3014491

# RESEARCH RABBIT (MIV)
# Modified Integrated Vehicle

## Phase 1

VOLKSWAGENWERK
Aktiengesellschaft
WOLFSBURG

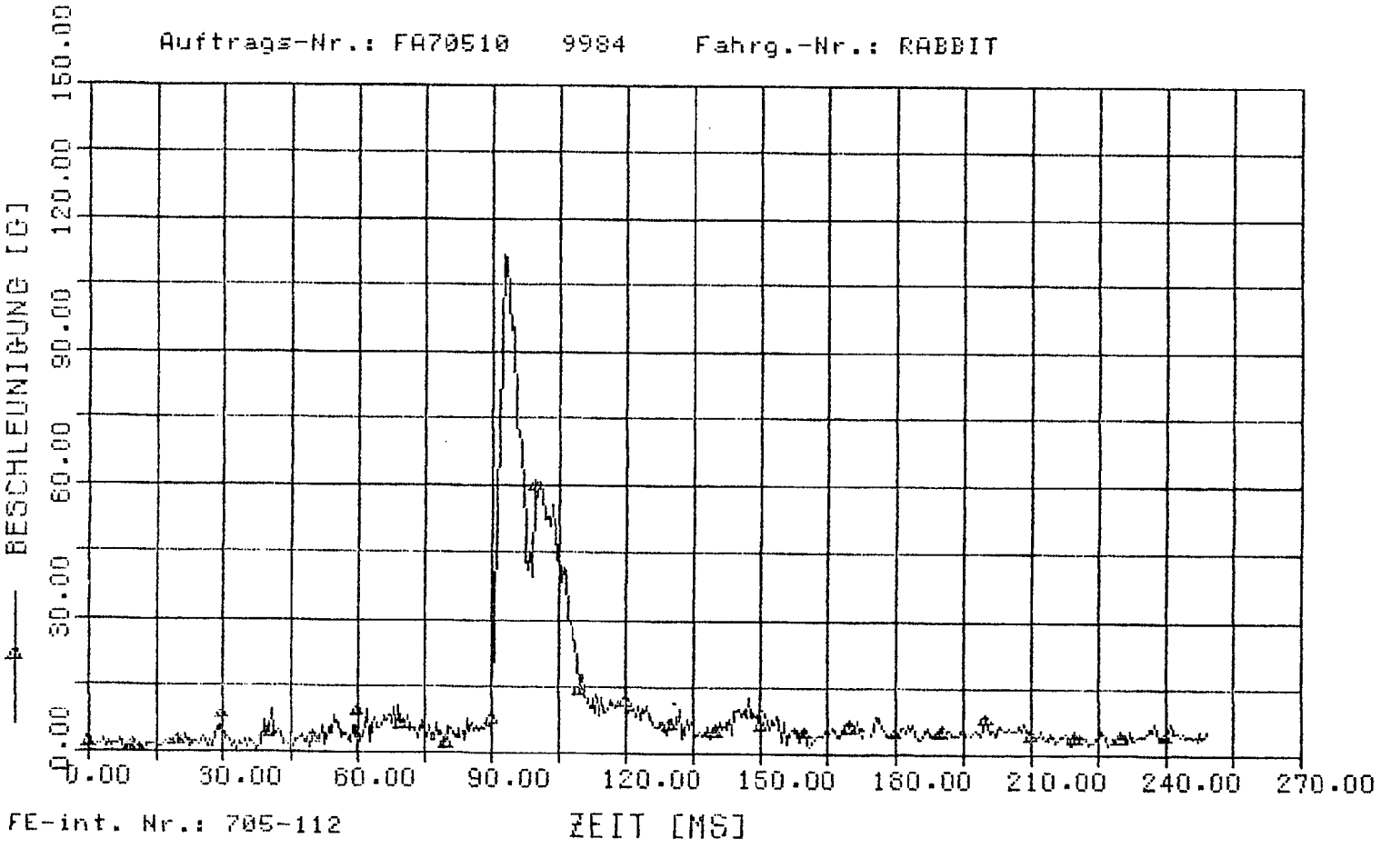
Contract No. DTNH 22-81-C-17085
June 1982
Final Report
Volume III/7 Side Impact

PREPARED FOR:
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
WASHINGTON, D.C. 20590

## B.2.2 Rear Passenger

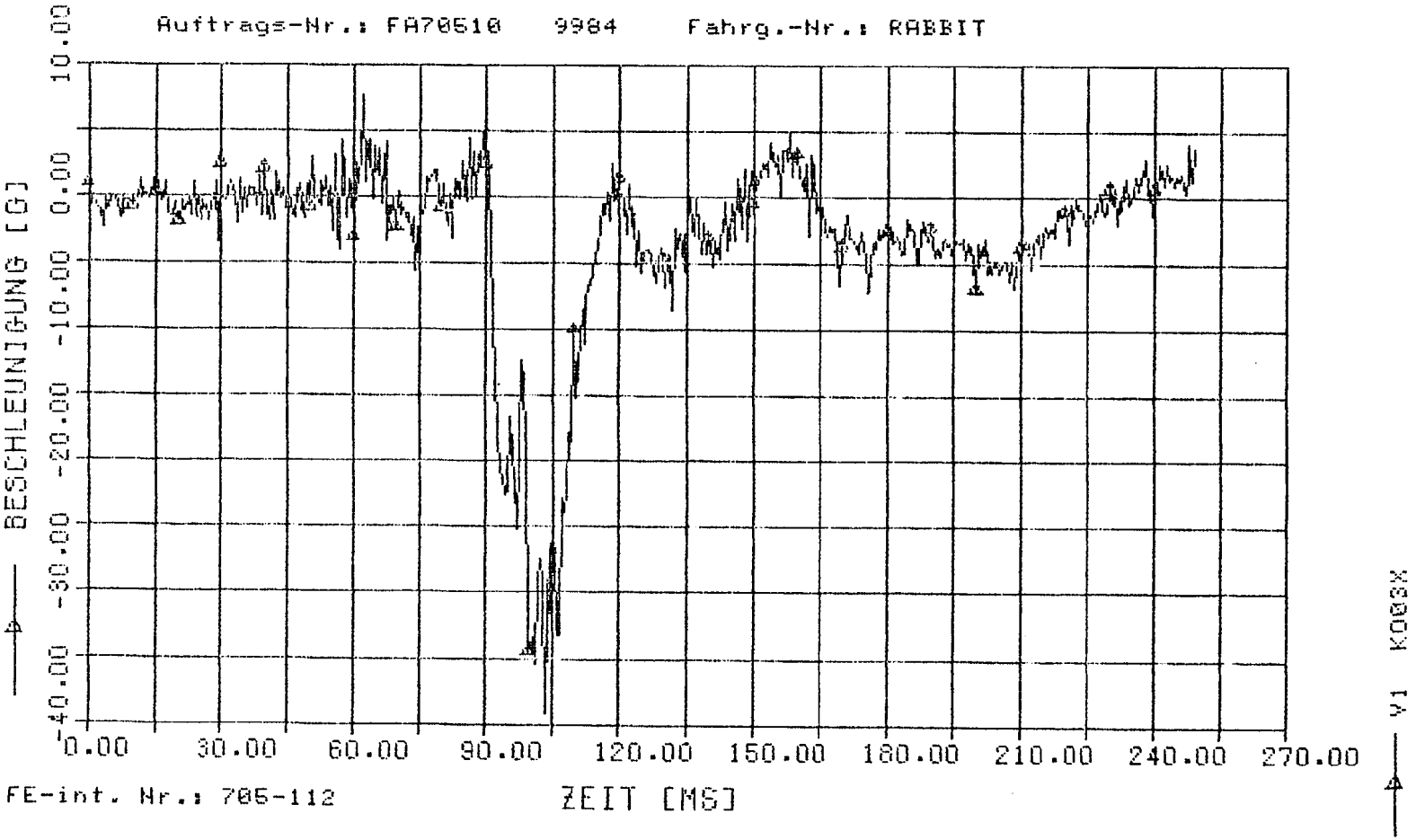
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| K003 | V1 | BE g | 111.889 | 93.00 | 86.15 |



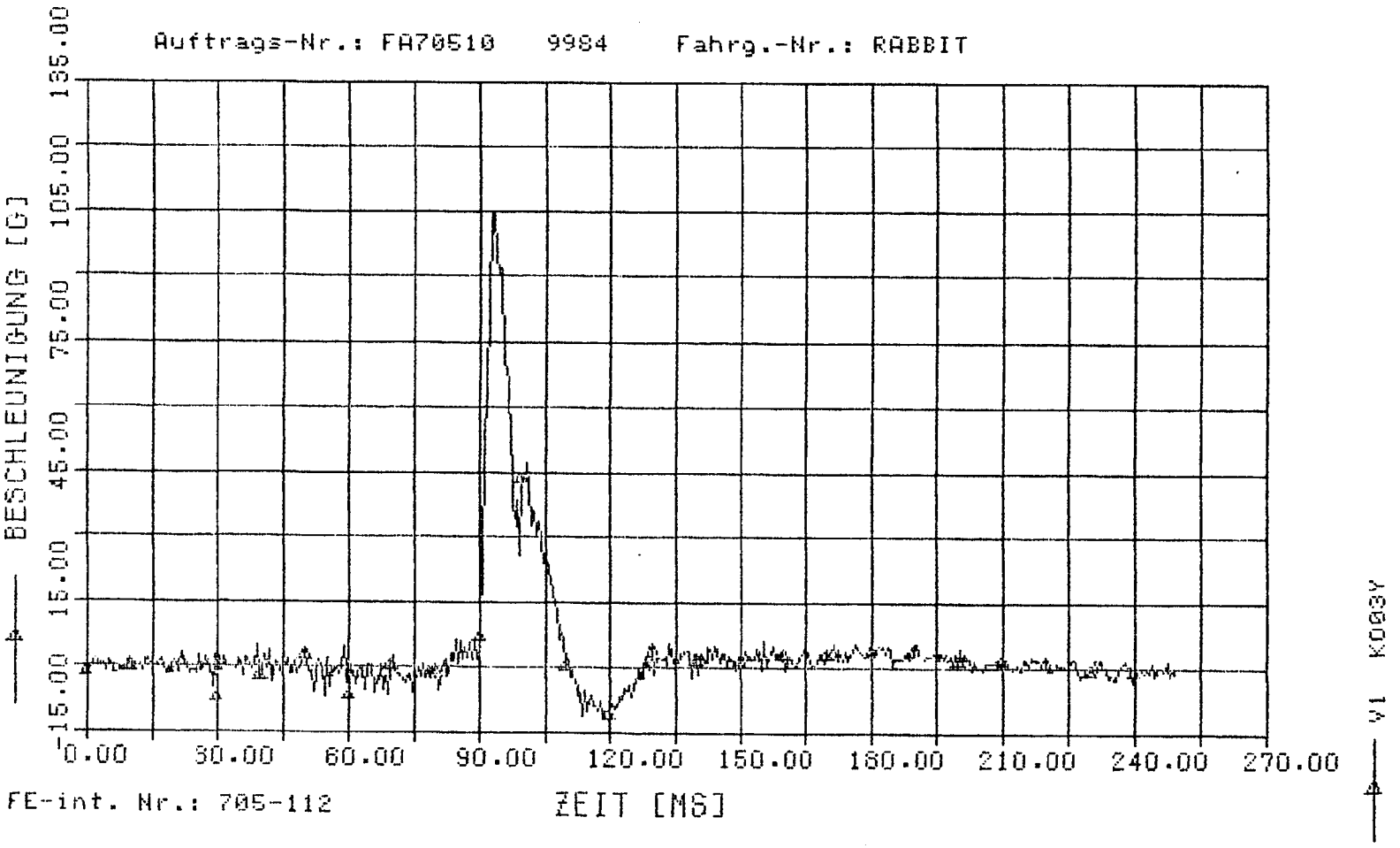
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | DP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| K003X | V1 | BE g | -40.399 | 101.30 | 4.57 |



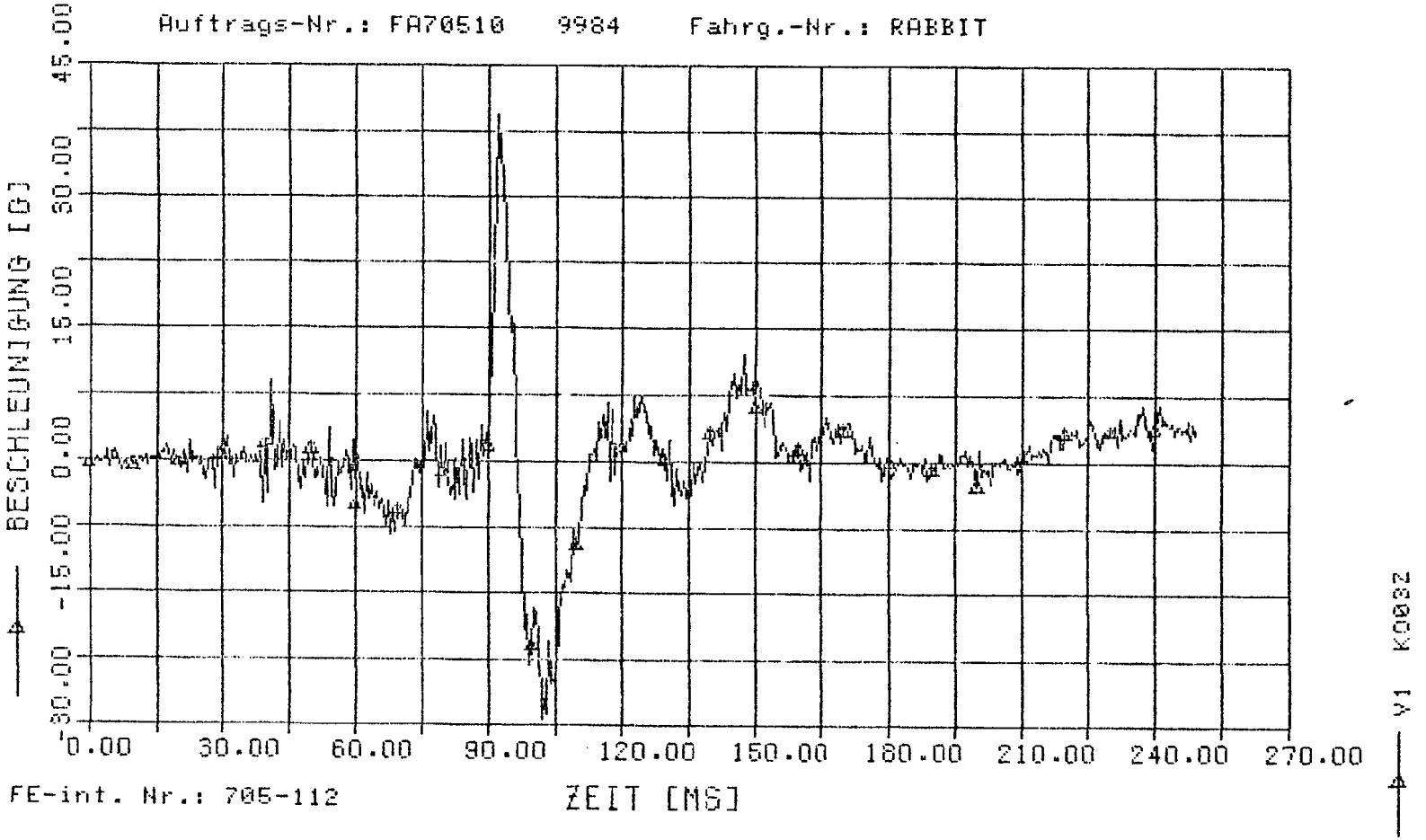
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|---|
| K003Y | V1 | BE | g | 105.272 | 73.60 | 77.19 |



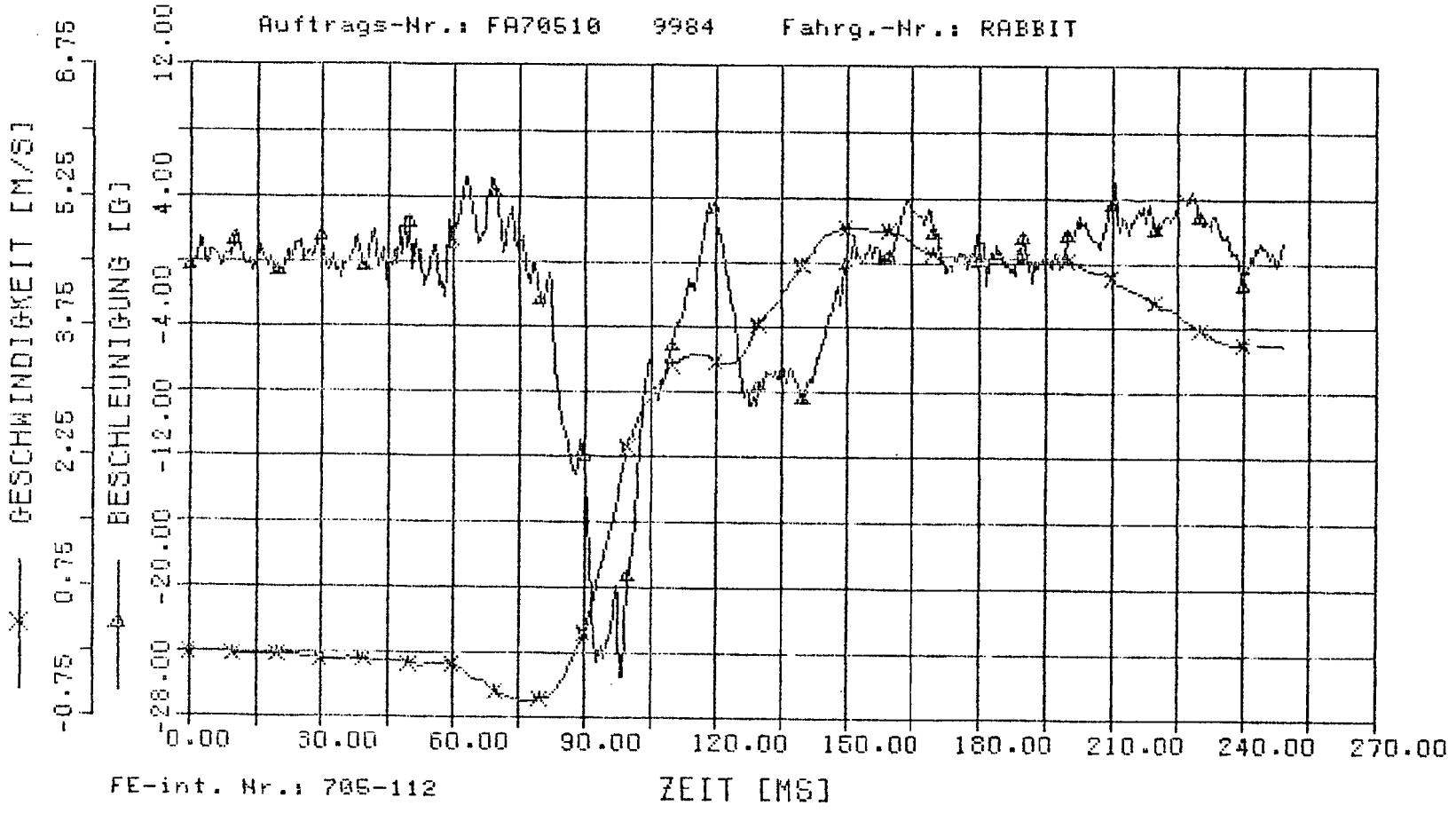
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|---|
| K003Z | V1 | BE | g | 47.171 | 72.70 | 19.37 |



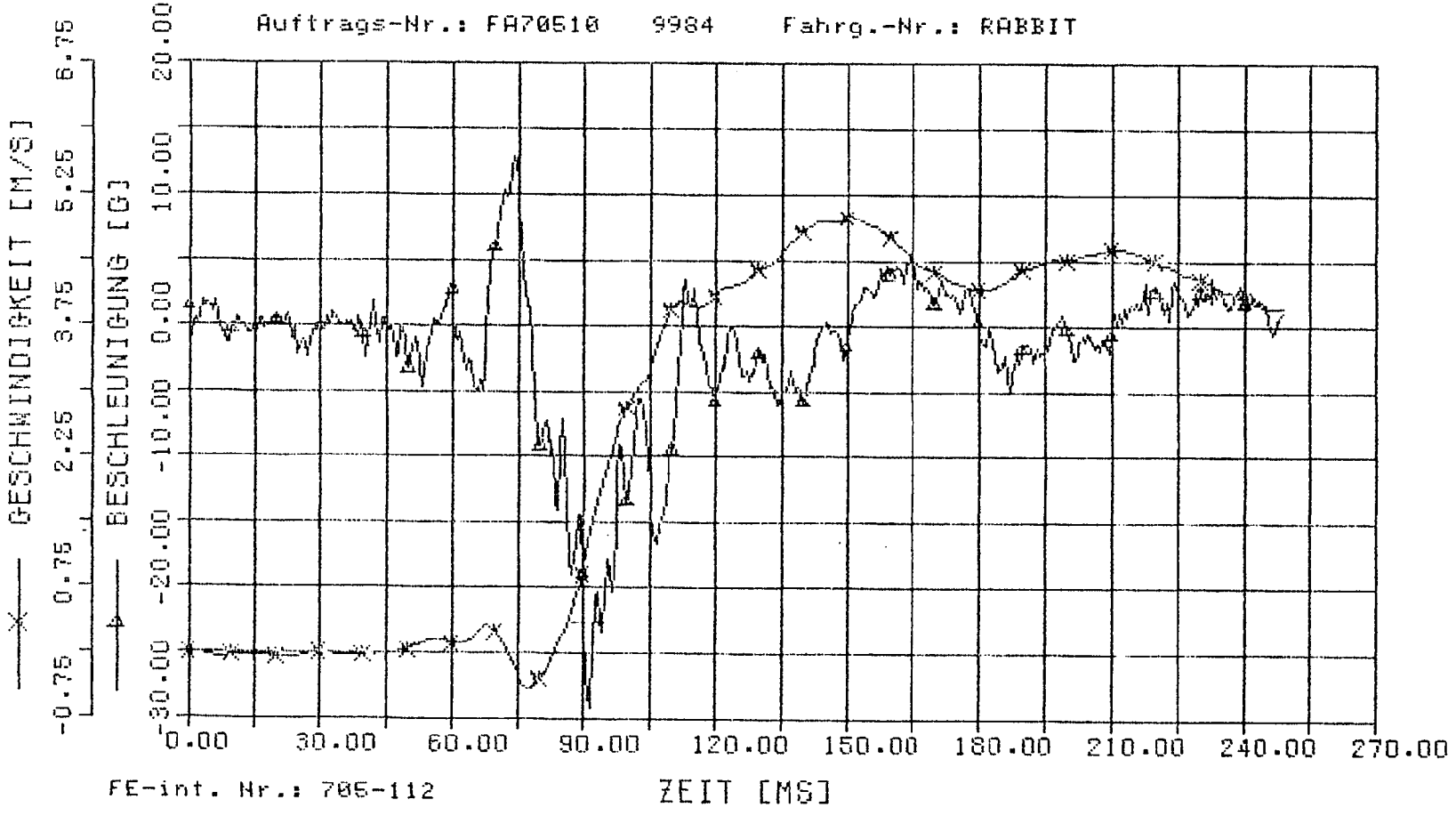
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| B003X | V1 | BE g | -25.497 | 99.00 | 0.00 |
| B003X | V1 | GE m/s | 4.899 | 151.00 | 0.00 |



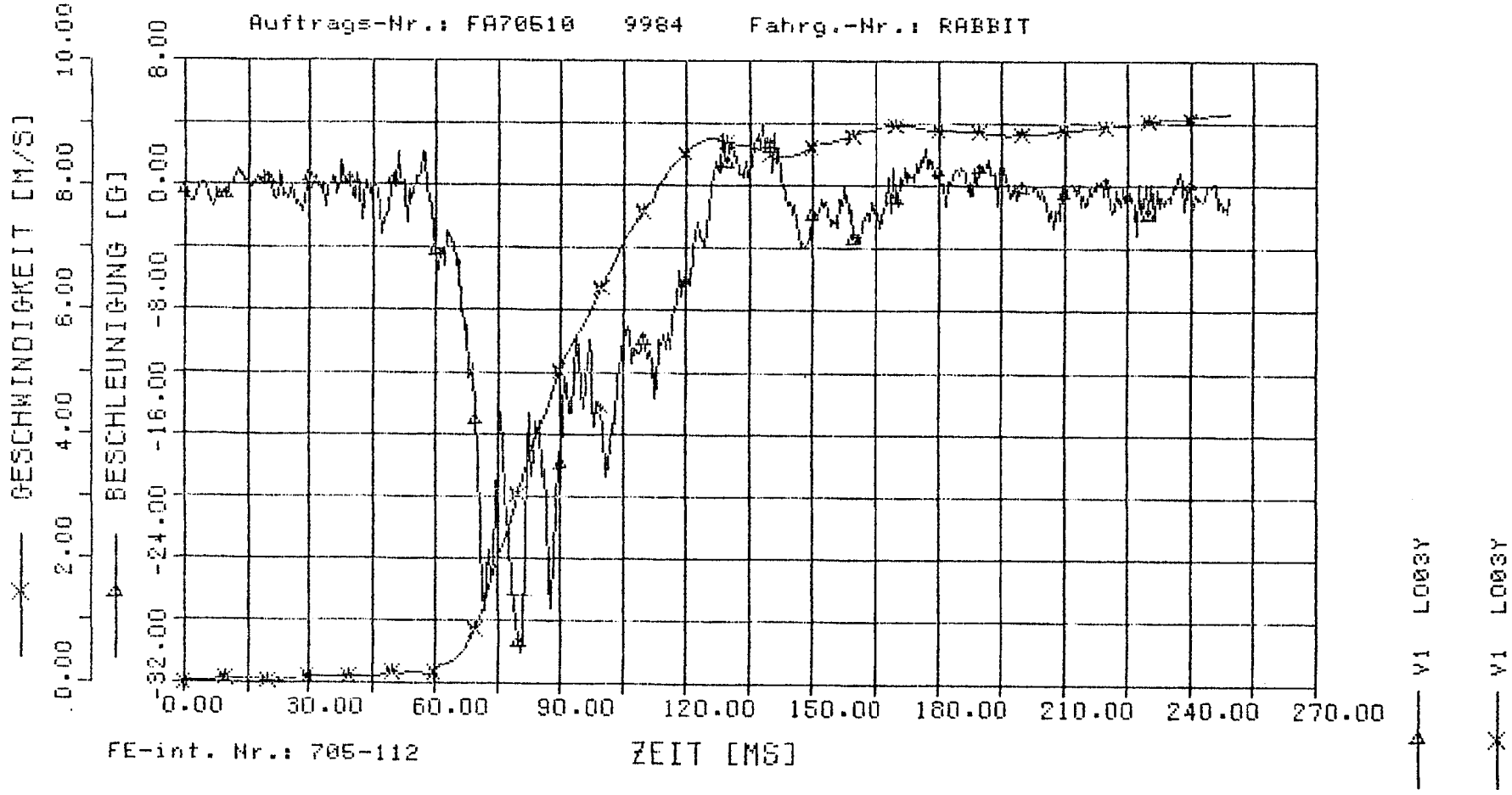
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BU03X | V1 | BE g | -29.177 | 92.00 | 0.00 |
| BU03X | V1 | GE m/s | 4.996 | 151.00 | 0.00 |



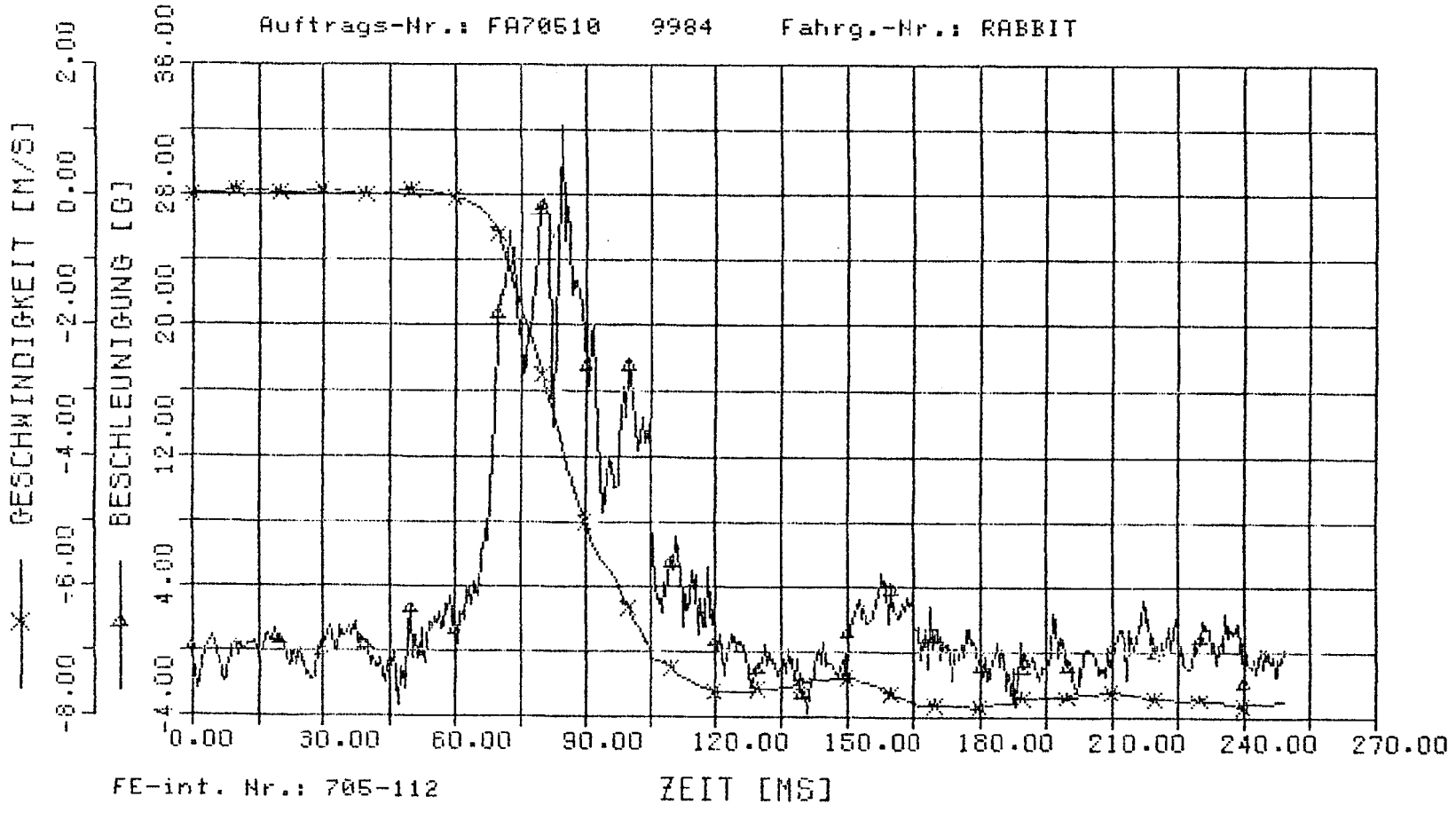
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| L003Y | V1 | BE g | -30.038 | 30.50 | 0.00 |
| L003Y | V1 | GE m/s | 9.163 | 252.00 | 0.00 |



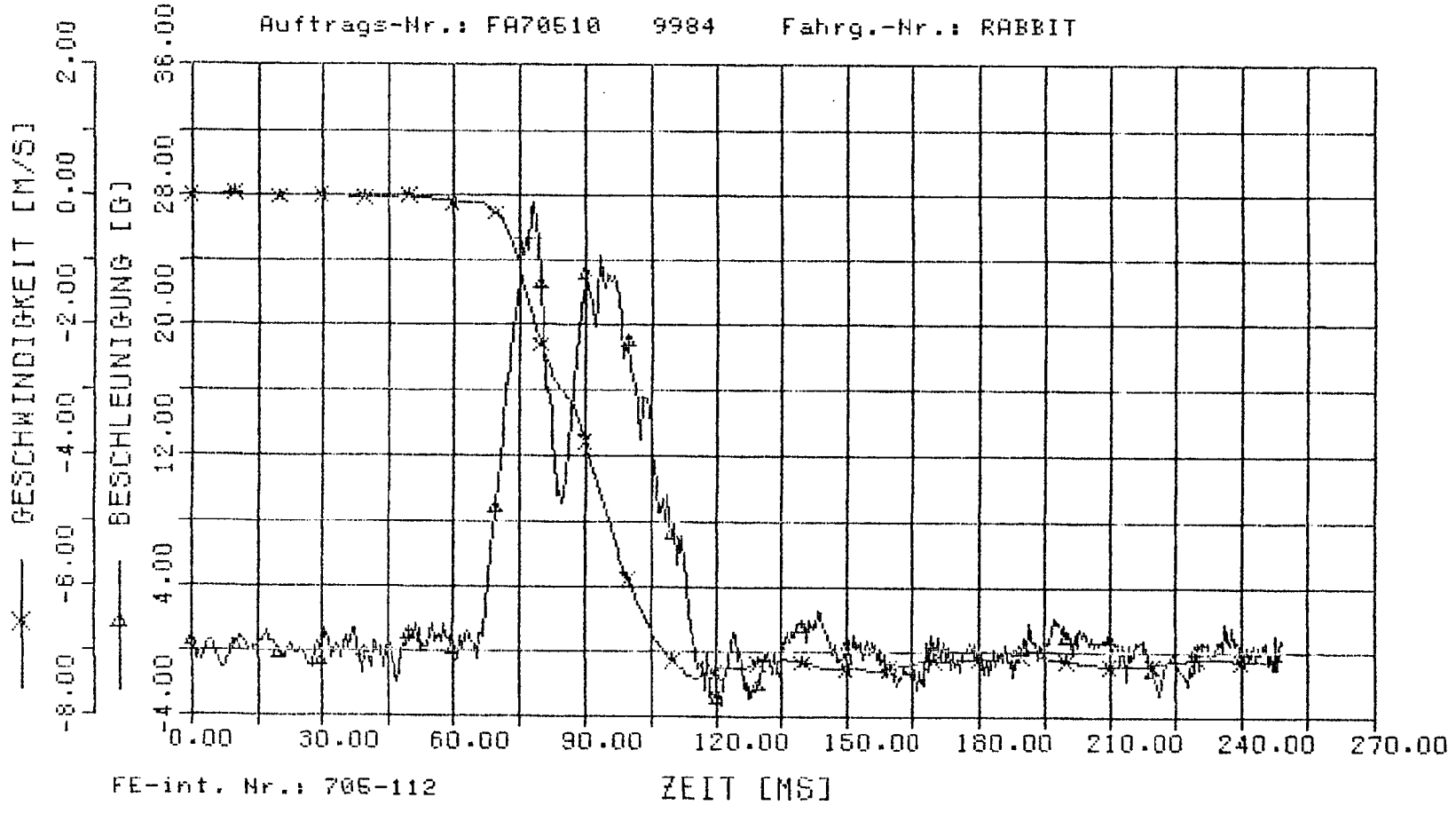
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| LU03Y | V1 | BE g | 32.220 | 85.00 | 0.00 |
| LU03Y | V1 | GE m/s | -7.855 | 179.00 | 0.00 |



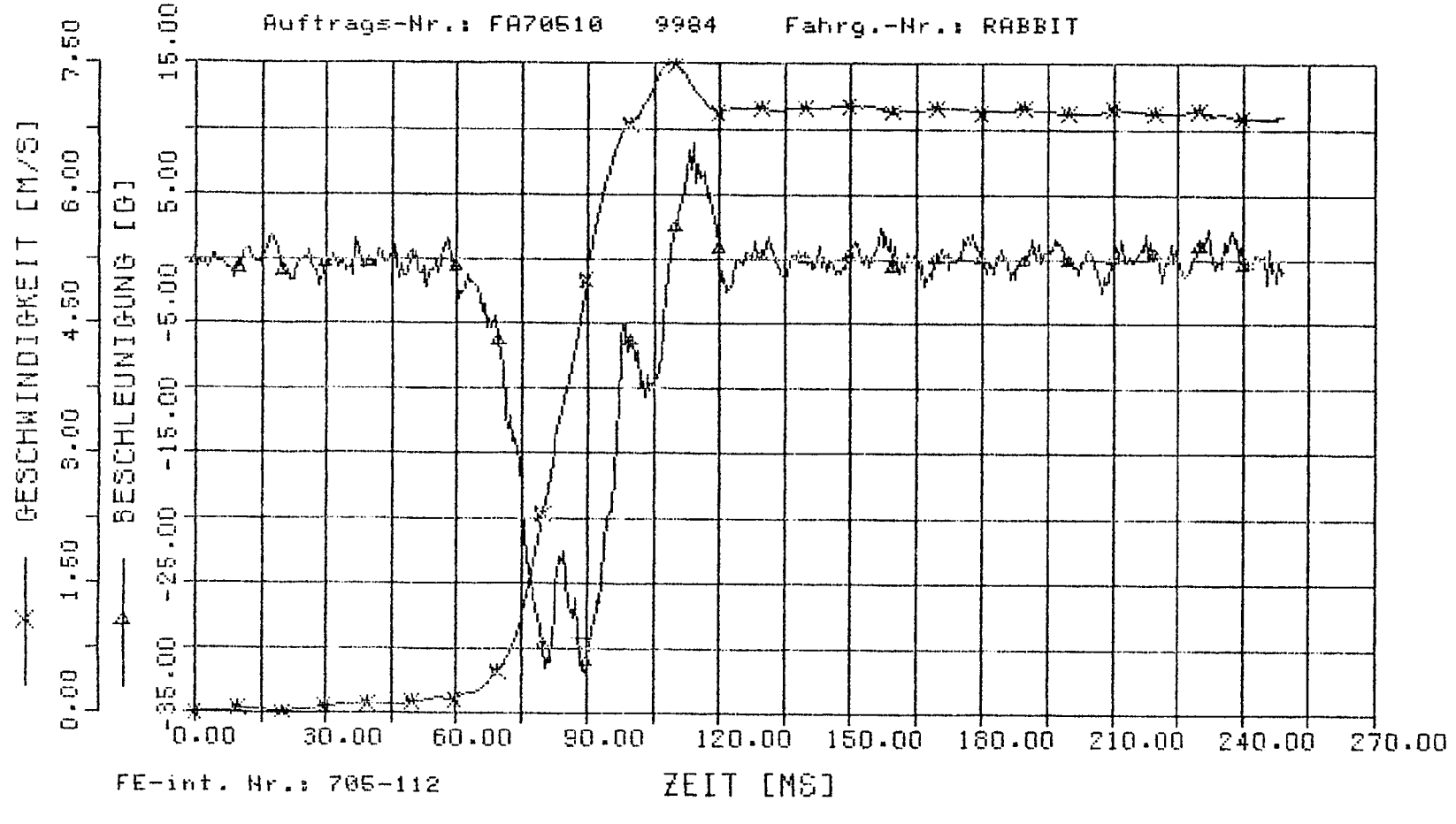
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|---|
| R003Y | V1 | BE | g | 27.477 | 78.50 | 0.00 |
| R003Y | V1 | GE | m/s | -7.392 | 115.50 | 0.00 |



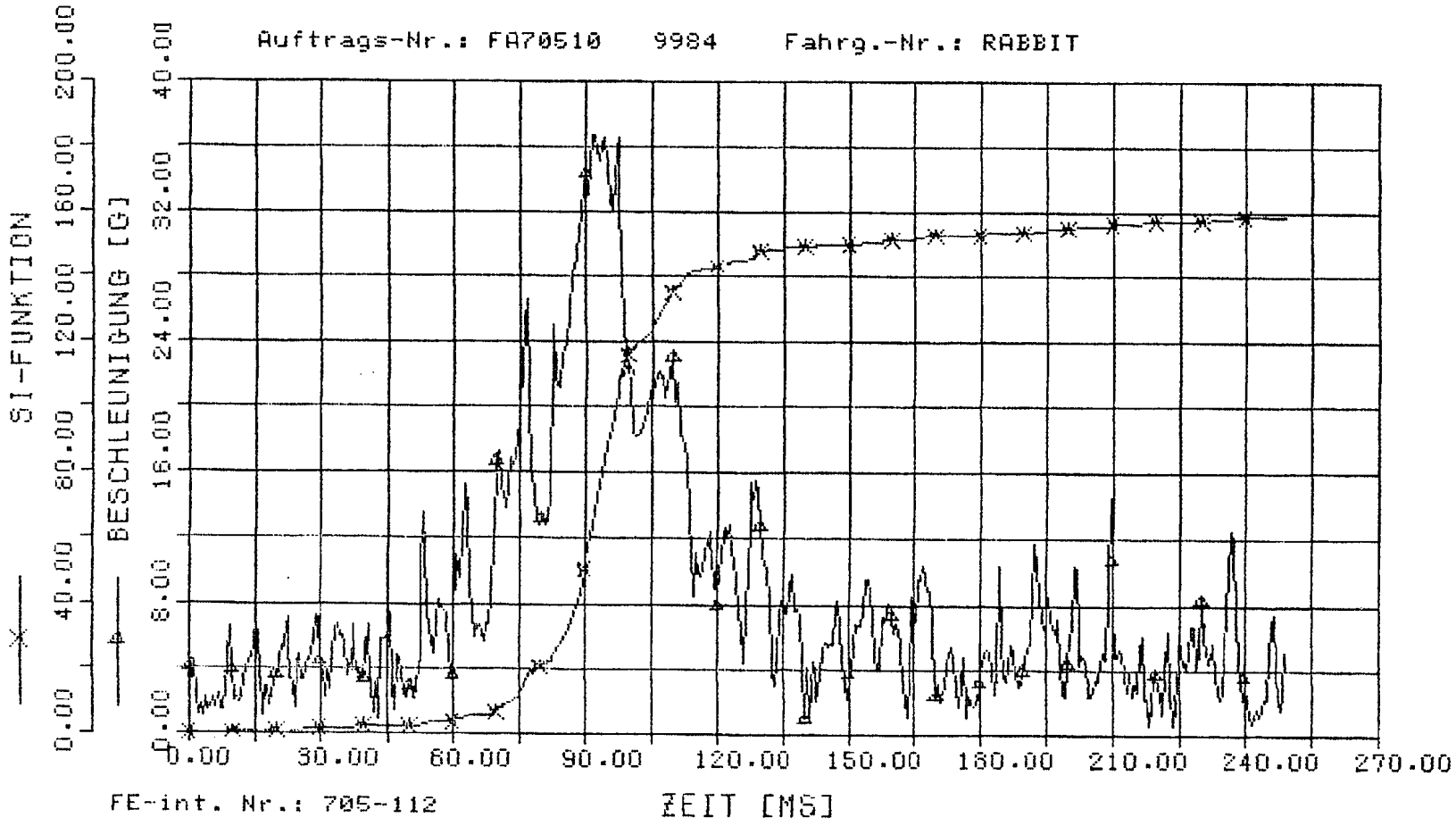
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| RU03Y | V1 | BE g | -31.904 | 39.50 | 0.00 |
| RU03Y | V1 | GE m/s | 7.479 | 109.00 | 0.00 |



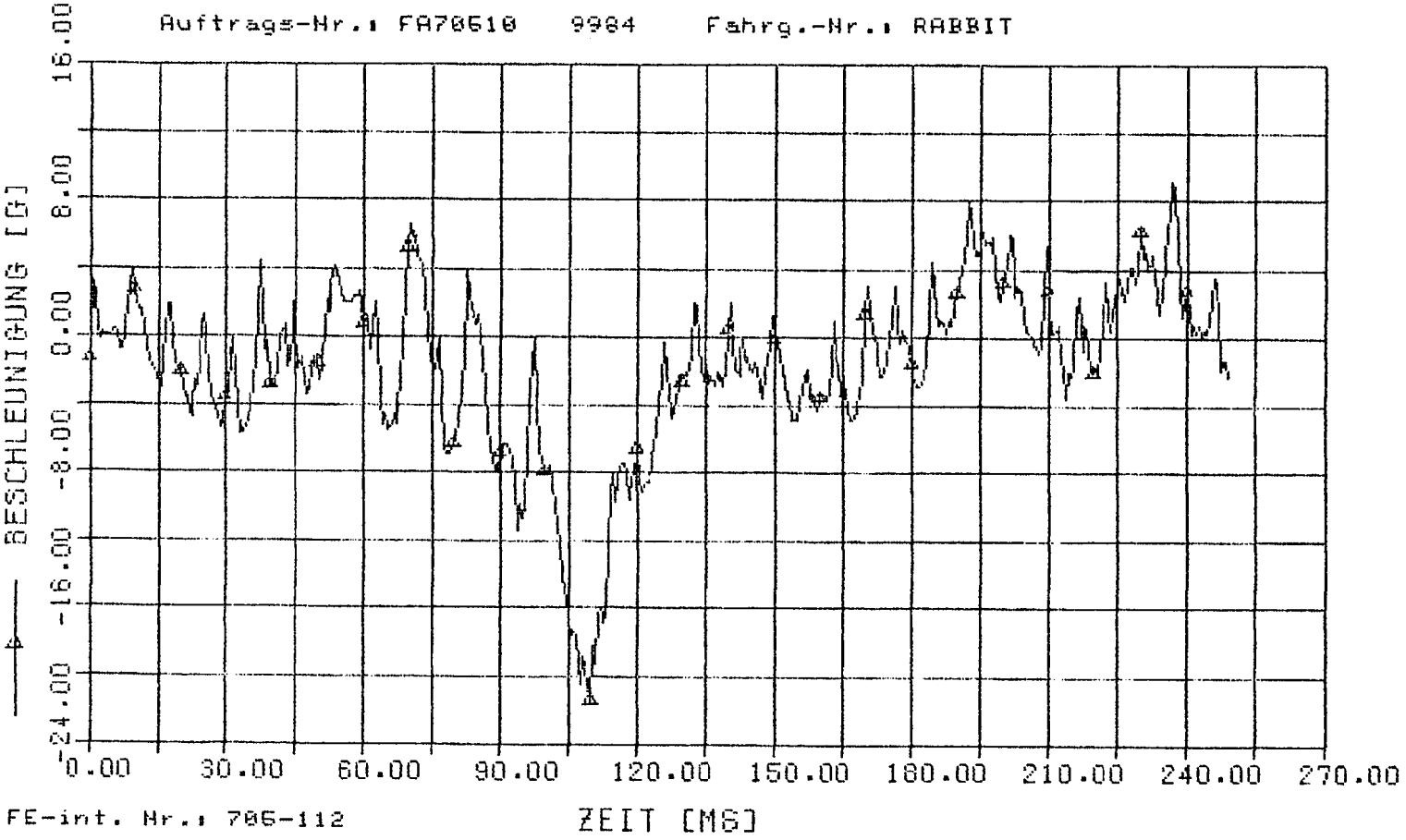
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| T003 | V1 | BE g | 36.721 | 92.50 | 0.00 |
| T003 | V1 | SI | 158.558 | 250.00 | 0.00 |



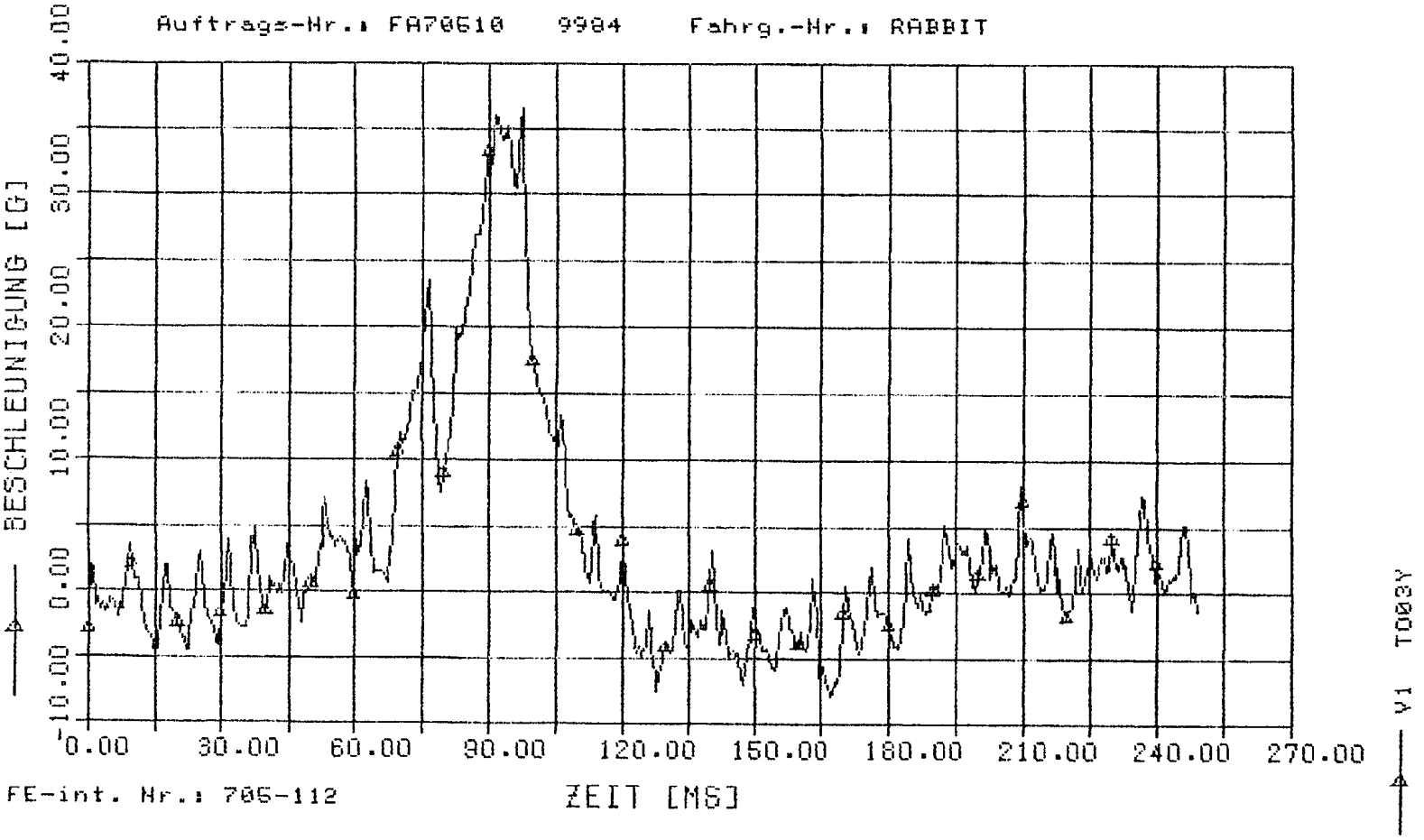
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| T003X | V1 | BE g | -21.433 | 110.00 | 0.00 |



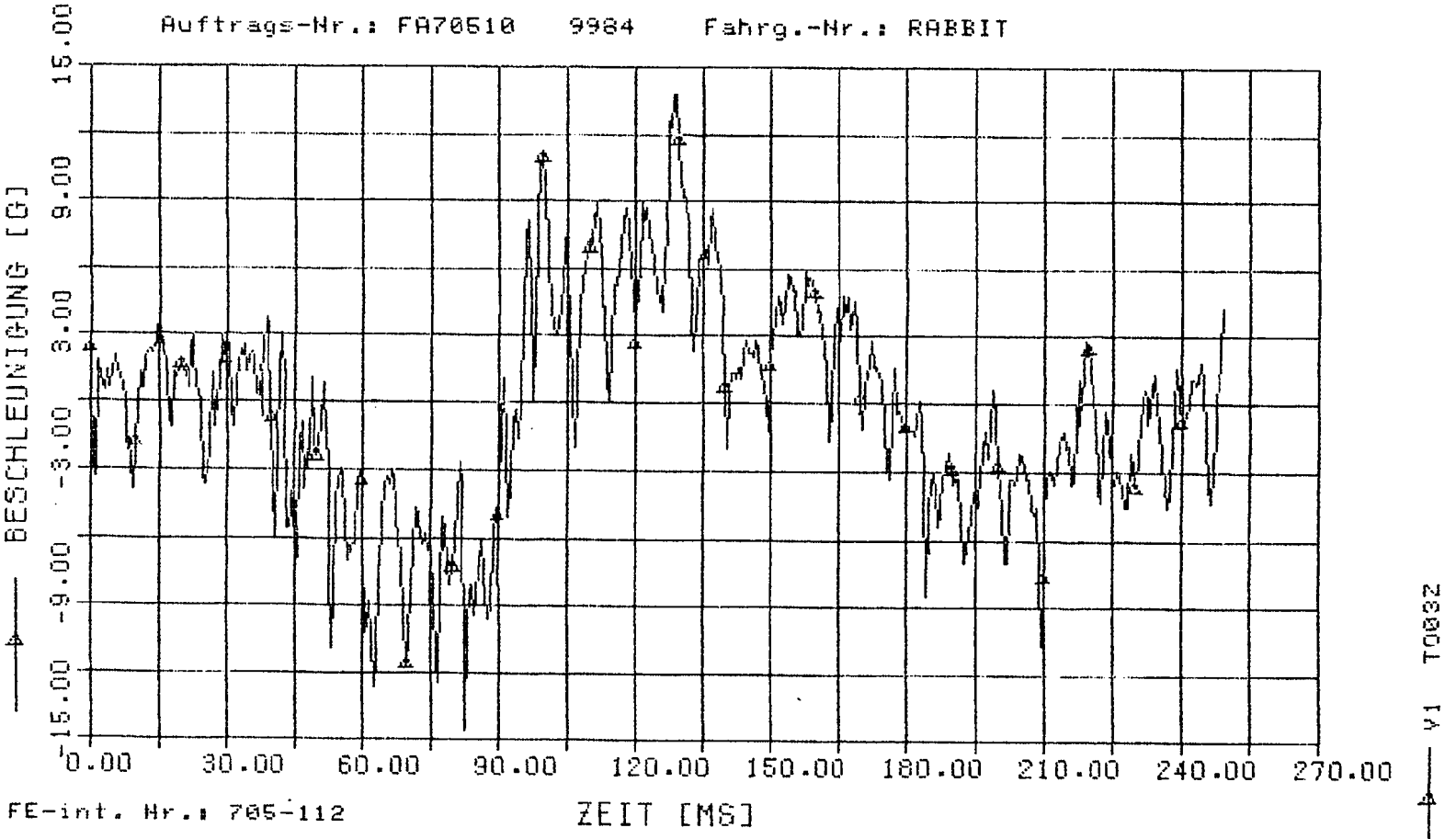
-.Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| T003Y | V1 | BE g | 36.473 | 97.50 | 0.00 |



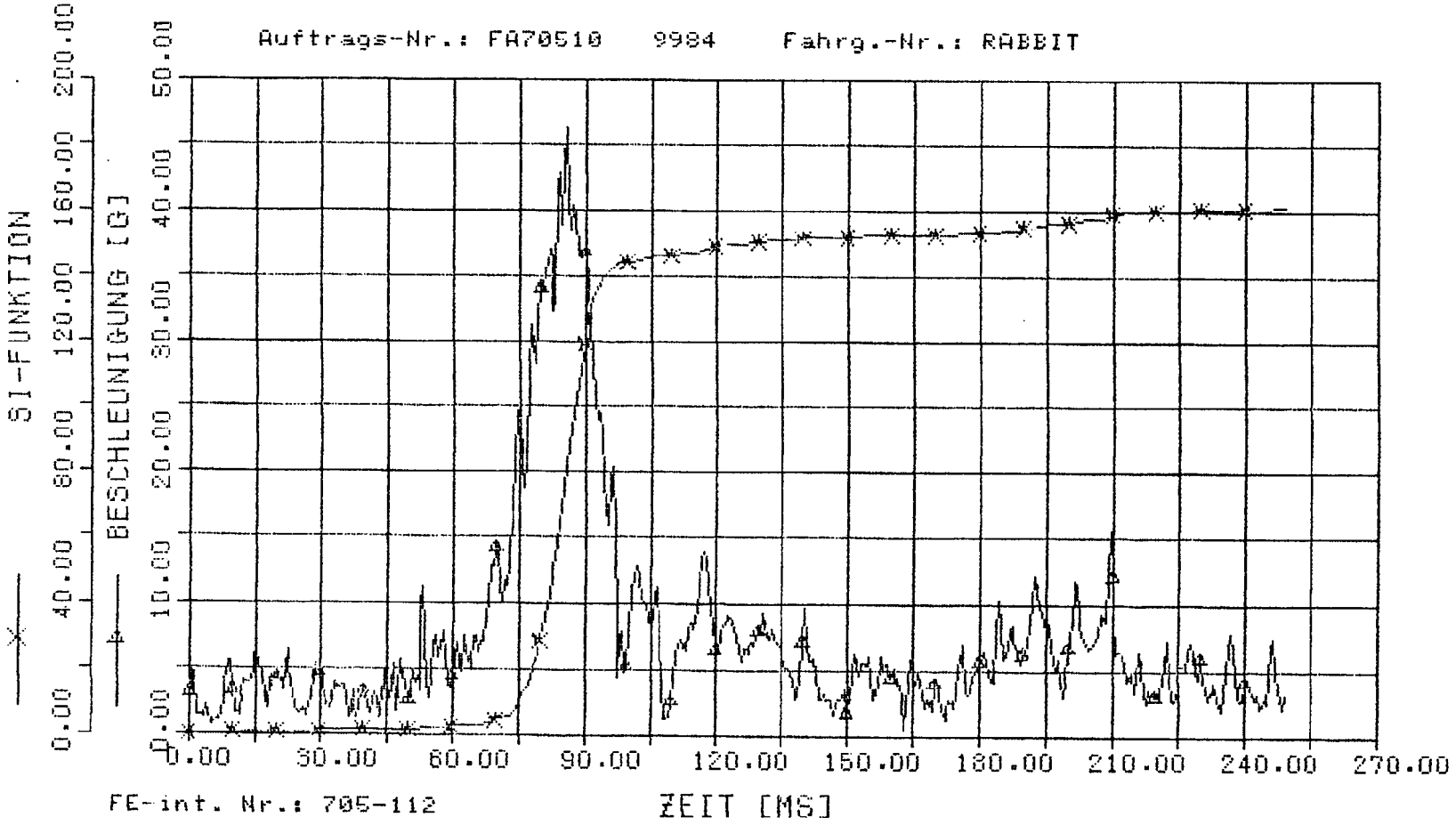
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| T003Z | V1 | BE g | -14.559 | 83.00 | 0.00 |



