# LIFT Certificate TU-Sofia

Technical University of Sofia - Technologies Ltd
holding TUV NORT CERT certificate according to ISO9001:2008

CE

# CERTIFICATE

## FOR

## "EU-TYPE EXAMINATION OF SAFETY COMPONENTS FOR LIFTS"

## №772/HT/19.04.2017

"LIFT CERTIFICAT TU - SOFIA" - conformity assessment notified body with Permission № 108-OC/07.06.2016, issued by STATE AGENCY FOR METROLOGICAL AND TECHNICAL SURVEILLANCE (SAMTS) with European Identification № 2201

**Verified** on the basis of examinations and tests that the product described below is in accordance with the essential safety requirements of the Directive 2014/33/EU, introduced by the "Ordinance for the essential requirements and conformity assessment of lifts and the safety devices for lifts".

| | |
|---|---|
| **Applicant:** (name, address) | **Hebei Dongfang Fuda Machinery Co., Ltd.** **Address:** No112, East Guangming Road, Langfang City, Hebei, 065000 China |
| **Mauufacturer of the safety component:** (name, address) | **Hebei Dongfang Fuda Machinery Co., Ltd.** |
| **Name and type of the safety component:** | **Progressive Safety Gear** **Type: AQ10** |
| **Additional data for identification of the safety component:** | The additional data and technical characteristics are according to "Annex 1" of this certificate |
| **Application form of Conformity assessment:** | № 772/07.11.2016 |
| **Testing laboratory:** | STL at "LIFT Certificat TU-Sofia" |
| **Test report:** | № 772/29.03.2017 |
| **Summary report of Conformity assessment:** | № 772/03.04.2017 |
| **Applied Directives and Standards:** | Directive 2014/33/EU – Annex IVA (Module B), EN81-50:2014 - p.5.3 |

This certificate contains two pages, the second page is "Technical Characteristic", which is an integral part of it. The certificate expires on the occurrence of changes in the conditions under which it was issue or after expiring the validity period. Please, check "valid until" date below.

Date of issue: 19/04/2017

Valid until: 19/04/2022

Head of NB "LIFT Certificate TU-Sofia":

/ Assoc. Prof. PhD Eng. Georgi Iliev /

Address: 8 Kliment Ohridski Blvd., TU-Sofia, lab.4100, 1756 Sofia, Bulgaria.
Tel/Fax: +359 2965 2984, e-mail:giliev@tu-sofia.bg, www.liftcertificate.eu

