGER Av.<br>F. PASSENGER | PASSAGER Arr.G.<br>L.R. PASSENGER | PASSAGER Arr.D.<br>R.R. PASSENGER |
|---------------------------------------------------------------------------------------|-------|----------------------|------------------------------|-----------------------------------|-----------------------------------|
| Angle du volant<br>Steering wheel angle                                               | +SWA  | <b>65.7°</b>         |                              |                                   |                                   |
| Angle du pare-brise<br>Windshield angle                                               | -WA   | <b>-29.0°</b>        |                              |                                   |                                   |
| Angle de la colonne de direction<br>Steering column angle                             | -SCA  | <b>-26.0°</b>        |                              |                                   |                                   |
| Angle du tibia gauche<br>Left tibial angle                                            | -TA   | <b>-57°</b>          | <b>-45°</b>                  |                                   |                                   |
| Angle du tibia droit<br>Right tibial angle                                            | -TA   | <b>-57°</b>          | <b>-45°</b>                  |                                   |                                   |
| Angle pelvis<br>Pelvic angle                                                          | +PA   | <b>21.1°</b>         | <b>19.8°</b>                 |                                   |                                   |
| Angle du nez à la jante de direction (haut)<br>Nose to steering wheel rim (top) angle | ±NA   | <b>-6.0°</b>         |                              |                                   |                                   |
| Angle du dossier<br>Seat back angle                                                   | +SA   | <b>16.5°</b>         | <b>18.5°</b>                 |                                   |                                   |
| Angle ST (horizontalement)<br>ST angle (horizontal)                                   | +ST-A | <b>40.8°</b>         | <b>42.3°</b>                 |                                   |                                   |
| Angle SK (horizontalement)<br>SK angle (horizontal)                                   | ±SK-A | <b>-6.2°</b>         | <b>-5.5°</b>                 |                                   |                                   |
| Angle SH (horizontalement)<br>SH angle (horizontal)                                   | -SH-A | <b>-13.1°</b>        | <b>-14.8°</b>                |                                   |                                   |

|                                 |                   |                     |                            |                    |               |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C. No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|

**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                      | 2102  | -395          | 500   |
| Point "H" extérieur mesure finale - H-Point, outboard final measurement                          | 2102  | -395          | 500   |
| Rotule, extérieure - Knee pivot, outboard                                                        | 1656  | -546          | 603   |
| Cheville, extérieure - Ankle pivot, outboard                                                     | 1271  | -440          | 356   |
| Talon du pied en contact avec sol - Accomodation heel point (AHP)                                | 1286  | -429          | 227   |
| Plante du pied en contact avec sol - Accomodation ball of foot point (ABFP)                      | 1102  | -468          | 332   |
| Ligne médiane du véhicule - Vehicle centreline                                                   |       | 0             |       |
| Centre du moyeu latéral - Lateral hub centre location (W20)                                      |       | 318           |       |
| Support poids du sternum, extérieur - Torso weigh hanger, outboard                               | 2249  | -485          | 823   |
| PRS / SRP                                                                                        | 2102  | -395          | 500   |
| Ligne médiane du coussin du siège (avant/milieu/arr.) - Seat cushion centreline (front/mid/rear) |       | -318/317/-318 |       |
| Ligne médiane du dossier du siège (avant/milieu/arr.) - Seat back centreline(front/mid/rear)     |       | -319/318/-315 |       |
| Hauteur Point "H" - H-Point height (H30 = Z H-POINT - Z AHP)                                     |       | 273           |       |
| 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)                                             |       | 24.3°         |       |
| Angle du coussin du siège - Skew angle                                                           |       | 0°            |       |
| Diamètre extérieur du volant - Steering wheel dia., outside (W9)                                 |       | 382           |       |

Véhicule et Mannequin - Vehicle and Dummy

**Femelle 5<sup>e</sup> percentile conducteur / 5<sup>th</sup> percentile female driver**

| DESCRIPTION                                                                               | X(mm)    | Y(mm) | Z(mm)    |
|-------------------------------------------------------------------------------------------|----------|-------|----------|
| Boulon siège avant, extérieur - Front seat bolt, outboard                                 | 1765     | -548  | 329      |
| Jante du volant, centre haut - Steering wheel rim, top centre                             | 1592     | -313  | 1030     |
| Jante du volant, centre bas - Steering wheel rim, bottom centre                           | 1755     | -315  | 685      |
| Jante du volant, centre gauche - Steering wheel rim, left centre                          | 1664     | -506  | 854      |
| Jante du volant, centre droit - Steering wheel rim, right centre                          | 1683     | -124  | 860      |
| Moyeu du volant, centre haut - Steering wheel hub, top centre                             | 1635     | -314  | 896      |
| Moyeu du volant, centre - Steering wheel hub, centre                                      | 1704     | -314  | 820      |
| Moyeu du volant, centre bas - Steering wheel hub, bottom centre                           | 1698     | -315  | 744      |
| Position du siège vs sa position la plus reculée - Seat position vs its rearmost position |          | 225   |          |
| Angle de dossier du siège - Seat back angle (deg)                                         |          | 16.5° |          |
| Genou au tableau de bord, minimum - Knee to dash, minimum                                 | G/L : 40 |       | D/R : 36 |
| Menton au haut du moyeu du volant - Chin to steering wheel hub top                        |          | 245   |          |

|                                 |                   |                     |                            |                    |               |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C. No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|

**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<sup>e</sup> percentile conducteur / 5<sup>th</sup> percentile female driver**

| DESCRIPTION                                                                    | X(mm) | Y(mm) | Z(mm) |
|--------------------------------------------------------------------------------|-------|-------|-------|
| Centre de gravité de la tête, extérieur - Head CG, outboard                    | 1942  | -393  | 1088  |
| Base du nez - Glabella (root of nose)                                          | 1862  | -321  | 1095  |
| Menton - Chin (bottom)                                                         | 1857  | -323  | 991   |
| Jonction menton et cou - Chin / neck junction                                  | 1928  | -325  | 993   |
| Thorax au niveau des côtes supérieures - Chest at upper rib level              | 1853  | -324  | 830   |
| Thorax au niveau des côtes inférieures - Chest at lower rib level              | 1828  | -326  | 719   |
| Boulon supérieur avant de l'épaule, ext. - Shoulder bolt, top front outboard   | 1980  | -484  | 862   |
| Boulon supérieur avant de l'épaule, int. - Shoulder bolt, top front inboard    | 1989  | -168  | 860   |
| Boulon du coude, extérieur - Elbow bolt, outboard                              | 1883  | -521  | 667   |
| Boulon du coude, intérieur - Elbow bolt, inboard                               | 1892  | -87   | 680   |
| Boulon du poignet, extérieur - Wrist bolt, outboard                            | 1725  | -529  | 815   |
| Boulon du poignet, intérieur - Wrist bolt, inboard                             | 1740  | -112  | 835   |
| Point d'articulation de la hanche, extérieur - Hip point, outboard             | 1923  | -447  | 567   |
| Boulon du genou gauche, côté gauche - Knee bolt, left leg, left side           | 1501  | -437  | 561   |
| Boulon de la cheville gauche, côté gauche - Ankle bolt, left leg, left side    | 1280  | -418  | 419   |
| Point du talon gauche - Heel point, left leg                                   | 1251  | -445  | 232   |
| Plante du pied gauche vs plancher - Ball of foot at toeboard contact, left leg | 1133  | -469  | 320   |
| Boulon du genou droit, côté gauche - Knee bolt, right leg, left side           | 1503  | -238  | 571   |
| Boulon de la cheville droite, côté gauche - Ankle bolt, right leg, left side   | 1294  | -204  | 411   |
| Point du talon droit - Heel point, right leg                                   | 1232  | -211  | 232   |
| Plante du pied droit vs plancher - Ball of foot at toeboard contact, right leg | 1150  | -221  | 350   |
| Espacement de genoux (centre) - Knee spacing (centre)                          |       | 192   |       |
| Ajustement du support de cou - Neck bracket adjustment (deg.)                  |       |       |       |

Remarques - Comments :



|                                 |                   |                     |                            |                    |               |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|
| Date de collision<br>Crash date | <b>1998-01-18</b> | Véhicule<br>Vehicle | <b>HYUNDAI ACCENT 1999</b> | T.C. N°<br>T.C. No | <b>99-211</b> |
|---------------------------------|-------------------|---------------------|----------------------------|--------------------|---------------|

**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                      | <b>2096</b> | <b>400</b>         | <b>505</b> |
| Point "H" extérieur mesure finale - H-Point, outboard final measurement                          | <b>2096</b> | <b>400</b>         | <b>505</b> |
| Rotule, extérieure - Knee pivot, outboard                                                        | <b>1648</b> | <b>538</b>         | <b>602</b> |
| Cheville, extérieure - Ankle pivot, outboard                                                     | <b>1258</b> | <b>381</b>         | <b>358</b> |
| Talon du pied en contact avec sol - Accomodation heel point (AHP)                                | <b>1280</b> | <b>378</b>         | <b>226</b> |
| Plante du pied en contact avec sol - Accomodation ball of foot point (ABFP)                      | <b>1089</b> | <b>411</b>         | <b>329</b> |
| Ligne médiane du véhicule - Vehicle centreline                                                   |             | <b>0</b>           |            |
| Support poids du sternum, extérieur - Torso weigh hanger, outboard                               | <b>2247</b> | <b>476</b>         | <b>829</b> |
| PRS / SRP                                                                                        | <b>2097</b> | <b>401</b>         | <b>505</b> |
| Ligne médiane du coussin du siège (avant/milieu/arr.) - Seat cushion centreline (front/mid/rear) |             | <b>315/314/311</b> |            |
| Ligne médiane du dossier du siège (avant/milieu/arr.) - Seat back centreline (front/mid/rear)    |             | <b>308/311/313</b> |            |
| Hauteur Point "H" - H-Point height (H30 = Z H-POINT - Z AHP)                                     |             | <b>279</b>         |            |
| Position du siège vs sa position la plus reculée - Seat position vs its rearmost position        |             | <b>0</b>           |            |
| Angle dossier du siège - Seat back angle (deg) (L40)                                             |             | <b>24.1°</b>       |            |
| Angle du coussin du siège - Skew angle                                                           |             | <b>0.6°</b>        |            |

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

| DESCRIPTION                                                                               | X(mm)           | Y(mm)        | Z(mm)           |
|-------------------------------------------------------------------------------------------|-----------------|--------------|-----------------|
| Boulon siège avant, extérieur - Front seat bolt, outboard                                 | <b>1769</b>     | <b>548</b>   | <b>325</b>      |
| Position du siège vs sa position la plus reculée - Seat position vs its rearmost position |                 | <b>225</b>   |                 |
| Angle dossier du siège - Seat back angle                                                  |                 | <b>18.5°</b> |                 |
| Genou au tableau de bord, minimum - Knee to dash, minimum                                 | <b>G/L : 50</b> |              | <b>D/R : 60</b> |
| Menton au tableau de bord - Chin to dash                                                  |                 | <b>447</b>   |                 |

|                                 |            |                     |                     |                    |        |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|

**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<sup>e</sup> percentile passager avant / 5<sup>th</sup> percentile female front passenger**

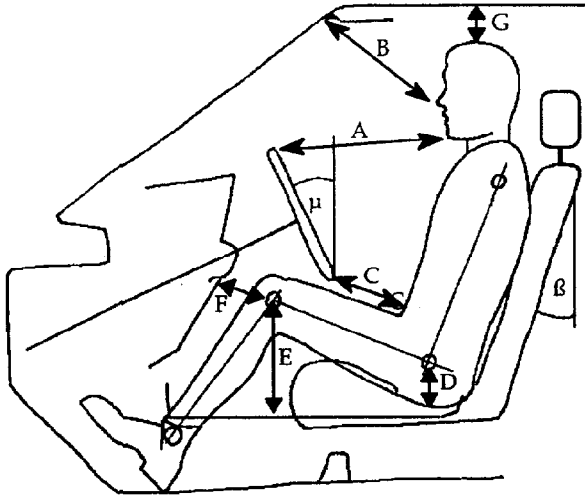
| DESCRIPTION                                                                    | X(mm) | Y(mm) | Z(mm) |
|--------------------------------------------------------------------------------|-------|-------|-------|
| Centre de gravité de la tête, extérieur - Head CG, outboard                    | 1963  | 385   | 1087  |
| Base du nez - Glabella (root of nose)                                          | 1874  | 321   | 1093  |
| Menton - Chin (bottom)                                                         | 1866  | 321   | 985   |
| Jonction menton et cou - Chin / neck junction                                  | 1937  | 322   | 988   |
| Thorax au niveau des côtes supérieures - Chest at upper rib level              | 1862  | 319   | 822   |
| Thorax au niveau des côtes inférieures - Chest at lower rib level              | 1837  | 320   | 714   |
| Boulon supérieur avant de l'épaule, ext. - Shoulder bolt, top front outboard   | 1986  | 473   | 854   |
| Boulon supérieur avant de l'épaule, int. - Shoulder bolt, top front inboard    | 1998  | 161   | 855   |
| Boulon du coude, extérieur - Elbow bolt, outboard                              | 1886  | 540   | 664   |
| Boulon du coude, intérieur - Elbow bolt, inboard                               | 1897  | 118   | 666   |
| Boulon du poignet, extérieur - Wrist bolt, outboard                            | 1685  | 478   | 605   |
| Boulon du poignet, intérieur - Wrist bolt, inboard                             | 1698  | 160   | 592   |
| Point d'articulation de la hanche, extérieur - Hip point, outboard             | 1939  | 444   | 560   |
| Boulon du genou gauche, intérieur - Knee bolt, left leg, right side            | 1514  | 430   | 570   |
| Boulon de la cheville gauche, intérieur - Ankle bolt, left leg, right side     | 1303  | 396   | 418   |
| Point du talon gauche - Heel point, left leg                                   | 1303  | 416   | 233   |
| Plante du pied gauche vs plancher - Ball of foot at toeboard contact, left leg | 1168  | 445   | 292   |
| Boulon du genou droit, intérieur - Knee bolt, right leg, right side            | 1513  | 266   | 573   |
| Boulon de la cheville droite, intérieur - Ankle bolt, right leg, right side    | 1311  | 226   | 407   |
| Point du talon droit - Heel point, right leg                                   | 1322  | 233   | 223   |
| Plante du pied droit vs plancher - Ball of foot at toeboard contact, right leg | 1186  | 253   | 266   |
| Espacement de genoux (centre) - Knee spacing (centre)                          |       | 163   |       |
| Ajustement du support de cou - Neck bracket adjustment (deg.)                  |       |       |       |

Remarques – Comments :

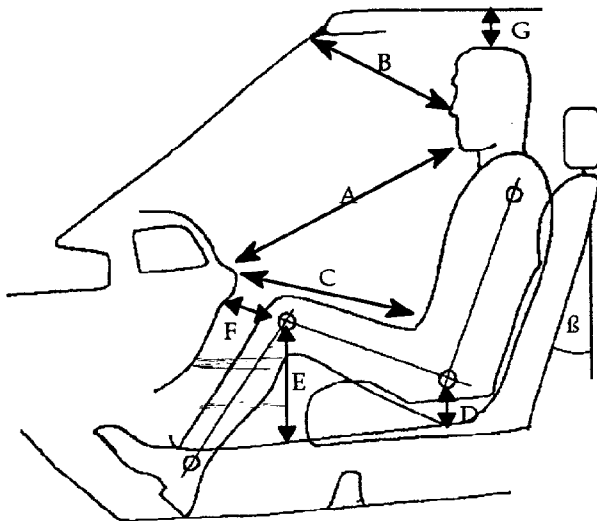
|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

EUROPEAN EXPERIMENTAL VEHICLES COMMITTEE:

MESURES DE POSITIONNEMENT DES MANNEQUINS /  
DUMMY POSITIONING MEASUREMENTS



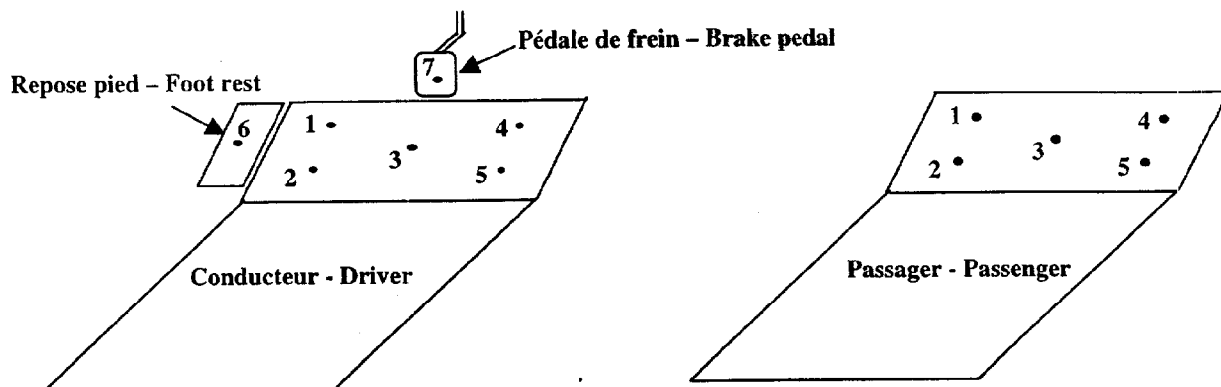
| CONDUCTEUR<br>DRIVER | mm    |
|----------------------|-------|
| A                    | 255   |
| B                    | 236   |
| C                    | 145   |
| D                    | 214   |
| E                    | 251   |
| F                    | 38    |
| G                    | 150   |
| β                    | 7.8°  |
| μ                    | 24.3° |



| PASSAGER<br>PASSENGER | mm   |
|-----------------------|------|
| A                     | 447  |
| B                     | 234  |
| C                     | 335  |
| D                     | 195  |
| E                     | 259  |
| F                     | 55   |
| G                     | 155  |
| β                     | 5.6° |

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

MESURES PLANCHER / FOOTWELL MEASUREMENTS

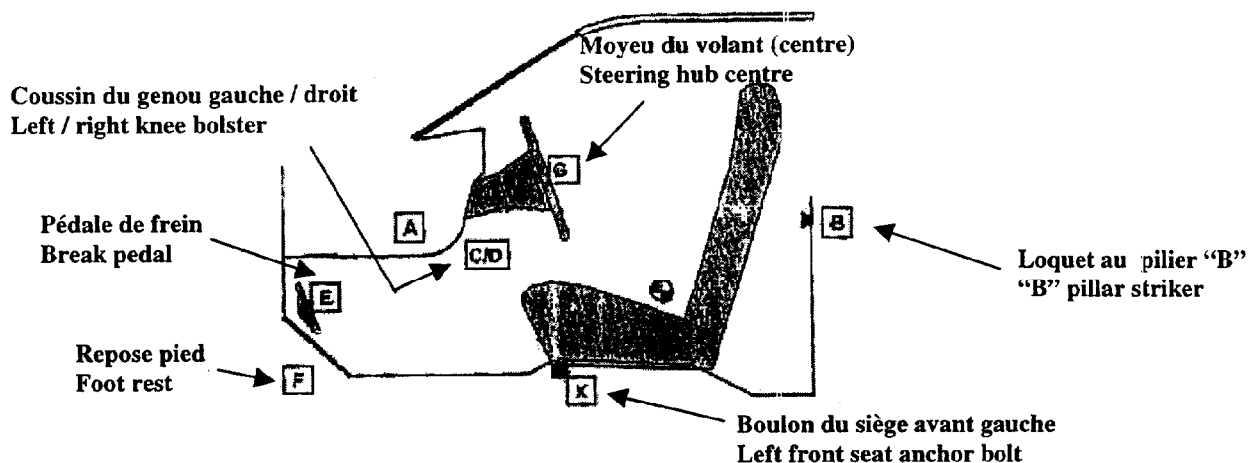


| N° Cible   | AVANT ESSAI | APRÈS ESSAI |             |
|------------|-------------|-------------|-------------|
| Target No. | PRE-TEST    | POST-TEST   | $\Delta$ mm |
| 1          | x           | 1030        | 1039        |
|            | y           | -402        | -395        |
|            | z           | 338         | 355         |
| 2          | x           | 1134        | 1137        |
|            | y           | -425        | -420        |
|            | z           | 253         | 263         |
| 3          | x           | 1074        | 1078        |
|            | y           | -280        | -274        |
|            | z           | 297         | 308         |
| 4          | x           | 1058        | 1063        |
|            | y           | -190        | -185        |
|            | z           | 315         | 326         |
| 5          | x           | 1143        | 1145        |
|            | y           | -171        | -165        |
|            | z           | 243         | 251         |
| 6          | x           | 1148        | 1171        |
|            | y           | -540        | -538        |
|            | z           | 425         | 424         |
| 7          | x           | 1192        | 1206        |
|            | y           | -279        | -271        |
|            | z           | 415         | 430         |

| N° Cible   | AVANT ESSAI | APRÈS ESSAI |             |
|------------|-------------|-------------|-------------|
| Target No. | PRE-TEST    | POST-TEST   | $\Delta$ mm |
| 1          | x           | 1019        | 1021        |
|            | y           | 199         | 198         |
|            | z           | 352         | 357         |
| 2          | x           | 1129        | 1131        |
|            | y           | 173         | 173         |
|            | z           | 249         | 252         |
| 3          | x           | 1062        | 1062        |
|            | y           | 305         | 305         |
|            | z           | 315         | 318         |
| 4          | x           | 1006        | 1007        |
|            | y           | 376         | 376         |
|            | z           | 371         | 375         |
| 5          | x           | 1132        | 1131        |
|            | y           | 424         | 425         |
|            | z           | 259         | 261         |

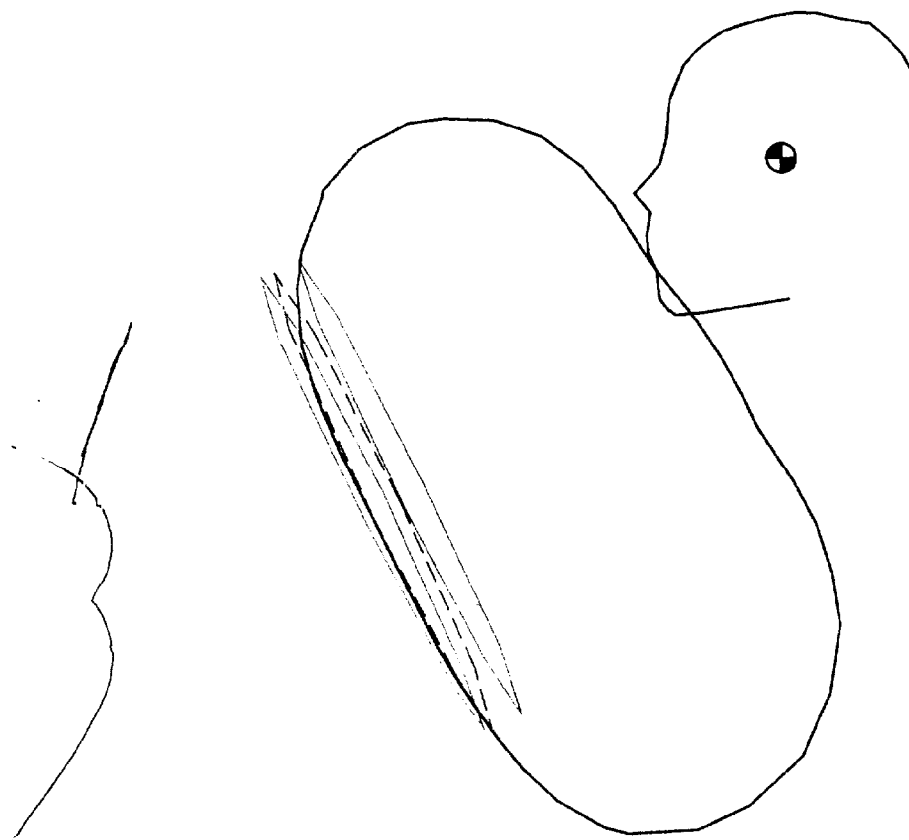
|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1998-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

**PÉNÉTRATION DE L'HABITACLE DU CONDUCTEUR (Distances en mm)**  
**DRIVER COMPARTMENT INTRUSION (Distances in mm)**

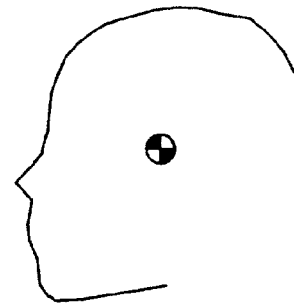
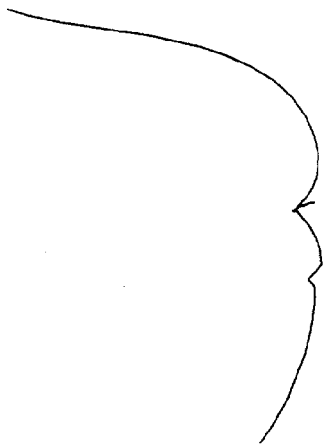


**Habitacle du conducteur  
Driver's compartment**

|   | DESCRIPTION                                                 | Avant essai / Pre-test |      |     | Après essai / Post-test |      |     |
|---|-------------------------------------------------------------|------------------------|------|-----|-------------------------|------|-----|
|   |                                                             | X                      | Y    | Z   | X                       | Y    | Z   |
| A | Ouverture de porte<br>Door opening                          | 1465                   | -723 | 890 | 1477                    | -742 | 882 |
| B | Loquet au pilier "B"<br>"B" pillar striker                  | 2434                   | -728 | 663 | 2441                    | -737 | 654 |
| C | Coussin du genou gauche<br>Left knee bolster                | 1379                   | -402 | 602 | 1383                    | -396 | 606 |
| D | Coussin du genou droit<br>Right knee bolster                | 1384                   | -214 | 613 | 1385                    | -213 | 621 |
| E | Pédale de frein<br>Break pedal                              | 1192                   | -279 | 415 | 1206                    | -271 | 430 |
| F | Repose pied<br>Foot rest                                    | 1148                   | -540 | 425 | 1171                    | -538 | 424 |
| G | Moyeu du volant (centre)<br>Steering hub (centre)           | 1704                   | -314 | 820 | 1679                    | -314 | 808 |
| X | Boulon du siège avant gauche<br>Left front seat anchor bolt | 1765                   | -548 | 329 | 1771                    | -568 | 317 |



|                             |          |           |                                 |
|-----------------------------|----------|-----------|---------------------------------|
|                             | PRE-TEST | POST-TEST | No. TC. : 99-211                |
| DASHBOARD / TABLEAU DE BORD | _____    | _____     | HYUNDAI ACCENT                  |
| MODULE                      | _____    | _____     | DRIVER'S SIDE / COTÉ CONDUCTEUR |
| STEERING WHEEL / VOLANT     | _____    | _____     | Project / Projet : 99-5001      |
| AIRBAG / COUSSIN GONFLABLE  | _____    | _____     |                                 |



0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

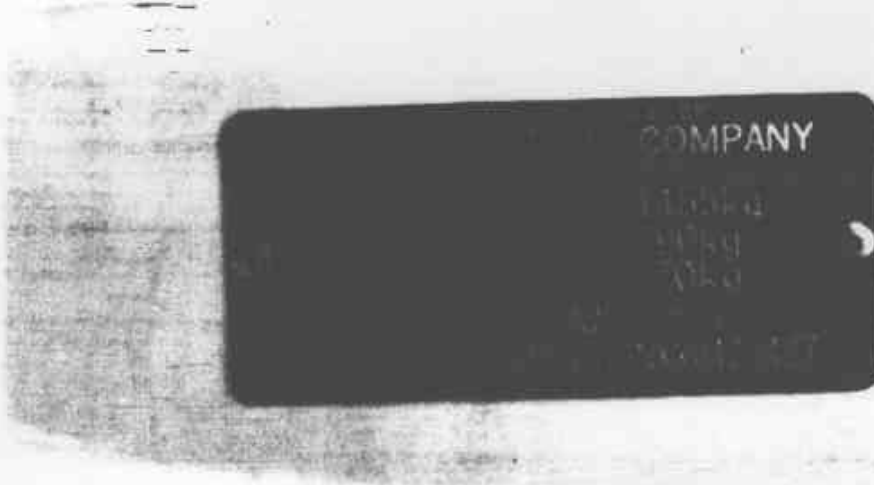
|                                                                                                |          |           |                                  |
|------------------------------------------------------------------------------------------------|----------|-----------|----------------------------------|
| DASHBOARD / TABLEAU DE BORD<br>MODULE<br>STEERING WHEEL / VOLANT<br>AIRBAG / COUSSIN GONFLABLE | PRE-TEST | POST-TEST | No. TC. : 99-211                 |
|                                                                                                | _____    | _____     | HYUNDAI ACCENT                   |
|                                                                                                | _____    | _____     | PASSENGER'S SIDE / COTÉ PASSAGER |
|                                                                                                | _____    | _____     | Project / Projet : 99-5001       |

**APPENDICE / APPENDIX A**

**PHOTOGRAPHIES DE L'ESSAI  
TEST PHOTOGRAPHS**

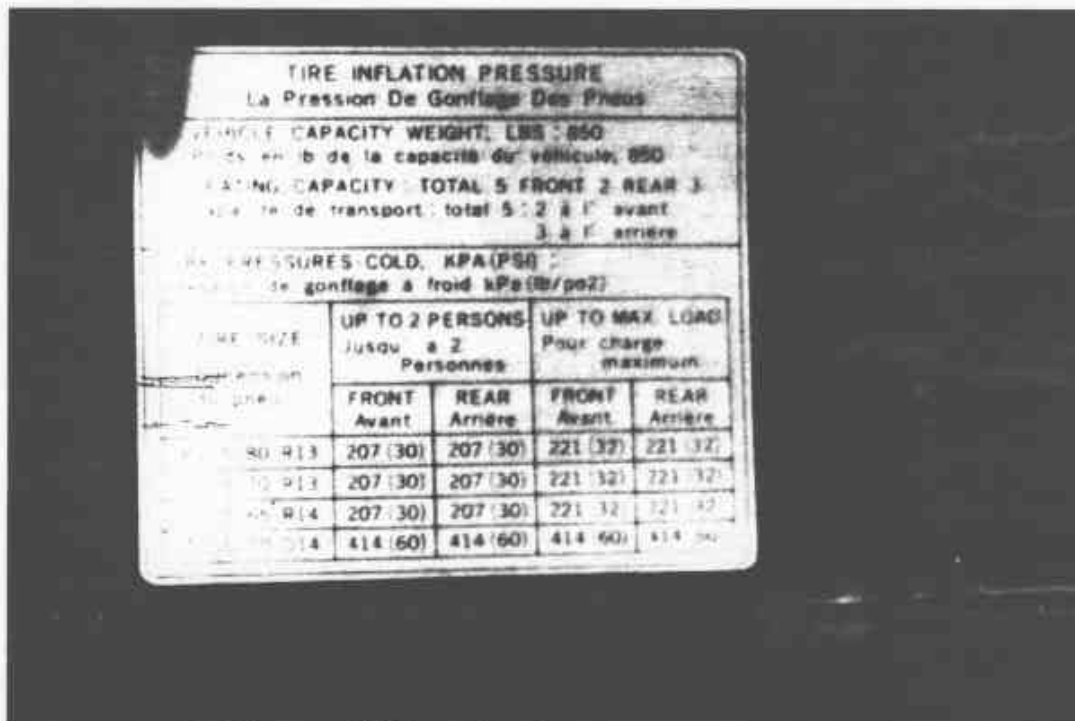


|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|



TC 99-211

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.

|                                 |            |                     |                     |                    |        |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|

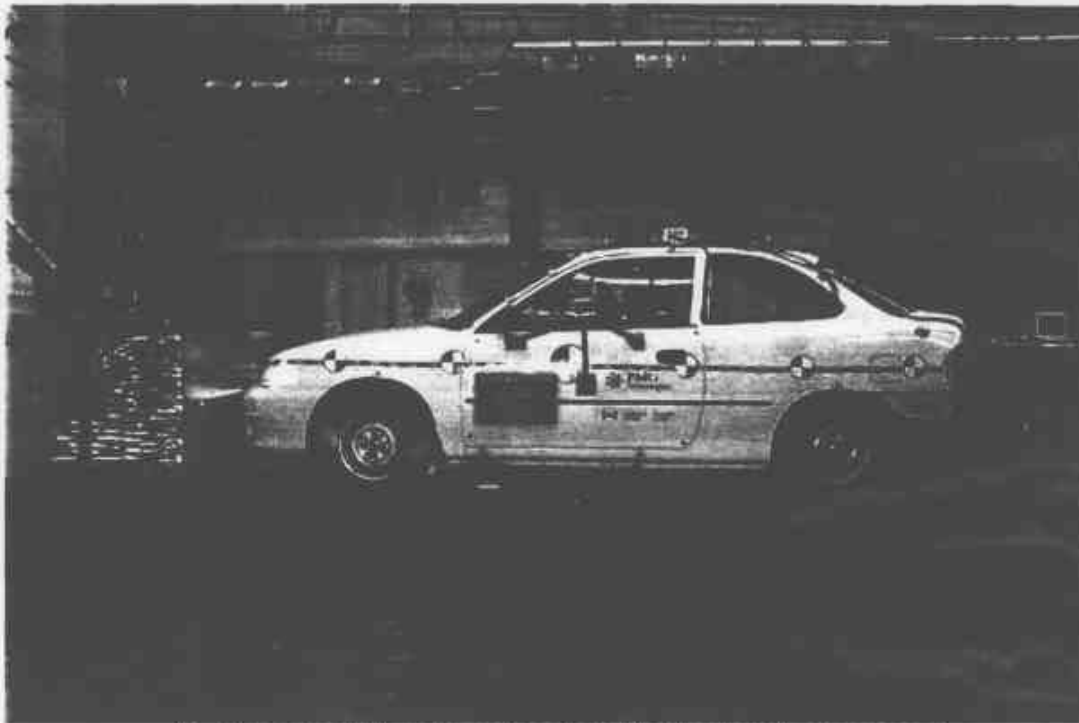


3. Vue  $\frac{3}{4}$  avant du véhicule d'essai.  
 $\frac{3}{4}$  front view of the test vehicle.



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

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|



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

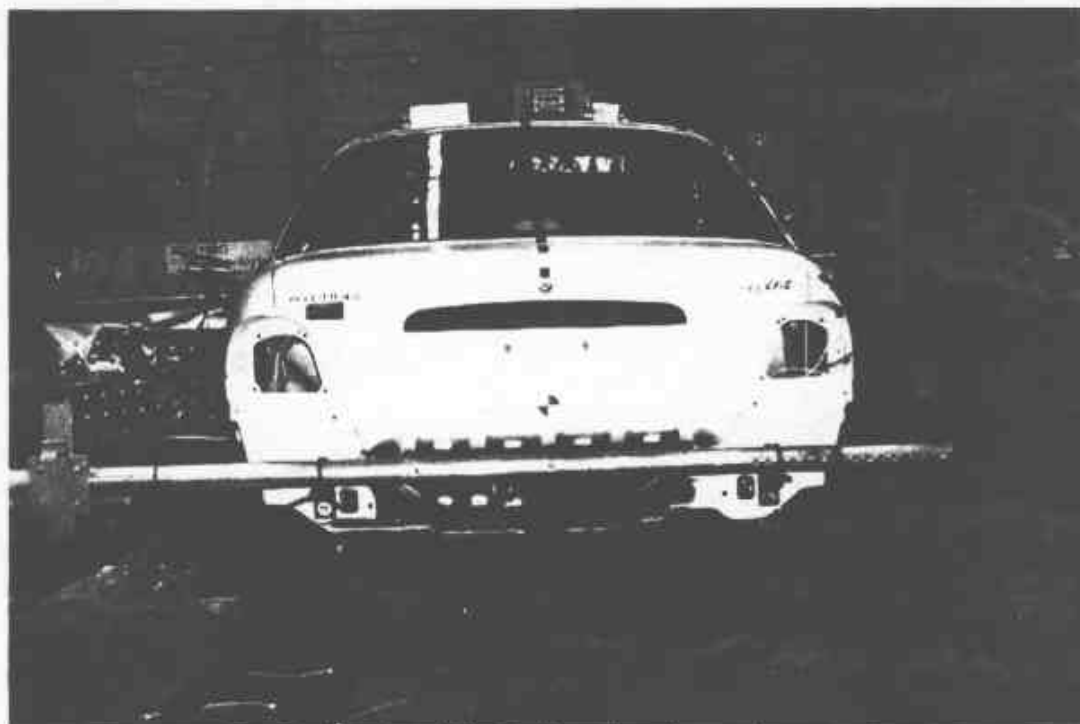


6. Vue générale côté gauche du véhicule d'essai, après essai.  
Left side view of the test vehicle, post-test.

|                                 |            |                     |                     |                    |        |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|



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.

|                                 |            |                     |                     |                  |        |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C.N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|

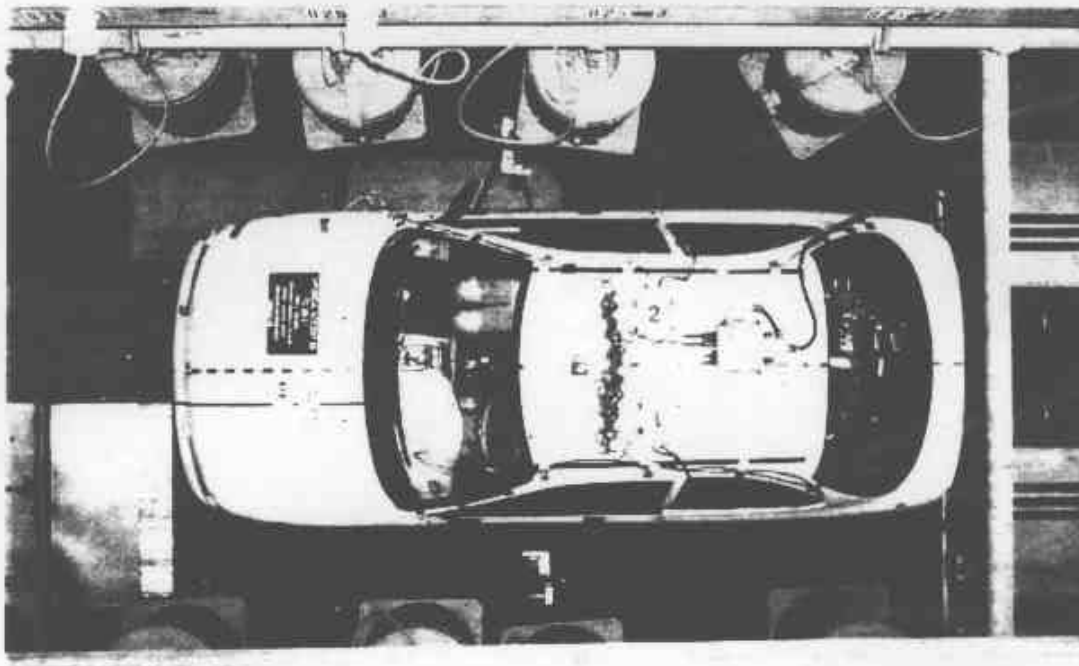


9. Vue générale côté droit du véhicule d'essai, avant essai.  
 General right side view of the test vehicle, pre-test.

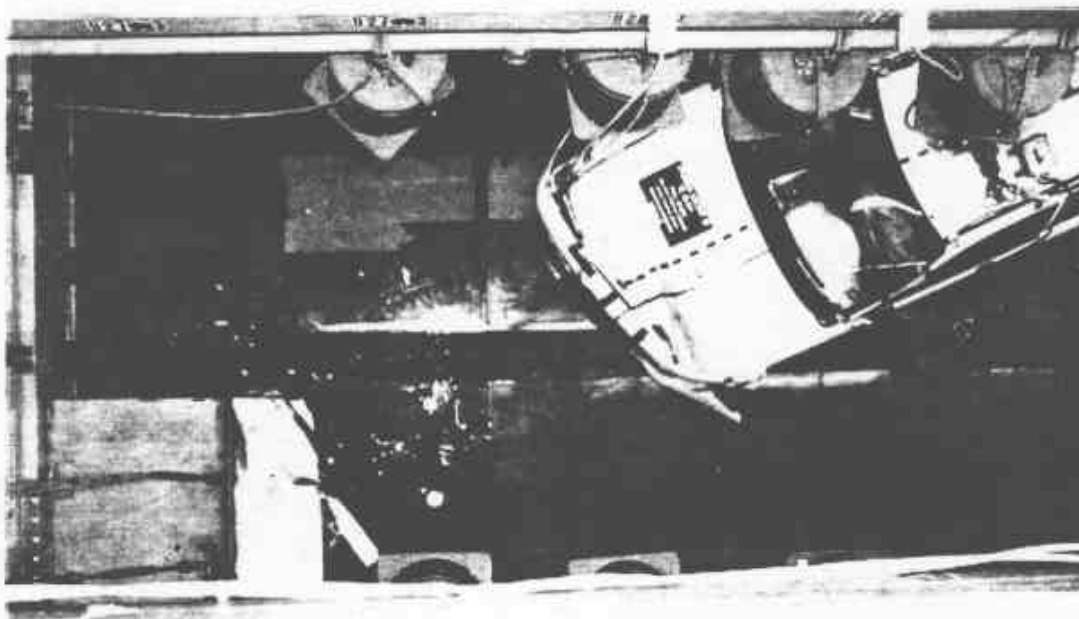


10. Vue générale côté droit du véhicule d'essai, après essai.  
 General right side view of the test vehicle, post-test.

|                                 |            |                     |                     |                    |        |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|



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



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

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|



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

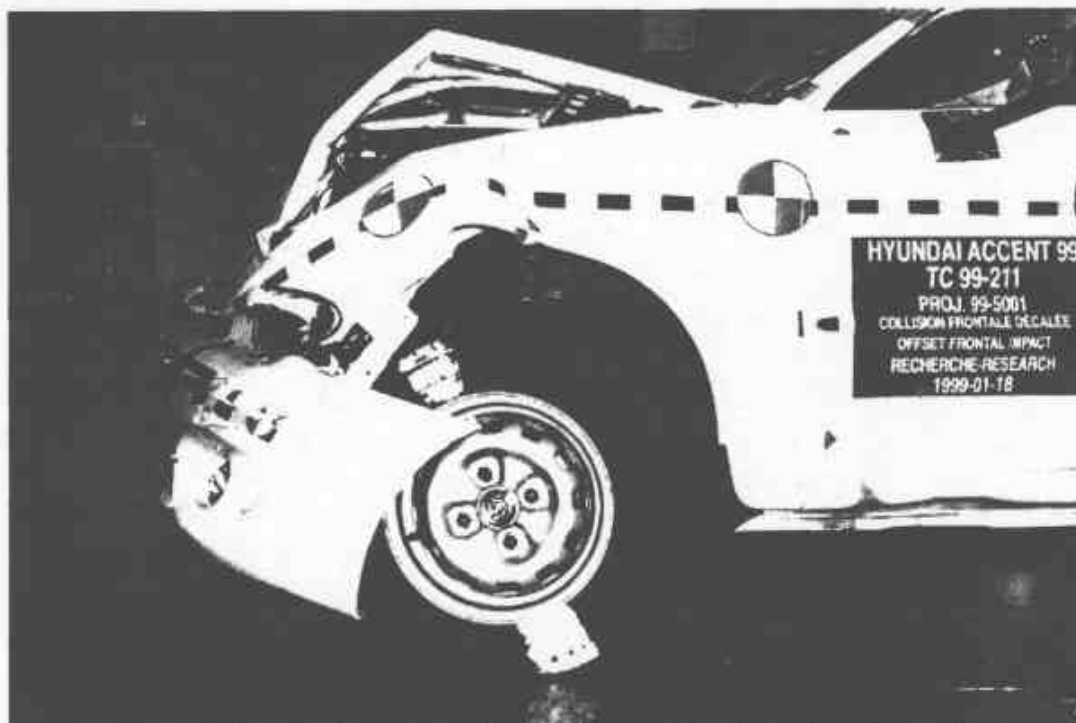


14. Vue avant du véhicule d'essai, après essai.  
 Front view of the test vehicle, post-test.

|                                 |            |                     |                     |                    |        |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|



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



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



|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

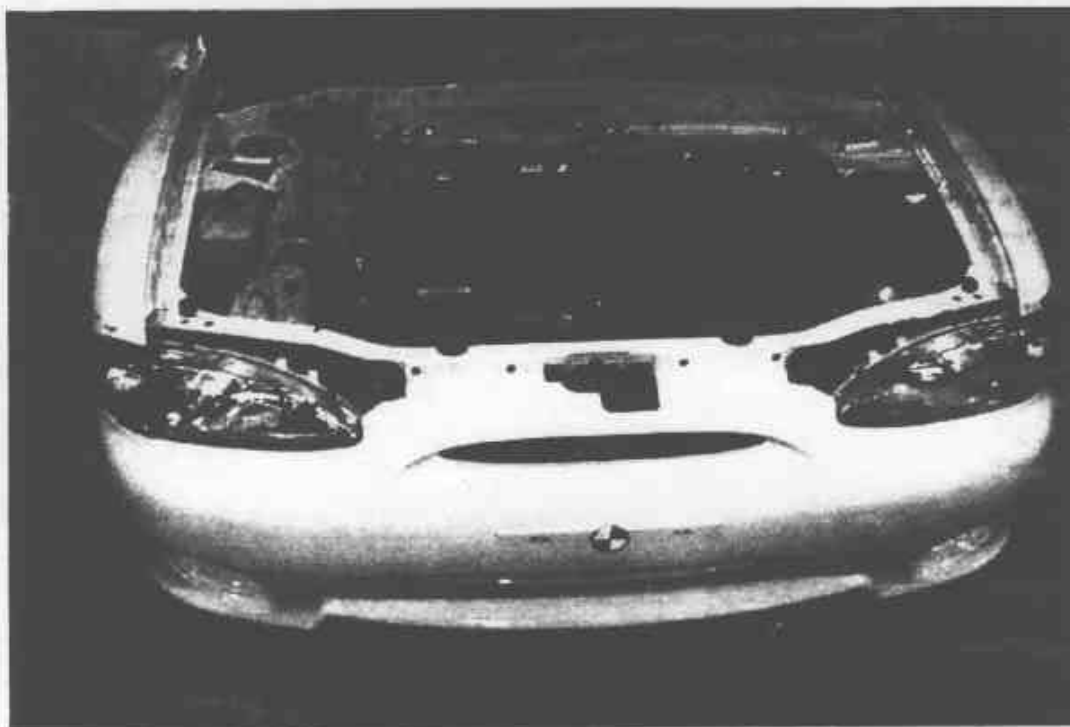


17. Vue côté droit de l'avant du véhicule d'essai, avant essai.  
Right side view of front of test vehicle, pre-test.



18. 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<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C.N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|

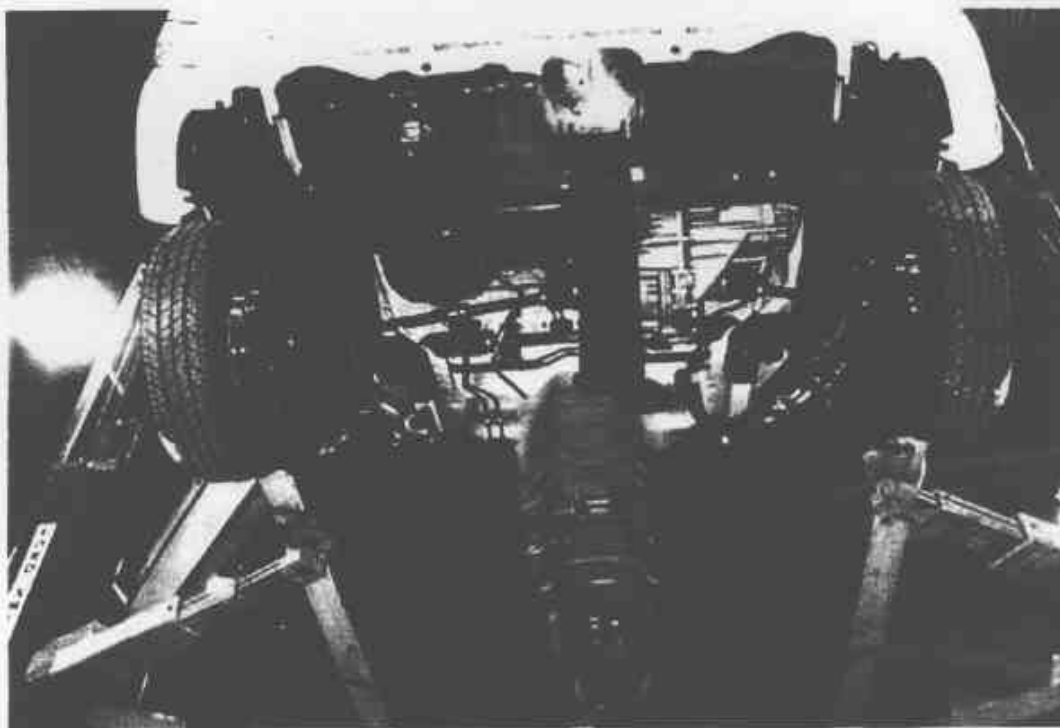


19. Vue du compartiment moteur du véhicule d'essai, avant essai.  
Engine compartment view of the test vehicle, pre-test.