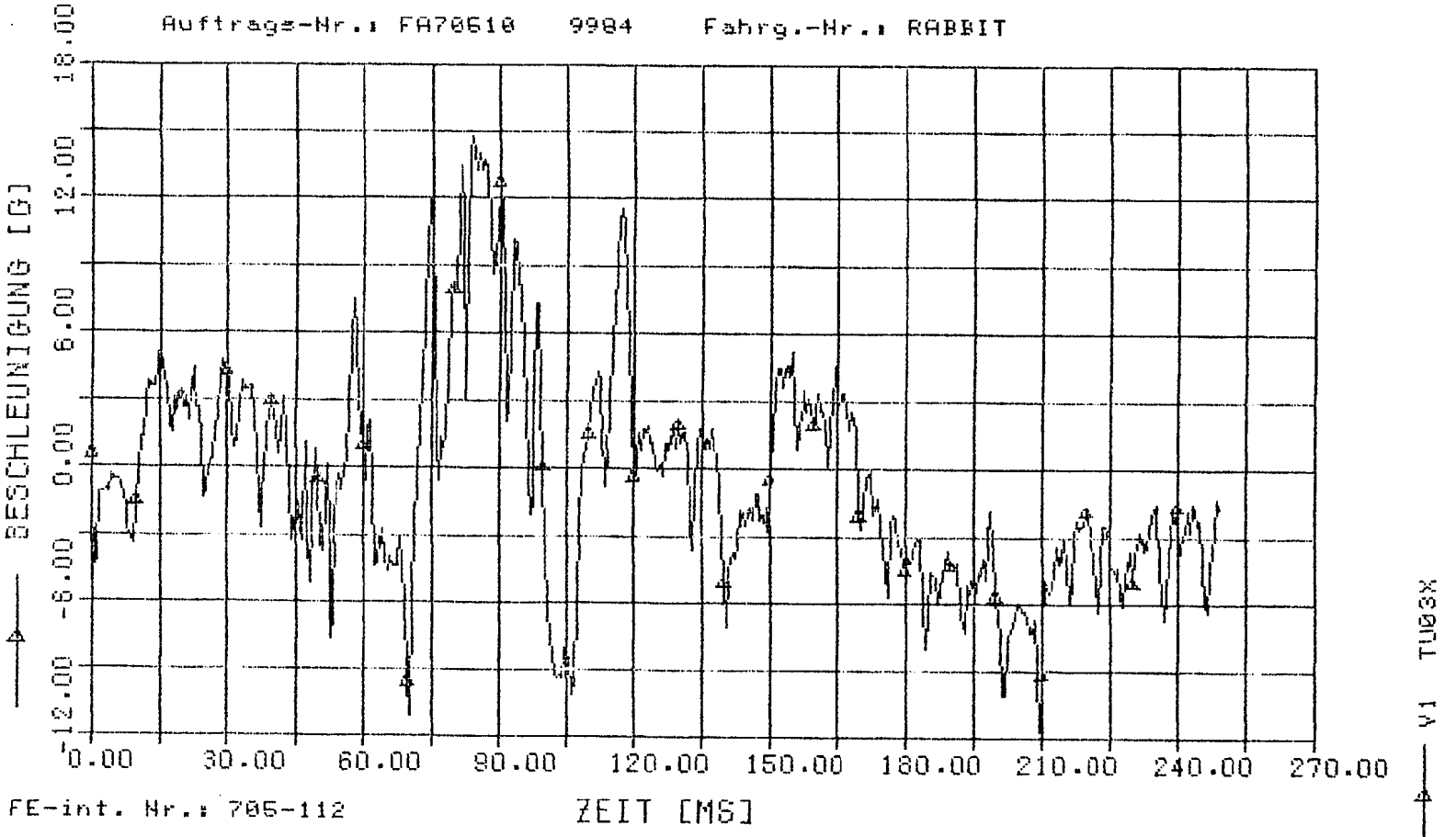
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TU03 | V1 | BE g | 46.269 | 86.00 | 0.00 |
| TU03 | V1 | SI | 160.989 | 250.00 | 0.00 |



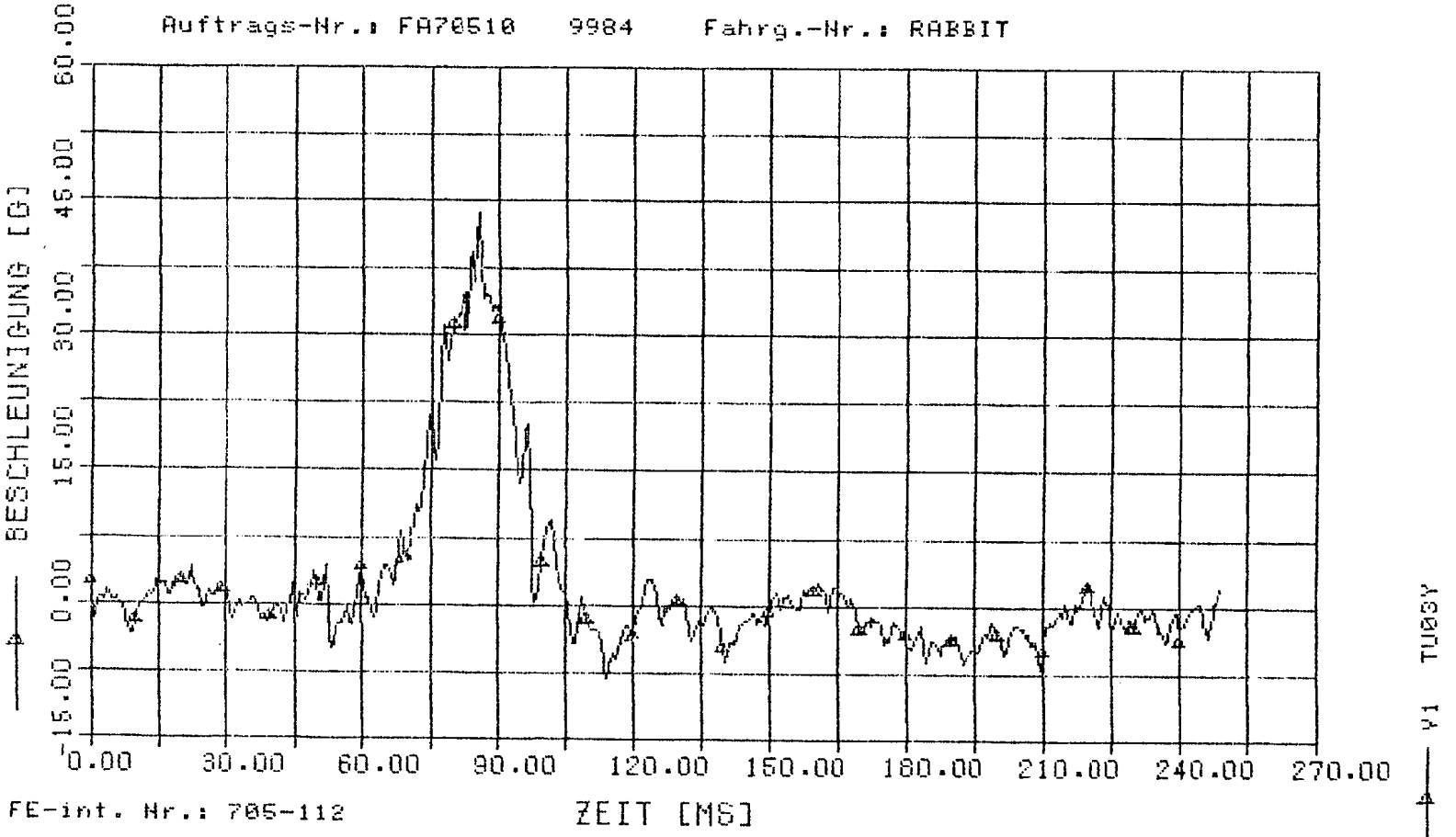
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TU03X | V1 | BE g | 14.787 | 84.50 | 0.00 |



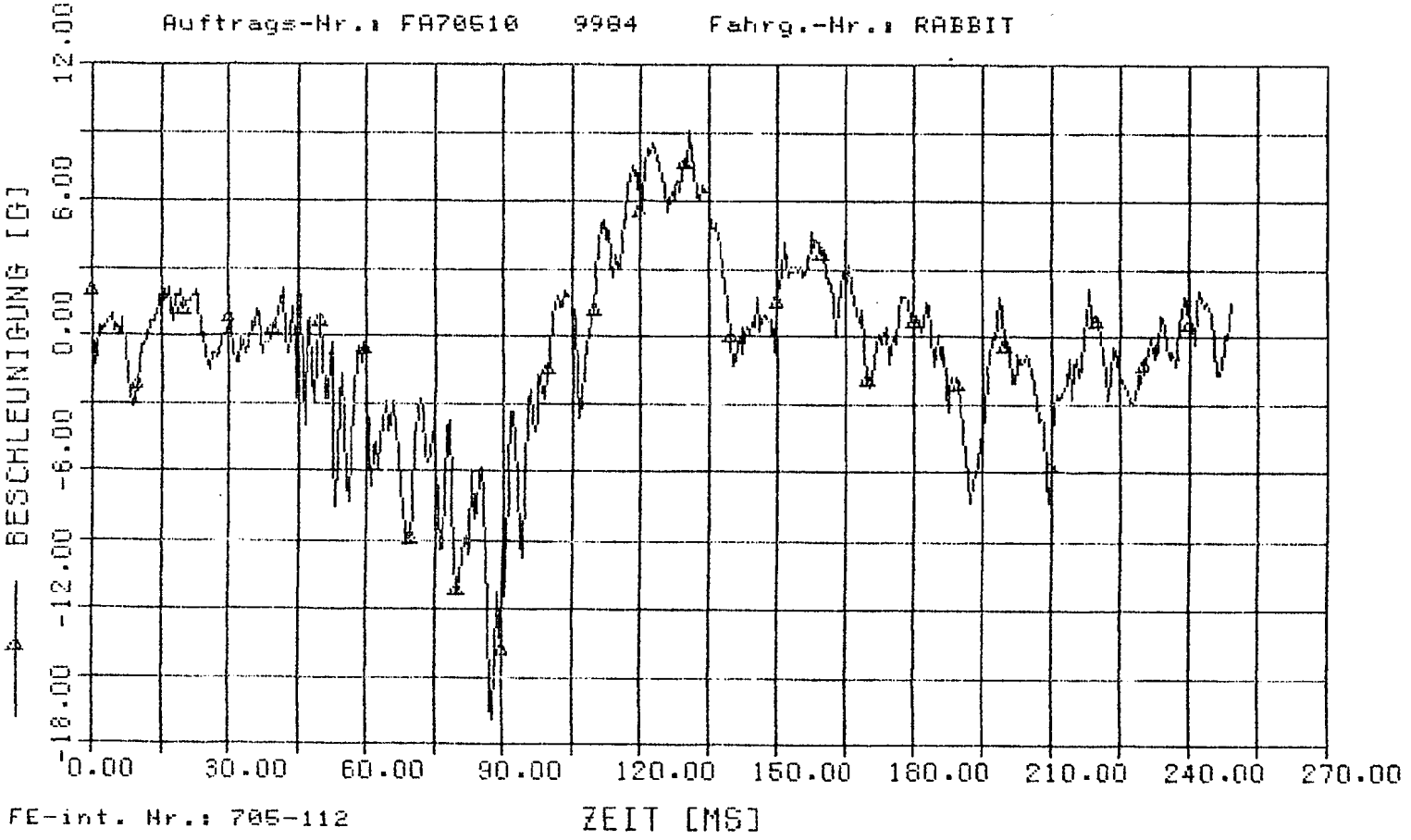
- Kenn-Werte:  Auftrags-Nr.: FA70510  Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TU03Y | V1 | BE g | 43.505 | 86.00 | 0.00 |



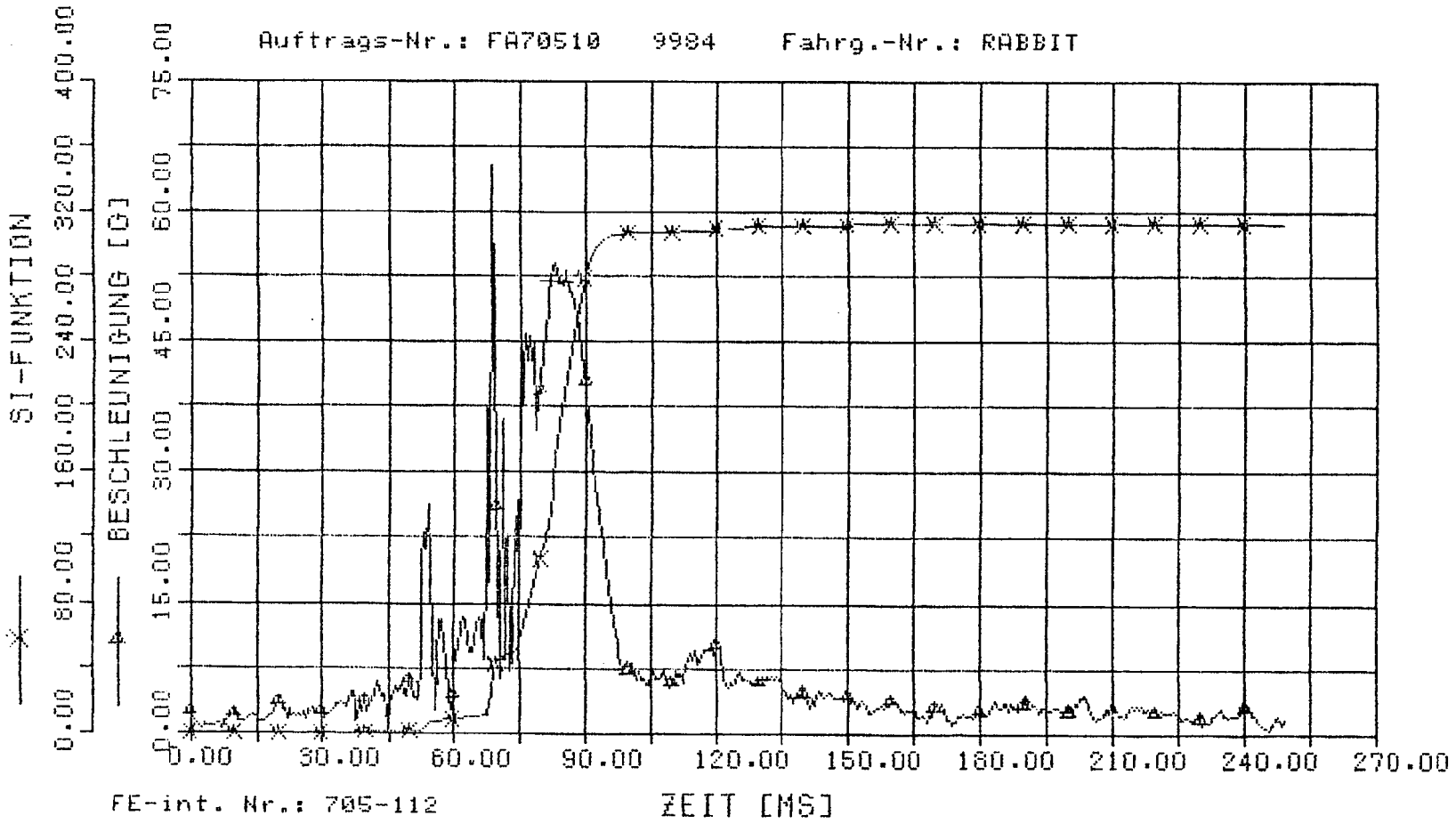
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TU03Z | V1 | BE g | -14.879 | 88.00 | 0.00 |



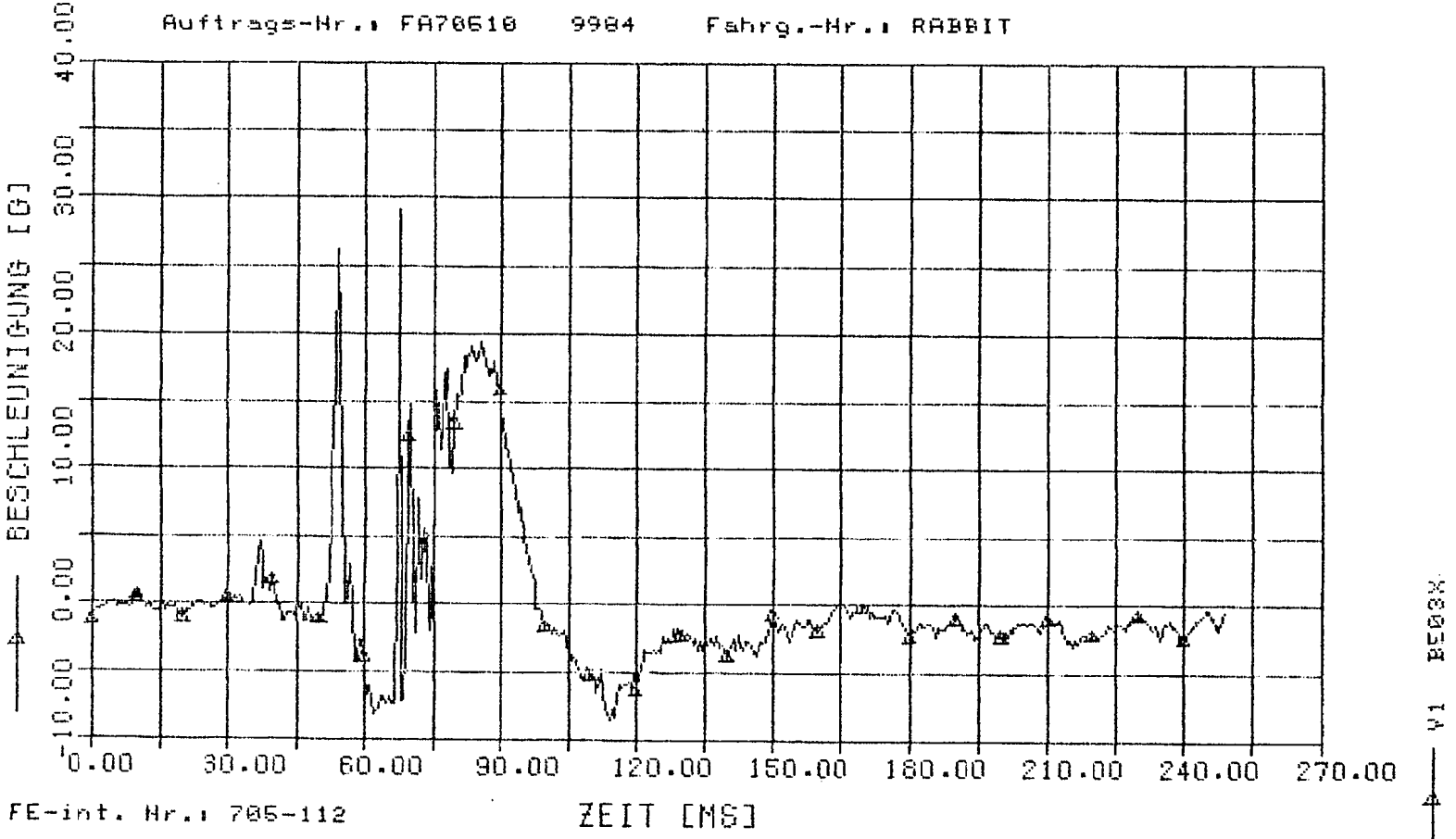
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BE03 | V1 | BE g | 65.409 | 69.00 | 52.07 |
| BE03 | V1 | SI | 312.785 | 250.00 | 0.00 |



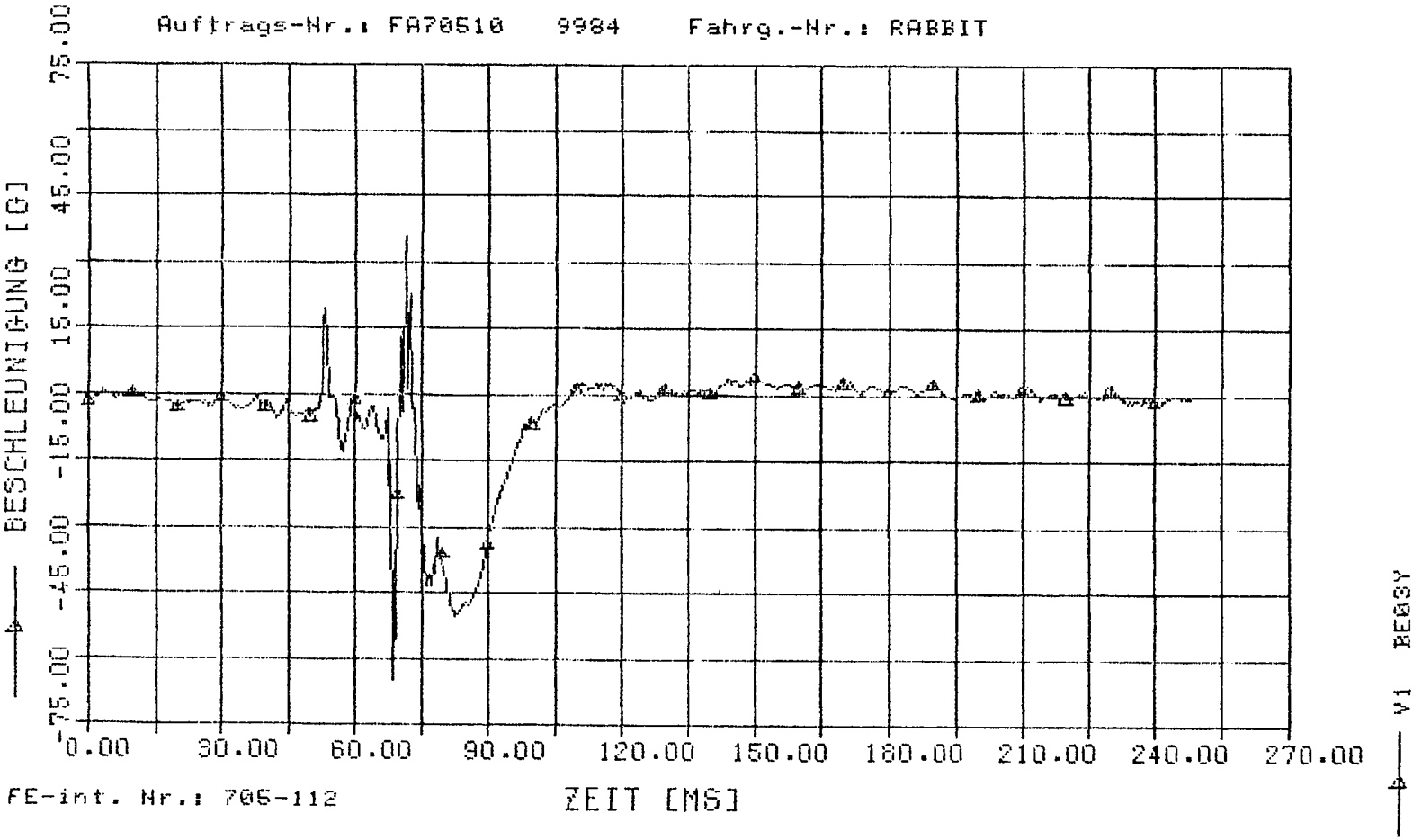
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BE03X | V1 | BE g | 29.096 | 68.00 | 18.39 |



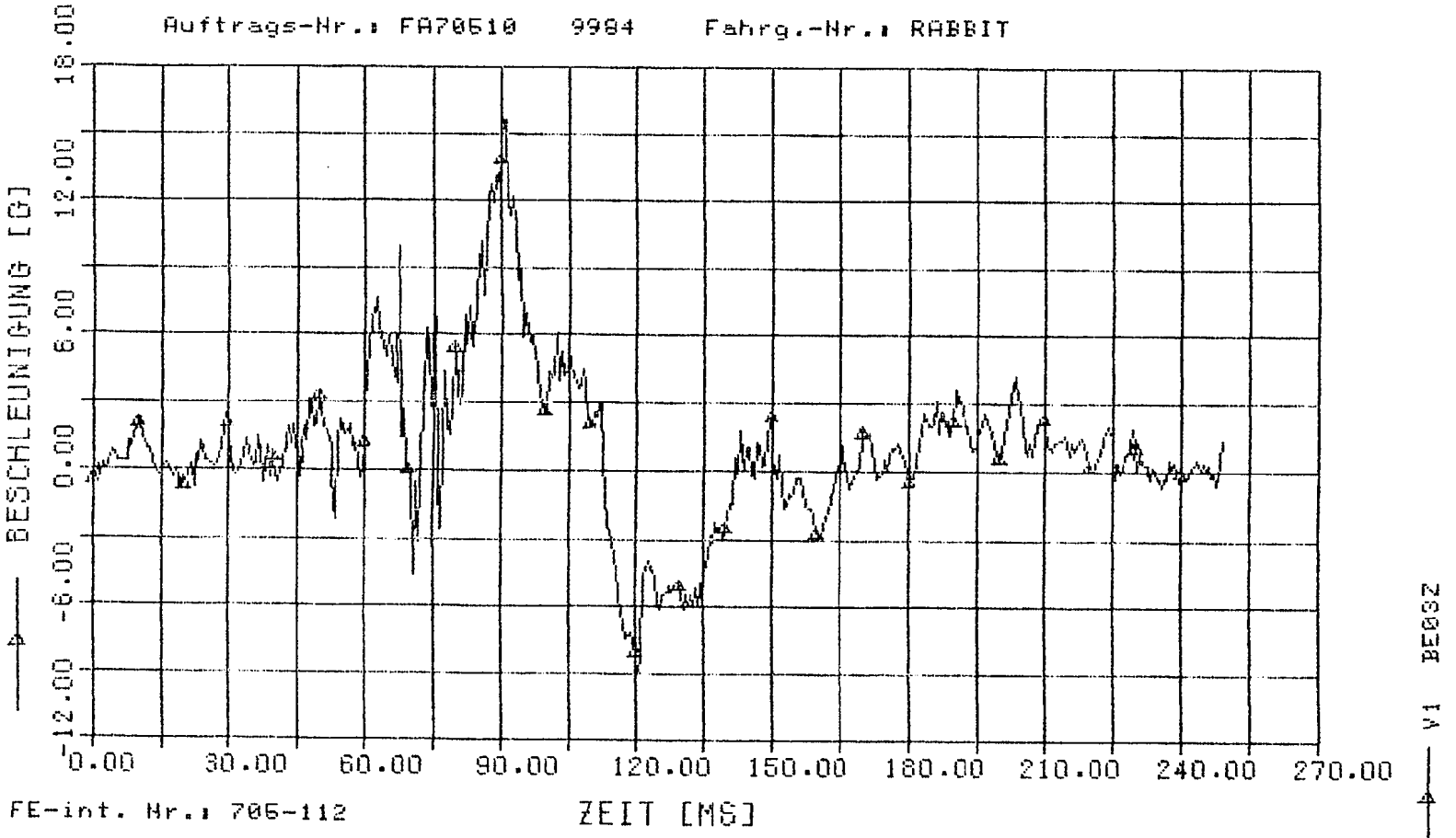
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BE03Y | V1 | BE g | -64.977 | 69.00 | 3.97 |



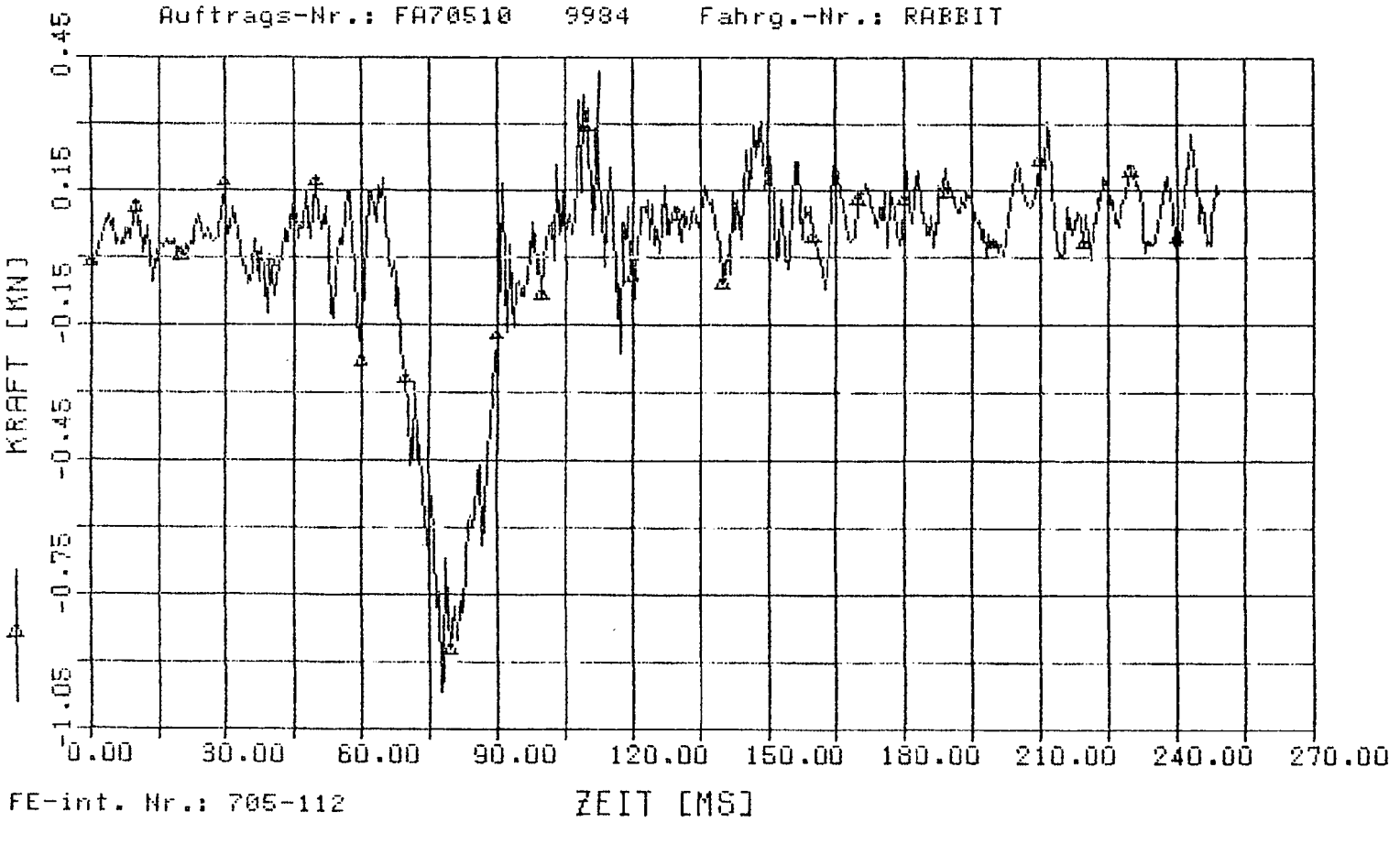
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

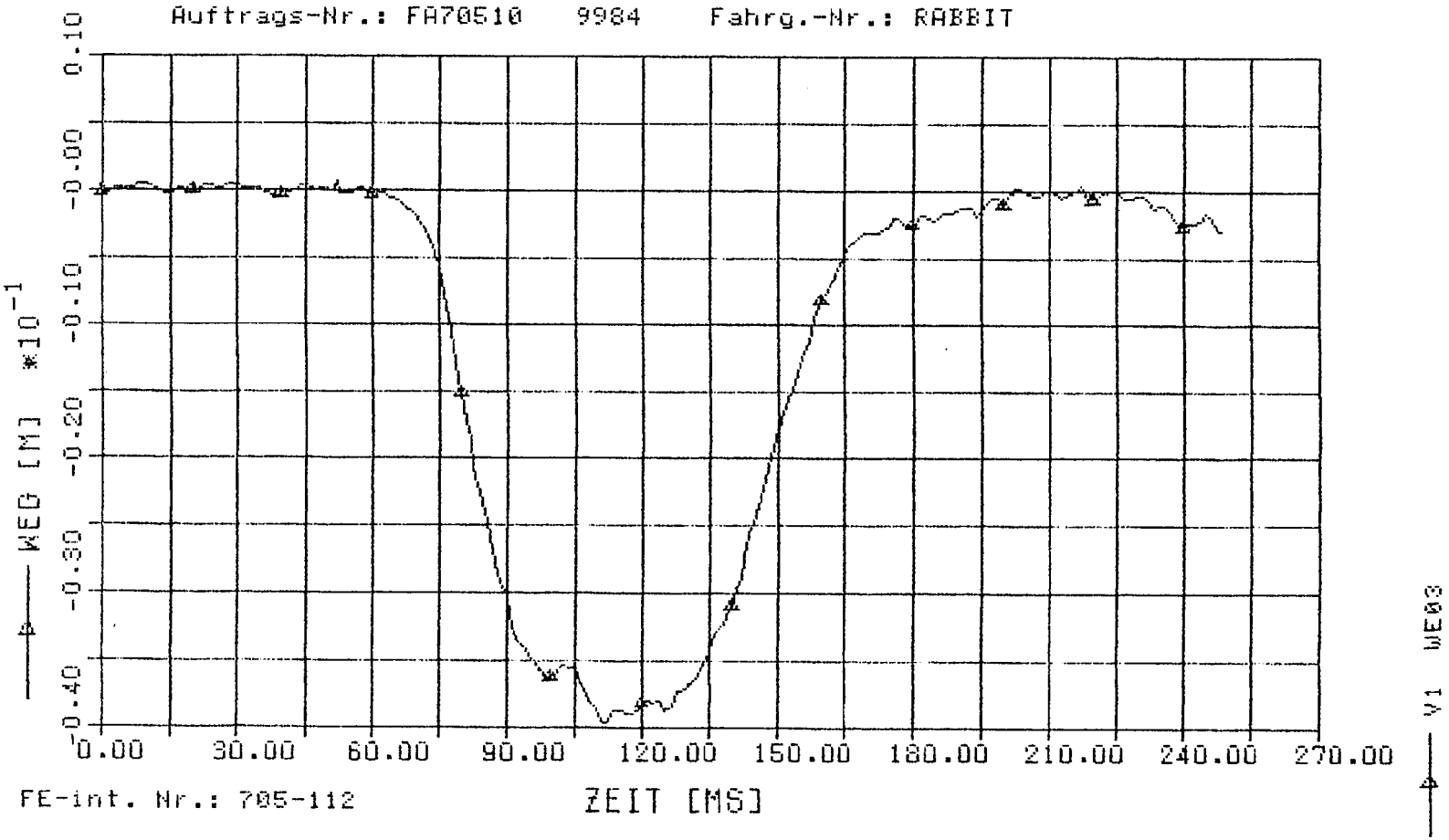
| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BE03Z | V1 | BE g | 15.996 | 90.50 | 12.72 |



- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

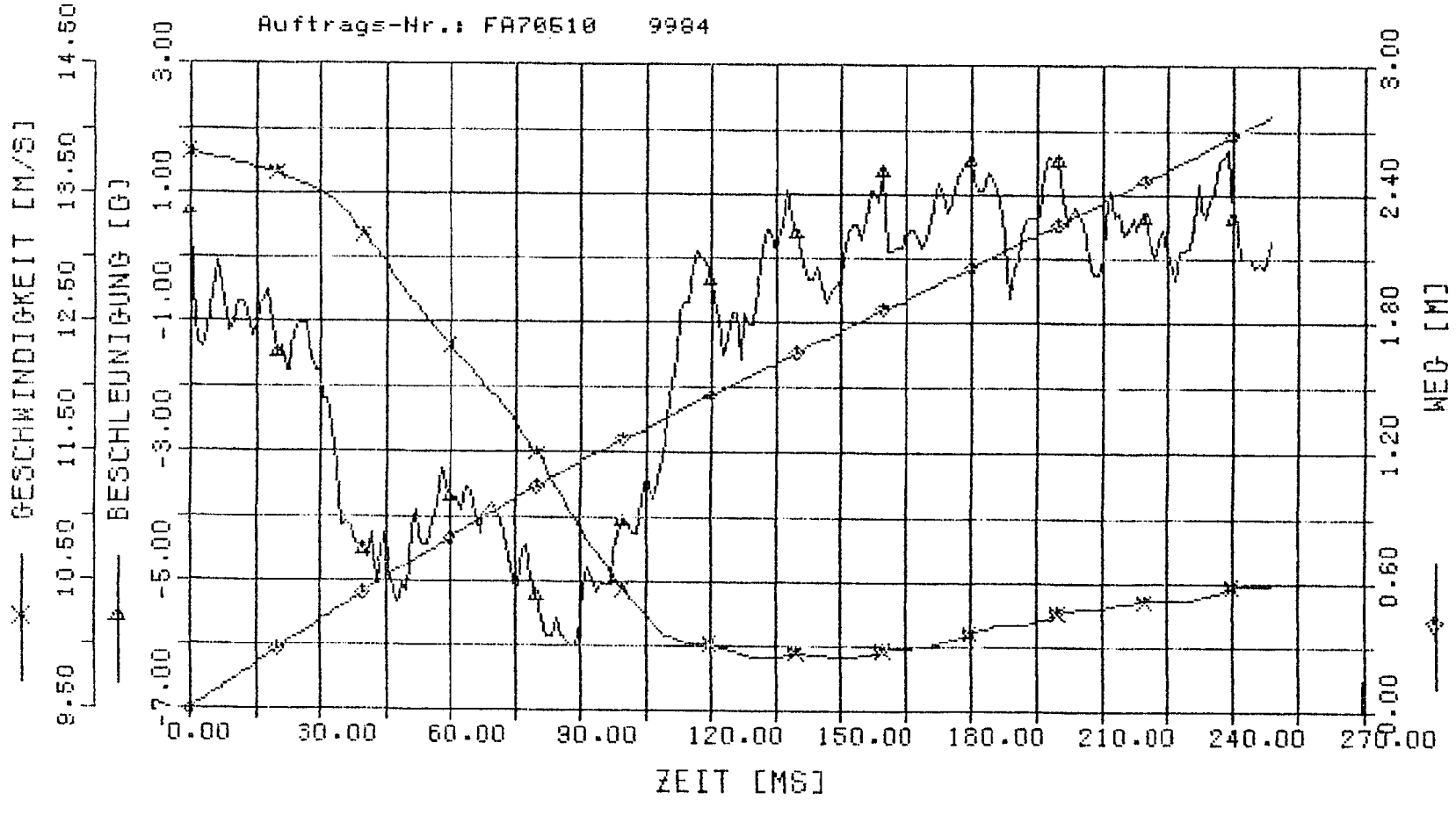
| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| CU03BA | V1 | KR kN | -.973 | 78.00 | 0.00 |




Auftrags-Nr.: FA70510 9984 Fahrg.-Nr.: RABBIT
0.10
-0.00
-0.10
-0.20
-0.30
-0.40
WEG [M] *10-1
0.00
30.00
60.00
90.00
120.00
150.00
180.00
210.00
240.00
270.00
ZEIT [MS]
FE-int. Nr.: 705-112
V1 WE03

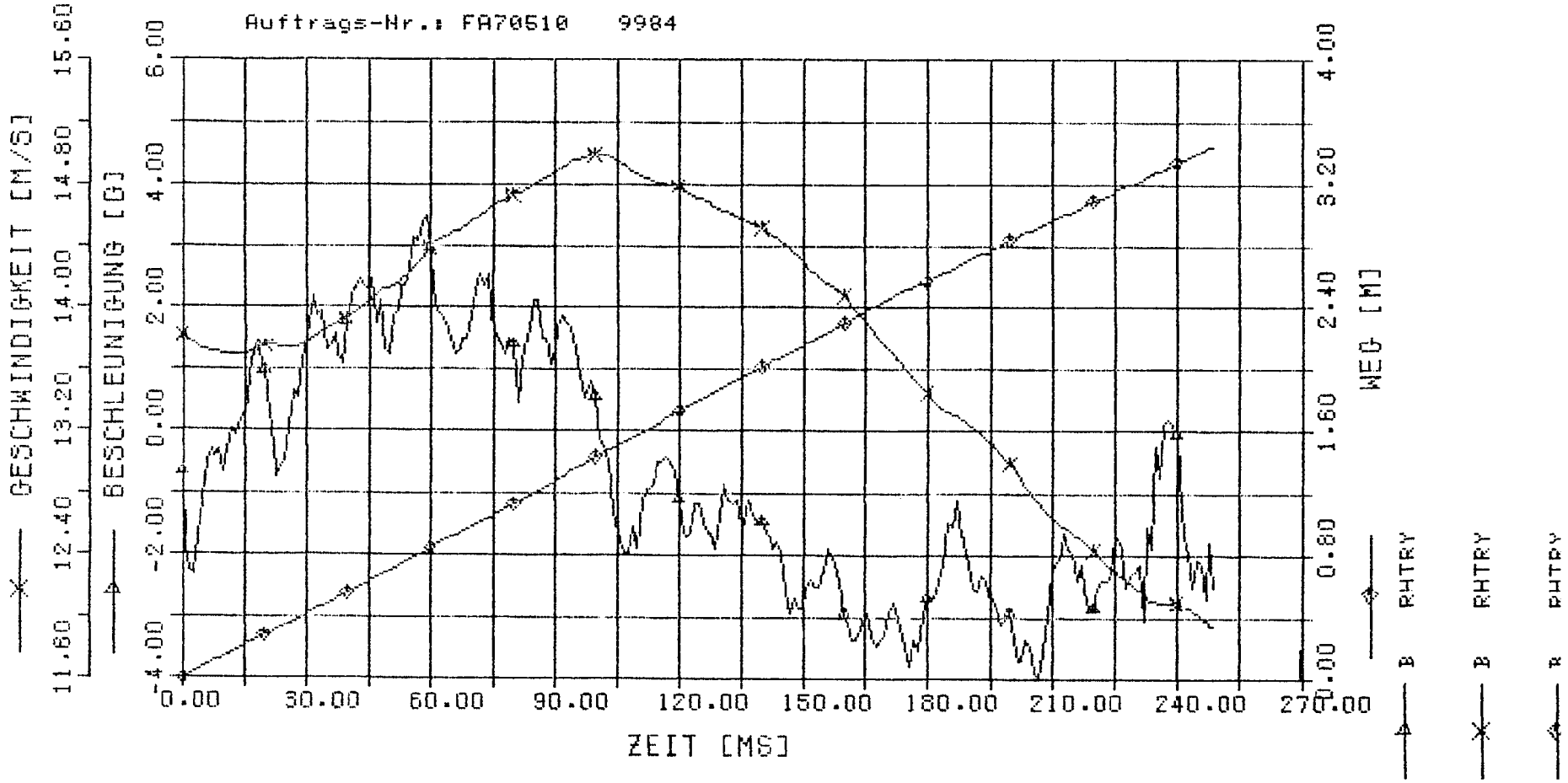
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| RHTRX | B | BE g | -6.025 | 89.00 | 0.00 |
| RHTRX | B | GE m/s | 13.818 | 1.00 | 0.00 |
| RHTRX | B | WE m | 2.831 | 255.00 | 0.00 |



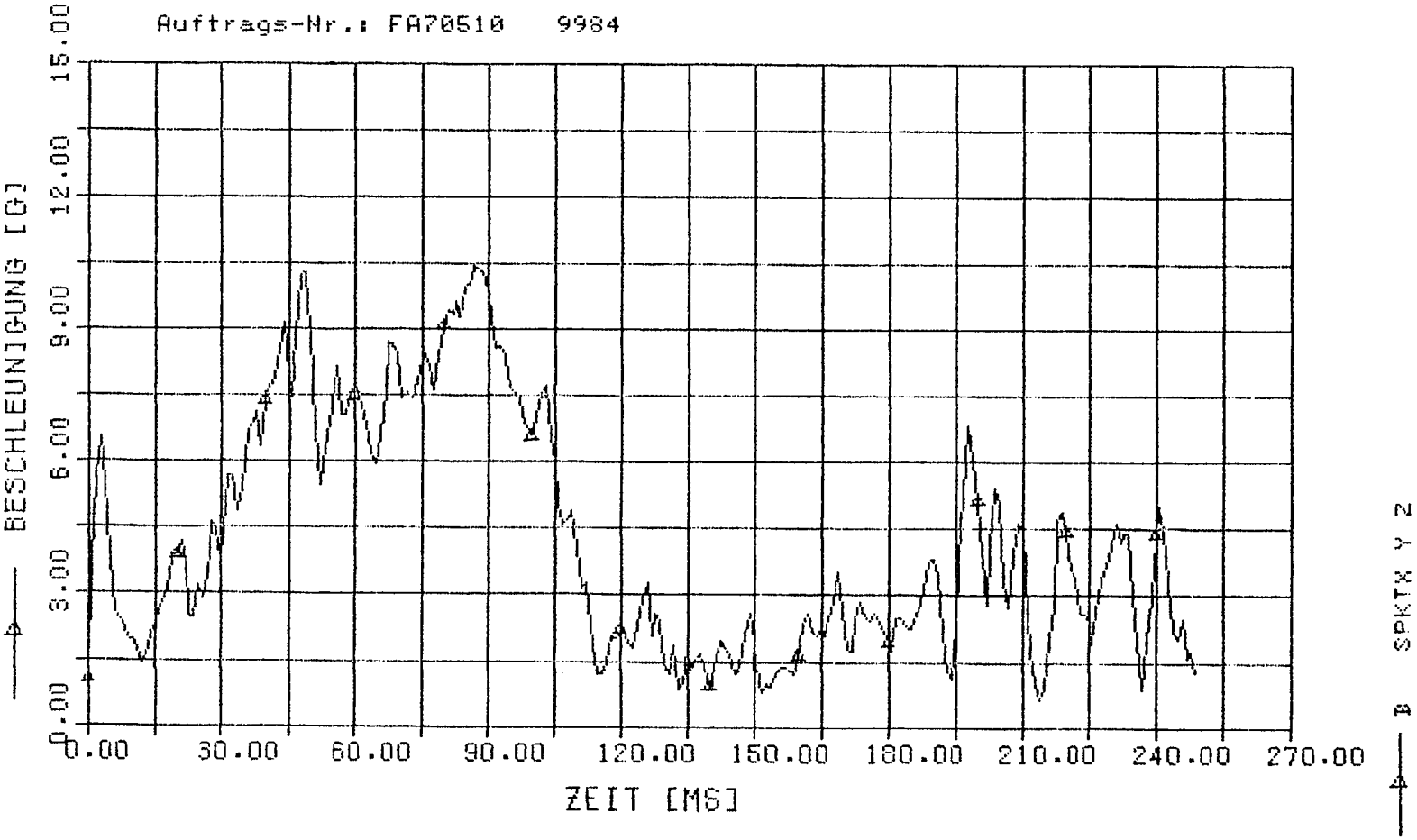
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| RHTRY | B | BE g | -3.984 | 207.00 | 0.00 |
| RHTRY | B | GE m/s | 14.985 | 101.00 | 0.00 |
| RHTRY | B | WE m | 3.515 | 255.00 | 0.00 |



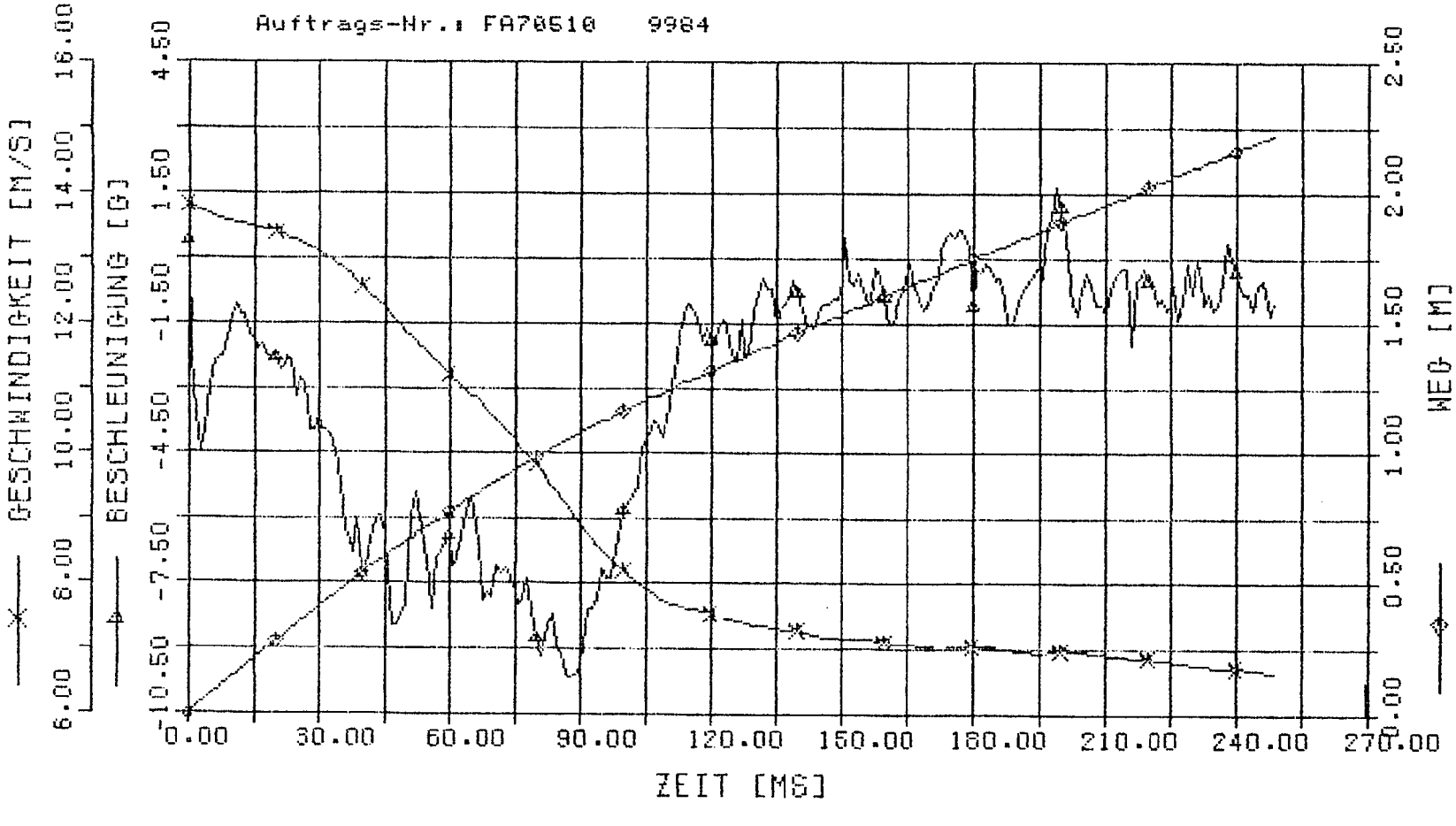
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|---|
| SPKT | B | BE | g | 10.423 | 87.00 | 0.00 |



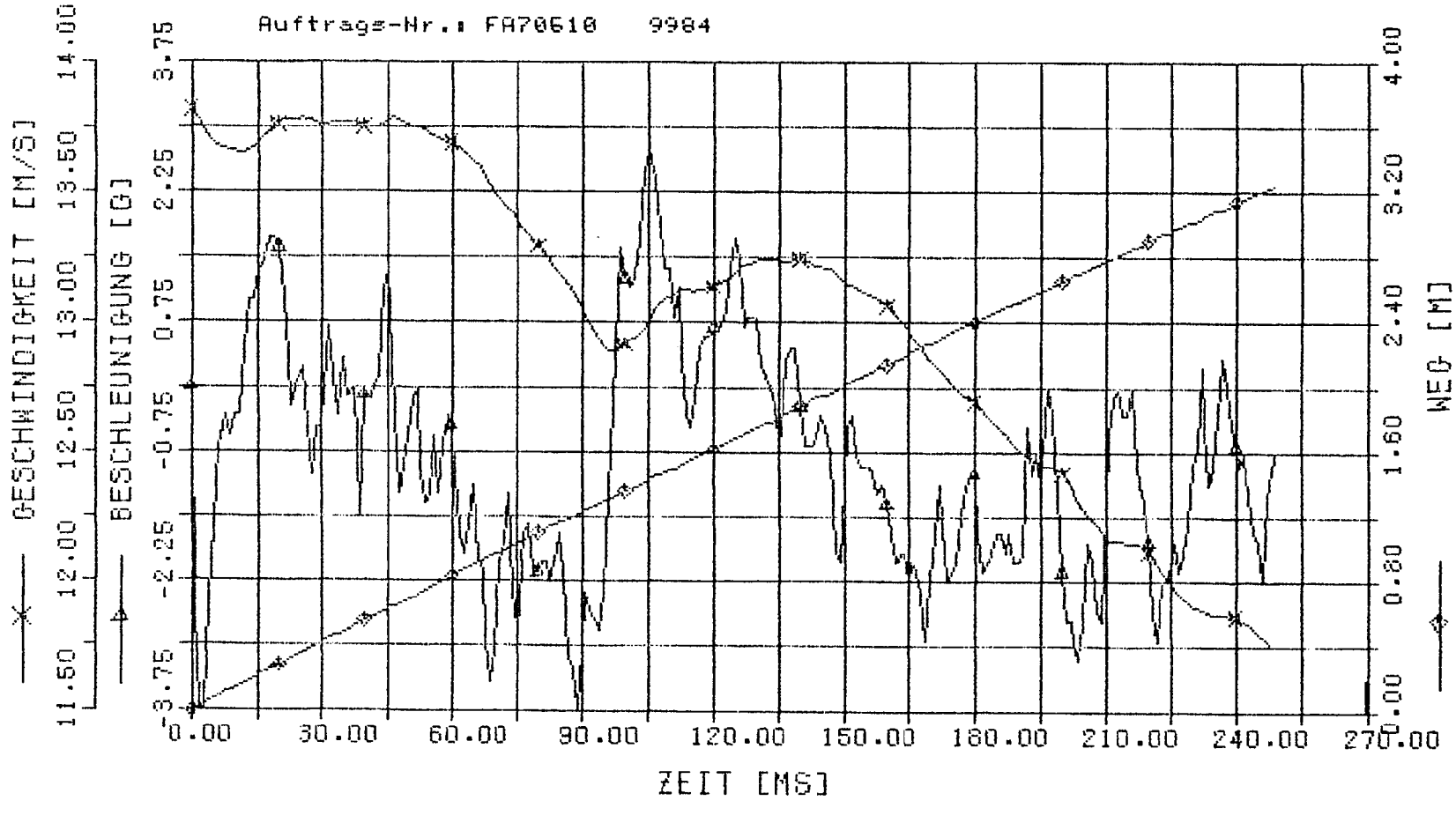
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SPKTX | B | BE g | -9.684 | 38.00 | 0.00 |
| SPKTX | B | GE m/s | 13.817 | 0.00 | 0.00 |
| SPKTX | B | WE m | 2.259 | 255.00 | 0.00 |



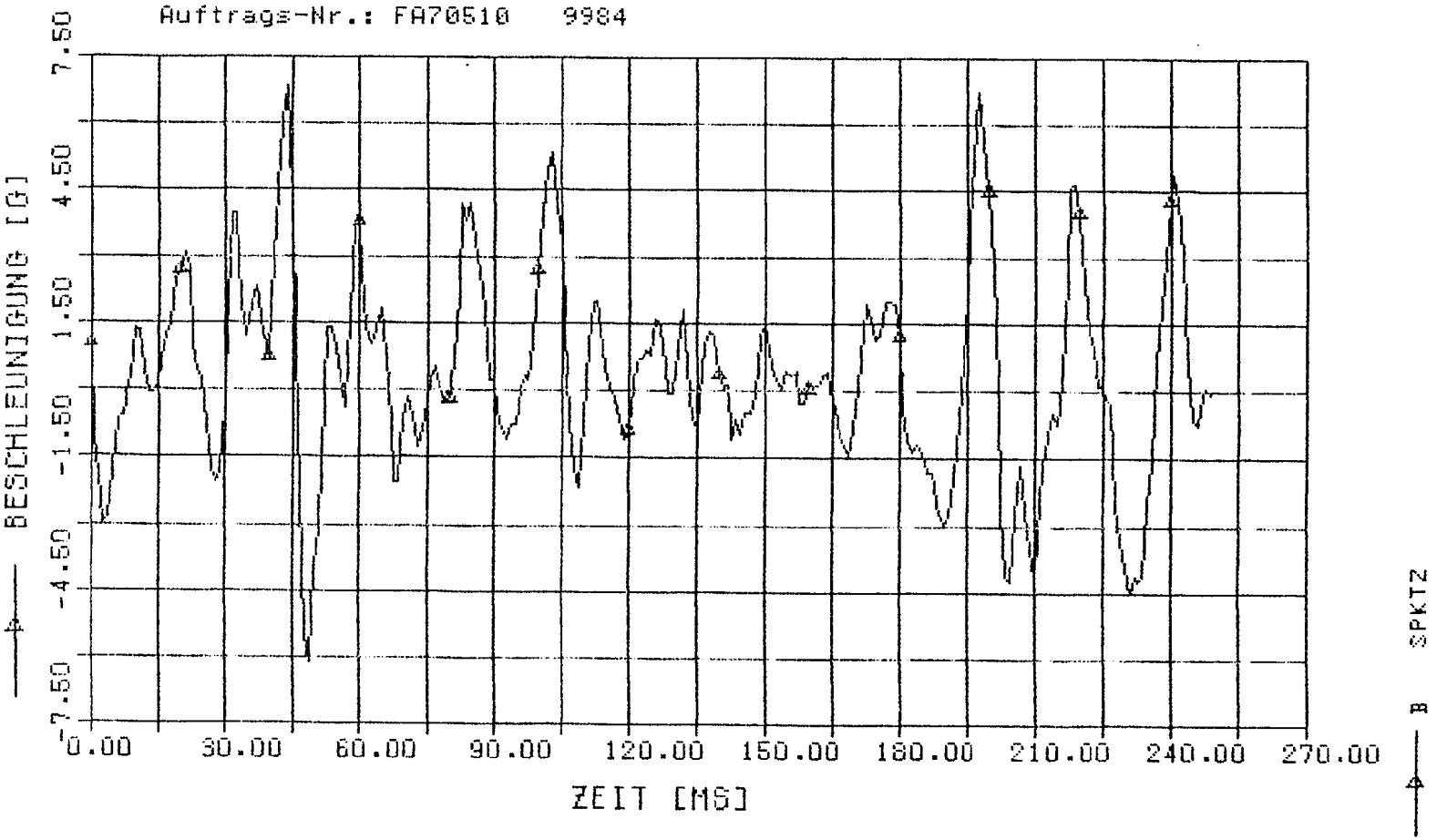
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SPKTY | B | BE g | -3.741 | 89.00 | 0.00 |
| SPKTY | B | GE m/s | 13.817 | 0.00 | 0.00 |
| SPKTY | B | WE m | 3.312 | 255.00 | 0.00 |



- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SPKTZ | B | BE g | 6.833 | 44.00 | 0.00 |