ANNEX №1
To the certificate **№ 772/HT/19.04.2017**

# TECHNICAL CHARACTERISTICS
## of safety component: **Safety gear, Type: AQ10**

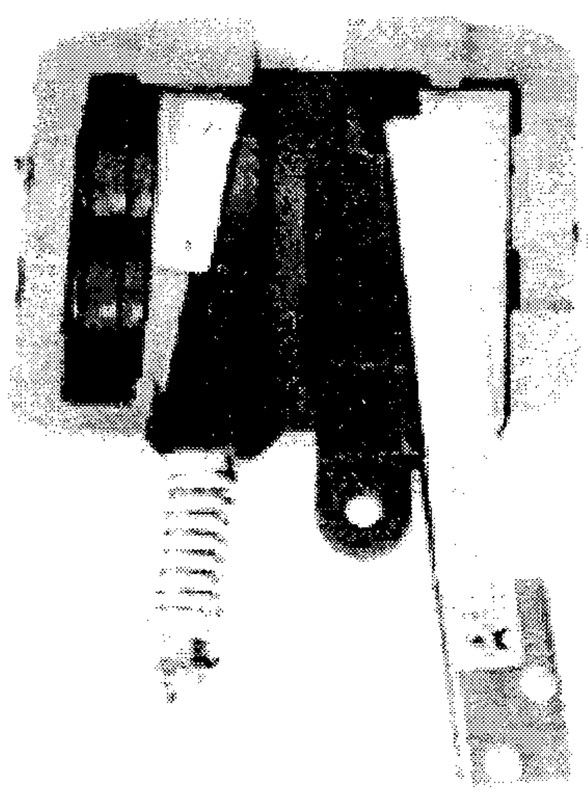
## 1. Application of the safety gear

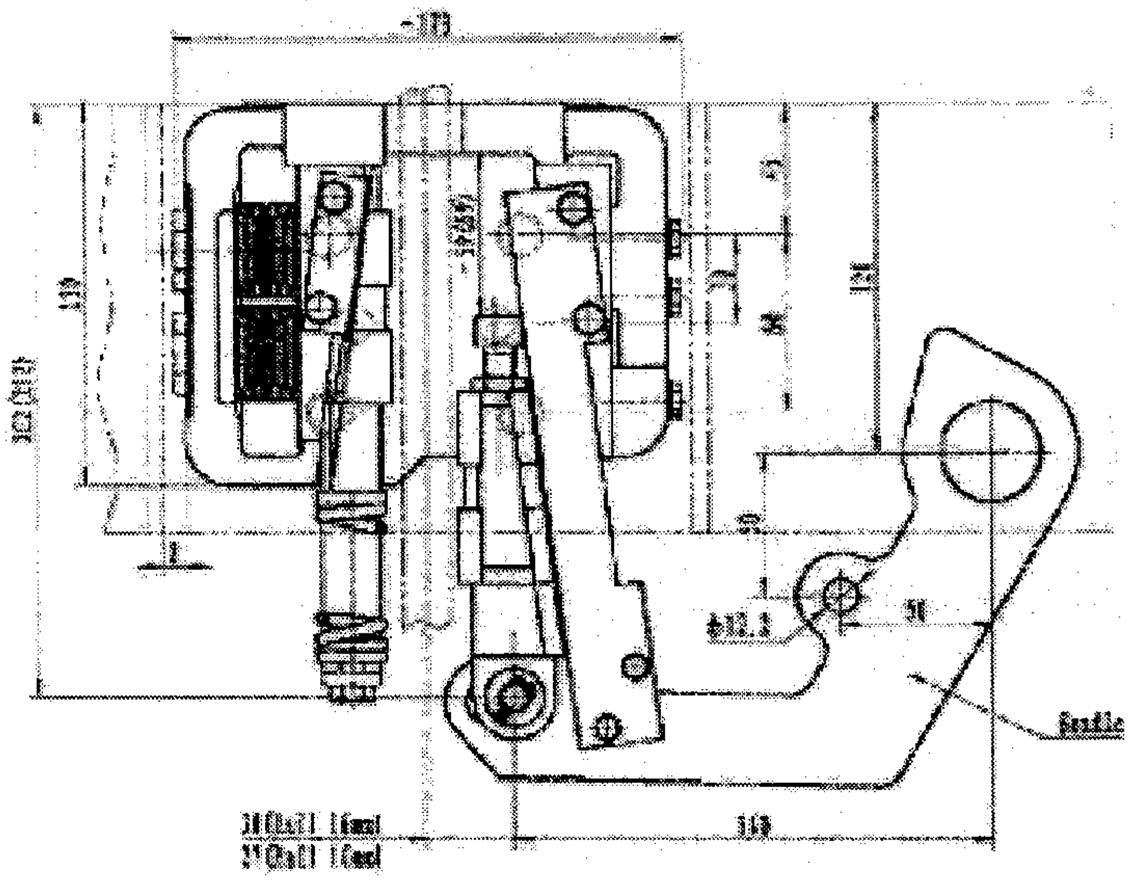
The following progressive safety gear conforms to the safety requirements of the applied Directive and Standards. It must be use according to the scope of application, described in p.2 of this Annex 1. Acting direction – one-way (downward).

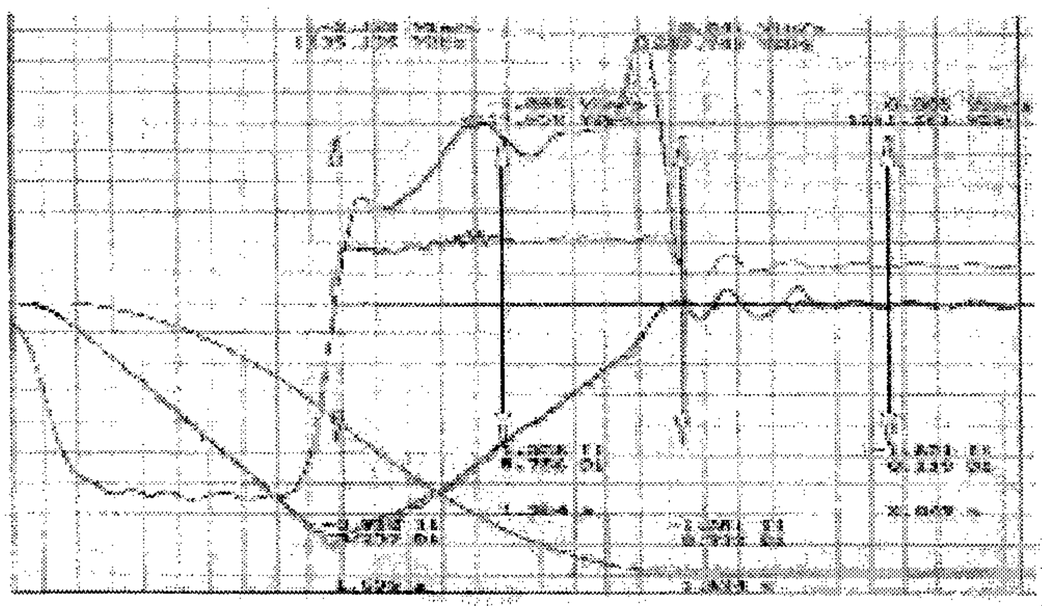
## 2. Parameters of the safety gear

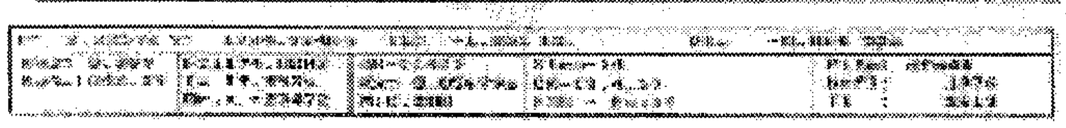
| | |
|---|---|
| Limits of the permissible masses (kg): | 1000 - 2800 |
| Rated speed (m/s): | 0.25 – 2.5 |
| Maximum tripping speed of the overspeed governor (m/s): | 3.23 |
| Type of guide rail: | T75/B, T78/B, T89/B, T90/B, T114/B, T125/B, T127-1/B, T127-2/B |
| Permissible thickness of the guide rail blade (mm): | 10, 15.88, 16 |
| Minimum width of the gripping area (mm): | 32 |
| Surface condition of the guide rails: | Machined |
| State of guide rails lubrication: | Lubricated, ISO VG 68 |

## 3. Picture, drawing and sample of the graphical test results of the safety gear









Head of NB "LIFT Certificate"O-Sofia":

/ Assoc. Prof. PhD Eng. Georgi Iliev /

MIRTEC
ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΒΙΟΜΗΧΑΝΙΚΗΣ ΕΡΕΥΝΑΣ, ΤΕΧΝΟΛΟΓΙΚΗΣ ΑΝΑΠΤΥΞΗΣ
& ΕΡΓΑΣΤΗΡΙΑΚΩΝ ΔΟΚΙΜΩΝ, ΠΙΣΤΟΠΟΙΗΣΗΣ ΚΑΙ ΠΟΙΟΤΗΤΑΣ
MATERIALS INDUSTRIAL RESEARCH & TECHNOLOGY CENTER S.A.