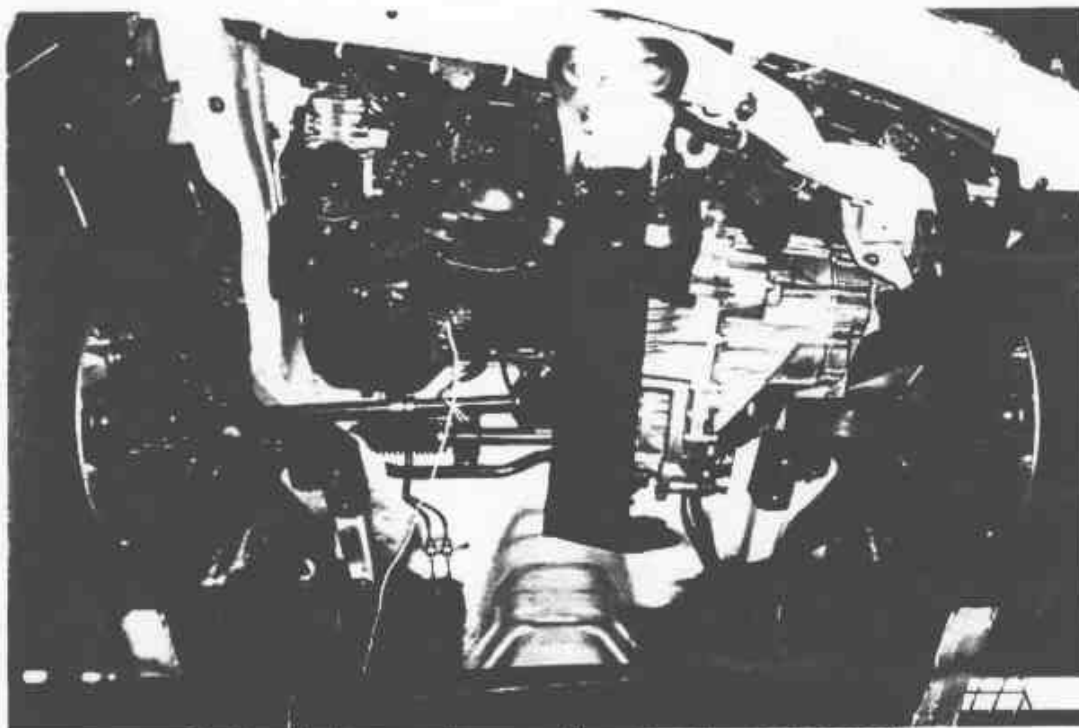


20. Vue du compartiment moteur du véhicule d'essai, après essai.  
Engine compartment view of the test vehicle, post-test.

|                                 |            |                     |                     |                  |        |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C.N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|

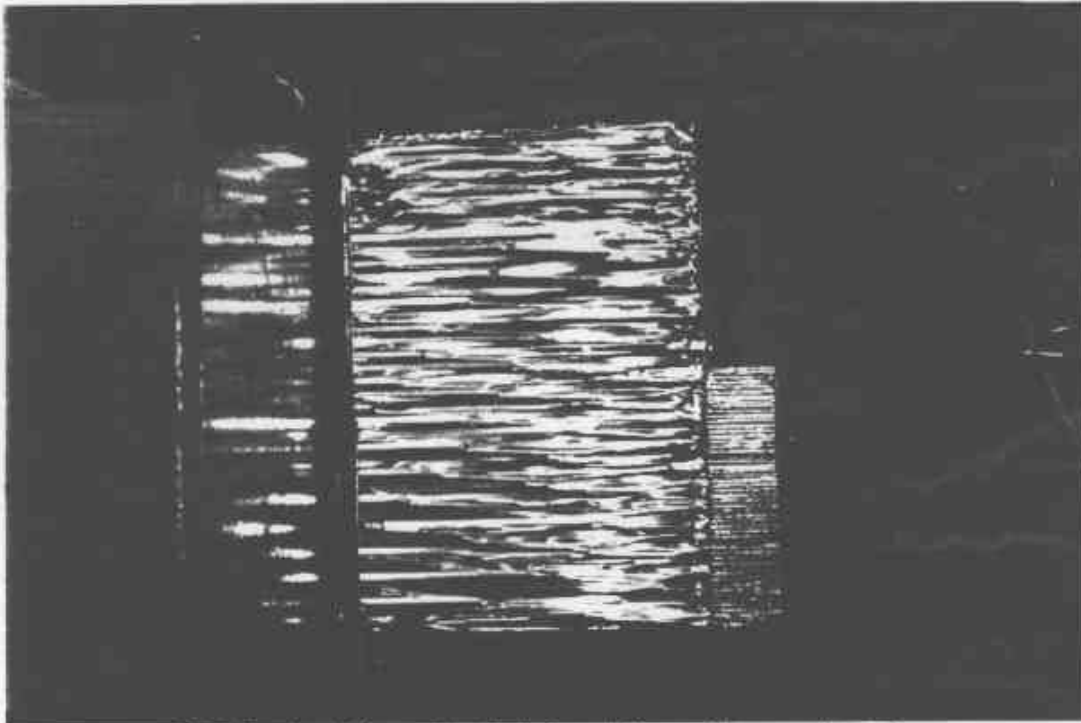


21. Vue du dessous du compartiment moteur, avant essai.  
Front underbody view of the test vehicle, pre-test.

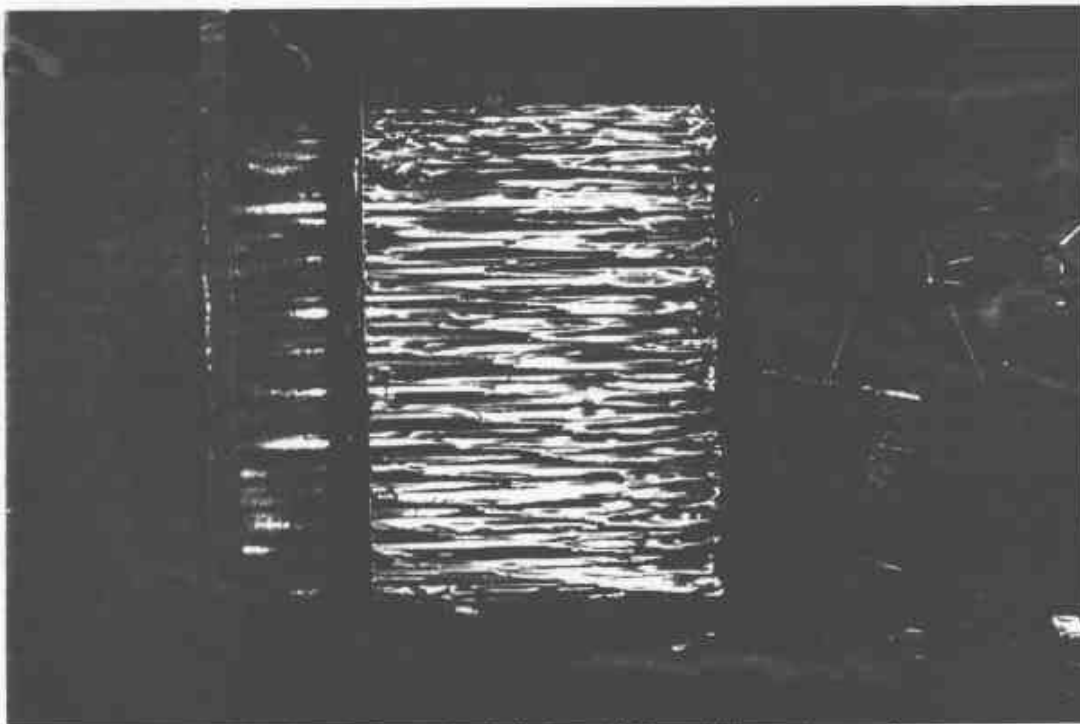


22. Vue du dessous du compartiment moteur, après essai.  
Front underbody view of the test vehicle, post-test.

|                                 |            |                     |                     |                    |        |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | L.C. N°<br>T.C. No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|

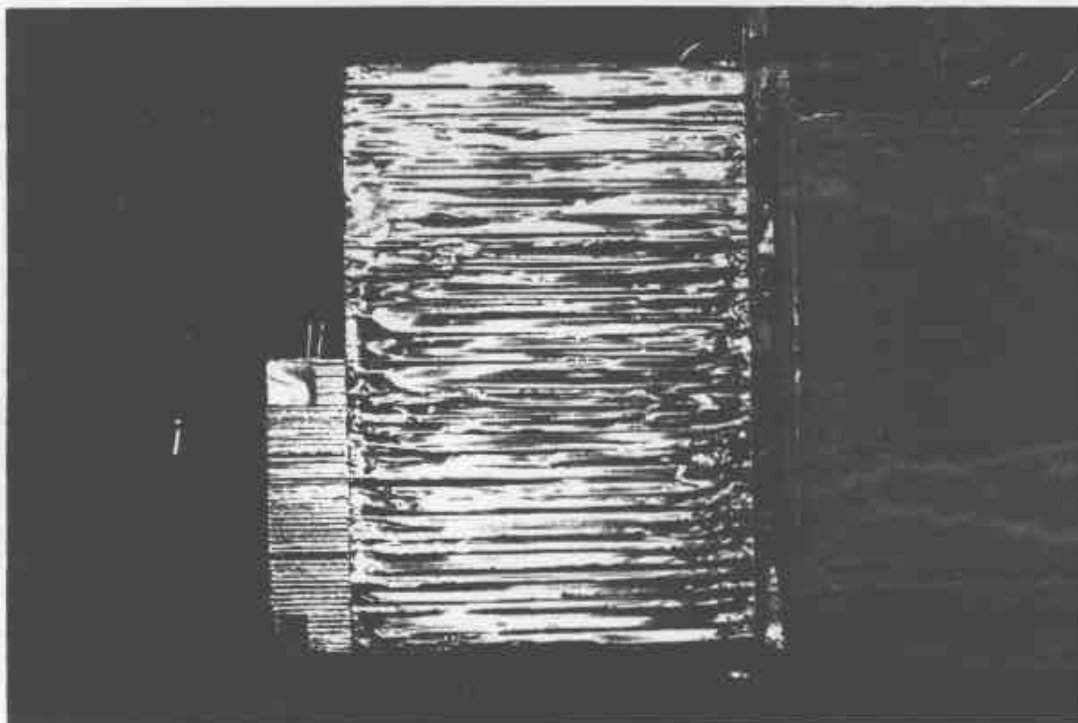


23. Vue du côté gauche de la face déformable, avant essai.  
Left side view of the deformable face, pre-test.

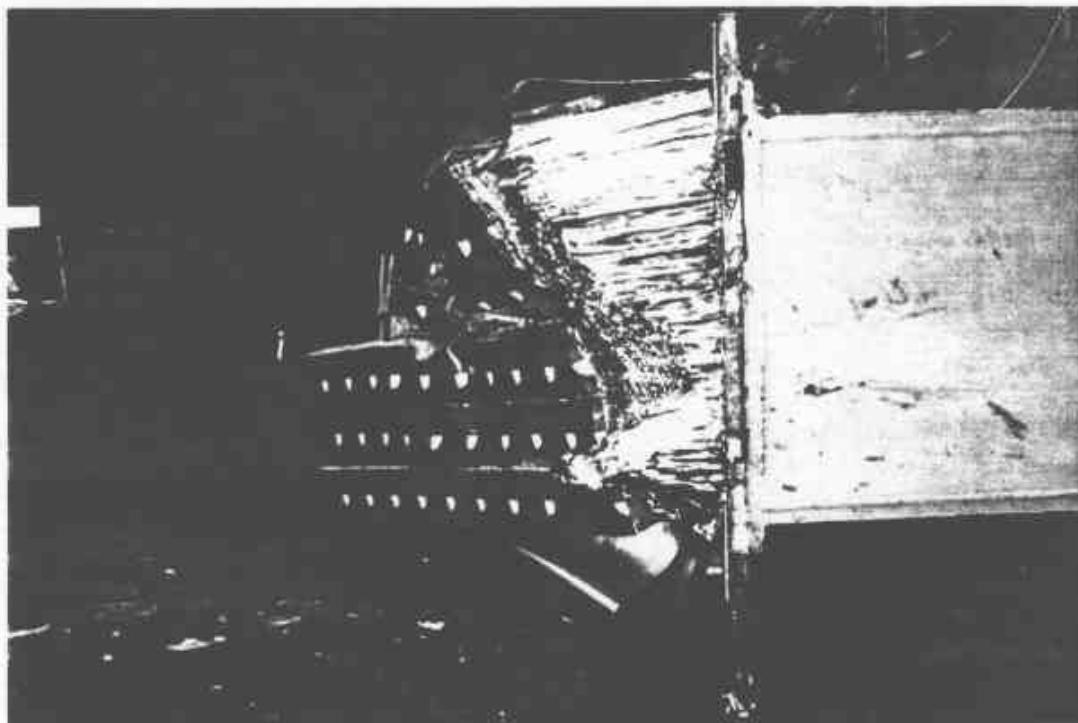


24. Vue du côté gauche de la face déformable, après essai.  
Left side view of the deformable face, post-test.

|                                 |            |                     |                     |                   |        |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|-------------------|--------|

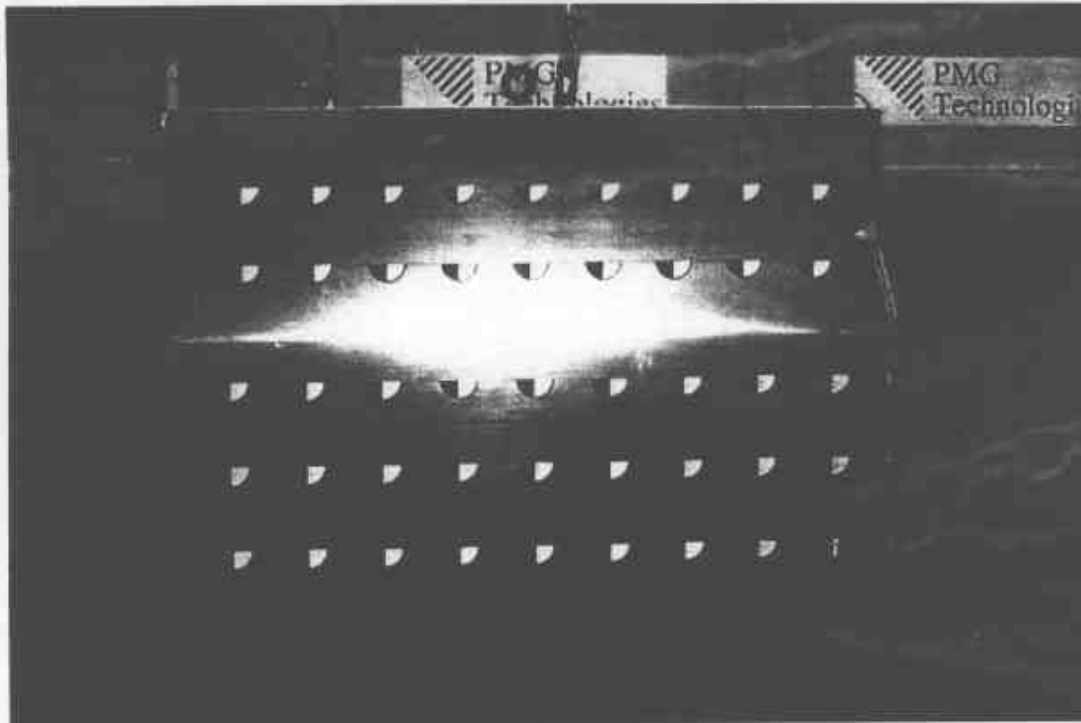


25. Vue du côté droit de la face déformable, avant essai.  
 Right side view of the deformable face, pre-test.

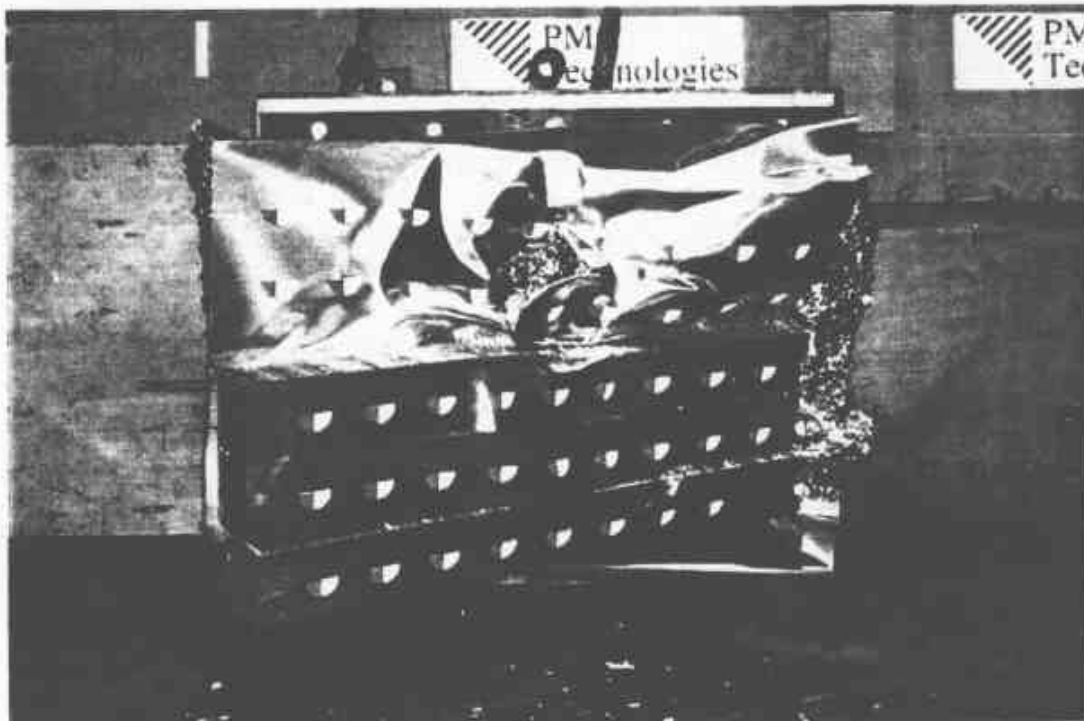


26. Vue du côté droit de la face déformable, après essai.  
 Right side view of the deformable face, post-test.

|                                 |            |                     |                     |                  |        |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C.N°<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|

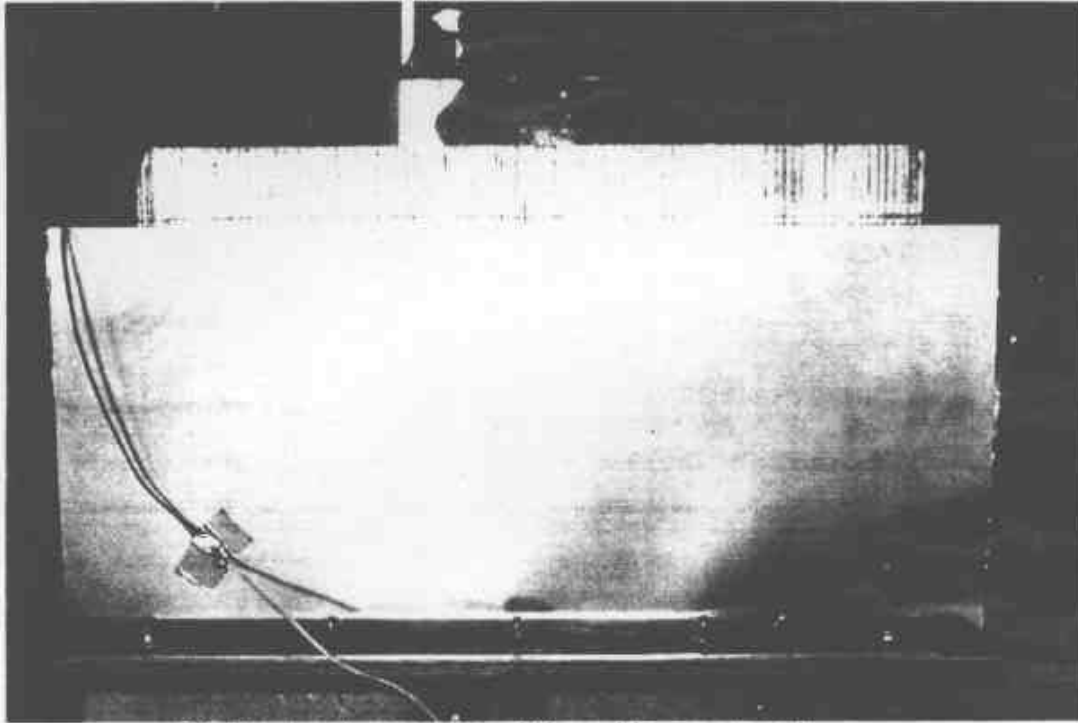


27. Vue de face de la face déformable, avant essai.  
Front view of the deformable face, pre-test.

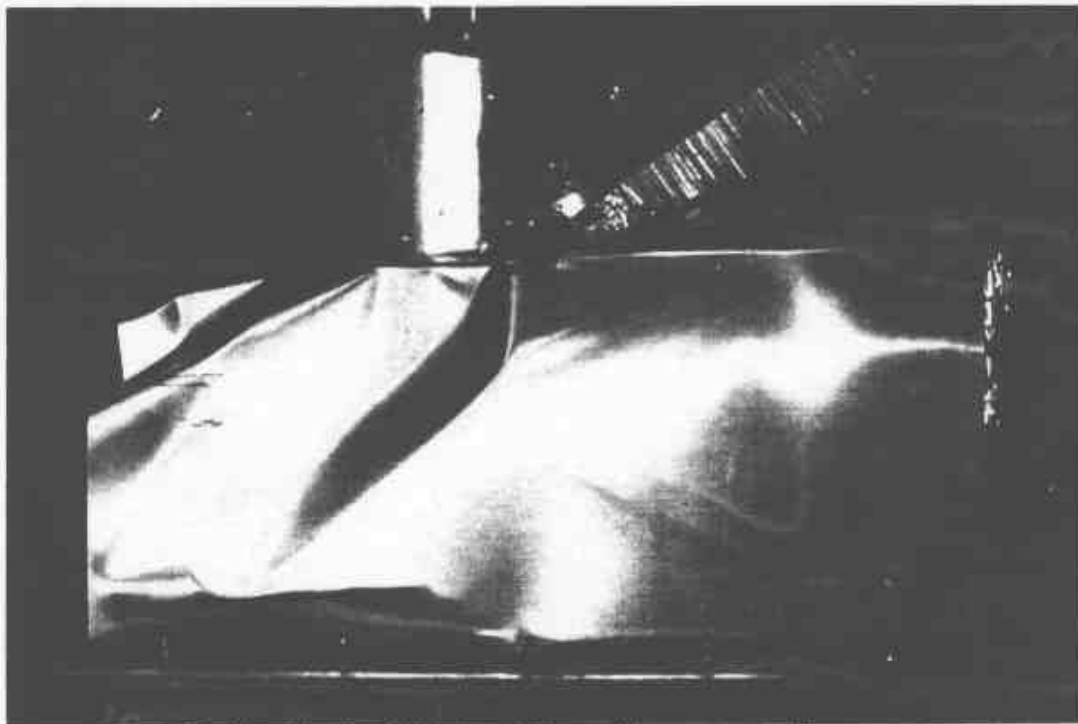


28. Vue de face de la face déformable, après essai.  
Front view of the deformable face, post-test.

|                                 |            |                     |                     |                    |        |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|

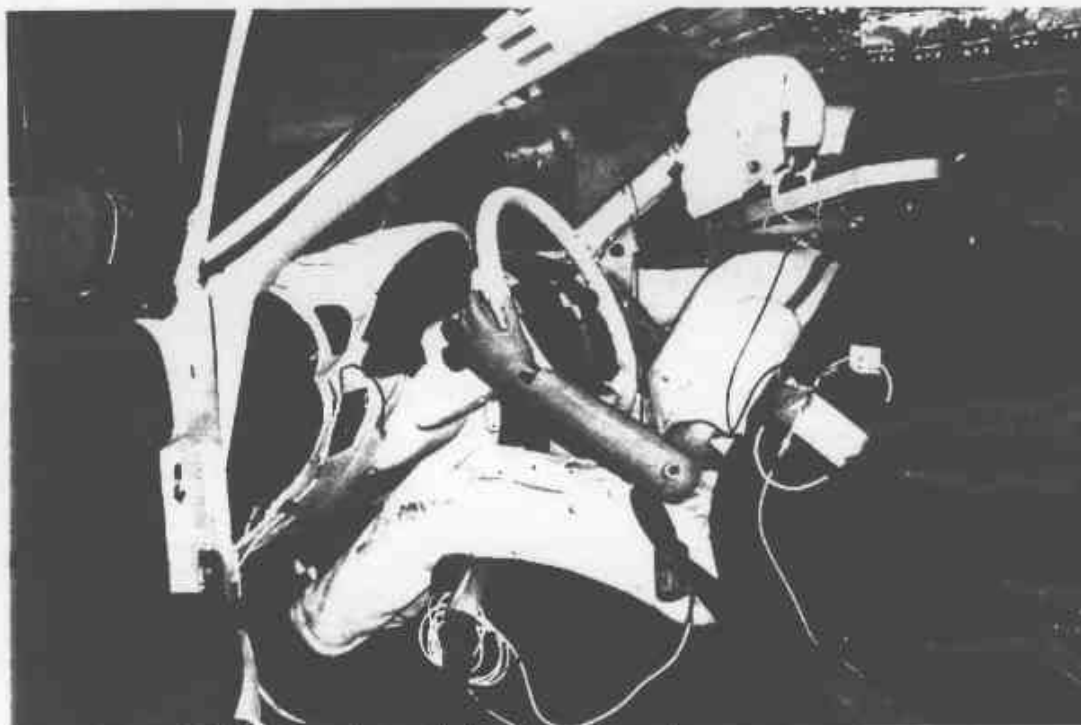


29. Vue de plan de la face déformable, avant essai.  
Plan view of the deformable face, pre-test.

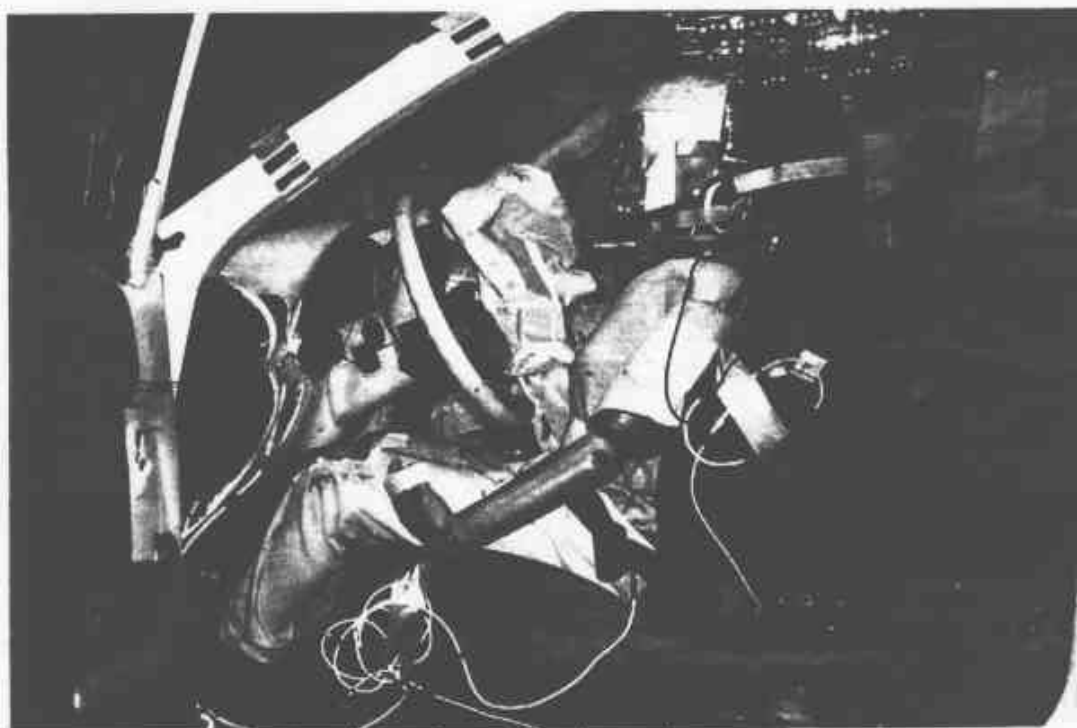


30. Vue de plan de la face déformable, après essai.  
Plan view of the deformable face, post-test.

|                                 |            |                     |                     |                     |        |
|---------------------------------|------------|---------------------|---------------------|---------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. No. | 99-211 |
|---------------------------------|------------|---------------------|---------------------|---------------------|--------|



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



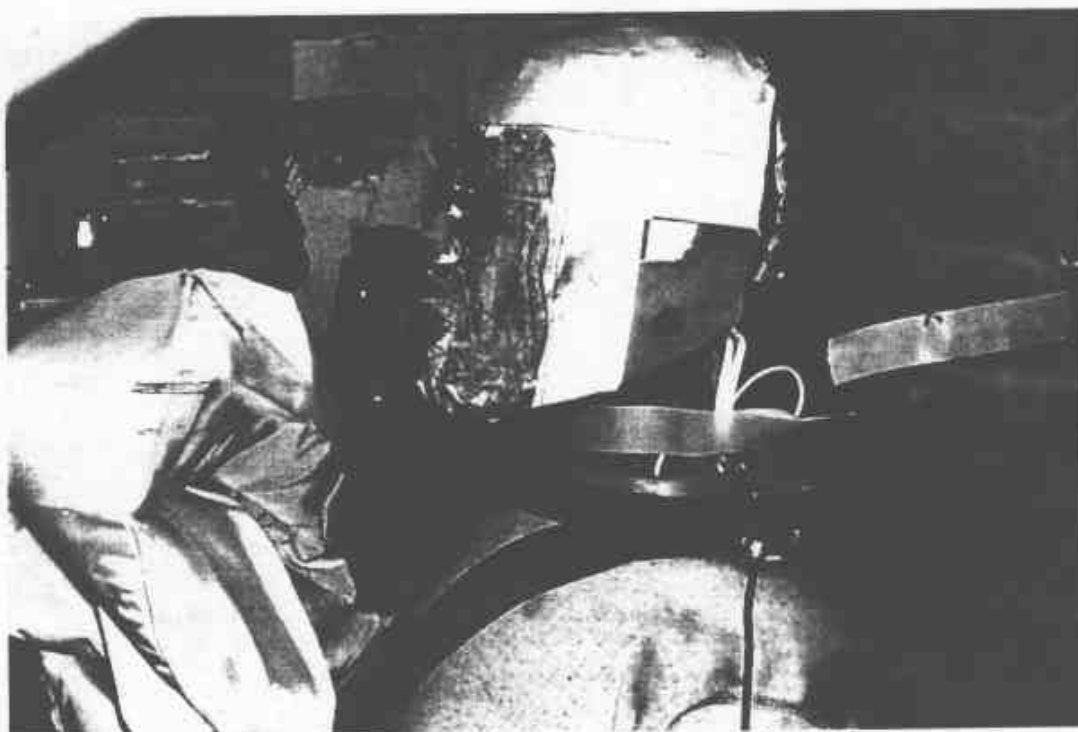
32. Position du conducteur, après essai.  
Driver's position, post-test.



|                                  |            |                      |                     |                   |        |
|----------------------------------|------------|----------------------|---------------------|-------------------|--------|
| Date de collision<br>Crash date: | 1999-01-18 | Véhicule<br>Vehicle: | HYUNDAI ACCENT 1999 | T.C.N°<br>T.C.No: | 99-211 |
|----------------------------------|------------|----------------------|---------------------|-------------------|--------|



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



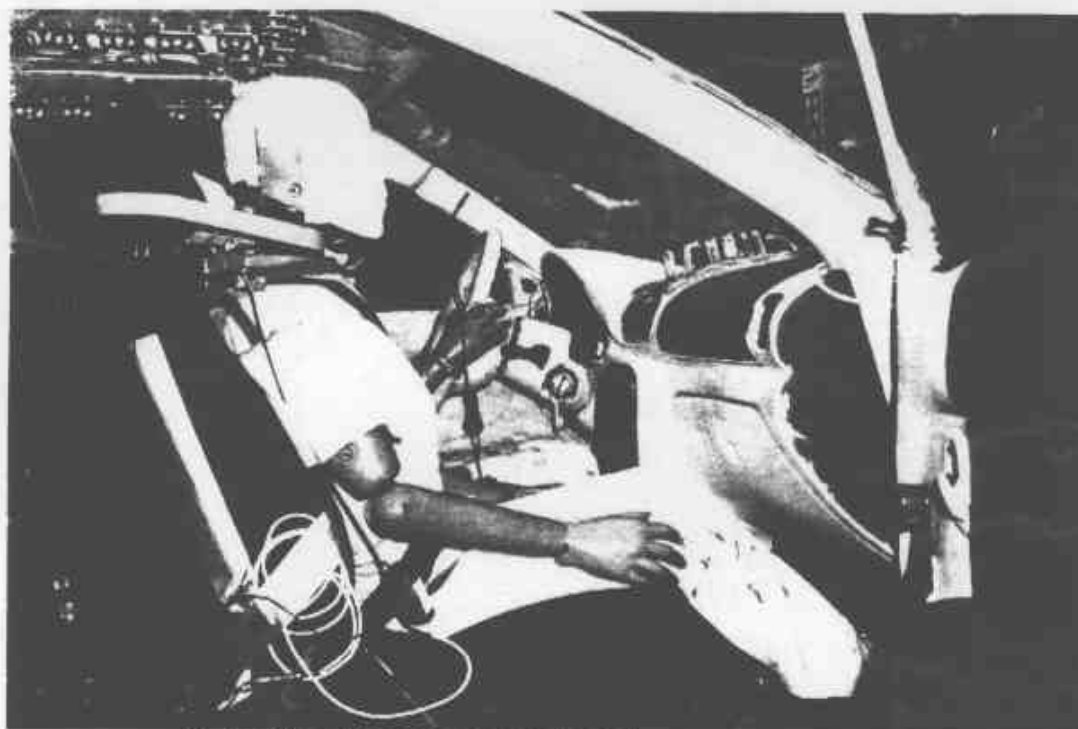
34. Point de contact de tête du conducteur, après essai.  
Driver's head contact point, post-test.

|                                 |            |                     |                     |                     |        |
|---------------------------------|------------|---------------------|---------------------|---------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. No. | 99-211 |
|---------------------------------|------------|---------------------|---------------------|---------------------|--------|

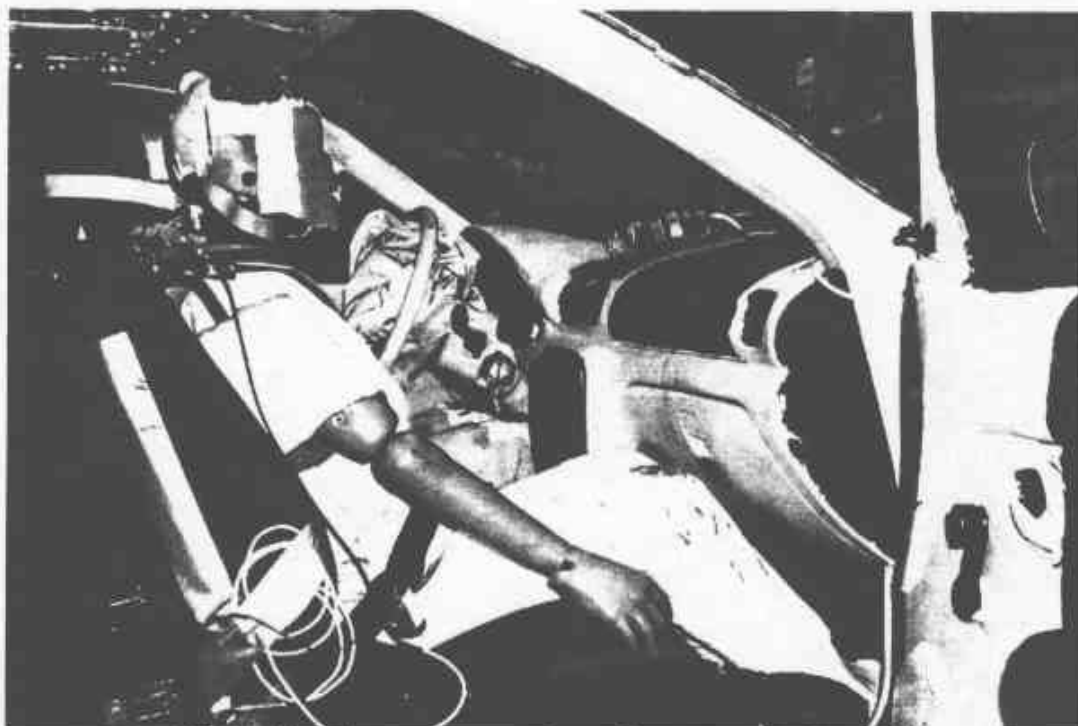


35. Point de contact des genoux du conducteur, après essai.  
Driver's knees contact point, post-test.

|                                 |            |                     |                     |                  |        |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C.N.<br>T.C.No | 99-211 |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|

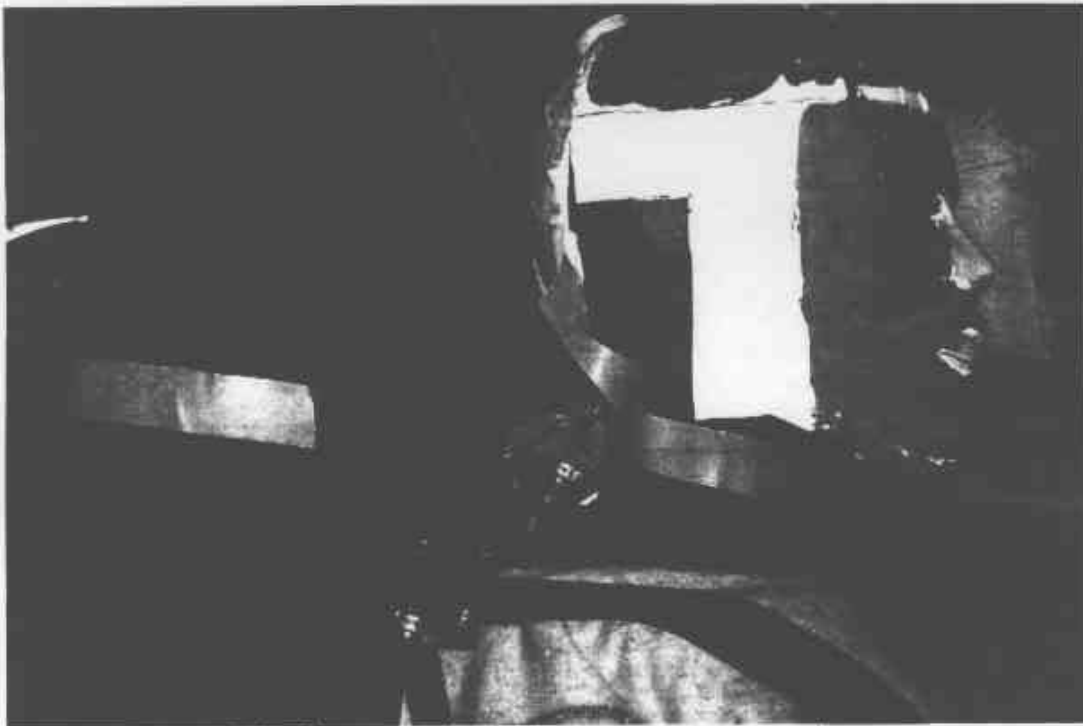


36. Position du passager, avant essai.  
Passenger's position, pre-test.



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

|                                 |            |                     |                     |                  |        |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C.N.<br>T.C.N. | 99-211 |
|---------------------------------|------------|---------------------|---------------------|------------------|--------|



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



39. Point de contact des genoux du passager, après essai.  
Passenger's knees contact point, post-test.

|                                 |            |                     |                     |                    |        |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|
| Date de collision<br>Crash date | 1999-01-18 | Véhicule<br>Vehicle | HYUNDAI ACCENT 1999 | T.C. N°<br>T.C. Nr | 99-211 |
|---------------------------------|------------|---------------------|---------------------|--------------------|--------|