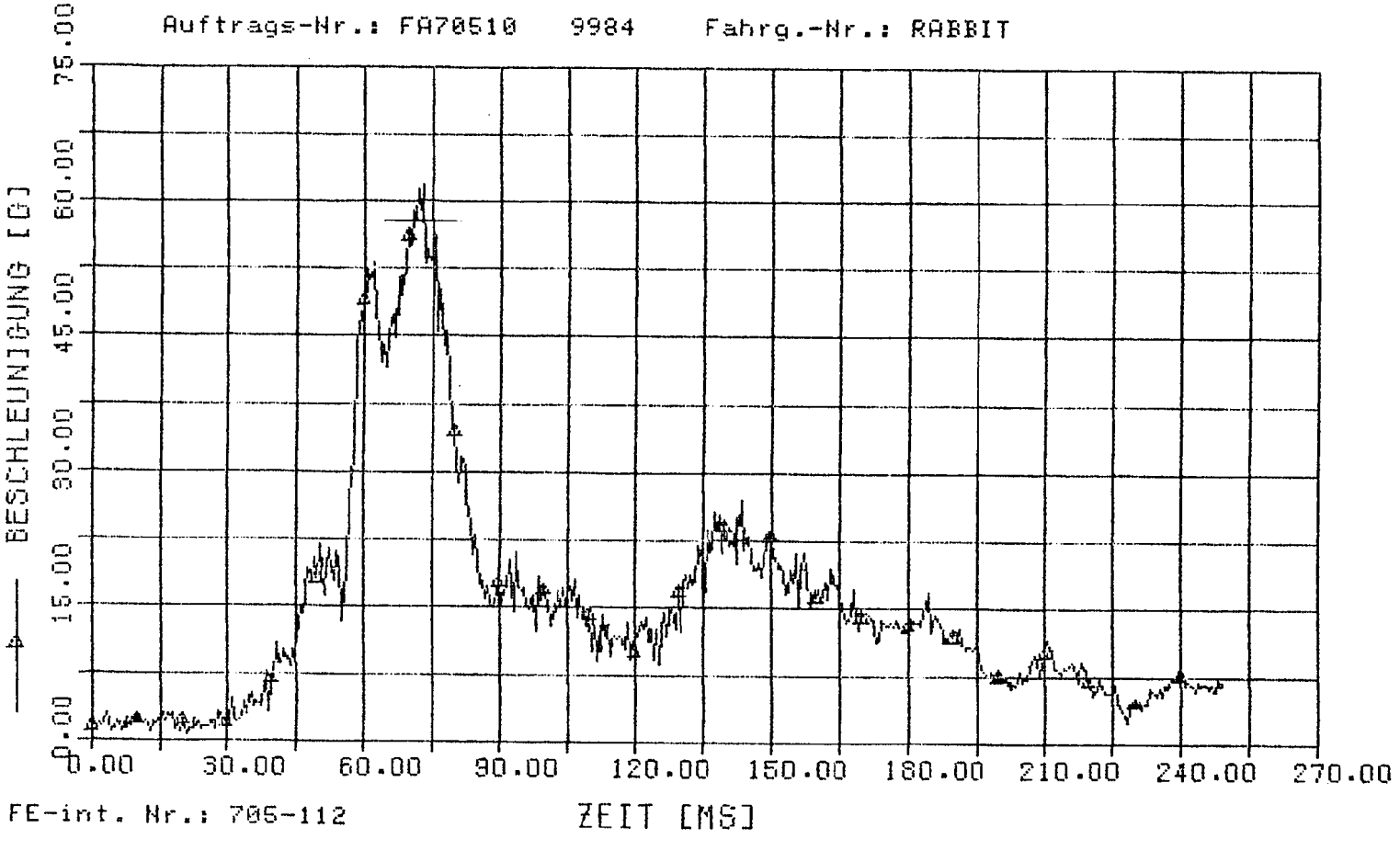


## B.2 Dummy Test Response

### B.2.1 Driver

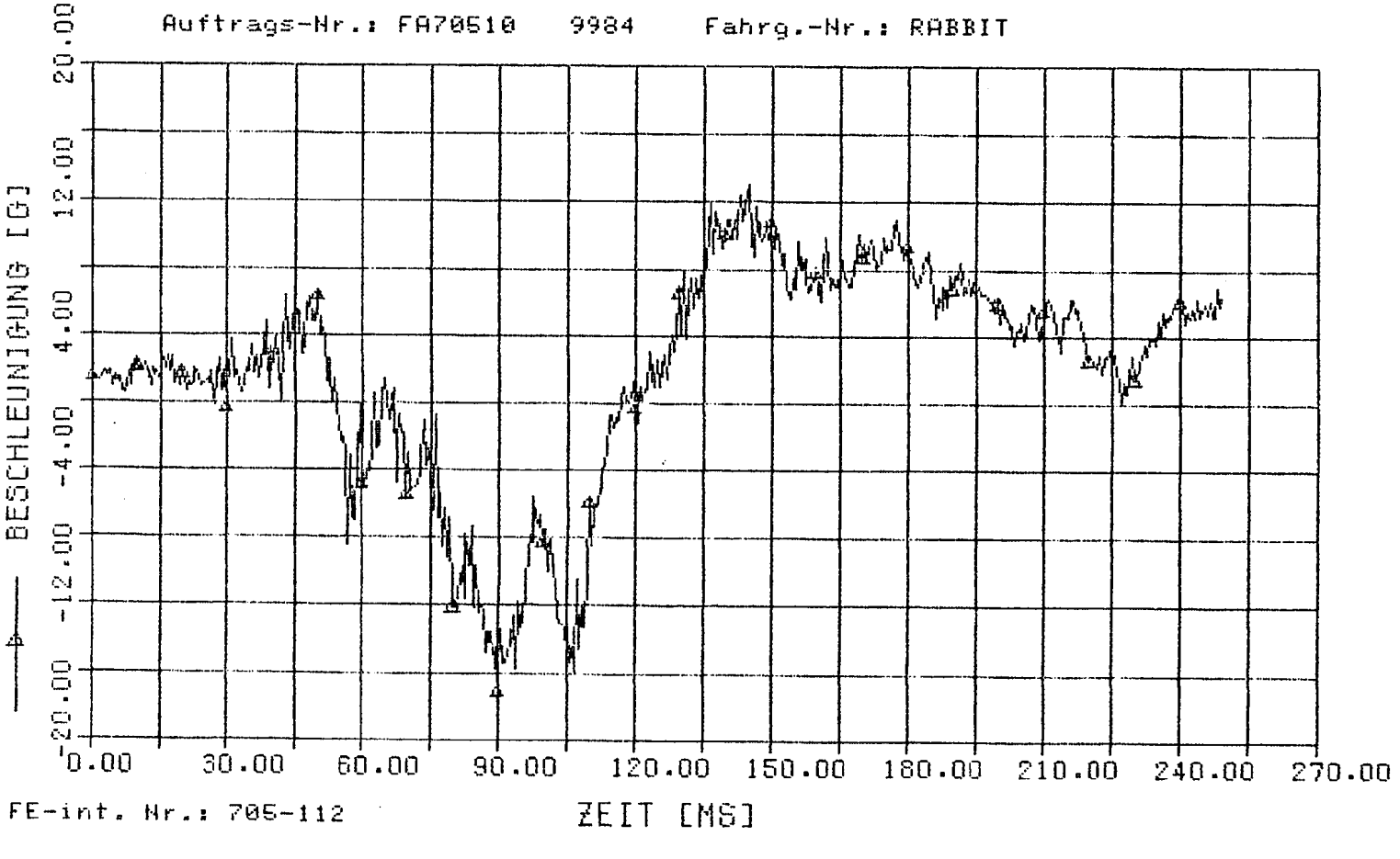
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| K001 | V1 | BE g | 66.311 | 71.90 | 56.80 |



- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

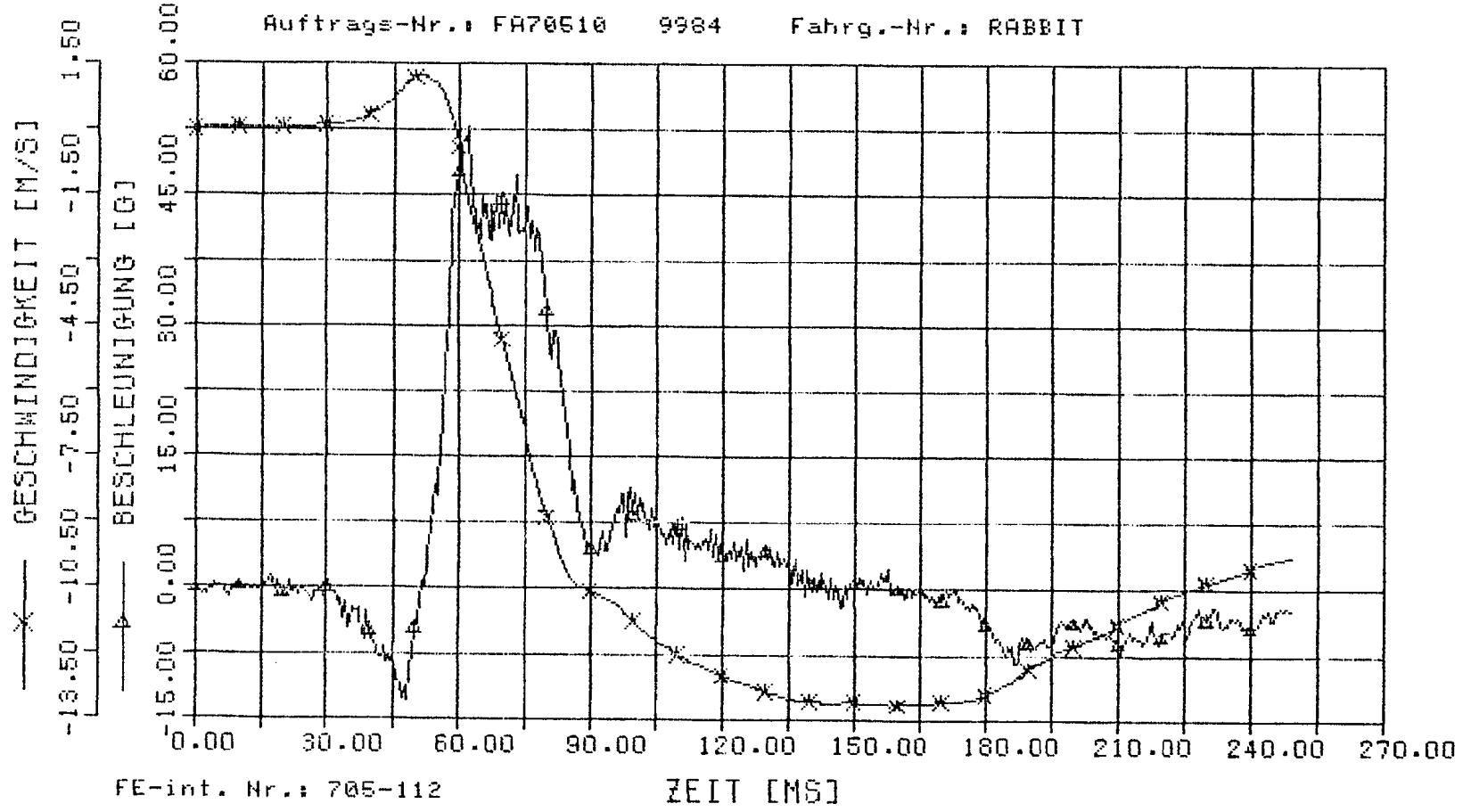
| Mess-Stelle | UP | ber. Groesse | | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|---|
| K001X | V1 | BE | g | -17.917 | 89.90 | 11.32 |



- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

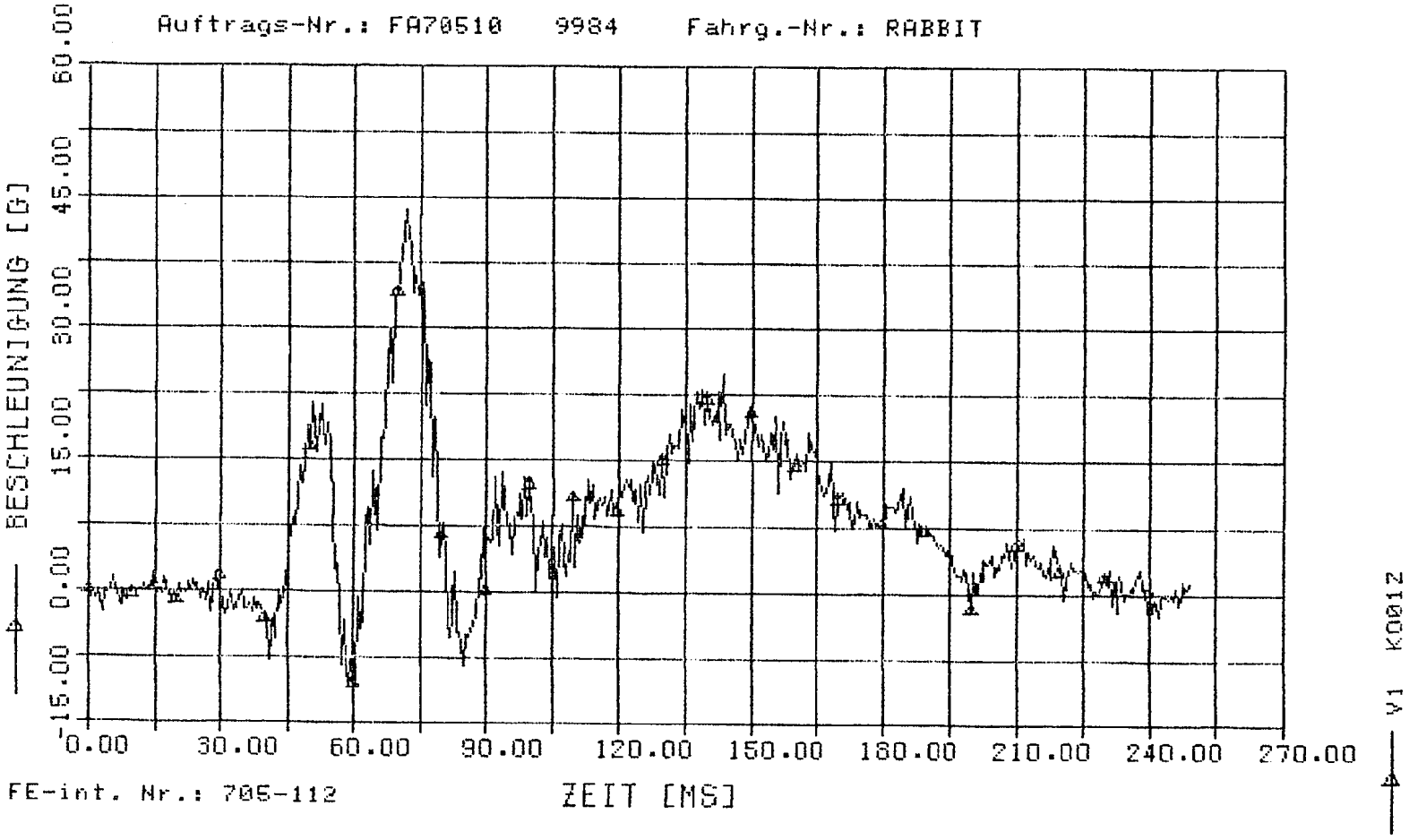
| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| K001Y | V1 | BE g | 53.986 | 61.70 | 46.96 |
| K001Y | V1 | GE m/s | -13.171 | 158.40 | 0.00 |

17.37 QUICK-LOOK >SE



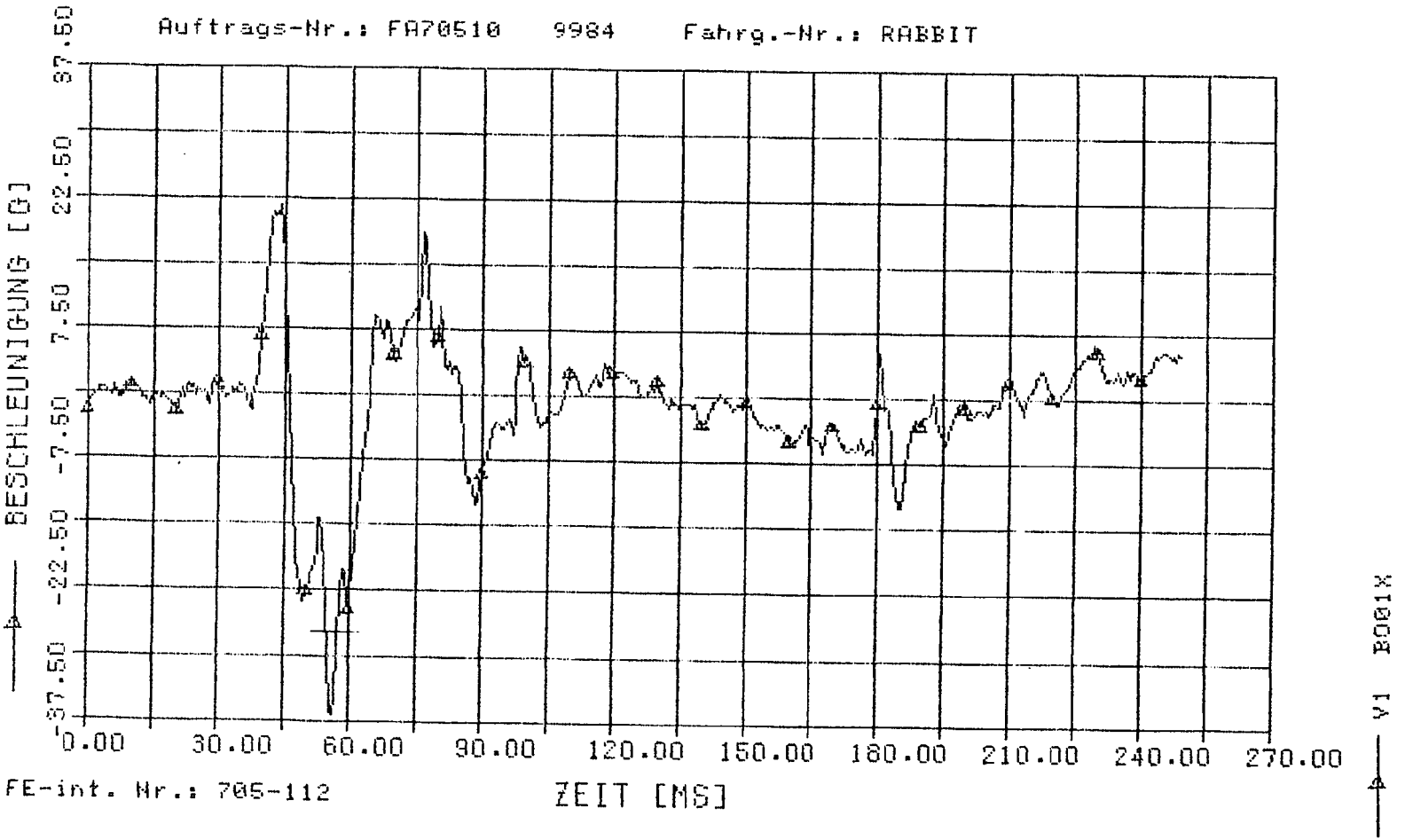
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| K001Z | V1 | BE g | 48.153 | 71.90 | 36.27 |



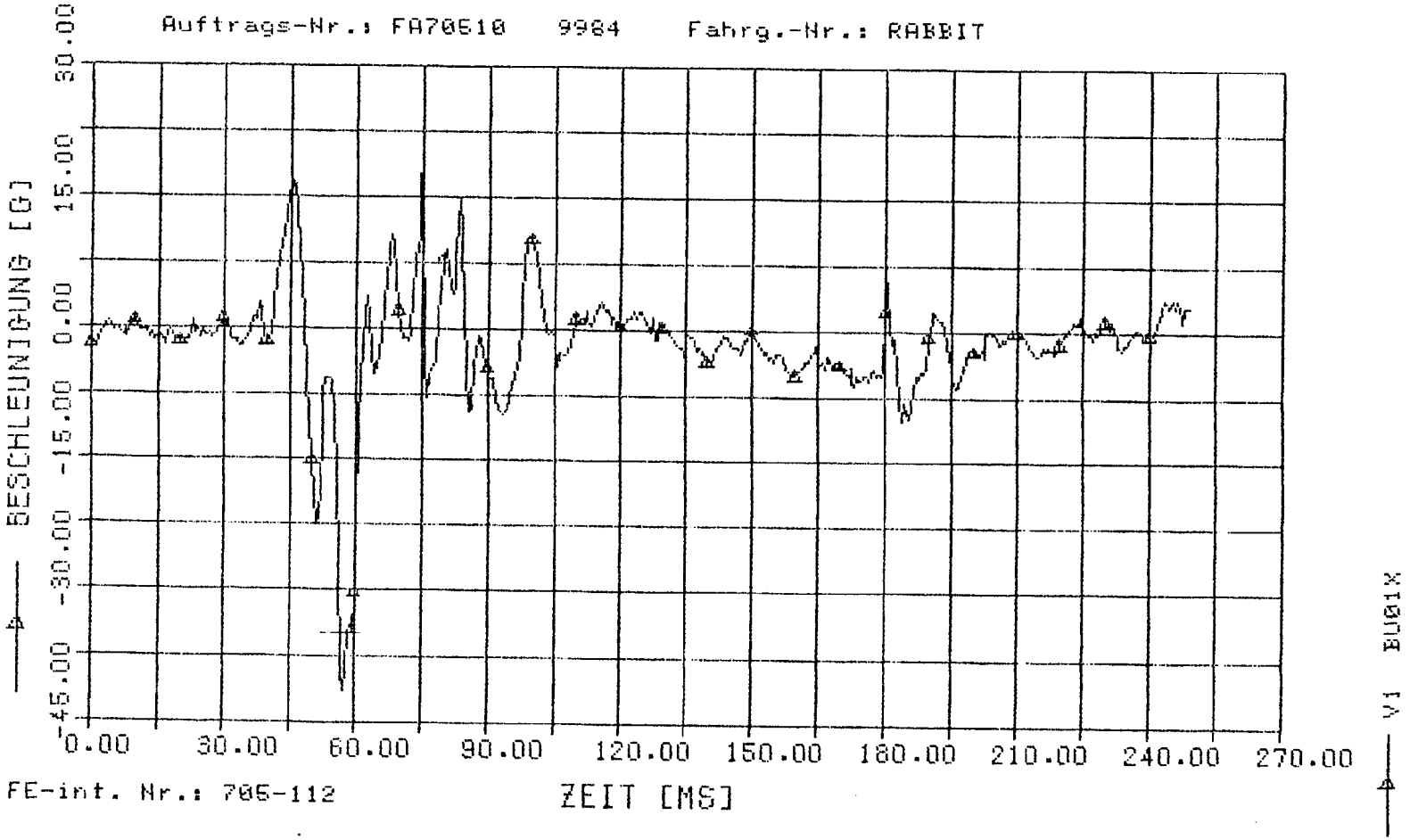
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| B001X | V1 | BE g | -36.731 | 56.50 | 0.00 |



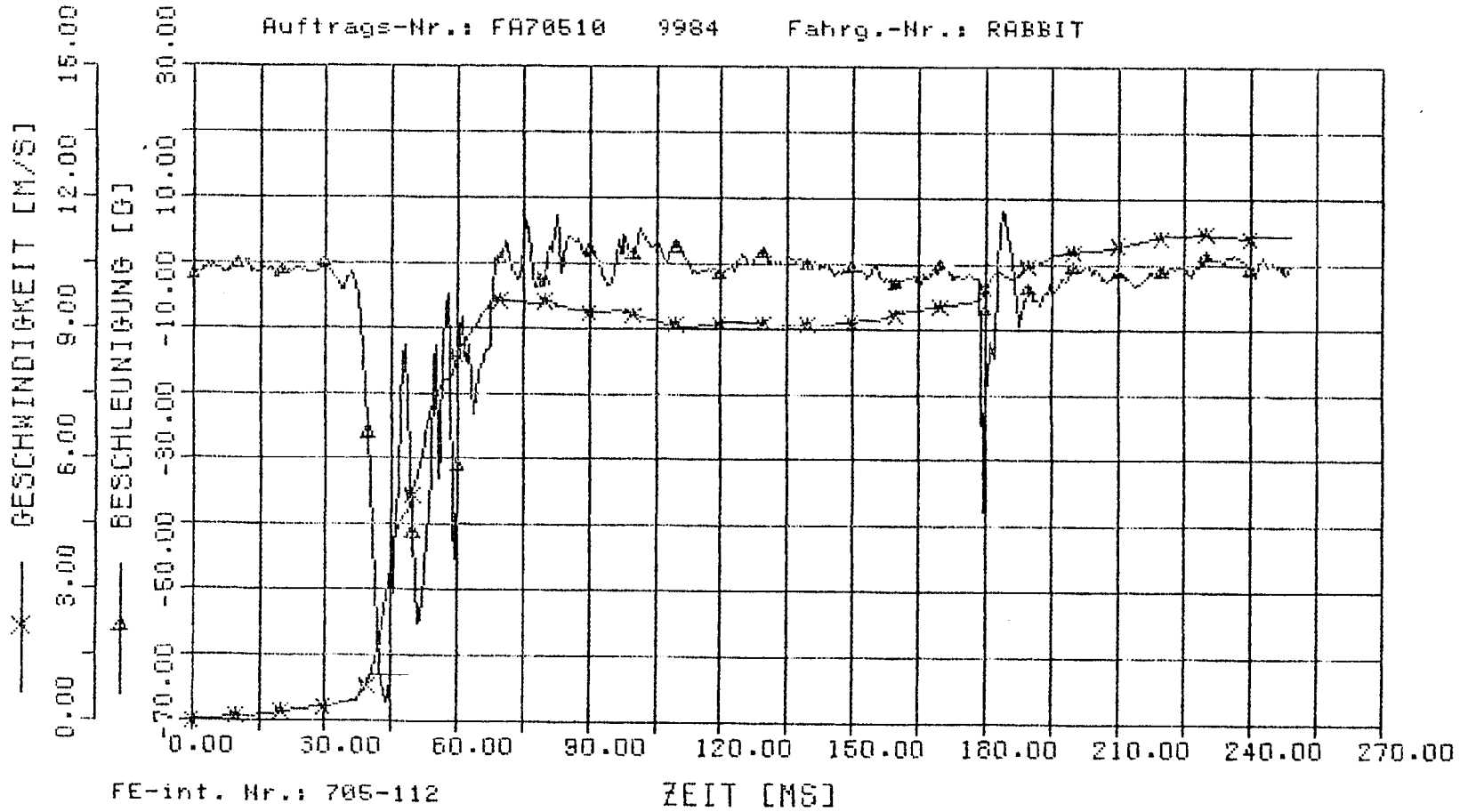
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BU01X | V1 | BE g | -41.618 | 57.50 | 0.00 |



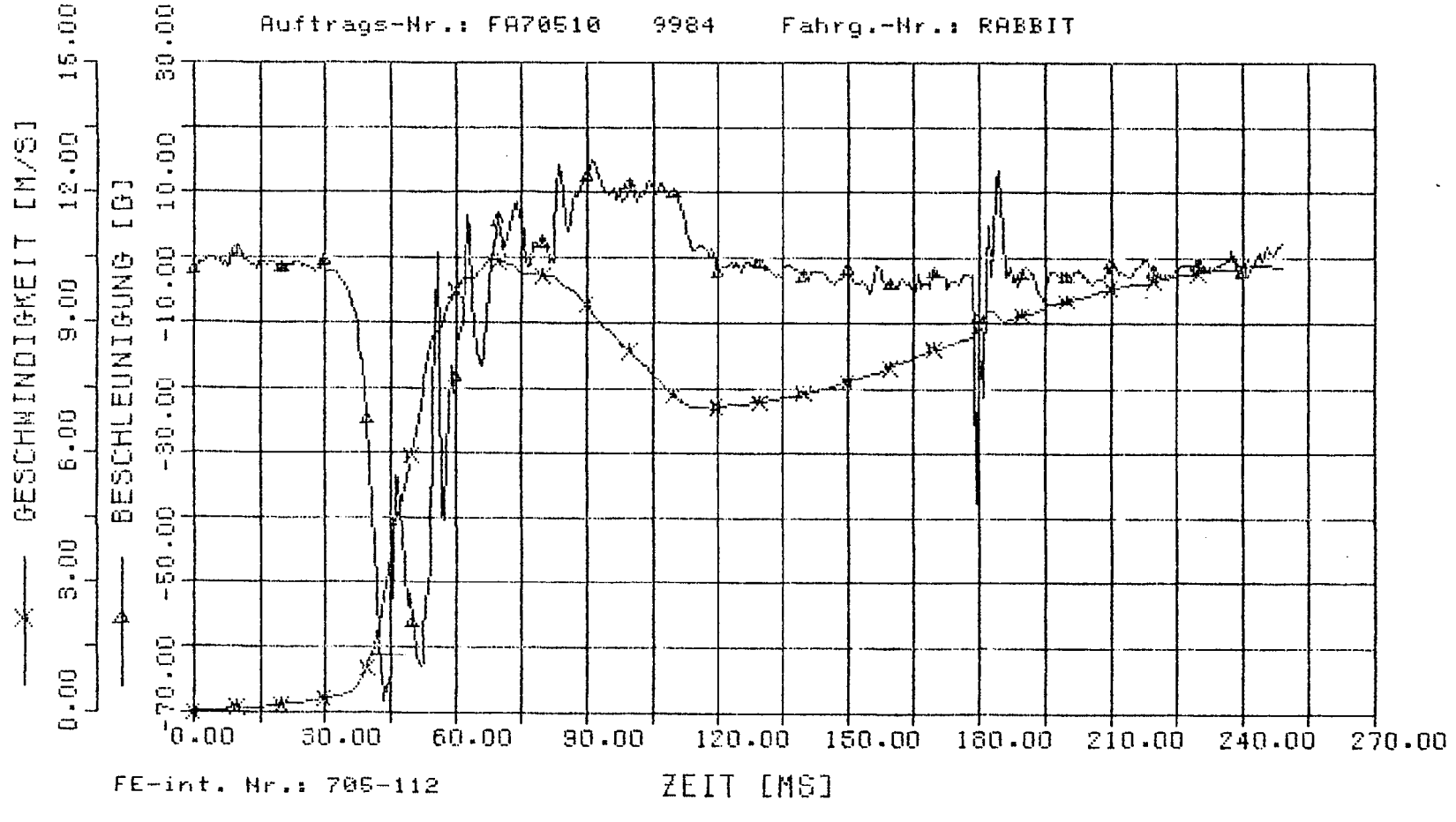
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| L001Y | V1 | BE g | -67.293 | 44.00 | 0.00 |
| L001Y | V1 | GE m/s | 11.162 | 229.00 | 0.00 |



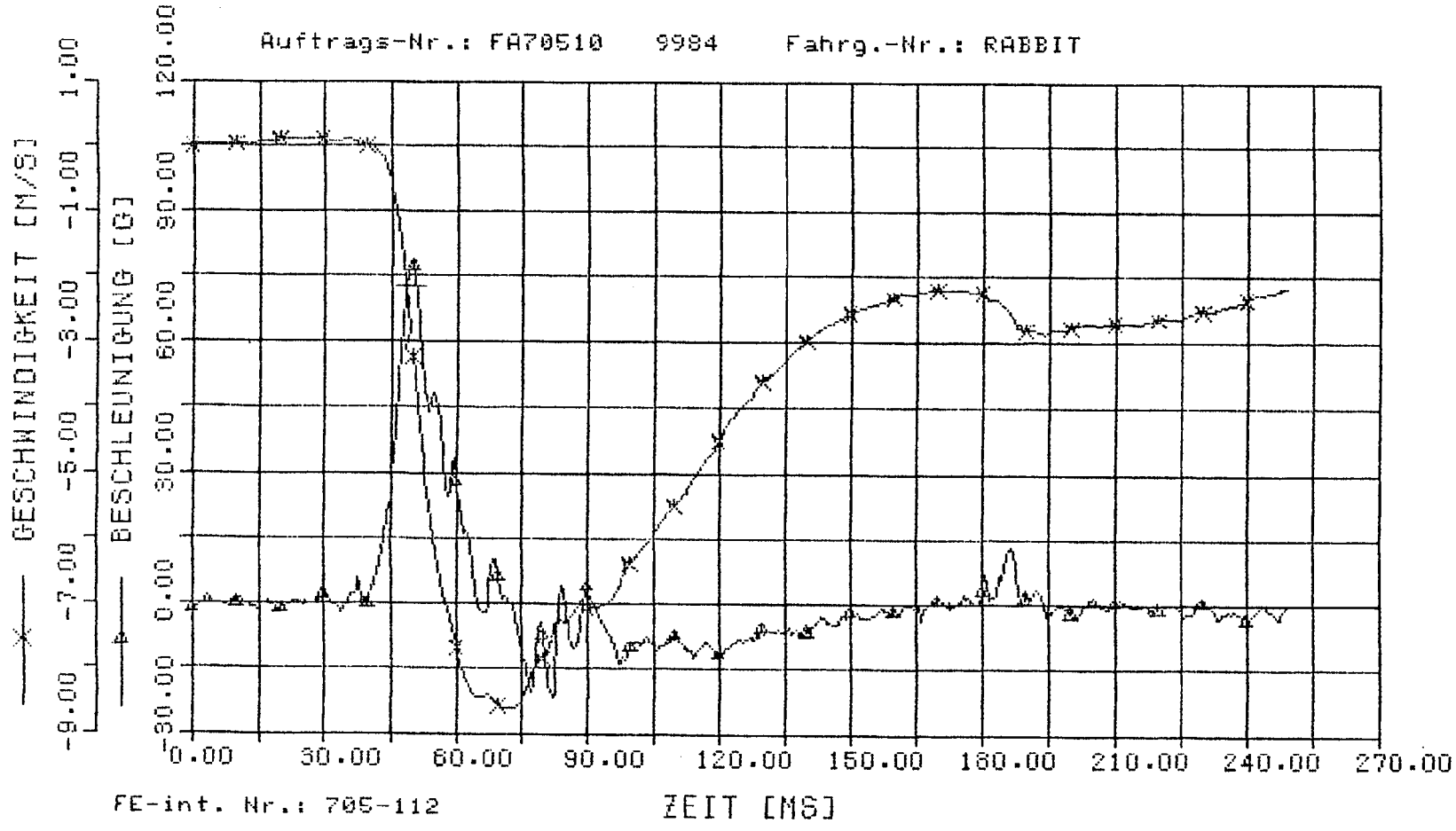
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| LU01Y | V1 | BE g | -68.334 | 43.50 | 0.00 |
| LU01Y | V1 | GE m/s | 10.436 | 69.00 | 0.00 |



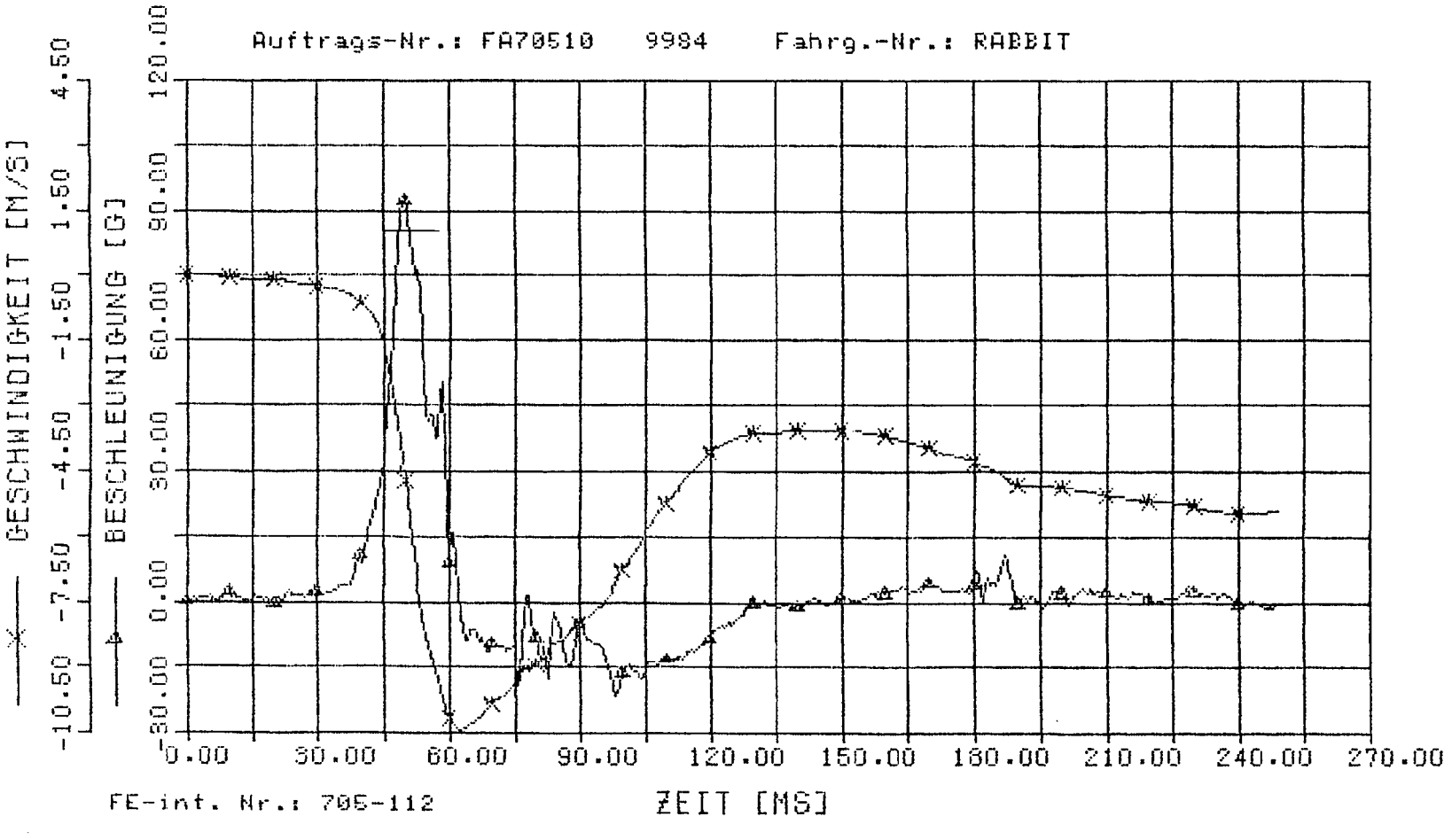
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| R001Y | V1 | BE g | 76.932 | 50.00 | 0.00 |
| R001Y | V1 | GE m/s | -8.620 | 72.50 | 0.00 |



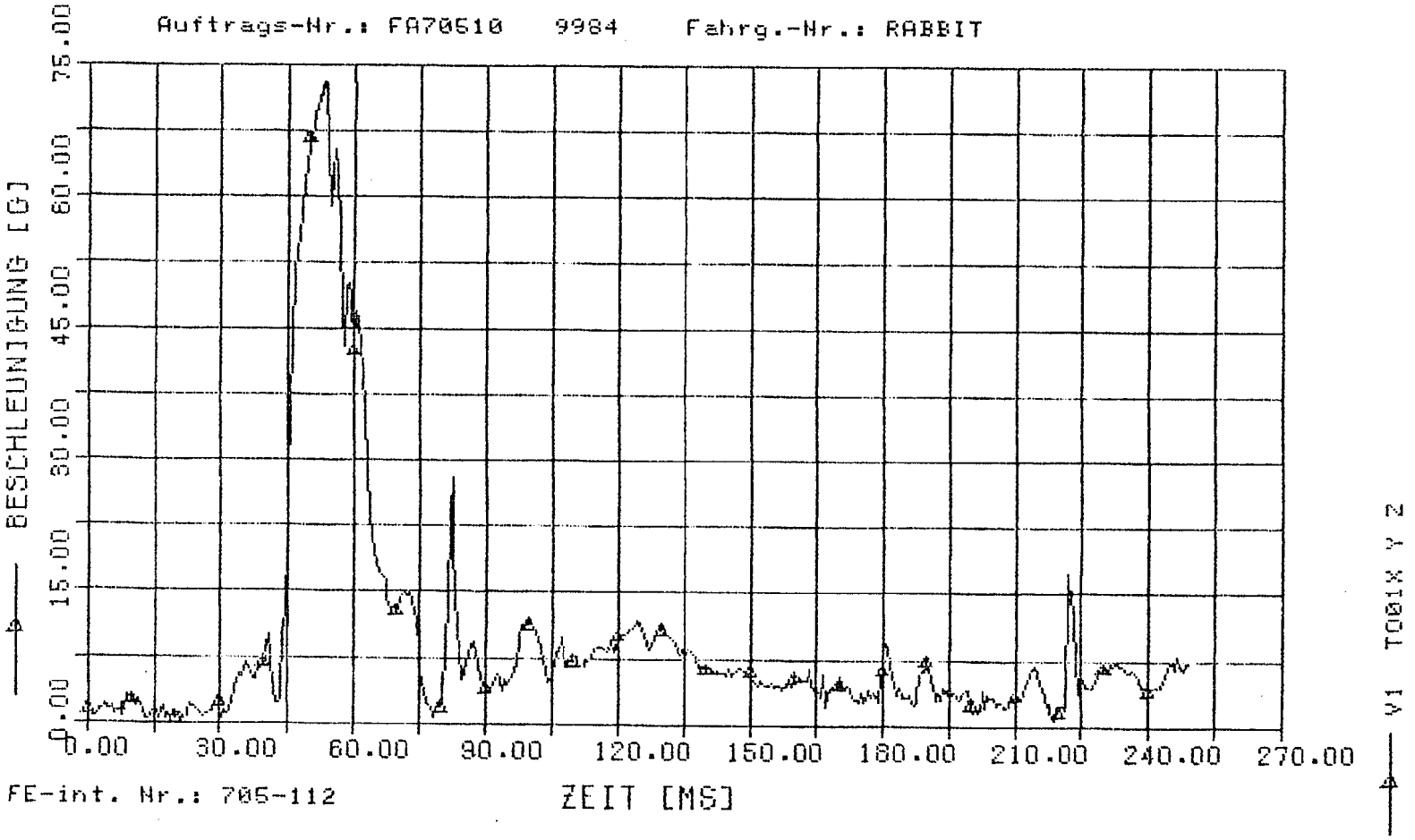
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | ZMS |
|---|---|---|---|---|---|
| RU01Y | V1 | BE g | 92.262 | 50.00 | 0.00 |
| RU01Y | V1 | GE m/s | -10.461 | 62.50 | 0.00 |



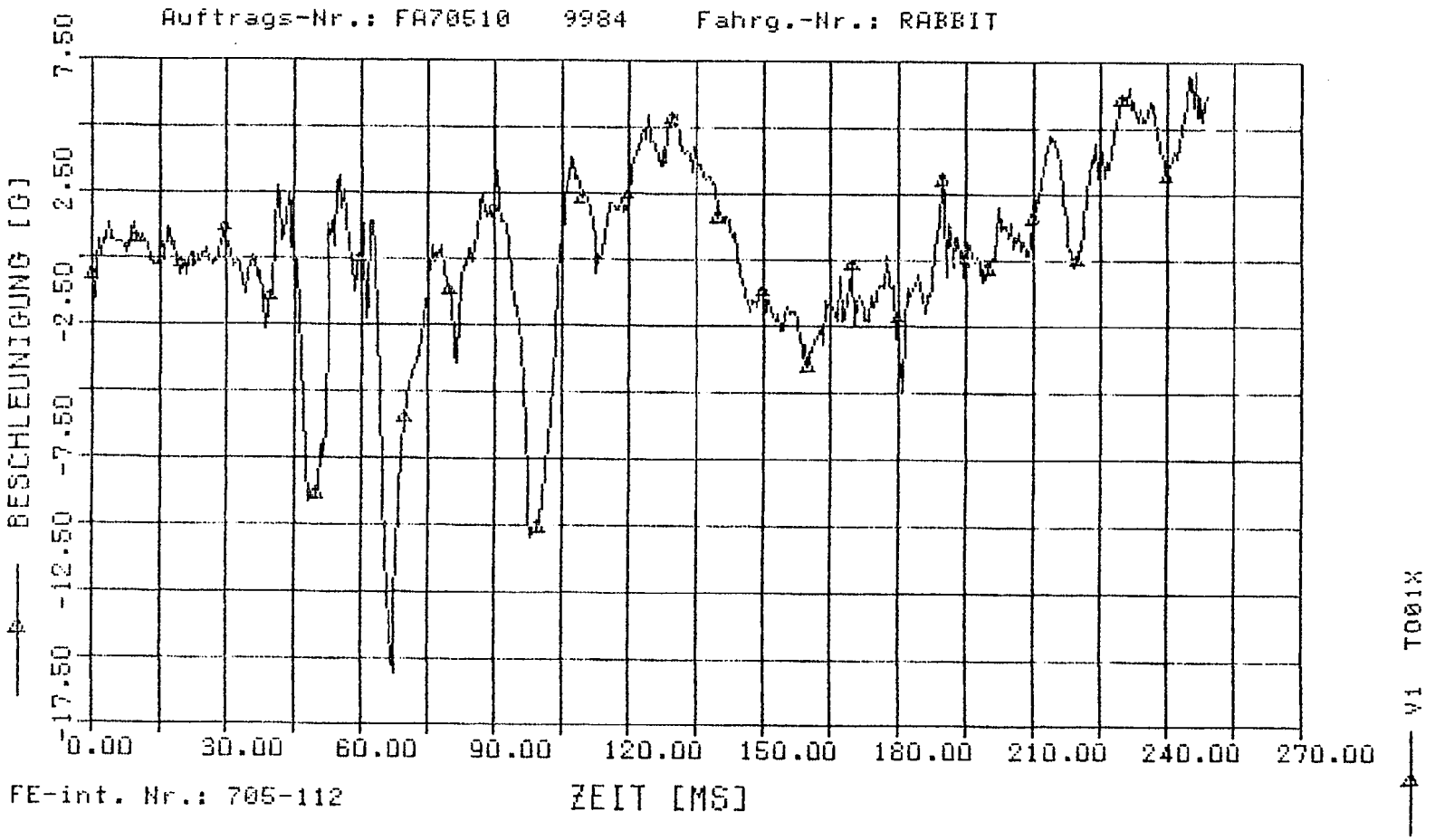
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| T001 | V1 | BE g | 73.065 | 53.50 | 0.00 |



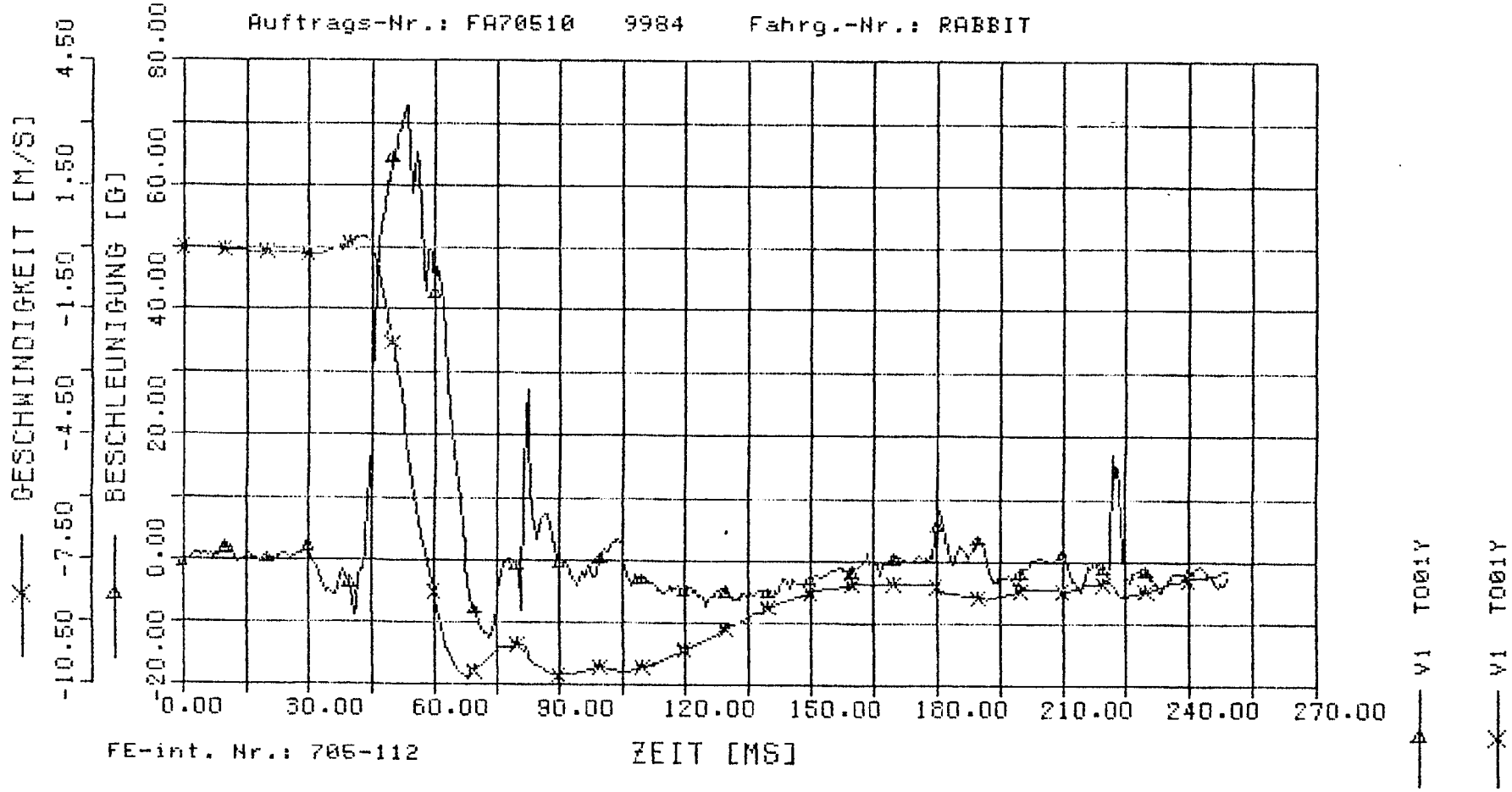
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| T001X | V1 | BE g | -15.526 | 67.50 | 0.00 |



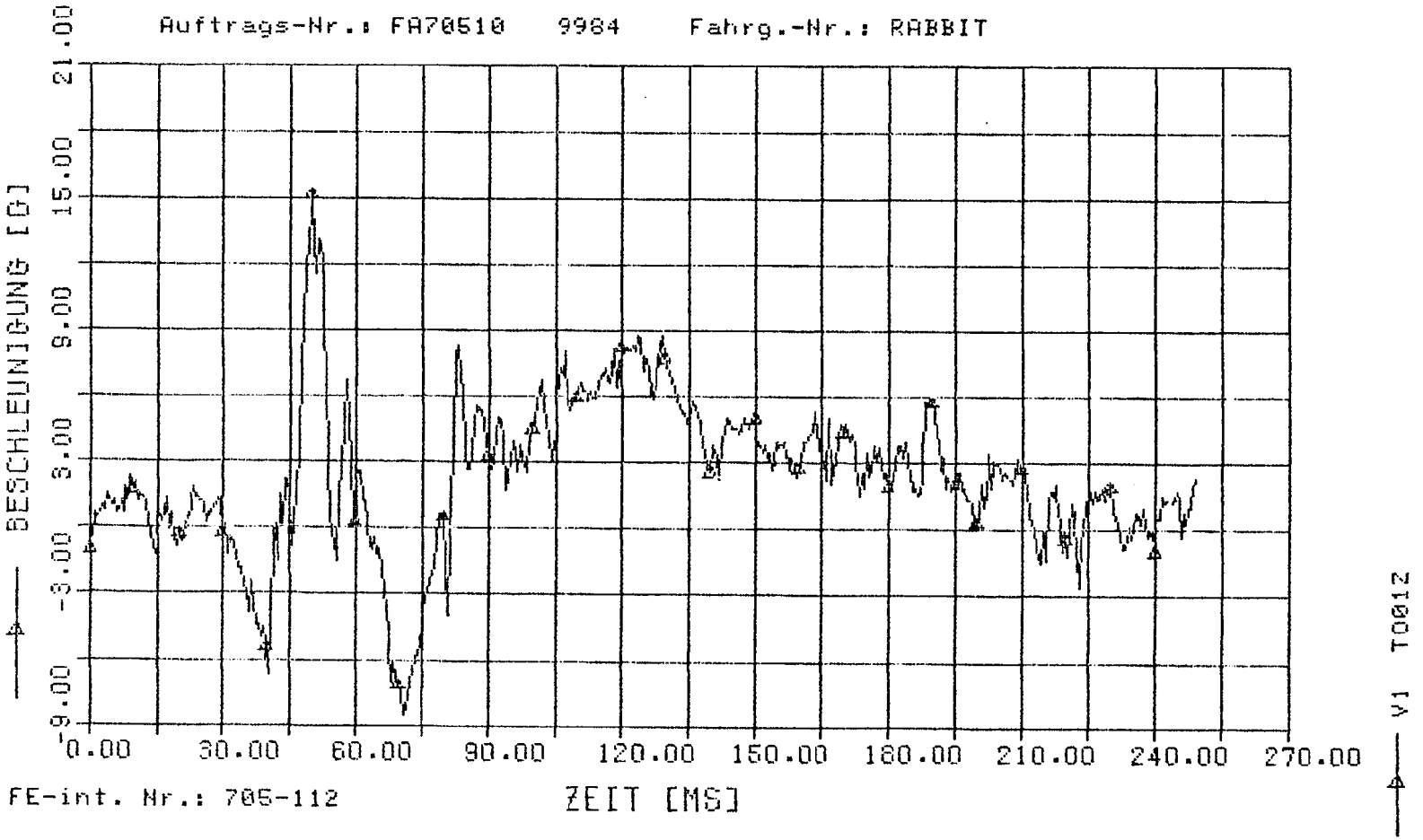
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| T001Y | V1 | BE g | 72.730 | 53.50 | 0.00 |
| T001Y | V1 | GE m/s | -10.288 | 68.00 | 0.00 |



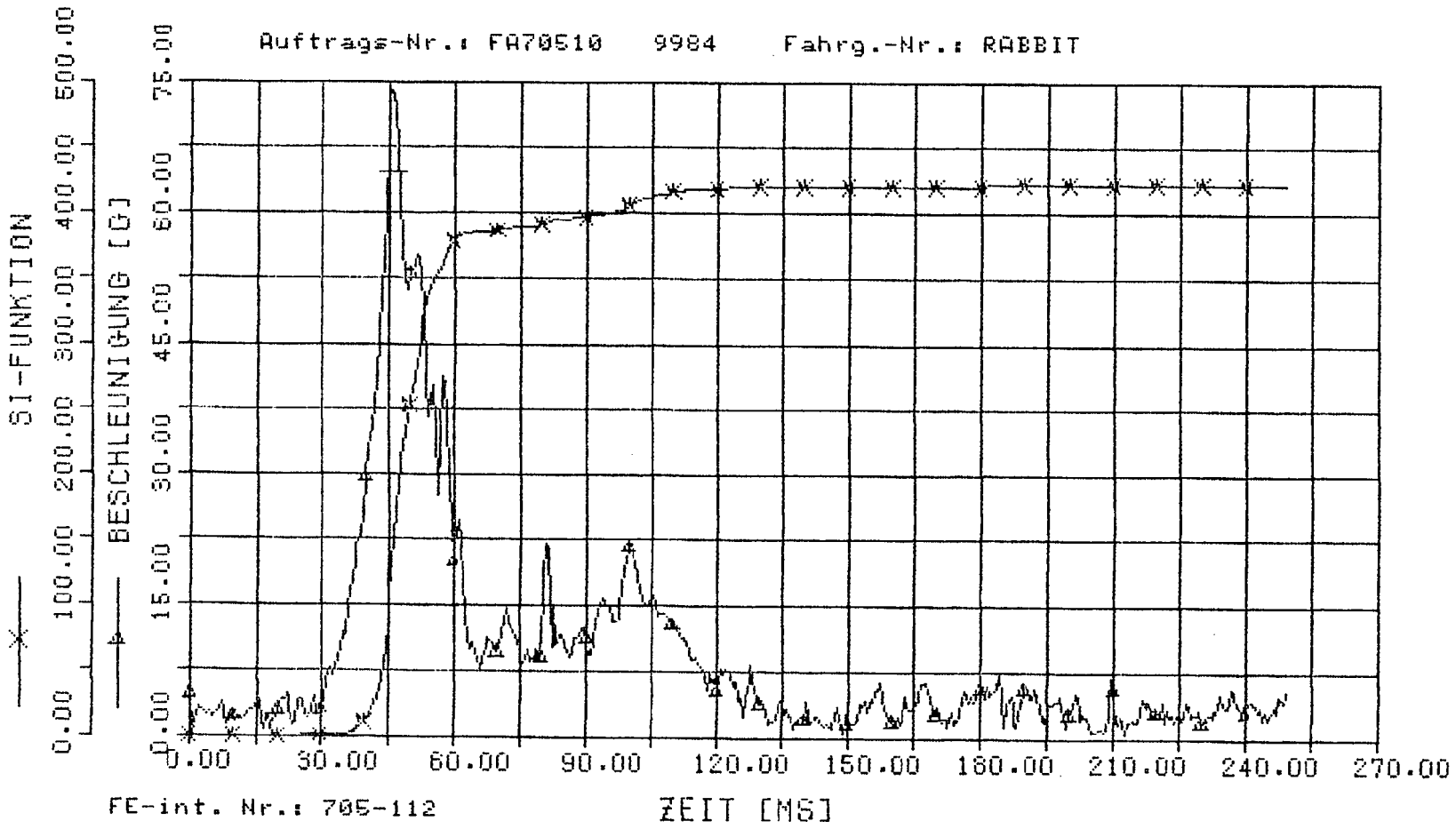
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| T001Z | V1 | BE g | 15.075 | 50.00 | 0.00 |