EBETAM

# CERTIFICATE of CONFORMITY to TYPE

## According to Directive 2014/33/EU (Module C2, Annex IX)

**Certificate No: LF/KSA/A-C-0126A/17**

| | |
|---|---|
| Name & Address of the Certificate Holder : of the Manufacturer: | **SHIJIAZHUANG TONG'AN MACHINERY CO ., LTD**<br>**NO. 112. East Guangming Road .**<br>**Langfang City. Hebie. 065000 China** |
| Date of sampling Examination: | 03/05/2017 |
| Number of EU Type-Examination Certificate: | MIRTEC, LF/KSA/A-C-0126/17 |
| Number & Date of Report: | LF/KSA/A-R-0126A/17, 03/05/2017 |
| Product Type of Safety Component: | **Progressive Safety Gear**<br>**Type: AQ10** |
| Test Laboratory: | SHANGHAI JIAOTONG UNIVERSITY ELEVATOR TEST CENTER (EU Type-examination ) |
| Surveillance Place: | HEBEI DONGFANG FUDA MACHINERY CO., LTD. (Production Surveillance) |
| Documents Annexed to this Certification: | Product Description, Drawings, Installation & Maintenance Instructions, Material List, Material Certificates. |

**DECLARATION**

***The manufacturer is -after examination of the prerequisites- authorized to provide his safety components (Progressive Safety Gear AQ10) manufactured within the scope of the type examination our identification number to the CE mark as illustrated:***

CE

Date of issue: 29.05.2017

Validity of the certificate: 29.05.2018

For MIRTEC S.A.

I. DIMITRIADIS
Director of Athens Office

Certification department for lifts

C. SPILIOTOPOULOS
Inspector of Lifts



Έδρα: Α' Βιομηχανική Περιοχή, Τ.Θ. 13, 385 00 Βόλος - **Head Office:** A' Industrial Area, P.O. Box 13, GR 385 00 Volos, **Tel.:** +30 24210 95340-2, **Fax:** +30 24210 95364, **E-mail:** volos.office@ebetam.gr
Γραφείο Αθηνών: Μελίνας Μερκούρη 76, 173 42 Άγιος Δημήτριος Αττικής - **Athens Office:** Melinas Merkouri 76, GR 173 42 Agios Dimitrios Attikis, **Tel.:** +30 210 9961408, **Fax:** +30 210 9969852, **E-mail:** athens.office@ebetam.gr
Γραφείο Θεσ/νίκης: Βιομηχανική περιοχή, 570 22 Θεσσαλονίκη - **Thessaloniki Office:** Industrial Area, GR 570 22 Thessaloniki, **Tel.:** +30 2310 797887, Fax: +30 2310 723117, **E-mail:** thess.office@ebetam.gr
Παράρτημα Αθηνών: Ελ. Βενιζέλου 4, 176 76 Καλλιθέα - **Athens Branch:** El. Venizelou 4, GR 176 76 Kallithea, **Tel.:** +30 210 9234932, Fax. +30 210 9235603, **E-mail:** athens.branch@ebetam.gr
Παράρτημα Θηβών: 72ο χλμ. ΕΟ Αθηνών - Λαμίας, Τ.Θ. 18646, 341 00 Χαλκίδα - **Thiva Branch:** 72 km of Athens - Lamia N.R., P.O. Box 18646 GR 341 00 Chalkida, **Tel.:** +30 22620 71811-15, **Fax:** +30 22620 71461, **E-mail:** thiva.office@ebetam.gr
Εργαστήρια Αθηνών: Λεωφ. Κηφισσού 50, 121 33 Περιστέρι - **Athens Laboratories:** Kifissou 50, 121 33 Peristeri, **Tel.:** +30 210 2283757, **Fax:** +30 210 5770556, **E-mail:** athens.lab@ebetam.gr

CNAS L0454 20110007082 (2011)质认鉴认字(134)号

# Certificate of Type Test for Special Equipment

No. TX F320-003-12 0037

| | |
|---|---|
| Applicant's name and address: | Hebei DongFang FuDa Machinery Co., Ltd. No.112 Guangming East Road,Langfang,Hebei |
| Manufacturer's name and address: | Hebei DongFang FuDa Machinery Co., Ltd. No.112 Guangming East Road,Langfang,Hebei |
| Name of product: | Progressive safety gear |
| Model and specifications: | AQ10<br>Rated speeds: 0.25m/s~2.50m/s<br>Permissible masses: 1000kg ~2800kg |
| Configuration of product: | See annex |
| Type test report No.: | T3-F32-12-037 |

This certificate is valid for products of the models and specifications below (without change of the product configuration): /

After Type Test, this product is accord with the *Regulation for Type Tests of Lifts (tryout 2012)*, *Rule for Type Test of Safety Gear (tryout2012)* , *GB 7588 -2003* and *EN 81-1:1998*.

Issue date: 2012年12月

NETEC

National Elevator Inspection and Testing Center

Note:

1. This certificate is to confirm the products on type and the tested sample on conformity, only valid for the products that are in conformance with the tested sample mentioned above.
2. The holder of this certificate has responsibilities to ensure that the products conform to the requirements of the codes and regulations, and to ensure that the products are consistent with the tested sample mentioned above.