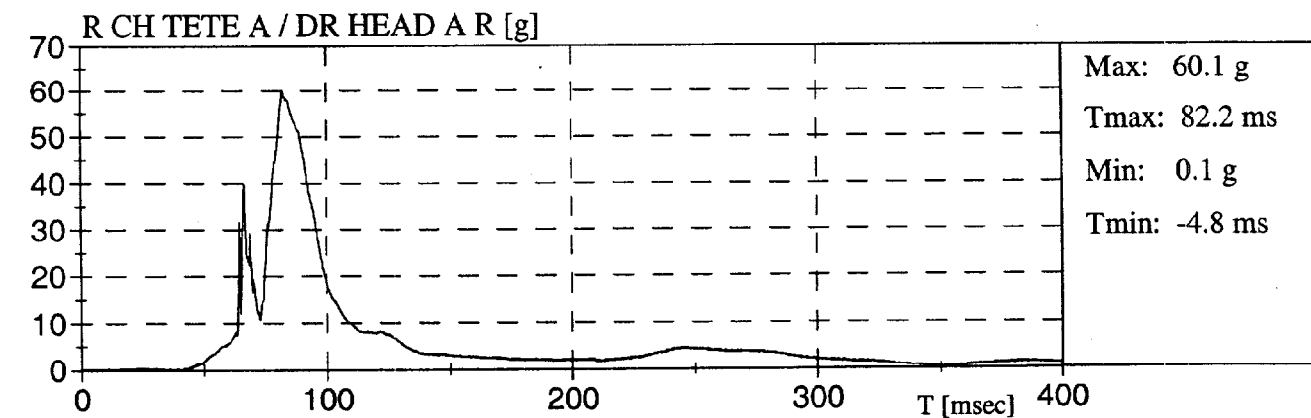
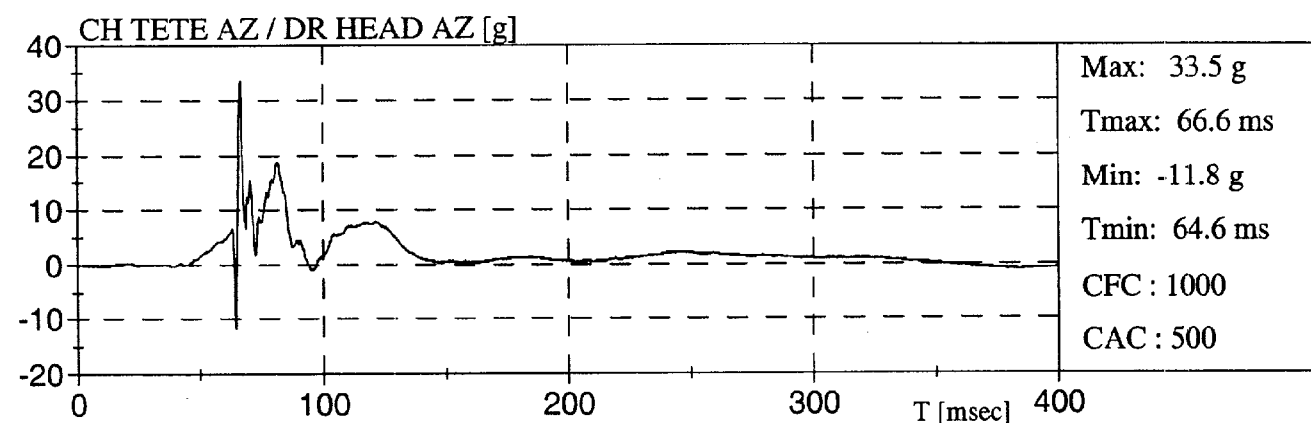
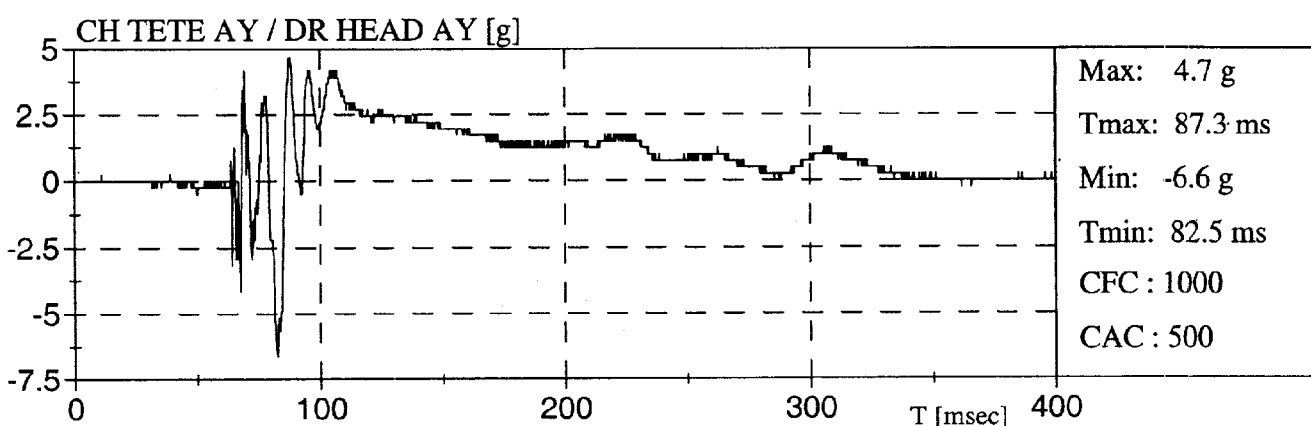
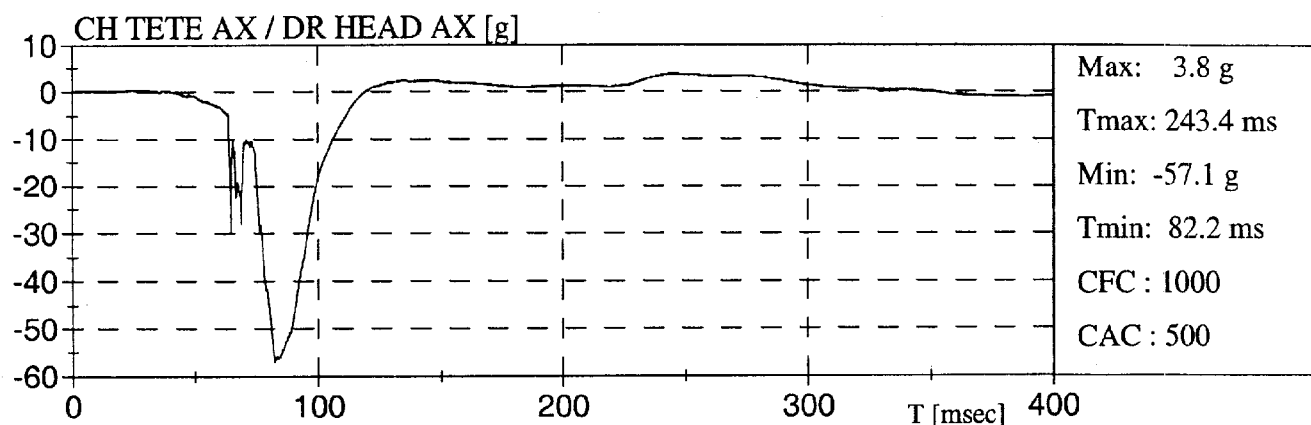


40. Affichage du lecteur de vitesse.  
Speed trap reading.

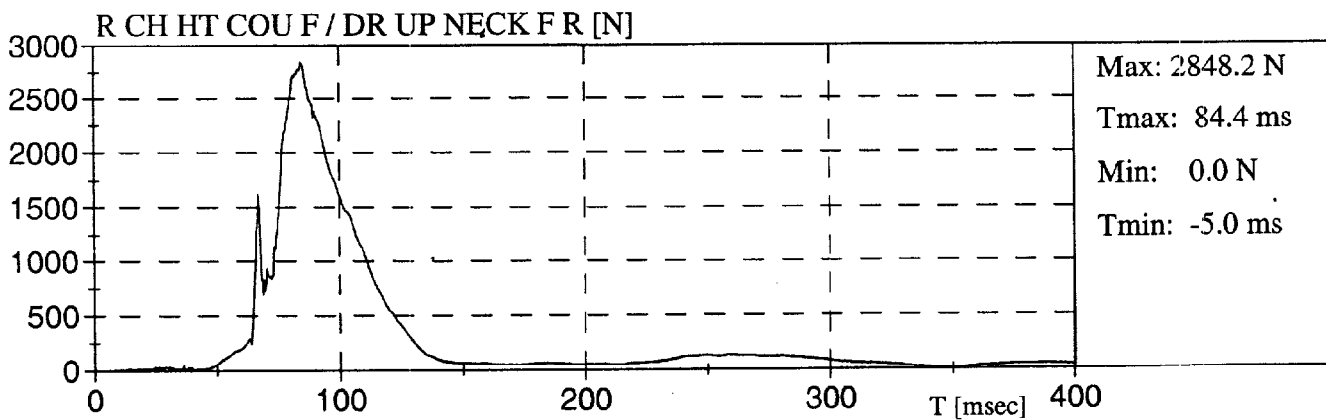
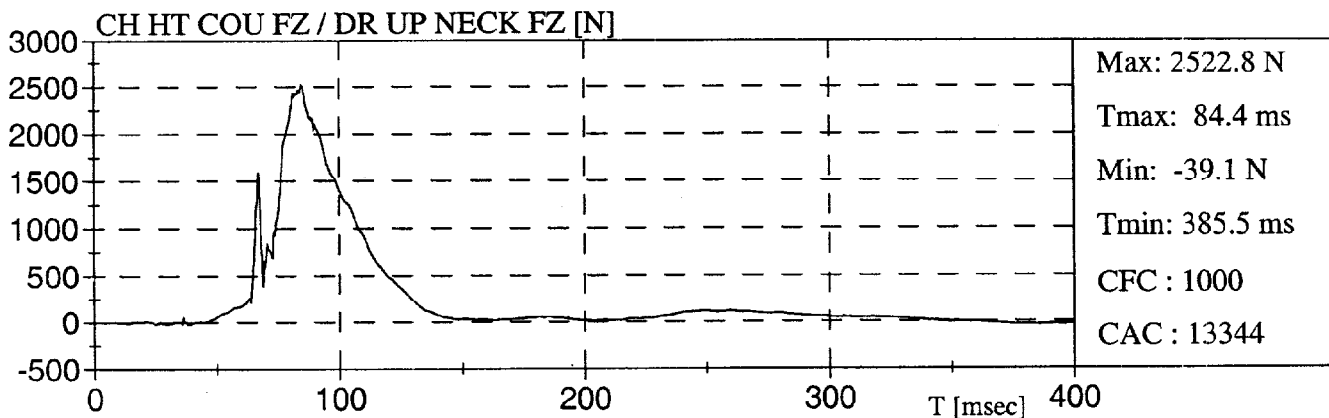
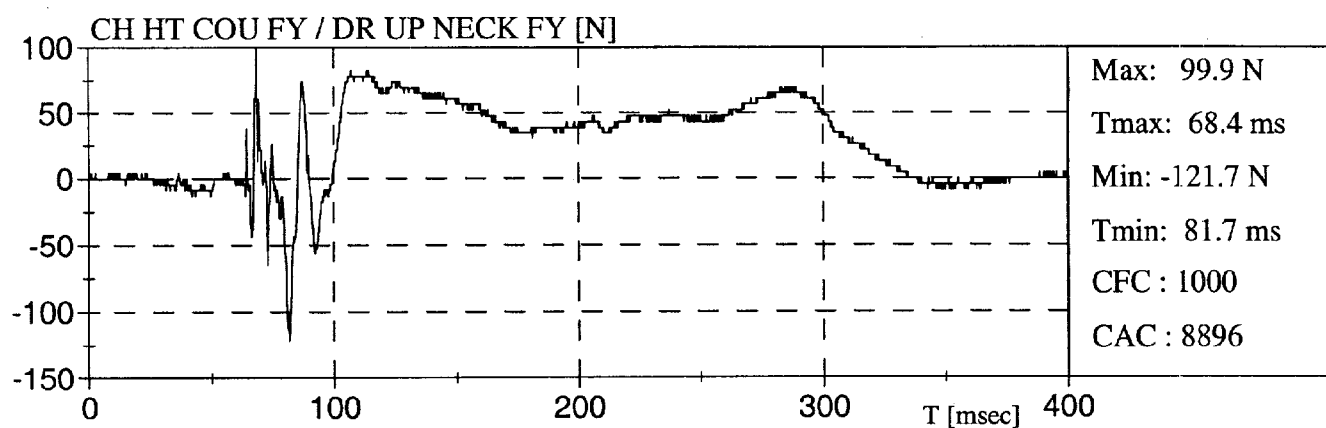
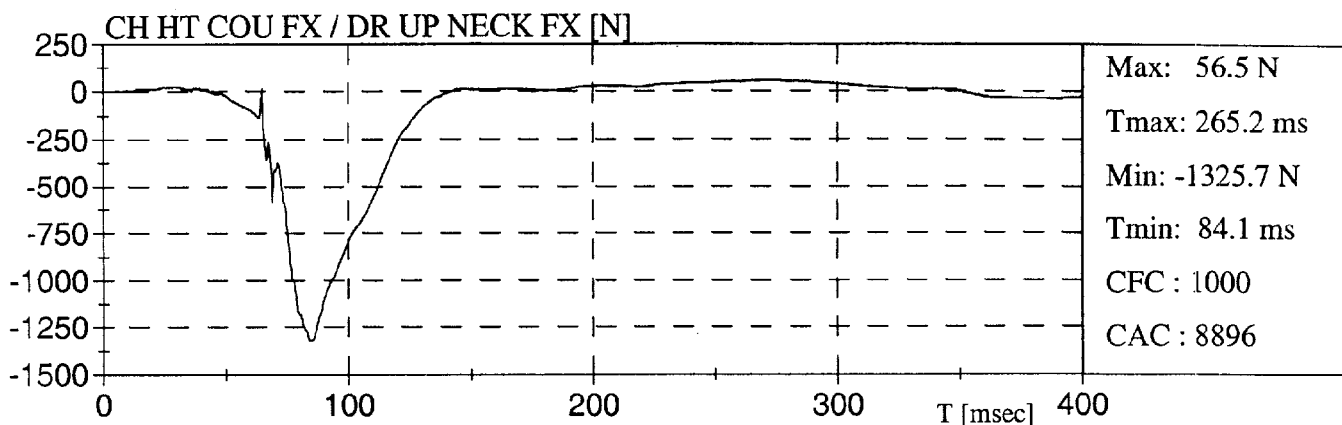
**APPENDICE / APPENDIX B**

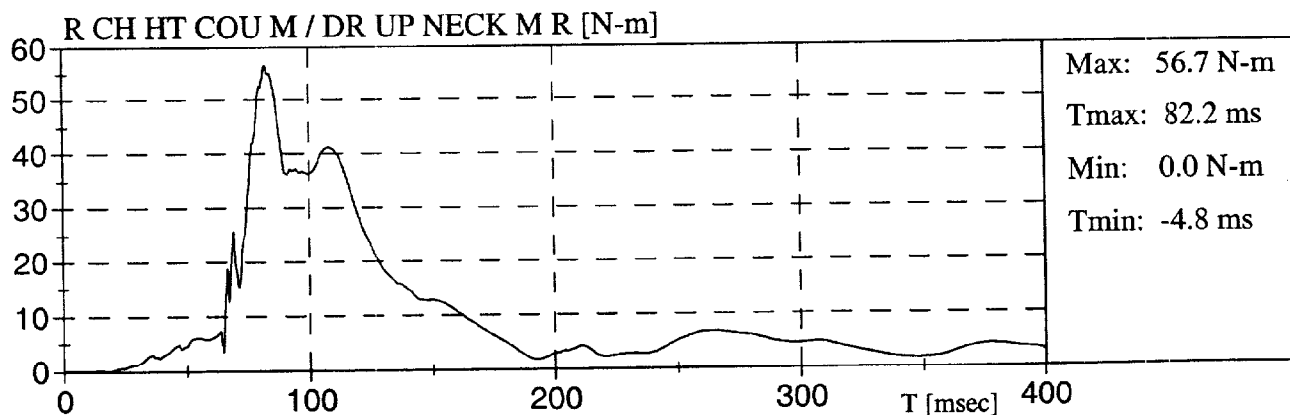
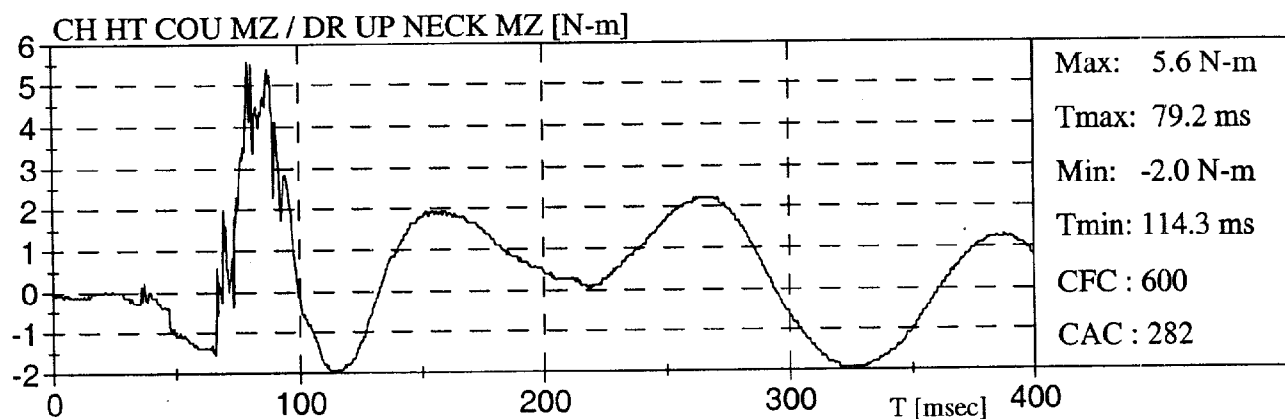
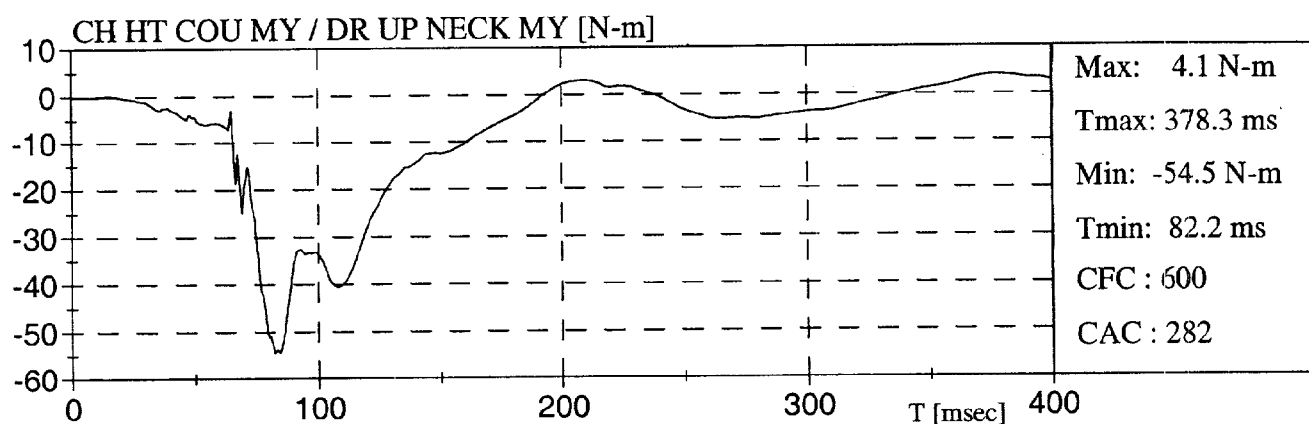
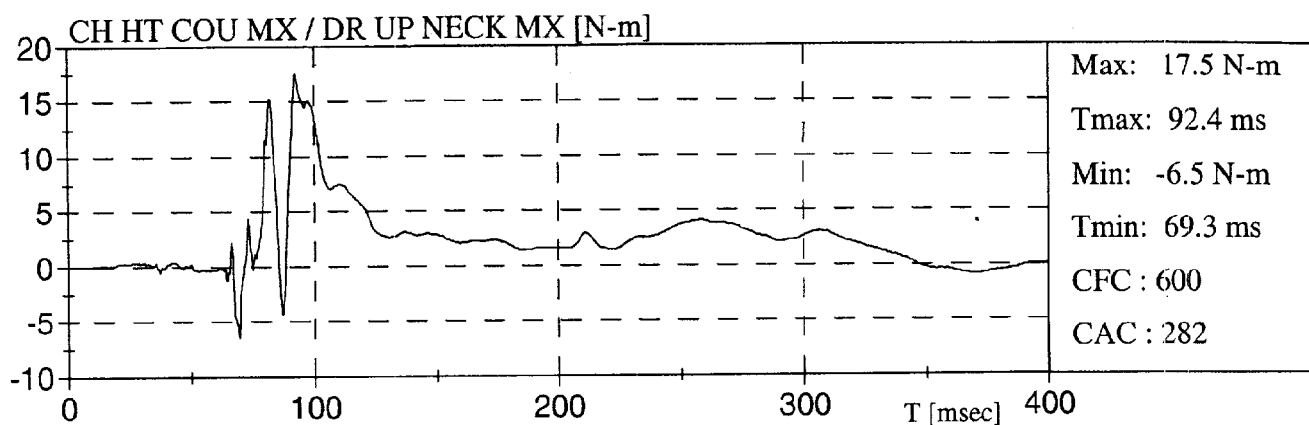
**DONNÉES GRAPHIQUES  
GRAPHICAL DATA**

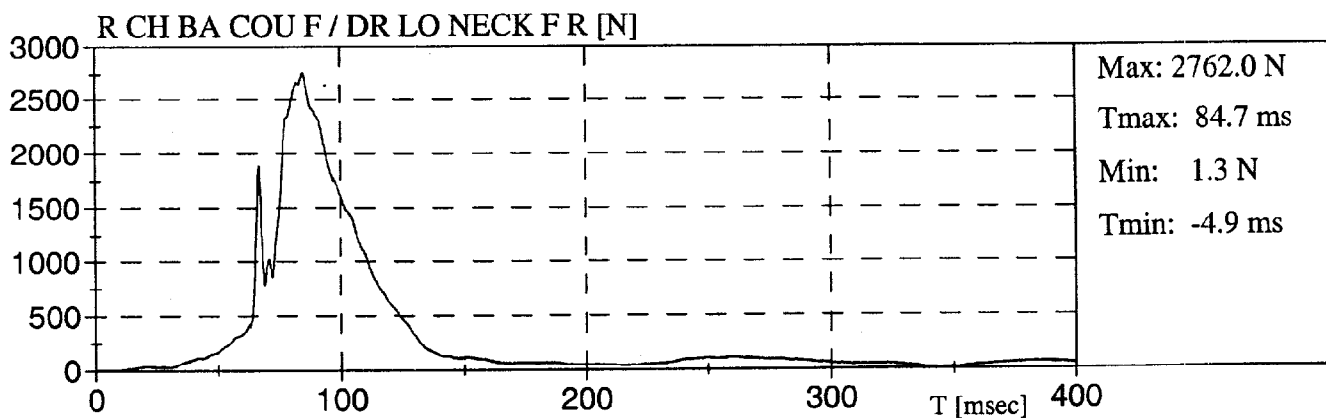
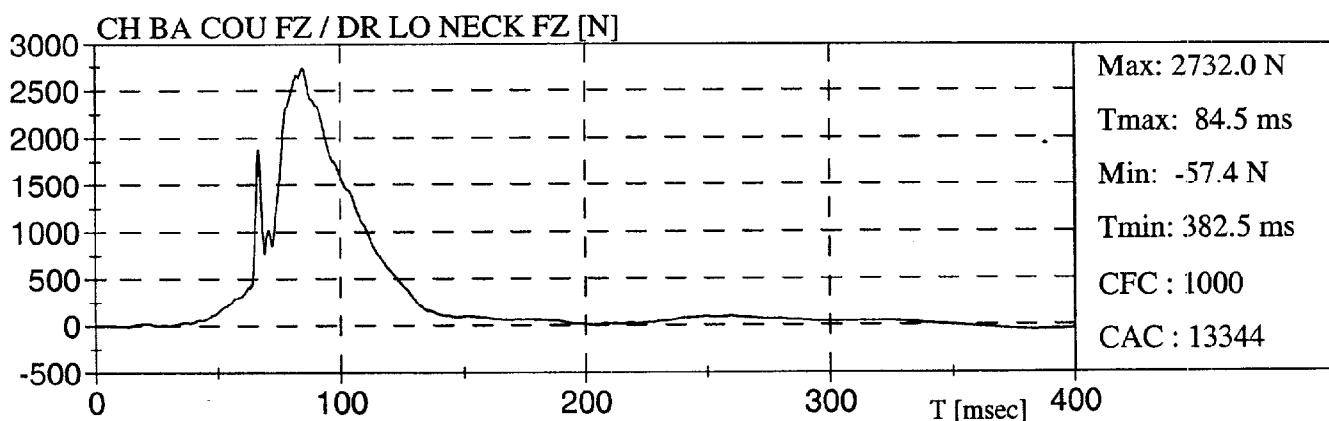
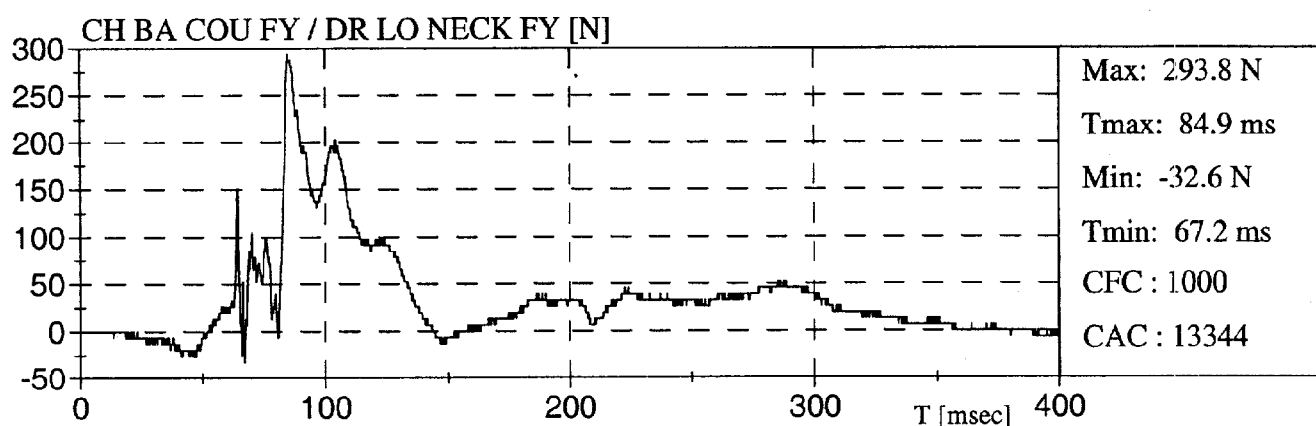
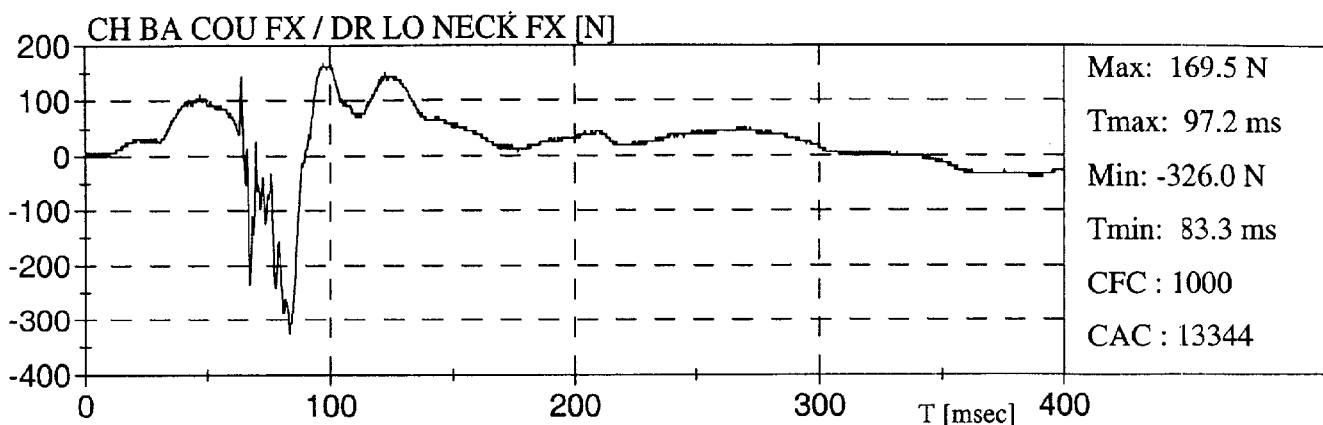
|                                                                             |                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nom du client</b><br><b>Client Name</b>                                  | <b>TRANSPORTS CANADA</b>                                                                                                                                                                                    |
| <b>Type de véhicule</b><br><b>Type of Vehicle</b>                           | <b>HYUNDAI ACCENT 99</b>                                                                                                                                                                                    |
| <b>Numéro de TC</b><br><b>Tc Number</b>                                     | <b>TC99-211</b>                                                                                                                                                                                             |
| <b>Numéro de contrat</b><br><b>Contract No</b>                              | <b>99-5001</b>                                                                                                                                                                                              |
| <b>Acquisition de données selon</b><br><b>Data Acquisition according to</b> | <b>SAE J211/1 MAR 95</b>                                                                                                                                                                                    |
| <b>Date de l'essai</b><br><b>Test date</b>                                  | <b>1999-01-18</b>                                                                                                                                                                                           |
| <b>Titre du projet</b><br><b>Project Title</b>                              | <b>COLLISIONS DE RECHERCHE CONJOINTE TC/NHTSA 98/99</b><br><b>FRONTALE DÉCALÉE 38 KM/H - 40% GAUCHE</b><br><b>98/99 TC/NHTSA JOINT RESEARCH COLLISION TESTS</b><br><b>OFFSET FRONTAL 38 KM/H - 40% LEFT</b> |
| <b>MANNEQUIN / DUMMY</b>                                                    |                                                                                                                                                                                                             |
| <b>Chauffeur</b><br><b>Driver</b>                                           | <b>HYBRID III 5% Femelle / Female</b>                                                                                                                                                                       |
| <b>Passager</b><br><b>Passenger</b>                                         | <b>HYBRID III 5% Femelle / Female</b>                                                                                                                                                                       |

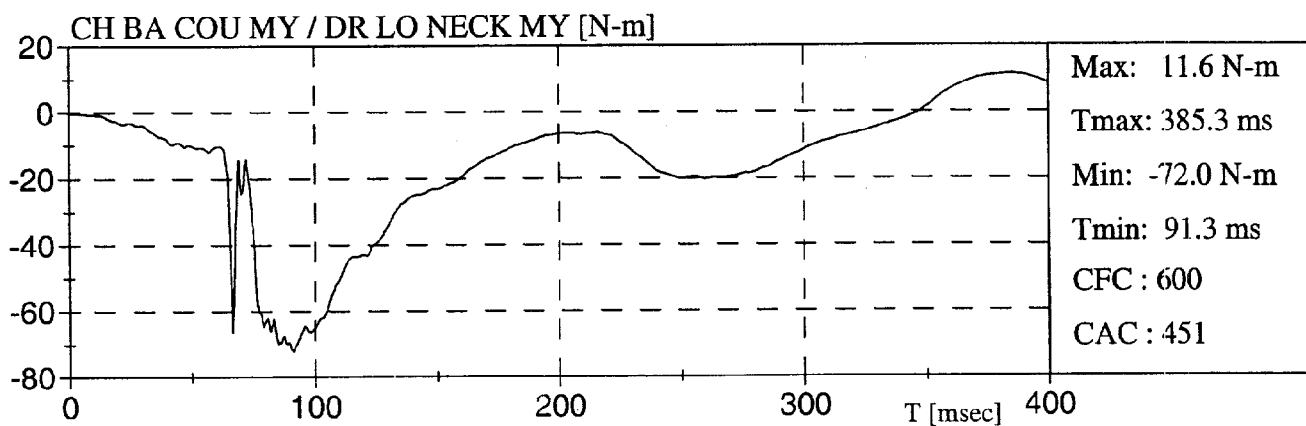
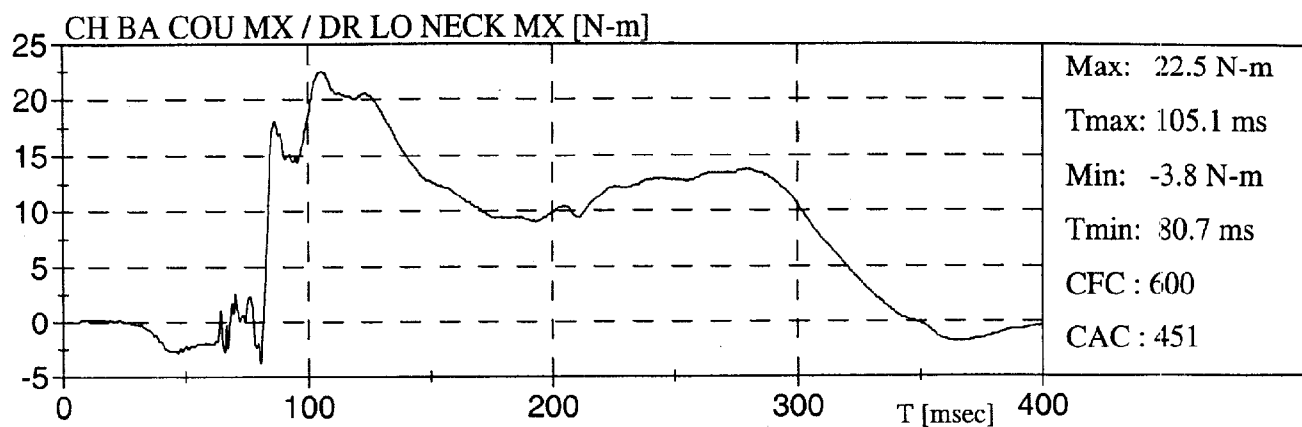


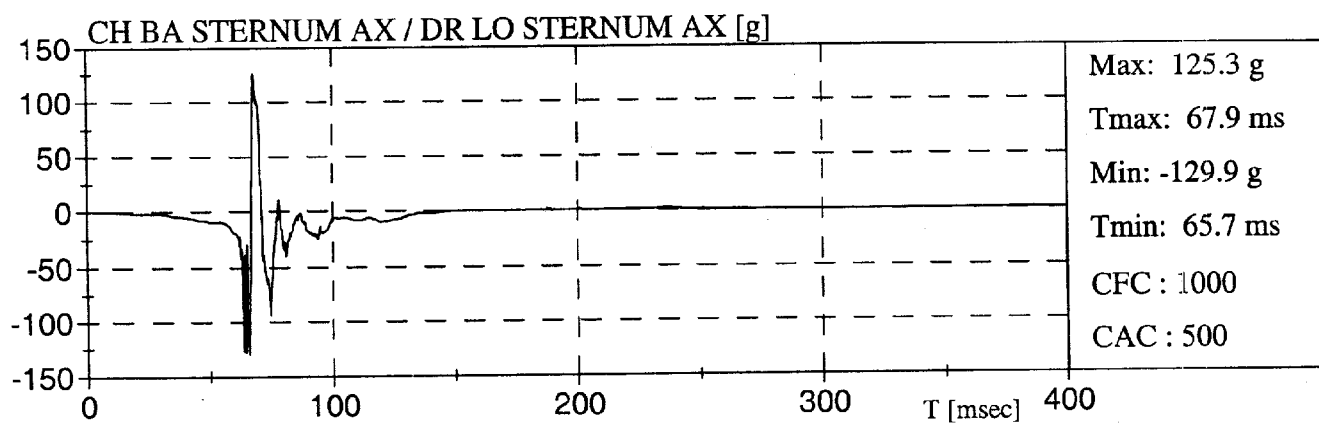
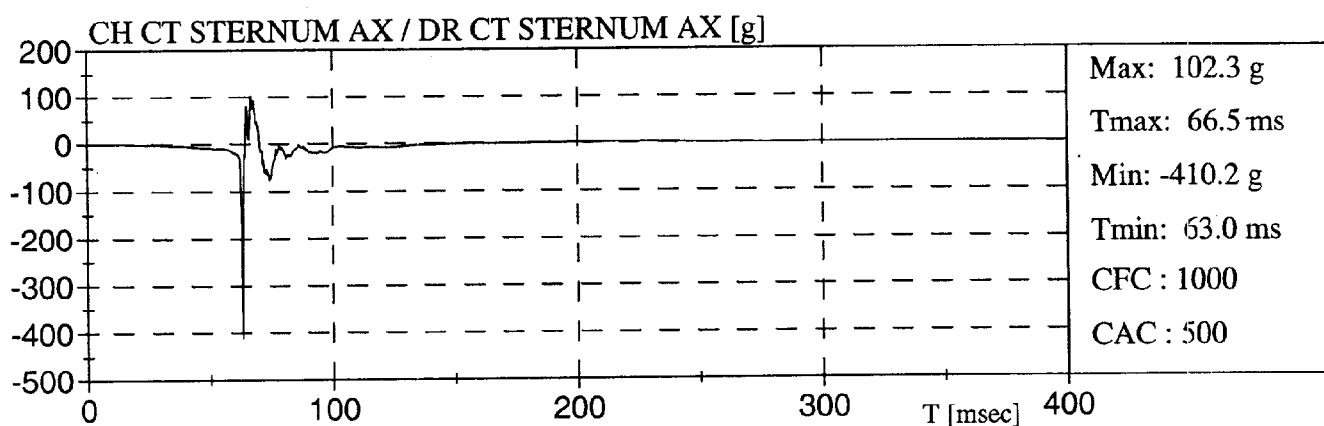
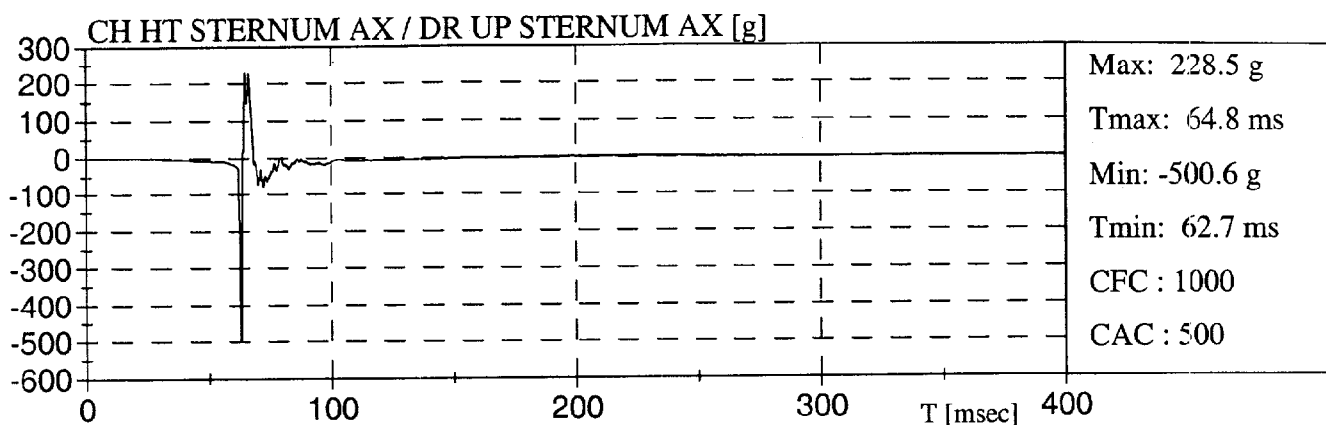


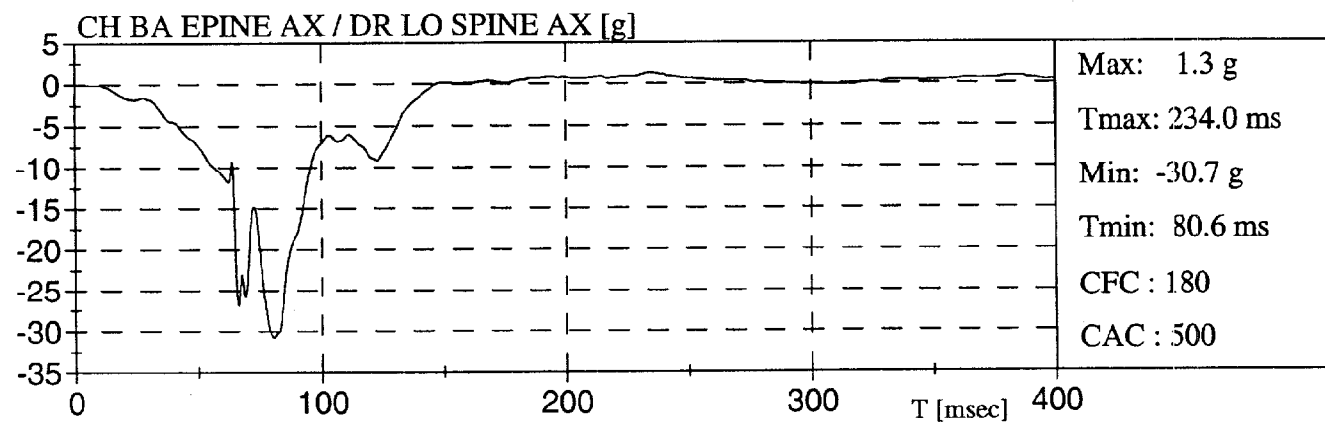
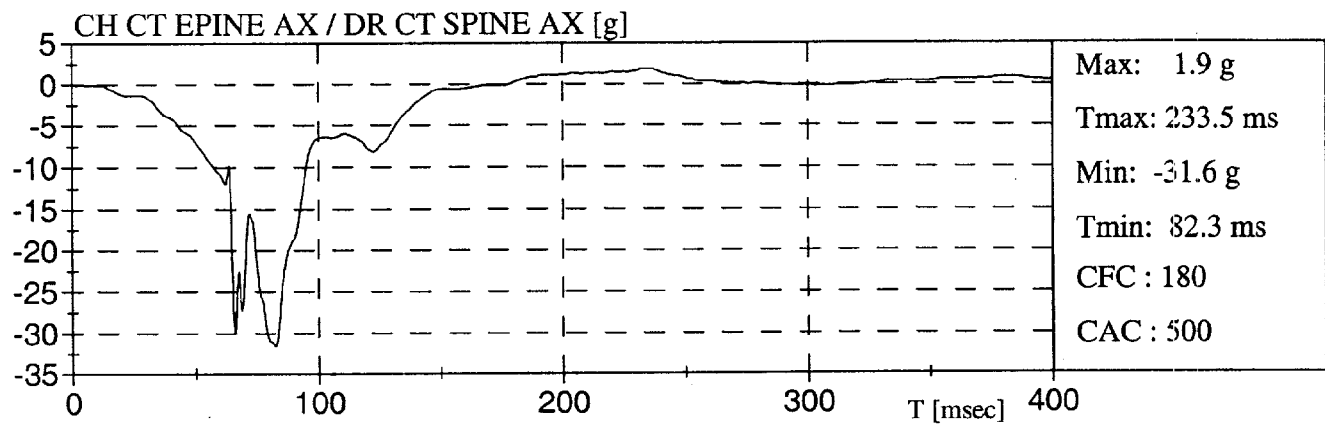
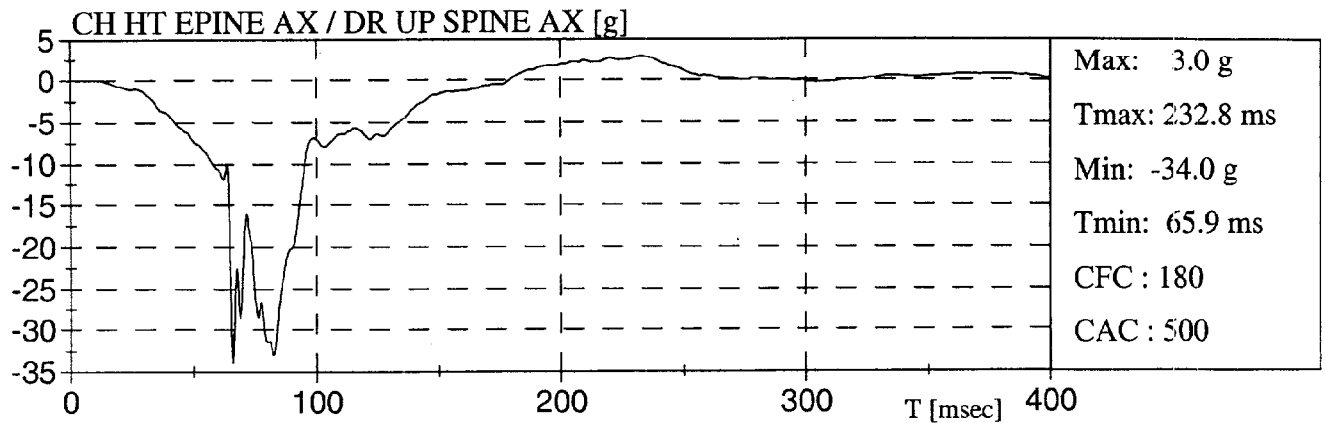