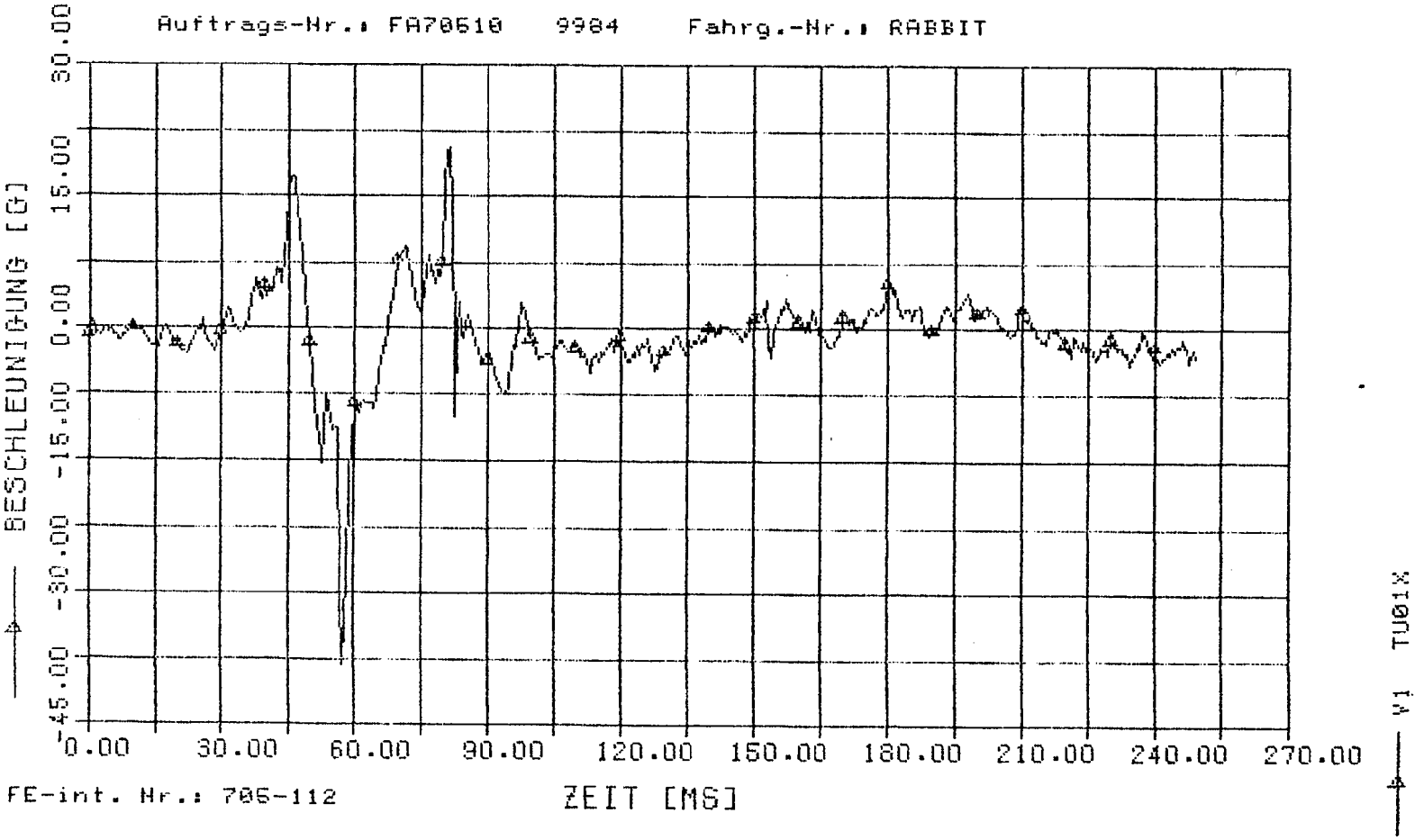
= Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TU01 | V1 | BE g | 73.848 | 46.00 | 0.00 |
| TU01 | V1 | SI | 421.661 | 250.00 | 0.00 |



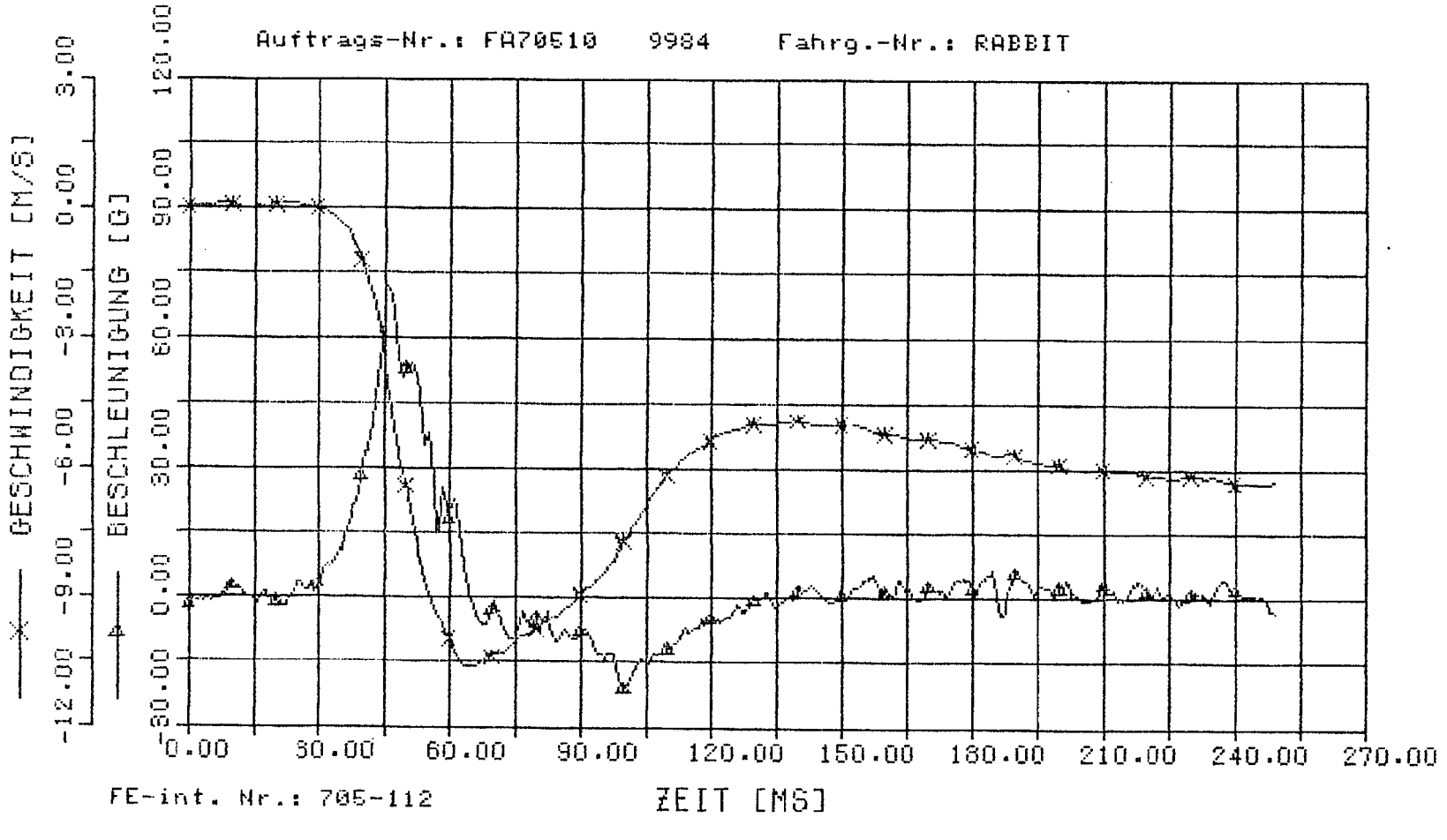
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TU01X | V1 | BE g | -38.145 | 57.50 | 0.00 |



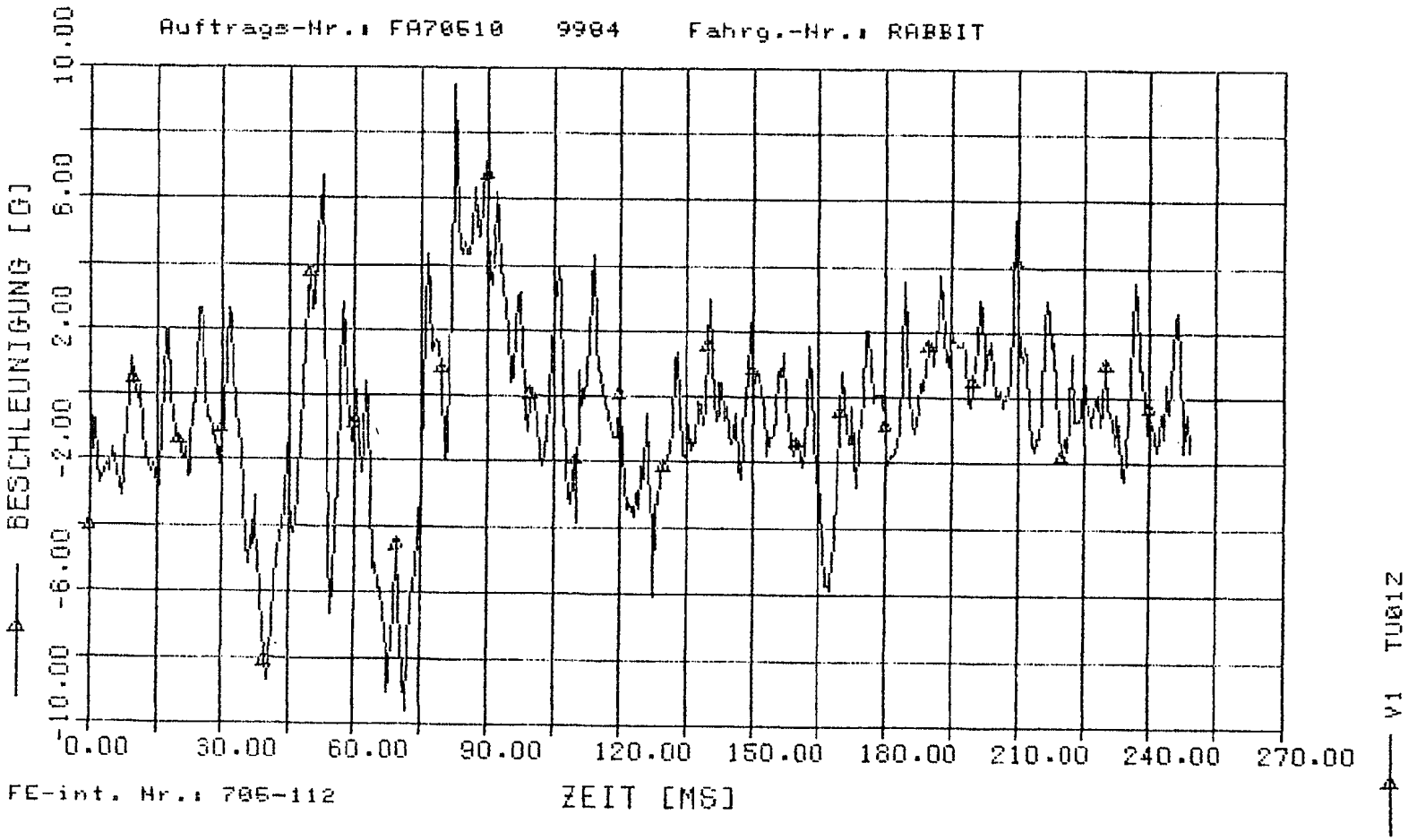
= Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TU01Y | V1 | BE g | 71.745 | 46.00 | 0.00 |
| TU01Y | V1 | GE m/s | -10.635 | 65.00 | 0.00 |



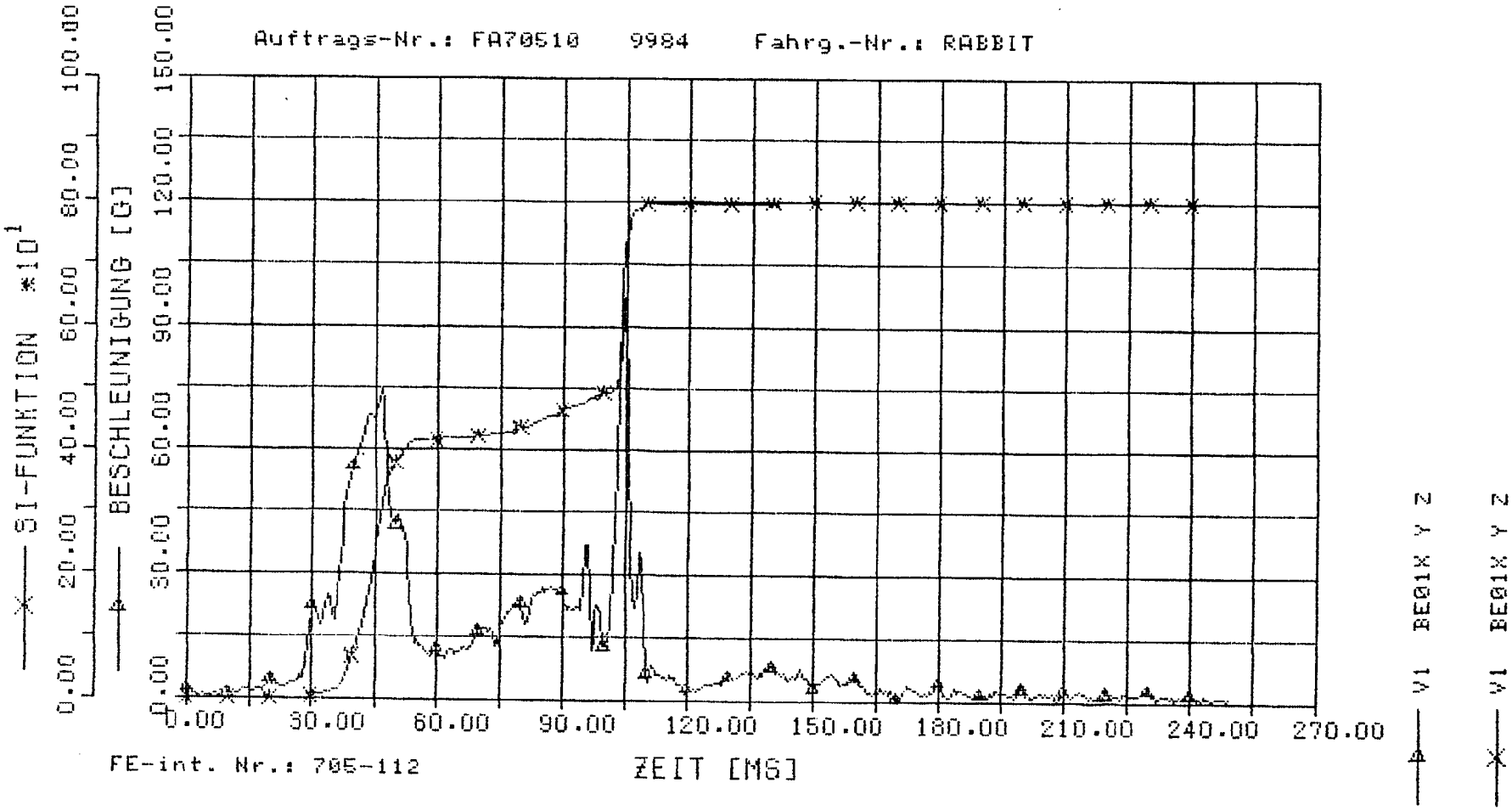
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TU01Z | V1 | BE g | -9.603 | 72.00 | 0.00 |



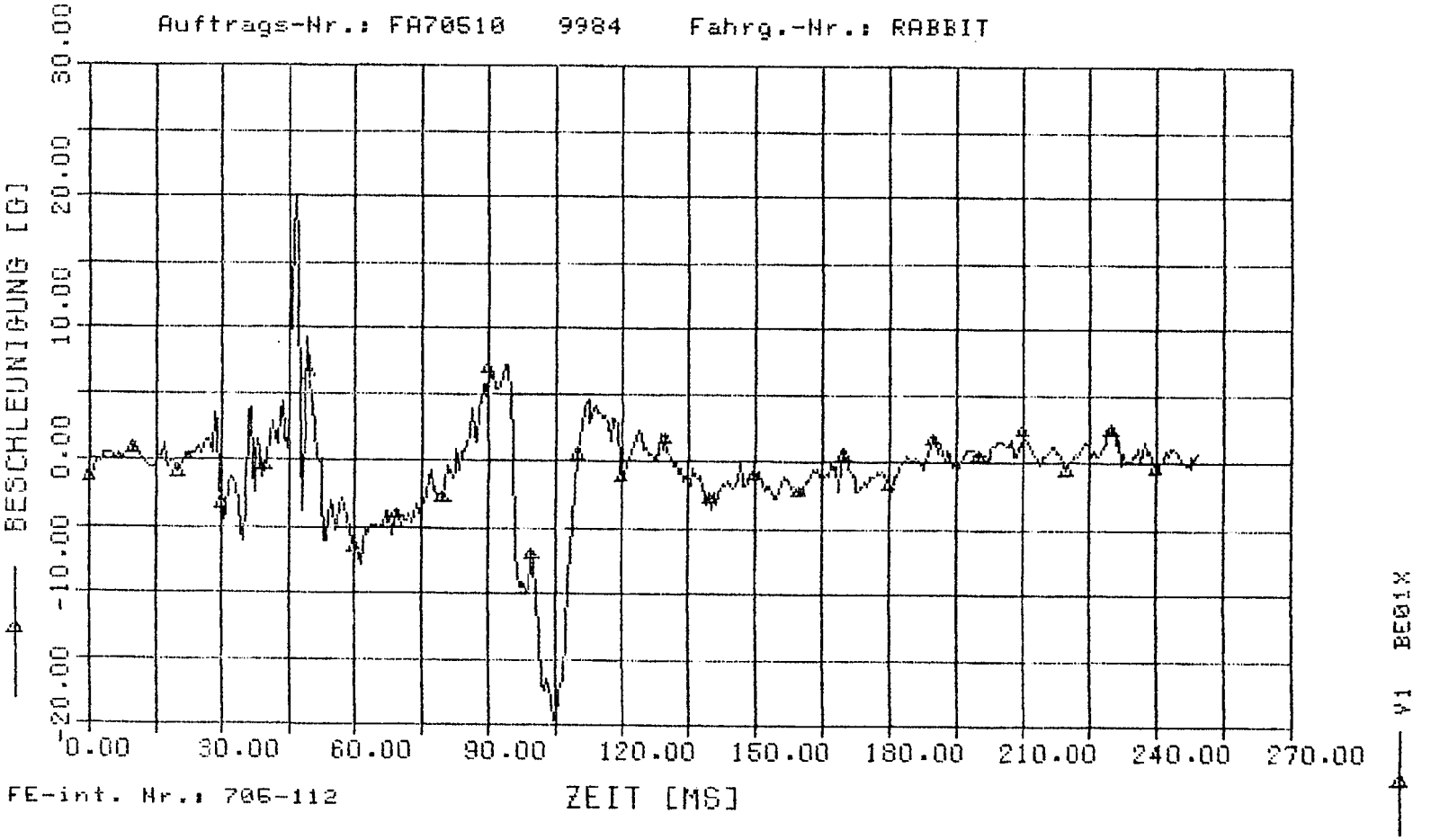
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BE01 | V1 | BE g | 111.363 | 105.00 | 71.39 |
| BE01 | V1 | SI | 798.809 | 250.00 | 0.00 |



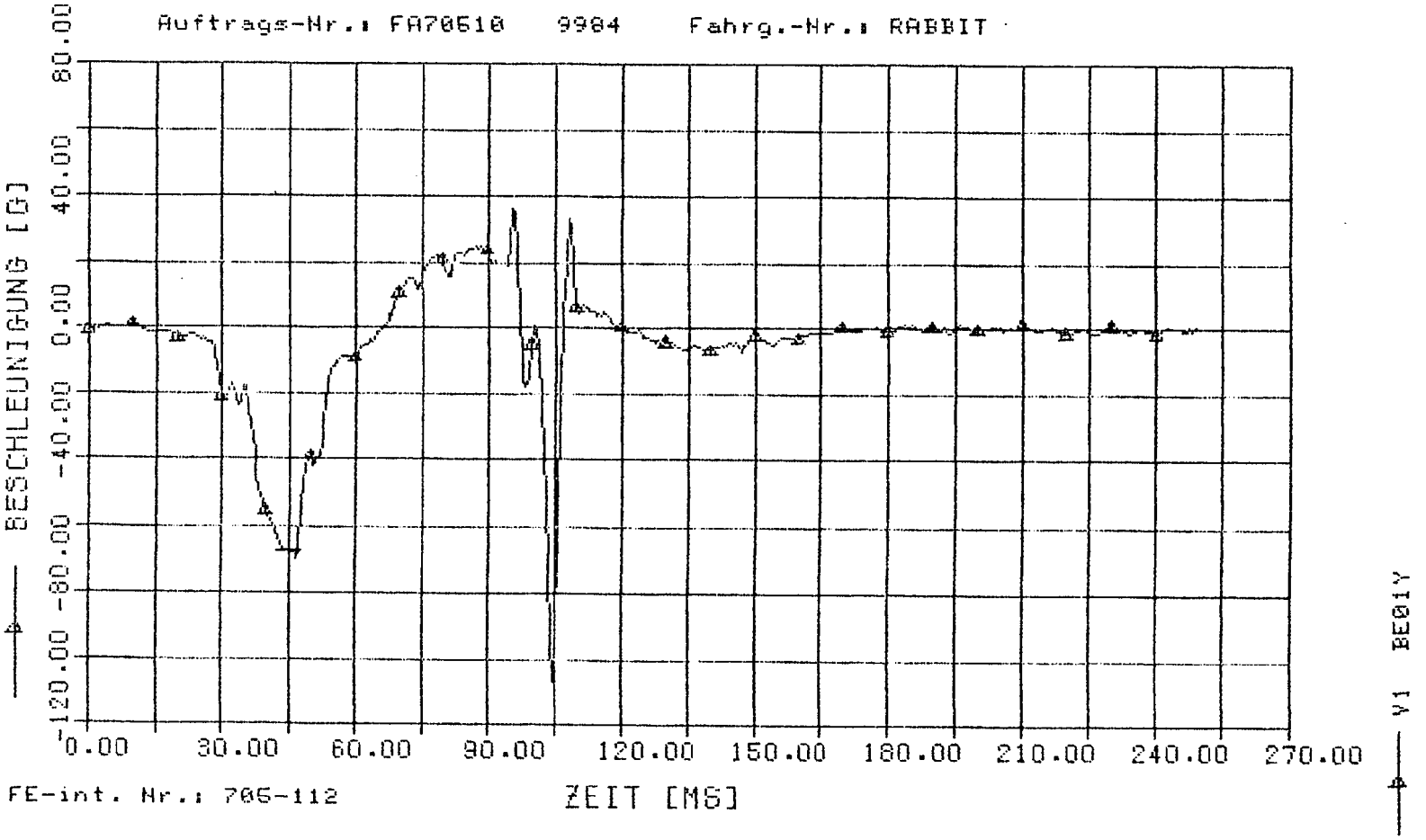
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|---|
| BE01X | V1 | BE | g | 20.060 | 47.00 | 7.16 |



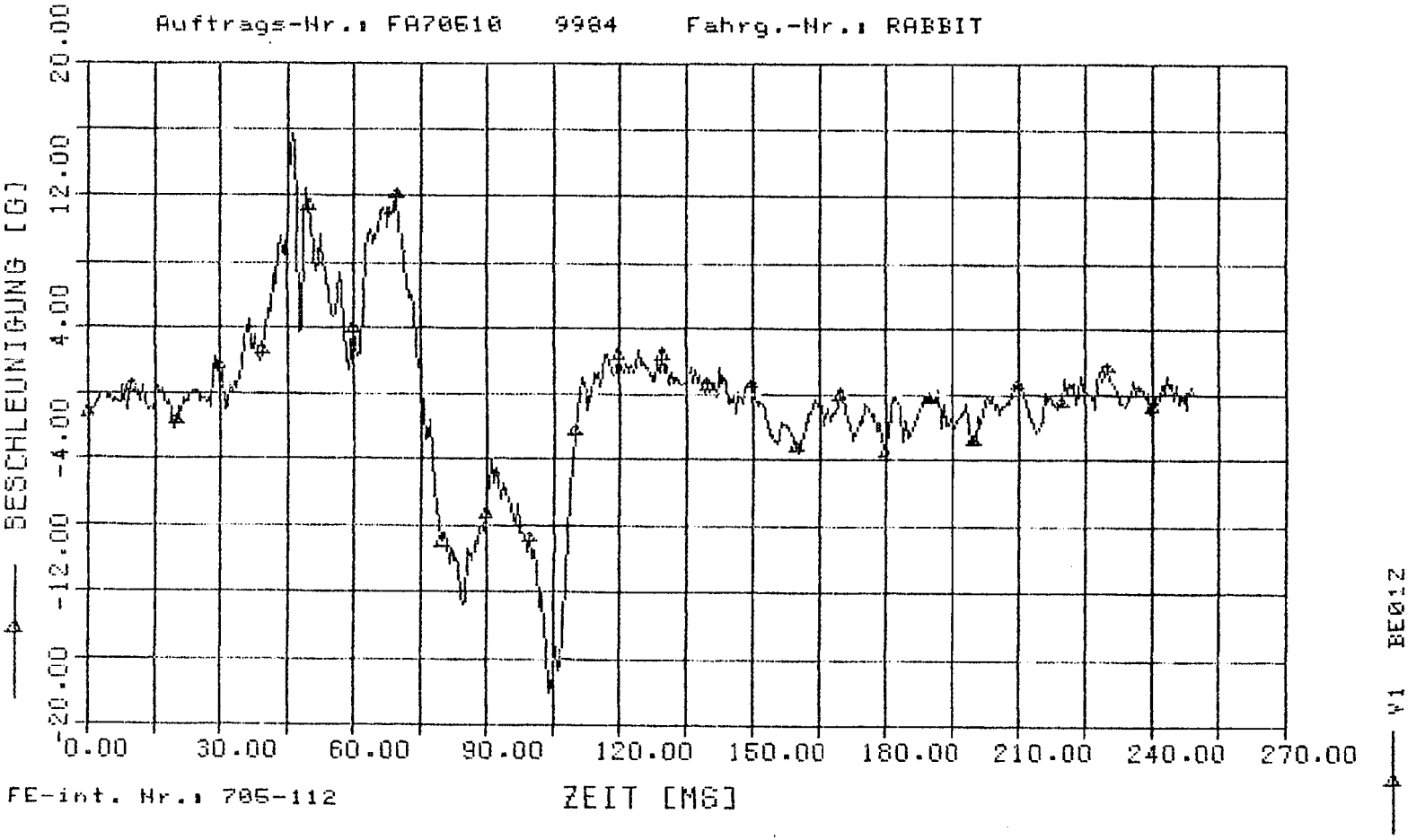
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BE01Y | V1 | BE g | -108.418 | 105.00 | 24.53 |



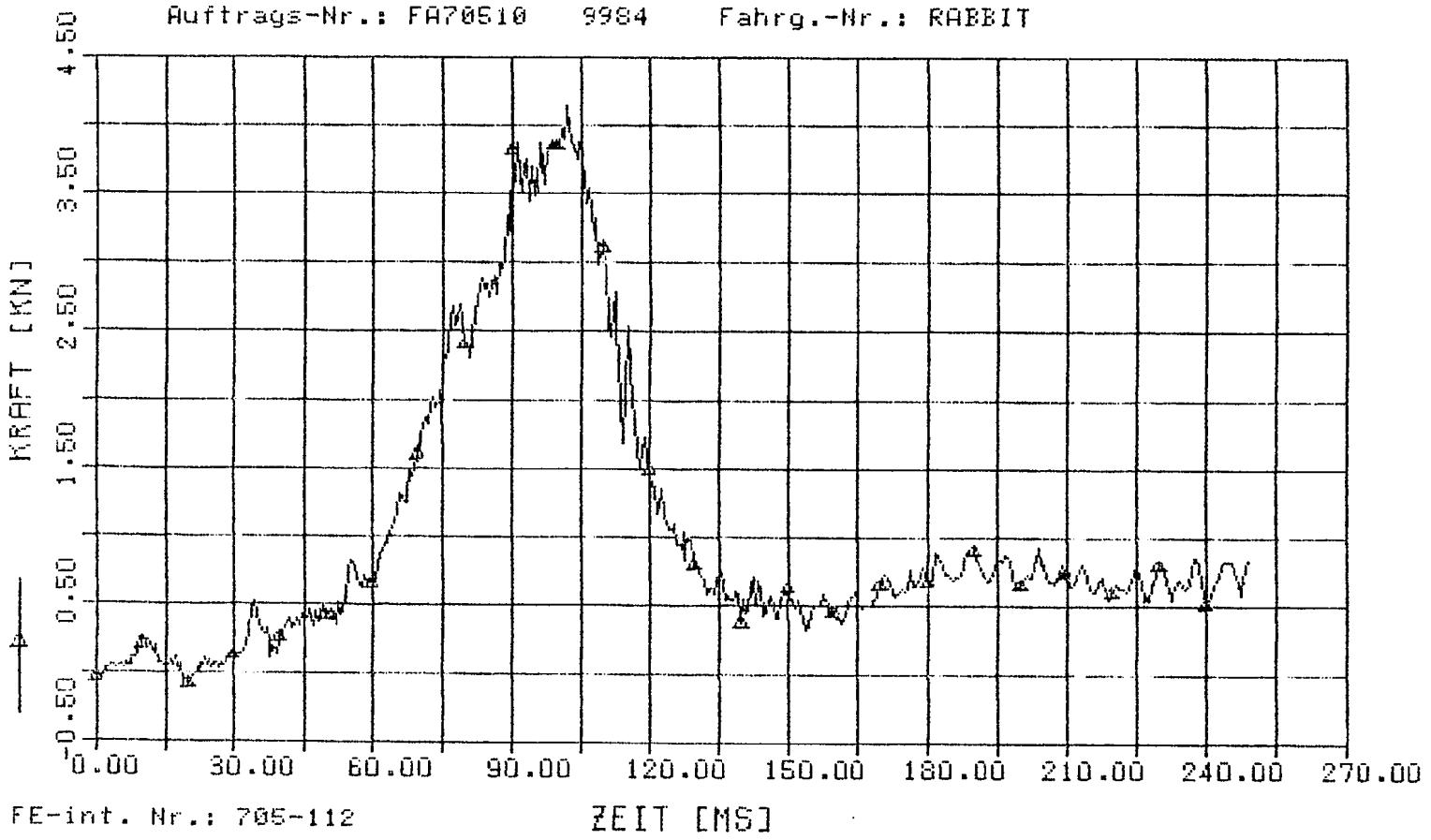
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

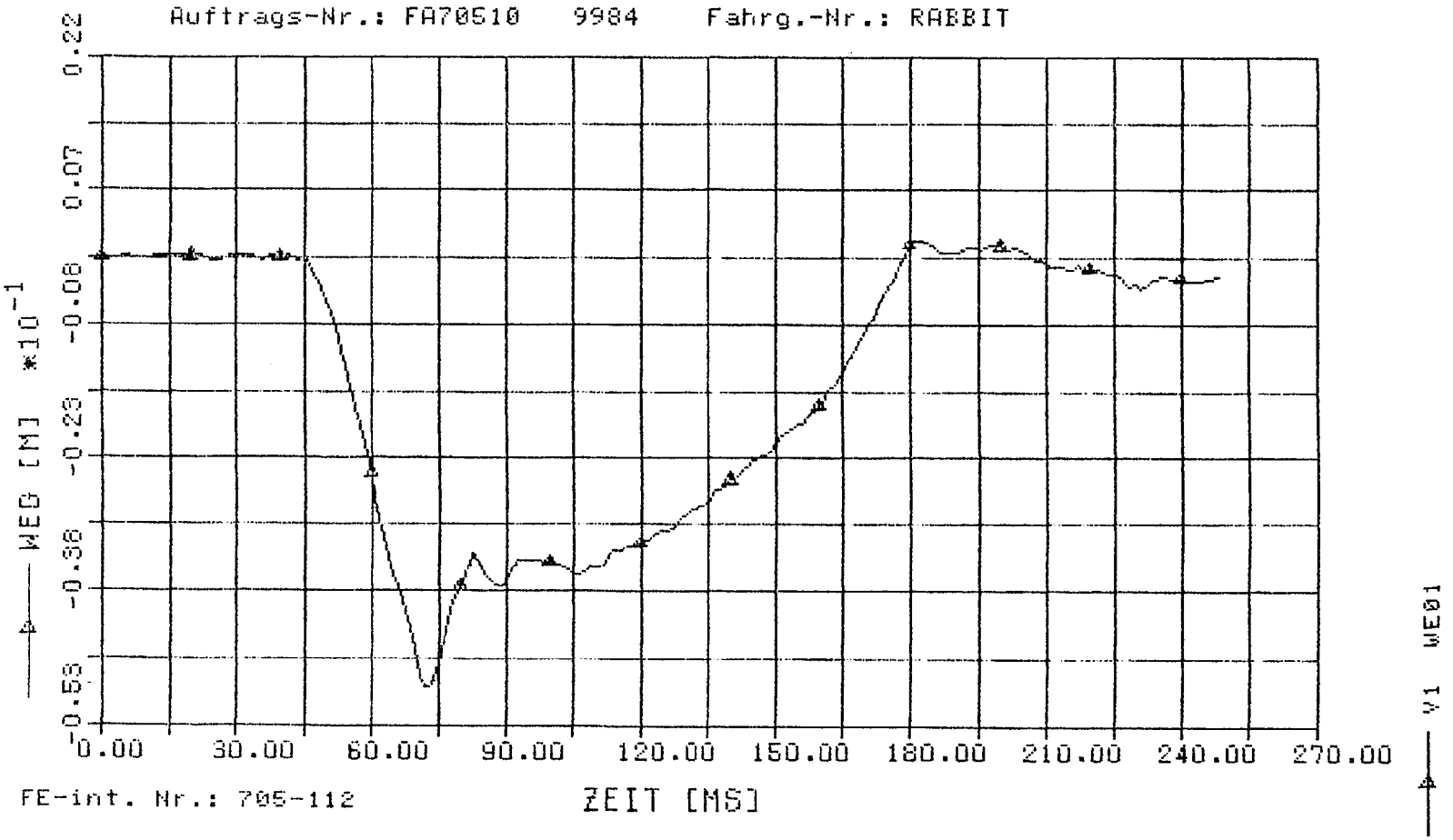
| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BE01Z | V1 | BE g | -17.990 | 104.00 | 11.34 |



- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

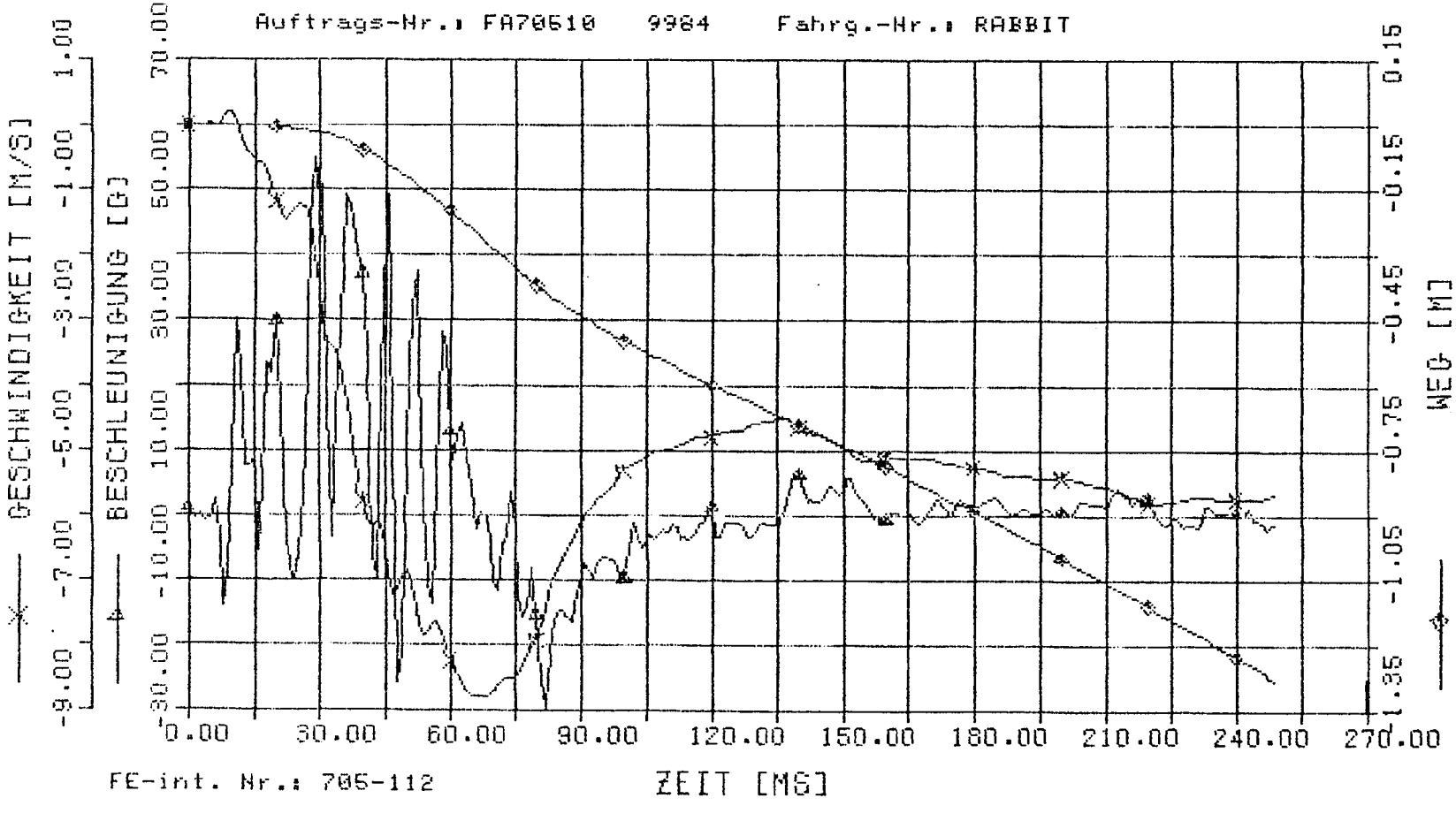
| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| CU01SA | V1 | KR kN | 4.141 | 102.00 | 0.00 |




Auftrags-Nr.: FA70510 9984 Fahrg.-Nr.: RABBIT
0.22
0.07
-0.08
-0.23
-0.38
-0.53
WEG [M] *10-1
0.00
30.00
60.00
90.00
120.00
150.00
180.00
210.00
240.00
270.00
ZEIT [MS]
FE-int. Nr.: 705-112
V1 WE01

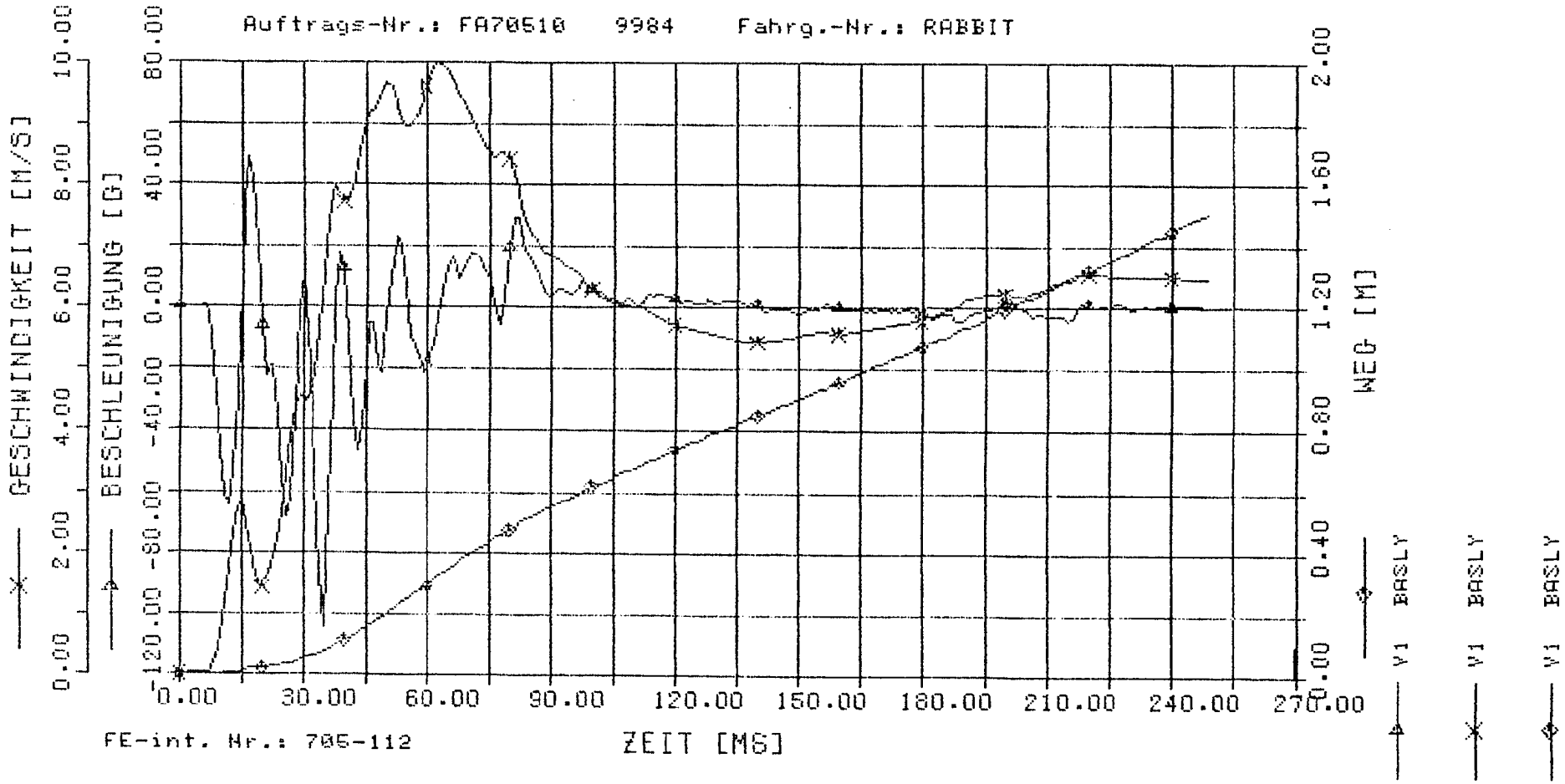
= Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SASLY | V1 | BE g | 54.936 | 29.00 | 0.00 |
| SASLY | V1 | GE m/s | -8.792 | 66.00 | 0.00 |
| SASLY | V1 | WE m | -1.314 | 255.00 | 0.00 |



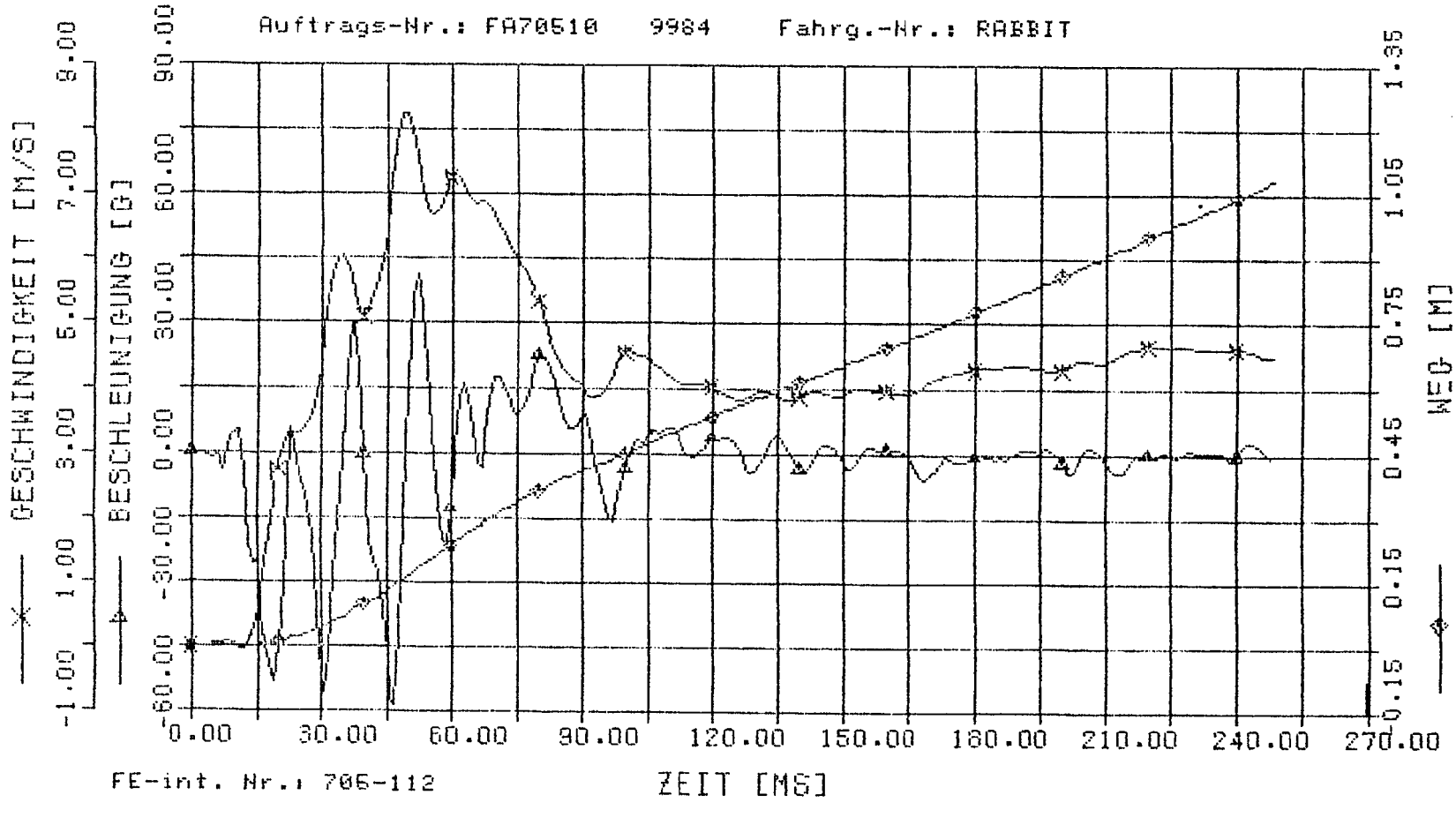
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BASLY | V1 | BE g | -104.266 | 35.00 | 0.00 |
| BASLY | V1 | GE m/s | 9.976 | 63.00 | 0.00 |
| BASLY | V1 | WE m | 1.546 | 255.00 | 0.00 |



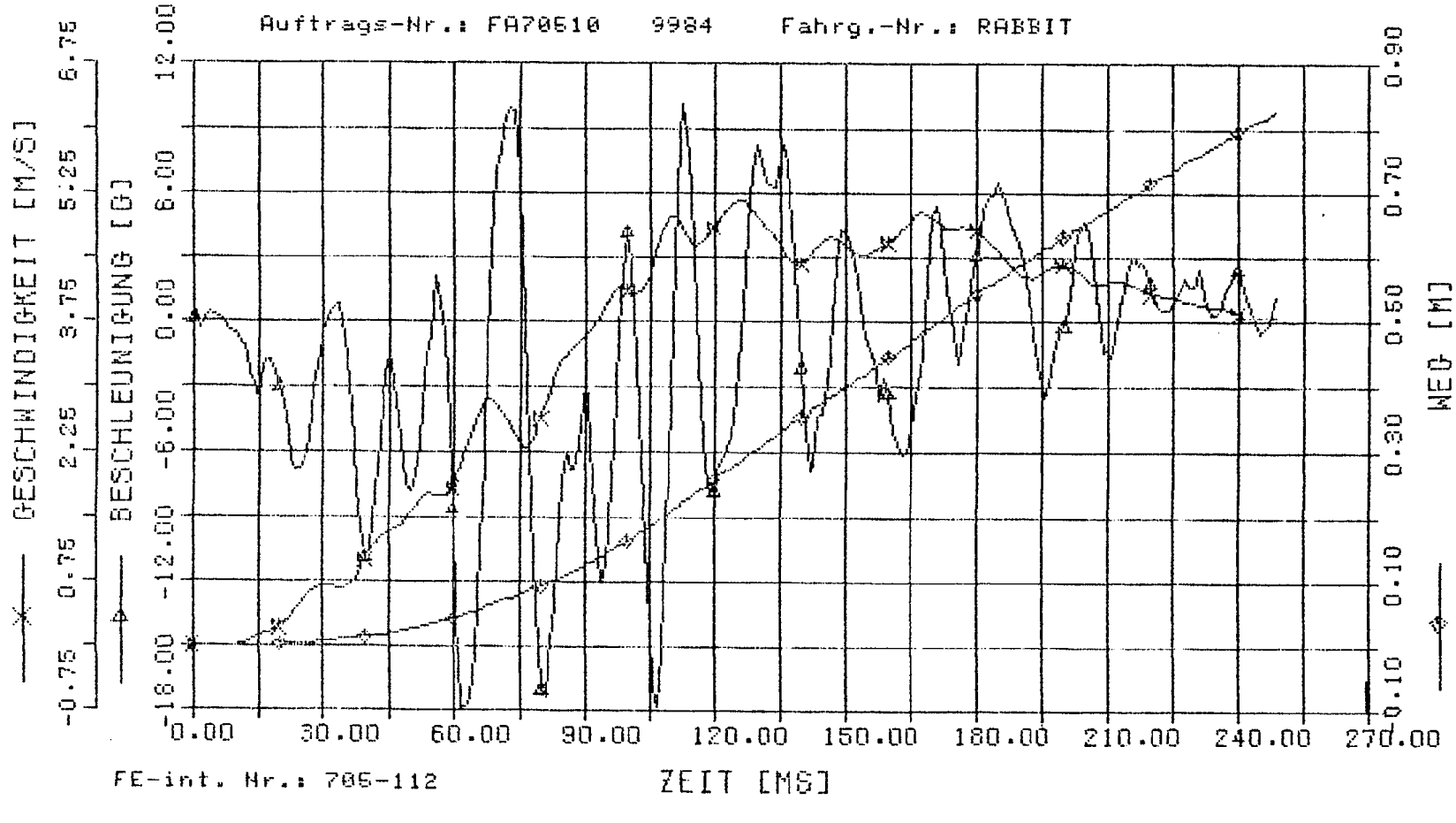
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| FBVLY | V1 | BE g | -58.670 | 47.00 | 0.00 |
| FBVLY | V1 | GE m/s | 8.242 | 49.00 | 0.00 |
| FBVLY | V1 | WE m | 1.109 | 255.00 | 0.00 |



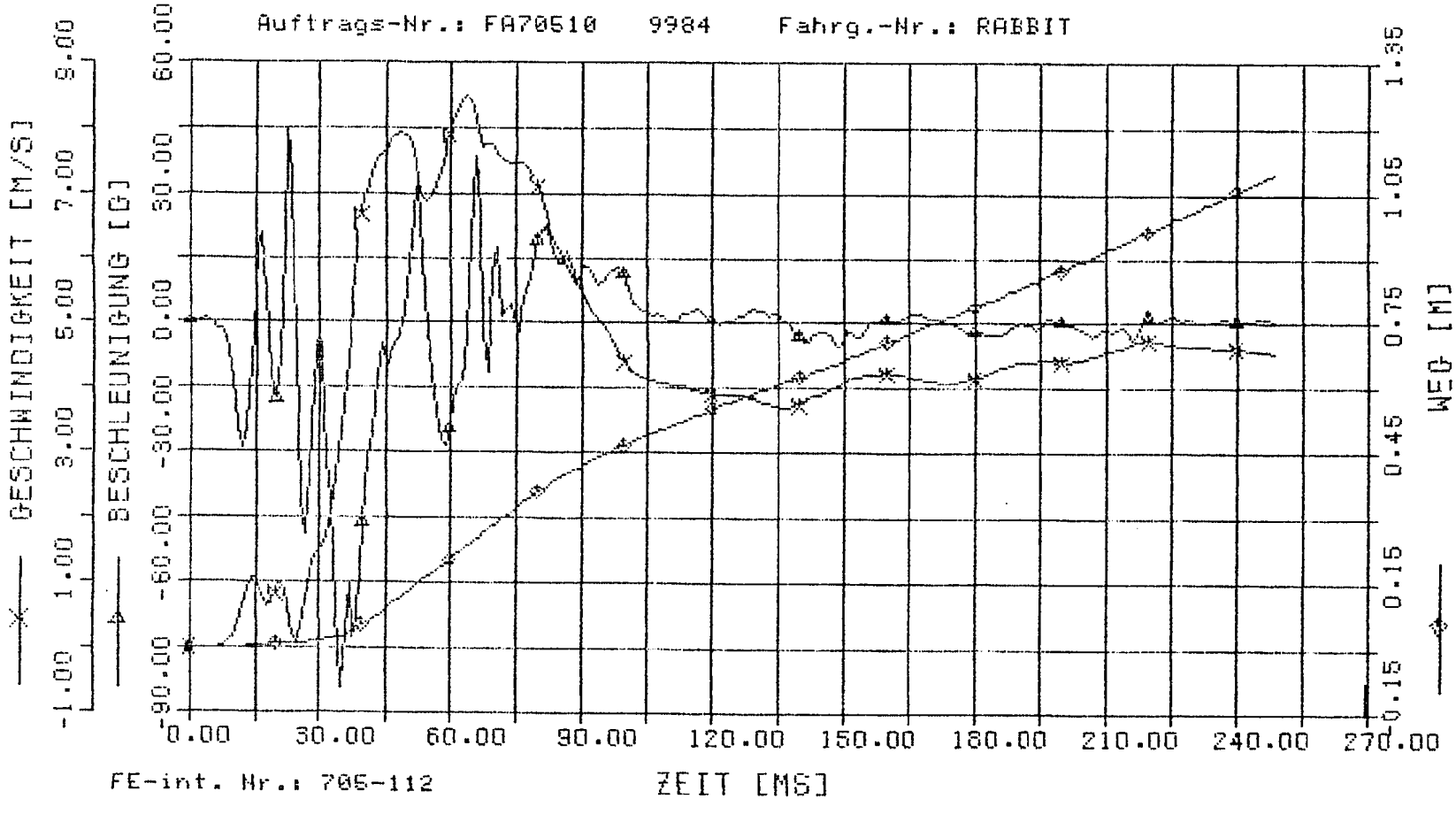
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| FBVRY | V1 | BE g | -17.954 | 62.00 | 0.00 |
| FBVRY | V1 | GE m/s | 5.160 | 126.00 | 0.00 |
| FBVRY | V1 | WE m | .351 | 255.00 | 0.00 |



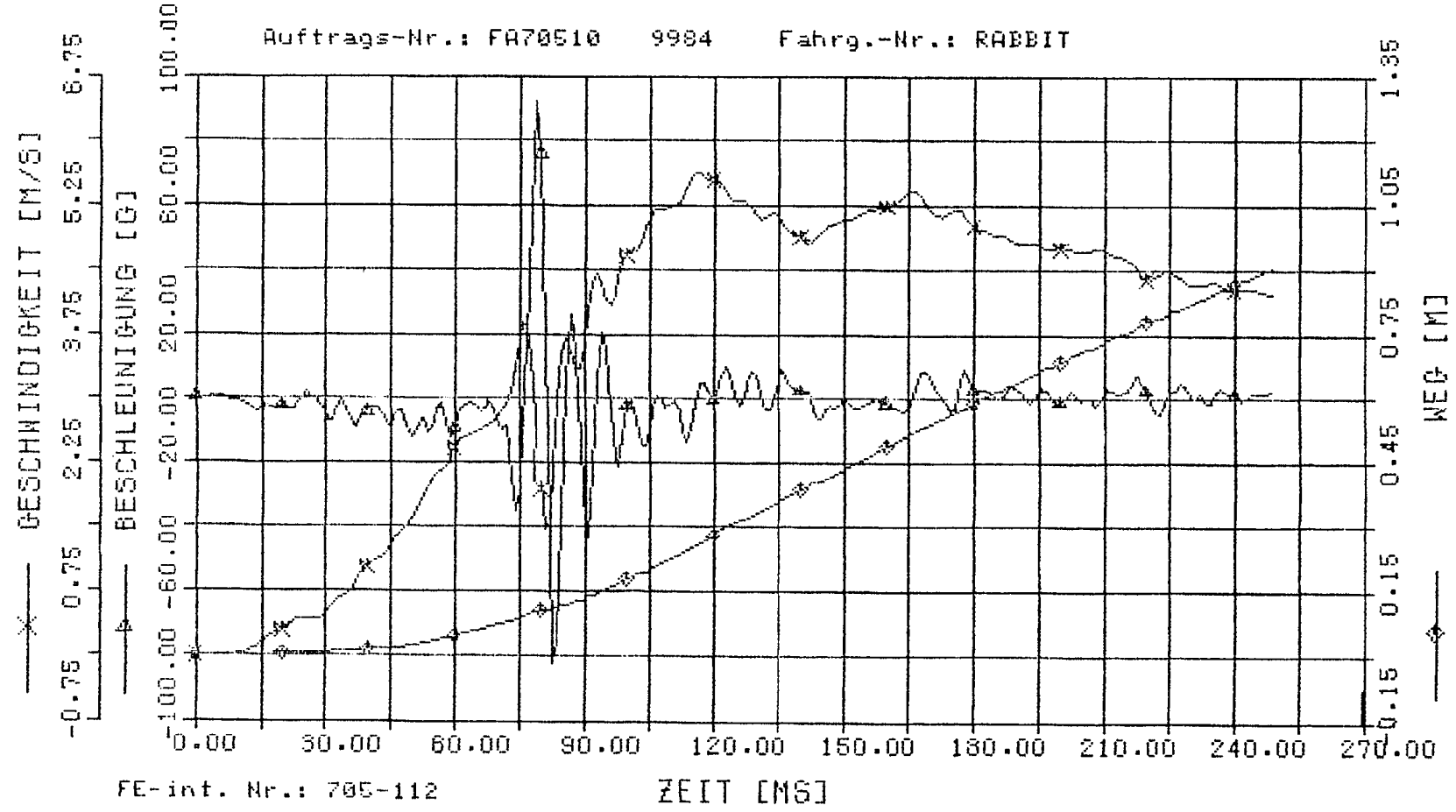
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BSLLY | V1 | BE g | -84.473 | 35.00 | 0.00 |
| BSLLY | V1 | GE m/s | 8.482 | 64.00 | 0.00 |
| BSLLY | V1 | WE m | 1.125 | 255.00 | 0.00 |