# Annex

## Configuration of Progressive Safety Gear

No. TX F320-003-12 0037

| | | | |
|---|---|---|---|
| Construction | Single-draw Single -wedge | | |
| Permissible masses | 1000kg ~2800kg | | |
| Rated speeds | 0.25m/s~2.50m/s | Tripping speeds of overspeed governor | 0.29m/s~3.55m/s |
| Surface condition of the guide rails | Machined | Permissible thickness of the guide rails blade | 10mm、15.88mm、16mm |
| State of lubrication of the guide rails | Oil lubrication | Hardness of the guide rails | HB 110~143 |
| The limits of the actual masses | When it is applied to a given lift, the mass stated by the installer are 923kg~3220kg | | |

Issue date: 2012-1-12

NETEC
National Elevator Inspection and Testing Center

# Type Test Report



| | | | | |
|---|---|---|---|---|
| Name of product | | Progressive safety gear | | |
| Model of product | | AQ10 | | |
| Serial No. of sample | | 12115003L/R | Production date | 2012-11-02 |
| Main technical parameter | Permissible masses | 1000kg ~2800kg | Rated speeds | 0.25m/s ~2.50m/s |
| Applicant | Name | Hebei DongFang FuDa Machinery Co., Ltd. | | |
| | Address | No.112 Guangming East Road,Langfang,Hebei | | |
| Manufacturer | Name | Hebei DongFang FuDa Machinery Co., Ltd. | | |
| | Address | No.112 Guangming East Road,Langfang,Hebei | | |
| Receiving date | 2012-11-06 | | Sample No. | A2012-1101~1102 |
| Test date | 2012-11-07~08 | | Sample state | Normal |
| Test category | Type test | | Test item | All application items |
| Test place | NETEC | | | |
| Test condition | Ambient temperature: 3℃~10℃, relative humidity: 40%~60% | | | |
| Test basis | *Regulation for Type Tests of Lifts (tryout 2012), Rule for Type Test of Safety Gear (tryout2012), GB 7588—2003, EN 81-1:1998* | | | |
| Test conclusion | Tripping speeds of the safety gear are 0.29m/s ~3.55m/s ( Rated speeds: 0.25m/s ~2.50m/s), The limits of the actual masses are 923kg ~3220kg.<br>The type test is certificated | | | |
| Reported by: | | Institute approval No.: TS7610014-2014 | | |
| Verified by: | | | | |
| Issued by: | | Issue date: 2012-11-12 | | |

Main technical parameter of the progressive safety gear

| Model and name of product | | AQ10... Progressive safety gear |
|---|---|---|
| Main technical parameter | Construction | Single-draw, Single -wedge |
| | Rated speeds | 0.25m/s~2.50m/s |
| | Tripping speeds of overspeed governor | 0.29m/s~3.55m/s |
| | Permissible masses | 1000kg ~2800kg |
| | Type of guide rails | T75/B, T78/B T89/B, T90/B, T114/B, T125/B, T127-1/B, T127-2/B |
| | Surface condition of the guide rails | Machined |
| | Permissible thickness of the guide rails blade | 10mm, 15.88mm, 16mm |
| | State of lubrication of the guide rails | Machine oil |
| | Hardness of the guide rails | HB110~143 |
| | Minimum width of the gripping areas | 32mm |

1. Technical dossier examinations

| No. | Items No. | Examination items | Examination results | Conclusions |
|---|---|---|---|---|
| 1 | O2.1 | Technical information | Comply with requirements | Pass |
| 2 | O2.2 | Information about structure of product | Comply with requirements | Pass |
| 3 | 02.3 | Design information about special environment | / | / |
| 4 | 02.4 | Other necessary information | / | / |

2 Test items and test results

| No. | Items No. | Test items | Test results | Conclusions |
|---|---|---|---|---|
| 1 | | Safety gear certified for a single mass | / | / |
| 2 | | Safety gear certified for different masses | Comply with requirements | Pass |
| 3 | O3.2.1 | The average values of determined in each test shall lie within a range of ±25% in relation to the value of the average braking force. | Comply with requirements | Pass |
| 4 | | If safety gears could be used at different tripping speed of overspeed governor, a check shall be made that the braking force at minimum tripping speed shall lie within a range of ±25% in relation to the value of the average braking force defined before | Comply with requirements | Pass |
| 5 | | Checking after the tests | Comply with requirements | Pass |
| 6 | | permissible mass | 923kg - 3220kg | Pass |
| 7 | O3.2.2 | If, during the tests, the values found differ by more than 20% from those expected by the applicant, it seems that the test failed. Other tests may be made with his agreement after adjustments | Comply with requirements | Pass |
| 8 | | Each mass test shall satisfy with O3.2.2 | Comply with requirements | Pass |
| 9 | O3.3.1 | Special precaution for the lift in the outdoor environment | / | / |
| 10 | O3.3.2 | Special precaution for the explosion protection lift | / | / |

Appendix 1 Test data

1.1 Determination of the maximum permissible mass.

1.1.1 Test condition

| | | | |
|---|---|---|---|
| Rated speed $v$ | 2.50m/s | Test total mass | 2800kg |
| Tripping speed of overspeed governor $v_t$ | 3.55m/s | Height of free fall | 642mm |
| Type of guide rails | T89/B | Hardness of the guide rails | Before test:HB118 |
| State of lubrication of the guide rails | Oil lubrication | Model and specification of lubricating oil | N68 Machine Oil |