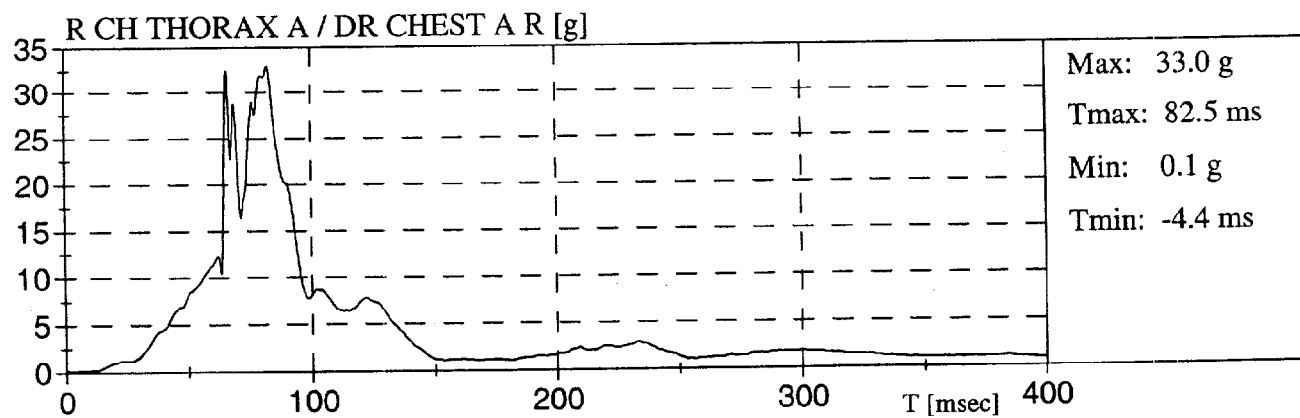
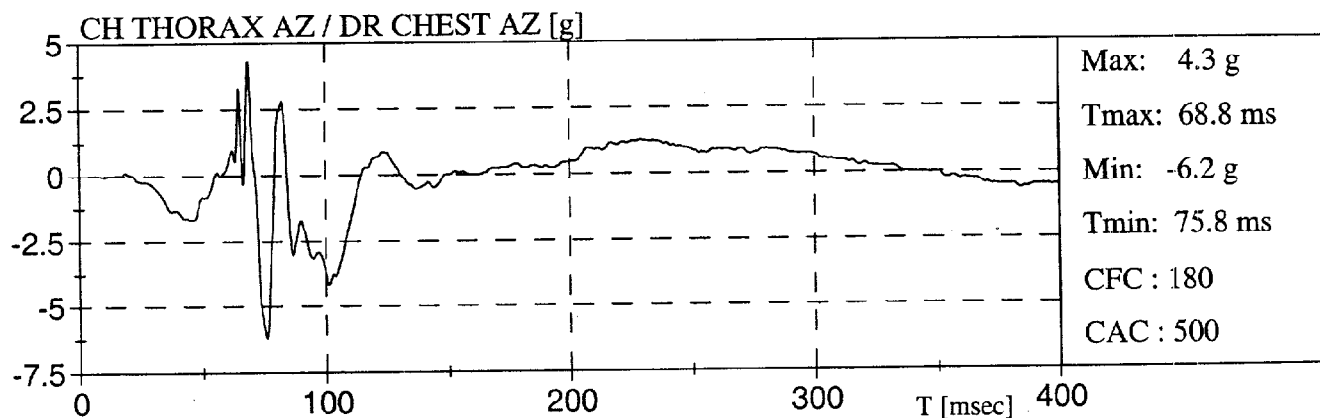
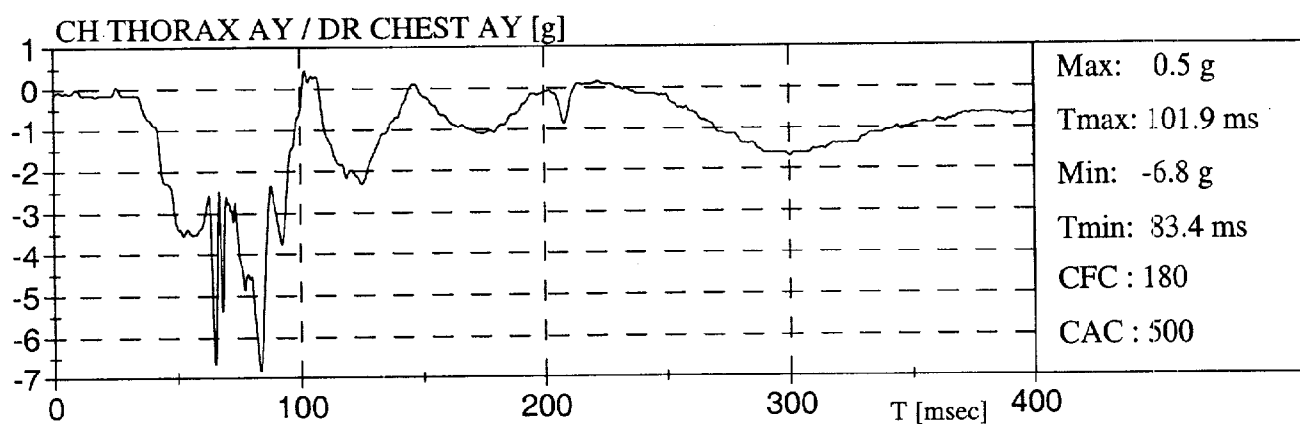
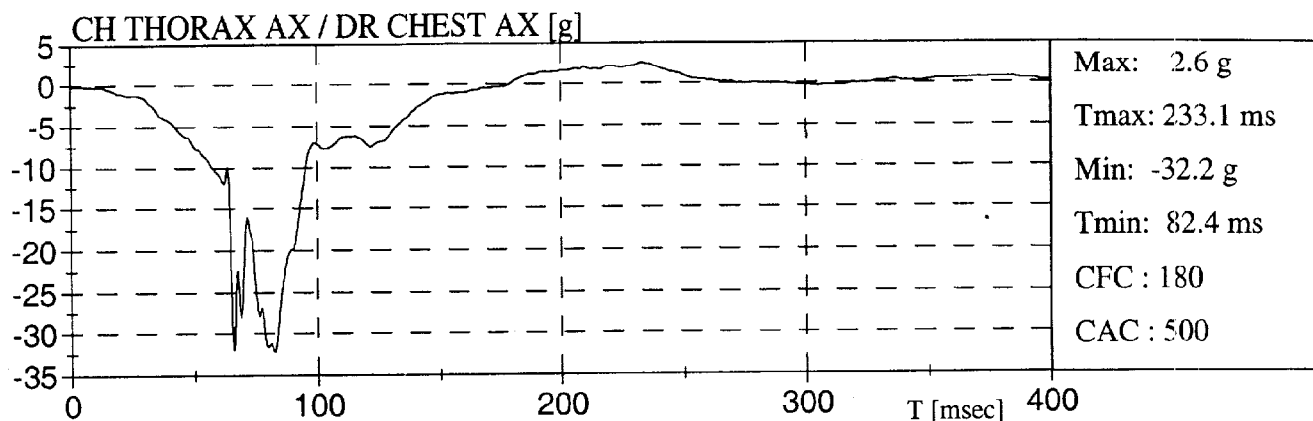


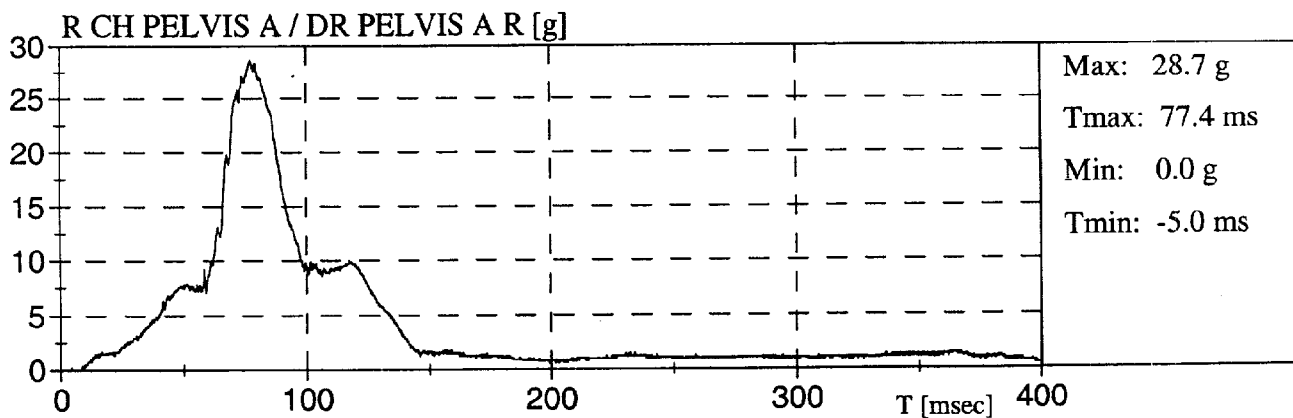
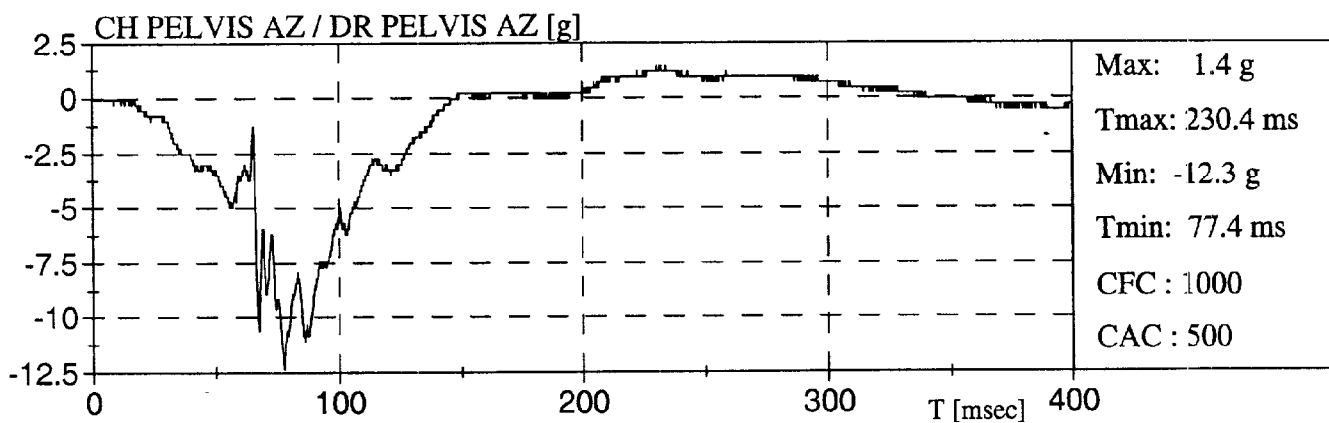
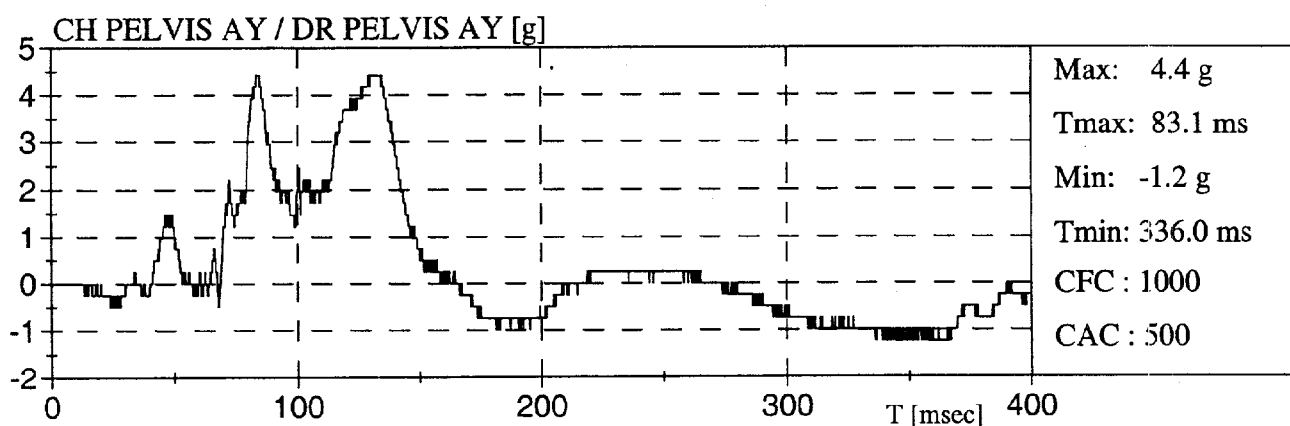
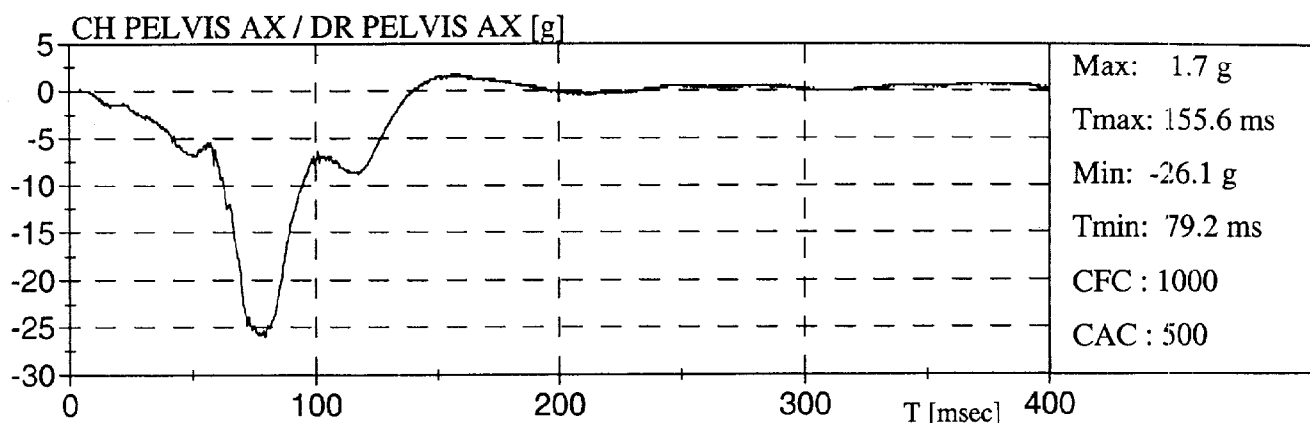




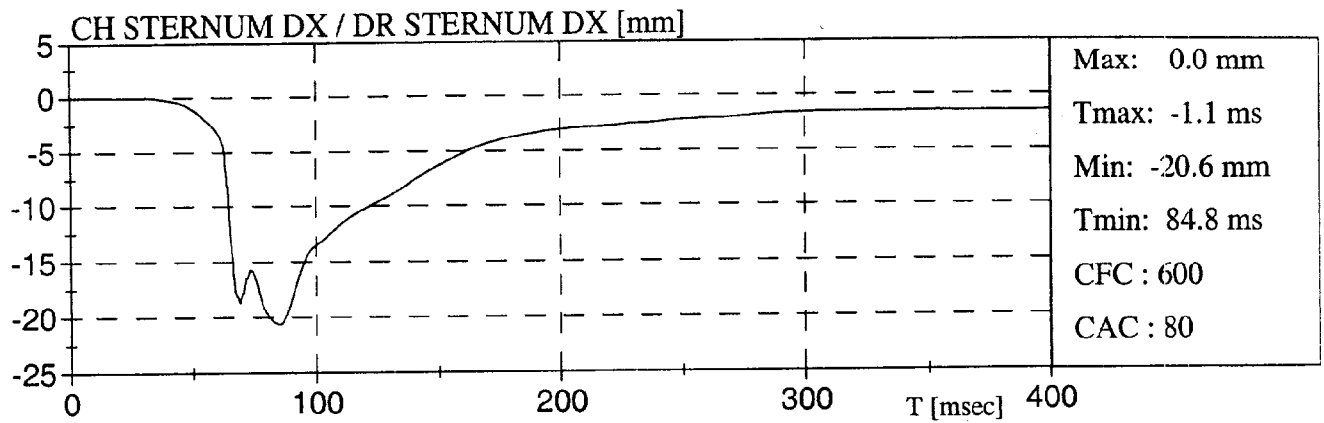


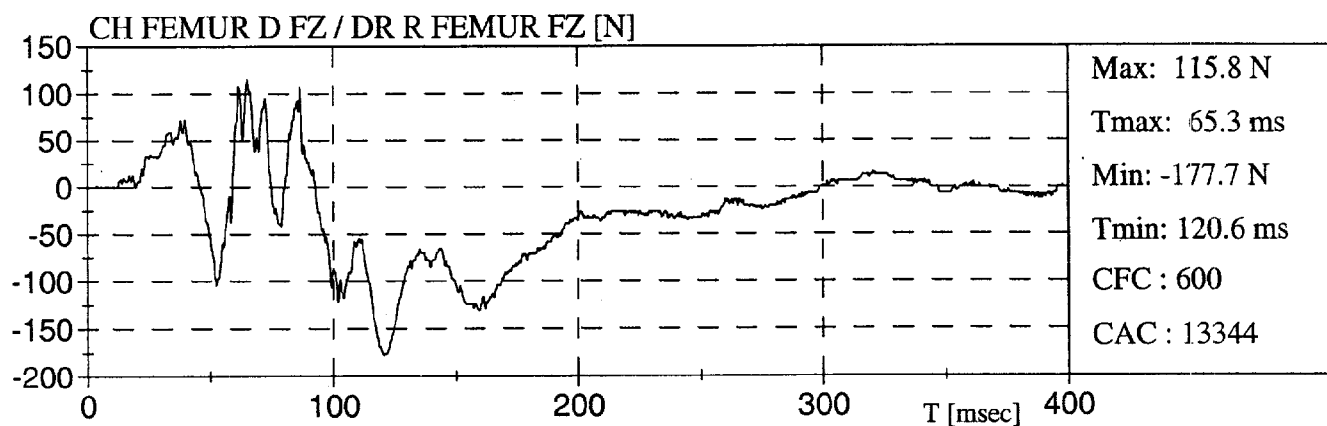
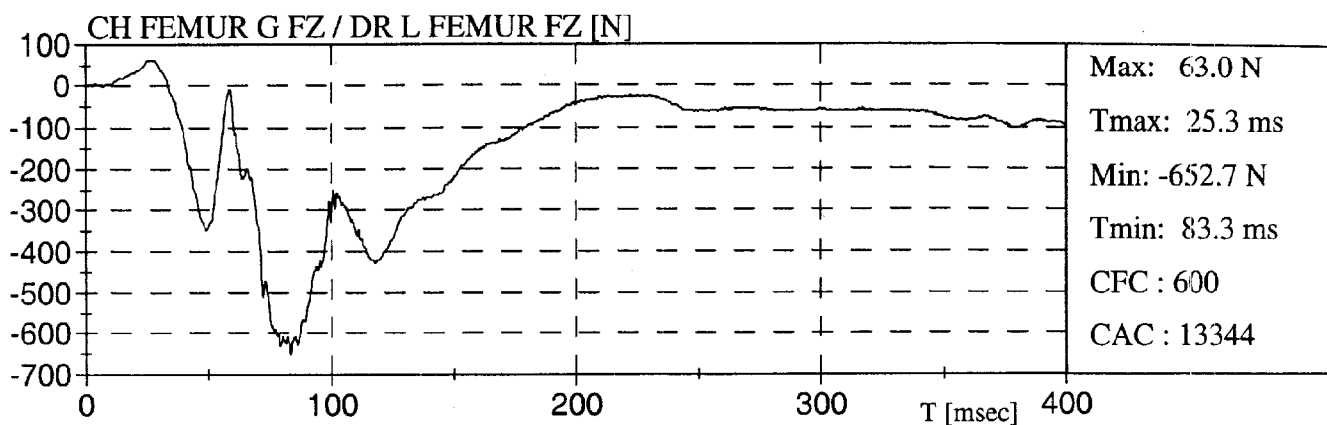


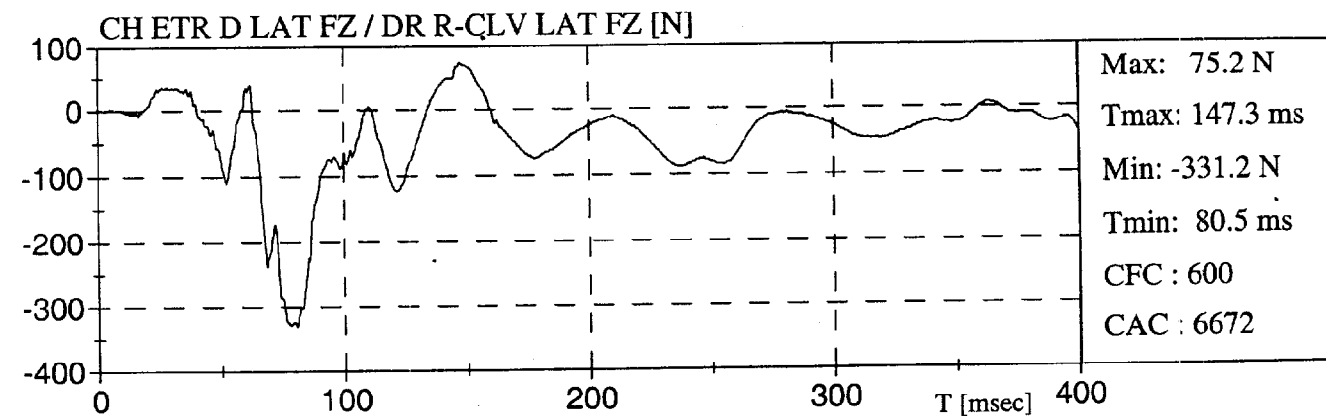
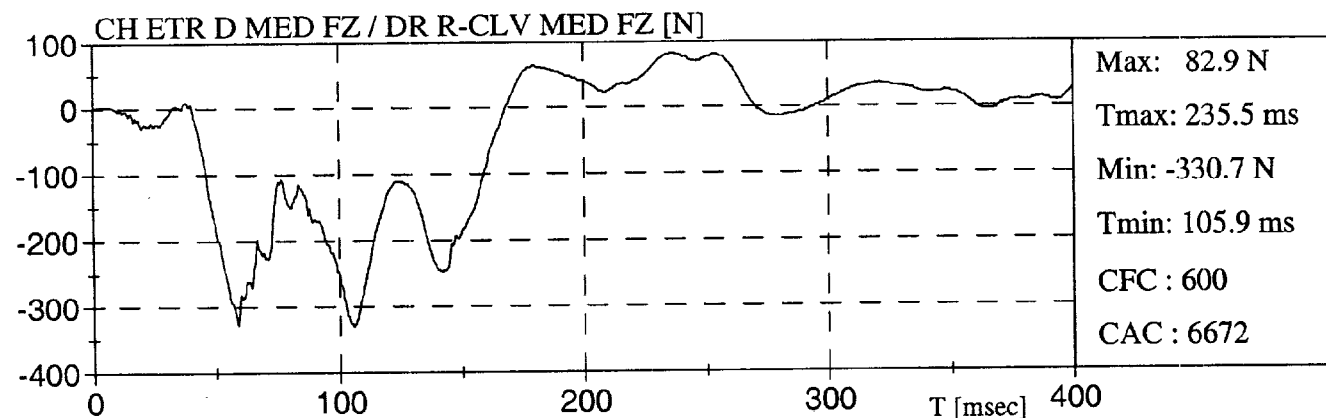
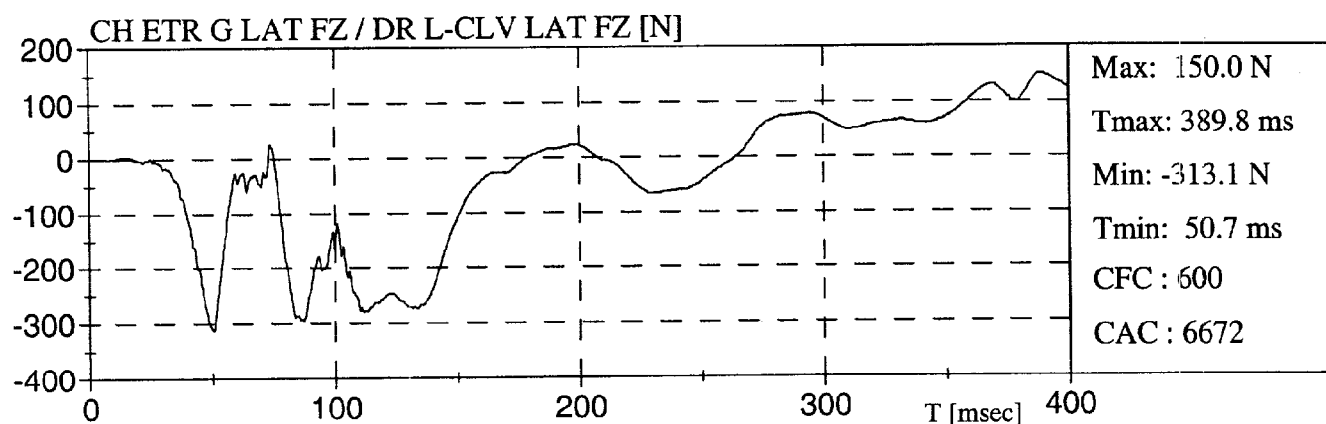
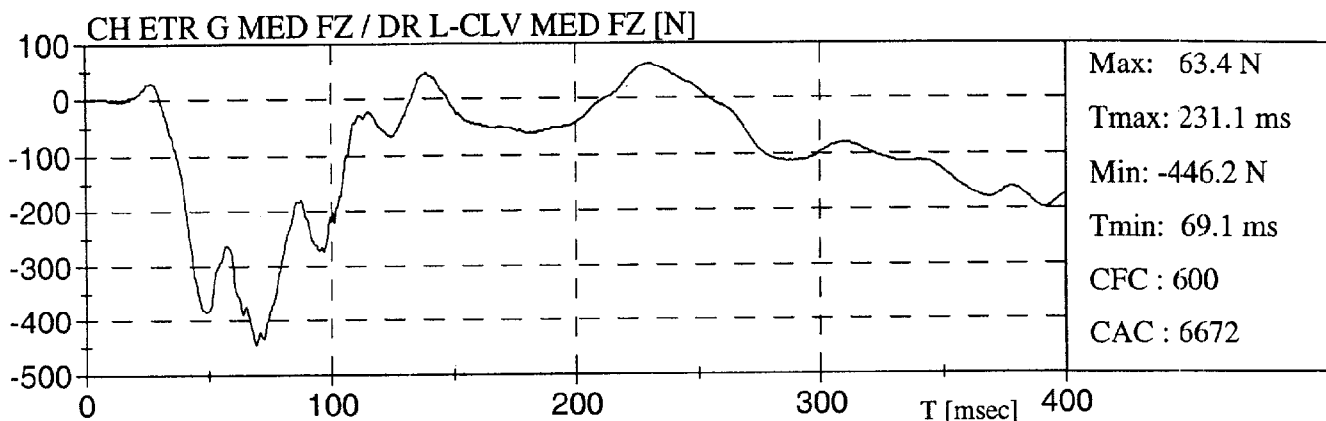


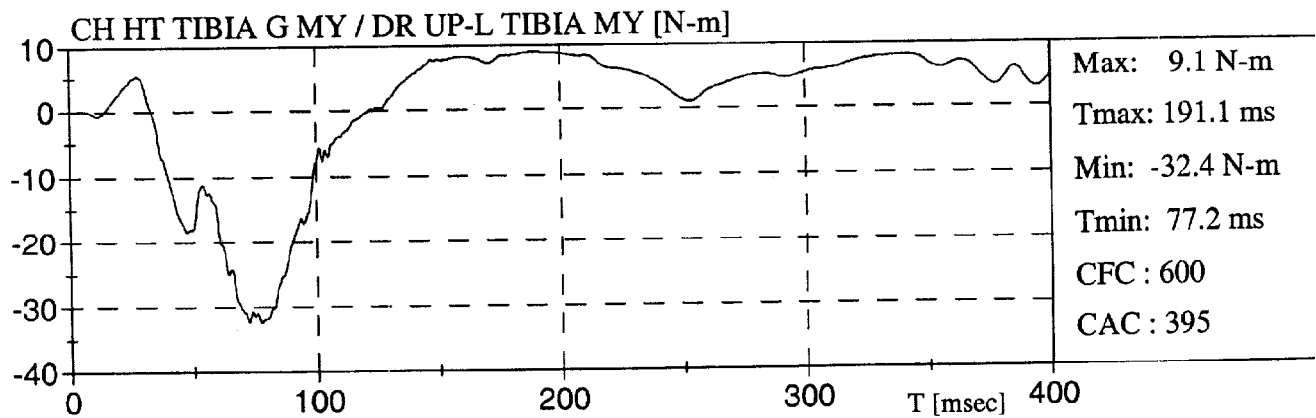
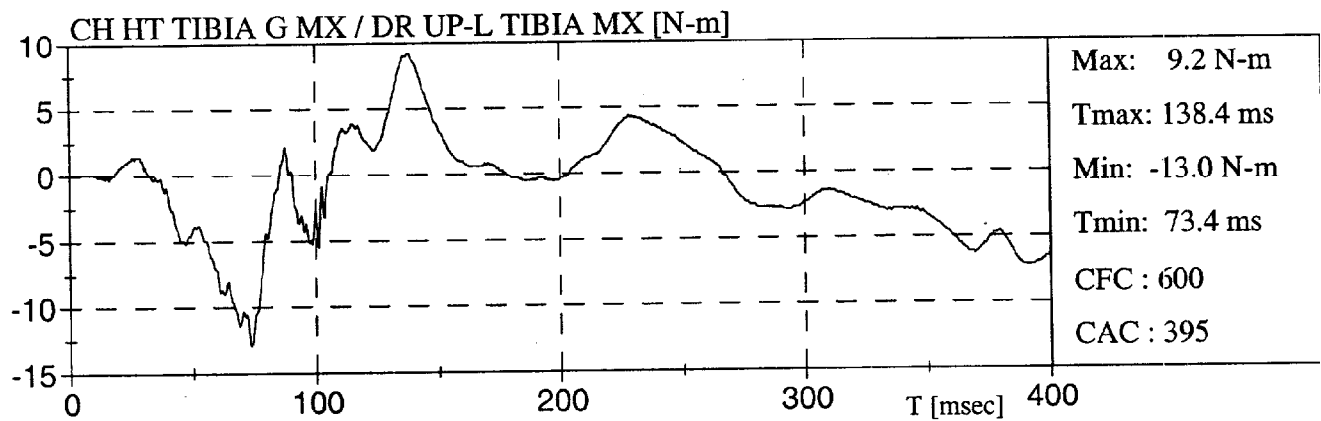
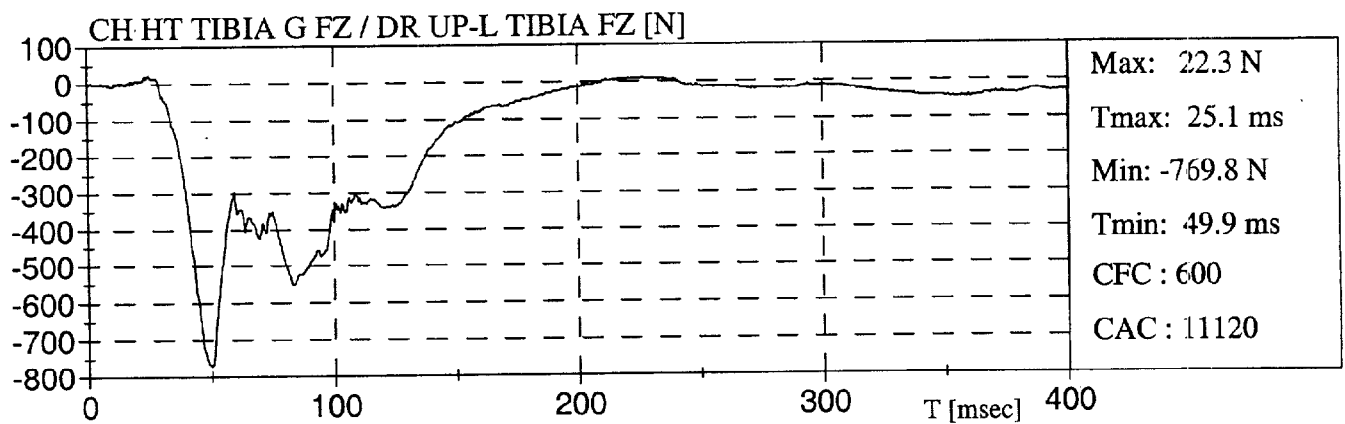
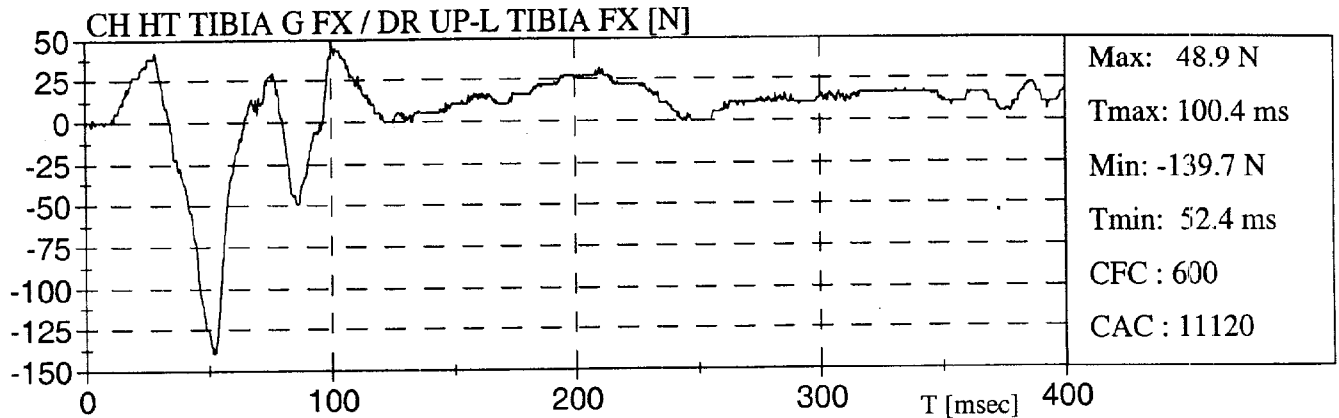


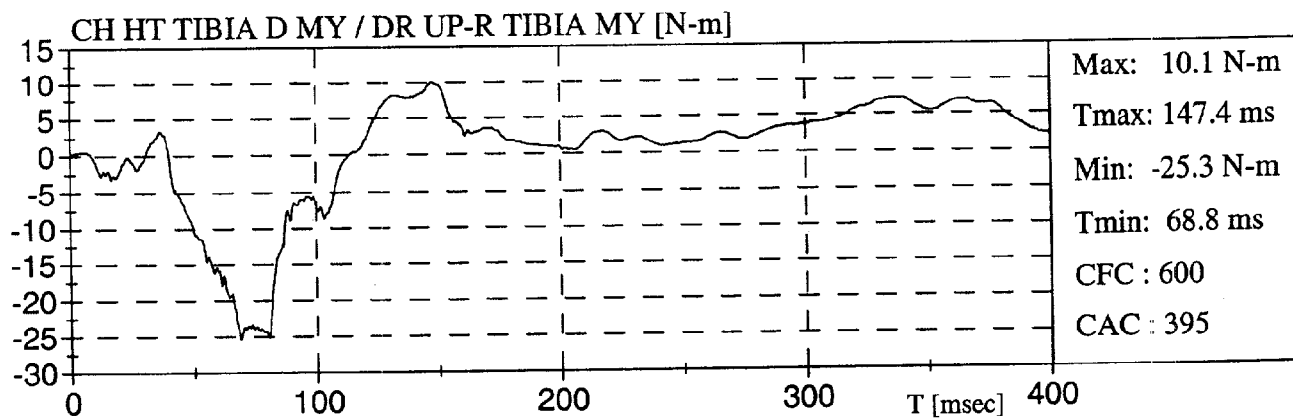
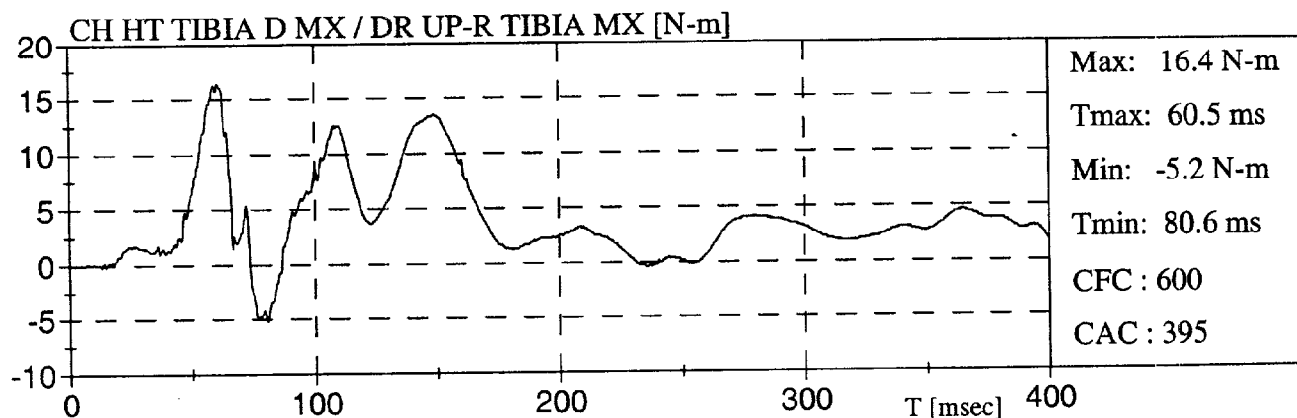
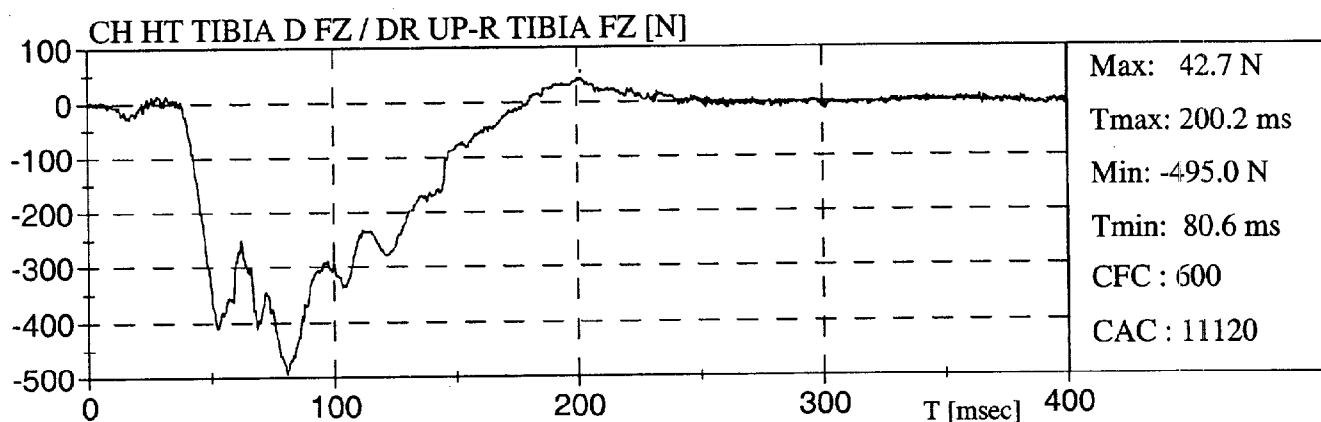
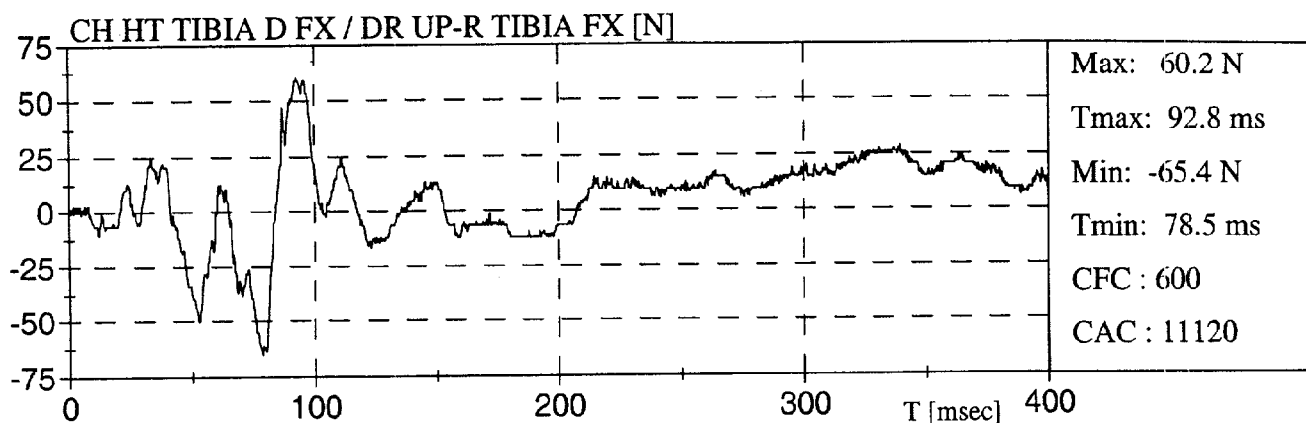


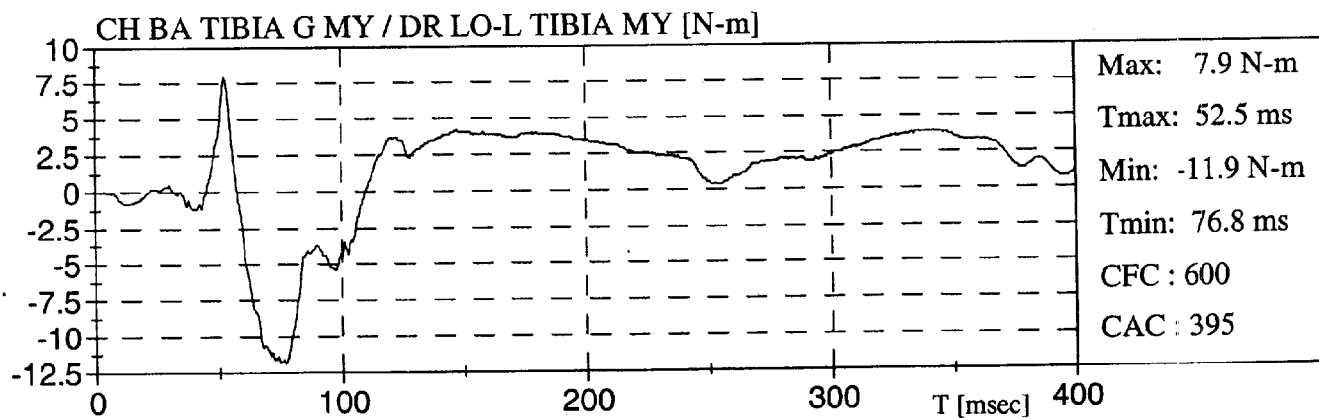
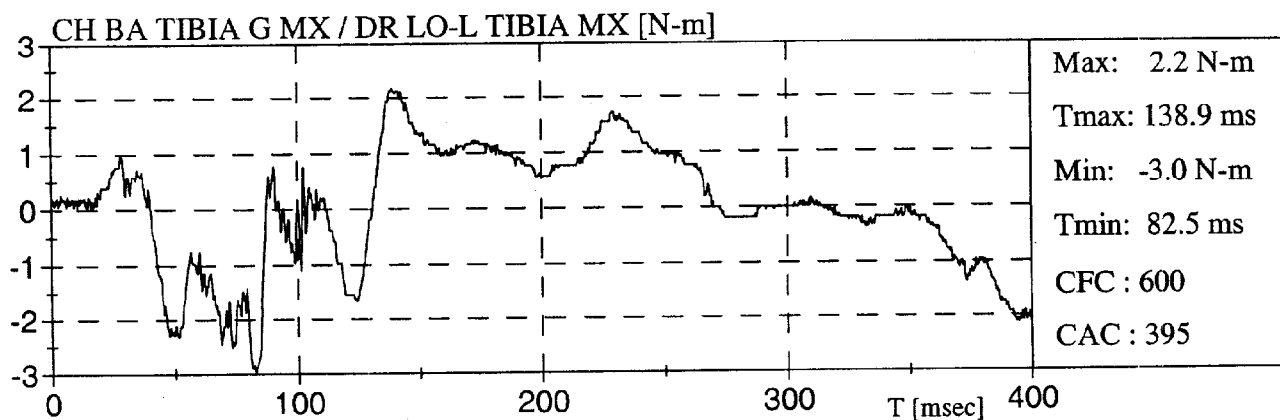
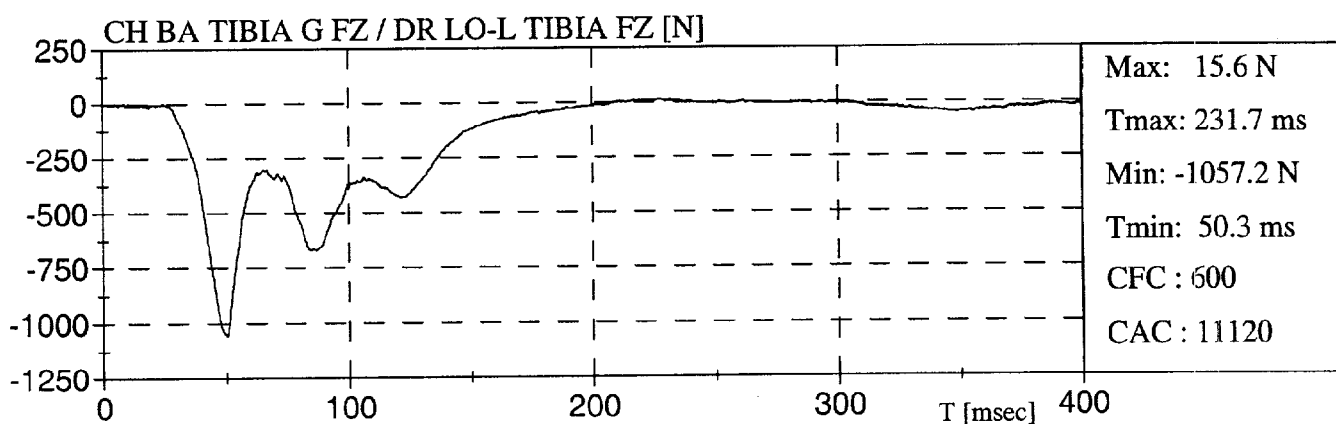
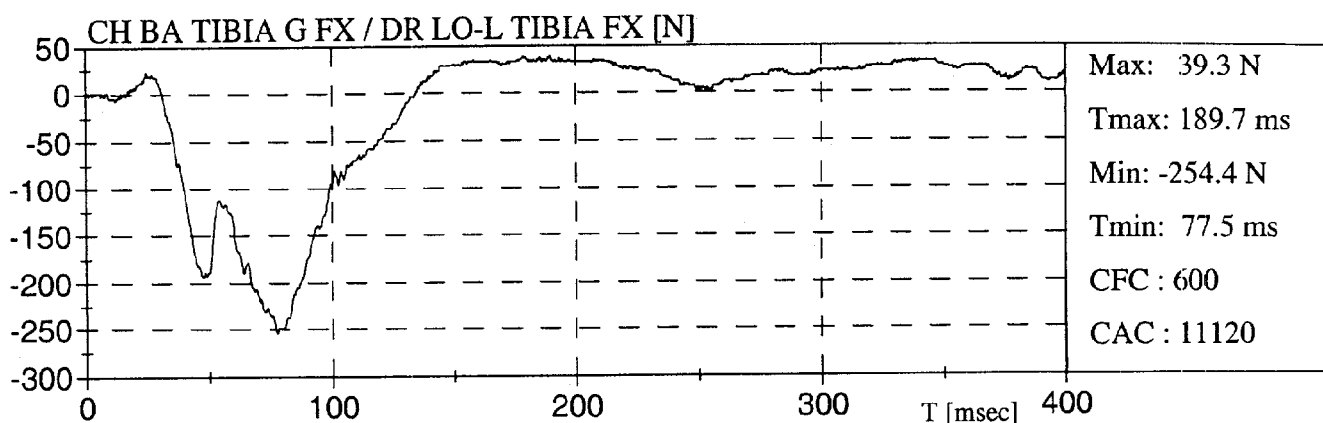