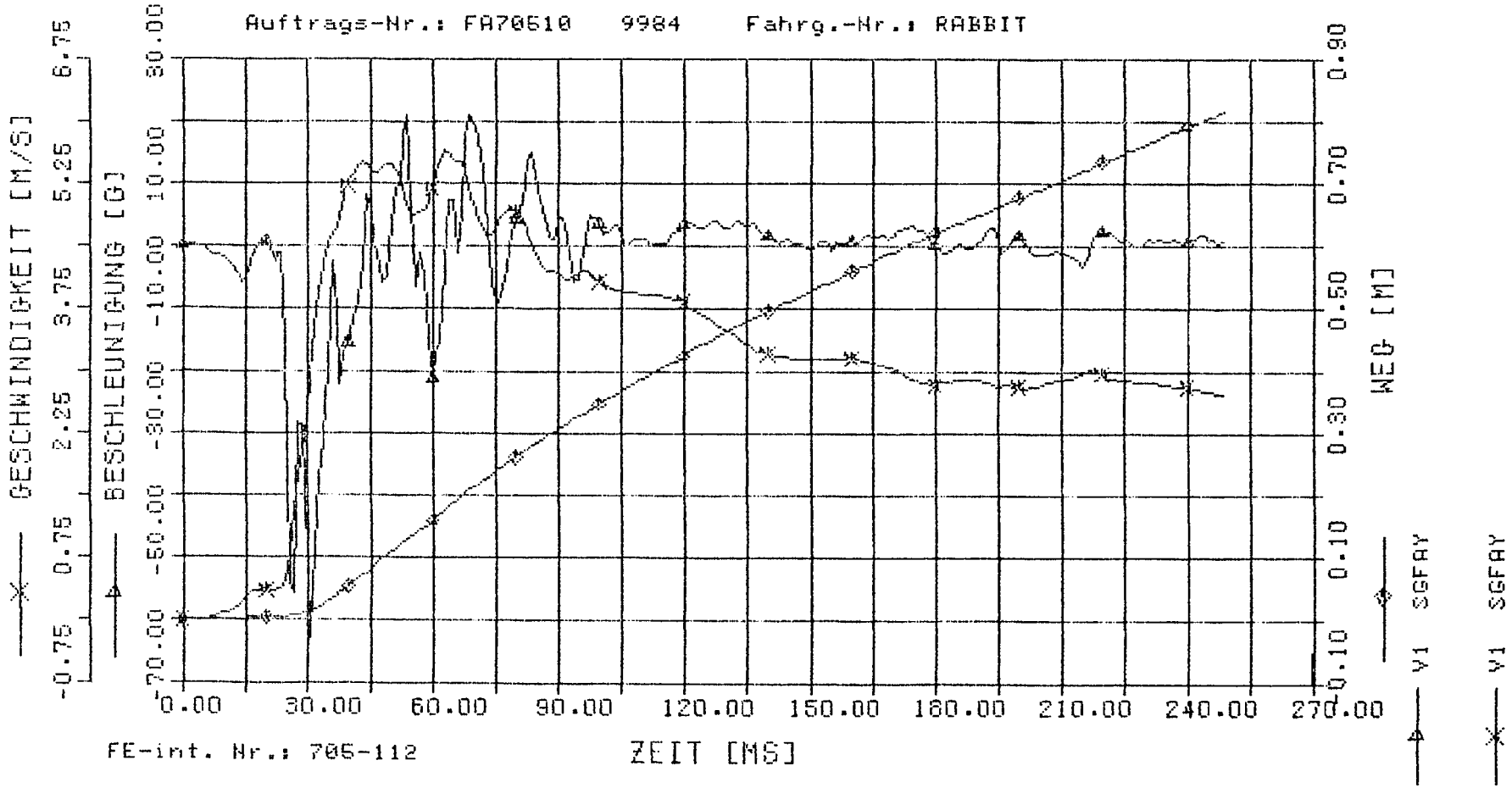
= Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| BSLRY | V1 | BE g | 91.573 | 79.00 | 0.00 |
| BSLRY | V1 | GE m/s | 5.629 | 116.00 | 0.00 |
| BSLRY | V1 | WE m | .929 | 255.00 | 0.00 |



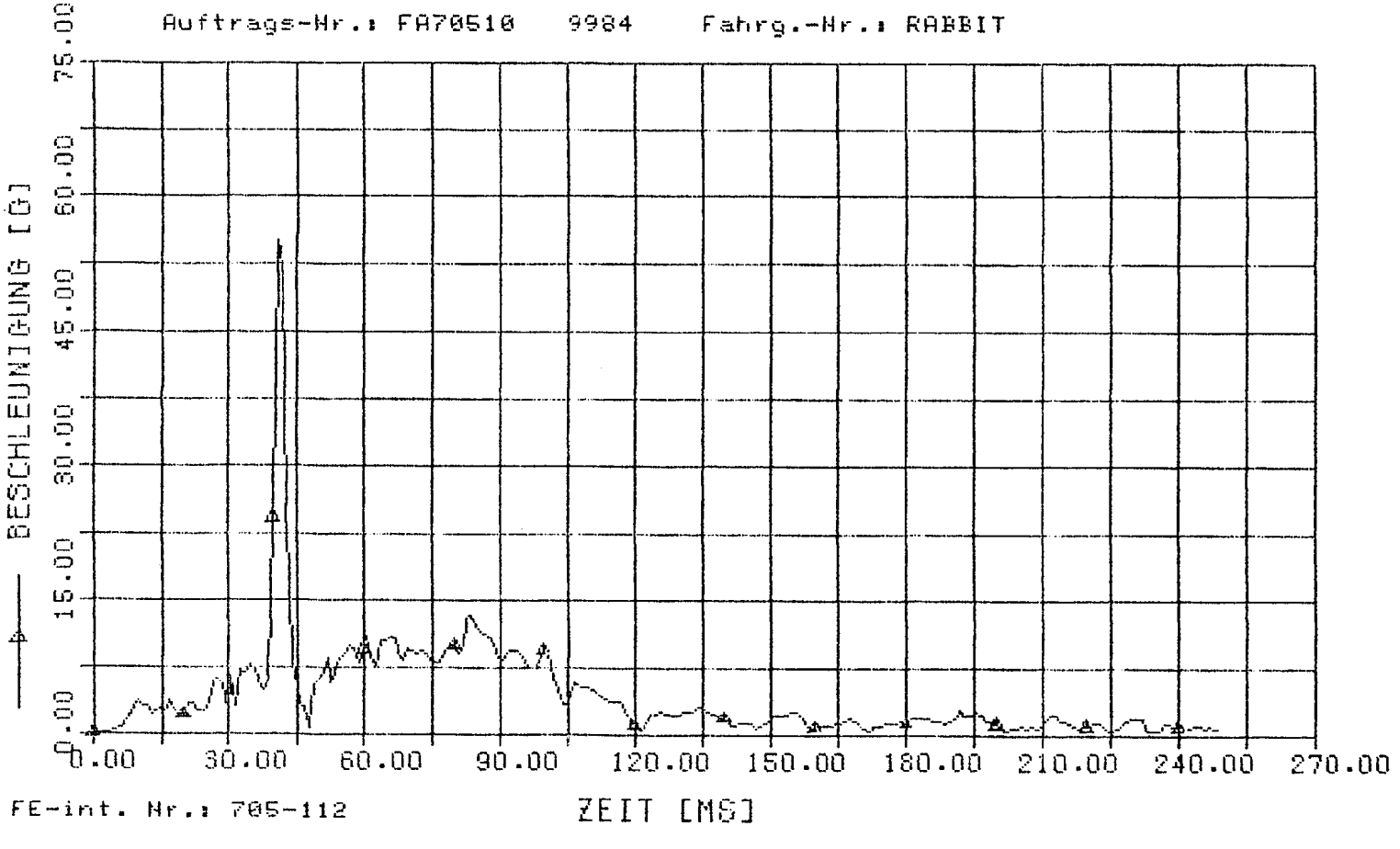
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SGFAY | V1 | BE g | -63.035 | 31.00 | 0.00 |
| SGFAY | V1 | GE m/s | 5.640 | 63.00 | 0.00 |
| SGFAY | V1 | WE m | .832 | 255.00 | 0.00 |



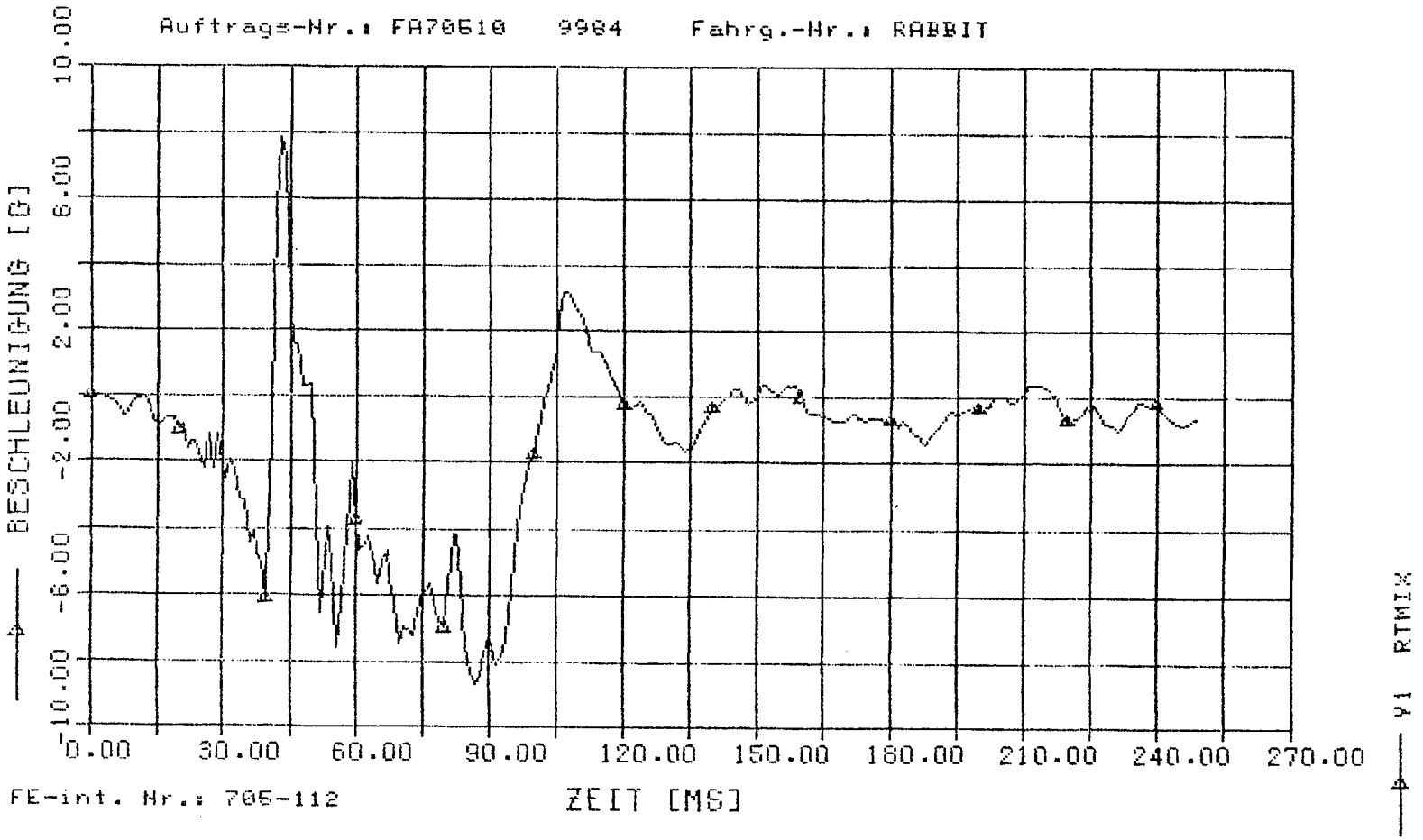
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| RTMI | V1 | BE g | 55.122 | 41.00 | 0.00 |



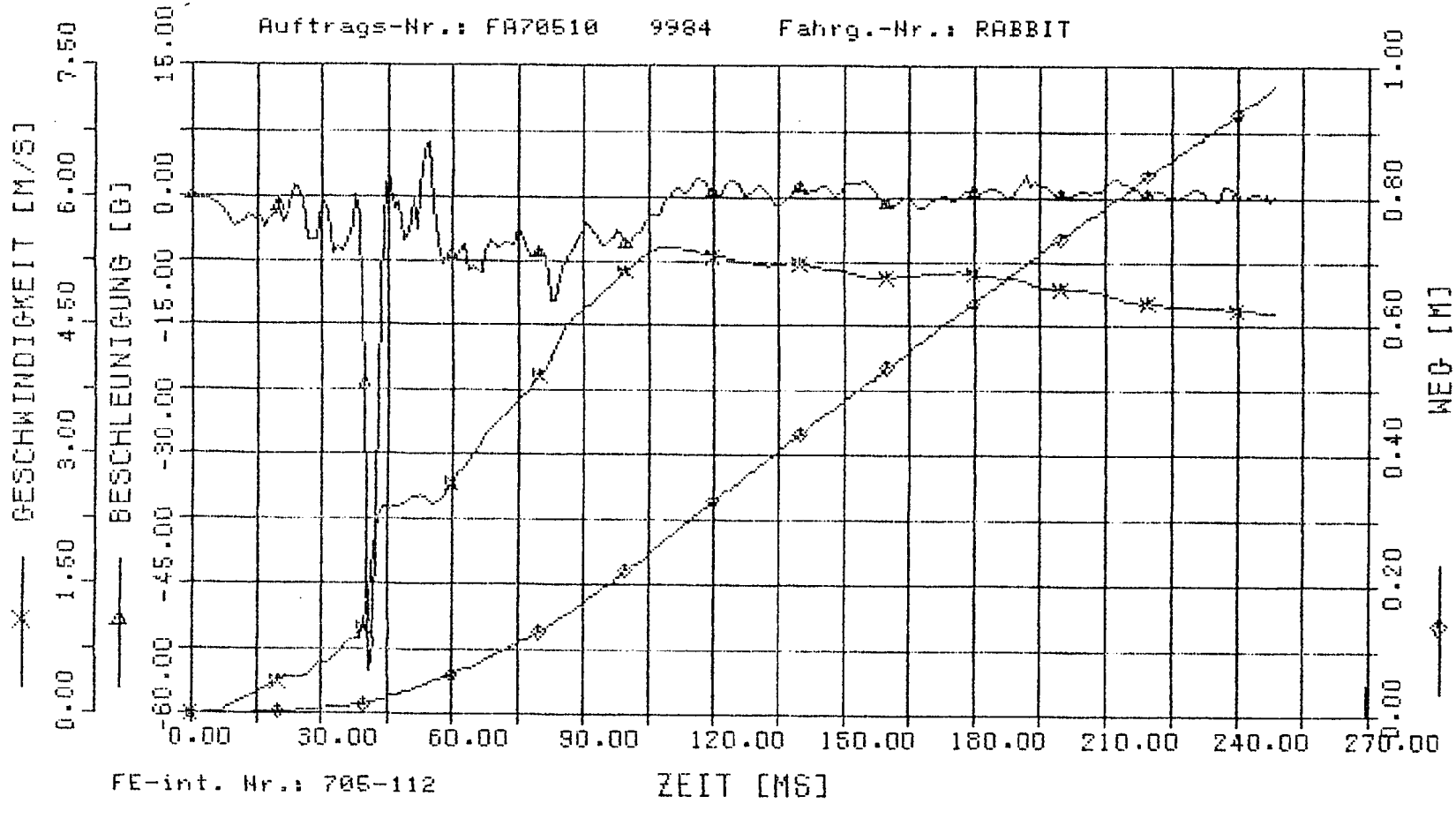
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| RTMIX | V1 | BE g | -8.691 | 87.00 | 0.00 |



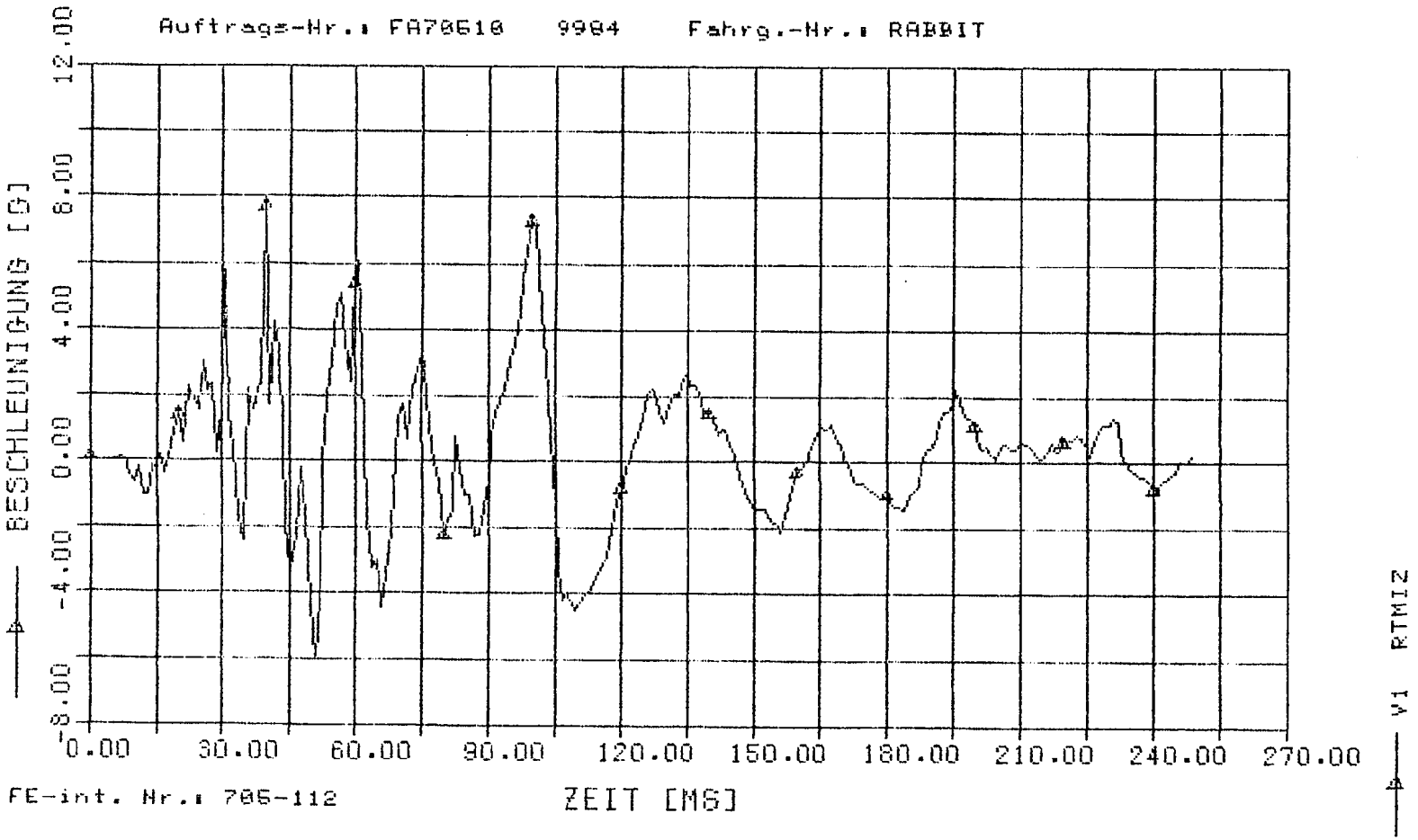
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

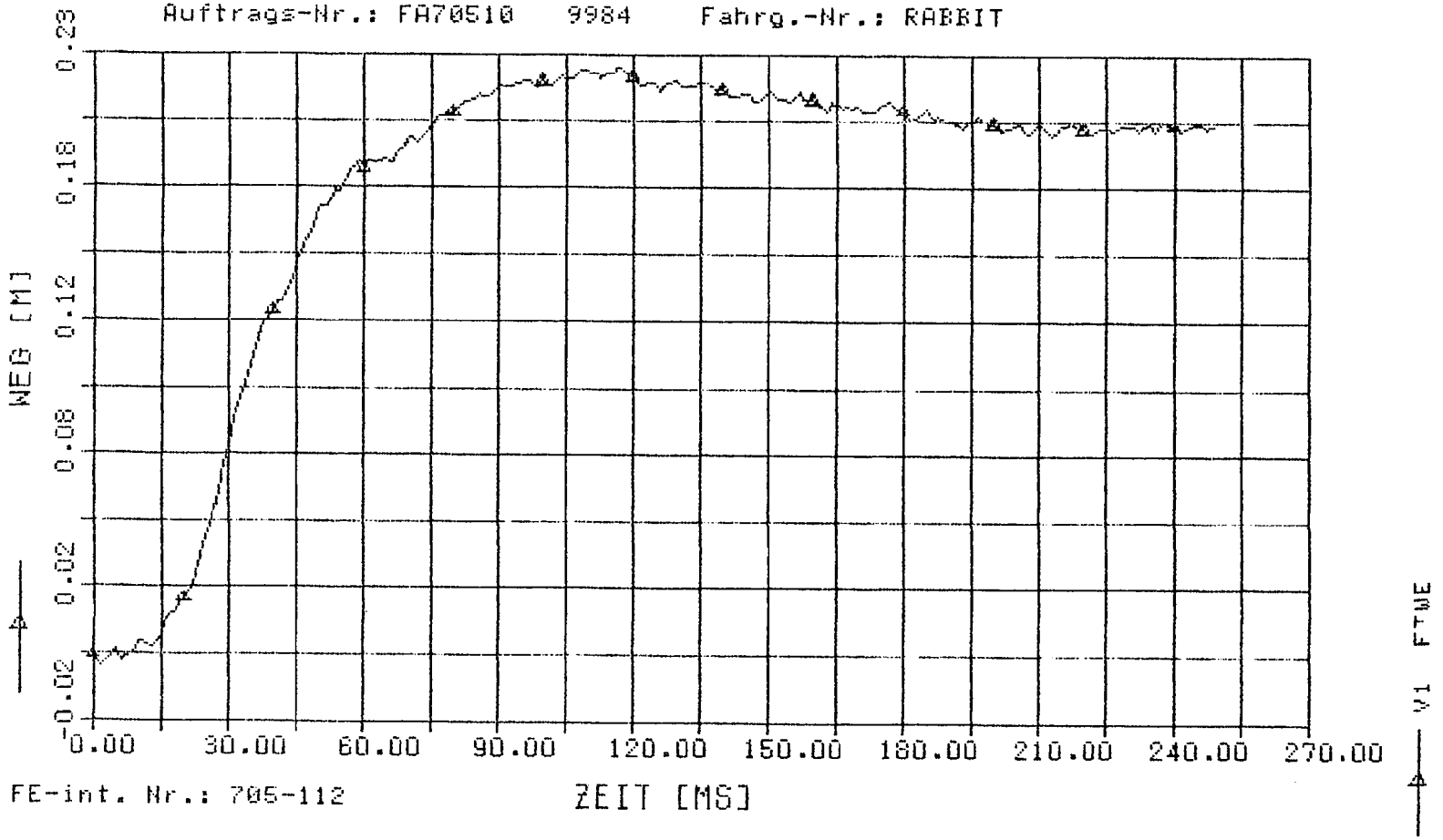
| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| RTMIY | V1 | BE g | -55.025 | 41.00 | 0.00 |
| RTMIY | V1 | GE m/s | 5.411 | 110.00 | 0.00 |
| RTMIY | V1 | WE m | .997 | 255.00 | 0.00 |



- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|---|
| RTMIZ | V1 | BE | g | 7.662 | 40.00 | 0.00 |




Auftrags-Nr.: FA70510 9984 Fahrg.-Nr.: RABBIT
WEG [M]
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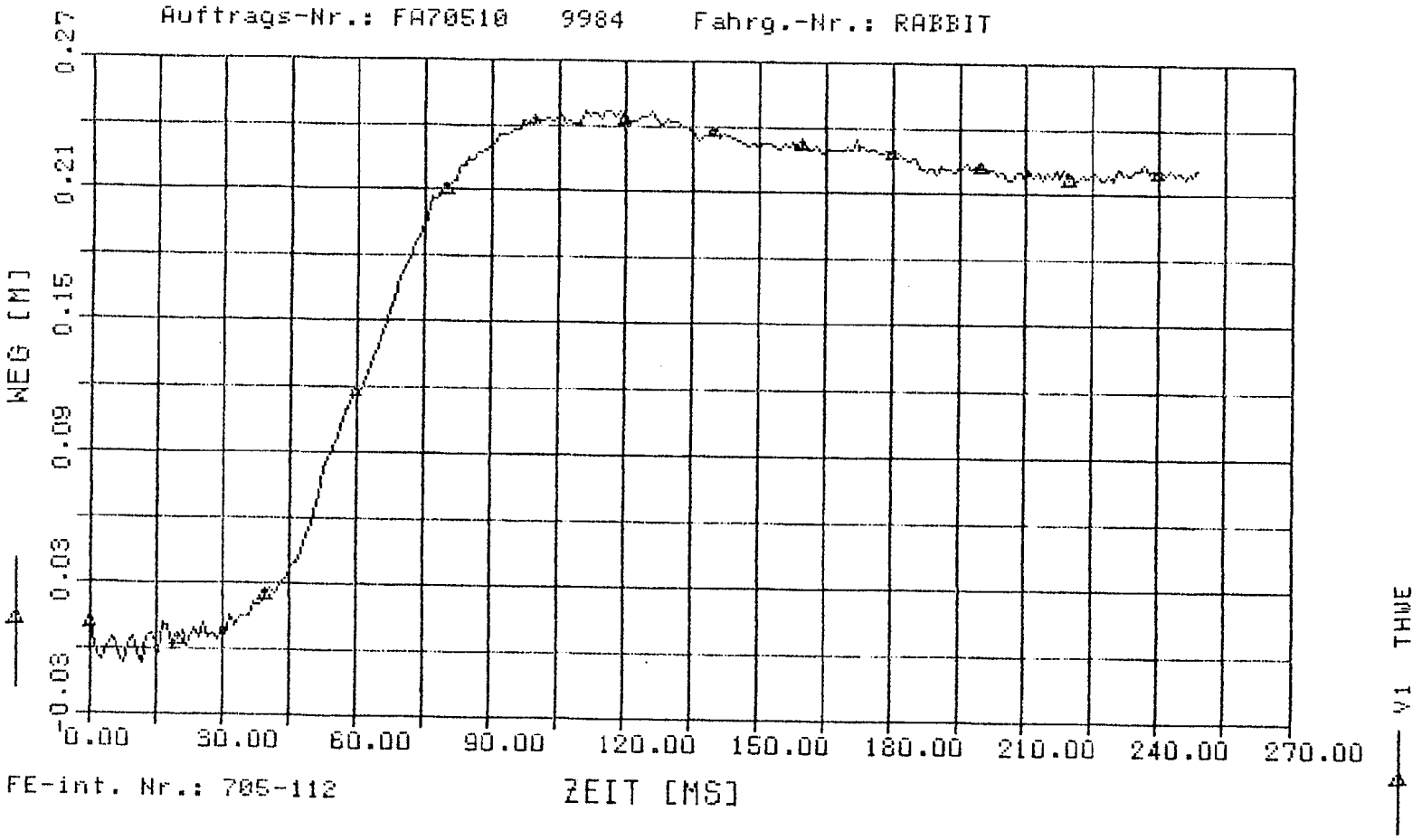
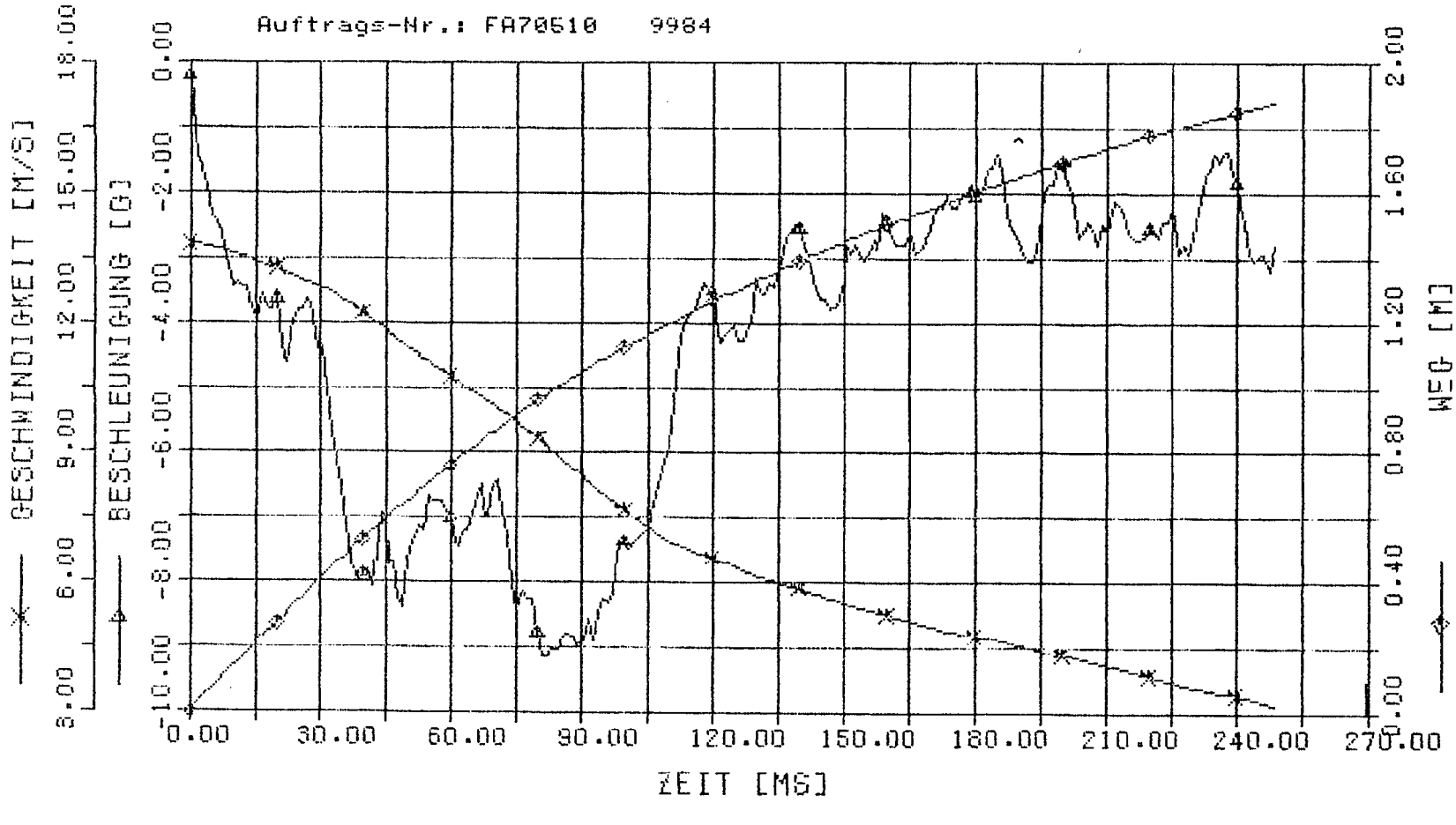
0.18
0.12
0.08
0.02
-0.02
0.00
30.00
60.00
90.00
120.00
150.00
180.00
210.00
240.00
270.00
ZEIT [MS]
FE-int. Nr.: 705-112
V1 FTWE


Auftrags-Nr.: FA70510 9984 Fahrg.-Nr.: RABBIT
WEG [M]
0.27
0.21
0.15
0.09
0.03
-0.03
0.00
30.00
60.00
90.00
120.00
150.00
180.00
210.00
240.00
270.00
ZEIT [MS]
FE-int. Nr.: 705-112
V1 THWE

## B.1.2 Crabbed Barrier

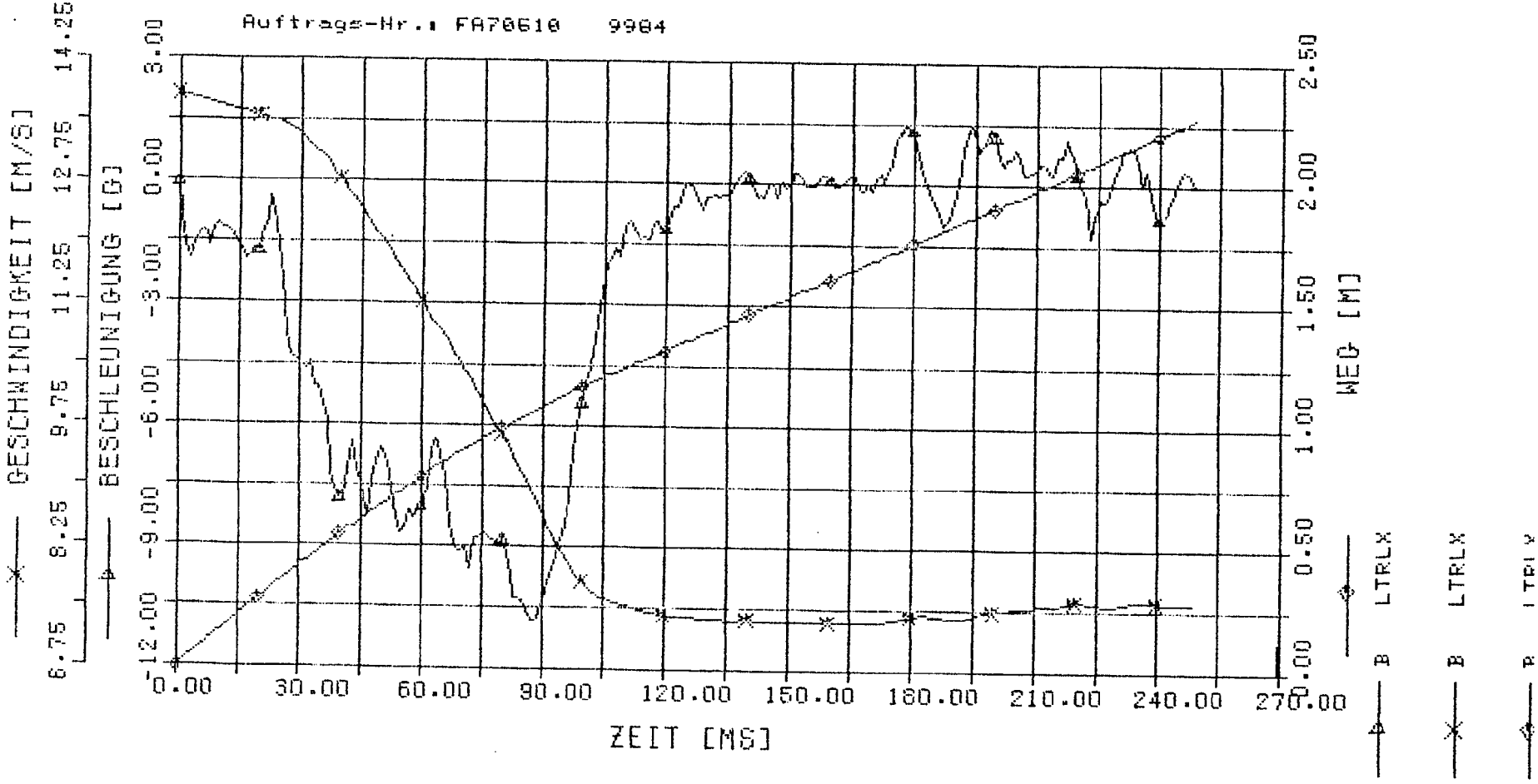
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| LTRRX | B | BE g | -9.159 | 32.00 | 0.00 |
| LTRRX | B | GE m/s | 13.817 | 0.00 | 0.00 |
| LTRRX | B | WE m | 1.896 | 255.00 | 0.00 |



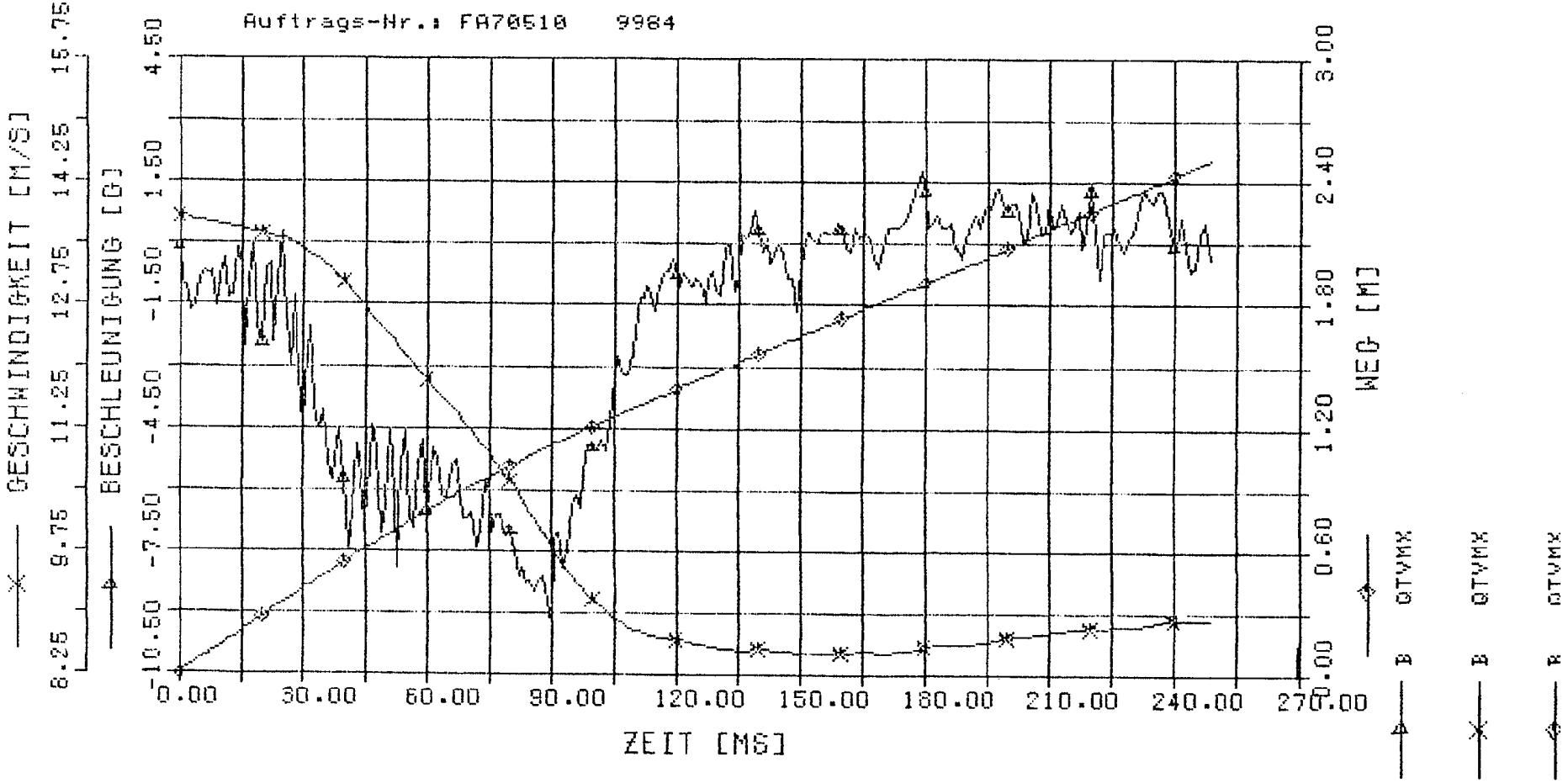
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| LTRLX | B | BE g | -10.820 | 88.00 | 0.00 |
| LTRLX | B | GE m/s | 13.817 | 0.00 | 0.00 |
| LTRLX | B | WE m | 2.318 | 255.00 | 0.00 |



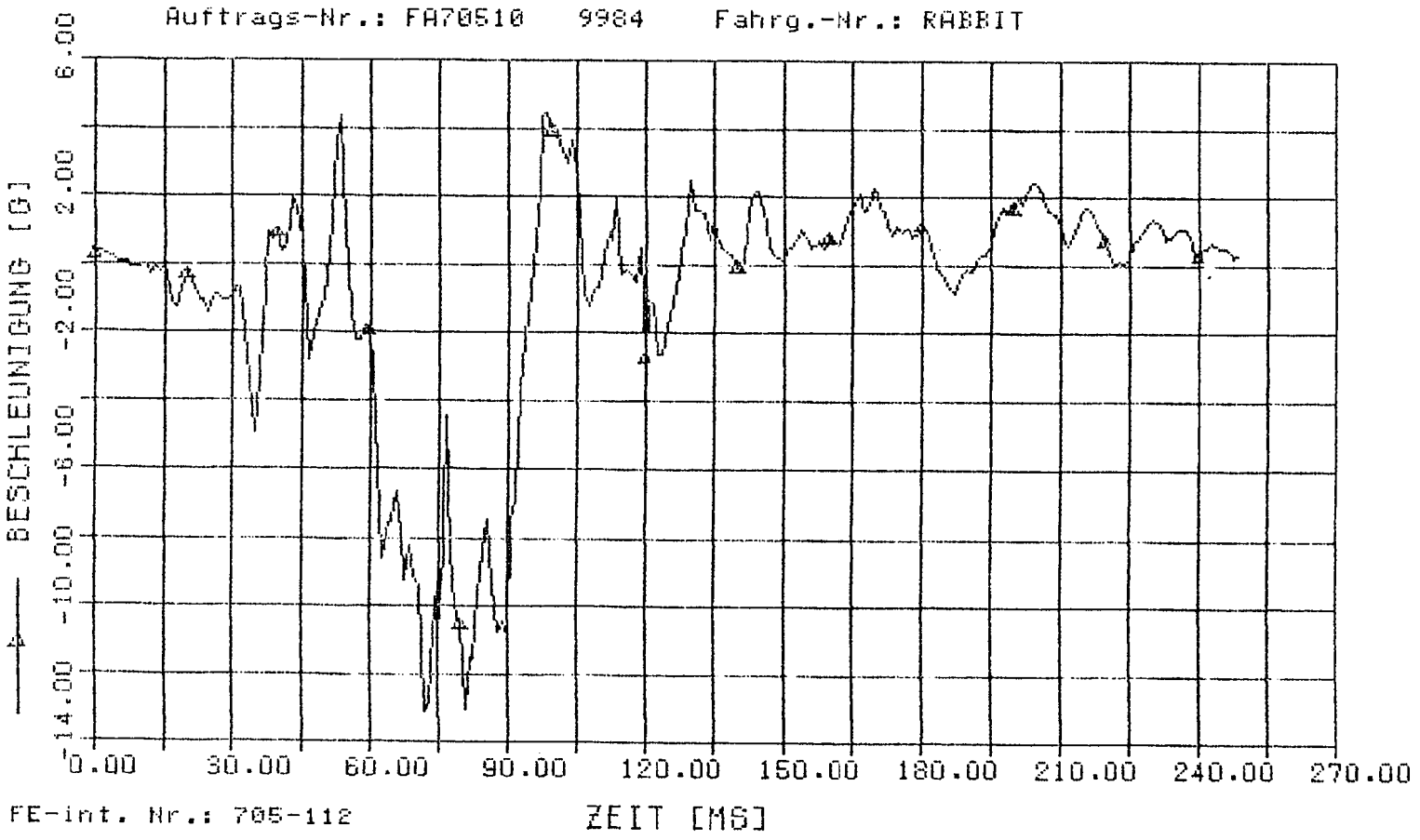
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| QTVMX | B | BE g | -9.257 | 90.00 | 0.00 |
| QTVMX | B | GE m/s | 13.817 | 0.00 | 0.00 |
| QTVMX | B | WE m | 2.560 | 255.00 | 0.00 |



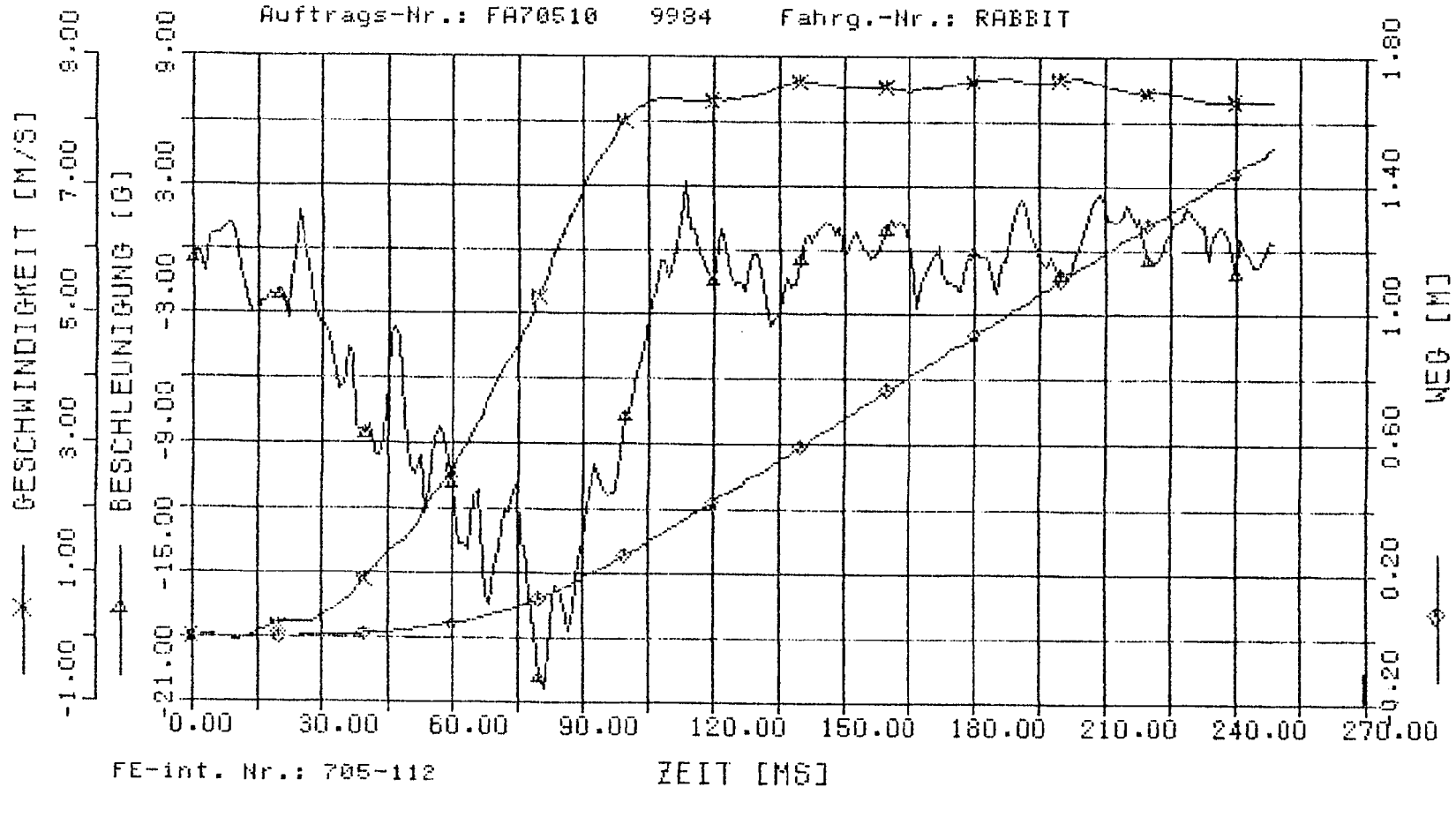
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| KOBOX | V1 | BE g | -13.058 | 72.00 | 3.88 |



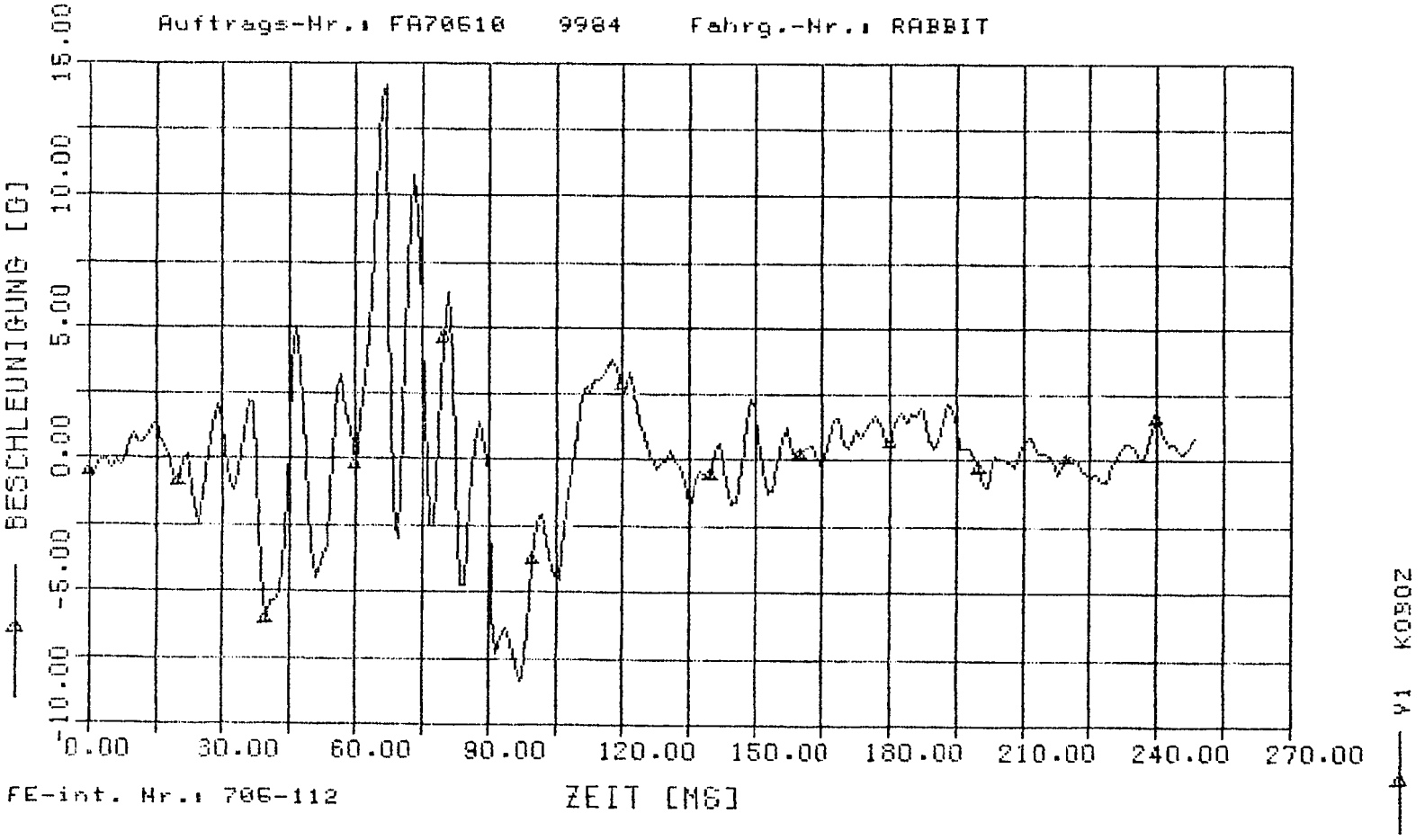
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| KOBOY | V1 | BE g | -20.417 | 81.00 | 2.32 |
| KOBOY | V1 | GE m/s | 8.666 | 188.00 | 0.00 |
| KOBOY | V1 | WE m | 1.567 | 255.00 | 0.00 |



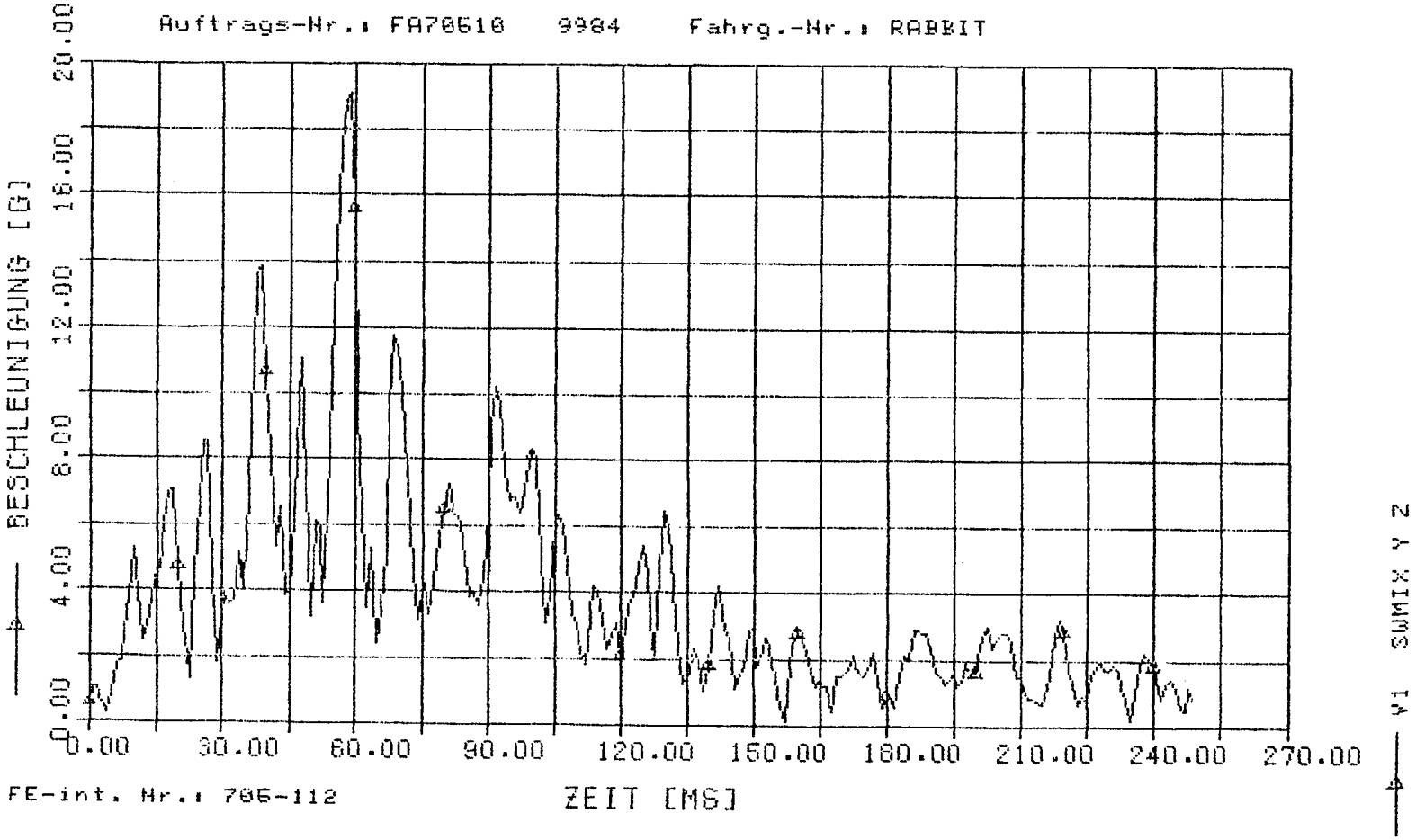
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|---|
| KOBOZ | V1 | BE | g | 14.159 | 67.00 | 9.74 |



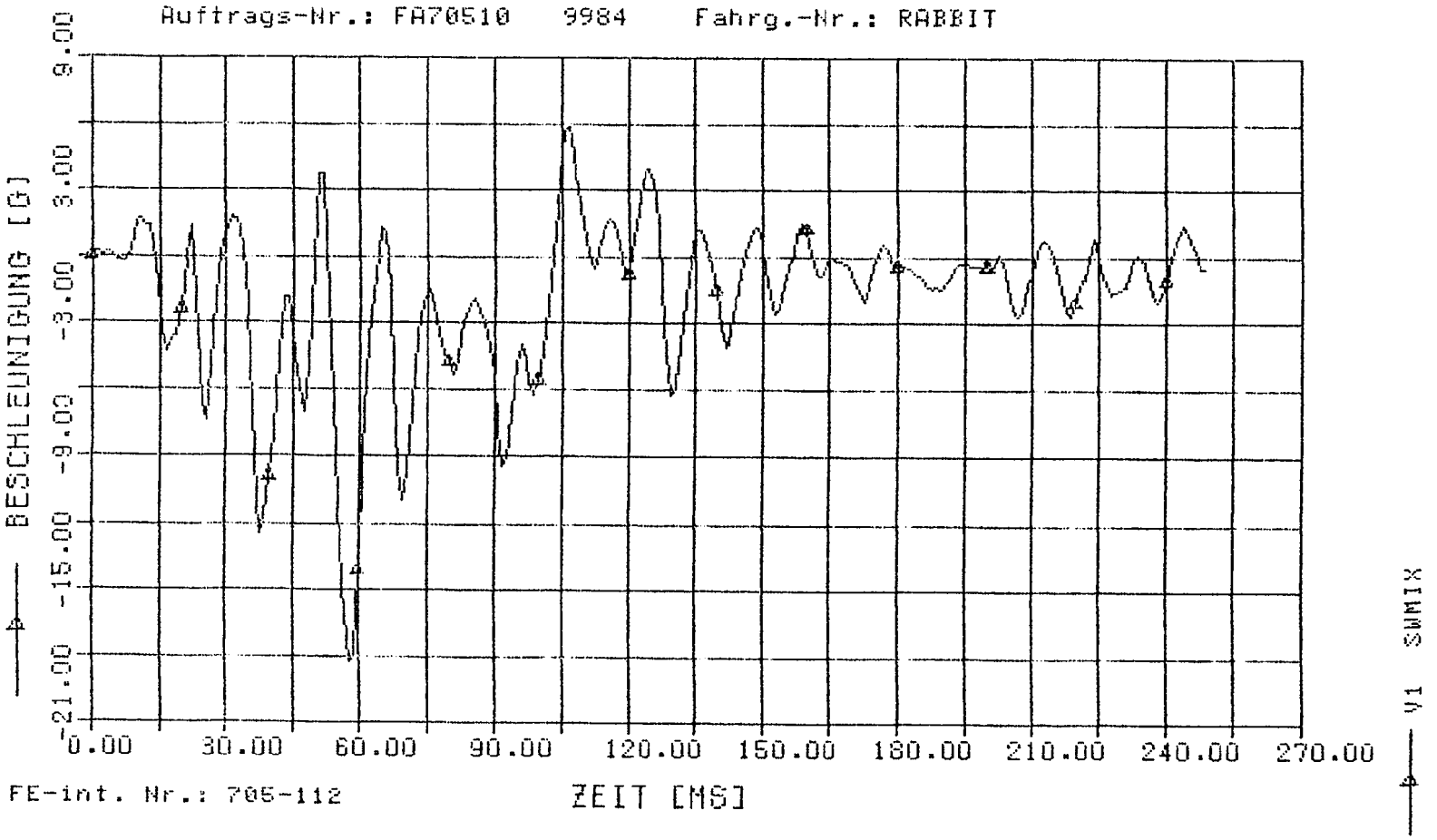
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SWMI | V1 | BE g | 19.089 | 59.00 | 0.00 |