1.1.2 Test data record table 1

| No. | Total height of the fall mm | Sliding distance of overspeed governor rope mm | Total travel of the elements forming the spring mm | | braking distance mm | | Average braking distance mm |
|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Right | |
| 1 | 1647 | 865 | / | / | 840 | 840 | 840 |
| 2 | 2050 | 1260 | / | / | 1220 | 1220 | 1220 |
| 3 | 1886 | 1100 | / | / | 1060 | 1060 | 1060 |
| 4 | 2170 | 1304 | / | / | 1275 | 1275 | 1275 |

1.1.3 Test data record table 2

| No. | Minimum retardation $g_n$ | Smallest instantaneous braking force N | Maximum retardation $g_n$ | Greatest instantaneous braking force N | Average retardation $g_n$ | Average braking force N | Mean of average braking forces N | Deviation of average braking force % | Total permissible mass kg |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.706 | 46915 | 1.328 | 63946 | 0.904 | 52299 | | +9.1 | |
| 2 | 0.387 | 38098 | 0.968 | 54057 | 0.609 | 44196 | | -7.8 | |
| 3 | 0.648 | 45267 | 0.893 | 51997 | 0.746 | 47959 | 47925 | +0.1 | 2995 |
| 4 | 0.503 | 41284 | 1.477 | 68038 | 0.720 | 47245 | | -1.4 | |

1.1.4 Deviation between total permissible mass and test total mass: +7.0%

1.2 Determination of the middle permissible mass

1.2.1 Test condition

| | | | |
|---|---|---|---|
| Rated speed v | 2.50m/s | Test total mass | 1900kg |
| Tripping speed of overspeed governor $v_t$ | 3.55m/s | Height of free fall | 642mm |
| Type of guide rails | T89/B | Hardness of the guide rails | Before test:HB118 |
| State of lubrication of the guide rails | Oil lubrication | Model and specification of lubricating oil | N68 Machine oil |

1.2.2 Test data record table 3

| No. | Total height of the fall mm | Sliding distance of overspeed governor rope mm | Total travel of the elements forming the spring mm | | Braking distance mm | | Average braking distance Mm |
|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Right | |
| 1 | 1763 | 935 | / | / | 910 | 910 | 910 |
| 2 | 2410 | 1568 | / | / | 1525 | 1625 | 1525 |
| 3 | 1740 | 903 | / | / | 860 | 860 | 860 |
| 4 | 2060 | 1276 | / | / | 1240 | 1240 | 1240 |

1.2.3 Test data record table 4

| No. | Minimum retardation g_n | Smallest instantaneous braking force N | Maximum retardation g_n | Greatest instantaneous braking force N | Average retardation g_m | Average braking force N | Mean of average braking forces N | Deviation of average braking force % | Total permissible mass kg |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.741 | 32450 | 1.449 | 45647 | 0.952 | 36383 | 31202 | +16.6 | 1950 |
| 2 | 0.436 | 26766 | 1.023 | 37707 | 0.622 | 30232 | | -3.1 | |
| 3 | 0.903 | 35470 | 1.378 | 44324 | 0.701 | 31705 | | +1.6 | |
| 4 | 0.112 | 20727 | 0.815 | 33830 | 0.421 | 26486 | | -15.1 | |

1.2.4 Deviation between total permissible mass and test total mass: +2.6%

1.3 Determination of the minimum permissible mass

1.3.1 Test condition

| | | | |
|---|---|---|---|
| Rated speed v | 2.50m/s | Test total mass | 1000kg |
| Tripping speed of overspeed governor $v_t$ | 3.55m/s | Height of free fall | 642mm |
| Type of guide rails | T89/B | Hardness of the guide rails | Before test:HB118 |
| State of lubrication of the guide rails | Oil lubrication | Model and specification of lubricating oil | N68 Machine oil |

1.3.2 Test data record table 5

| No. | Total height of the fall mm | Sliding distance of overspeed governor rope mm | Total travel of the elements forming the spring mm | | Braking distance mm | | Average braking distance Mm |
|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Right | |
| 1 | 2380 | 1520 | / | / | 1490 | 1490 | 1490 |
| 2 | 1975 | 1072 | / | / | 1050 | 1050 | 1050 |
| 3 | 2510 | 1710 | / | / | 1690 | 1690 | 1690 |
| 4 | 2278 | 1445 | / | / | 1420 | 1420 | 1420 |

1.3.3 Test data record table 6

| No. | Minimum retardation $g_n$ | Smallest instantaneous braking force N | Maximum retardation $g_n$ | Greatest instantaneous braking force N | Average retardation $S_n$ | Average braking force N | Mean of average braking forces N | Deviation of average braking force % | Total permissible mass Kg |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.217 | 11939 | 1.024 | 19865 | 0.517 | 14882 | | -6.8 | |
| 2 | 0.531 | 15019 | 1.341 | 22965 | 0.872 | 18364 | | +15.0 | |
| | | | | | | | 15966 | | 998 |
| 3 | 0.299 | 12743 | 1.035 | 19563 | 0.552 | 15225 | | -4.6 | |
| 4 | 0.316 | 12910 | 1.093 | 20582 | 0.569 | 15392 | | -3.6 | |

1.3.4 Deviation between total permissible mass and test total mass: -0.2%

1.4 The limits of actual masses

When it is applied to a given lift, the mass stated by the installer are 923kg~3220kg .