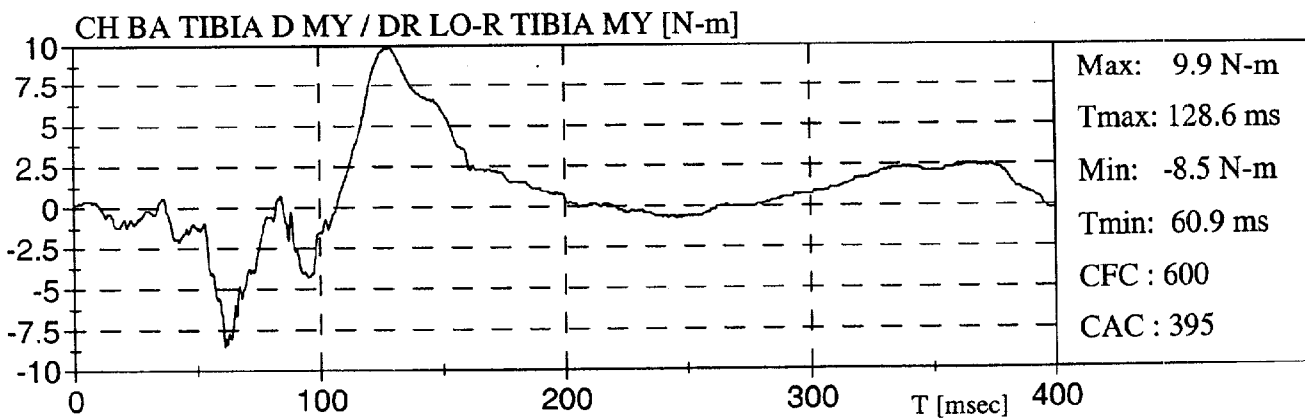
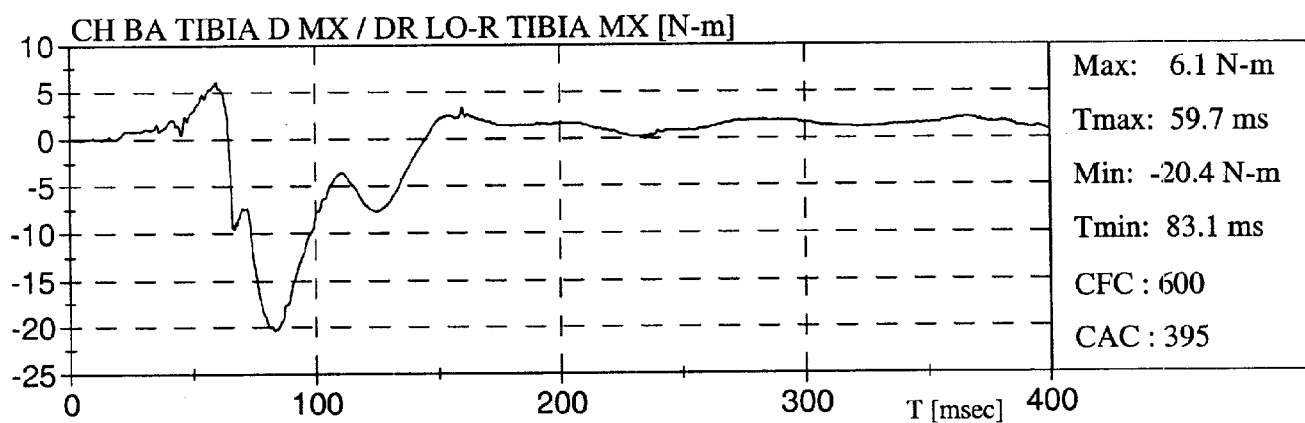
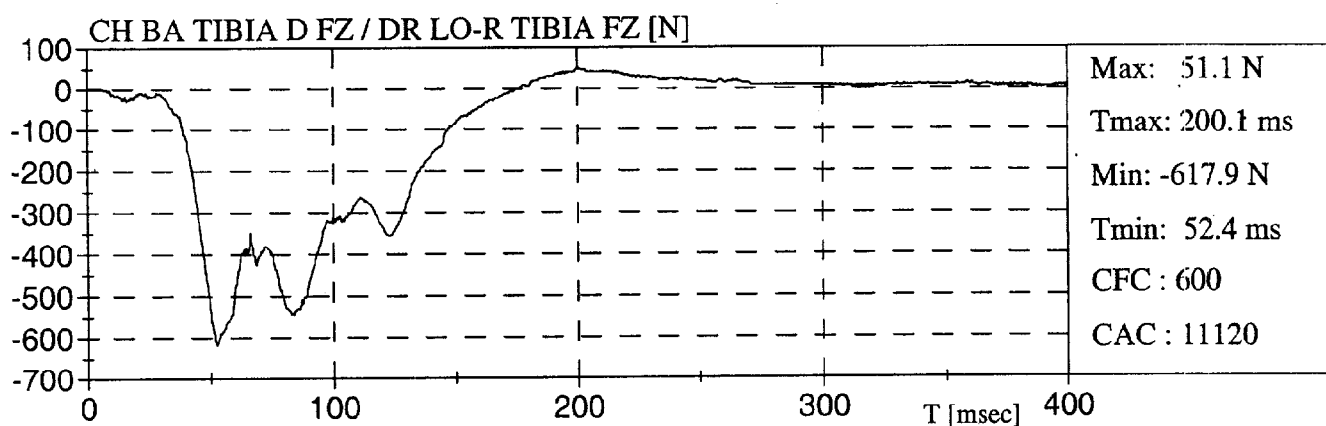
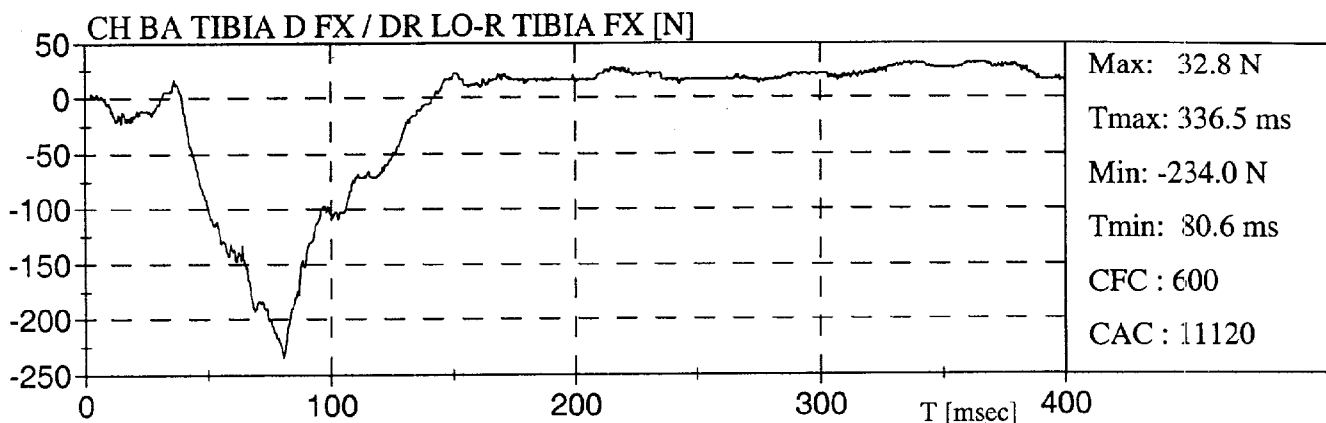


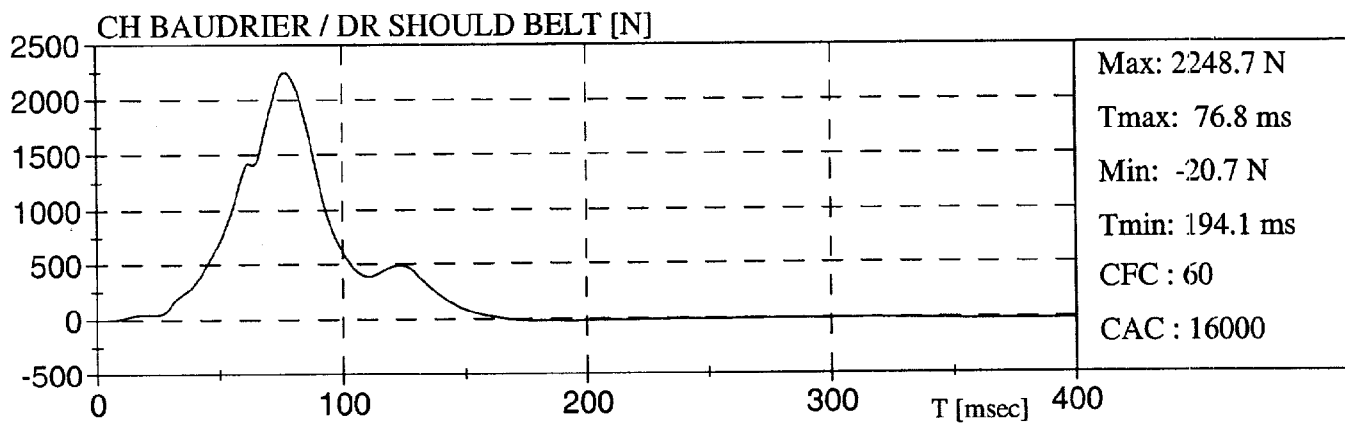
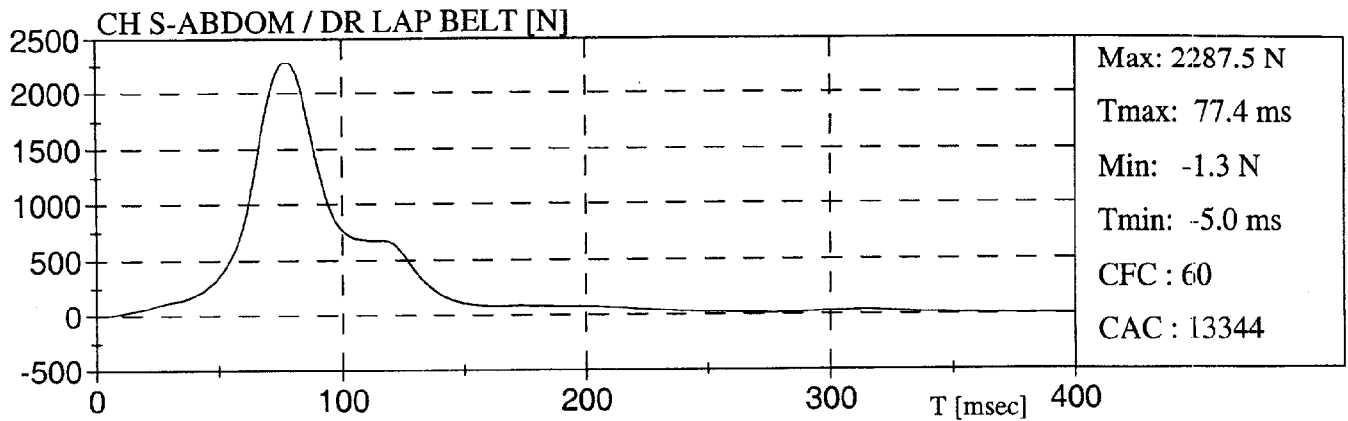




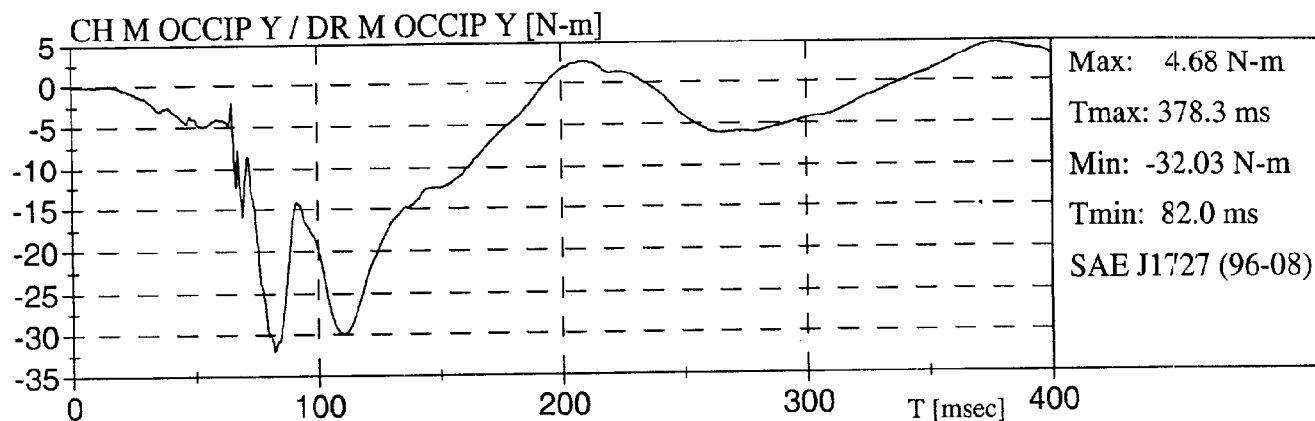


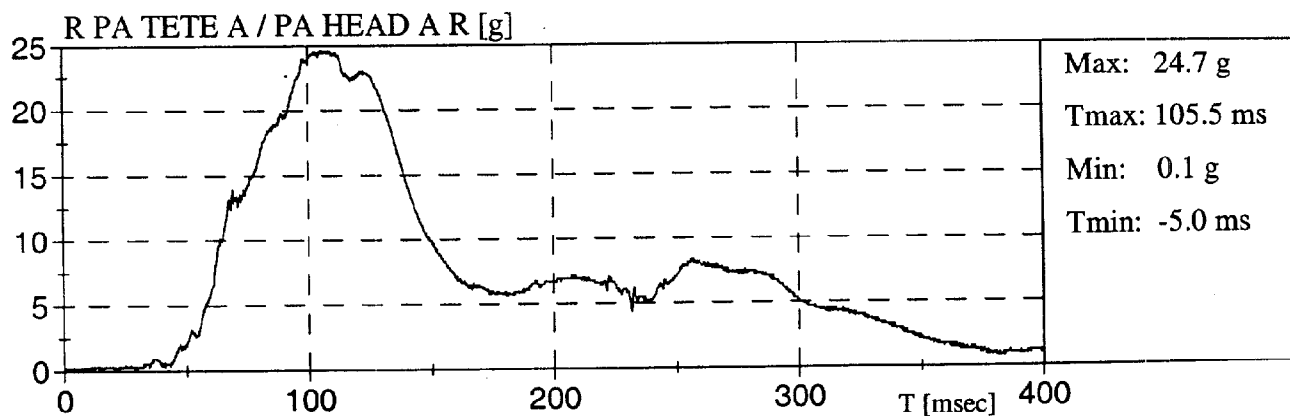
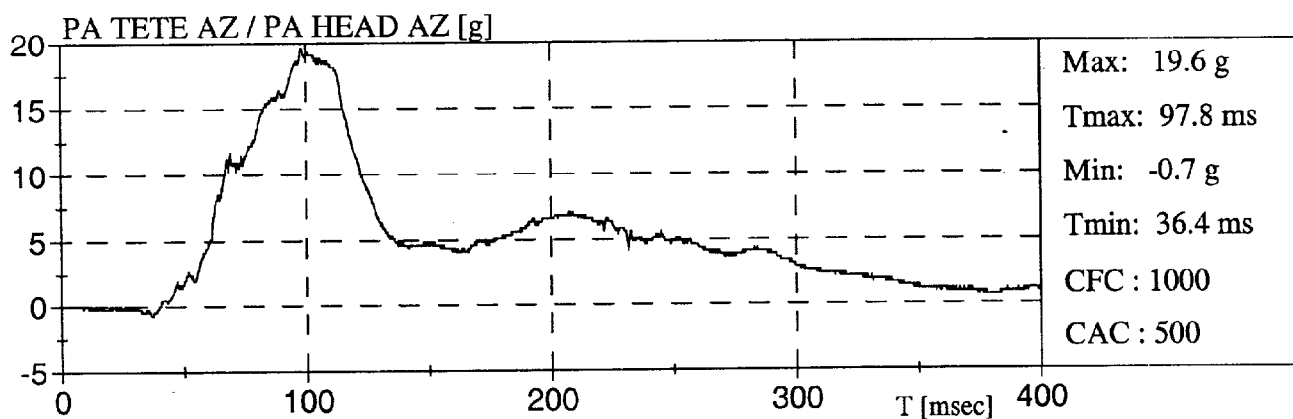
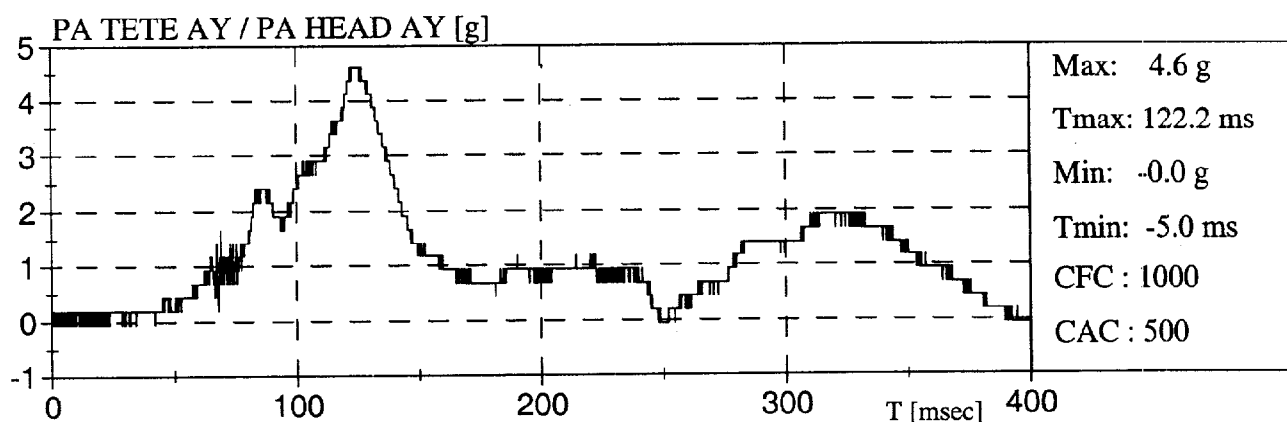
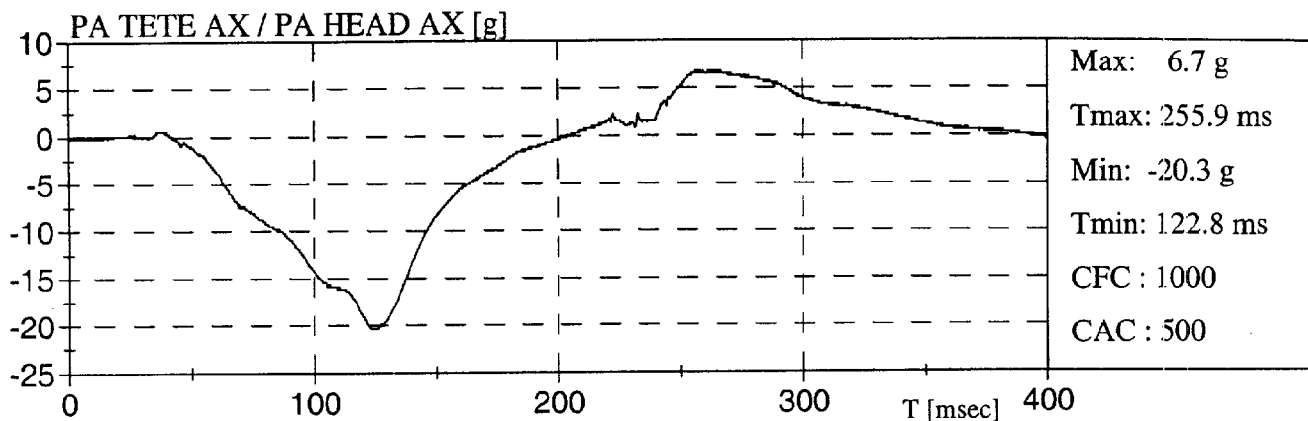


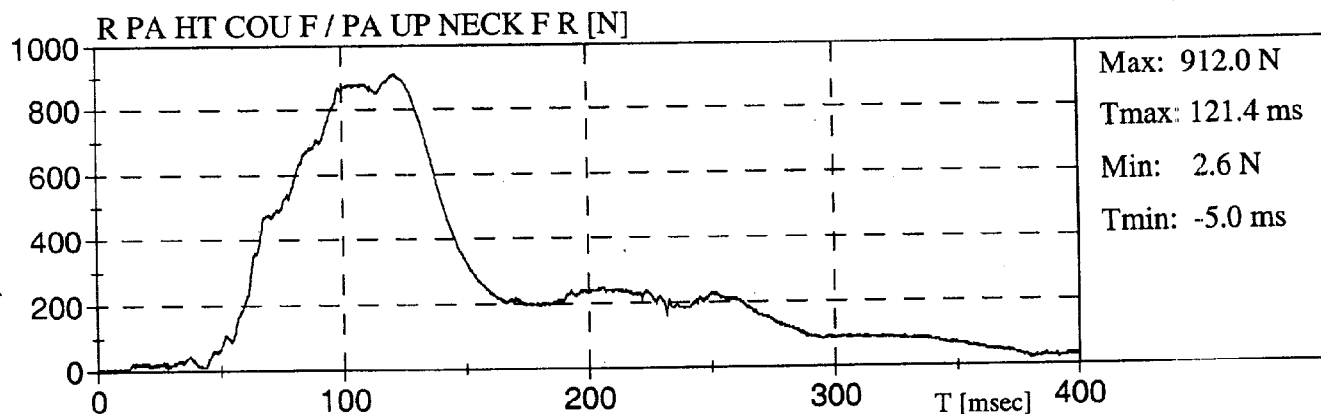
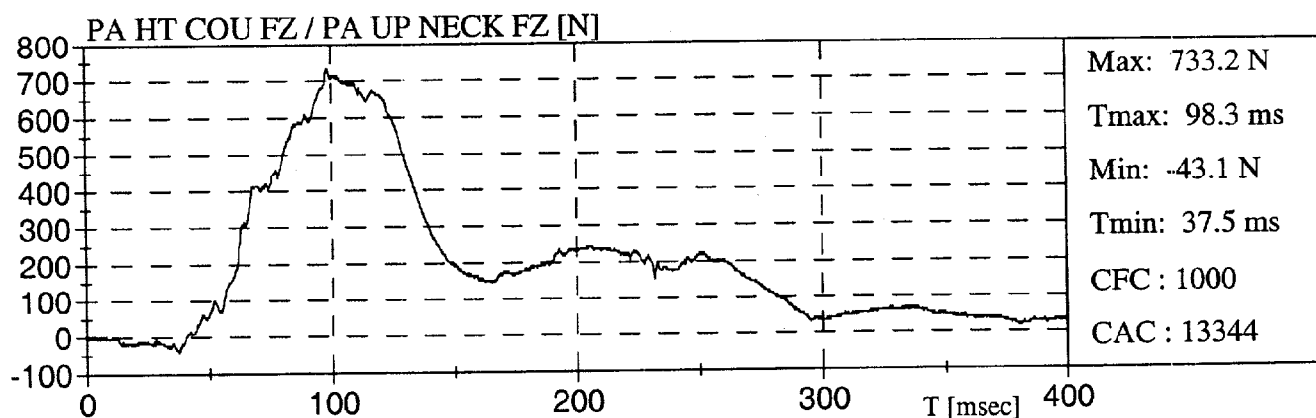
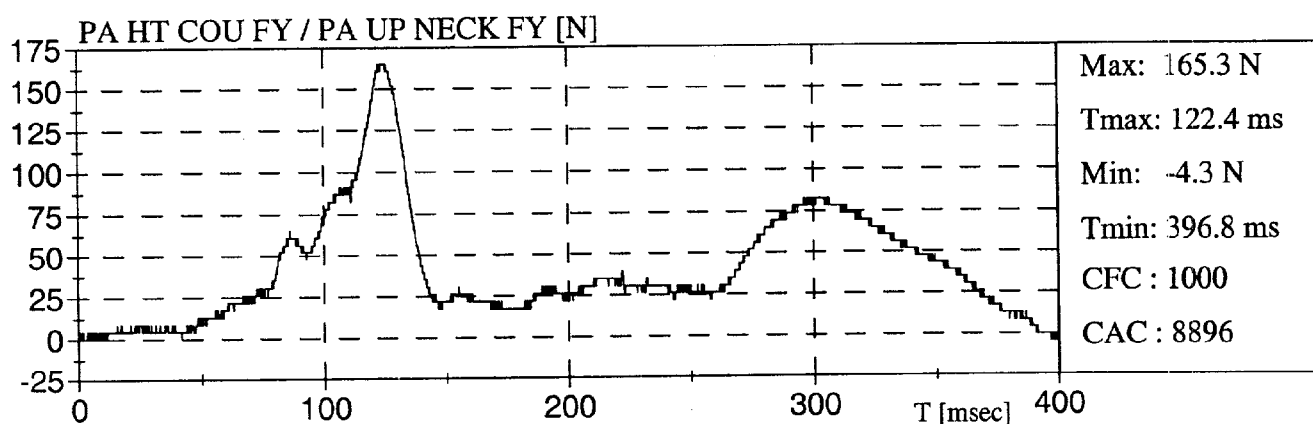
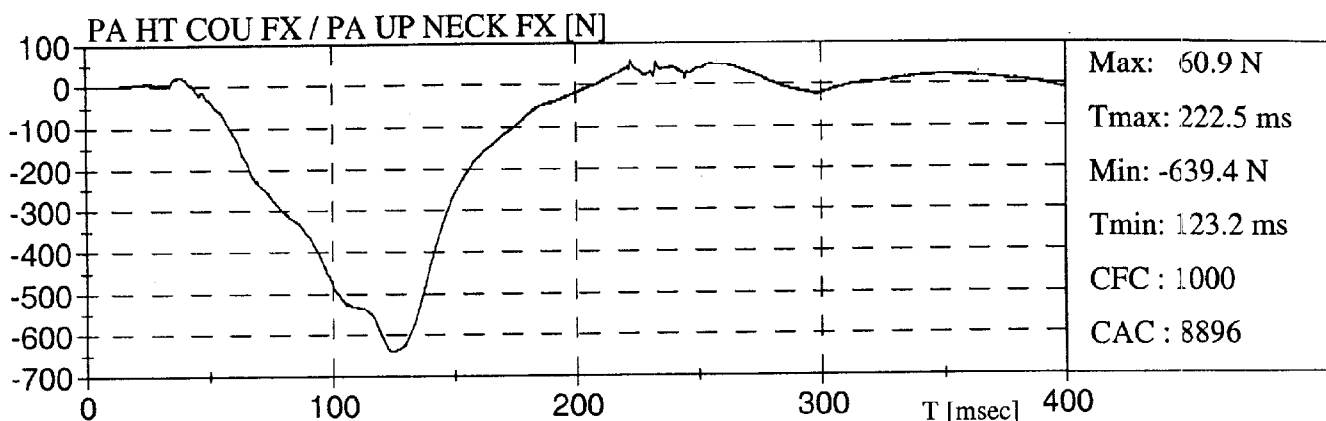


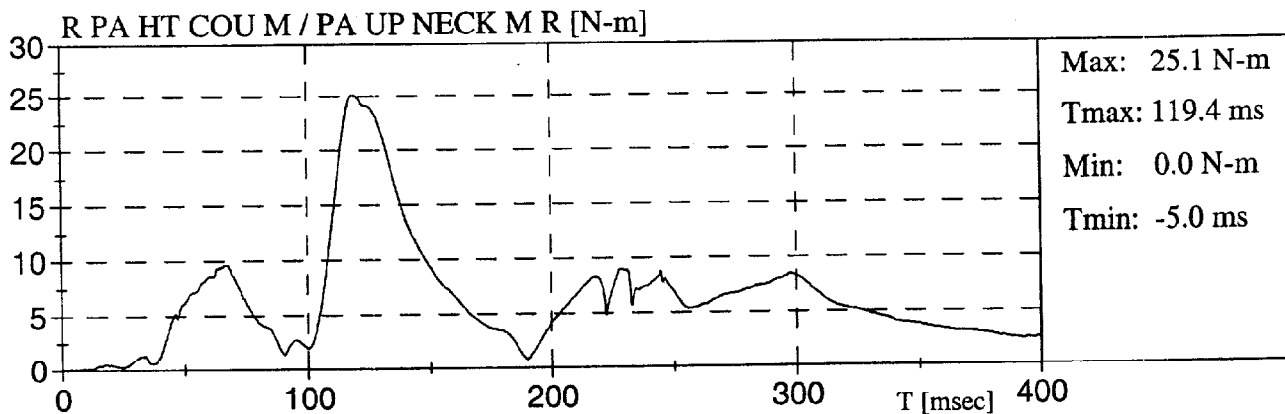
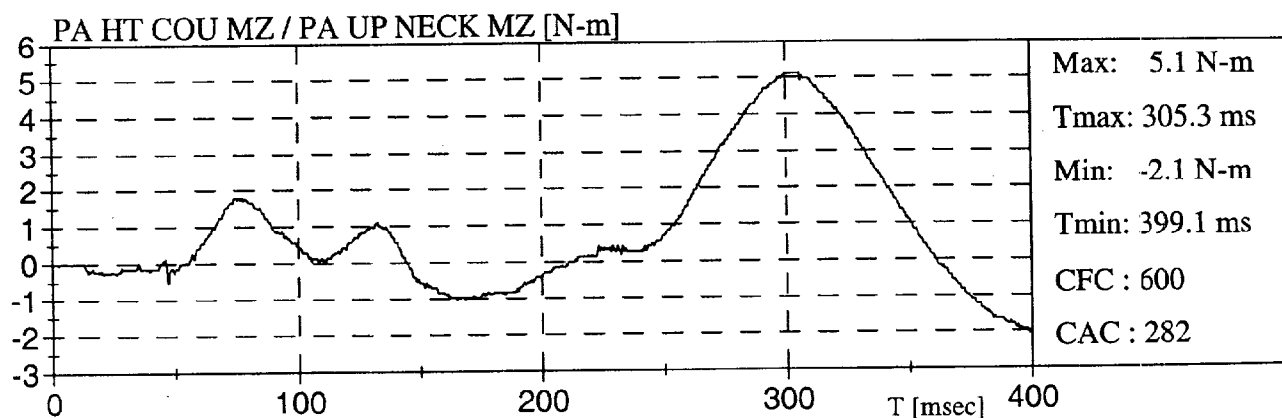
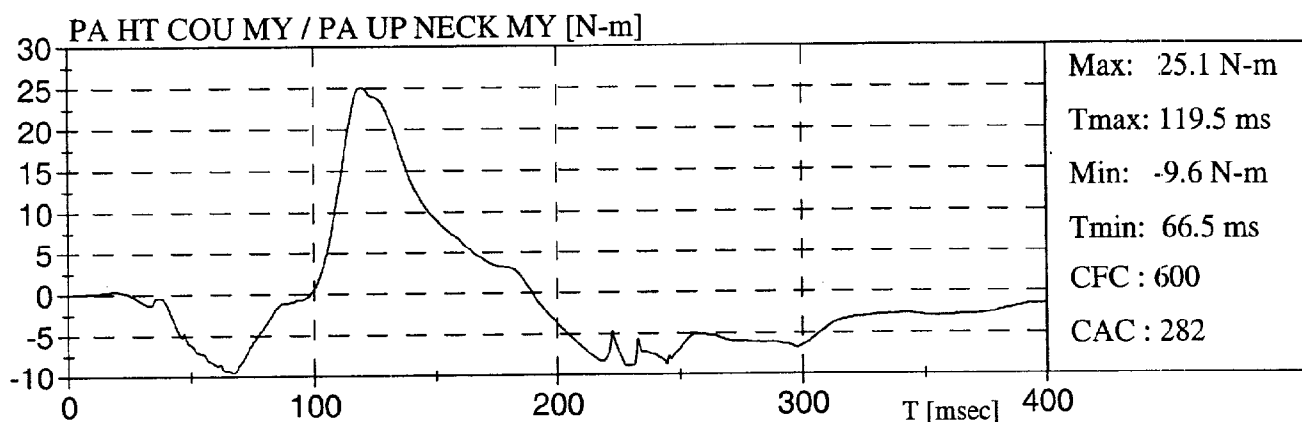
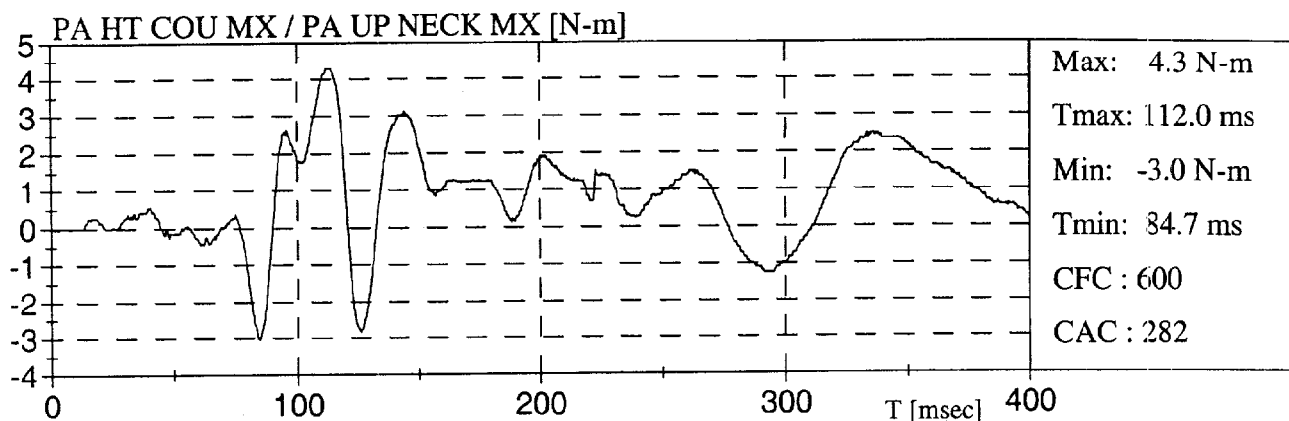


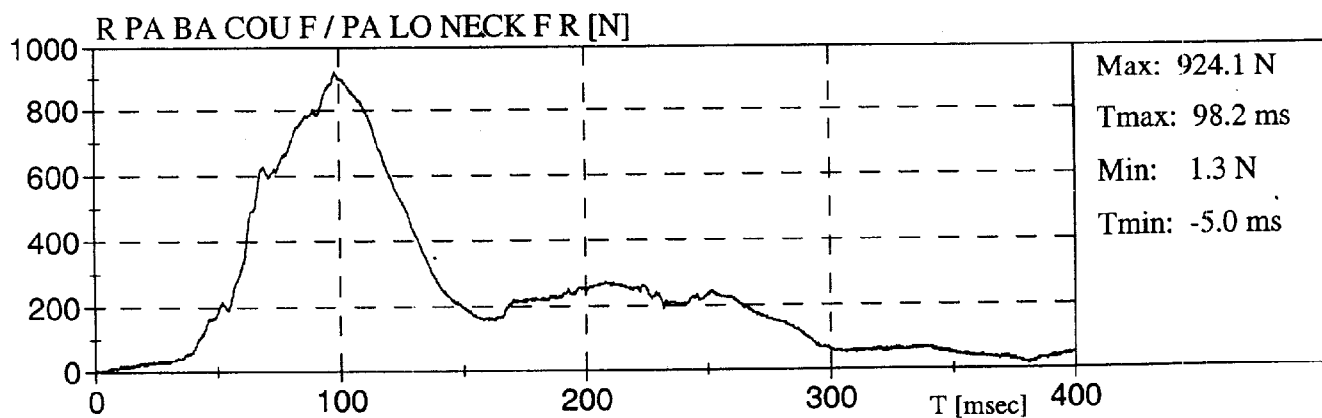
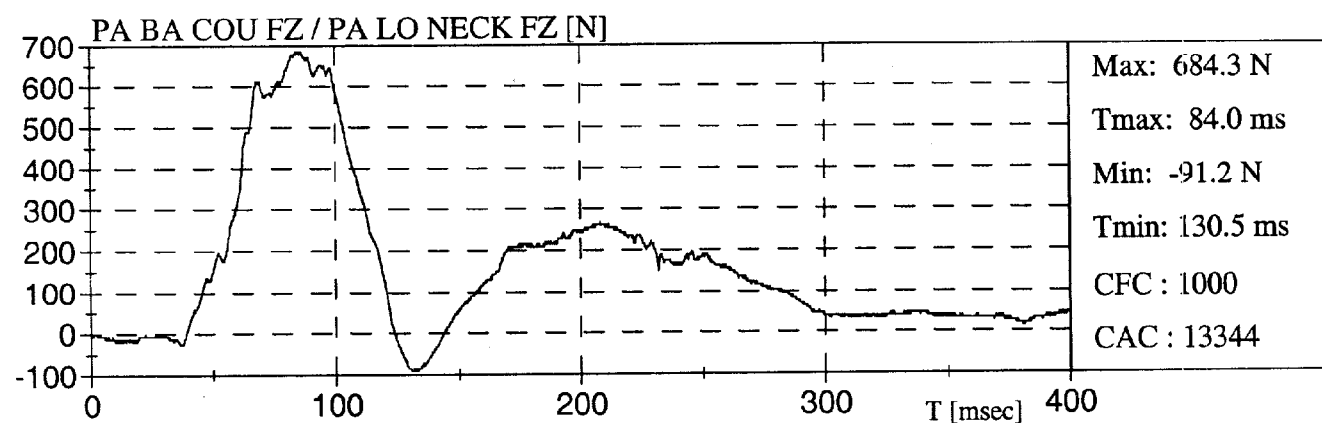
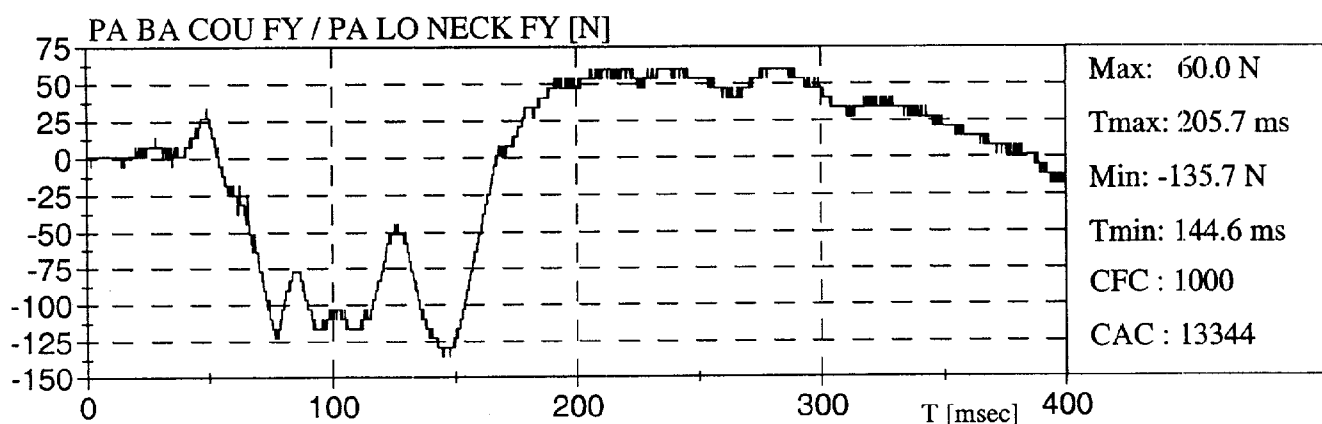
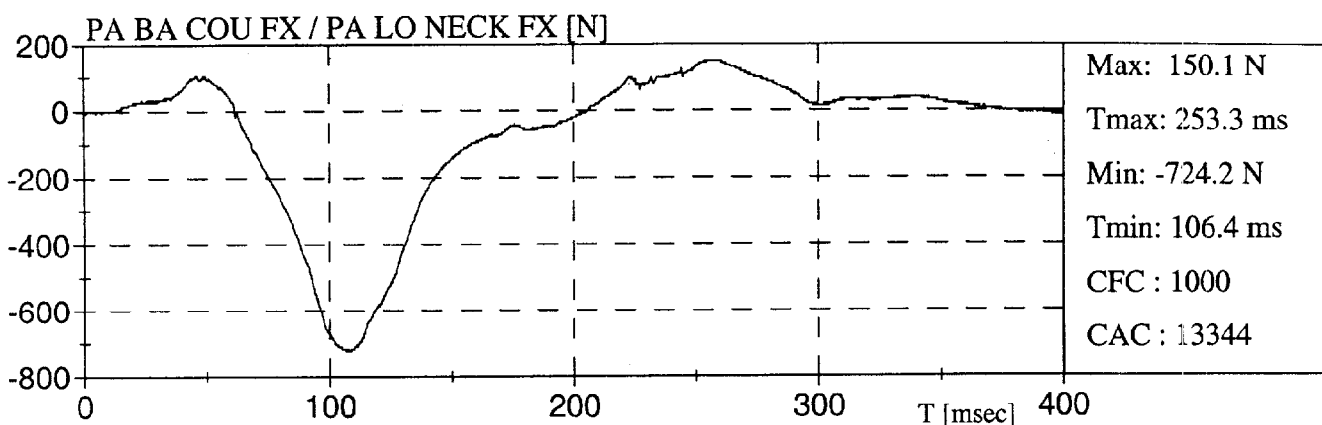