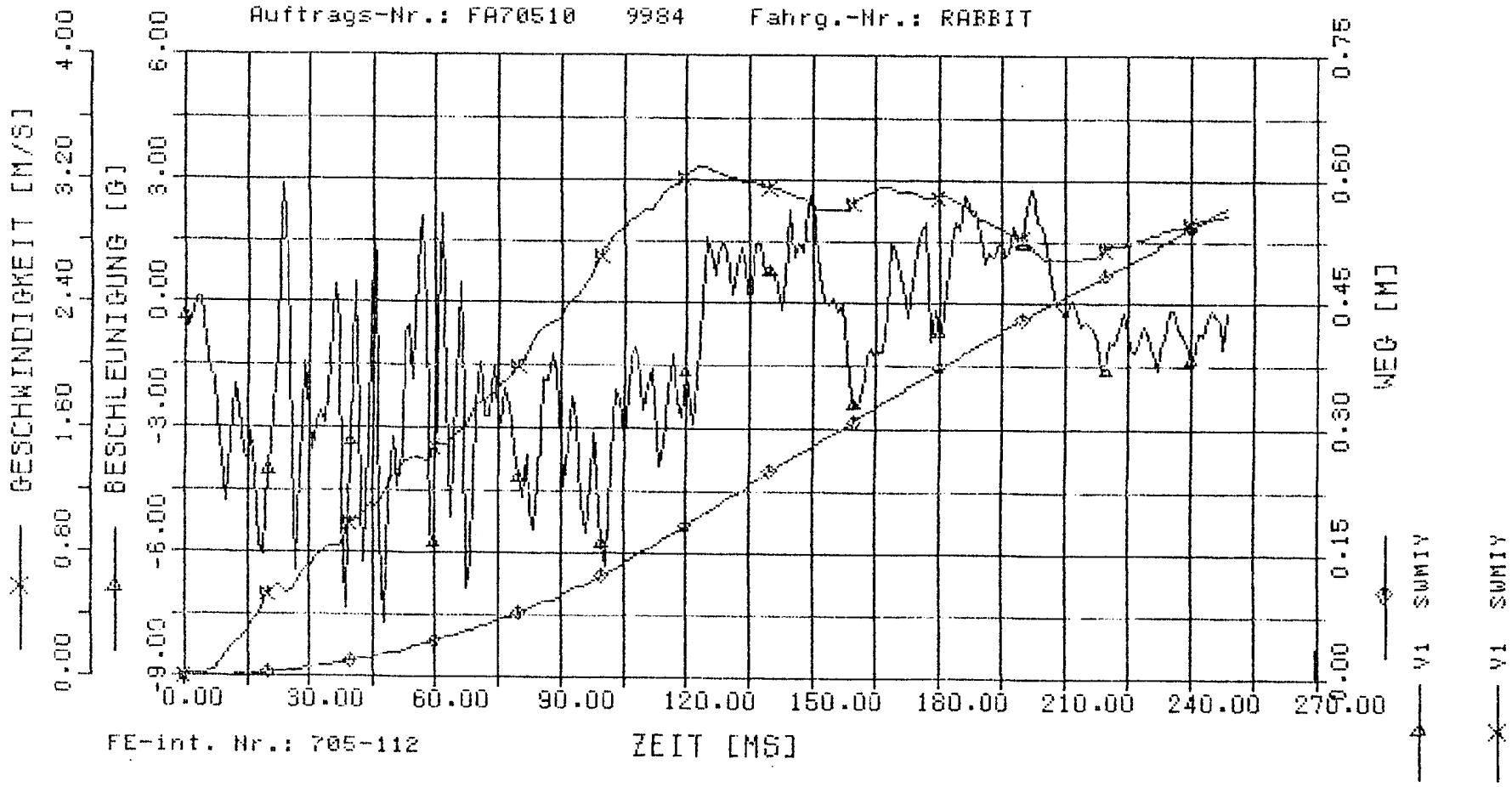
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SWMIX | V1 | BE g | -18.195 | 58.00 | 0.00 |



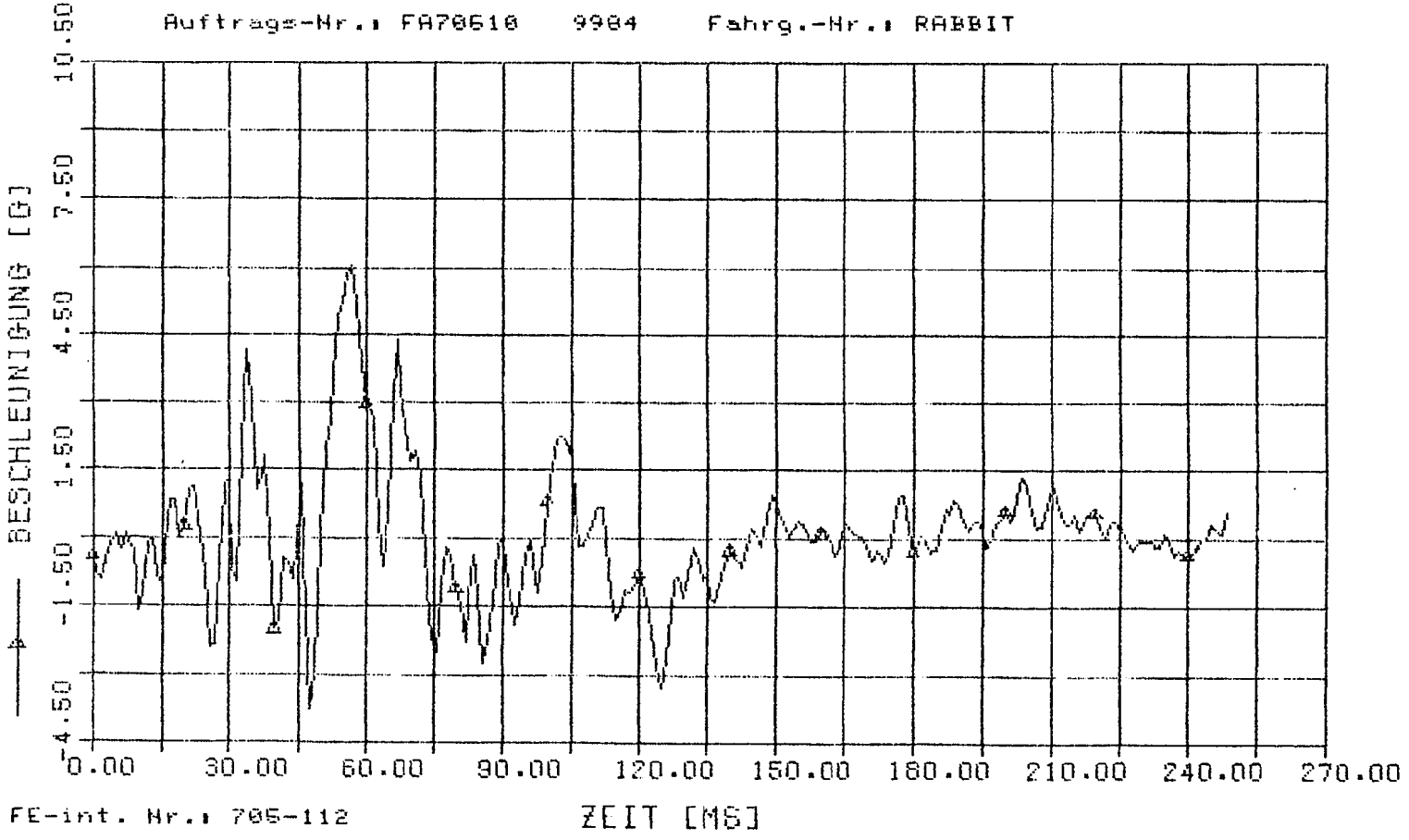
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SWMIY | V1 | BE g | -7.726 | 48.00 | 0.00 |
| SWMIY | V1 | GE m/s | 3.288 | 124.00 | 0.00 |
| SWMIY | V1 | WE m | .585 | 255.00 | 0.00 |



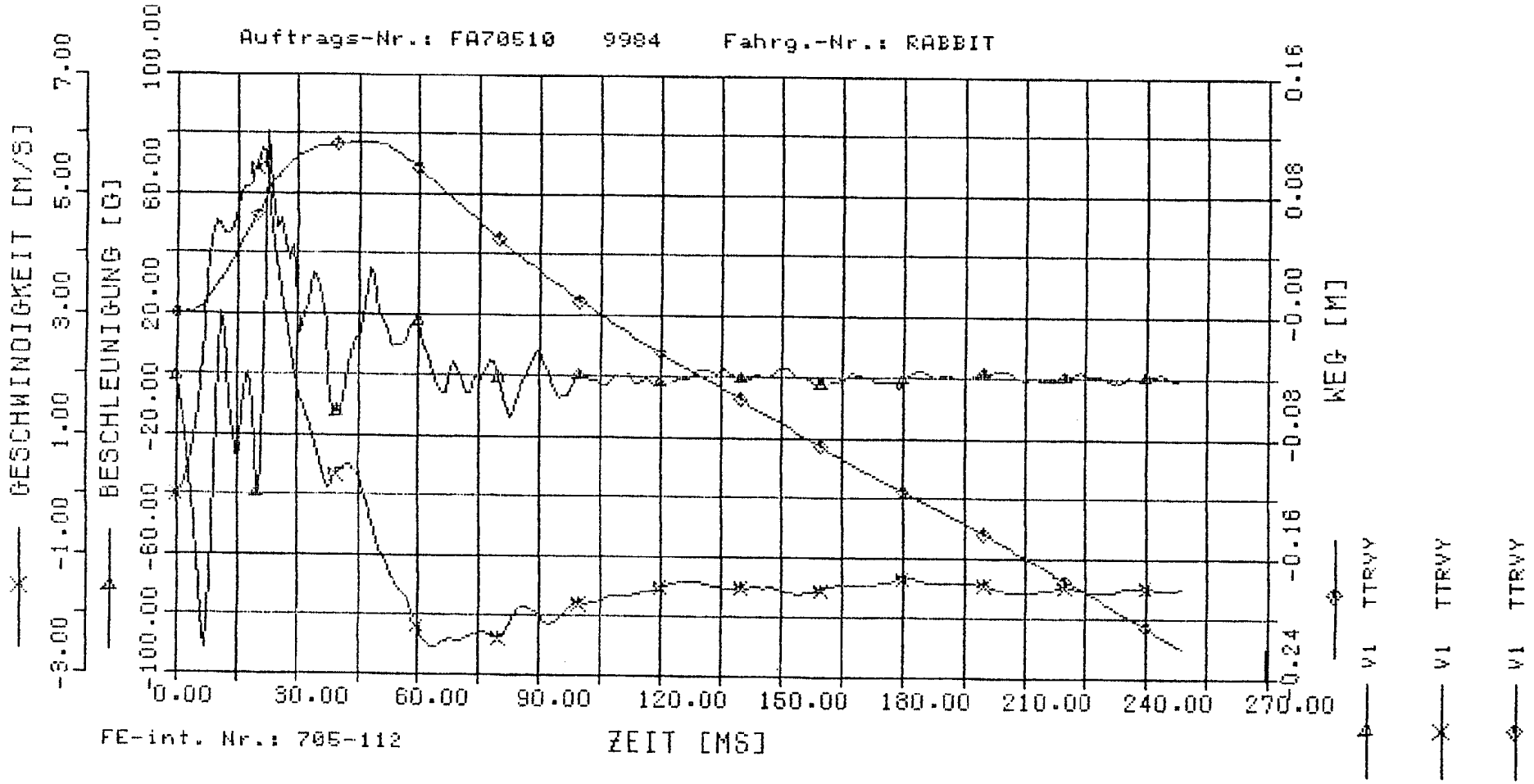
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SWMIZ | V1 | BE g | 6.017 | 57.00 | 0.00 |



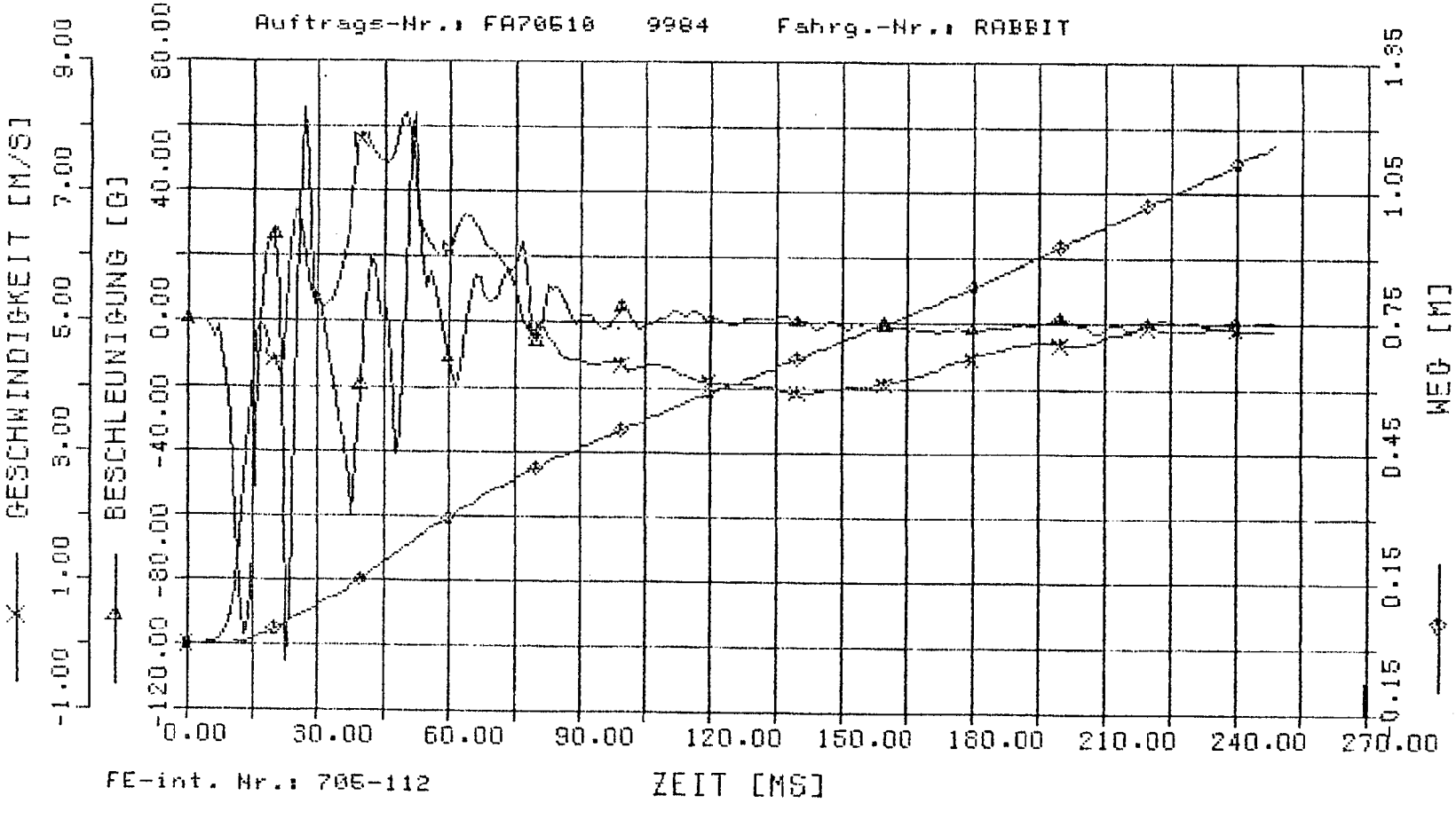
- Kenn-Werte:  Auftrags-Nr.: FA70510  Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TTRVY | V1 | BE g | -91.441 | 7.00 | 0.00 |
| TTRVY | V1 | GE m/s | 5.755 | 21.00 | 0.00 |
| TTRVY | V1 | WE m | -.230 | 255.00 | 0.00 |



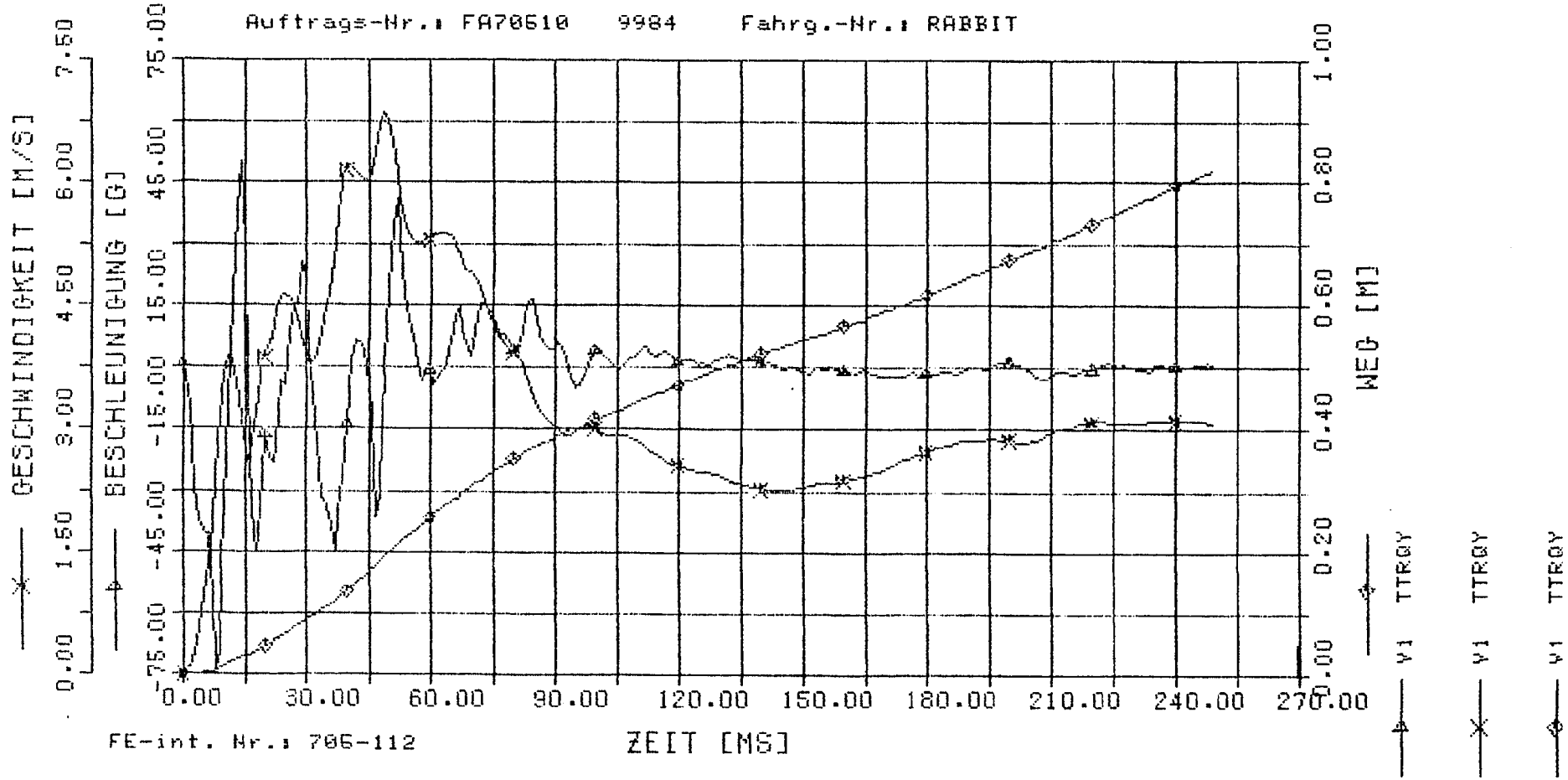
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TTRMY | V1 | BE g | -105.314 | 23.00 | 0.00 |
| TTRMY | V1 | GE m/s | 8.214 | 50.00 | 0.00 |
| TTRMY | V1 | WE m | 1.191 | 255.00 | 0.00 |



- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TTRQY | V1 | BE g | -73.527 | 8.00 | 0.00 |
| TTRQY | V1 | GE m/s | 6.858 | 49.00 | 0.00 |
| TTRQY | V1 | WE m | .840 | 255.00 | 0.00 |



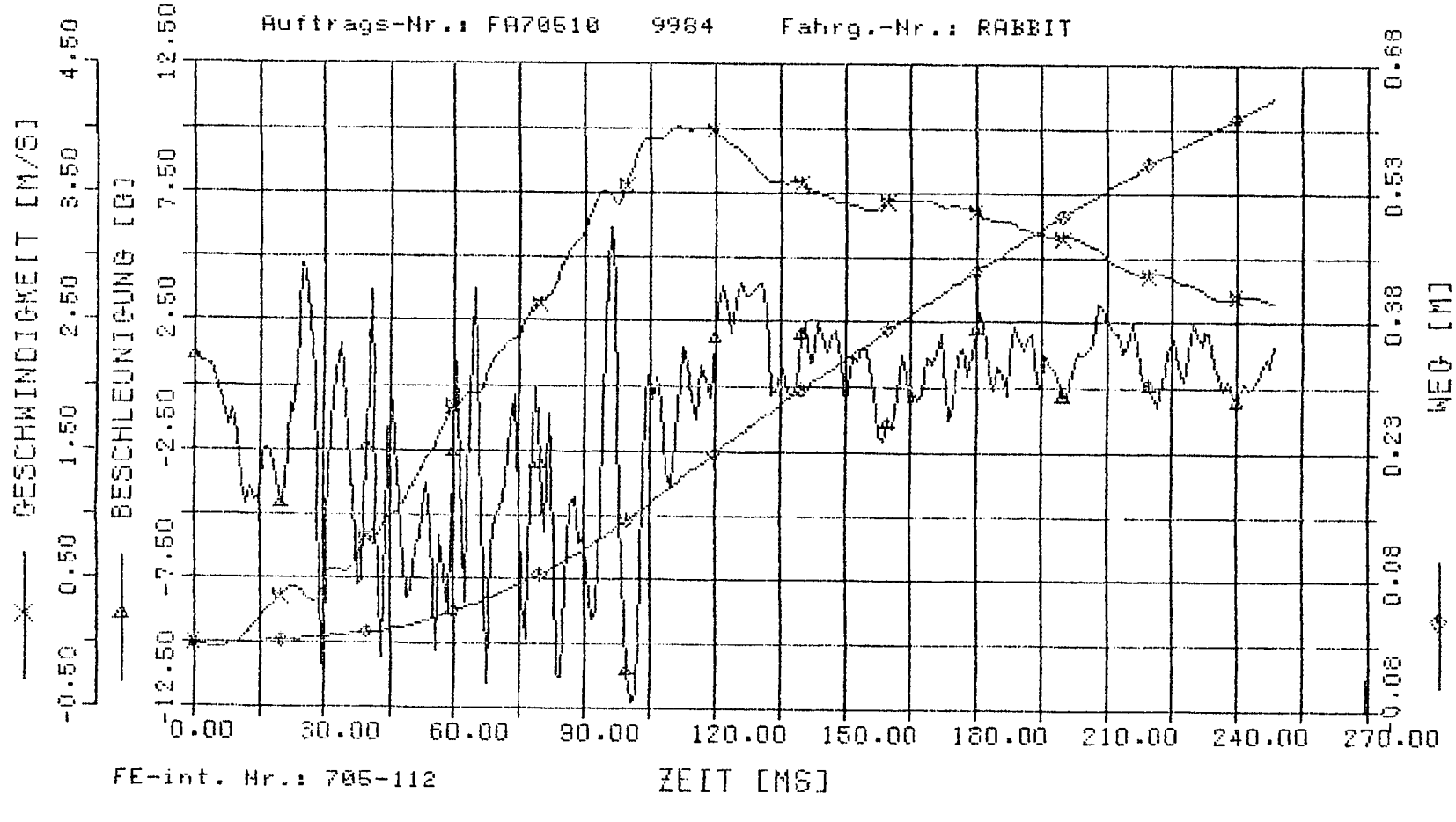
# A P P E N D I X  B

Vehicle and Dummy Test Respone Acceleration/ - and Velocity/Time History

## B.1.1 Target Vehicle

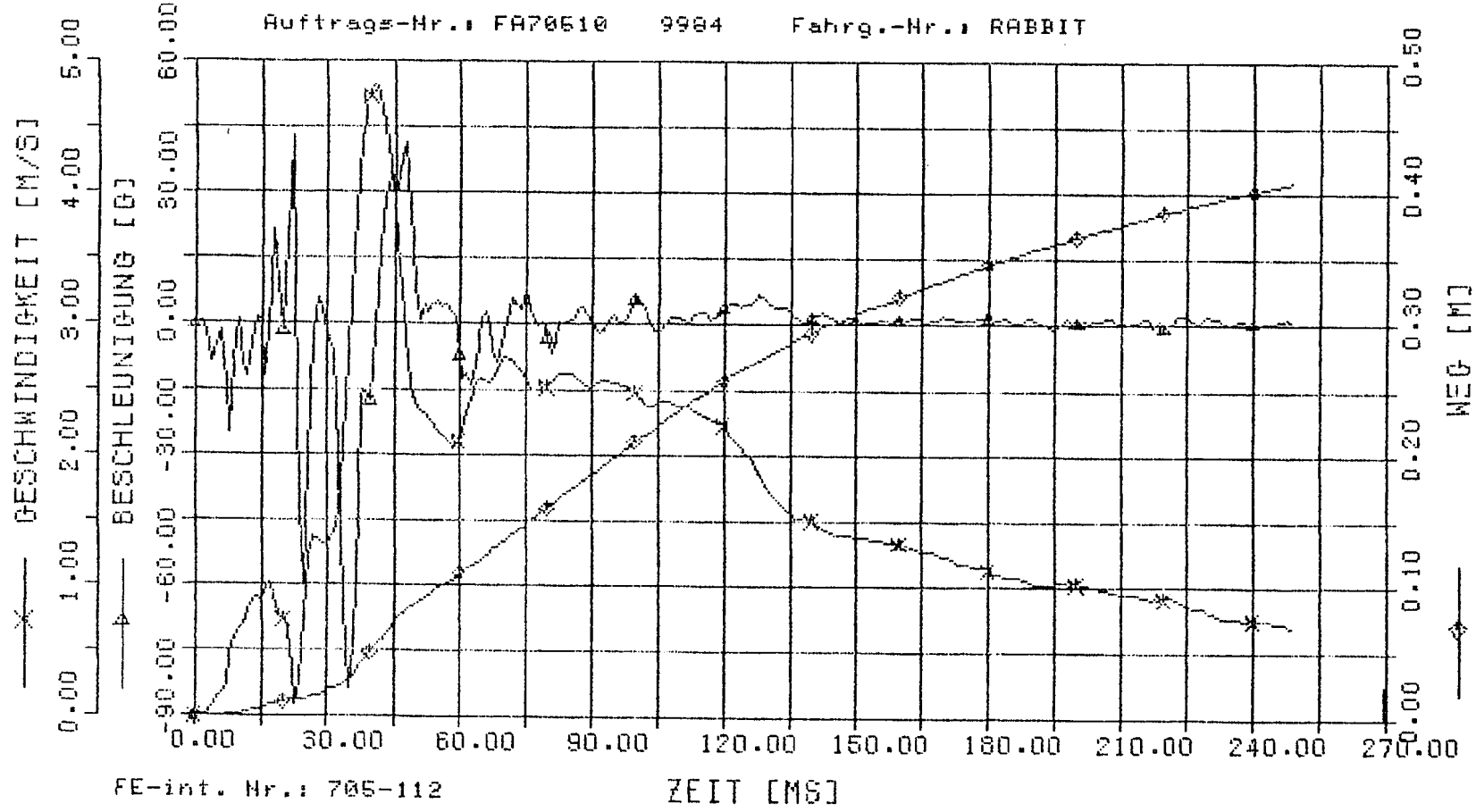
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TSVRY | V1 | BE g | -12.244 | 101.00 | 0.00 |
| TSVRY | V1 | GE m/s | 4.007 | 112.00 | 0.00 |
| TSVRY | V1 | WE m | .653 | 255.00 | 0.00 |



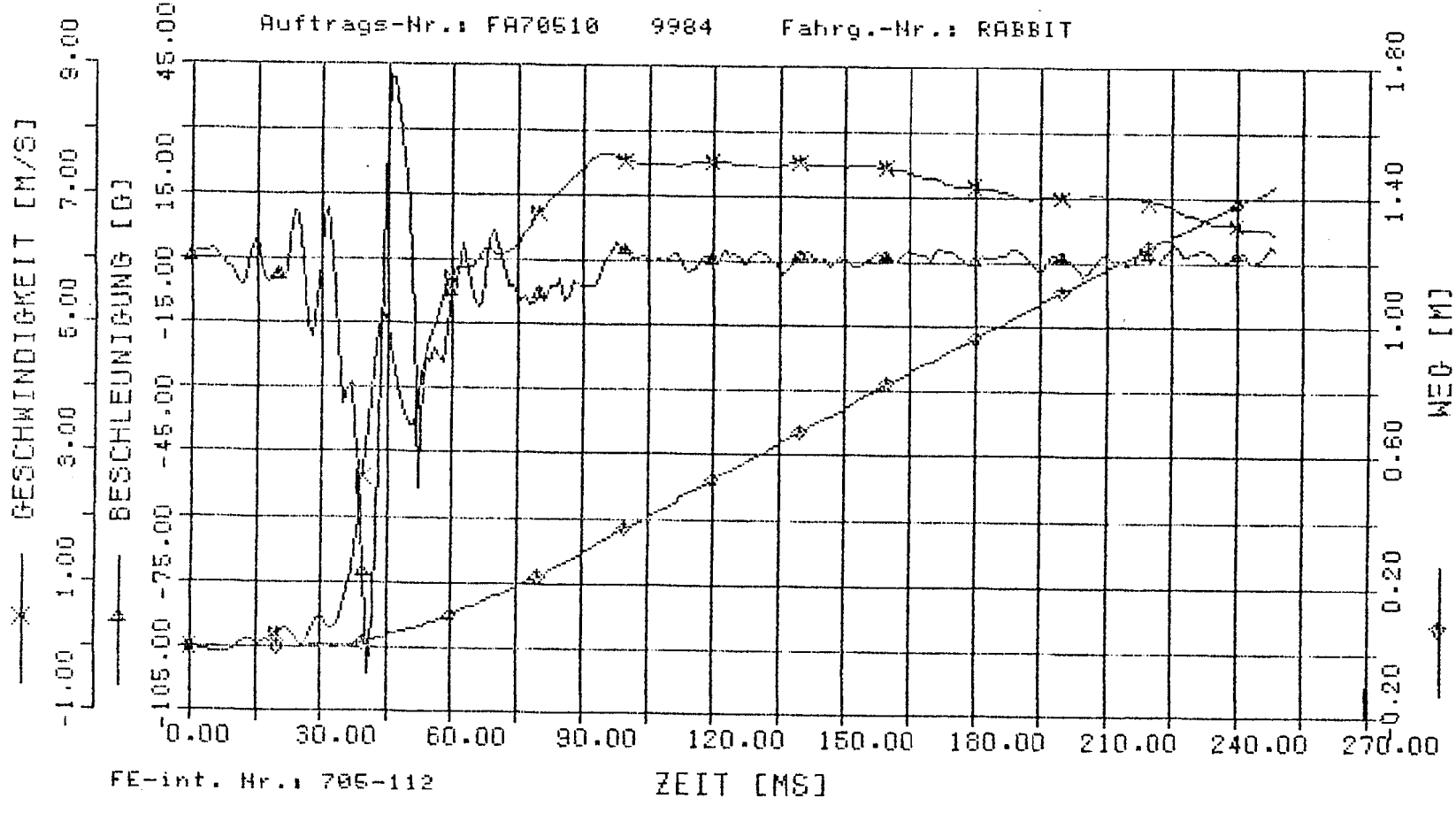
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| TSVLY | V1 | BE g | -83.761 | 35.00 | 0.00 |
| TSVLY | V1 | GE m/s | 4.817 | 41.00 | 0.00 |
| TSVLY | V1 | WE m | .412 | 255.00 | 0.00 |



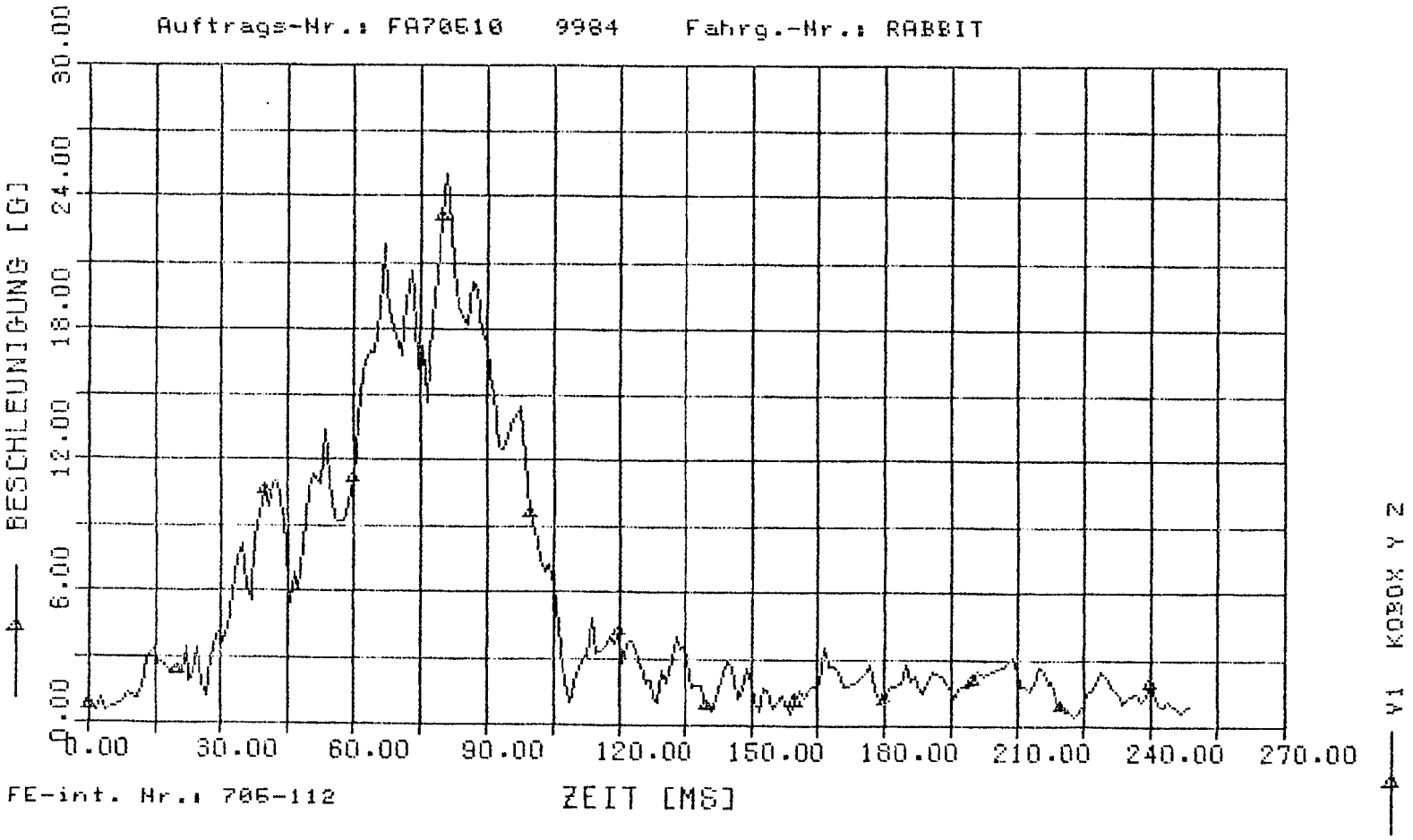
- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| SHHLY | V1 | BE g | -95.954 | 41.00 | 0.00 |
| SHHLY | V1 | GE m/s | 7.642 | 95.00 | 0.00 |
| SHHLY | V1 | WE m | 1.477 | 255.00 | 0.00 |



- Kenn-Werte: Auftrags-Nr.: FA70510 Versuchs-Nr.: 9984

| Mess-Stelle | UP | ber. Groesse | Extremum | t Extr. | 3MS |
|---|---|---|---|---|---|
| KOBO | V1 | BE g | 25.022 | 81.00 | 21.83 |



Prepared for the Department of Transportation, National Highway Traffic Safety Administration under Contract No. DTNH 22-81-C-17085

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15. Supplementary Notes

16. Abstract

Vehicle and vehicle occupant response data from side impact test No. 7 - Crabbed Barrier/Production 4 door Rabbit with modified padding at 60° impact angle and v = 30 mph impact speed are summarized in this report.

Volume III/7

| 17. Key Words | 18. Distribution Statement |
|---|---|
| | |

| 19. Security Classif. (of this report) | 20. Security Classif. (of this page) | 21. No. of Pages | 22. Price |
|---|---|---|---|
| | | 151 | |

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The Test Results belong to the specified NHTSA Test Configuration for Side Impacts with the Crabbed Barrier and HSRI-SID-Dummies both of which are currently under development.

NHTSA Project DTNH 22-81-C-17085

Volume III/ 7

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Vehicle and Dummy Test Response
Acceleration-/ and Velocity/Time History

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- B.1.2 Crabbed Barrier

B.2 Dummy Test Response
- B.2.1 Driver
- B.2.2 Rear Passenger

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## 1. Introduction

The Objective of the MIV project was to optimize the contradictory design aspects of a high degree of passive safety and low fuel consumption.

The project was arranged in Phase I and II. The results of Phase I are the basis of this report. Phase II was redefined by NHTSA. According to this, the three engine/transmission concepts that were to be newly developed are no longer part of Phase II.

Possibilities were to be found for a 4 door Rabbit for further increasing occupant protection in specified side and frontal impacts. The Rabbit Modifications should be possible to implement on the production line. NHTSA's design goals were the 35 mph frontal fixed barrier impact and the 30, 35 or 40 mph side impact with the new 1.565 kg (3,450 lbs) deformable Crabbed Barrier and the new HSRI Dummy which were specially conceived for the side impact and are presently still under development.

Modifications for the 4 door Rabbit were derived from Crabbed Barrier/ Production Rabbit baseline tests.
NHTSA contract specifications called for a maximum weight increase of 20 lbs for the modified 4 door Rabbit.

The NHTSA goal to achieve the greatest possible reduction in dummy loads, in keeping with the objective of lowest possible weight together with the prerequisite that the design be suited to mass production at the lowest possible cost, required the development of a new "Integrated Structure" for the 4 Door Modified Rabbit. This concept requires that the greatest number of components be effective during a frontal and a side impact. The "Integrated Structure" approach, rather than the Budd strategy to use add-on parts, is necessary to achieve the goals established by NHTSA.

2. Method
   2.1 Test Devices and Test Configuration
   2.2 List of Accelerometer Location
      2.2.1 Target Vehicle Instrumentation
      2.2.2 Side Impactor Instrumentation
      2.2.3 Dummy Instrumentation
   2.3 Camera Location and Frame Rate

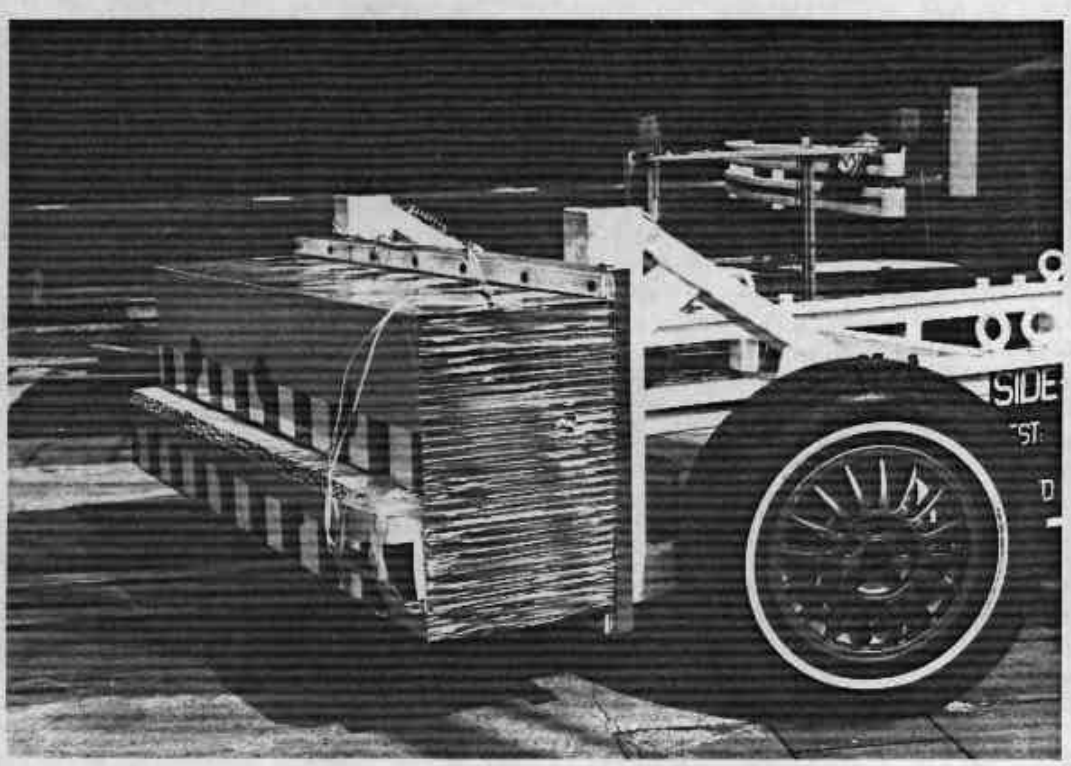




FIGURE 1 : 19° CRABBED BARRIER TEST DEVICE

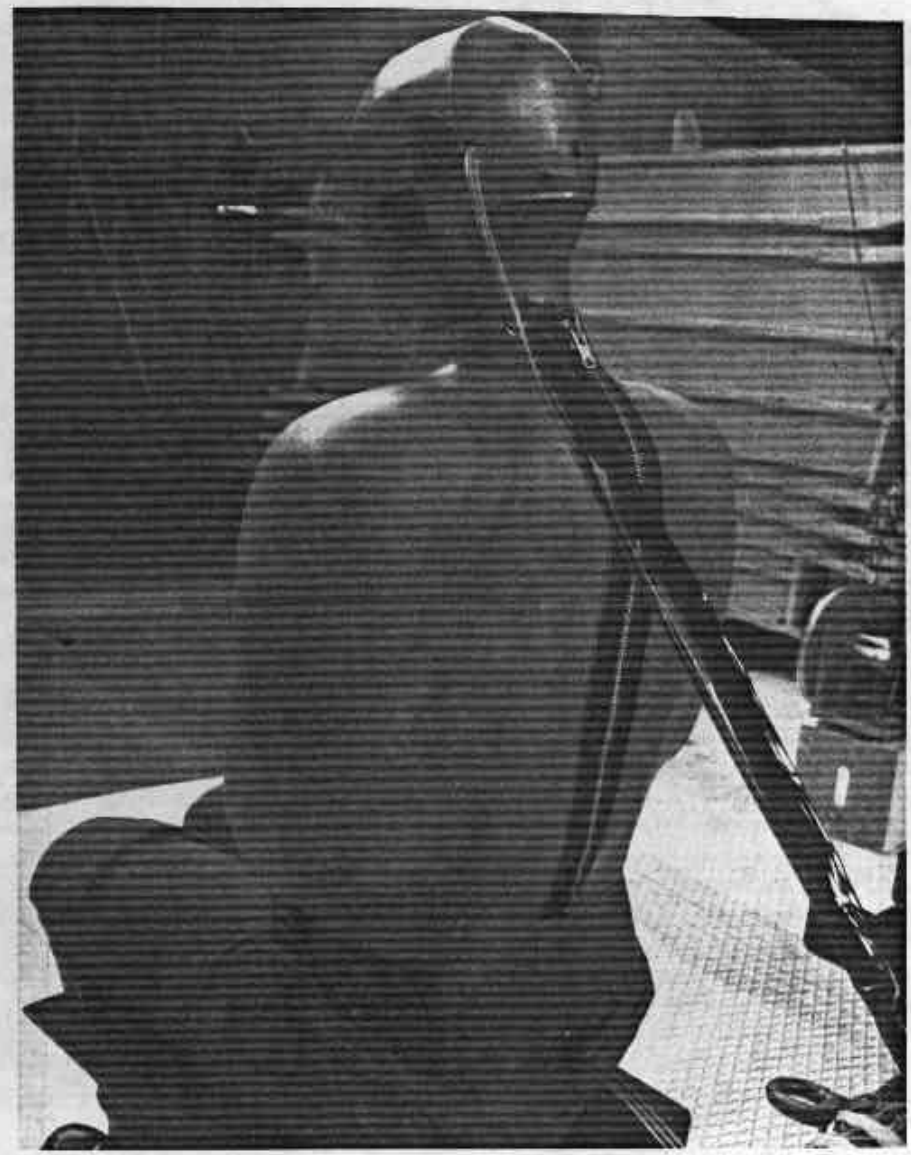
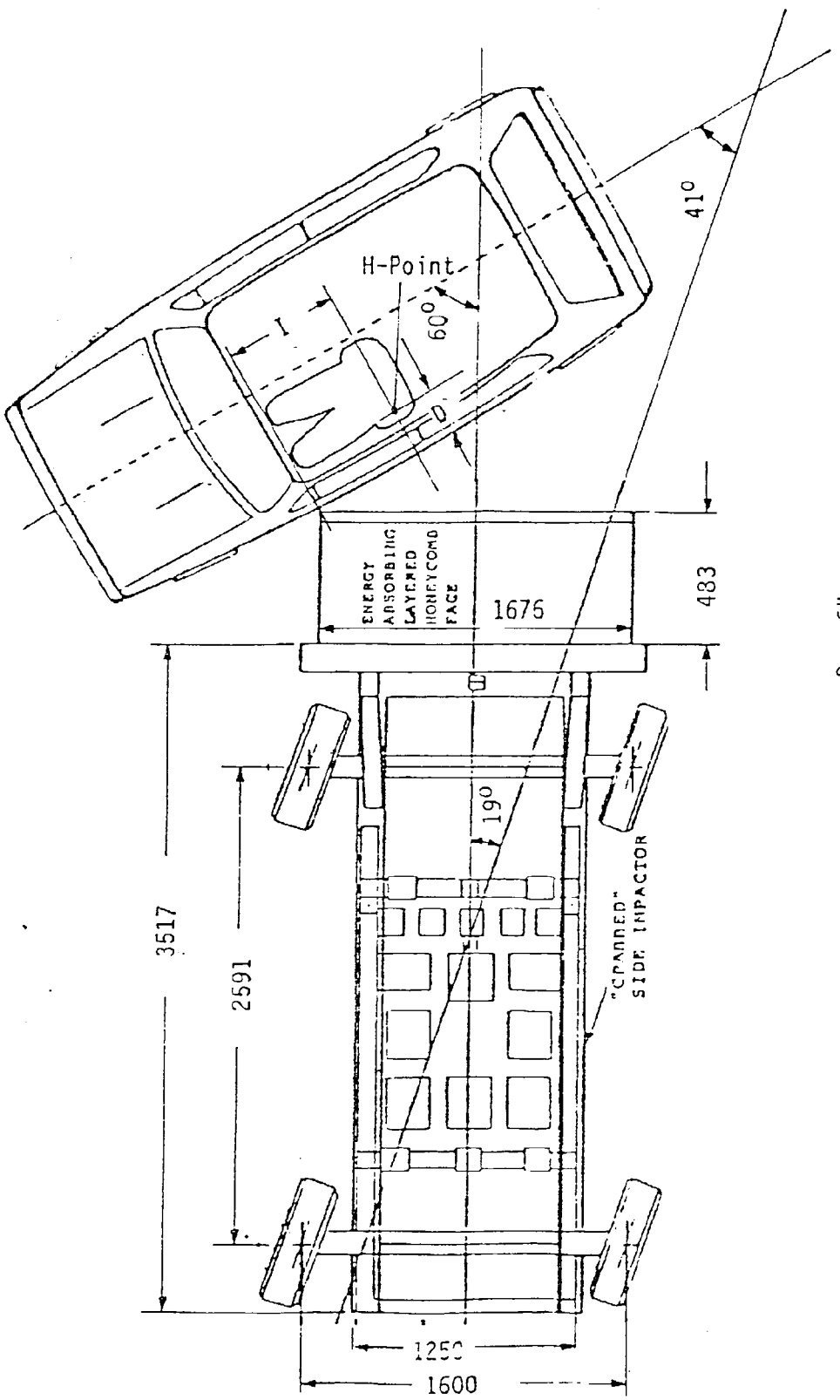


FIGURE 2 : HSRI SIDE IMPACT DUMMY




$$I = \frac{D + 6"}{0,8693} + 1,5 \quad (\pm 1,5") \qquad \text{(D and I in inch)}$$

Remarks: I = Impact-Point
D = Distance H-Point - Door Exterior

**Figure 3: Test Configuration**

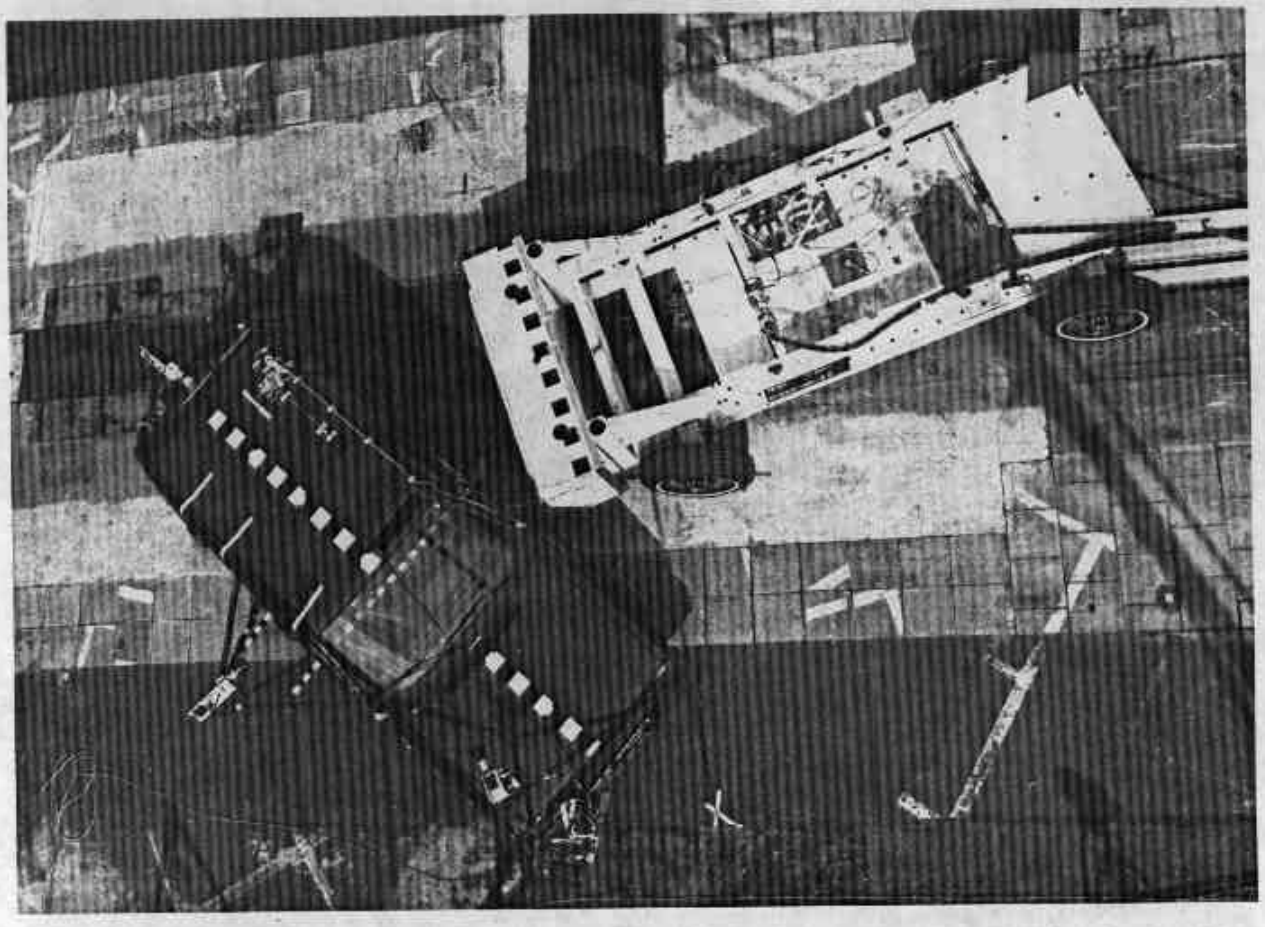


FIGURE 4 : SIDE IMPACT TEST CONFIGURATION

CRABBED BARRIER / VW RABBIT

Table 1: List of Accelerometer - Location

VEHICLE

| No. | Location | Shortened Form | Direction |
|---|---|---|---|
| 1 | Right Front-Doorsill | TSVR | Y |
| 2 | Left Front-Doorsill | TSVL | Y |
| 3 | Left Rear-Doorsill | SHHL | Y |
| 4 | Rear Deck over Centerline | KOBO | X, Y, Z |
| 5 | Front Firewall over $C_L$ | SWMI | X, Y, Z |
| 6 | Mid-front Edge of left Front-Door | TTRV | Y |
| 7 | Middle of left Front-Door | TTRM | Y |
| 8 | Shoulder Contact at Front-Door | SASL | Y |
| 9 | Pelvis Contact at Front-Door | BASL | Y |
| 10 | Left Front-Door on Windowsill | FBVL | Y |
| 11 | Right Front-Door on Windowsill, directly across No. 10 | FBVR | Y |
| 12 | Left B-Pillar near Door Latch | BSLL | Y |
| 13 | Right B-Pillar across No. 12 | BSLR | Y |
| 14 | Underneath left Front Seat attached to Seat | SGFA | Y |
| 15 | Vehicle Center of Gravity | RTMI | X, Y, Z |
| 16 | Left Front-Door Intrusion | FTWE | Y |
| 17 | B-Pillar Intrusion | THWE | Y |
| 18 | Shoulder Contact Driver | SKO1K | |
| 19 | Pelvis Contact Driver | BKO1K | |
| 20 | Shoulder Contact Left Rear Passenger | SKO3K | |
| 21 | Pelvis Contact Left Rear Passenger | BKO3K | |

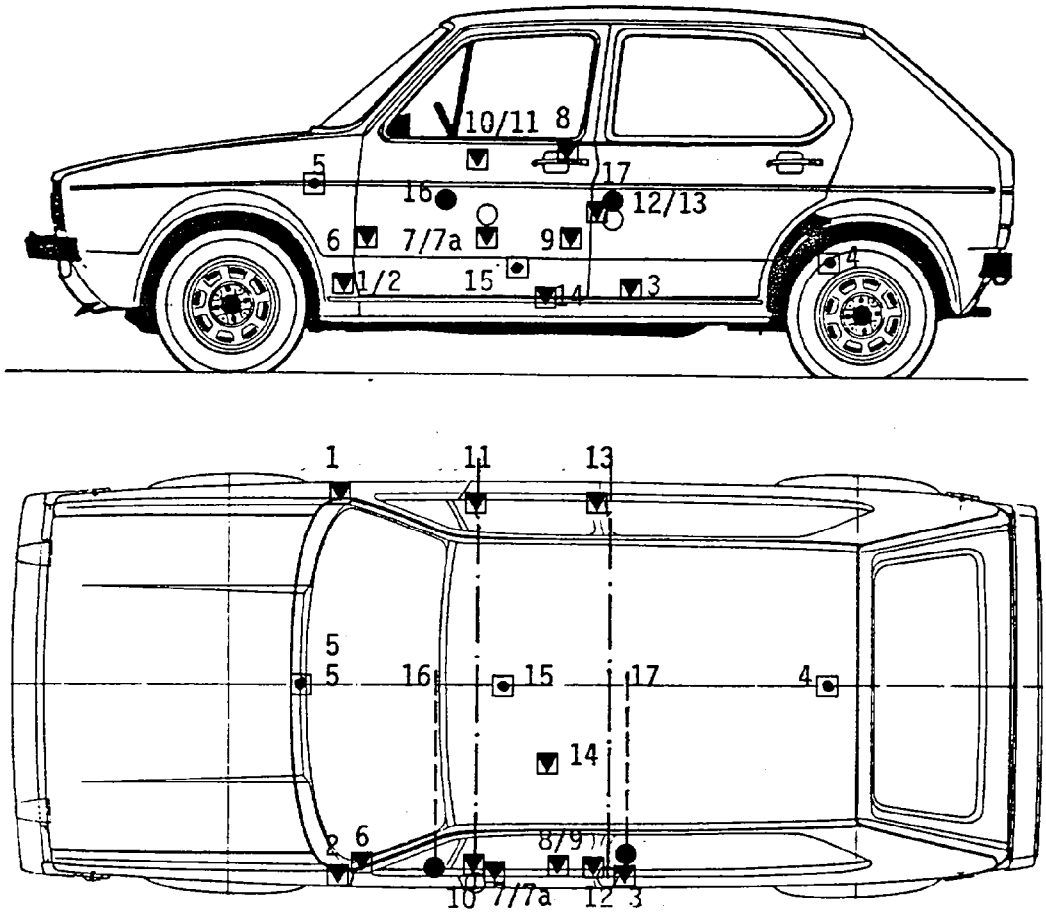
19° CRABBED SIDE IMPACTOR

| | | | |
|---|---|---|---|
| 1 | Right Frame Rail | LTRR | X |
| 2 | Left Frame Rail | LTRL | X |
| 3 | Front Crossmember at $C_L$ | QTVM | X |
| 4 | Right Rear Vertikal Framerail | RHTR | X, Y |
| 5 | Center of Gravity | SPKT | X, Y, Z |

Declaration: X = Longitudinal
Y = Lataral
Z = Vertikal

## Location of Accelerometer for the HSRI Side Impact Dummies

| Location | Shortened Form | Direction |
|---|---|---|
| **DRIVER** | | |
| Head Triaxial | KO01 | X, Y, Z |
| Upper Sternum | BO01 | X |
| Lower Sternum | BU01 | X |
| Left upper Rib | LO01 | Y |
| Left lower Rib | LU01 | Y |
| Right upper Rib | RO01 | Y |
| Right lower Rib | RU01 | Y |
| Upper Thorax (T 1) | TO01 | X, Y, Z |
| Lower Thorax ( T 12 ) | TU01 | X, Y, Z |
| Pelvis Triaxial | BE01 | X, Y, Z |
| Chest Deflection | WE01 | Y |
| Shoulder Beltforce | GU01SA | |
| **REAR LEFT PASSENGER** | | |
| Head Triaxial | KO03 | X, Y, Z |
| Upper Sternum | BO03 | X |
| Lower Sternum | BU03 | X |
| Left upper Rib | LO03 | Y |
| Left lower Rib | LU03 | Y |
| Right upper Rib | RO03 | Y |
| Right lower Rib | RU03 | Y |
| Upper Thorax ( T 1 ) | TO03 | X, Y, Z |
| Lower Thorax ( T 12 ) | TU03 | X, Y, Z |
| Pelvis Triaxial | BE03 | X, Y, Z |
| Chest Deflection | WE03 | Y |
| Pelvis Beltforce | GU03BA | |




Axial Accelerometer ( Y - Direction)

Biaxial Accelerometer (X, Y - Direction)

Triaxial Accelerometer (X, Y, Z -Direction)

Displacement Tube

Displacement Transducer

Note: See Table for Additional Information

**Figure 5 : Target Vehicle Instrumentation**

| Accelerometer - | | Coordinates [mm] | | | Results [ $g_{max}$ ] | | |
|---|---|---|---|---|---|---|---|
| No. | Location | X * | Y * | Z * | X | Y | Z |
| 1 | Occupant Compartment, right Front-Doorsill | 2630 | 620 | 300 | | 12.2 | |
| 2 | Occupant Compartment, left Front-Doorsill | 2630 | -620 | 300 | | 83.8 | |
| 3 | Occupant Compartment, left Rear-Doorsill | 1410 | -560 | 290 | | 96.0 | |
| 4 | Rear Deck over Vehicle Centerline | 910 | 0 | 440 | 13.1 | 20.4 | 14.2 |
| 5 | Front Firewall over Vehicle Centerline | 2890 | 0 | 650 | 18.2 | 7.7 | 6.0 |
| 6 | Mid-front Edge of Left Front Door | 2550 | -620 | 457 | | 91.4 | |
| 7 | Middle of left Front Door | 2060 | -620 | 630 | | 105.3 | |
| 8 | Shoulder Contact Front Door | 1775 | -665 | 850 | | 54.9 | |
| 9 | Pelvis Contact Front Door | 1840 | -660 | 480 | | 104.3 | |
| 10 | Left Front Door on Windowsill, slightly forward of surrogate's | 2050 | -650 | 850 | | 58.7 | |
| 11 | Right Front Door on Windowsill, directly across from Nr. 10 | 2050 | 650 | 850 | | 18.0 | |
| 12 | Left B-Pillar near Door Lock | 1480 | -650 | 670 | | 84.5 | |
| 13 | Right B-Pillar across from Nr. 12 | 1480 | 650 | 670 | | 91.6 | |
| 14 | Underneath left Front Seat attached to Seat | 1960 | 325 | 285 | | 63.0 | |
| 15 | Vehicle Center of Gravity | | | | 8.7 | 55.1 | 7.7 |
| 16 | Displacement Transducer Front Door | 2235 | - | 670 | | 0.22m | |
| 17 | Displacement Transducer B-Pillar | 1415 | - | 850 | | 0.25m | |
| 7a | Middle of Left Front-Door-Beam | 2060 | -700 | 457 | | 73.5 | |

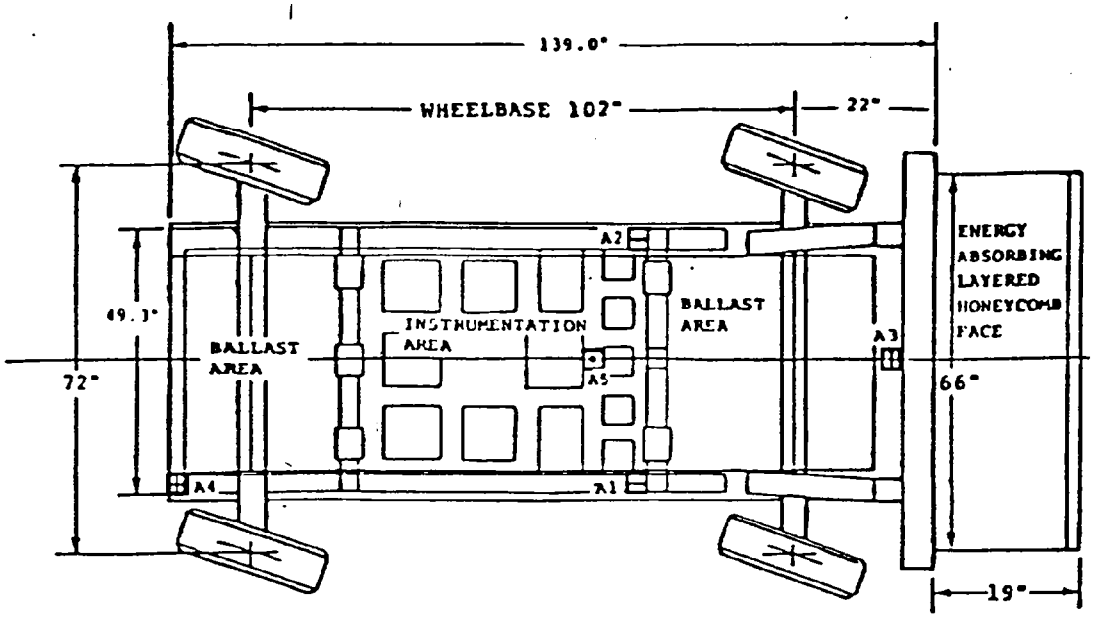
* Reference Points: X - Rear Bumper
Y - Vehicle Centerline
Z - Ground Level

**Table 2: Summary of Target Vehicle Instrumentation**

TEST NO : 7



Form FE 76a




Axial Accelerometer, Longitudinal

Biaxial Accelerometer, Long., Lat.