1.5 Verify permissible mass referring to the minimum tripping speed of overspeed governor

1.5.1 Test condition

| No. | Rated speed V | Tripping speed of overspeed governor $V_t$ | Test total mass | Height of free fall | Type of guide rails | Hardness of the guide rails | State of lubrication of the guide rails | Model and specification of lubricating oil |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.25 | 0.29 | 2800 | 4 | T89/B | 118 | Oil lubrication | N68 Machine oil |
| 2 | 0.25 | 0.29 | 1900 | | | 118 | | |
| 3 | 0.25 | 0.29 | 1000 | | | 118 | | |

1.5.2 Test data record table 7

| No. | Total height of the fall mm | Sliding distance of overspeed governor rope mm | Total travel of the elements forming the spring mm | | Braking distance mm | | Average braking distance mm |
|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Right | |
| 1 | 90 | 73 | / | / | 55 | 55 | 55 |
| 2 | 105 | 85 | / | / | 70 | 70 | 70 |
| 3 | 155 | 108 | / | / | 95 | 95 | 95 |

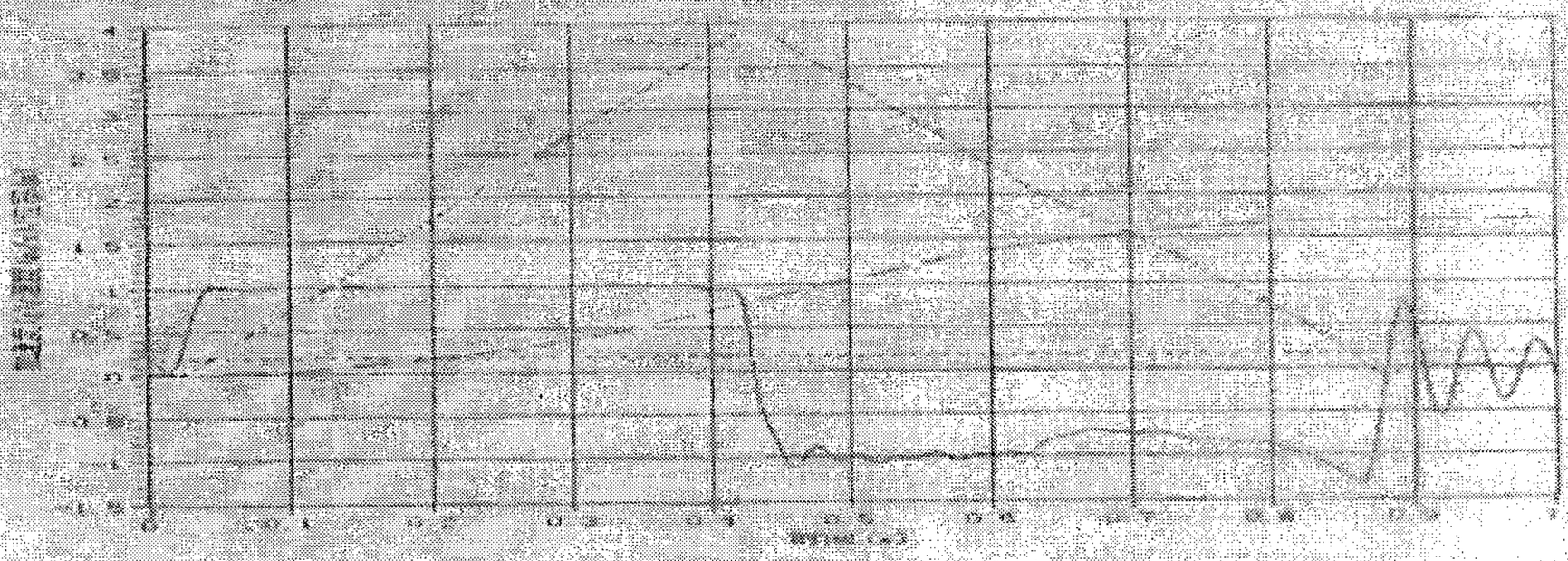
1.5.3 Test data record table 8

| No | Minimum retardation $g_n$ | Smallest instantaneous braking force N | Maximum retardation $g_n$ | Greatest instantaneous braking force N | Average retardation $g_n$ | Average braking force N | The former mean of average braking force M | Deviation of average braking force % |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.466 | 40268 | 1.021 | 55513 | 0.658 | 46542 | 47925 | -5.0 |
| 2 | 0 | 18639 | 0.966 | 36644 | 0.584 | 29624 | 31202 | -5.4 |
| 3 | 0.432 | 14048 | 1.162 | 21209 | 0.721 | 16883 | 15966 | +5.7 |