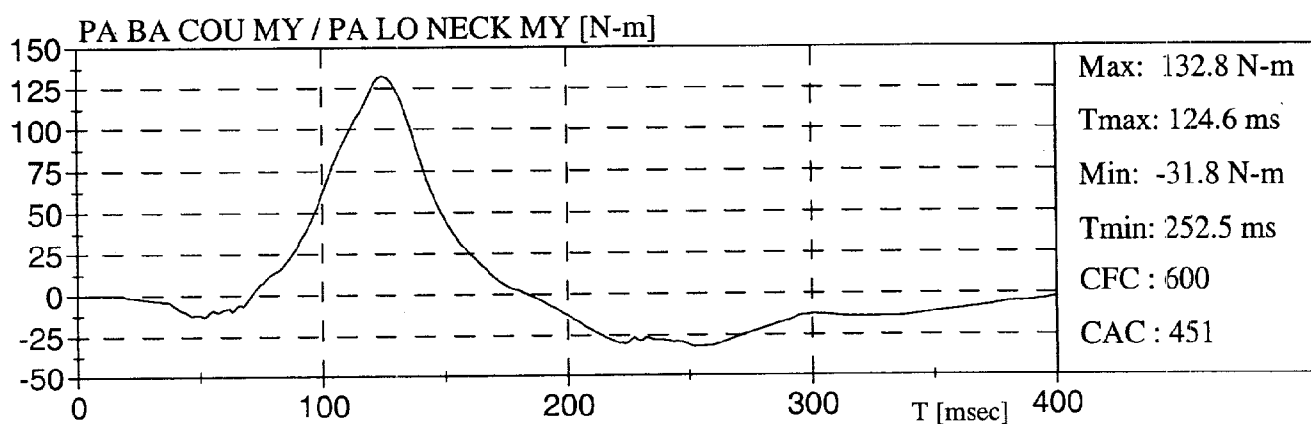
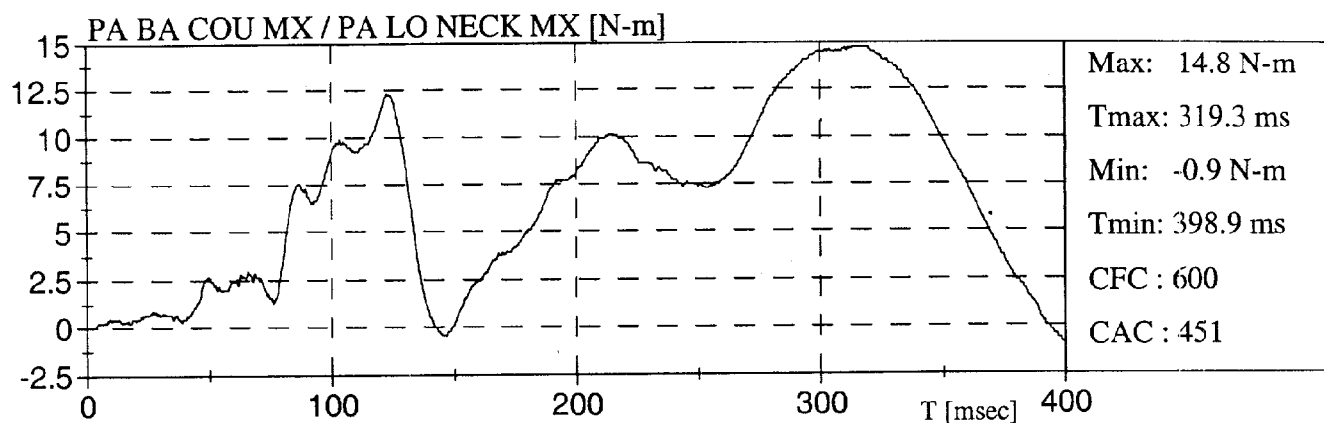


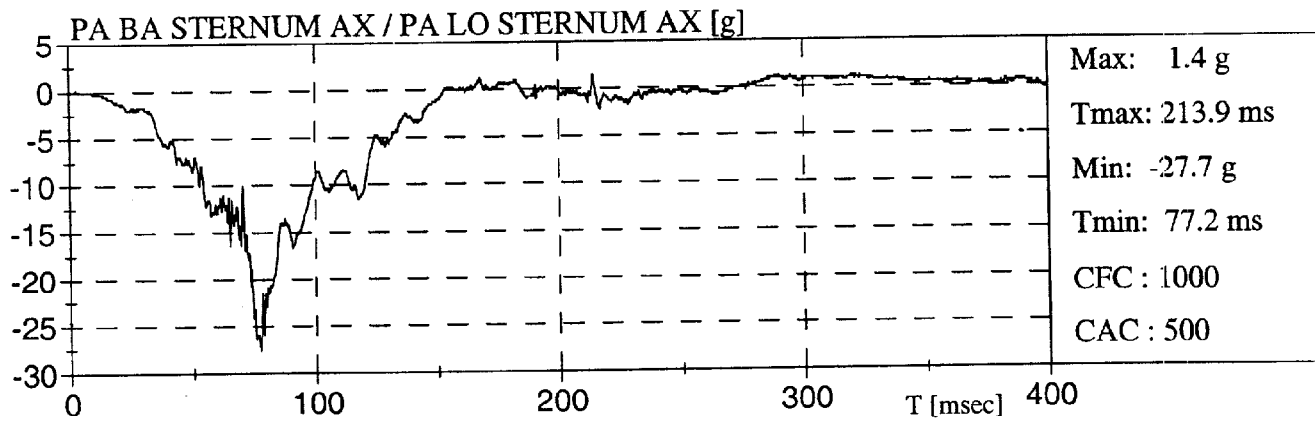
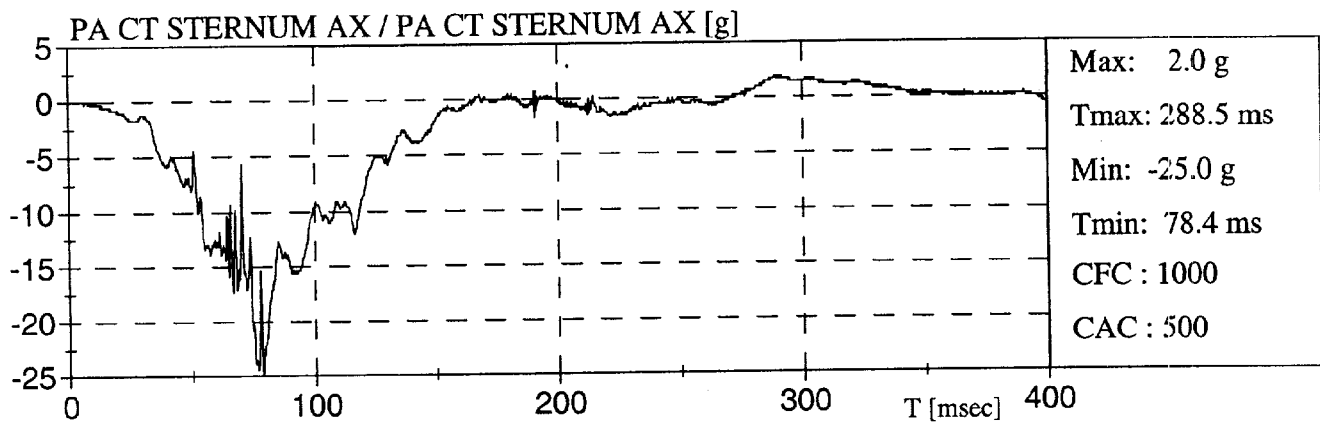
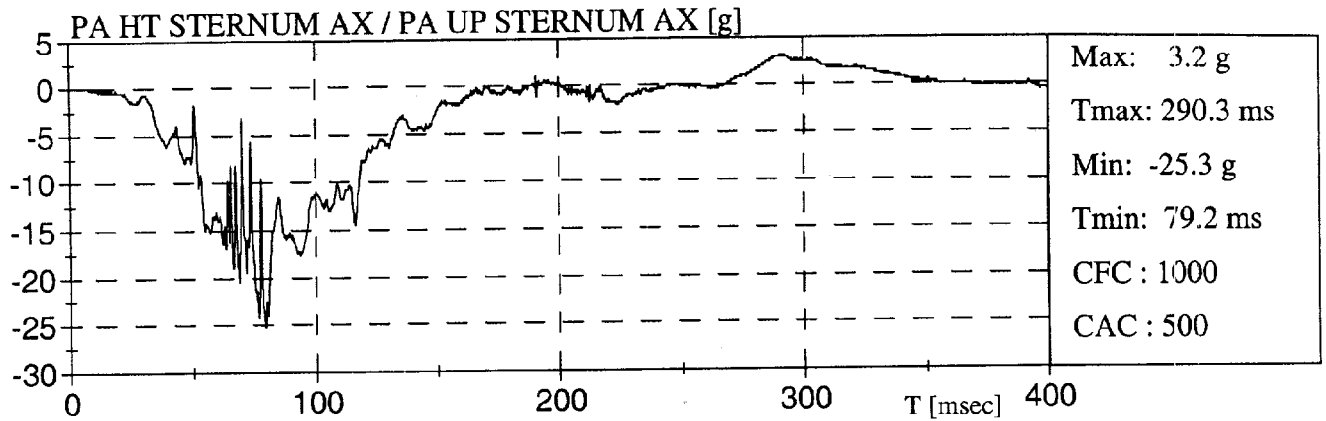


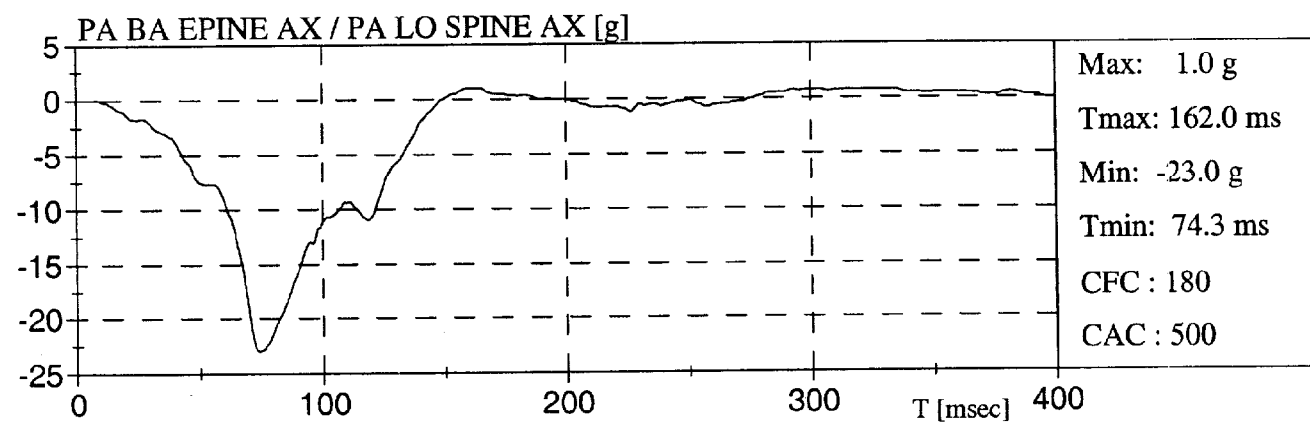
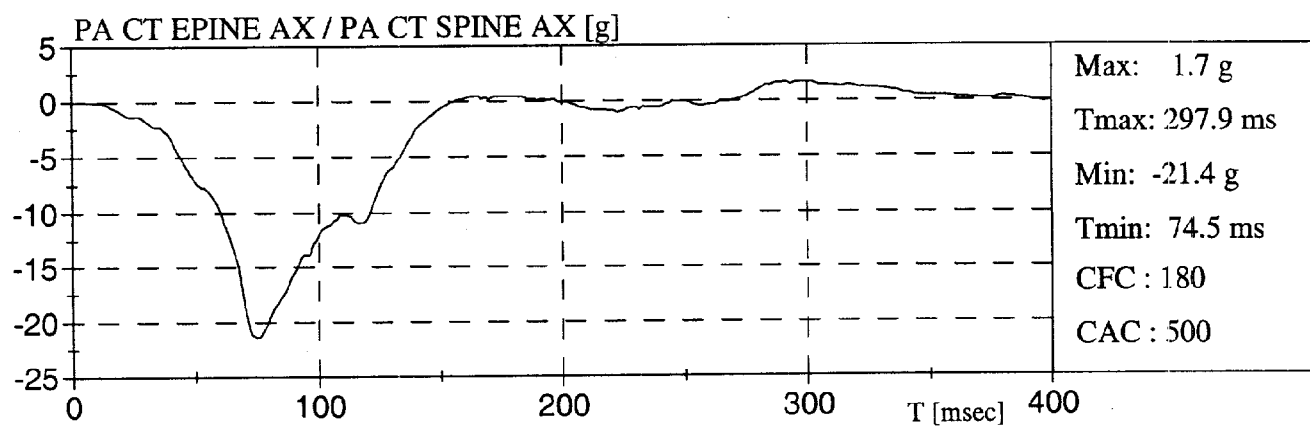
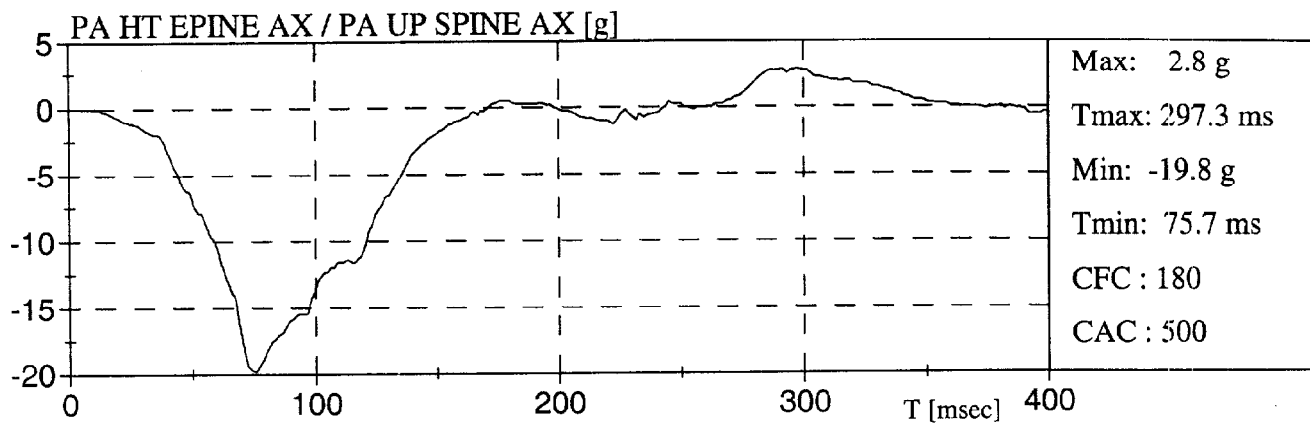




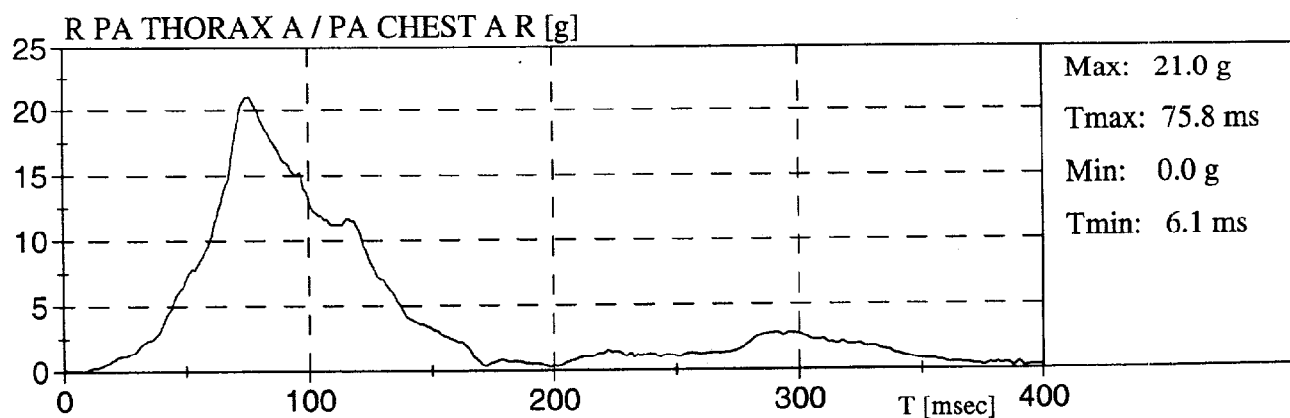
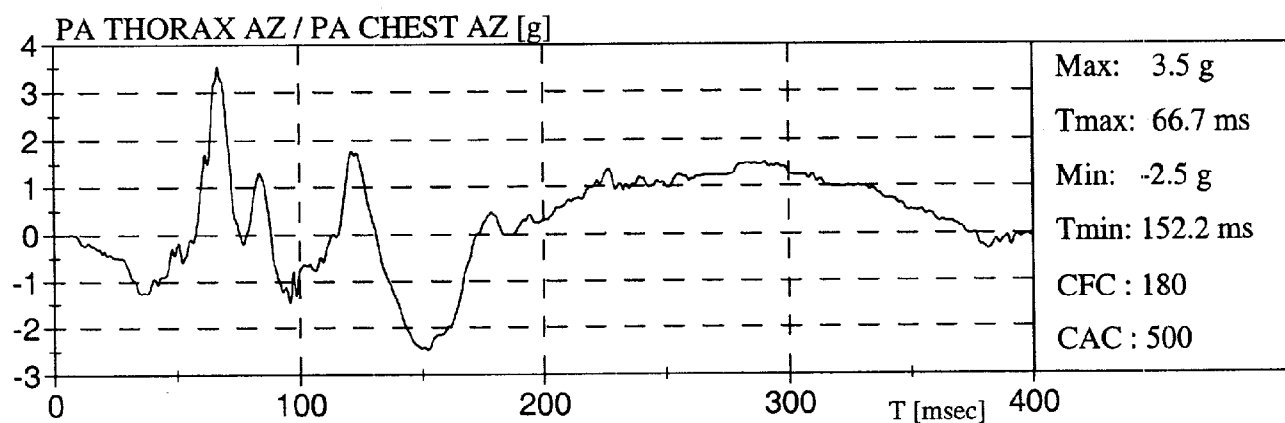
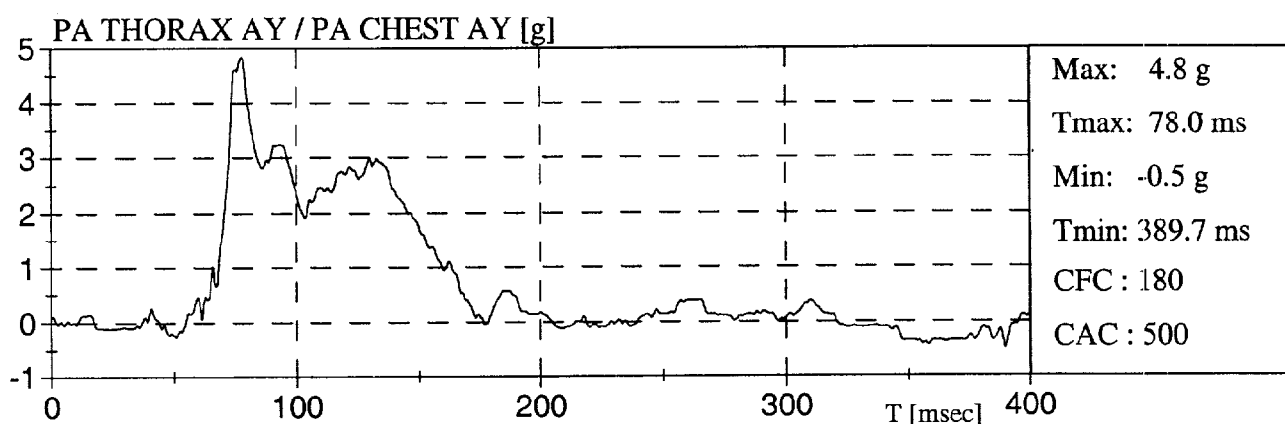
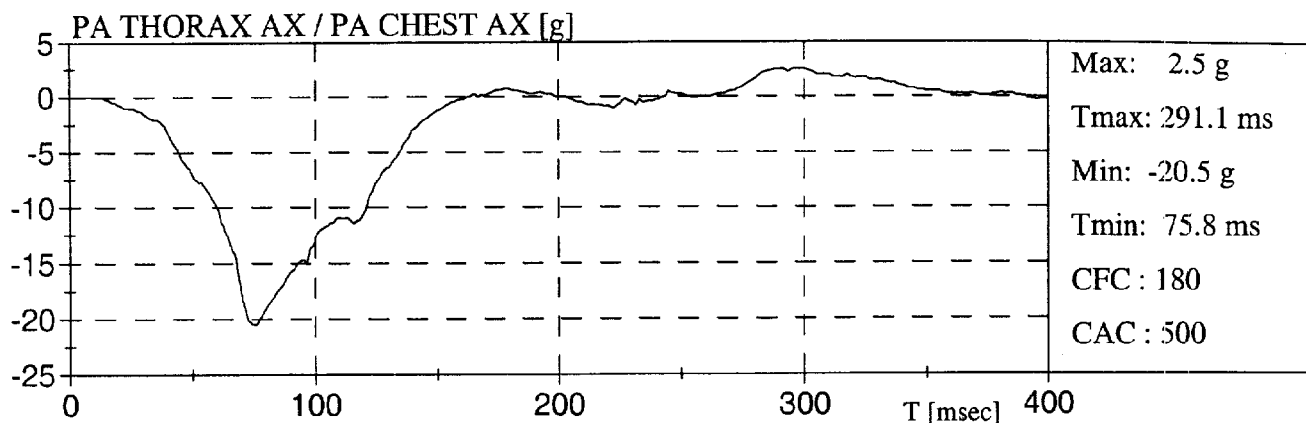


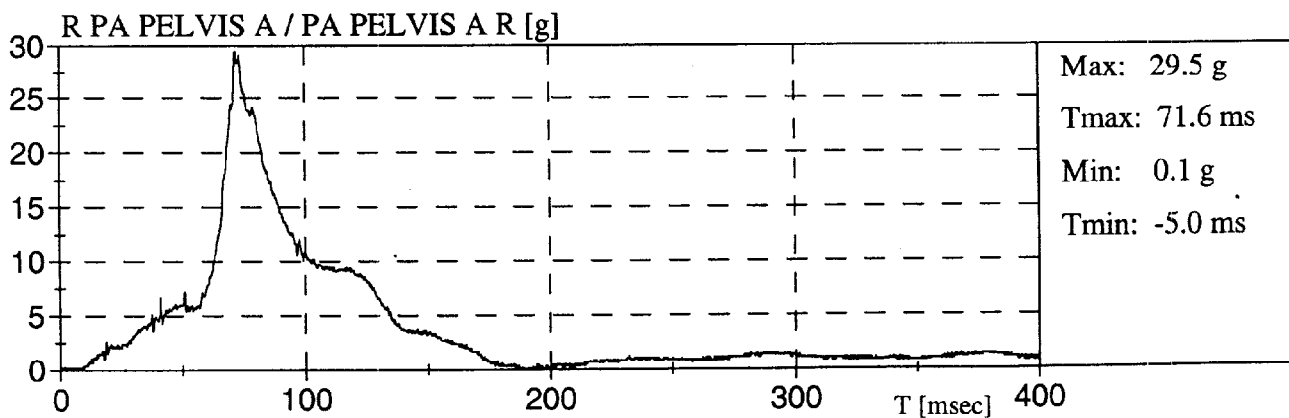
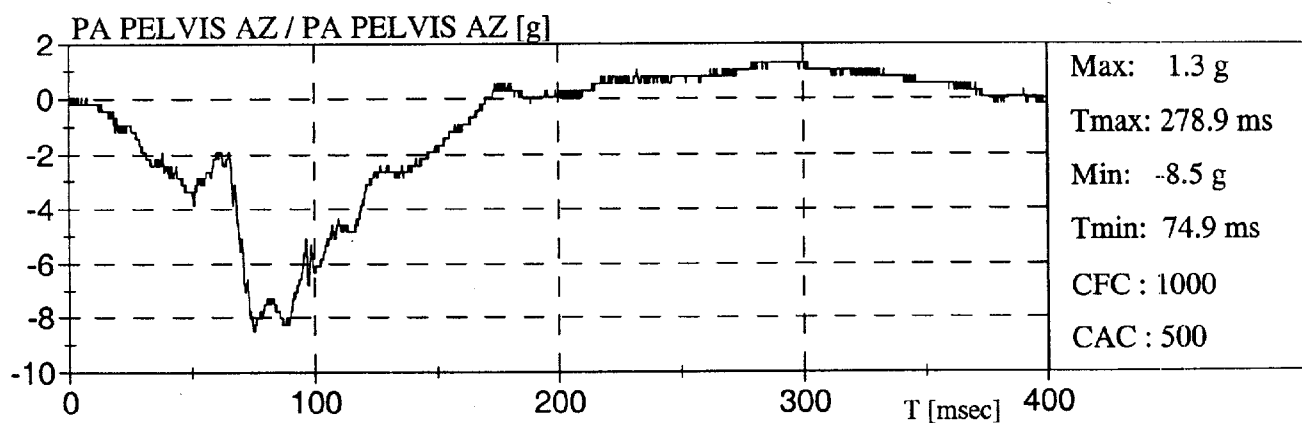
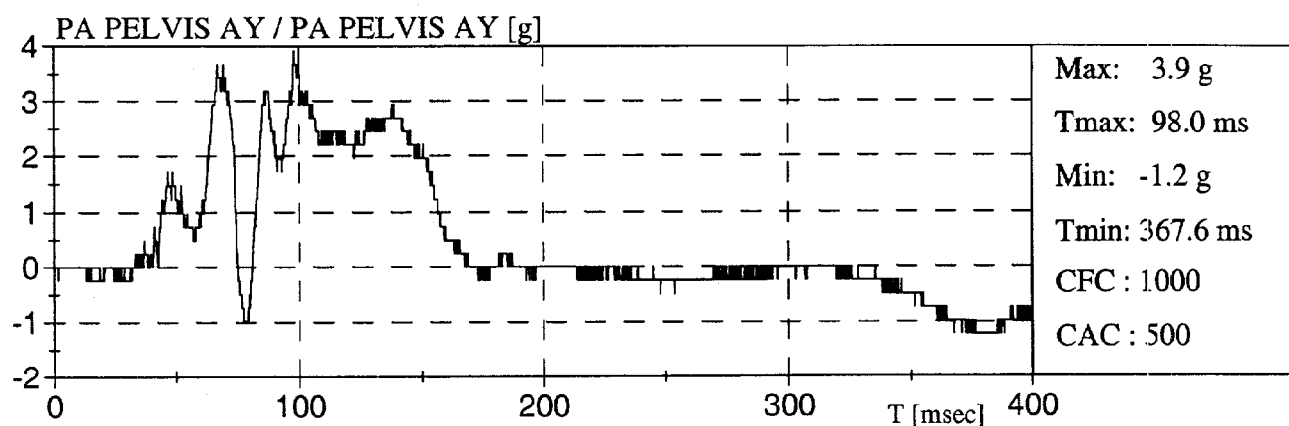
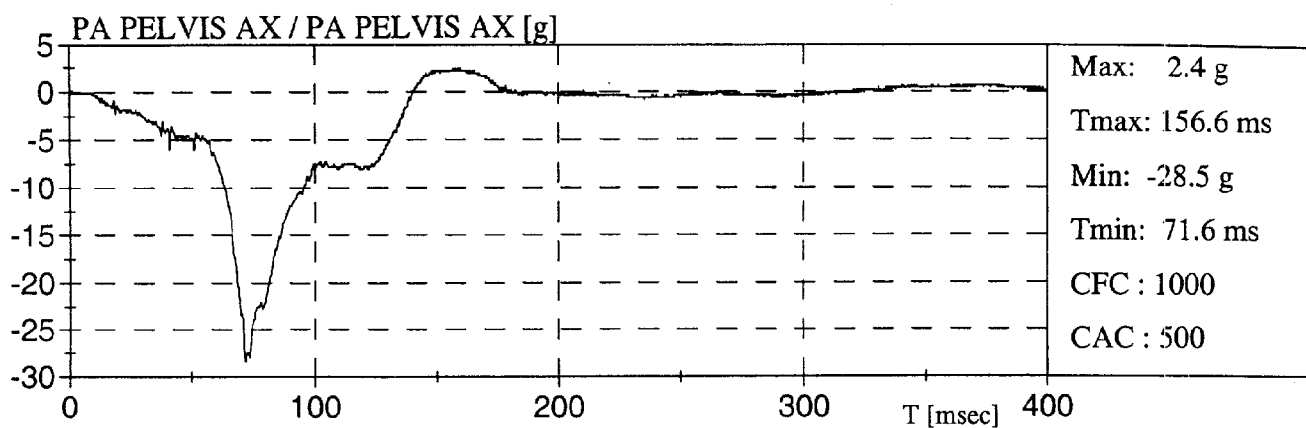


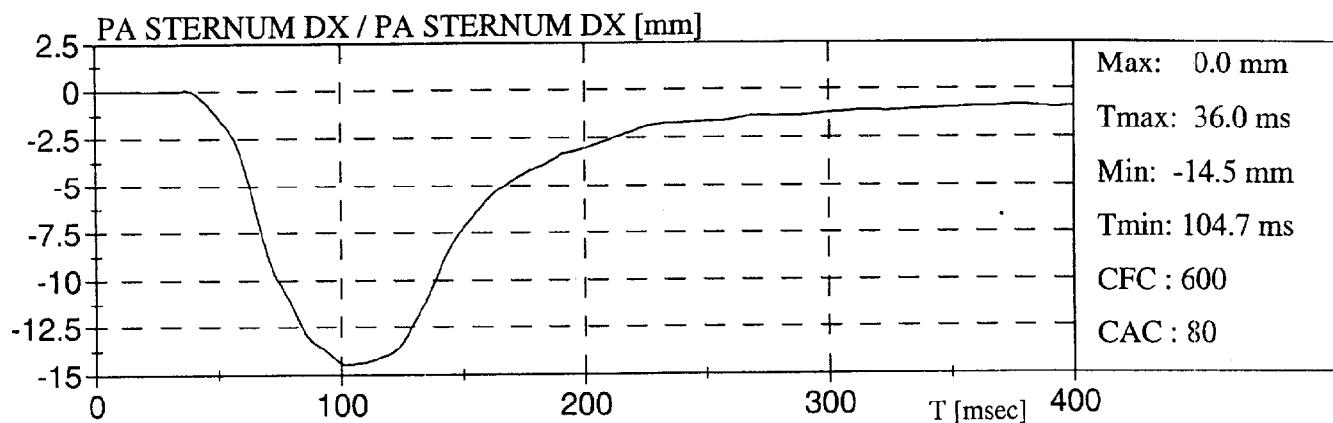


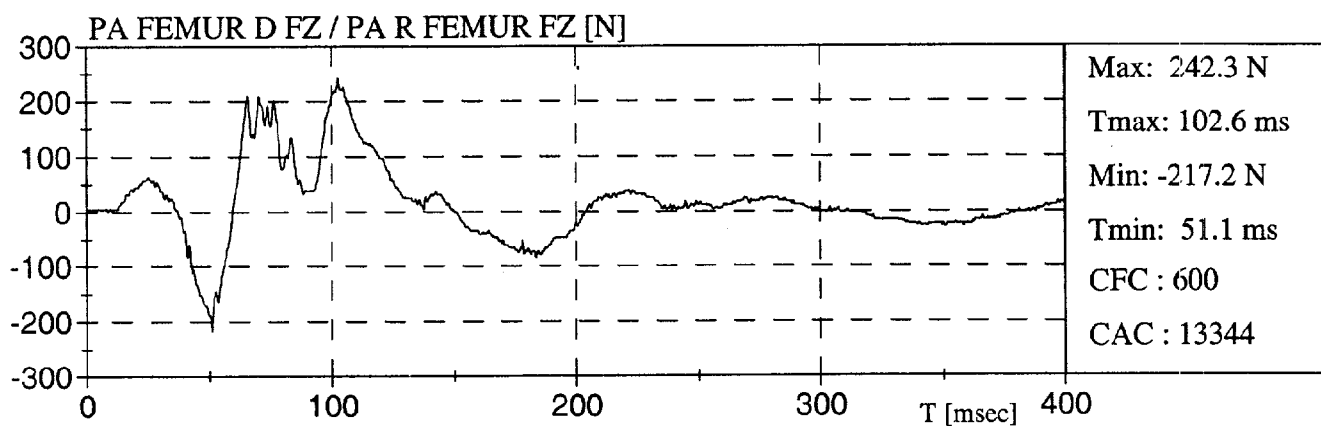
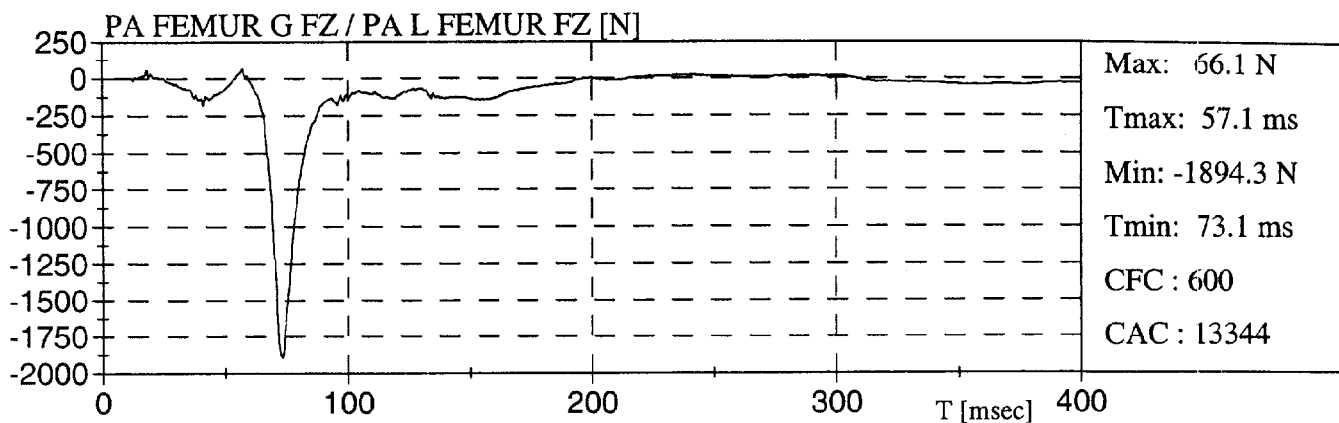


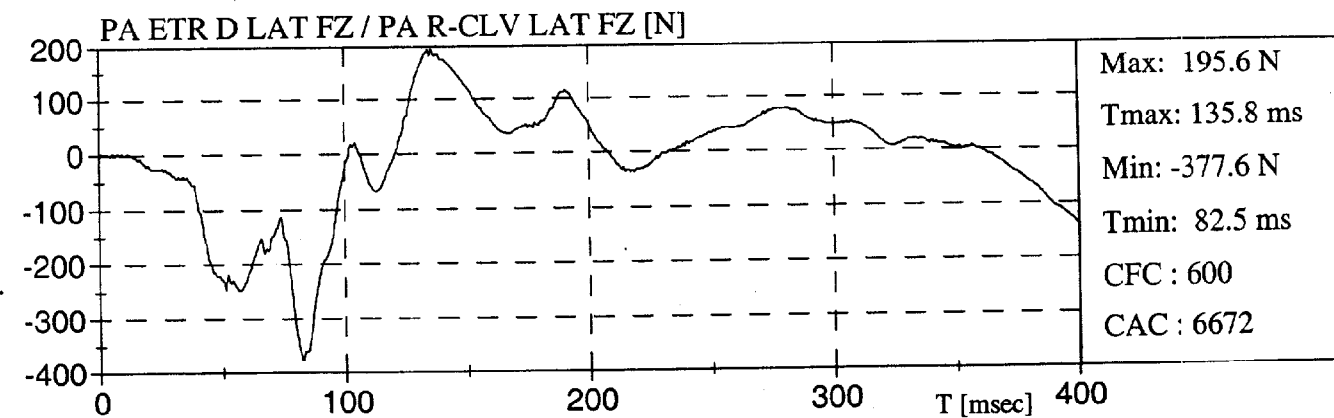
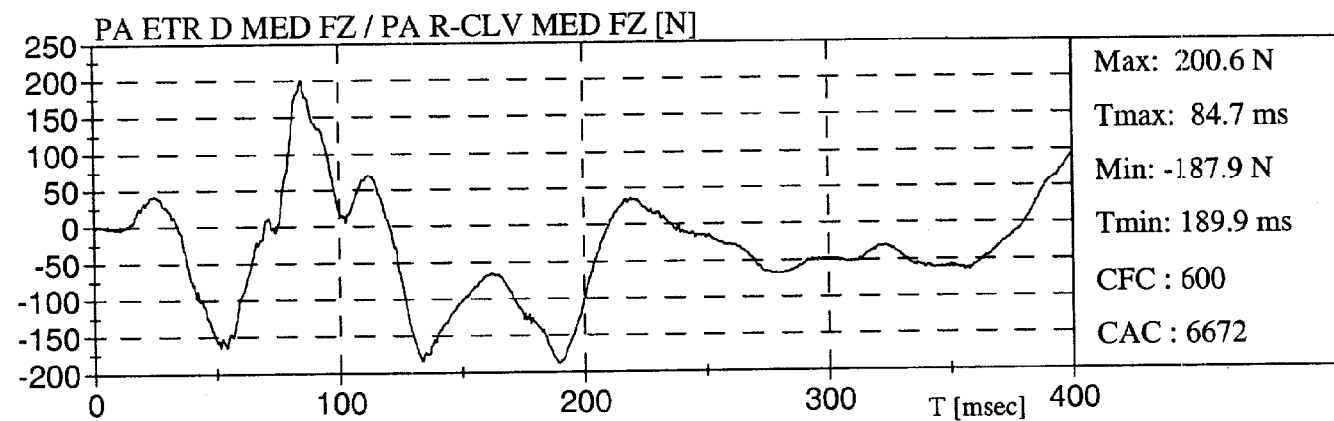
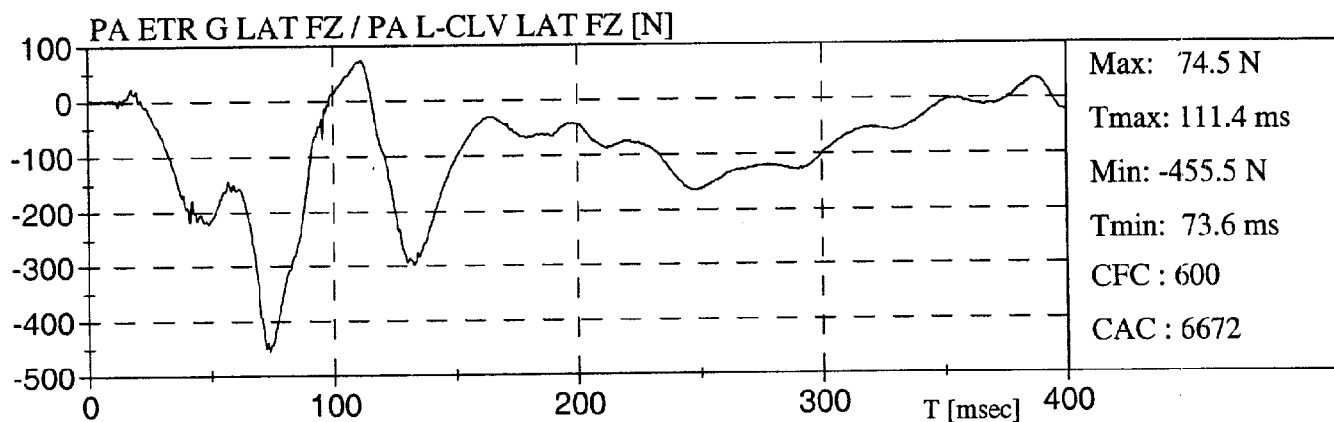
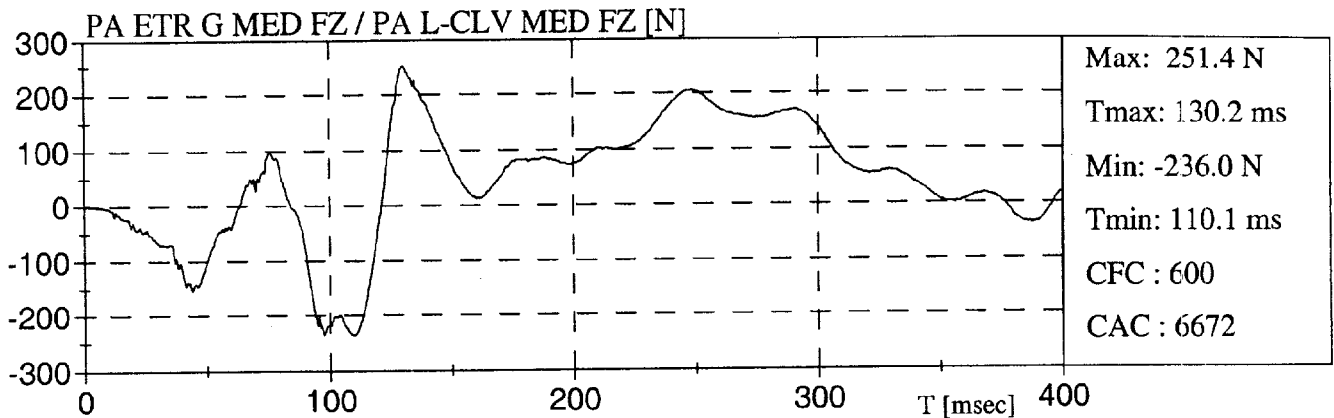


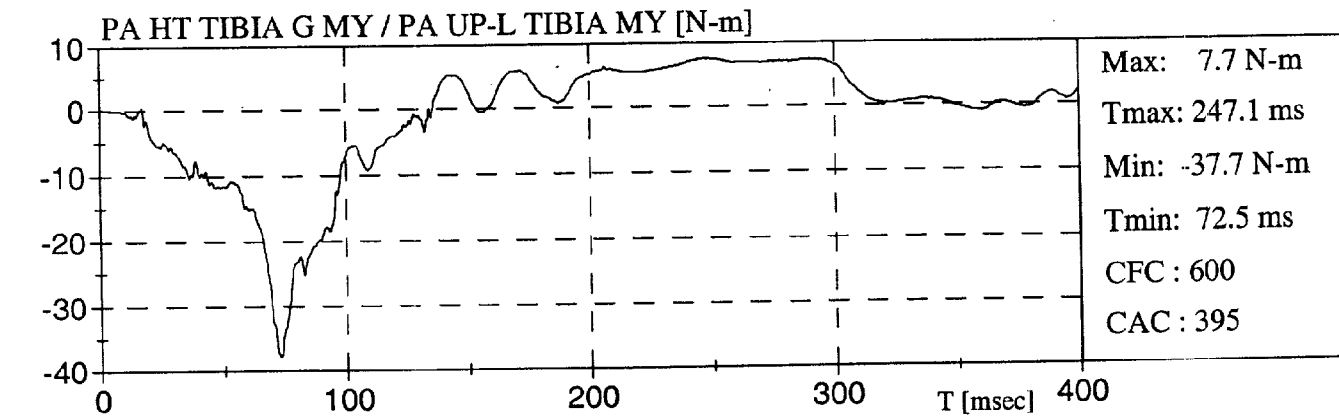
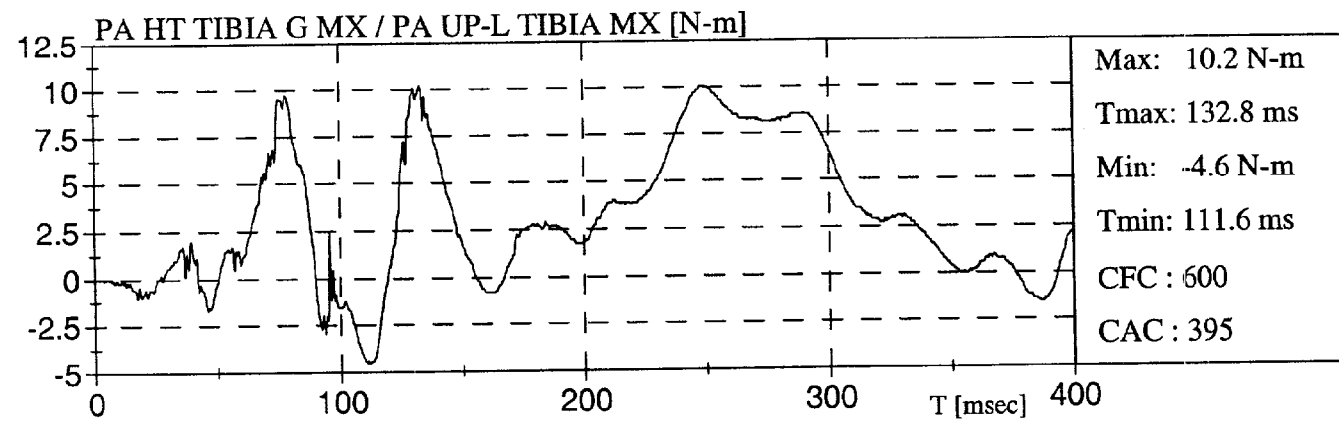
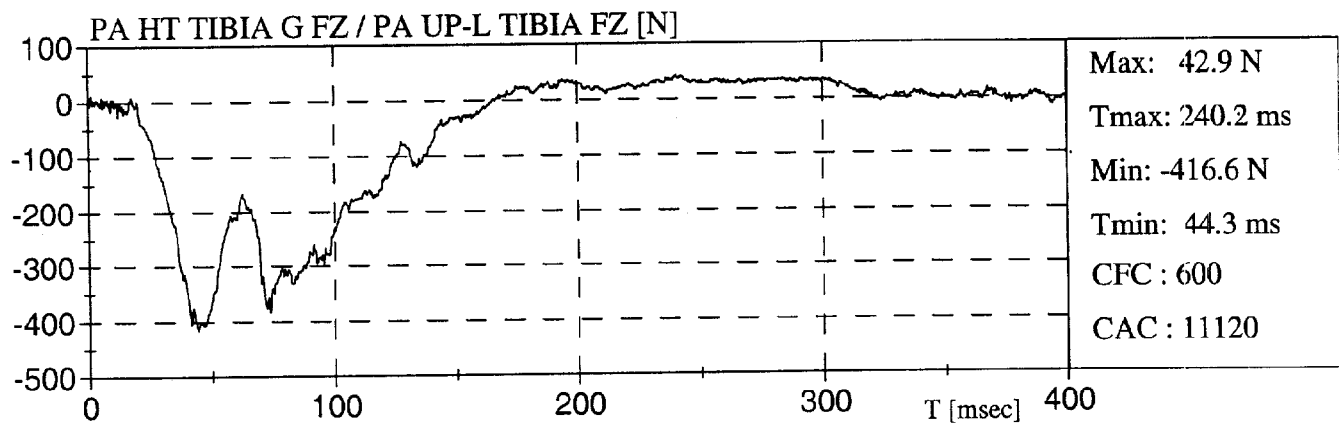
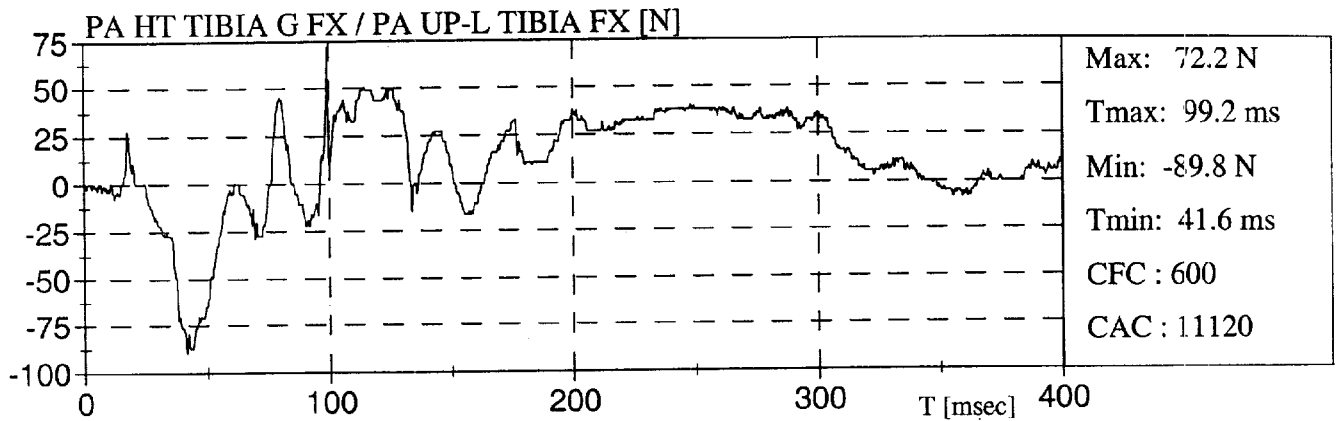