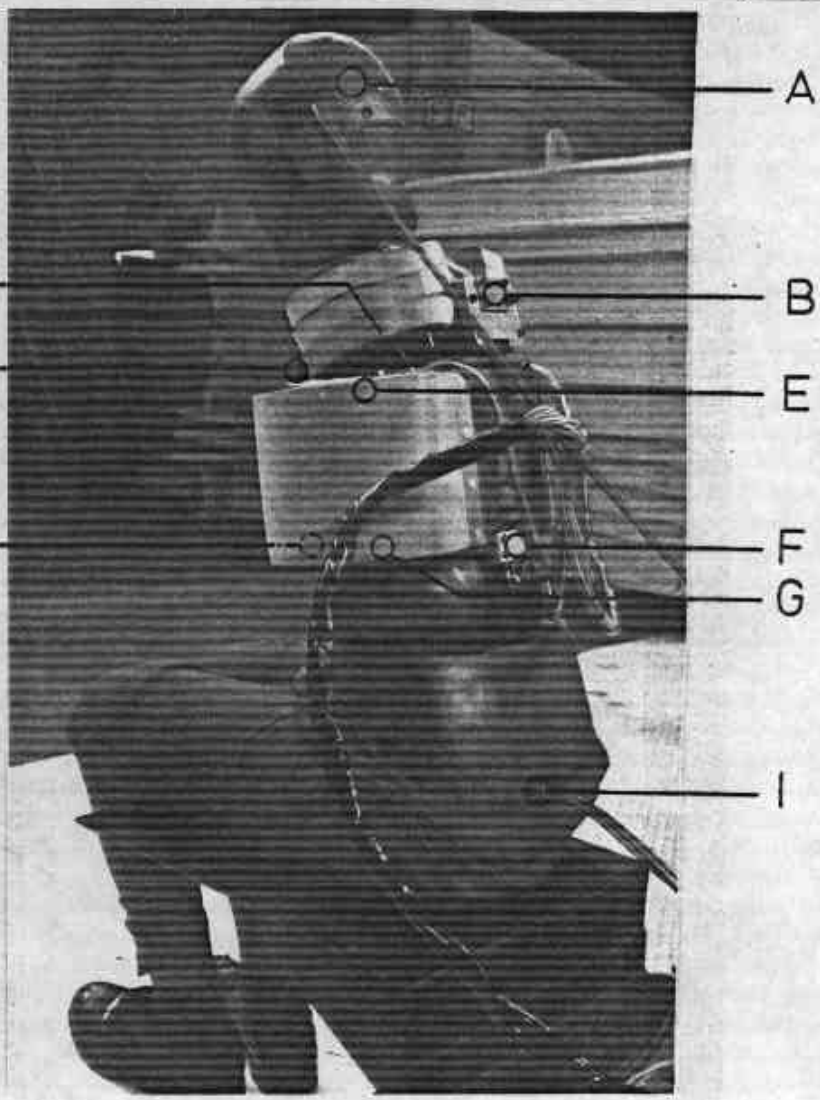
Triaxial Accelerometer, Long., Lat., Vert.

| No. | Accelerometer - Location | Coordinates [mm] | | | Results [G] | | |
|---|---|---|---|---|---|---|---|
| | | X | Y | Z | Long | Lat | Vert |
| A 1 | Right Frame Rail | 2134 | 584 | 508 | 9.2 | | |
| A 2 | Left Frame Rail | 2134 | -584 | 508 | 10.8 | | |
| A 3 | Front Crossmember at Centerline | 3300 | 0 | 610 | 9.3 | | |
| A 4 | Right rear vertikal Frame Rail | 228 | 560 | 407 | 6.0 | 4.0 | |
| A 5 | Side Impactor Center of Gravity | 1727 | 0 | 305 | 9.7 | 3.7 | 6.8 |

Reference Plane: X - Rear of Side Impactor
Y - Side Impactor Centerline
Z - Ground

FIGURE 6 : SIDE IMPACTOR INSTRUMENTATION

TEST NO : 7




A. Head Triaxial
B. Upper Thorax (T 1), Triaxial
C. Upper Sternum, Longitudinal
D. Lower Sternum, Longitudinal
E. Left Upper Rib, Lateral (also on right)
F. Lower Thorax (T 12), Triaxial
G. Left Lower Rib, Lateral (also on right)
H. Displacement Transducer
I. Pelvis, Triaxial

**Figure 7 : Location of 18 Accelerometer for Side Impact Dummy**

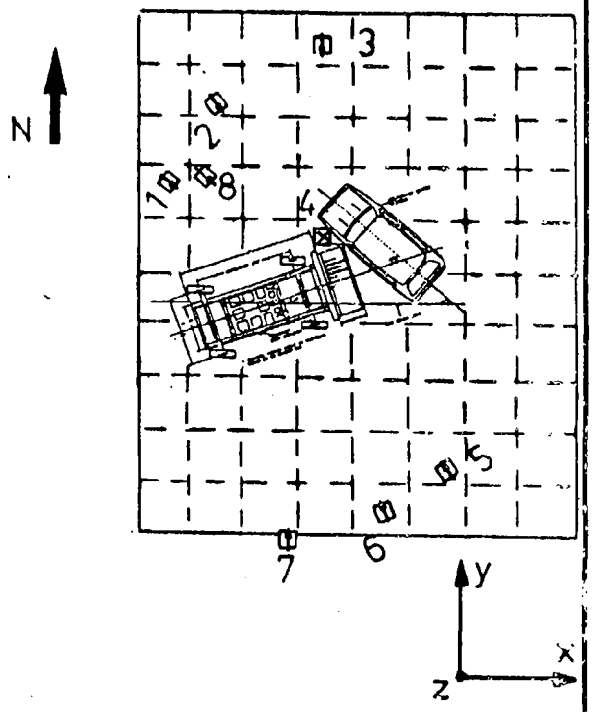
Test No: 7 Test Date: 08.03.1982

Test Type: 60° Side Impact Simulation

Vehicle A : Side Impactor

Vehicle B: VW-Rabbit 705 112

Comments: Side Impactor "Crabbed" 19°




| Camera | Yes |
|---|---|
| Stills | |
| Movie | |
| Slides | |
| Polaroid | |

Camera Symbols

- ⊙ Pit
- ⊤ Ground
- △ Barrier
- ⊠ Overhead
- □ On-Board

Frame Rate

1. 1000 fr/sec
2. 25 fr/sec
3. 400 fr/sec

Timing Light, Speed

1. 100 Hz (10 msec/light)
2. Other

| Loc. No. | Location | Field of View | Lens Size | Frm Rate | Tmng Spd | Real Fr.R. | Impact Dist-X | C. L. Dist-Y | Cam [m] Dist-Z |
|---|---|---|---|---|---|---|---|---|---|
| 1 | North Side -Parallel To Bullet | Overall of Both Vehicles (Locam) | 16 | 3 | 10 | 350 | -7.0 | 4.0 | 1.3 |
| 2 | North Side -Parallel to Target | Close-up of Both Vehicles at Impact (Locam) | 10 | 3 | 10 | 350 | -3.0 | 4.5 | 2.2 |
| 3 | North Side-Perpendicular to Bullet | Overall of Both Vehicles (Locam) | 26 | 3 | 10 | 400 | 8.0 | 4.0 | 1.3 |
| 4 | Overhead | Elevated - Looking Down at Impact Point (Photosonics) | 10 | 3 | 10 | 470 | -0.8 | 2.0 | 7.0 |
| 5 | South Side -Parallel to Target | Close-up of Both Vehicles at Impact (Locam) | 16 | 3 | 10 | 350 | 10.0 | -12.0 | 1.3 |
| 6 | South Side- Perpendicular to Target | Overall of Both Vehicles ( ) | 16 | 2 | - | | 5.0 | -12.0 | 1.0 |
| 7 | South Side | Overall of Both Vehicles (Locam) | 16 | 3 | 10 | 330 | 2.0 | -12.0 | 1.3 |
| 8 | North Side | Overall of Both Vehicles (Mitchel) | 50 | - | - | | -4.5 | 4.0 | 1.4 |

Figure 8 :Camera Location - Ground based

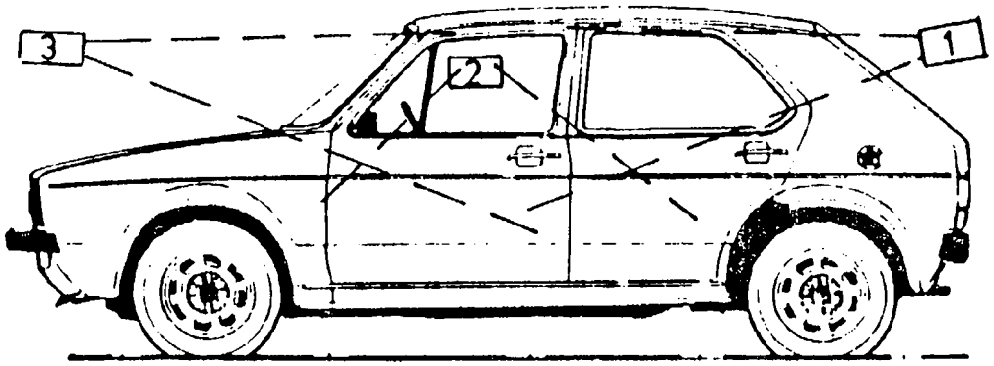
Test No.: 7 Test Date: 03.08.1982

Test Type: 60° Side Impact Simulation

Vehicle A: Side Impactor

Vehicle B: VW-Rabbit

Comments: Side Impactor "Crabbed" 19°




Camera Symbols

- ☐ on-Board
- [1] Ground
- △ Overhead

Frame Rate

1. 1000 fr/sec
2. 400 fr/sec
3. Other _____ fr/sec

Timing Light, Speed

1. 100 Hz (10msec/light)
2. Other _____

| Log. No. | Location | Field of View | Lens Size | Frm Rate | Tmng Spd | Real Fr.R. | Impact Dist-X | C. L. Dist-Y | CAM Dist-Z [ m ] |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Vehicle Rear Hatch-back Door | Front and Rear Occupant Compartment (Photosonics) | 8 | 1 | 1 | 890 | | | |
| 2 | Vehicle Right Front Door | Front Occupant Compartment (Photosonics) | 8 | 1 | 1 | defect | | | |
| 3 | Vehicle Front Right Side | Front and Rear Occupant Compartment (Photosonics) | 8 | 1 | 1 | 980 | | | |
| | | | | | | | | | |

Figure 9: Camera Locations - on Board

3. Test Parameter and Results
   - 3.1 Crash Test Summary
     - 3.1.1 Target Vehicle
     - 3.1.2 Side Impactor (19° Crabbed Barrier)
   - 3.2 Pre-Test Conditions
     - 3.2.1 Driver Pre-Test Position
     - 3.2.2 Rear Passenger Pre-Test Position
   - 3.3 Vehicle Pre- and Post-Test Position
   - 3.4 Post-Test Observations
   - 3.5 Dummy Test Response
     - 3.5.1 Dummy Test Response Summary - Driver
     - 3.5.2 Dummy Test Response Summary - Rear Passenger
     - 3.5.3 AIS and Coefficients
   - 3.6 Target Vehicle Test Response
     - 3.6.1 Pre- and Post-Test Measurements
     - 3.6.2 Exterior and Interior Vehicle Measurement
     - 3.6.3 Exterior and Interior Static Crush (Top View)
     - 3.6.4 Exterior and Interior Static Crush (Front View)
   - 3.7 Crabbed Barrier Test Response
     - 3.7.1 Pre- and Post-Test Frontal Profile
     - 3.7.2 Exterior Static Crush

# Table 3: Crash Test Summary for Target Vehicle

| VEHICLE DATA | TEST 7 |
|---|---|
| Test Vehicle | VW Rabbit 4-Door |
| Overall Length/Width (mm) | 3960 / 1610 |
| Test Weight by Wheel (kp) | LR 286 RR 251<br>LF 339 RF 317 |
| Total Weight (kp) | 1193 |
| Wheelbase (mm) | 2400 |
| Longitudinal C.G. (from Center of Front Axle) (mm) | 1080.30 |
| Impact Angle (deg) * | 60 |
| Impact Speed (mph) | 0 (stationary) |
| Maximum C.G. Resultant Velocity Change (mph msec) | |
| Maximum C.G. Resultant Acceleration (G // msec) | 55.1 // 41.0 |
| Maximum Door Acceleration (G // msec)** | 104.27 // 35.0 |
| Maximum Exterior Static Crush (mm) | |
| • Level 4 (32.0") | 335 |
| • Level 3 (26.0") | 360 |
| • Level 2 (20.0") | 411 |
| • Level 1 (12.0") | 251 |
| Maximum Post-test Intrusion (mm) | 337 |
| OCCUPANTS | |
| Type | SID SID |
| Location | Driver Left Rear Passenger |
| Restraints | VW-RA LAP Pelvis Belt |
| INSTRUMENTATION | |
| Number of Data Channels | 68 |
| Number of cameras (On Board) | 3 |

* With respect to bullet vehicle.
**At mid-rear edge of left front door.

# Table 4 : Crash Test Summary for Side Impactor

| VEHICLE DATA | TEST 7 |
|---|---|
| Test Vehicle | 19 $^{o}$ Crabbed Side Impactor |
| Overall Lenght/Width (mm) | 4000 / 2155 |
| Test Weight by Axle (kp) | LR 398 RR 383<br>LF 390 RF 401 |
| Total Weight (kp) | 1572 |
| Wheelbase (mm) | 2591 |
| Longitudinal C.G. (from Center of Front Axle) (mm) | 1266 |
| Impact Angle (deg) | 60 |
| Impact Speed (mph) | 31.09 |
| Maximum C.G. Resultant Velocity Change (mph msec) | |
| Maximum C.G. Averange Resultant Compartment Acceleration (G msec) | |
| Maximum Static Crush (mm) | |
| • Row C (Top of Stack Level) | 102 |
| • Row B (Mod-Stack Level) | 102 |
| • Row A (Bumper Level) | 80 |
| OCCUPANTS | |
| Type | - |
| Location | - |
| Restraints | - |
| INSTRUMENTATION | |
| Number of Data Channels | 10 |
| Number of Cameras (Ground Based) | 8 |

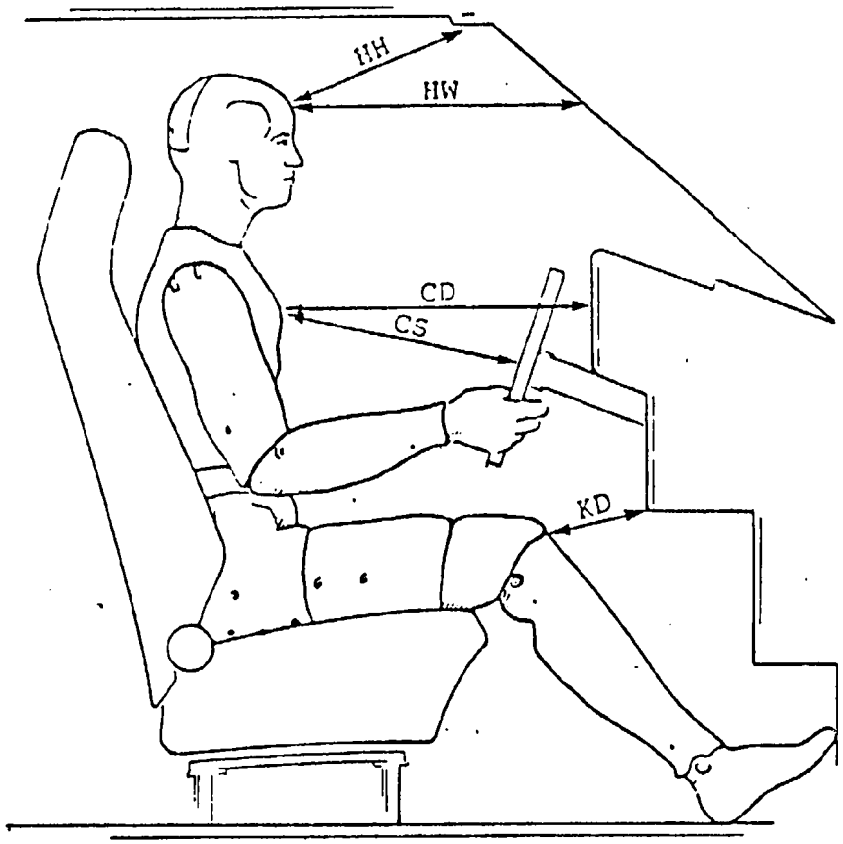
Test No.: 7 Vehicle: 6 LF 339 (kp) RF 317 (kp)
Test Date: 03.08.82 Total Test Wt. 1193 (kp) LR 286 (kp) RR 251 (kp

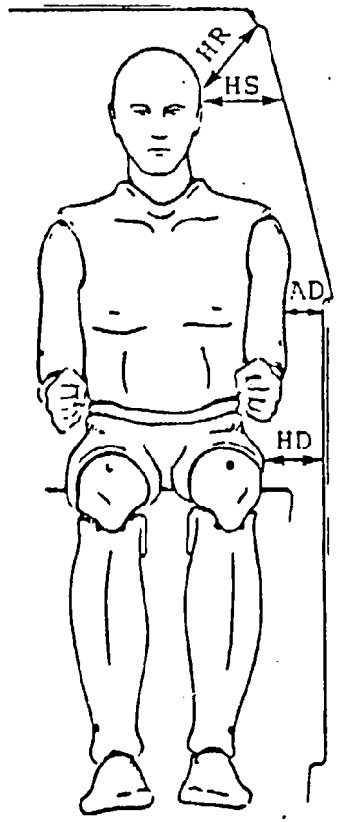
HEAD RESTS - up down other none
FRONT SEAT - forward midpoint rearward latched welded
FRONT SEAT TILT - forward midpoint back other 25° none
REAR SEAT - in place removed
STEERING WHEEL - up midpoint down not adjustable
SUN VISORS - up down removed
GLOVE COMPARTMENT - locked closed none
SEAT BELT - fastened unfastened removed none
SHOULDER HARNESSES - fastened unfastened removed
VENT WINDOW _ closed open removed none stationary
LEFT FRONT WINDOW - up down removed
RIGHT FRONT WINDOW - up down removed
LEFT REAR WINDOW - up down removed
RIGHT REAR WINDOW - up down removed
BACKLIGHT - in place removed
LEFT FRONT DOOR - closed locked removed
RIGHT FRONT DOOR - closed locked removed
LEFT REAR DOOR - closed locked removed
RIGHT REAR DOOR - closed locked removed
ENGINE - in place removed mounts modified
TRANSMISSION - neutral other _____ removed
DRIVESHAFT - in place removed
PARKING BRAKE - off on disconnected
FRONT BUMPER - in place removed none
REAR BUMPER - in place removed none
HOOD - in place removed
WINDSHIELD WIPERS - in place removed
FUEL TANK - 95 Percent full empty other _____
RADIATOR - full empty none removed
BATTERY - in place removed drained
SPARE TIRE - in place removed none
JACK - in place removed none
WHEEL COVERS - in place removed none
BALLAST - none _____ kg
DUMMY LOCATION - LF RF LR RR none
DUMMY POSITIONING CRITERIA - FMVSS 208 side impact criteria other

Table 5 : Pre-Test Conditions

Form FE 76.6

TEST NO : 7




| | | |
|---|---|---|
| HH= | 385 | 15.1 |
| HW= | 530 | 20.9 |
| CD= | 515 | 20.3 |
| CS= | 310 | 12.2 |
| KD= | 85 | 3.3 |

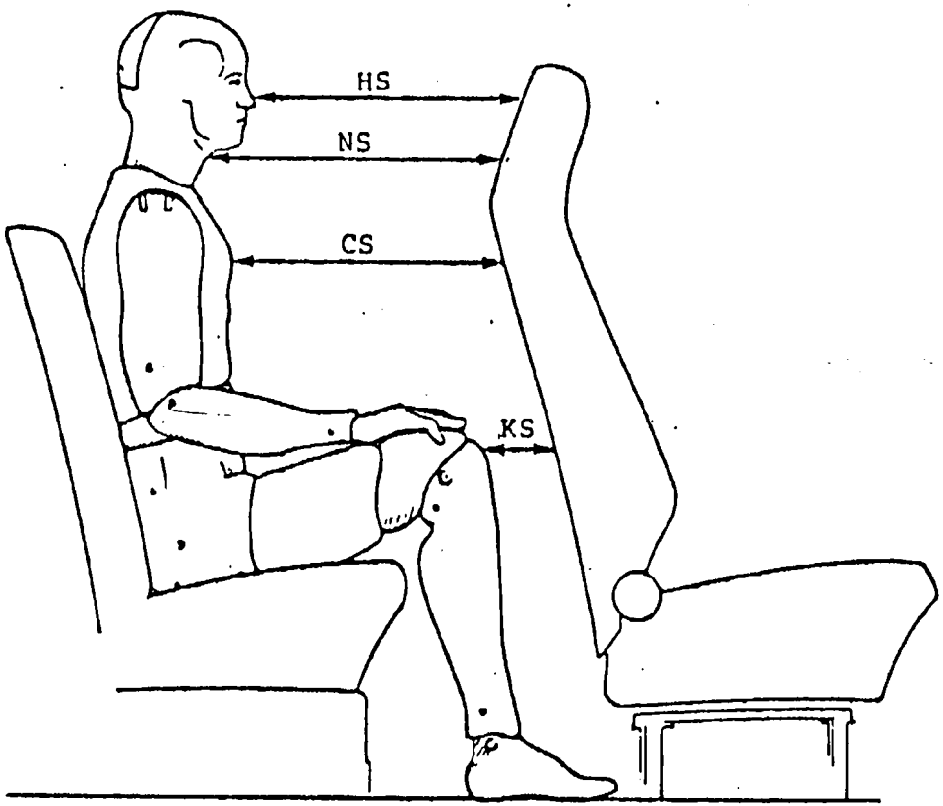
(ALL DIMENSION IN MM)

| | | |
|---|---|---|
| HR= | 150 | 5.9 |
| HS= | 170 | 6.7 |
| AD= | 10 | 0.4 |
| HD= | 70 | 2.7 |

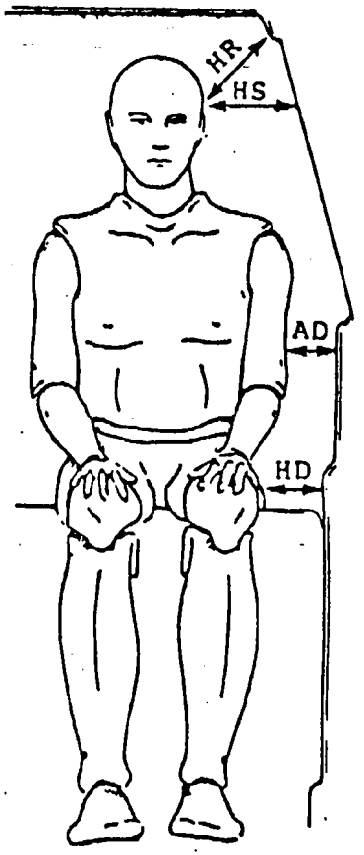
**Table 6 : Driver Pre-Test Position**

Form FE 76a

TEST NO : 7



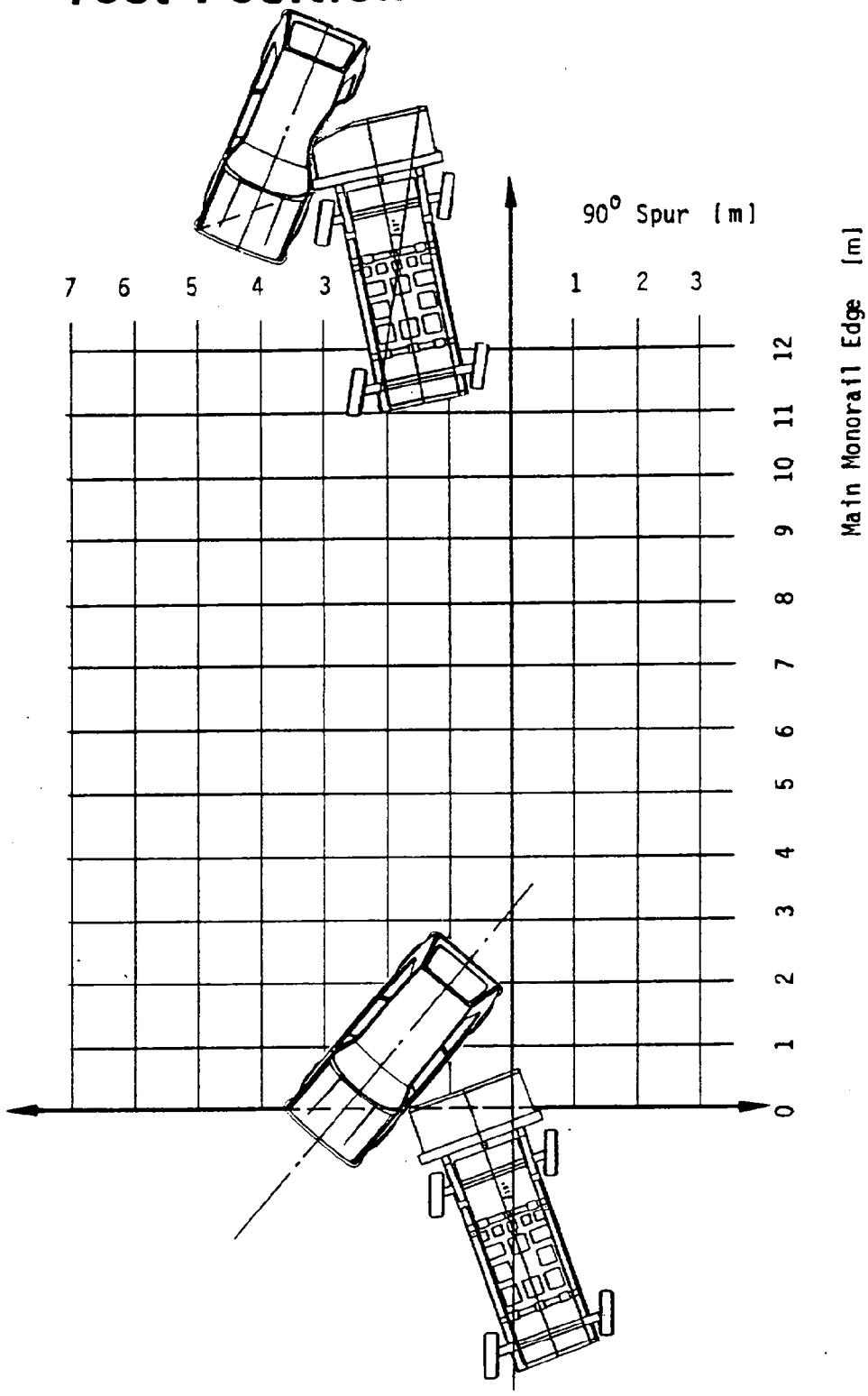

| | | |
|---|---|---|
| HS | 480 | 18.9 |
| NS | 500 | 19.6 |
| CS | 405 | 15.9 |
| KS | 85 | 3.34 |




| | | |
|---|---|---|
| HR | 165 | 6.4 |
| HS | 175 | 6.9 |
| AD | 35 | 1.4 |
| HD | 95 | 3.7 |

**Table 7 : Rear Passenger Pre-Test Position**

# Table 8 : Vehicle Pre- and Post-Test Position




TEST NO : 7

# Table 9: Summary of Post-Test Observations

VEHICLE: VW Rabbit 6

Test No. (Moving Test Device) 7

| Dummy Contact Points: | Left Front | Left Rear |
|---|---|---|
| Head | no Contact | Contact at C-Pillar and Roof-Line |
| Chest | Upper Door Panel and Lower Window-Sill | Upper Door Panel and Lower Window-Sill |
| Knees/Hip | Lower Front Door Panel | Lower Front Door Panel |

Glazing: Left Front- and Rear-Side-Window shattered. Windshield no damage.

Doors: Left Front- and Rear Door damaged, would not open without Tools.

Seat Belt Anchorages : Left Seat Frame damaged, but Seat Anchorages remained.

Restraints: Driver (RA) and Left Rear (Lap - Belt ) in use.

Fuel Leakage: none

General Observations: Impact Point 650 mm from Front Axle. Side Impactor Bumper impacted under the Door Beams. B-Pillar damaged and bended on the Level of the Window-Sill. Left Front-Door separated from lower Sill. A-Pillar turned.

Driver Dummy - no damage

Left Rear Dummy - no damage

Left Front- and Left Rear-Door : Modified Padding in the Area of Dummy-Impact.

TEST NO. 7 TEST DATE 03.08.1982

TEST CONFIGURATION:

Target Vehicle VW - Rabbit 4- Door Speed 0 [mph]

Bullet Vehicle 19° Crabbed Side Impactor Speed 40.03 [mph]

Impact Location behind Front Axle 650 [mm] Angle 60 [deg]

PASSENGER: D R I V E R

HEAD RESPONSE:

Peak $a_R$ 66.3 (g) ⩾ 3 ms = 58 (g) Impacted Objekt none

HIC 384 Time T 1 57 [ms] T2 83 [ms]

CHEST RESPONSE:

| Location | [g] | ⩾ 3ms [g] | SI | $\Delta v_y$ [mph] | Imp.Time [ms] | Time a-max [ms] |
|---|---|---|---|---|---|---|
| Upper Sternum (X) | 36.7 | 27 | -- | -- | 37.5 | 56 |
| Lower Sternum (X) | 41.6 | 35 | -- | -- | 41.0 | 57 |
| LUR (Y) | 67.3 | 63 | -- | 25.1 | 36.0 | 44 |
| LLR (Y) | 68.3 | 61.5 | -- | 23.5 | 33.0 | 43.5 |
| RUR (Y) | 76.9 | 73.0 | -- | 19.4 | 39.0 | 50.0 |
| RLR (Y) | 92.3 | 84.5 | -- | 23.5 | 37.5 | 50.0 |

CHEST DEFLECTION: Damper - DY 48.5 [mm]

VERTEBRAL COLUMN RESPONSE:

| Location | Pk ay[g] | Pk $a_R$[g] | ⩾3 ms[g] | SI | $\Delta v_y$[mph] | Imp.Time [ms] | Time a-max [ms] |
|---|---|---|---|---|---|---|---|
| Upper Thorax (T1) | 72.7 | 73.1 | 69.5 | 486 | 23.2 | 44 | 53.5 |
| Lower Thorax (T12) | 71.8 | 73.9 | 64.0 | 422 | 23.9 | 30 | 46.0 |

PELVIS RESPONSE:

Pk $a_R$[g] 111.4 SI 799 ⩾3 ms [g] 71.4 Impact Time [ms] 27.5

**Table 10: Side Impact Dummy Test Response Summary**

TEST NO. 7 TEST DATE 08.03.1982

TEST CONFIGURATION:

Target Vehicle VW-Rabbit 4-Door Speed 0 [mph]

Bullet Vehicle 19° Crabbed Side Impactor Speed 40.03 [mph]

Impact Location behind Front Axle 650 [mm] Angle 60 [deg]

PASSENGER: L E F T R E A R

HEAD RESPONSE:

Peak $a_R$ 112 (g) ≥ 3 ms = 86.2 (g) Impacted Objekt C-Pillar and Roof-Line

HIC 477.7 Time T 1 91 [ms] T2 107 [ms]

CHEST RESPONSE:

| Location | [g] | ≥ 3ms [g] | SI | $\Delta v_y$ [mph] | Imp.Time [ms] | Time a-max [ms] |
|---|---|---|---|---|---|---|
| Upper Sternum (X) | 25.5 | 24.0 | -- | -- | 60 | 99.0 |
| Lower Sternum (X) | 29.2 | 23.0 | -- | -- | 49 | 92.0 |
| LUR (Y) | 30.1 | 26.5 | -- | 20.6 | 60 | 80.5 |
| LLR (Y) | 32.2 | 26.5 | -- | 17.7 | 60 | 85.0 |
| RUR (Y) | 27.5 | 25.5 | -- | 16.6 | 65 | 78.5 |
| RLR (Y) | 31.9 | 29.0 | -- | 16.8 | 60 | 89.5 |

CHEST DEFLECTION: Damper - DY 39.5 [mm]

VERTEBRAL COLUMN RESPONSE:

| Location | Pk ay[g] | Pk $a_R$[g] | ≥ 3 ms[g] | SI | $\Delta v_y$[mph] | Imp.Time [ms] | Time a-max [ms] |
|---|---|---|---|---|---|---|---|
| Upper Thorax (T1) | 36.5 | 36.7 | 35.5 | 159 | | 60 | 97.5 |
| Lower Thorax (T12) | 43.5 | 46.3 | 40.0 | 161 | | 62 | 86.0 |

PELVIS RESPONSE:

Pk $a_R$[g] 65.4 SI 313 ≥3 ms [g] 52.0 Impact Time [ms] 38

**Table 11: Side Impact Dummy Test Response Summary**

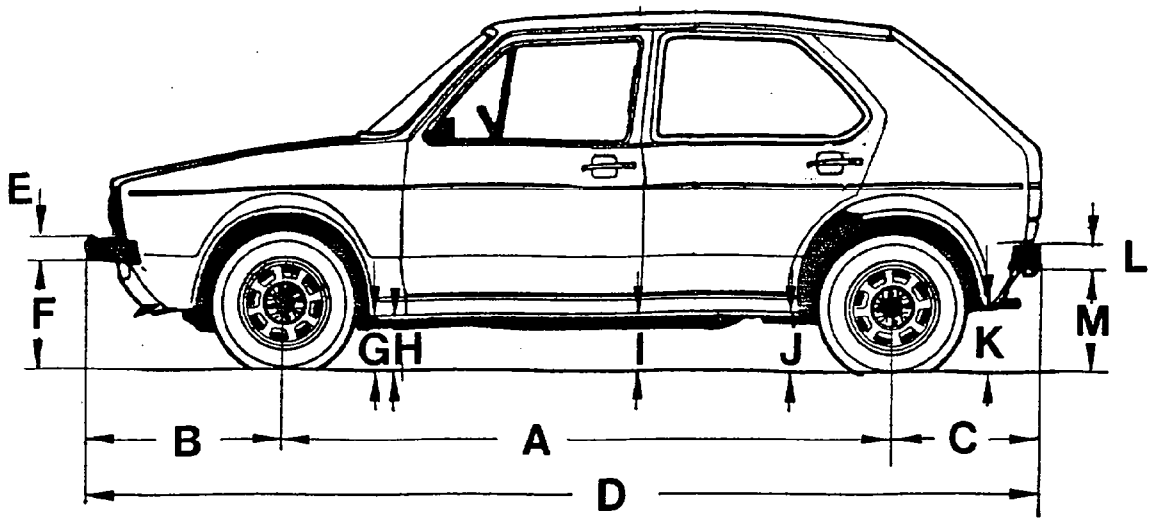
TEST NO. 7 TEST DATE 03.08.1982

COMPUTED COEFFICIENTS:

| Location of Accelerometer | AIS B-Param. | AIS Av.Pow. | PAP TB / TE (ms) | B | Q | $V_{1050}$ | $V_{1090}$ | RVS |
|---|---|---|---|---|---|---|---|---|
| Left Upper Rib LUR | 3.30 | 3.30 | 1300 40.0/ 62.5 | 6.6963 | 885.73 | 7.50 | 20.62 | 2.7500 |
| Left Lower Rib LLR | 3.45 | 3.55 | 1753 40.6/ 56.9 | 6.7991 | 971.97 | 8.12 | 17.50 | 2.1538 |
| Upper Thorax T 1 Y | 3.62 | 3.79 | 2418 46.3/ 64.4 | 6.9138 | 983.61 | 5.63 | 13.75 | 2.4444 |
| Lower Thorax T 12 Y | 3.51 | 3.67 | 1916 39.4/ 57.5 | 6.8378 | 1078.7 | 8.75 | 18.75 | 2.1429 |

TABLE 12 : AIS AND COEFFICIENTS

TEST NO : 7




| | PRE - TEST | POST - TEST | Δ CHANGE |
|---|---|---|---|
| A | 2400 | 2390 | - 10 |
| B | 815 | 820 | 5 |
| C | 710 | 685 | - 25 |
| D | 3960 | 3880 | - 80 |
| E | 125 | 125 | 0 |
| F | 380 | 400 | 20 |
| G | 180 | 182 | 2 |
| H | 178 | 180 | 2 |
| I | 166 | 185 | 19 |
| J | 152 | 185 | 33 |
| K | 185 | 230 | 45 |
| L | 125 | 125 | 0 |
| M | 302 | 340 | 38 |
| | | | |

**Table 13: Pre-and Post-Test Measurements**

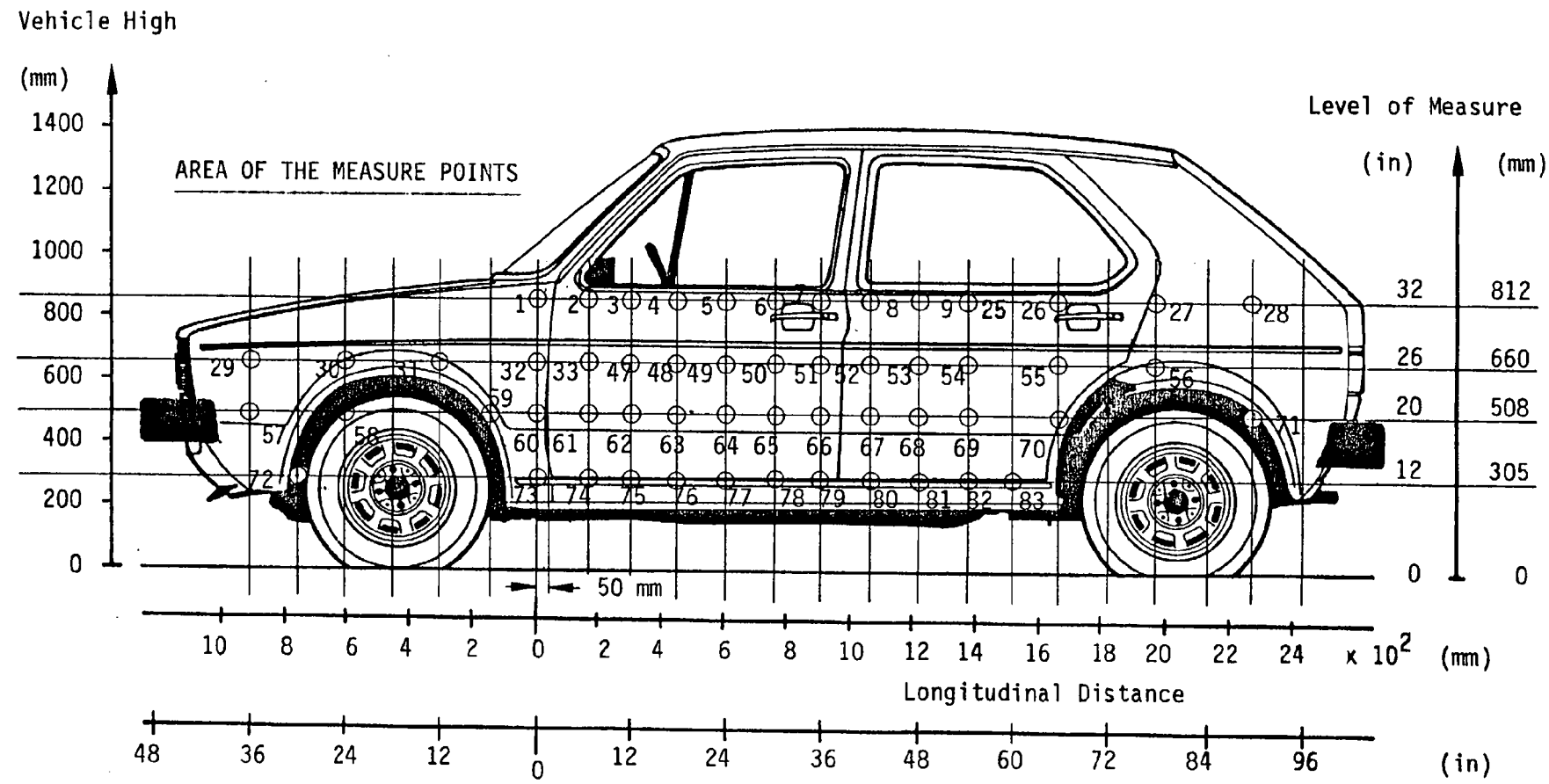


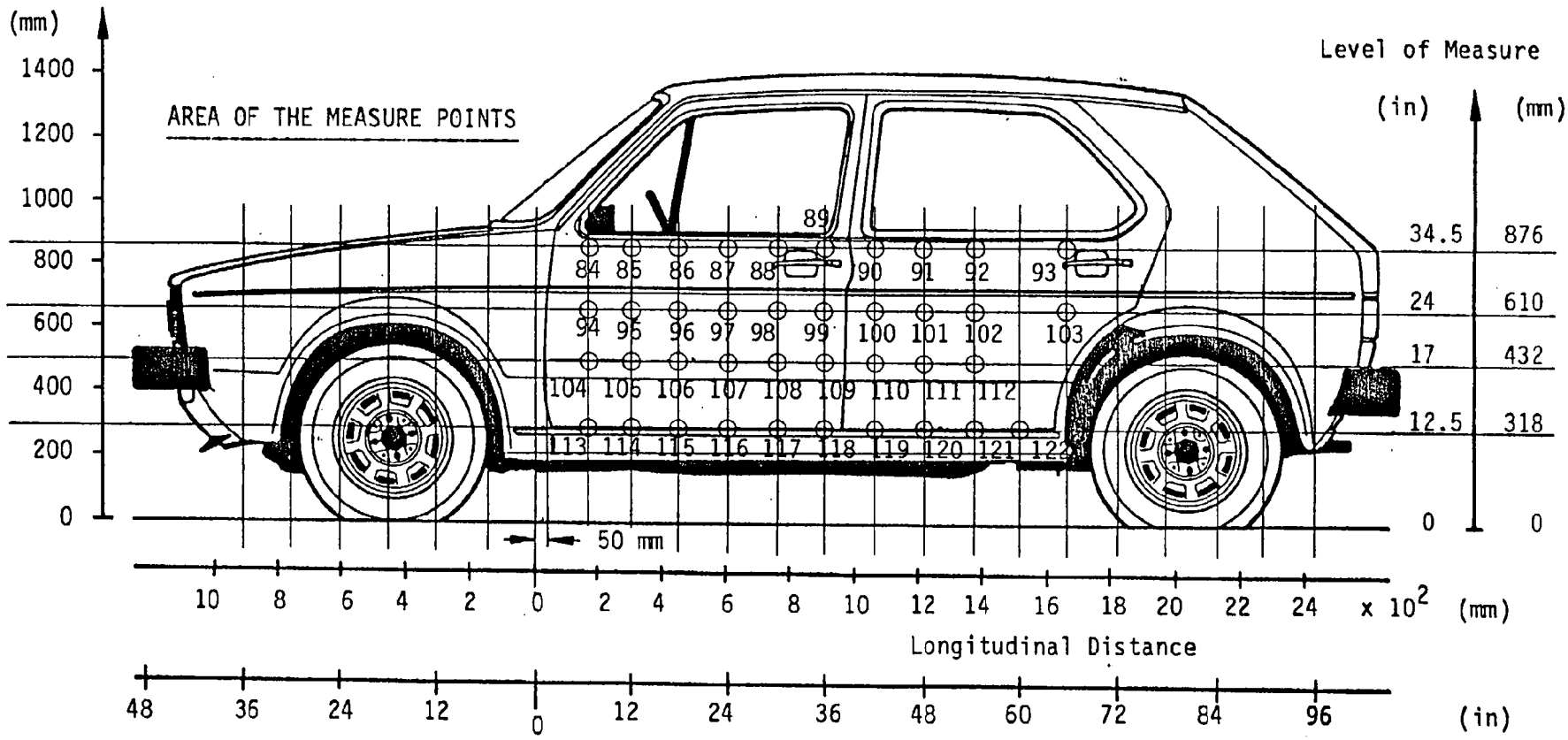

**Figure 10: Vehicle Measurement Side (Exterior)**

# Table 14 : Exterior Static Crush for VW Rabbit

TEST No: 7

| | | (Front) | | | | | Zero Distance Located at Door [mm] | | | | | | | | | | (Rear) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Height [mm] * | 762 | 610 | 457 | 305 | 152 | 0 | 152 | 305 | 457 | 610 | 762 | 914 | 1067 | 1220 | 1372 | 1524 | 1676 | 1829 | 1981 | 2286 |
| Window-Sill | 812 | / | / | / | / | / | 2 | 91 | 183 | 253 | 313 | 335 | 299 | 277 | 208 | 118 | / | 12 | / | +12 | +27 |
| Bullet Vehicle Hood | 660 | +27 | / | +11 | 2 | / | 12 | 131 | 245 | 302 | 360 | 357 | 306 | 288 | 222 | 152 | / | 28 | / | +7 | / |
| Mid-Door | 508 | +28 | / | +16 | / | 18 | 25 | 153 | 284 | 360 | 393 | 411 | 353 | 300 | 247 | 183 | / | 81 | / | / | +25 |
| Rocker-Sill | 305 | / | +21 | / | / | / | 25 | 106 | 133 | 160 | 187 | 217 | 237 | 251 | 159 | 99 | 47 | / | / | / | / |

* All heights measured above ground level.




TEST NO : 7

VEHICLE NO : 705 112

**Figure 11: Vehicle Measurement Side (Interior)**

# Table 15: Interior Static Intrusion for VW-Rabbit

TEST No: 7

| Location | Height [mm] * | Zero Distance Starting at Door [ mm ] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 152 | 305 | 457 | 610 | 762 | 914 | 1067 | 1220 | 1372 | 1524 | 1676 |
| Windowsill Level | 876 | / | 70 | 144 | 202 | 264 | 283 | 277 | 284 | 209 | 132 | / | 0 |
| Mid-door Level | 610 | / | 105 | 197 | 255 | 323 | 337 | 327 | 282 | 186 | 124 | / | 20 |
| Bullet Vehicle Bumper Level | 432 | / | 137 | 213 | 266 | 305 | 334 | 324 | 262 | 175 | / | / | / |
| Doorsill Level | 305 | / | 72 | 111 | 134 | 164 | 200 | 215 | 177 | 67 | / | / | / |

* Heights measured above ground level.