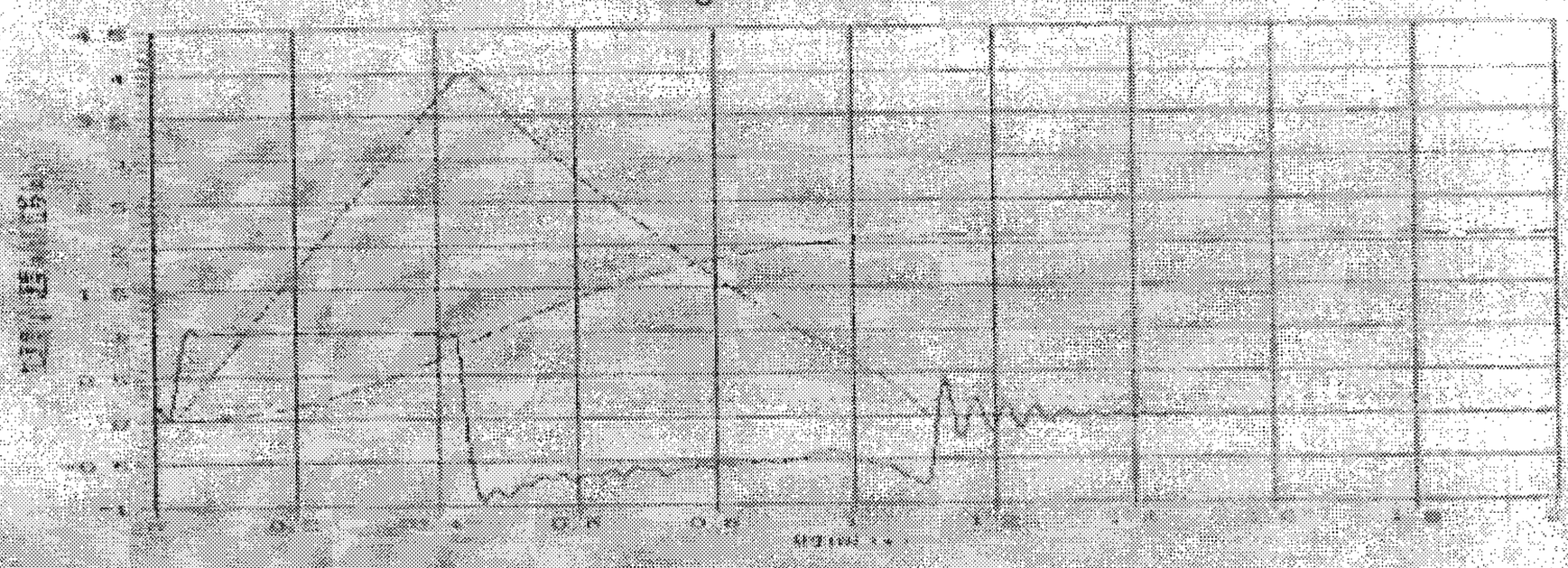
Note: *Deviation of average braking force* $= \frac{\text{Average braking force-The former average braking force}}{\text{The former average braking force}} \times 100\%$