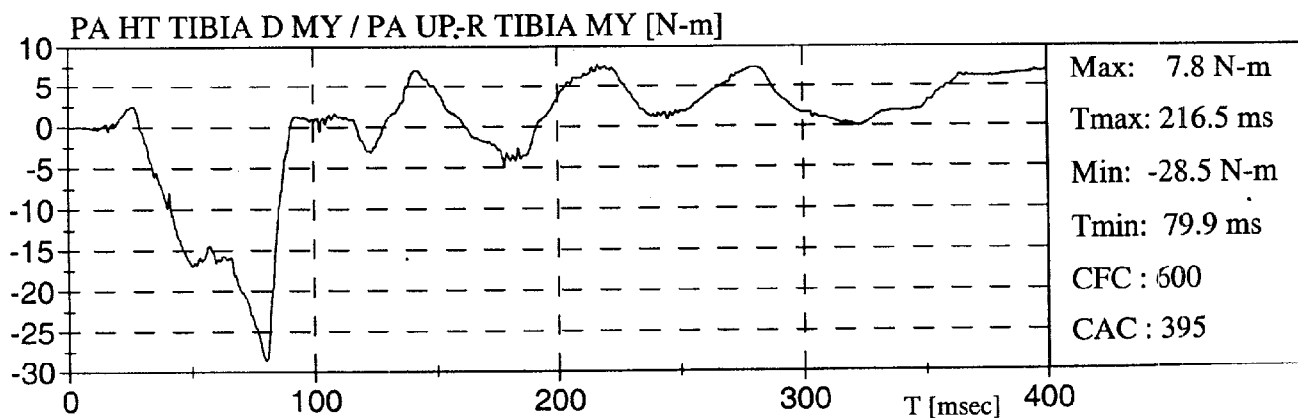
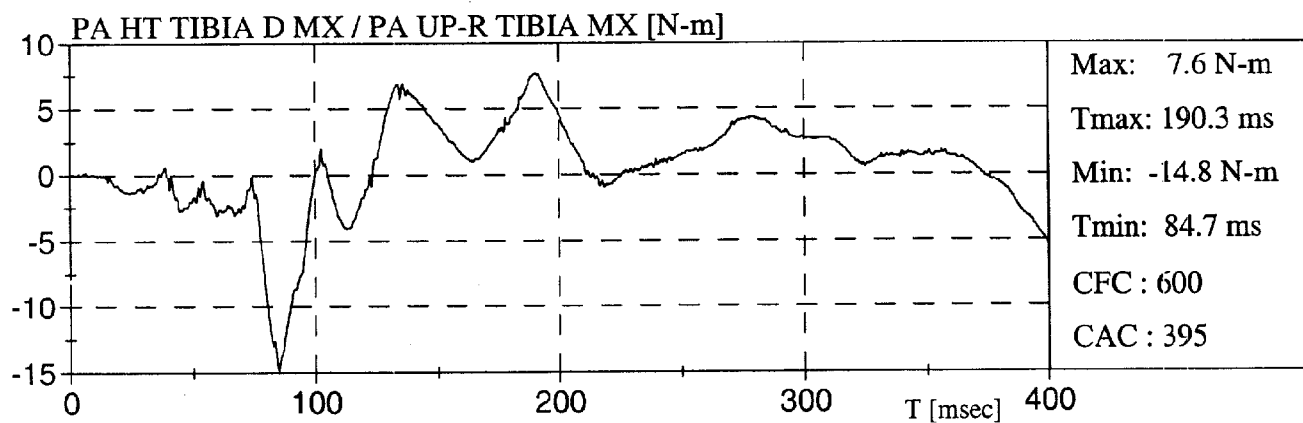
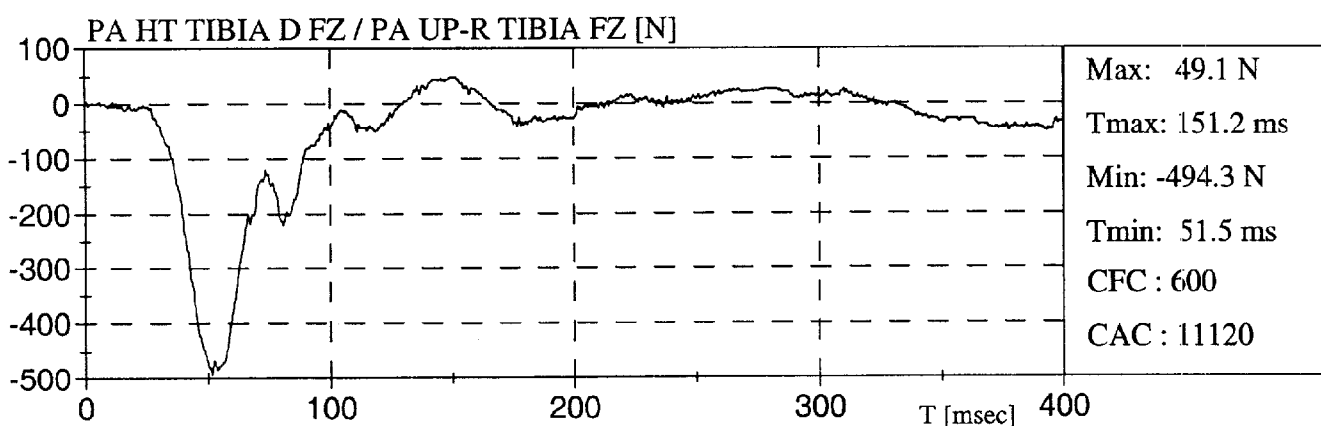
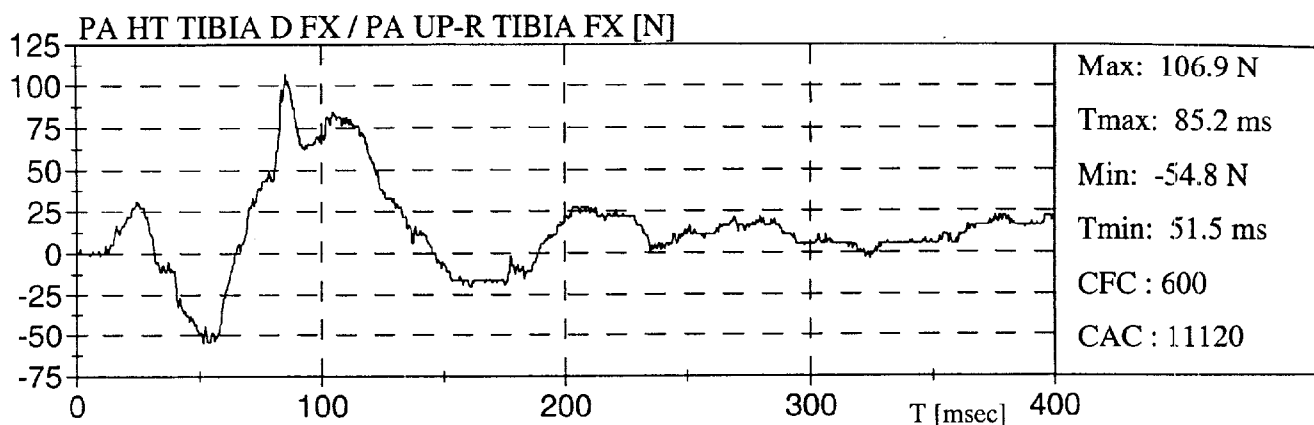


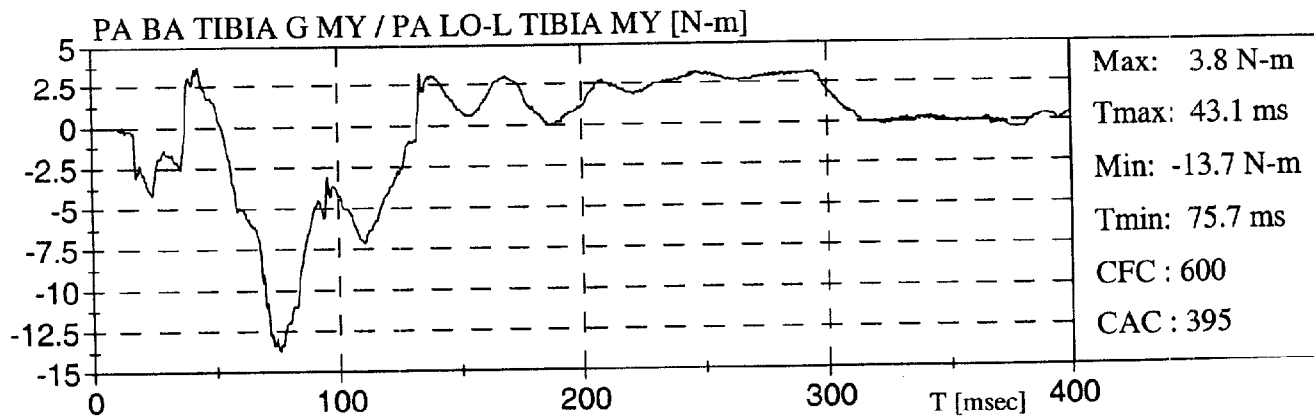
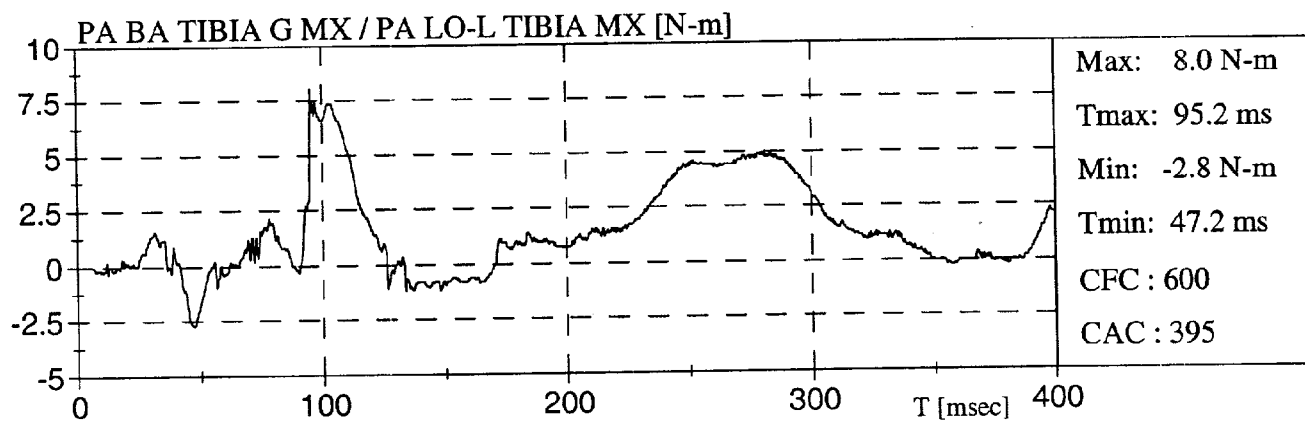
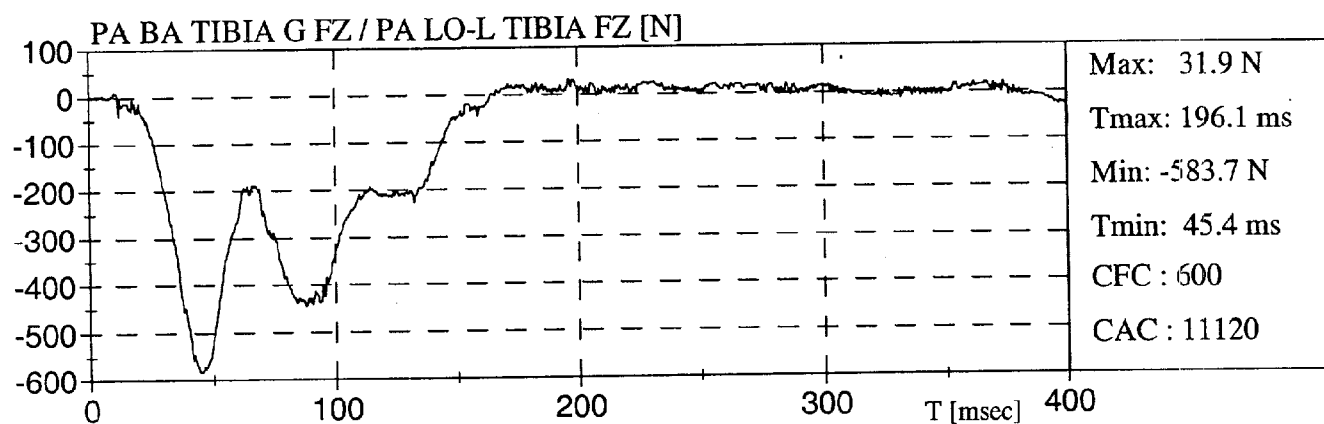
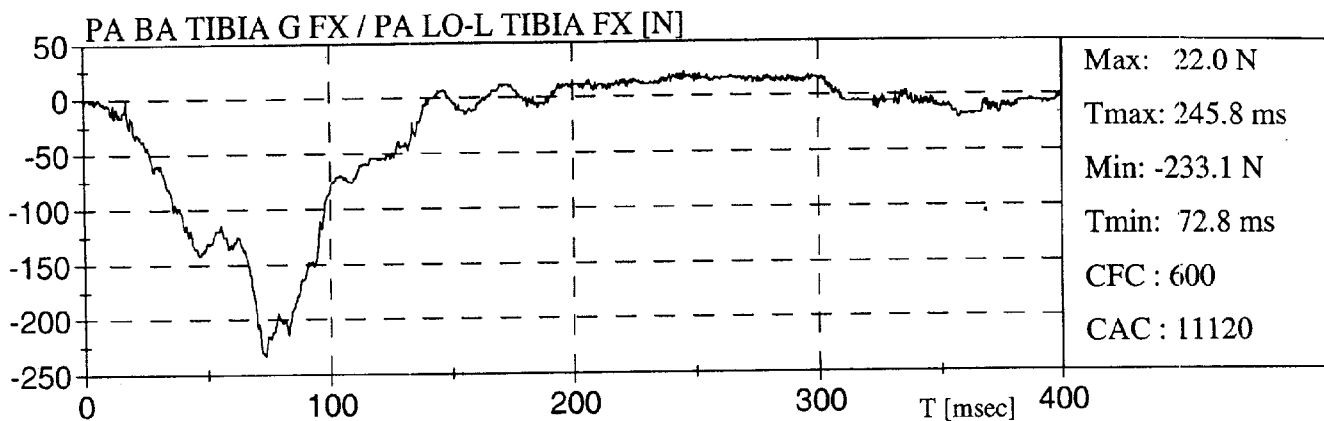




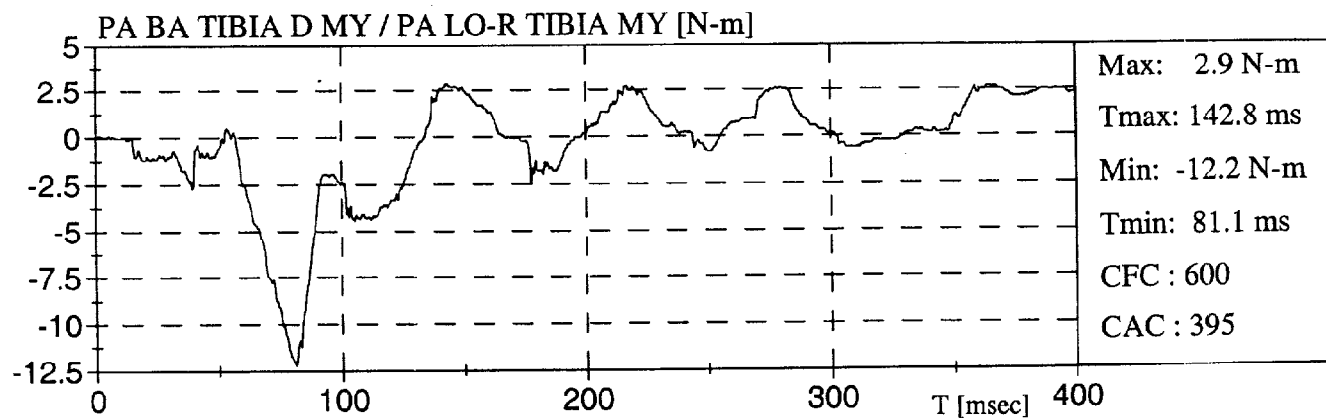
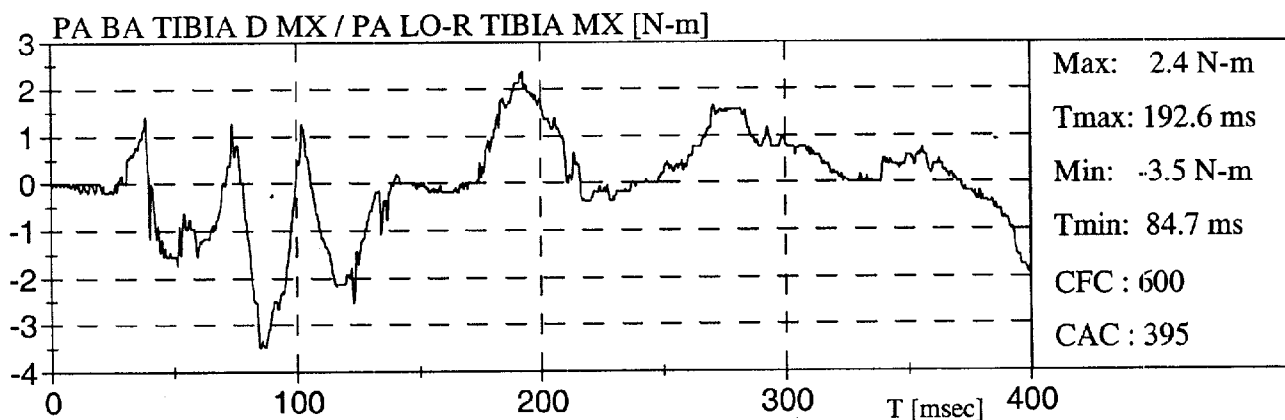
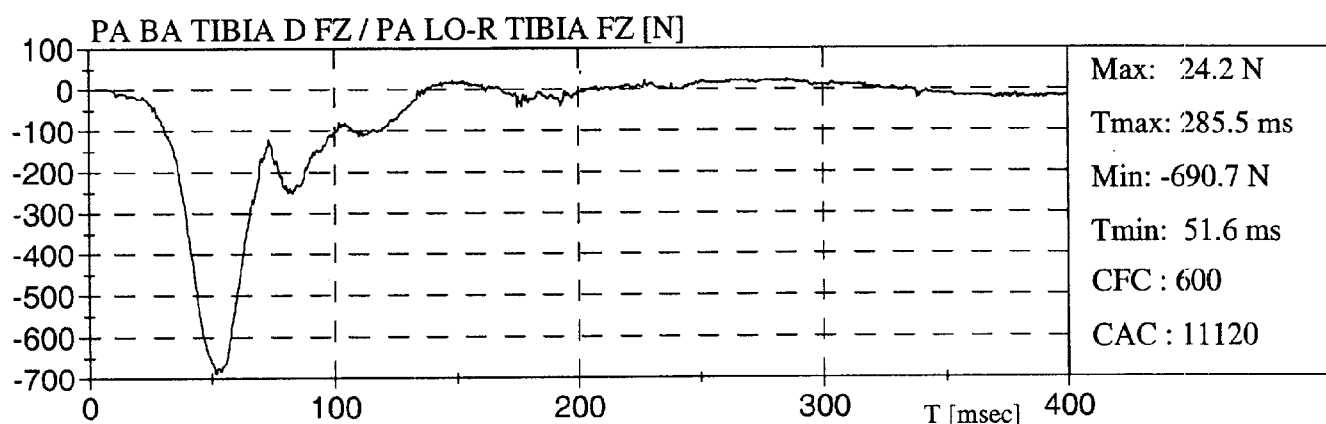
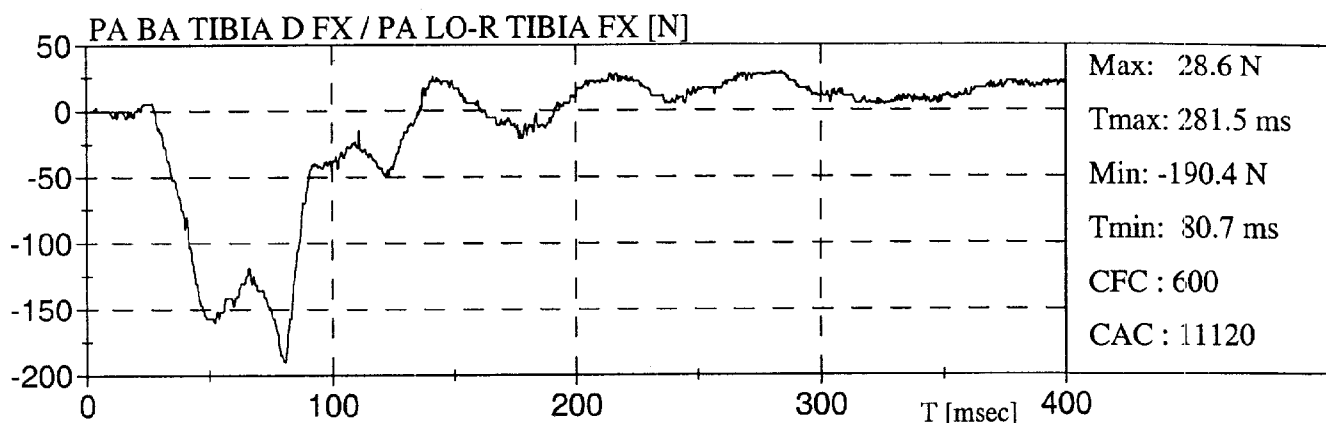


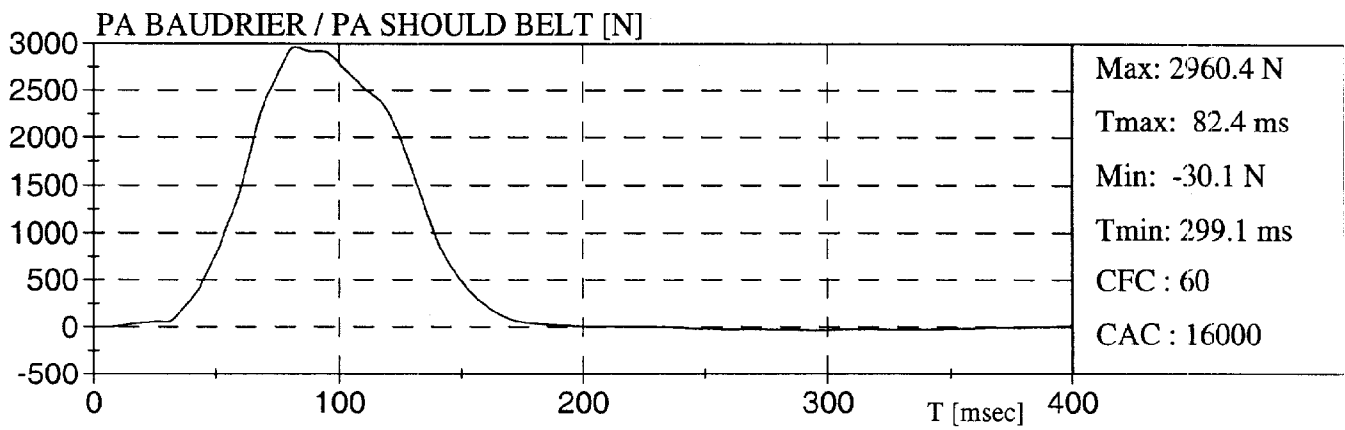
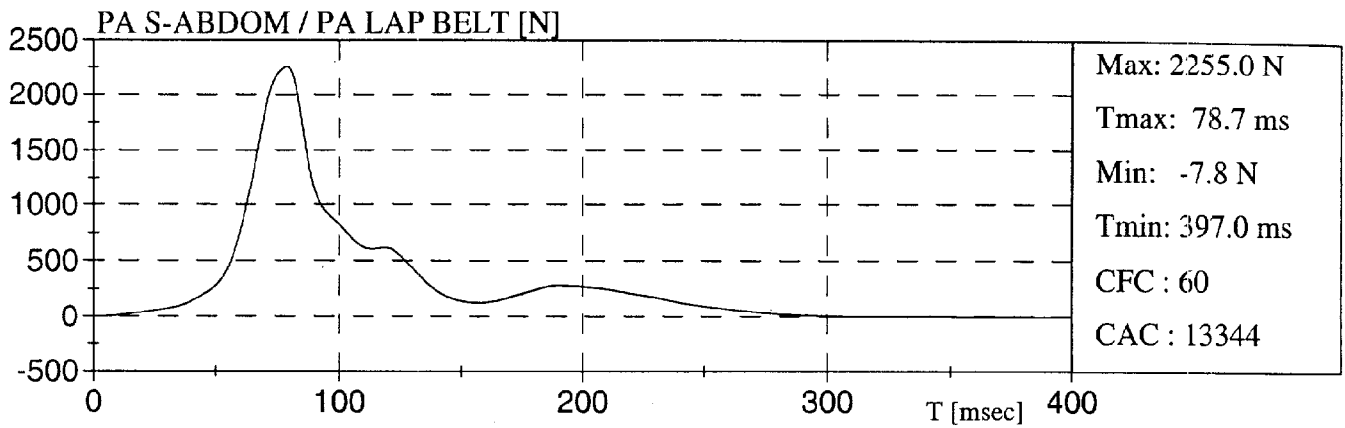


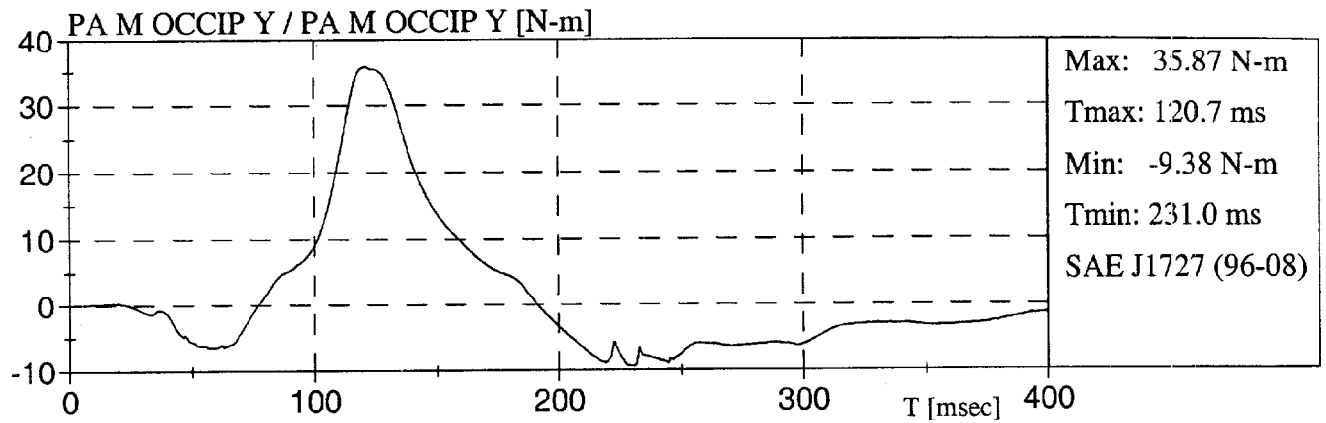


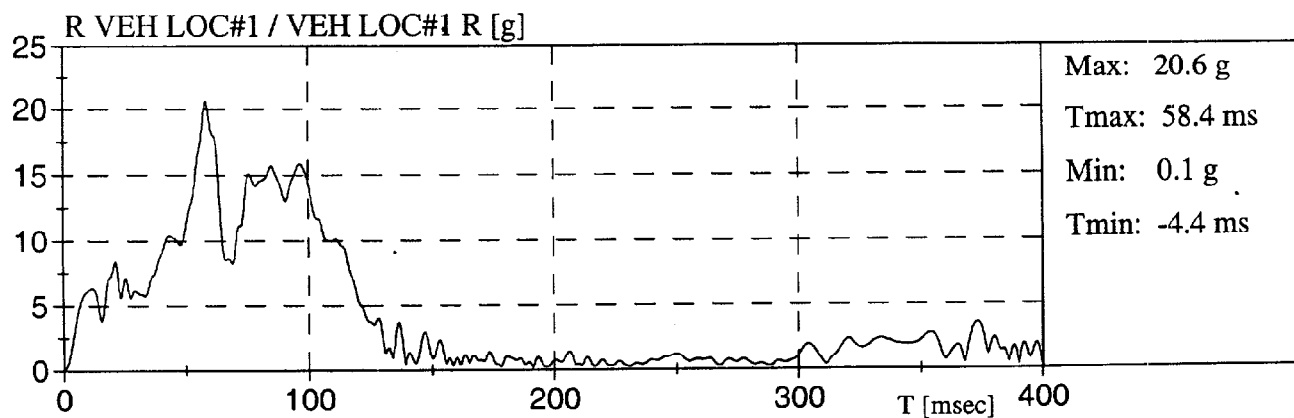
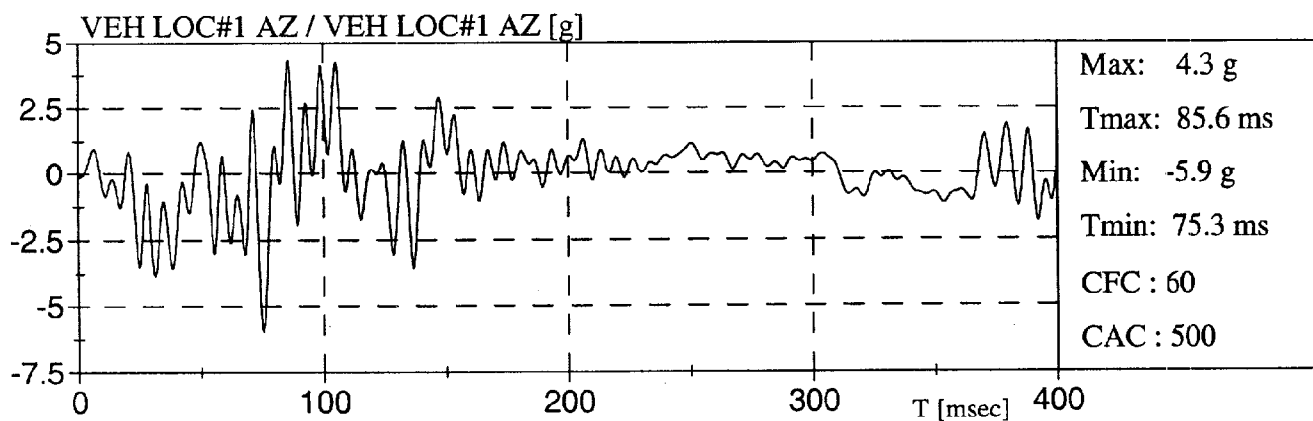
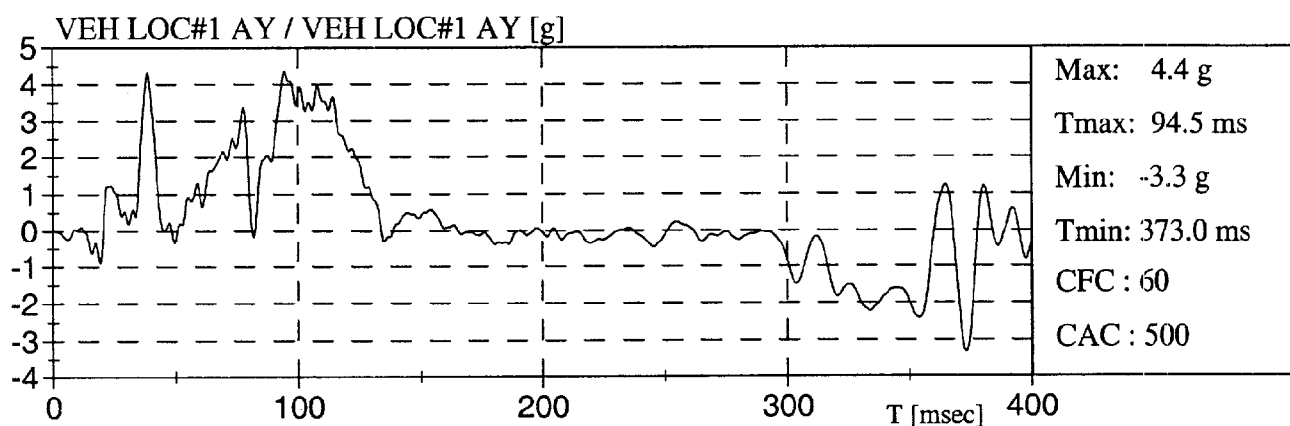
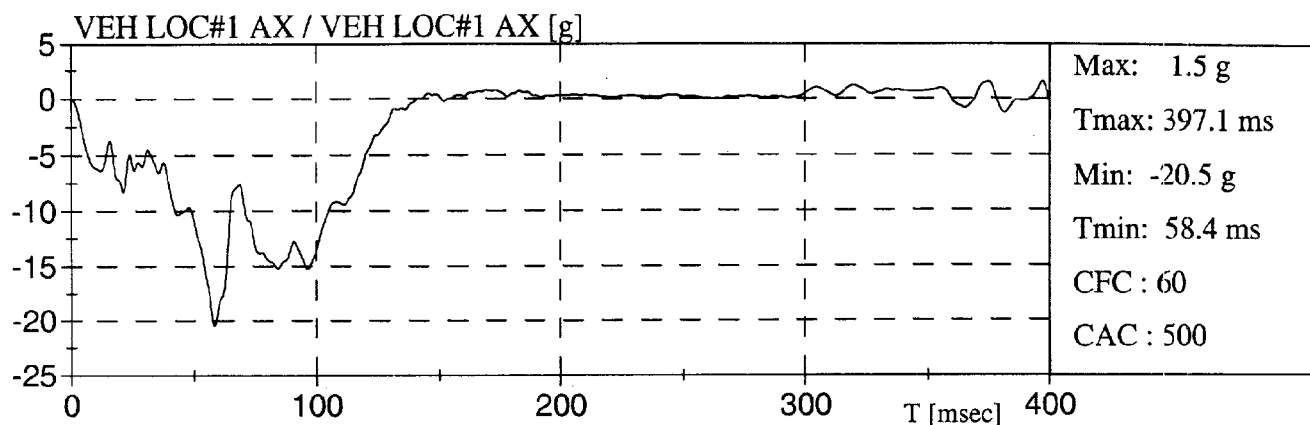


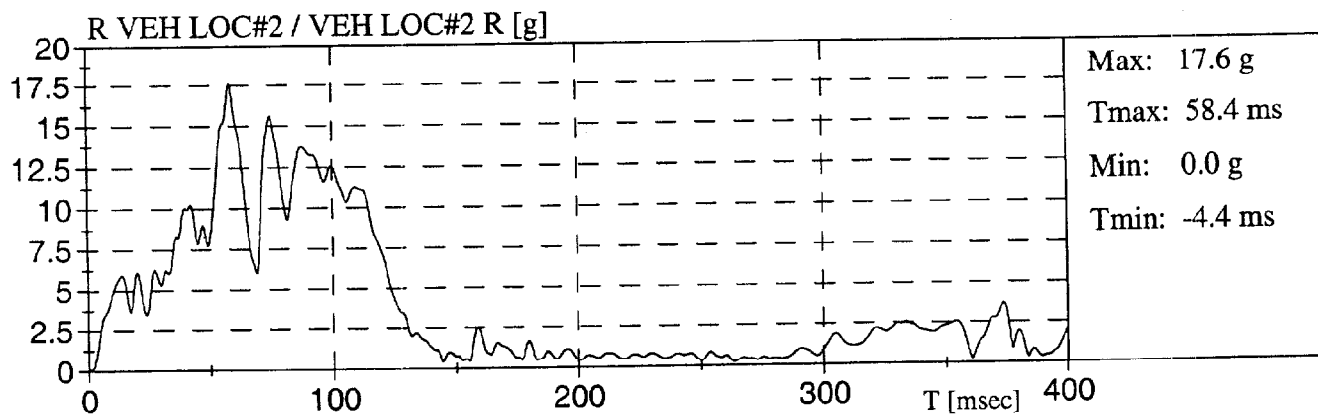
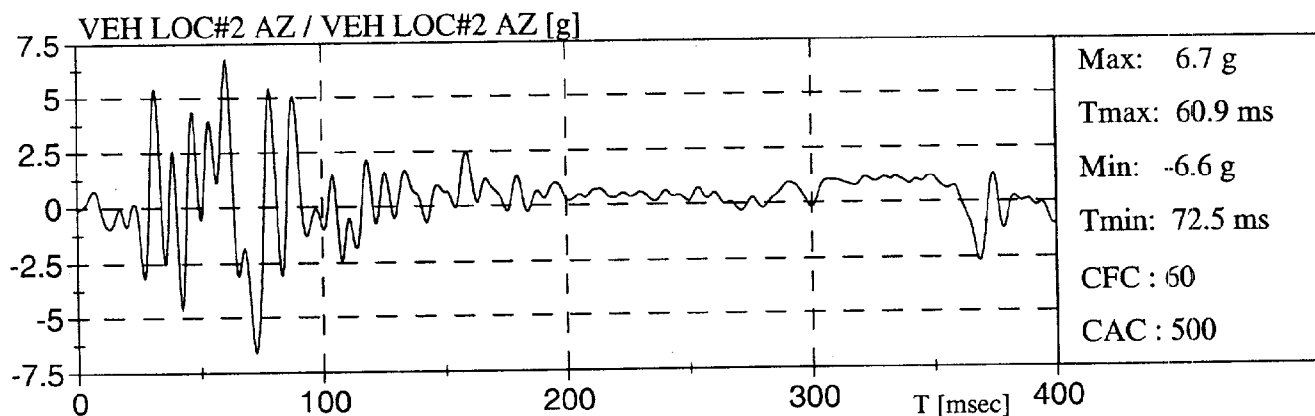
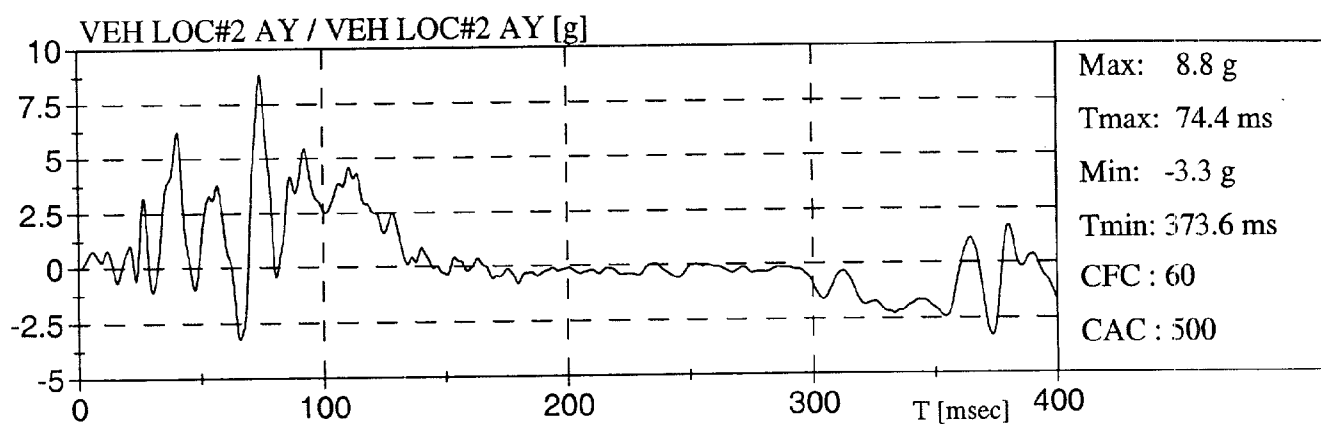
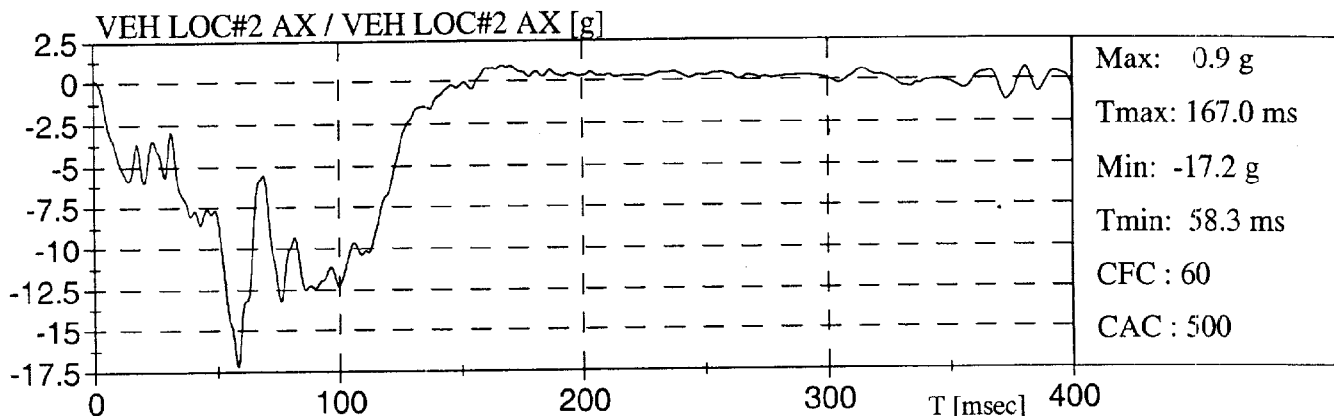