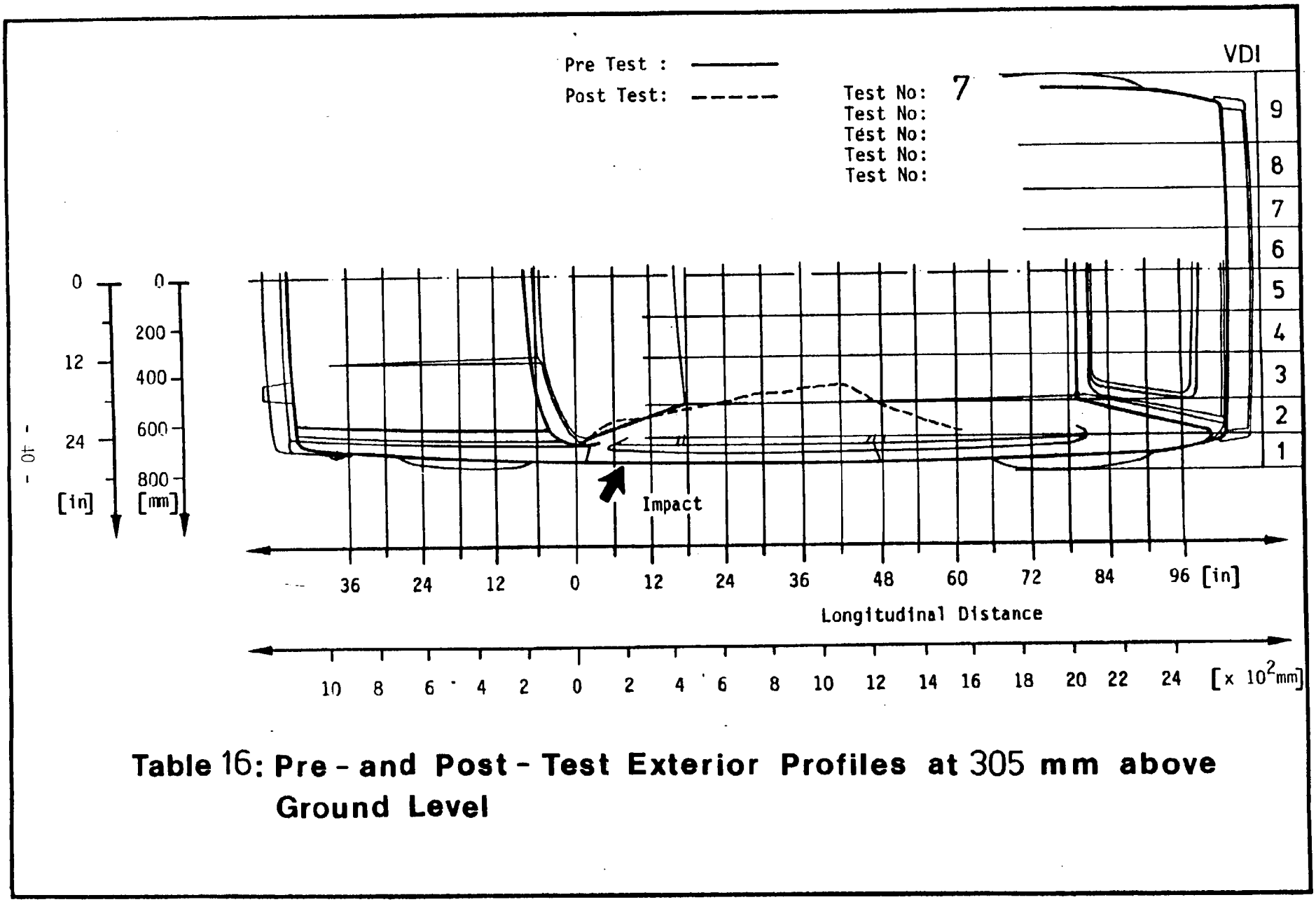



**Table 16: Pre - and Post - Test Exterior Profiles at 305 mm above Ground Level**

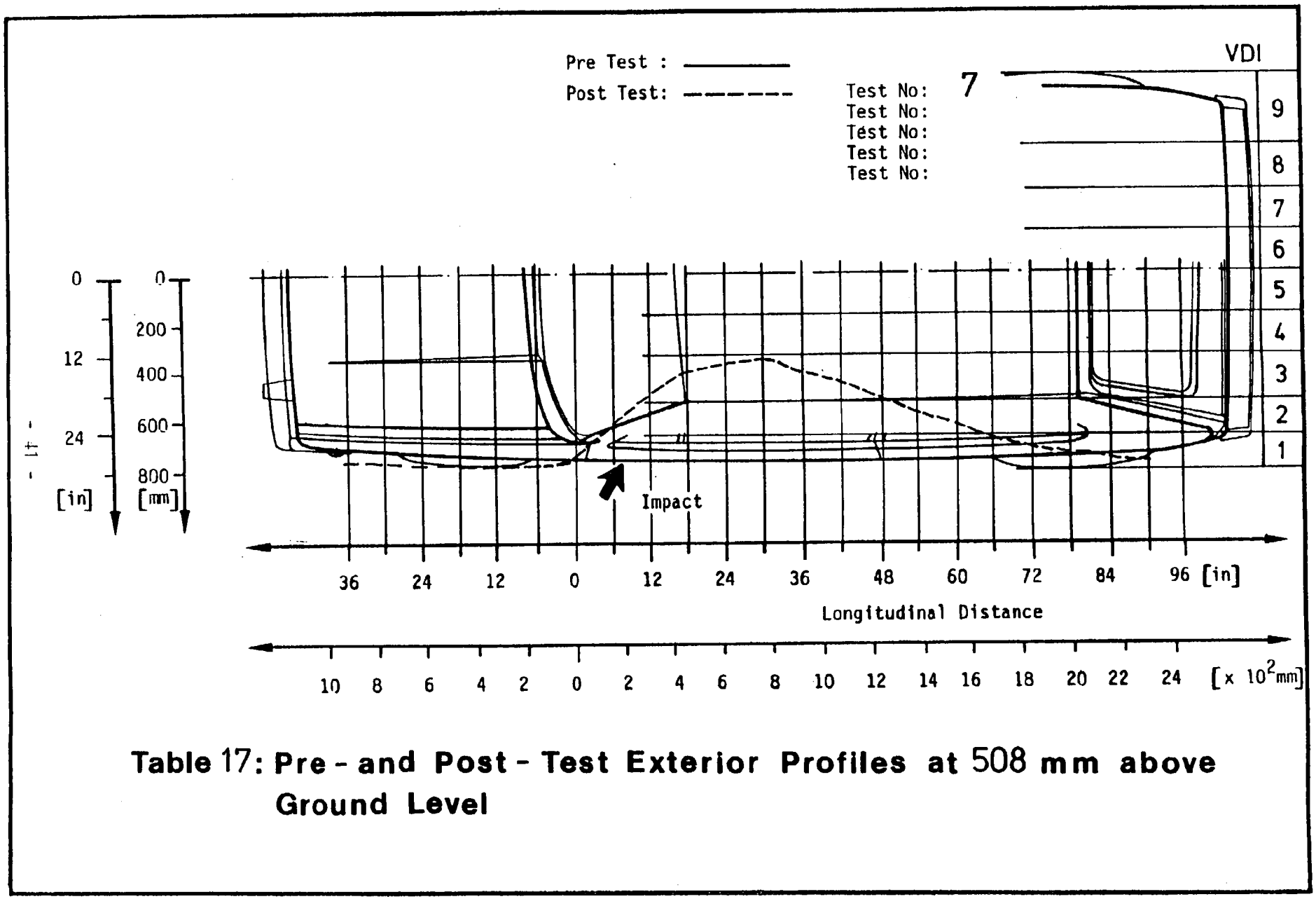



**Table 17: Pre - and Post - Test Exterior Profiles at 508 mm above Ground Level**

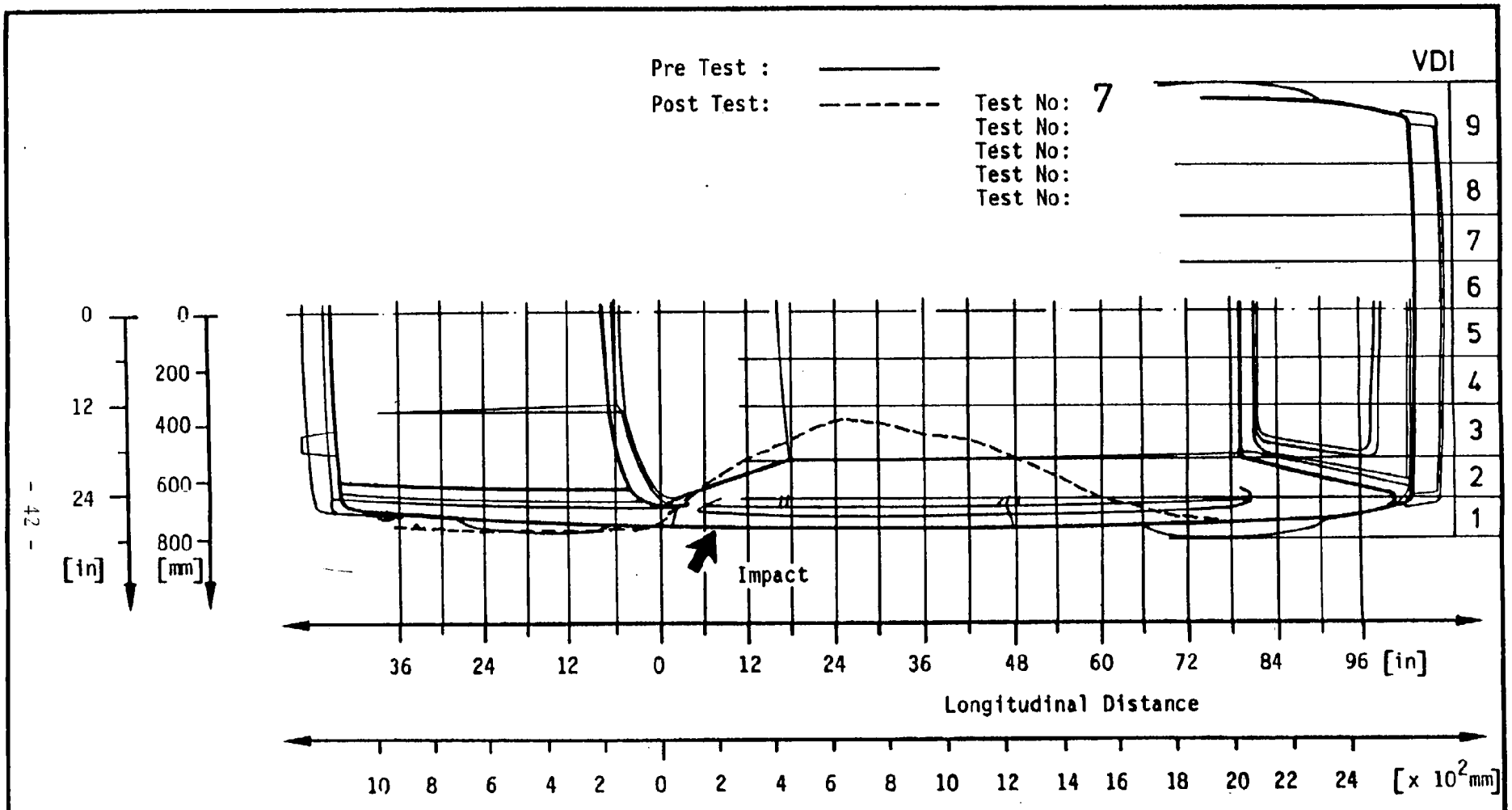



**Table 18: Pre - and Post - Test Exterior Profiles at 660 mm above Ground Level**

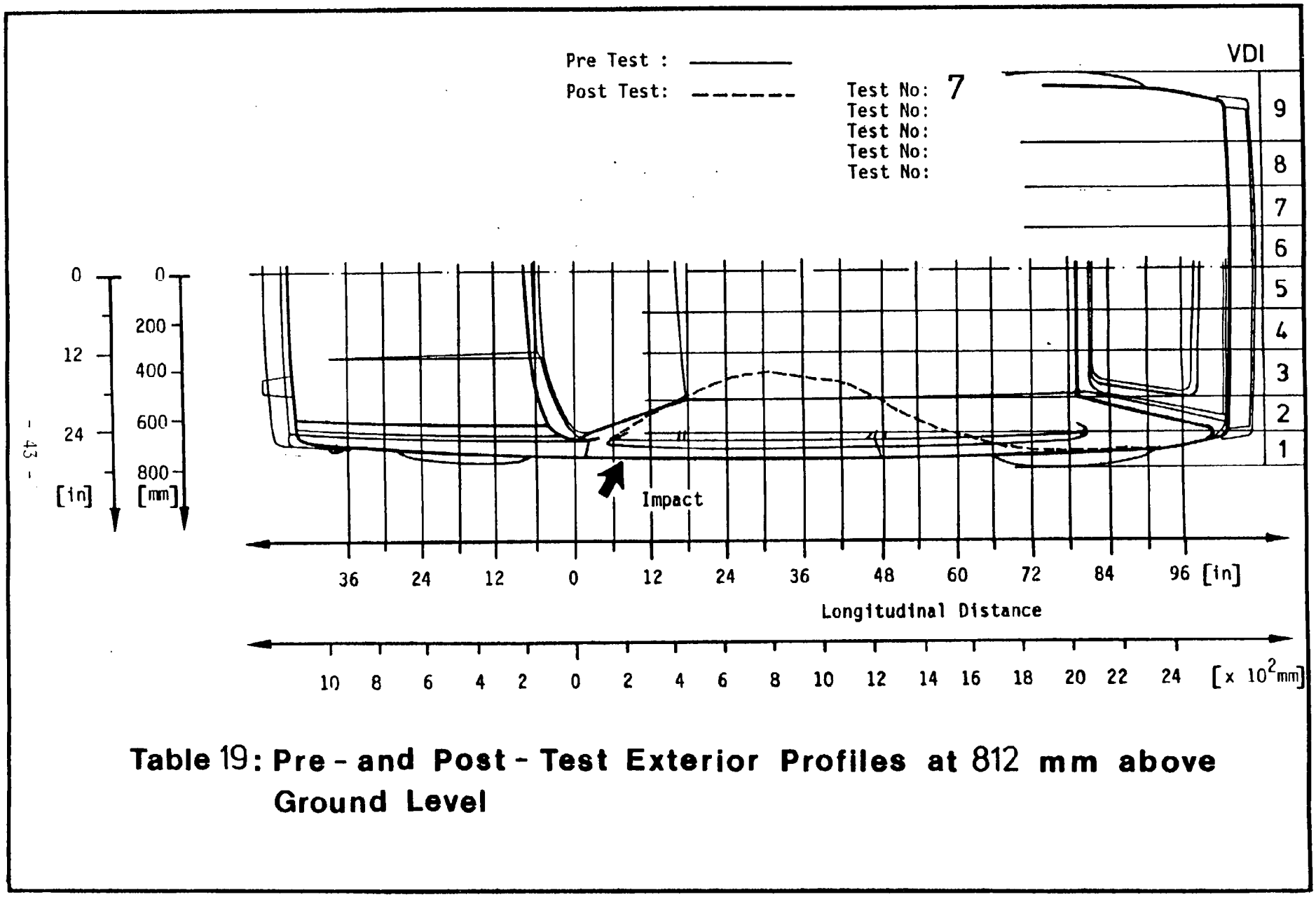



**Table 19: Pre - and Post - Test Exterior Profiles at 812 mm above Ground Level**

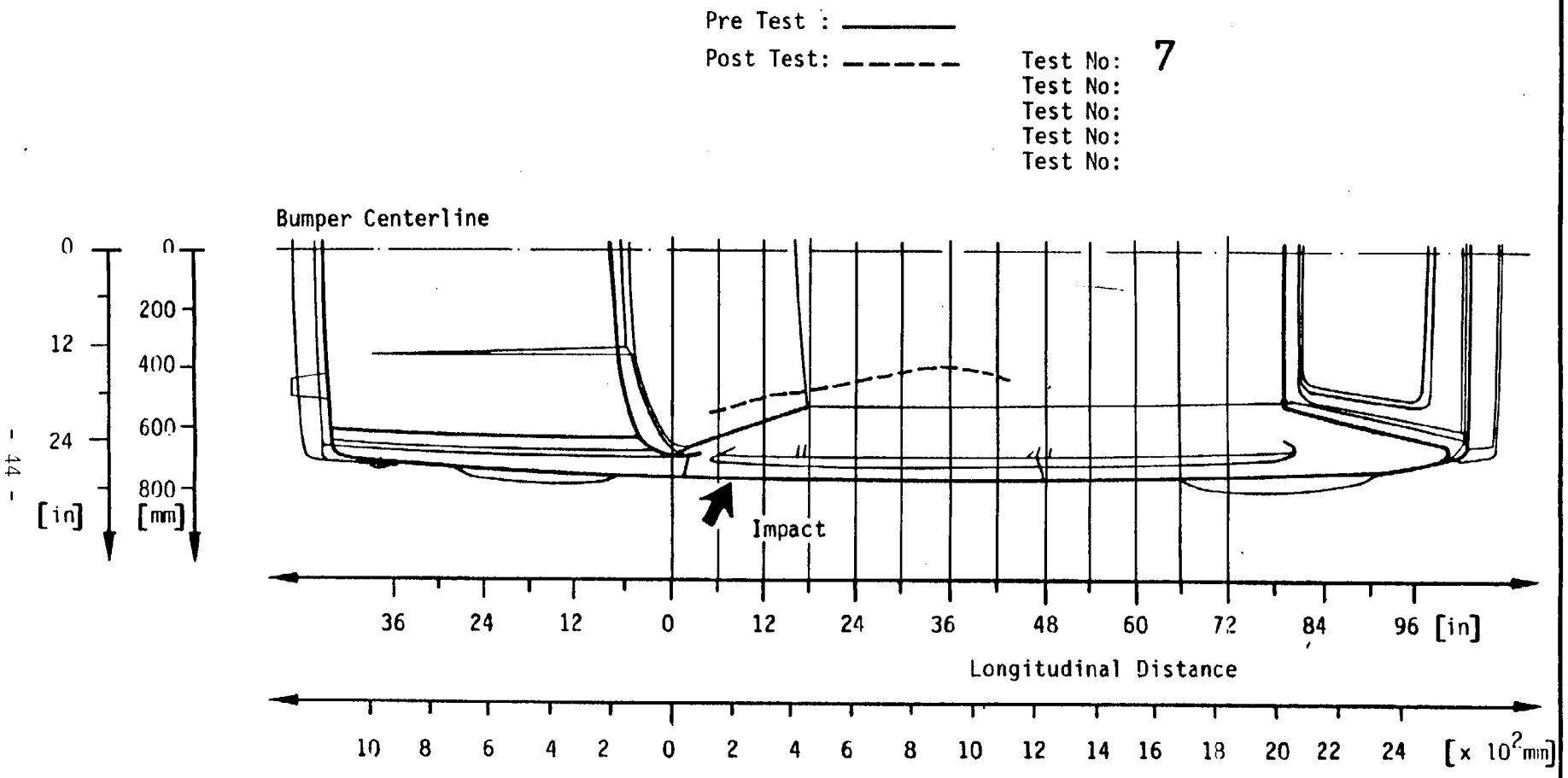



**Table 20: Pre - and Post - Test Interior Profiles at 318 mm above Ground Level**

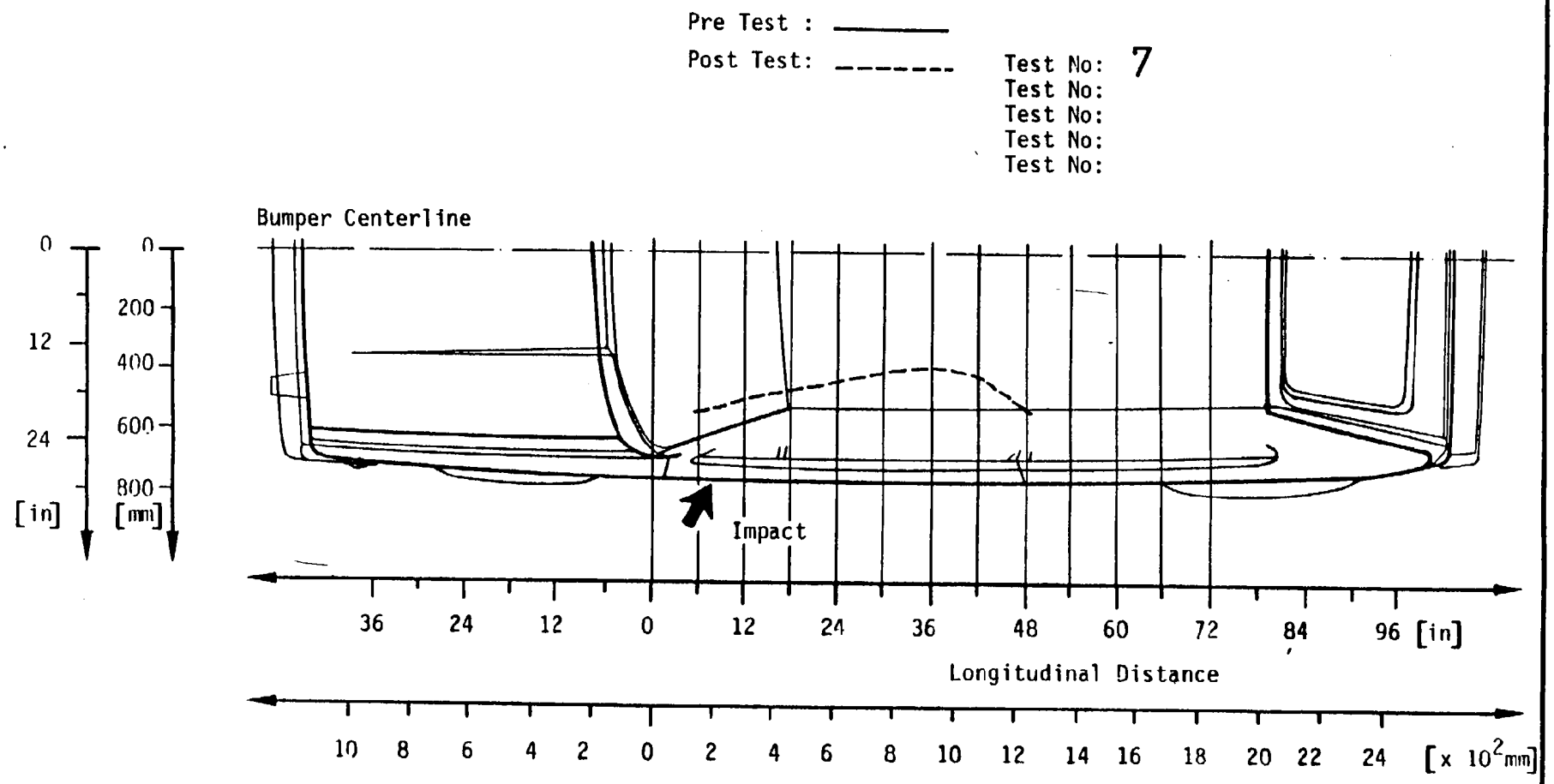



**Table 21: Pre - and Post - Test Interior Profiles at 432 mm above Ground Level**

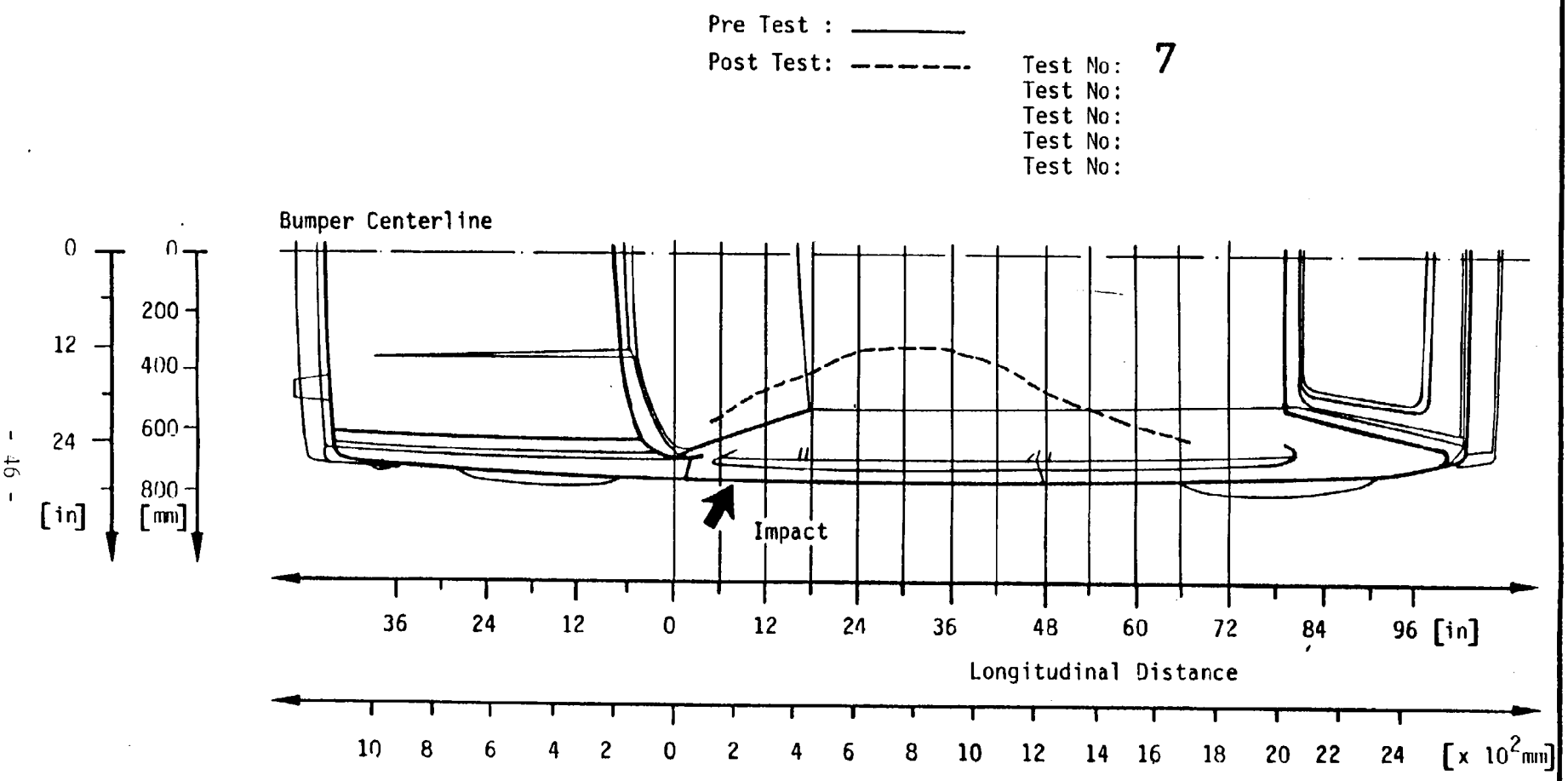



**Table 22 Pre - and Post - Test Interior Profiles at 610 mm above Ground Level**

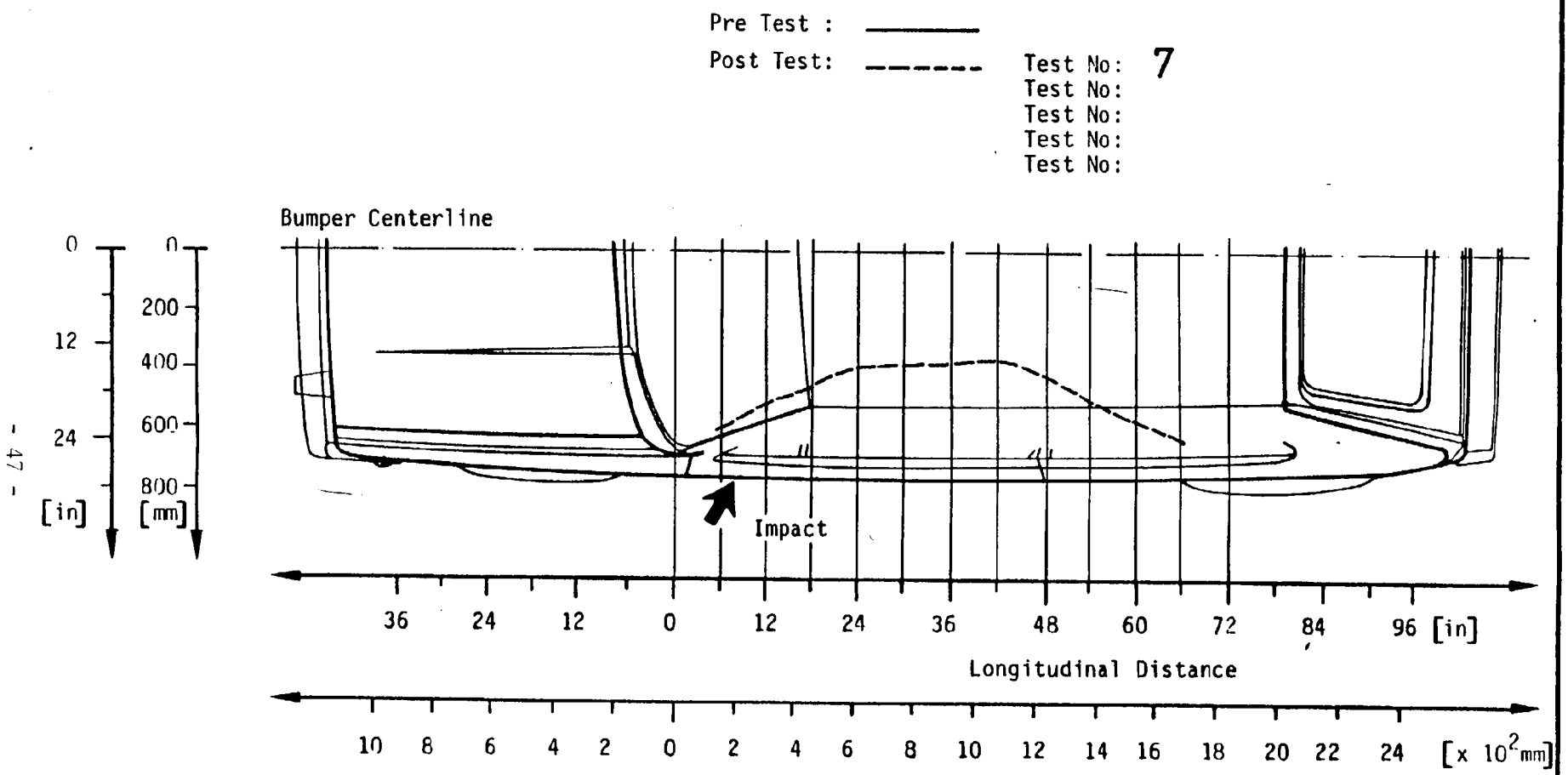
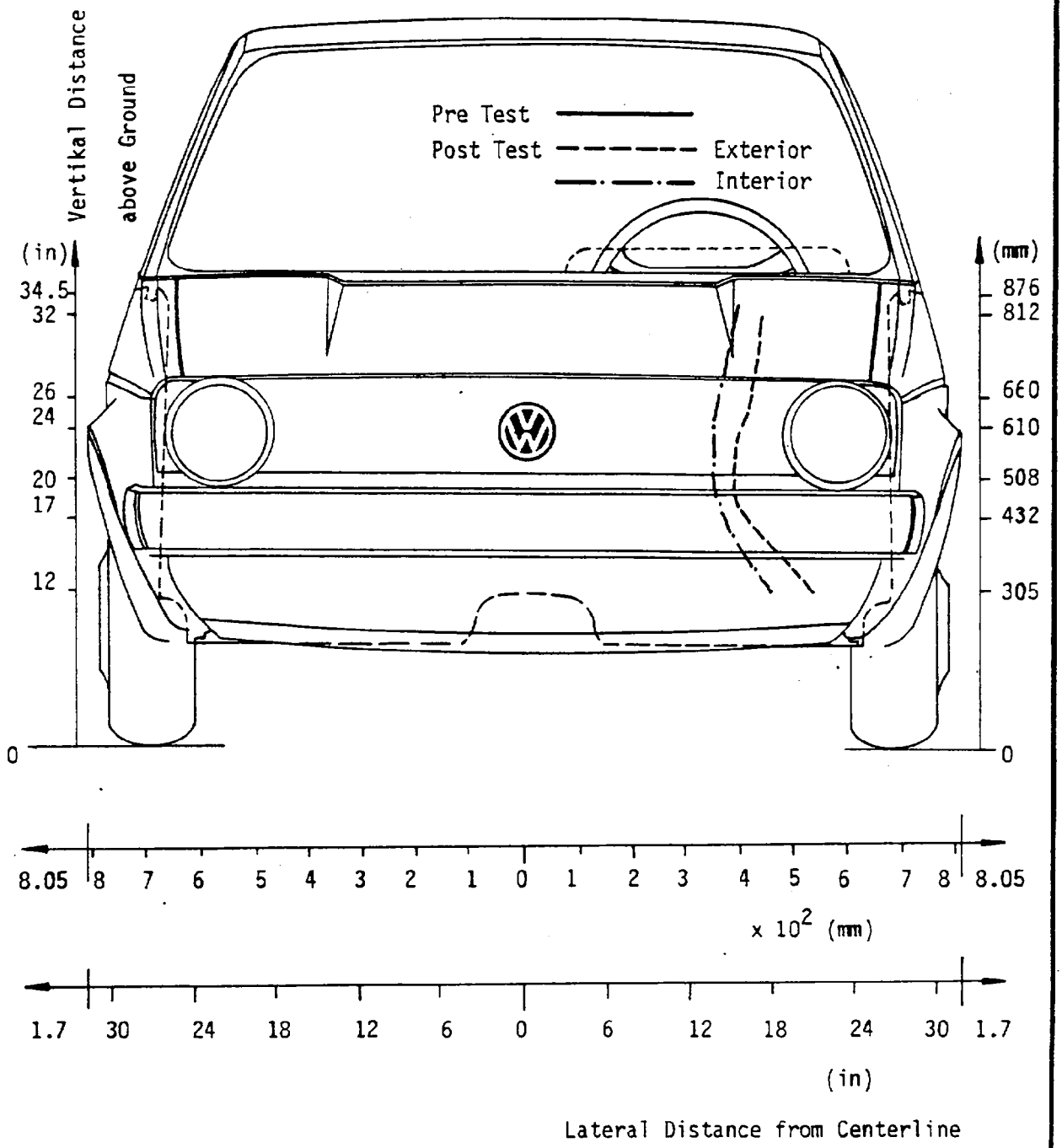
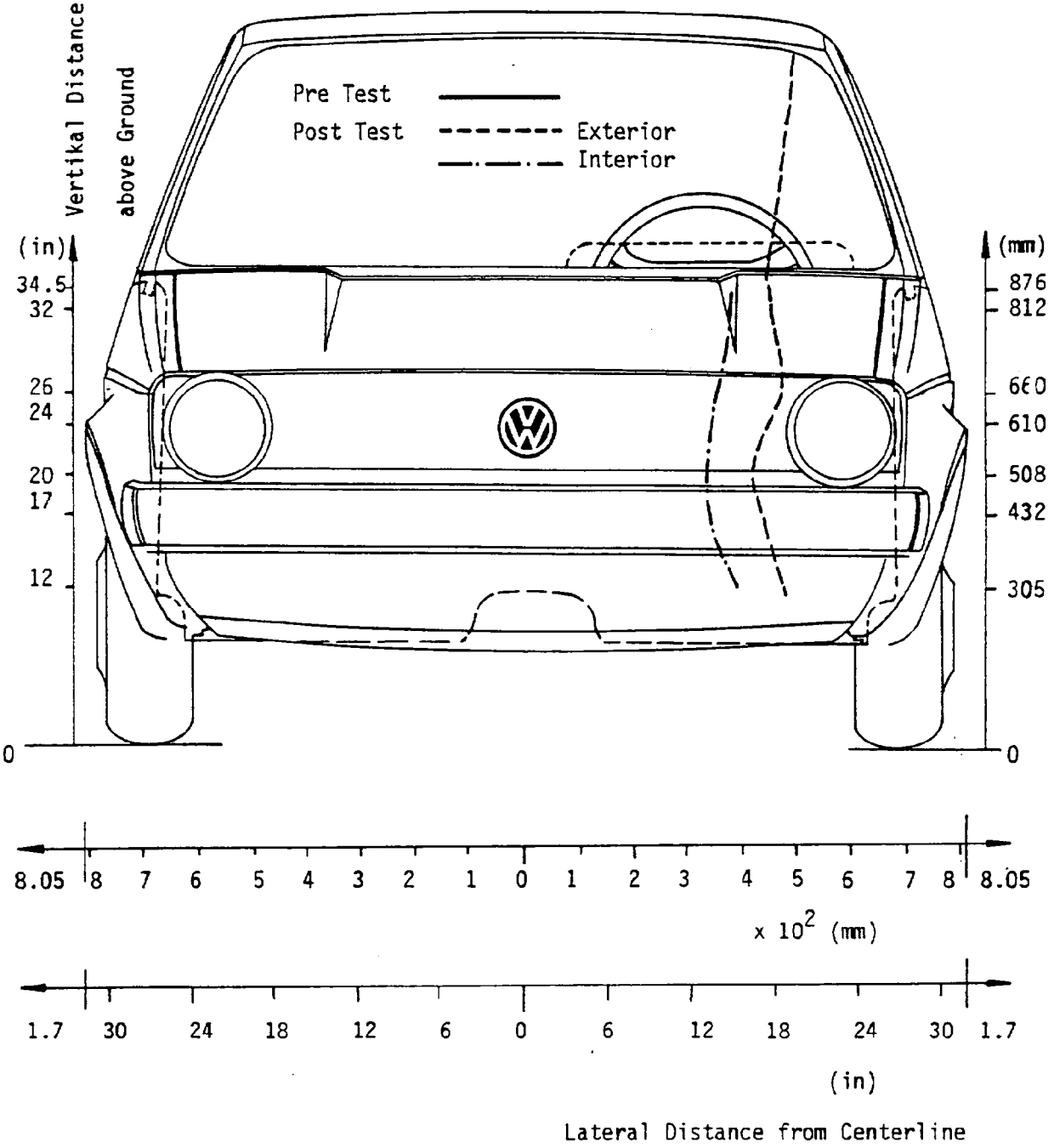



**Table 23: Pre - and Post - Test Interior Profiles at 876 mm above Ground Level**




TEST NO : 7

FIGURE 12 : EXTERIOR AND INTERIOR STATIC PROFILES AT THE LONGITUDINAL DISTANCE 610 MM FROM DOOR




TEST NO : 7

FIGURE 13 : EXTERIOR AND INTERIOR STATIC PROFILES AT THE LONGITUDINAL DISTANCE 914 MM FROM DOOR

# Table 24 : Exterior Static Crush for Side Impactor

Test No: 7

| | | Distance right of Center [ mm] | | | | | | | | | Distance left of Center [ mm] ** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Height at $C_L$ * | 835 | 700 | 600 | 500 | 400 | 300 | 200 | 100 | 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 835 |
| Top of Stack Level | 813 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | -1 | 0 | 3 | 5 | 5 | 8 | 25 | 102 |
| Mid - Stack Level | 554 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 5 | 6 | 13 | 18 | 30 | 40 | 41 | 52 | 102 |
| Bumper Level | 432 | -5 | -2 | 0 | 2 | 4 | 5 | 8 | 10 | 11 | 15 | 22 | 38 | 50 | 51 | 53 | 62 | 80 |

* Heights measured above ground level.

** Impact side.

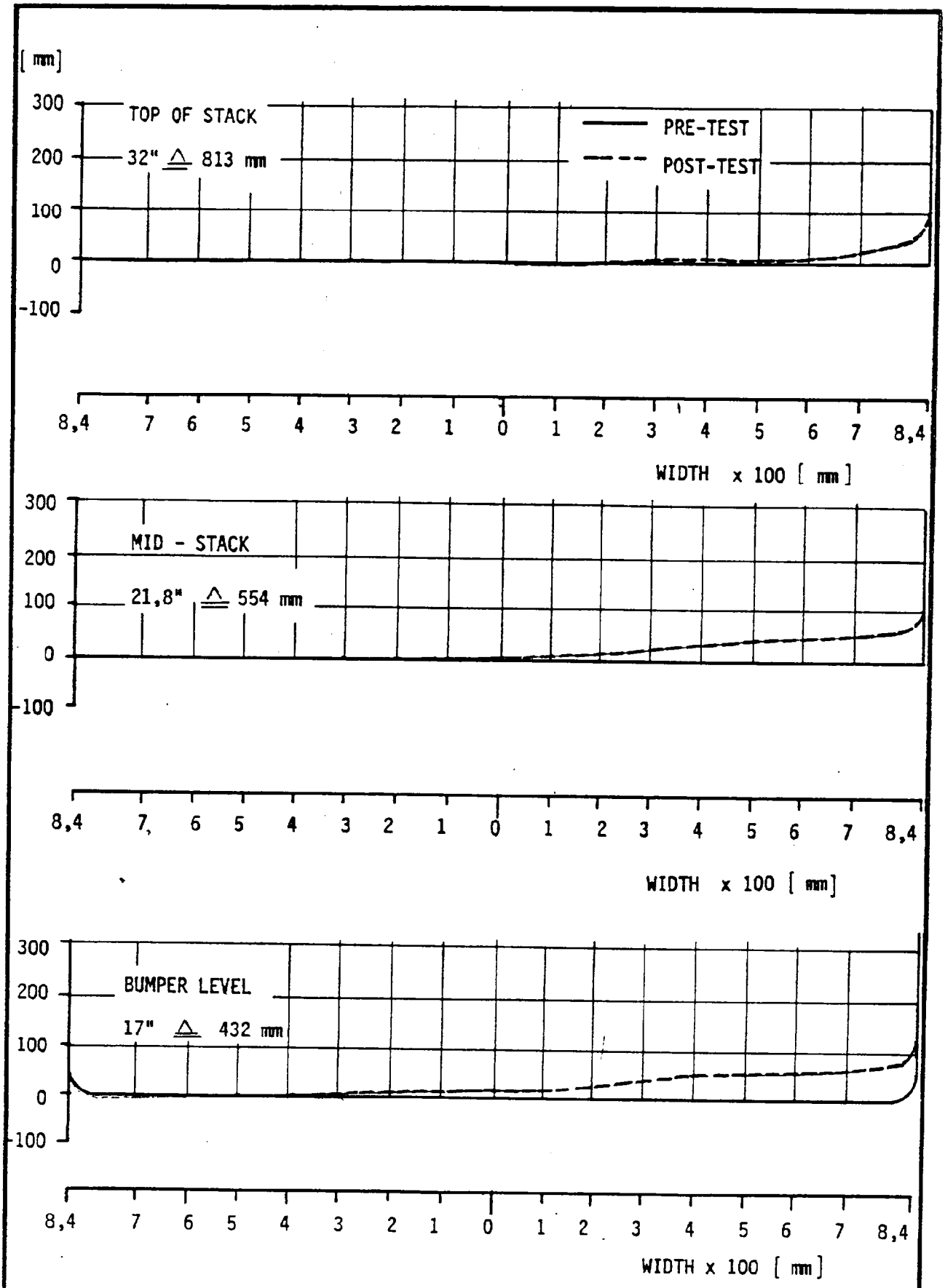



Table 25 : Pre- and Post-Test Frontal Profiles for Side Impactor (Test 7 )

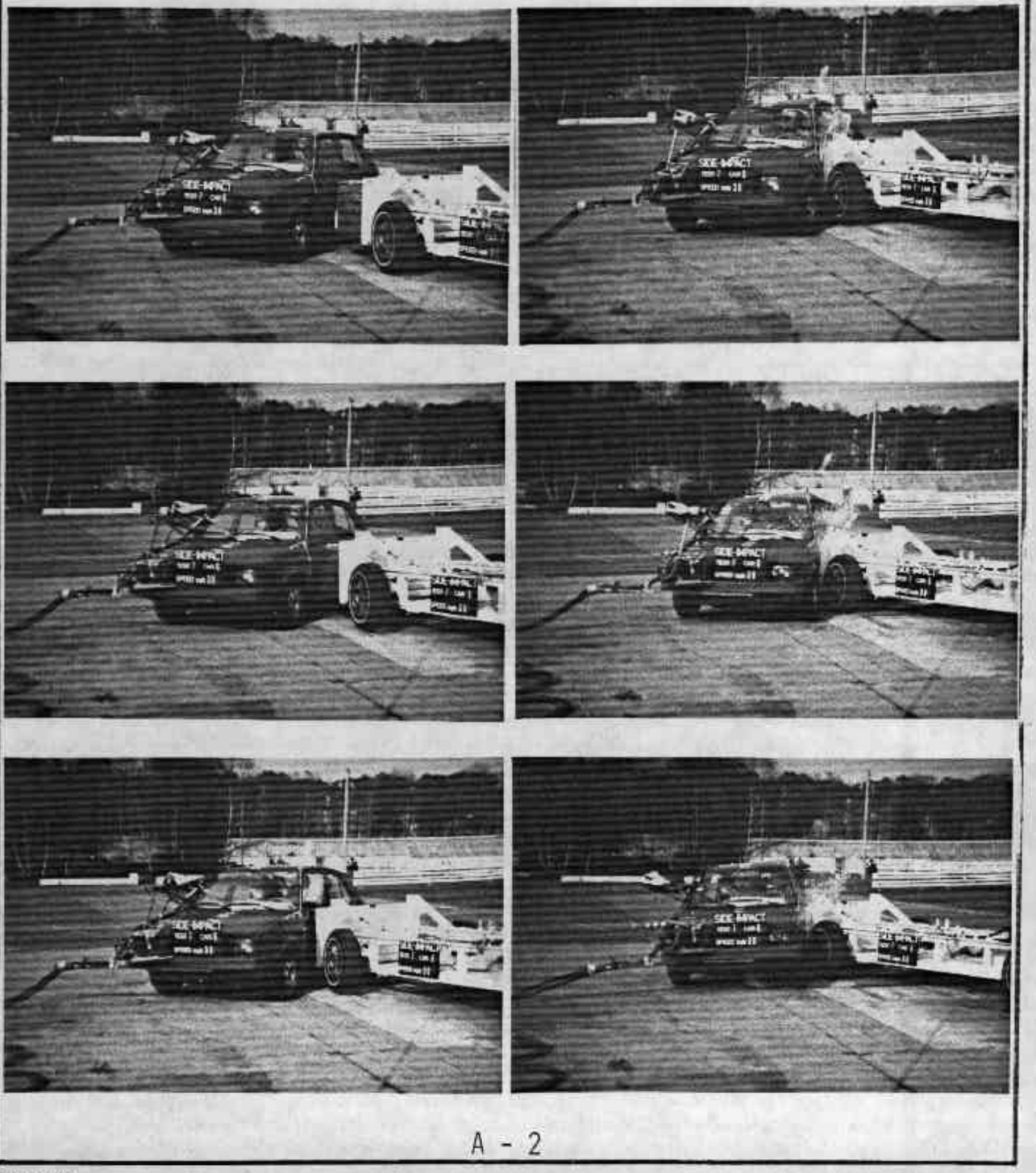
# A P P E N D I X  A

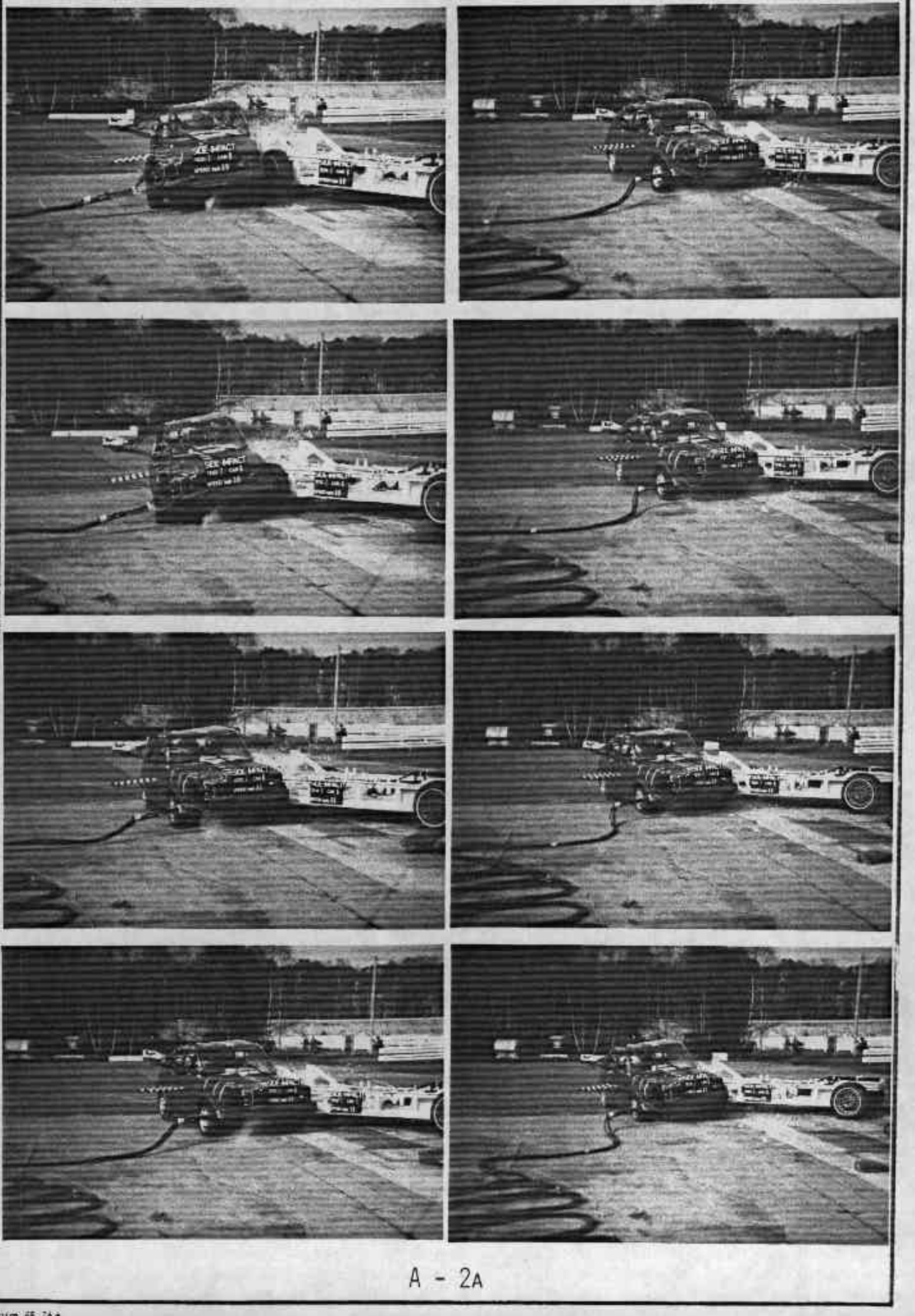
Photographs

List of Illustrations

# Figure A1 : Crash Sequence Figures

TEST 7 - 30 mph





A - 2A

Form FE 76a

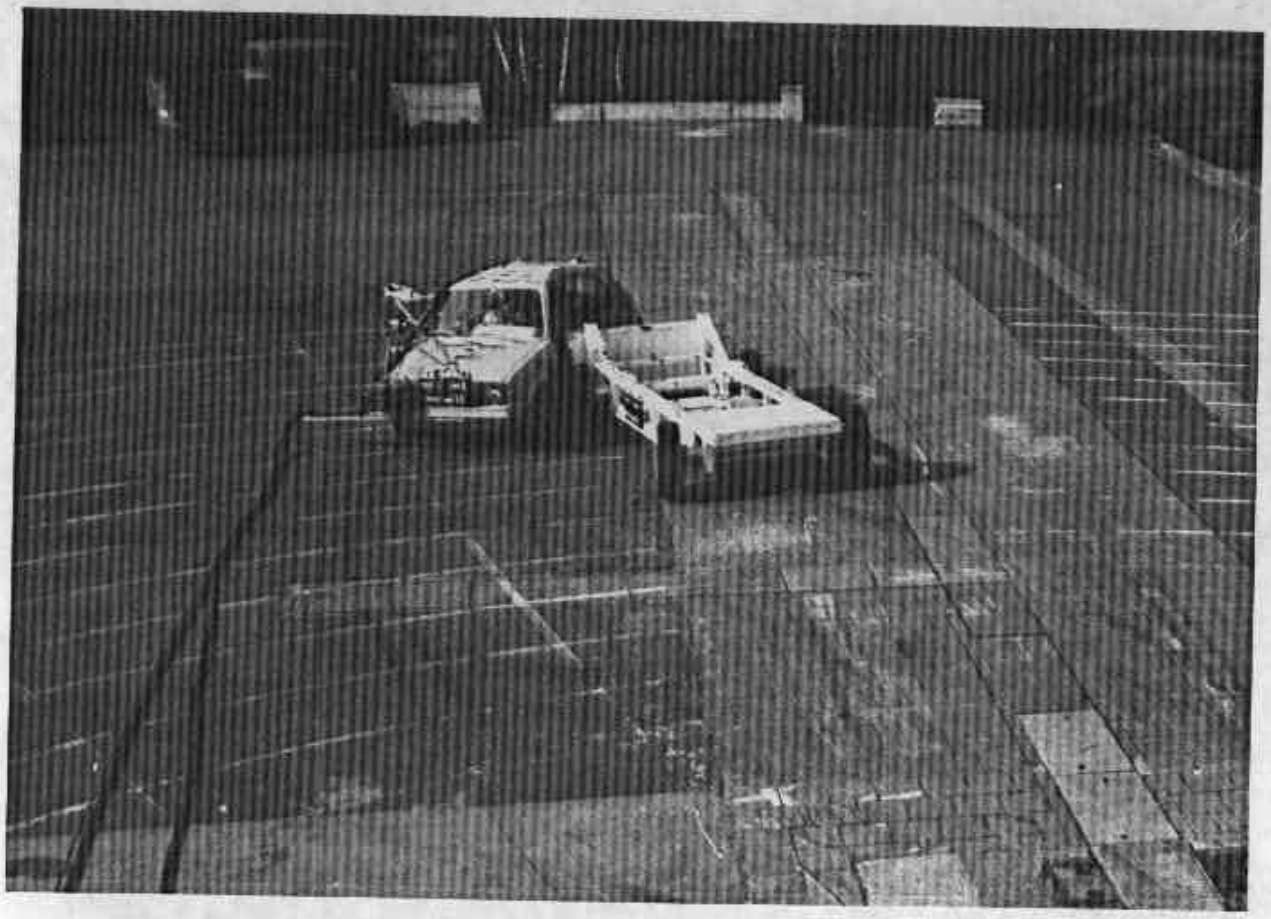


FIGURE A 2 : POST TEST 'POSITION'

CRABBED BARRIER AND VW RABBIT


FIGURE A 3 : VW RABBIT LEFT SIDE

POST TEST VIEW (FRONT-SIDE DIRECTION)


FIGURE A 4 : VW RABBIT LEFT SIDE
POST TEST VIEW

FIGURE A 5 : VW RABBIT LEFT SIDE

POST TEST VIEW (REAR-SIDE DIRECTION)

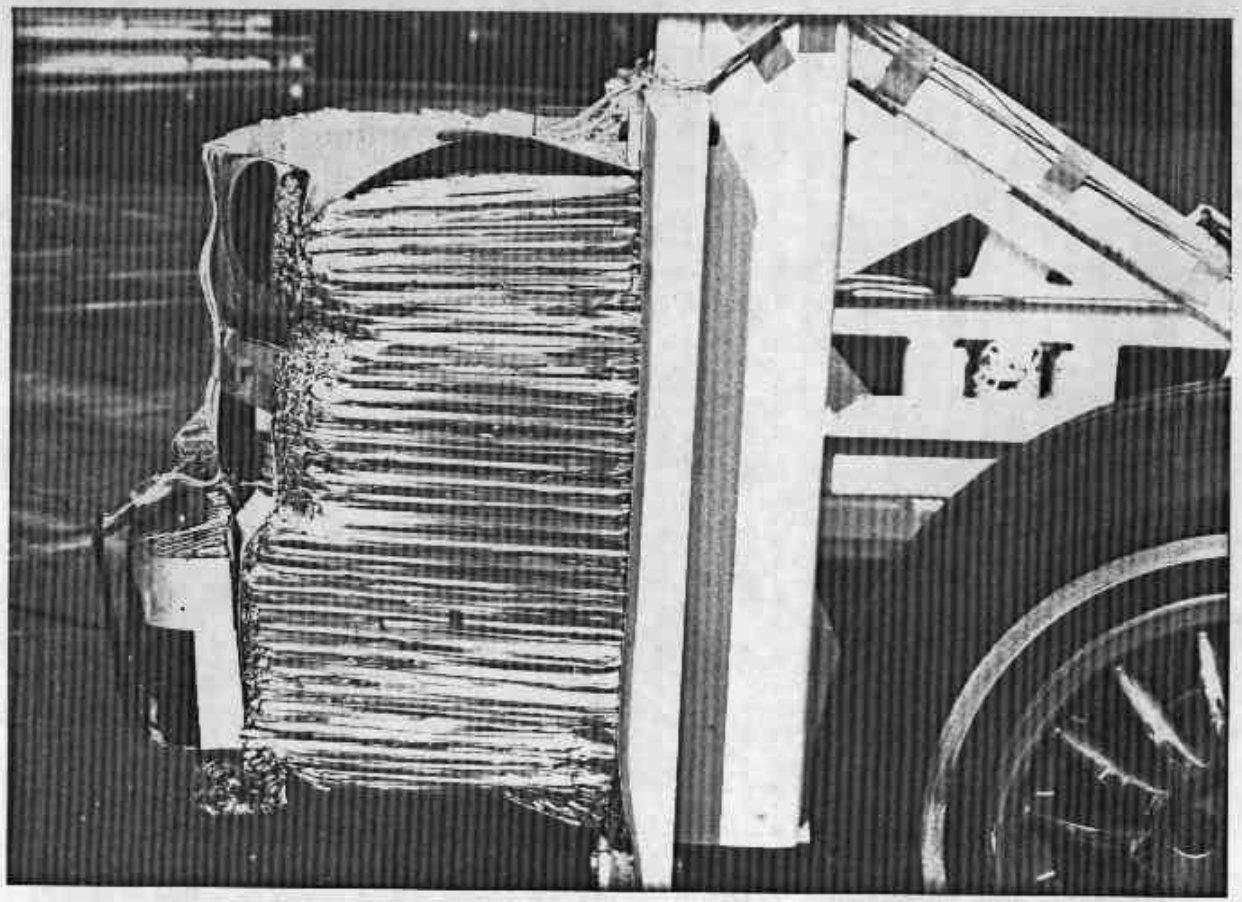


FIGURE A 6 : CRABBED BARRIER POST TEST VIEW

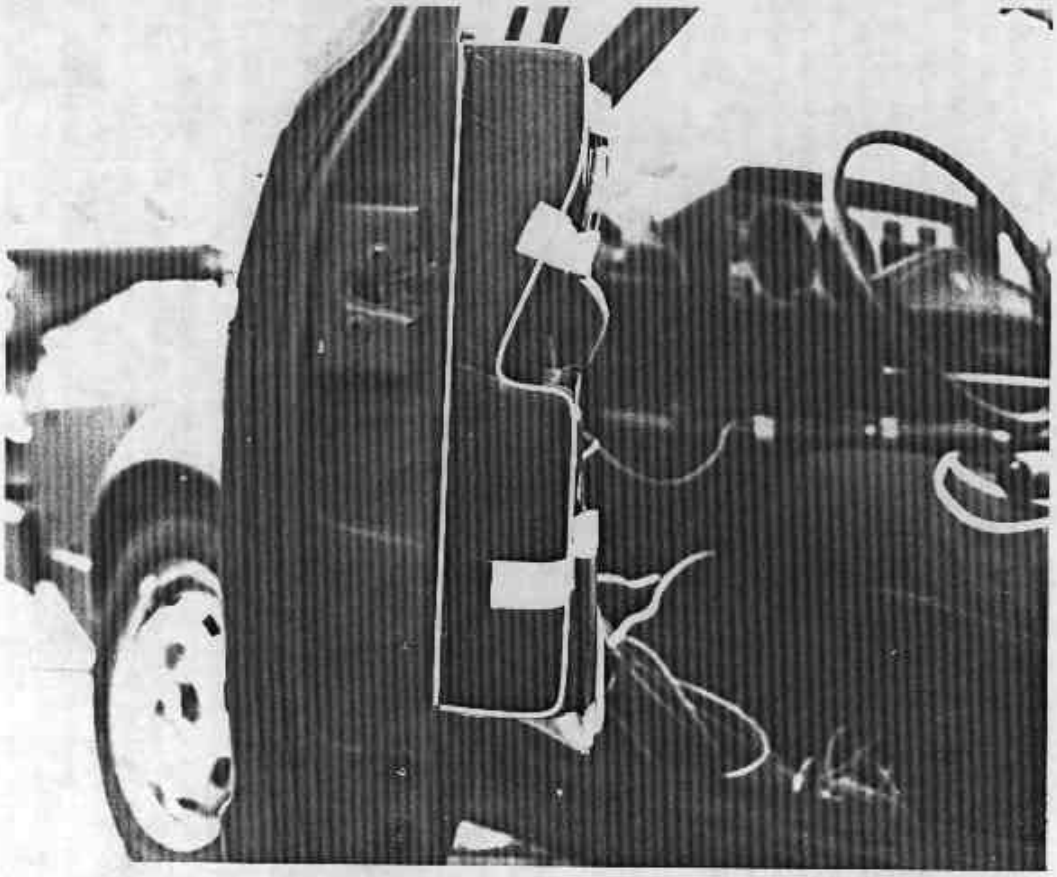


FIGURE A 7 : FRONT DOOR PADDING

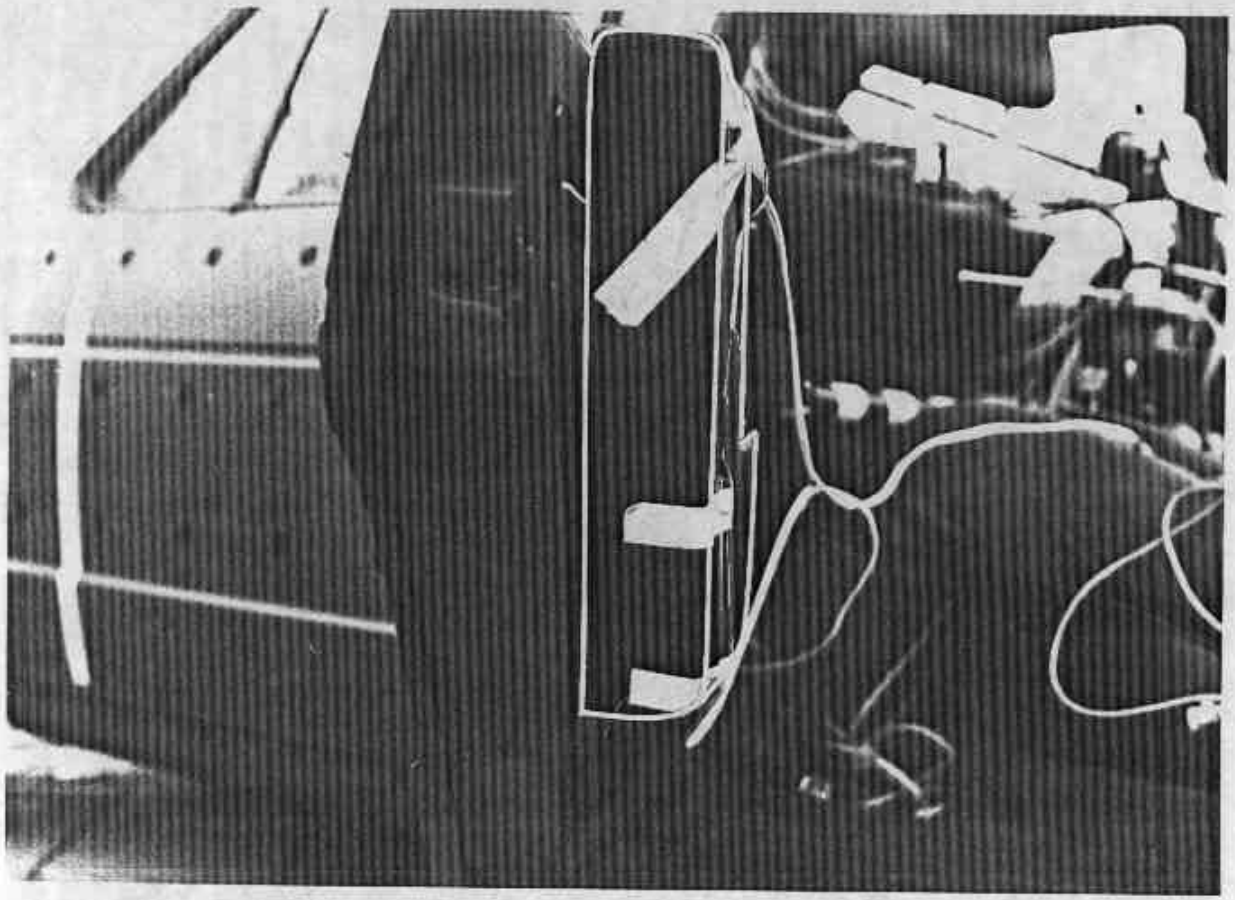


FIGURE A 8 : REAR DOOR PADDING