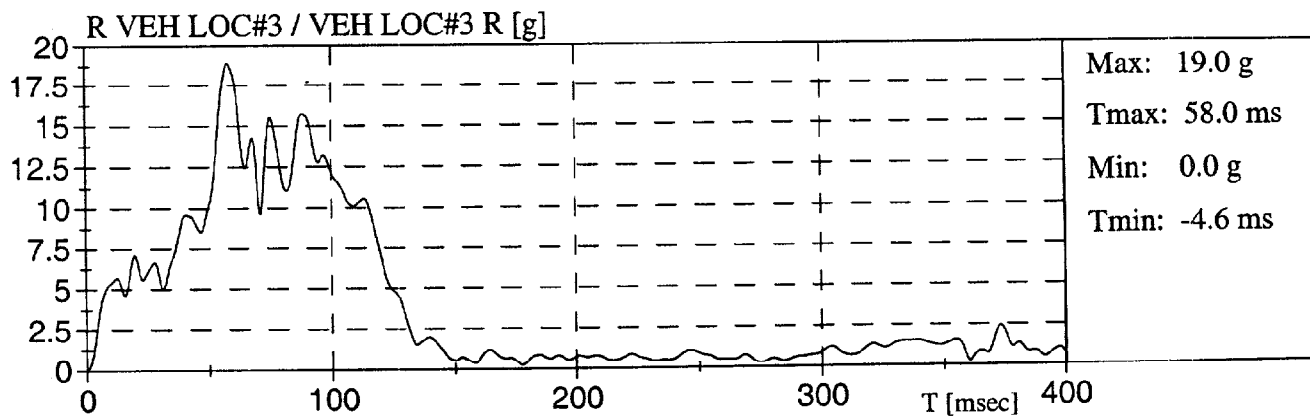
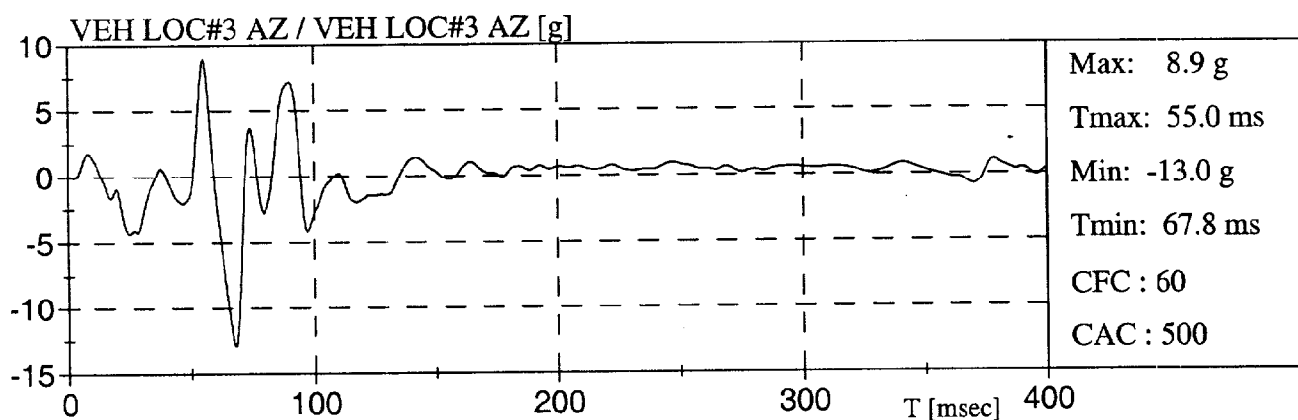
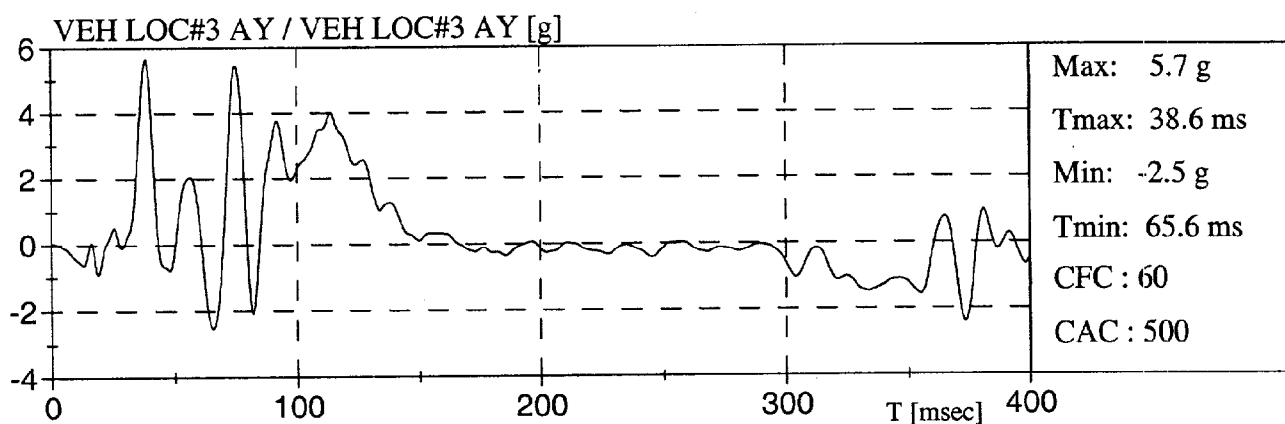
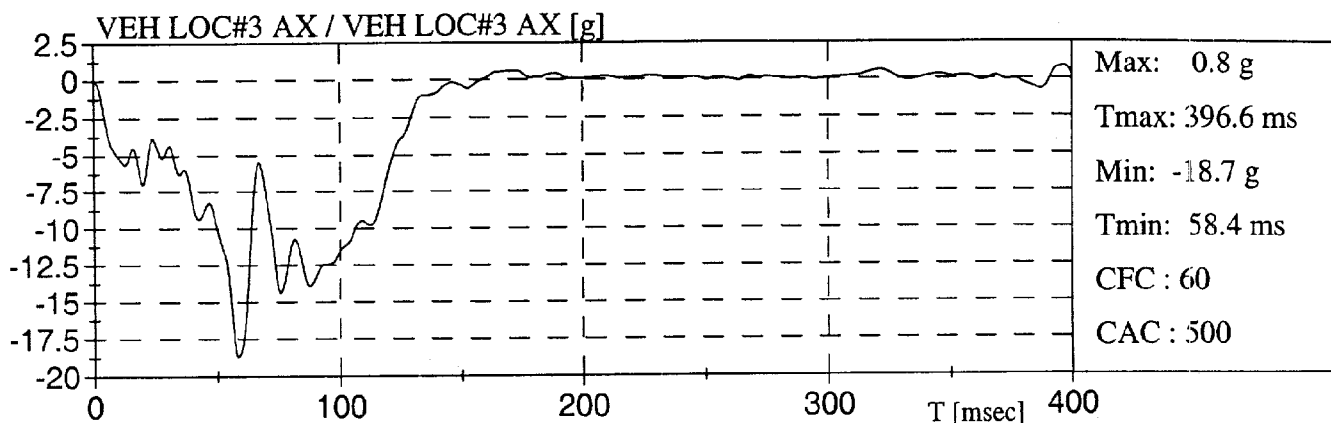


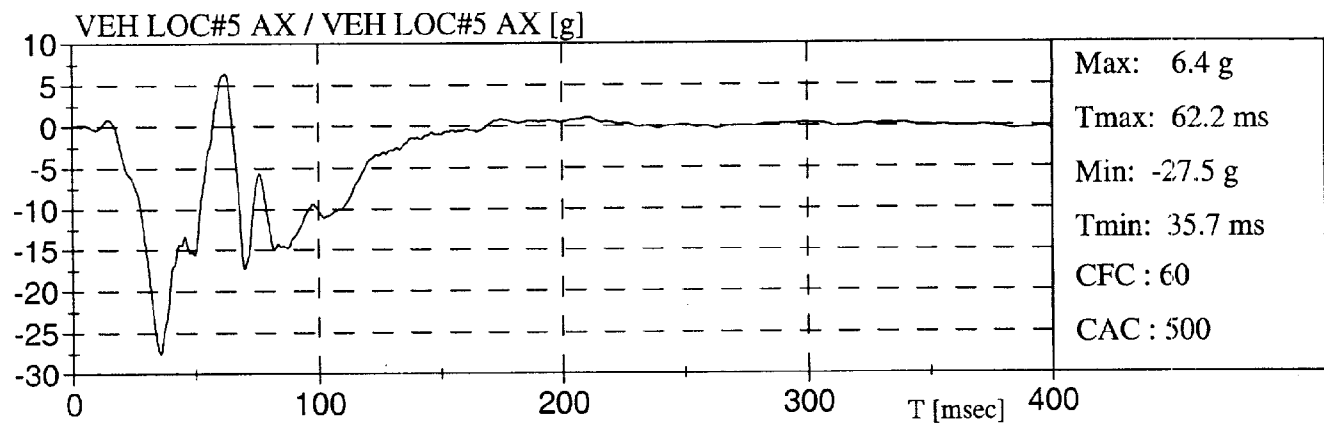
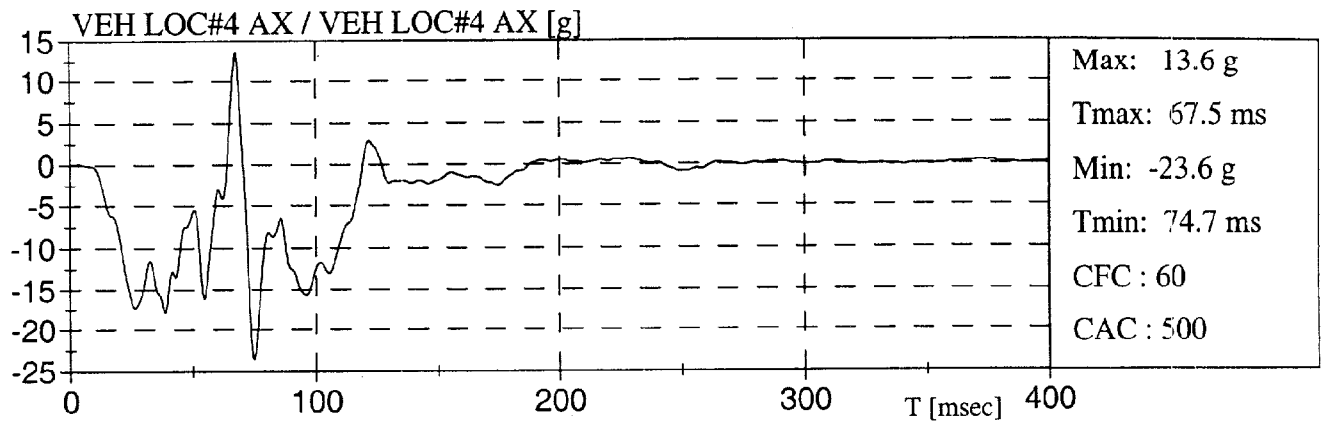


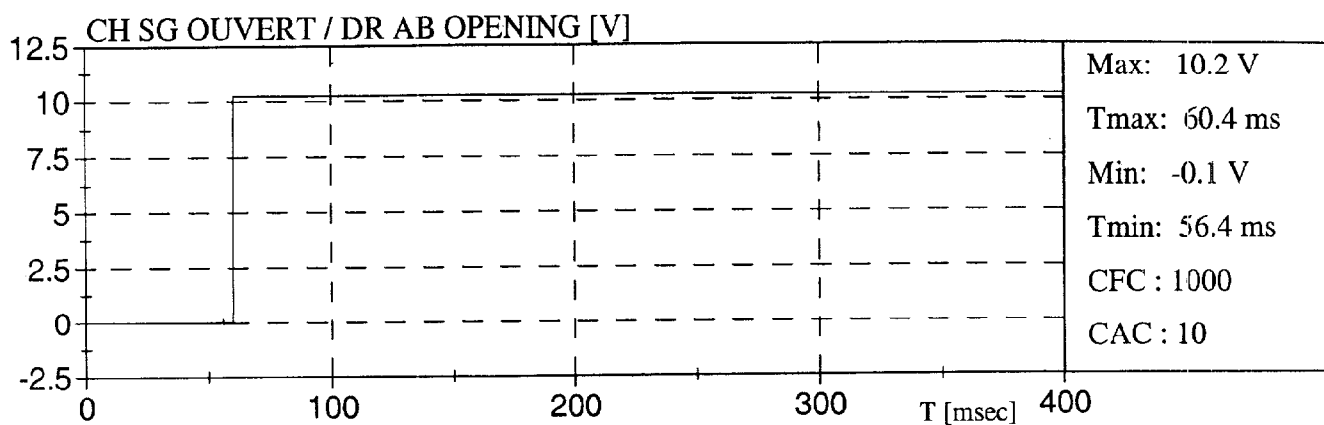




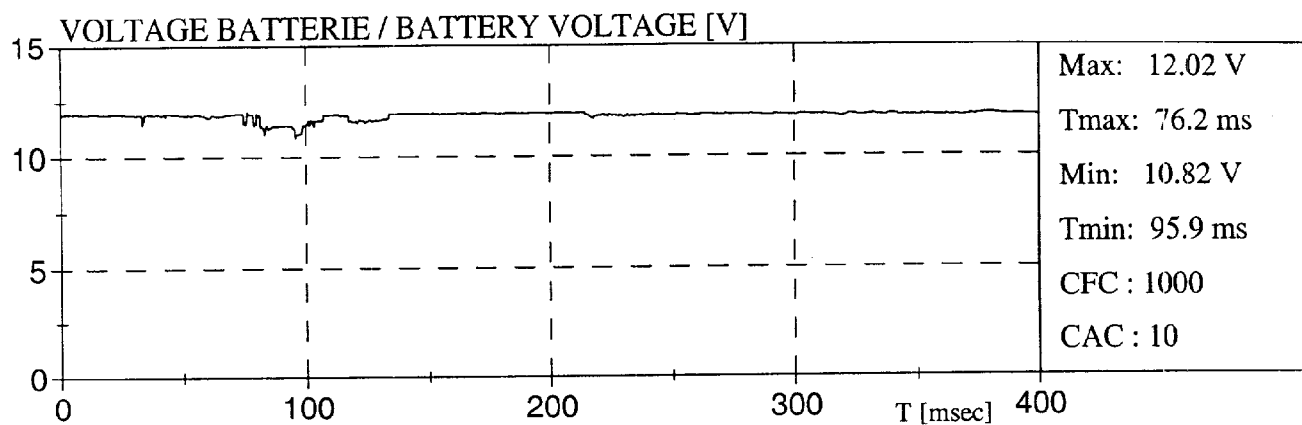


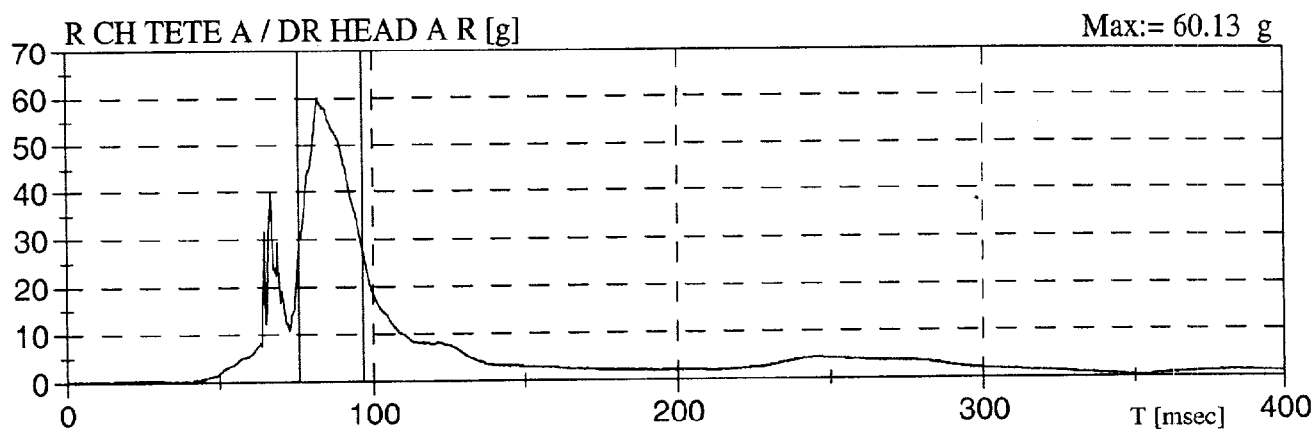








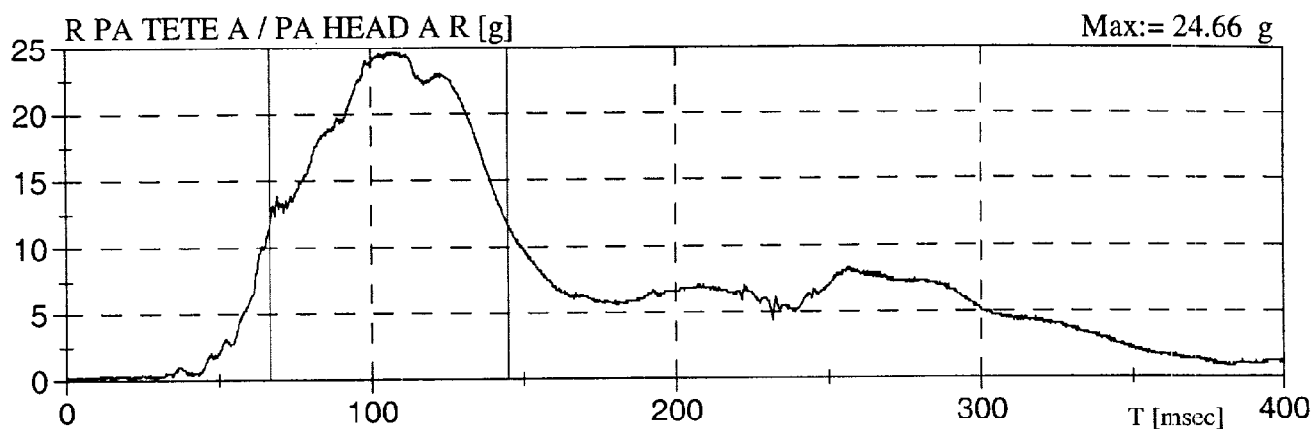




HEAD INJURY CRITERIA (HIC) \*  
CRITÈRE DE BLESSURE DE LA TÊTE

|              |                 |                 |
|--------------|-----------------|-----------------|
| HIC:= 296    | HIC(36ms):= 296 | HIC(15ms):= 276 |
| T1:= 75.8 ms | T1:= 75.8 ms    | T1:= 77.8 ms    |
| T2:= 96.6 ms | T2:= 96.6 ms    | T2:= 92.8 ms    |

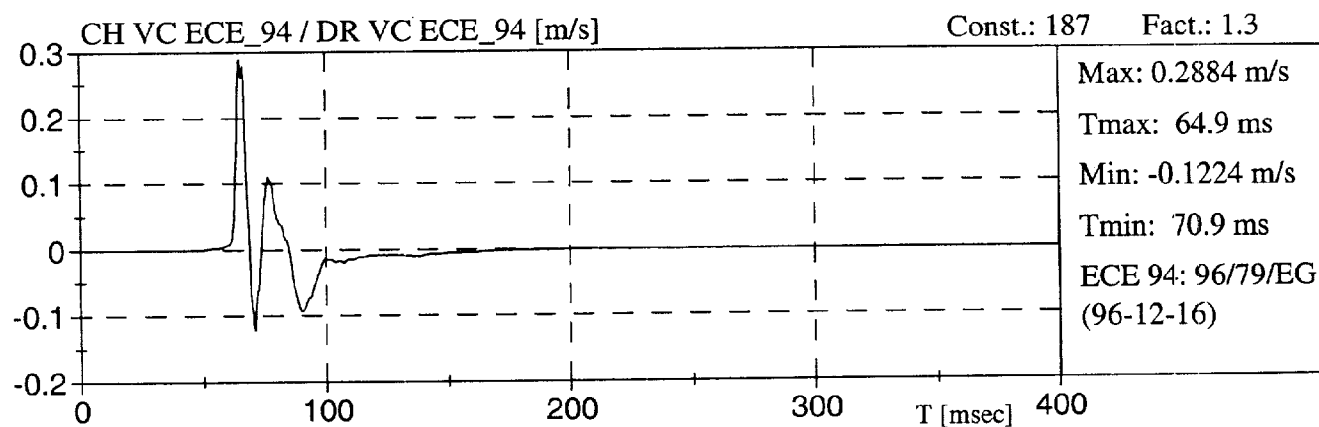
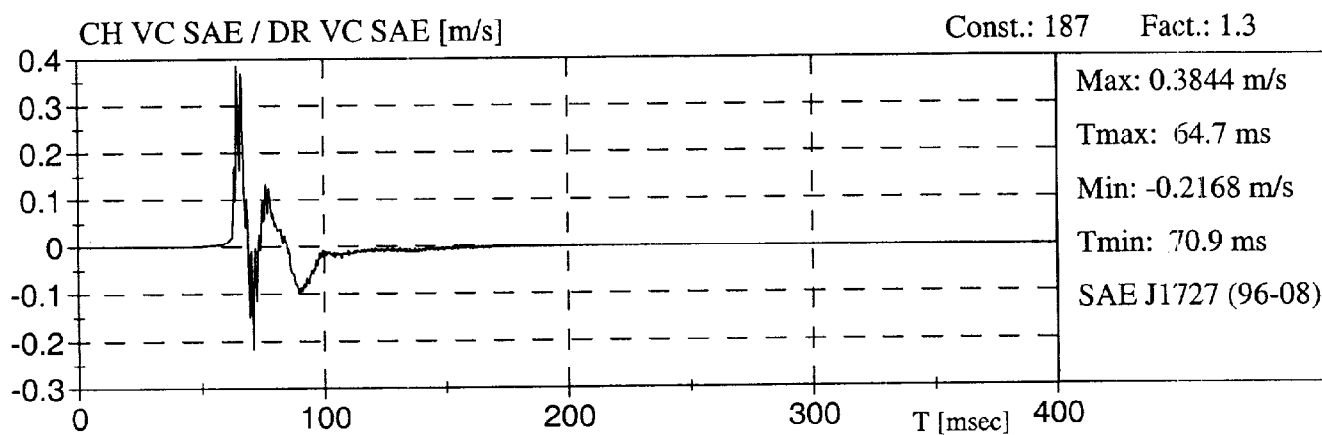
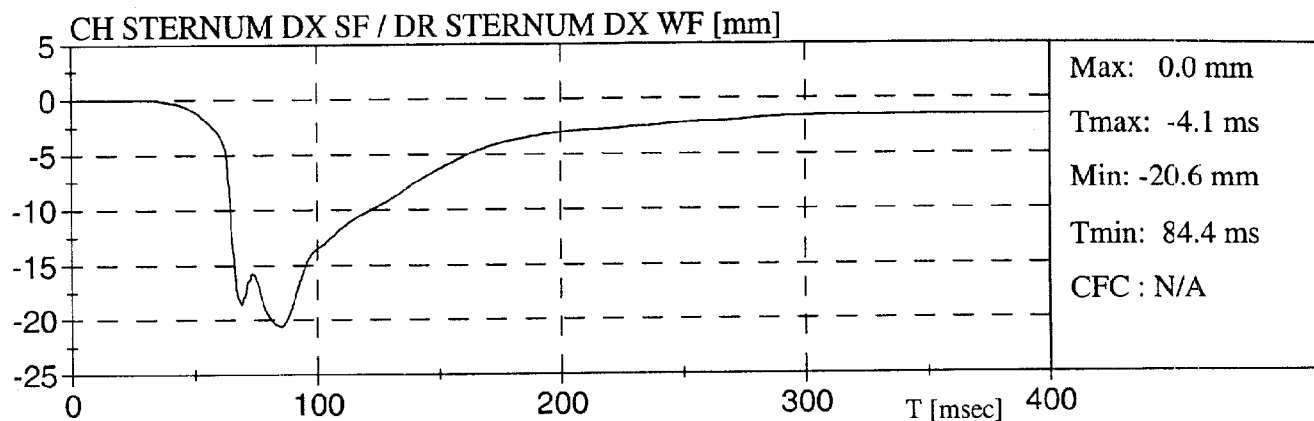
\* Selon / According To: SAE J1727 96-08

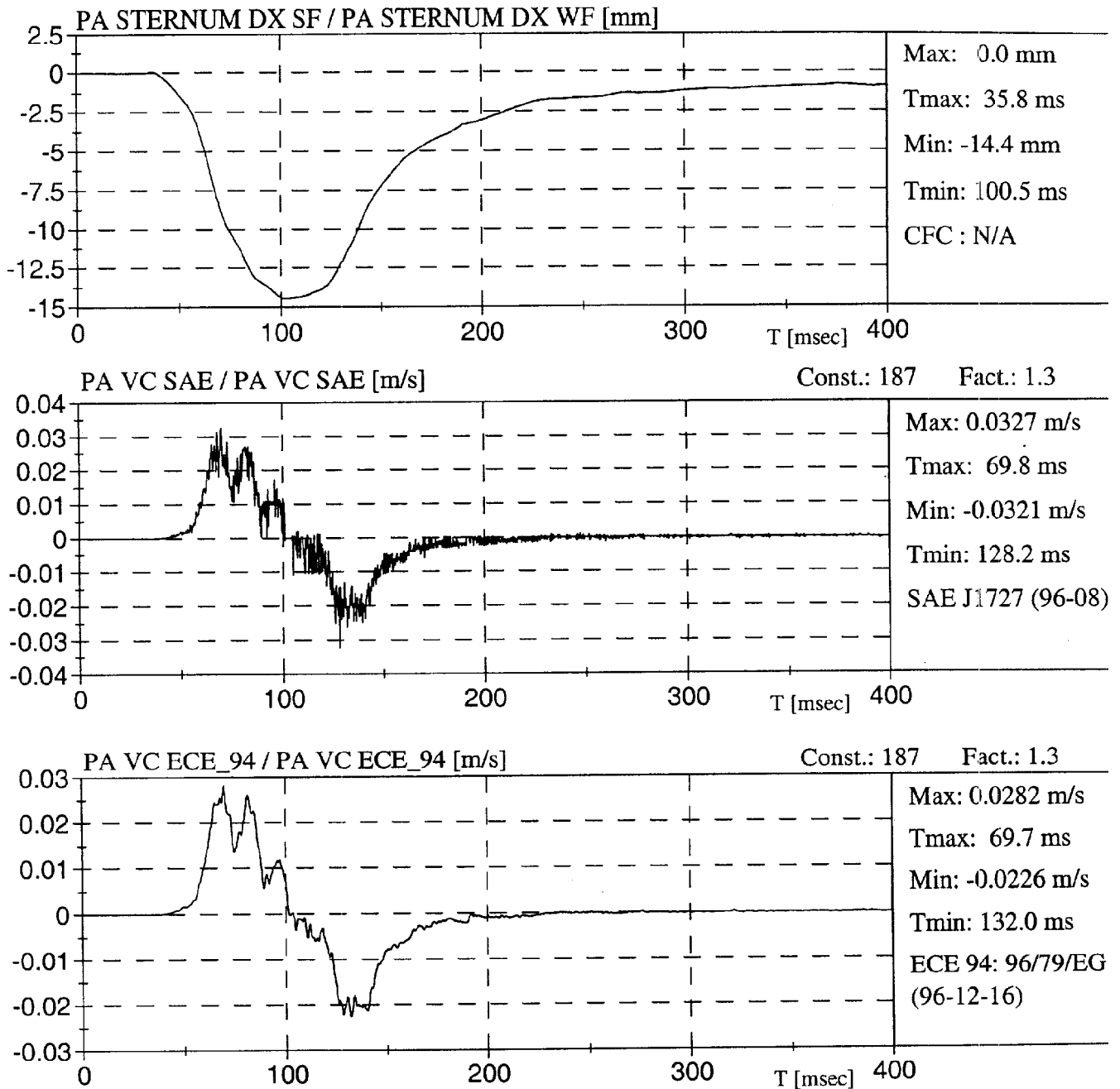


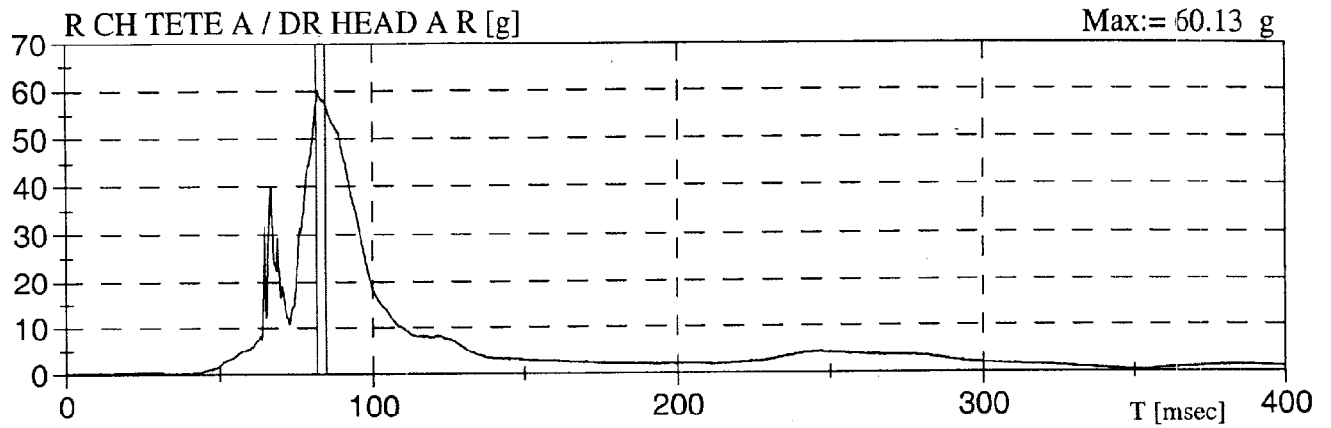
**HEAD INJURY CRITERIA (HIC) \***  
**CRITÈRE DE BLESSURE DE LA TÊTE**

|               |                |                |
|---------------|----------------|----------------|
| HIC:= 132     | HIC(36ms):= 94 | HIC(15ms):= 44 |
| T1:= 66.6 ms  | T1:= 93.3 ms   | T1:= 98.2 ms   |
| T2:= 144.9 ms | T2:= 129.3 ms  | T2:= 113.2 ms  |

\* Selon / According To: SAE J1727 96-08

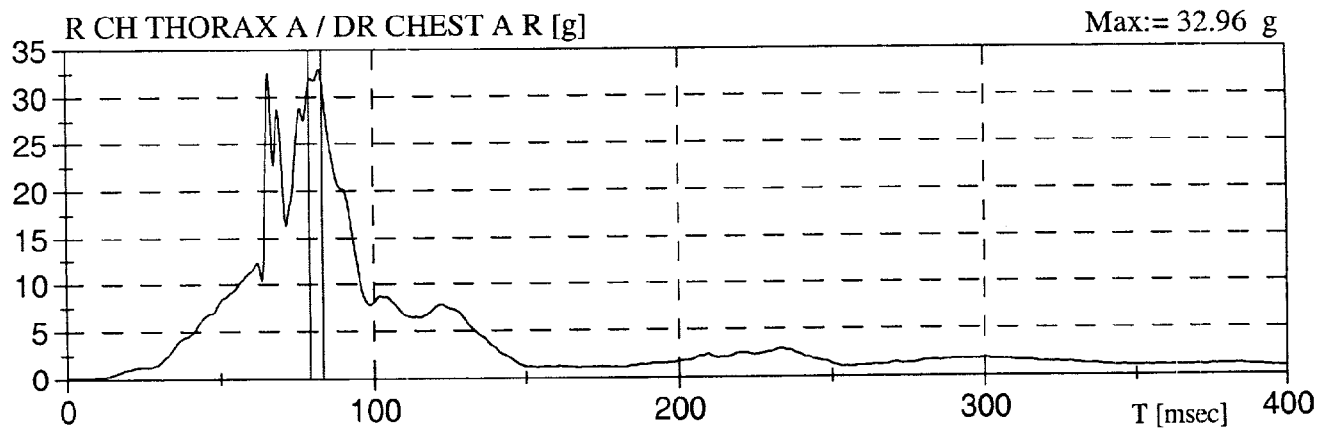






CLIP 3ms \*

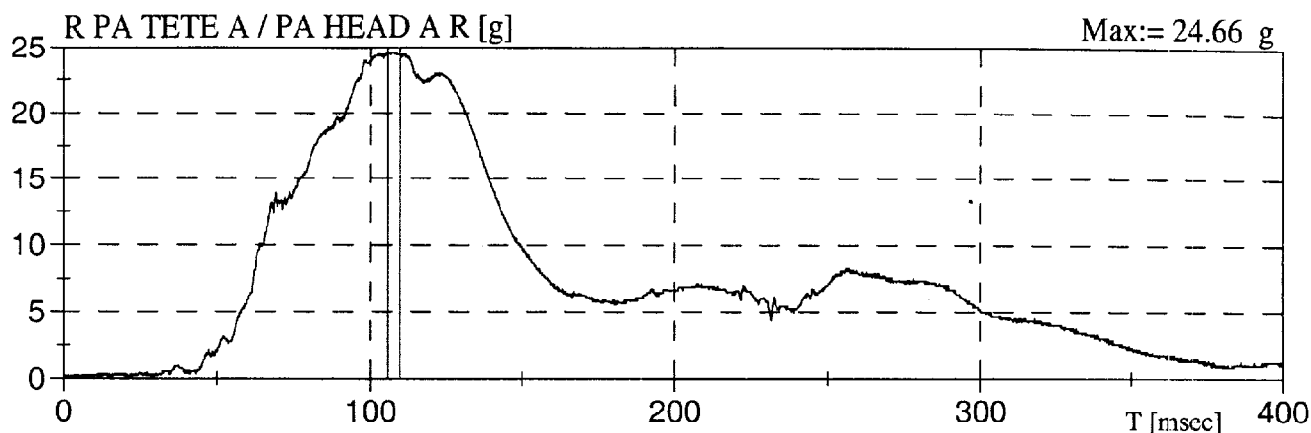
|                 |              |              |
|-----------------|--------------|--------------|
| Acc. := 57.43 g | T1:= 81.6 ms | T2:= 84.6 ms |
|-----------------|--------------|--------------|



CLIP 3ms \*

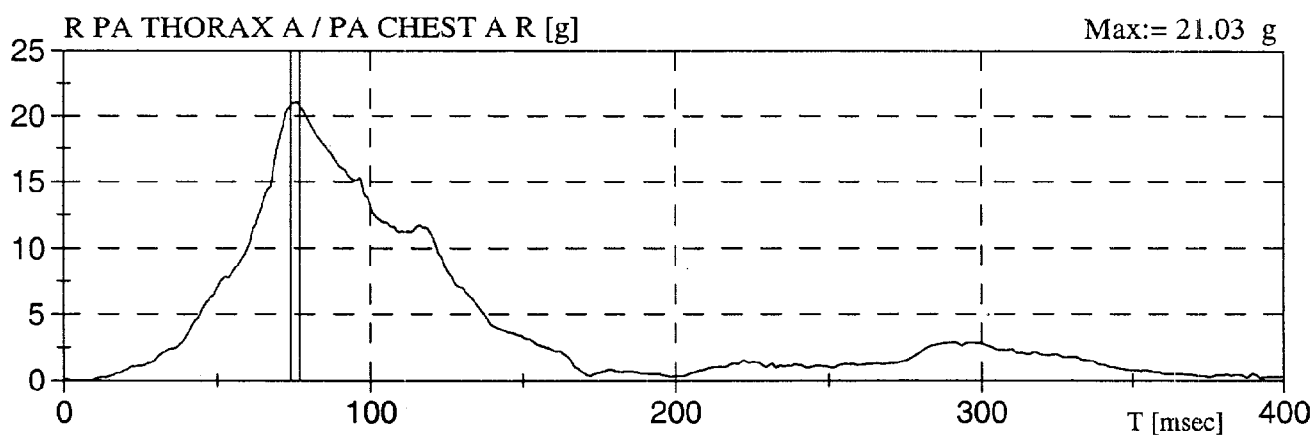
|                 |              |              |
|-----------------|--------------|--------------|
| Acc. := 31.72 g | T1:= 79.2 ms | T2:= 83.4 ms |
|-----------------|--------------|--------------|

\* Selon / According To: NHTSA CLIP VERSION 2.1 5/95



CLIP 3ms \*

|                 |               |               |
|-----------------|---------------|---------------|
| Acc. := 24.45 g | T1:= 105.7 ms | T2:= 109.6 ms |
|-----------------|---------------|---------------|



CLIP 3ms \*

|                 |              |              |
|-----------------|--------------|--------------|
| Acc. := 20.78 g | T1:= 73.8 ms | T2:= 76.8 ms |
|-----------------|--------------|--------------|

\* Selon / According To: NHTSA CLIP VERSION 2.1 5/95

**INDEX DU TIBIA \***  
**TIBIA INDEX \***
**TI Chauffeur / Driver**       $M_c := 115 \text{ N-m}$        $F_c := 22.9 \text{ kN}$ 

| TIBIA        | GAUCHE / LEFT | DROIT / RIGHT |
|--------------|---------------|---------------|
| HAUT / UPPER | <b>0.315</b>  | <b>0.244</b>  |
| BAS / LOWER  | <b>0.124</b>  | <b>0.201</b>  |

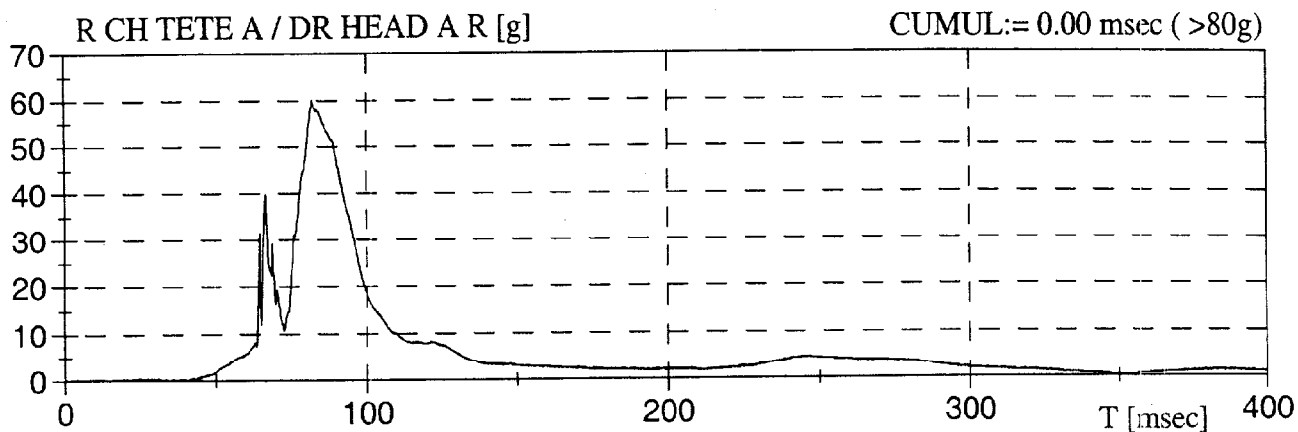
**TI Passager / Passenger**       $M_c := 115 \text{ N-m}$        $F_c := 22.9 \text{ kN}$ 

| TIBIA        | GAUCHE / LEFT | DROIT / RIGHT |
|--------------|---------------|---------------|
| HAUT / UPPER | <b>0.349</b>  | <b>0.272</b>  |
| BAS / LOWER  | <b>0.133</b>  | <b>0.118</b>  |

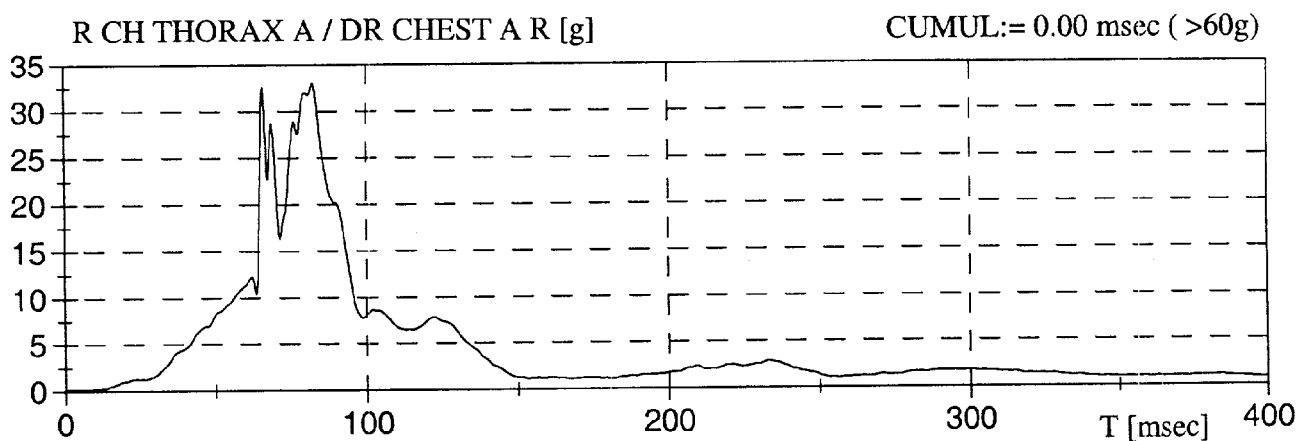
\* Selon / According To: SAE J1727 AUG 96



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

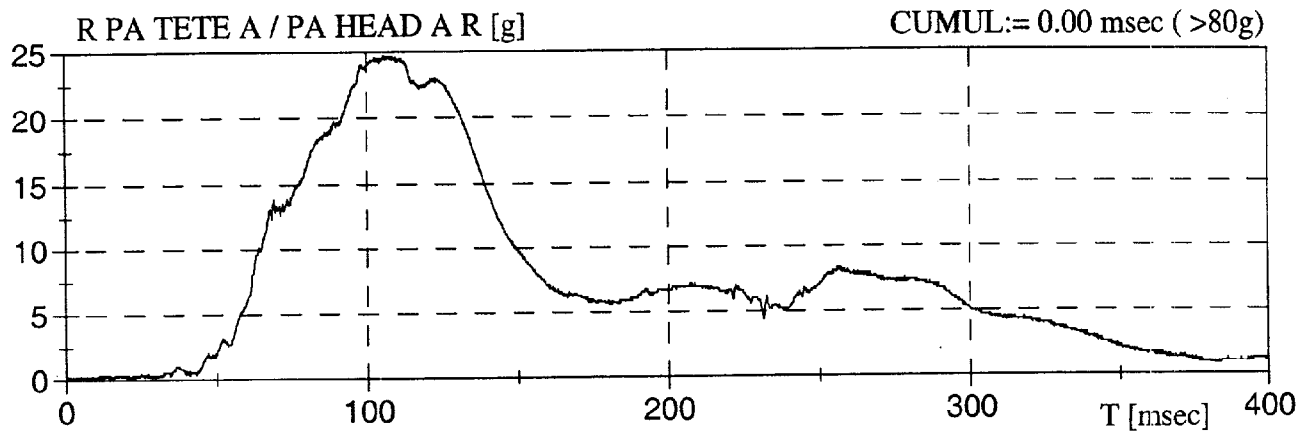


ACCÉLÉRATION DU THORAX >60 g / THORAX ACCELERATION > 60 g

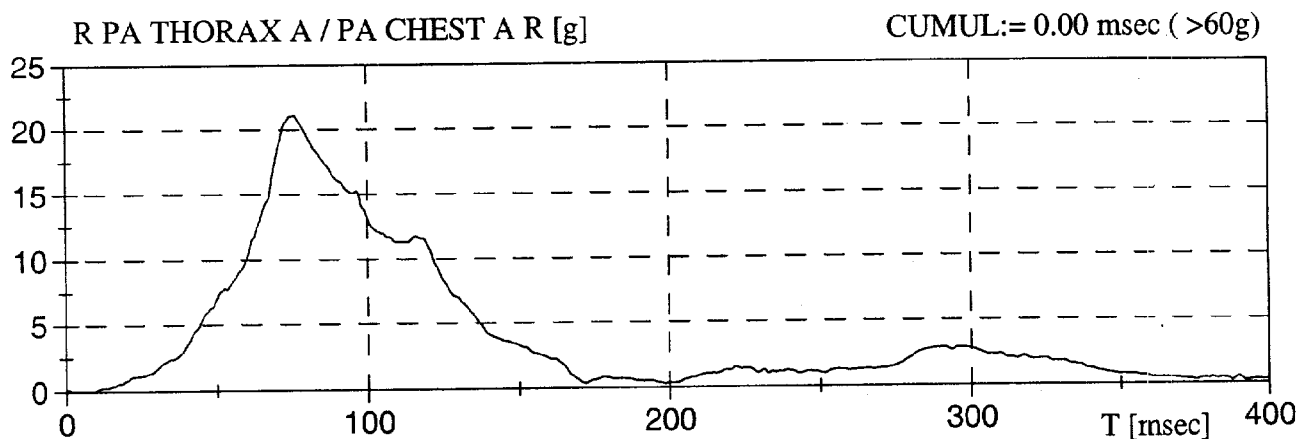




ACCÉLÉRATION DE LA TÊTE >80 g / HEAD ACCELERATION > 80 g



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



**APPENDICE /APPENDIX C**  
**DONNÉES DES TEMPÉRATURES**  
**TEMPERATURE DATA**

# Temperature TC99-211