Appendix 2 Test charts

2800kg 2.50m/s No.1

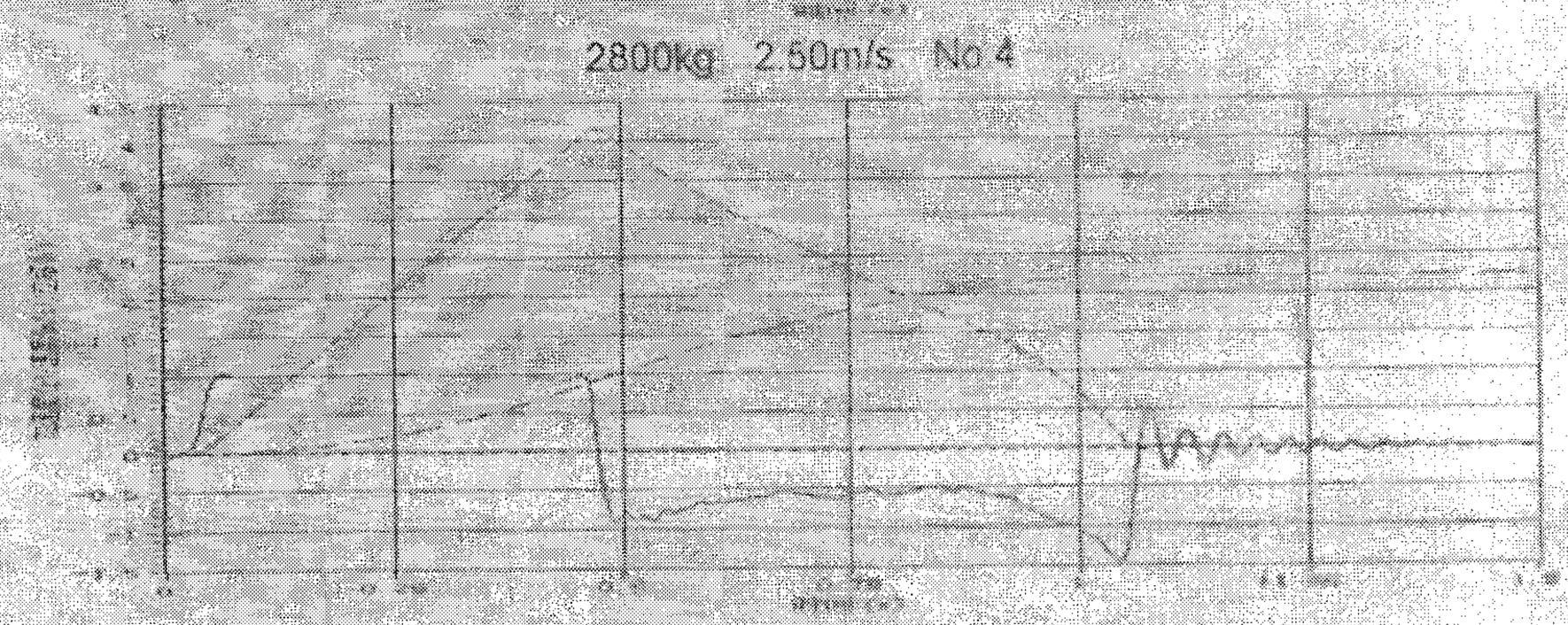


2800kg 2.50m/s No.2



2800kg 2.50m/s No.3

2800kg 2.50m/s No.4



CNAS C1067 2011000070E7

# Special Equipment Type Test Report

Report No. T3-F32-12-037

Category of Equipment: Safety Protection Component

Type of Equipment: Safety Gear

Name of Product: Progressive Safety Gear

Model of Product: AQ10

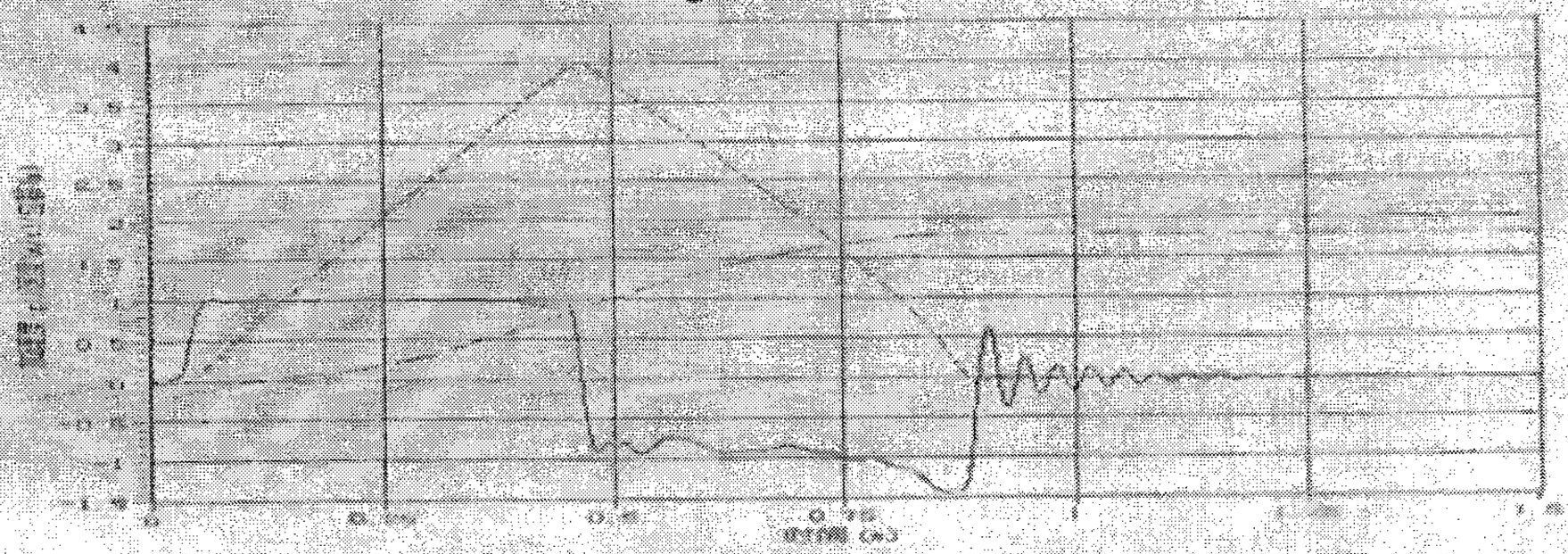
Applicant: HeBei DongFang Fuda Machinery Co., Ltd.

Manufacturer: HeBei DongFang Fuda Machinery Co., Ltd.

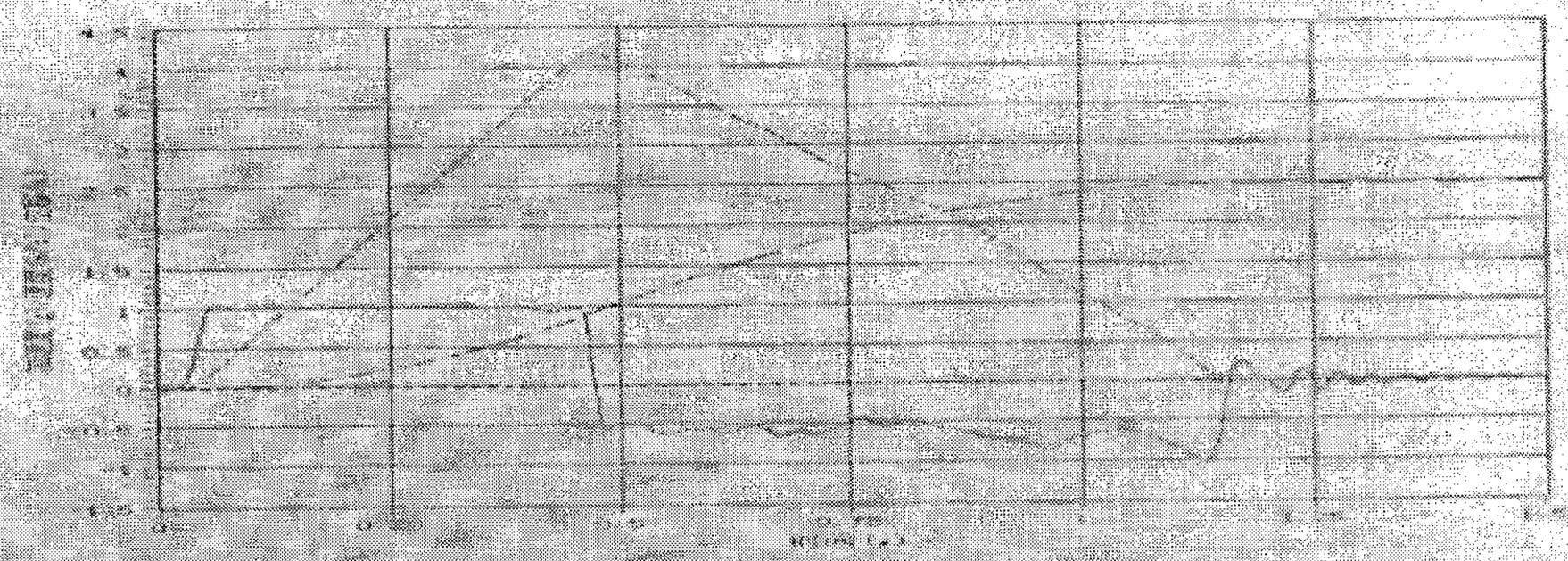
NETEC

National Elevator Inspection and Testing Center

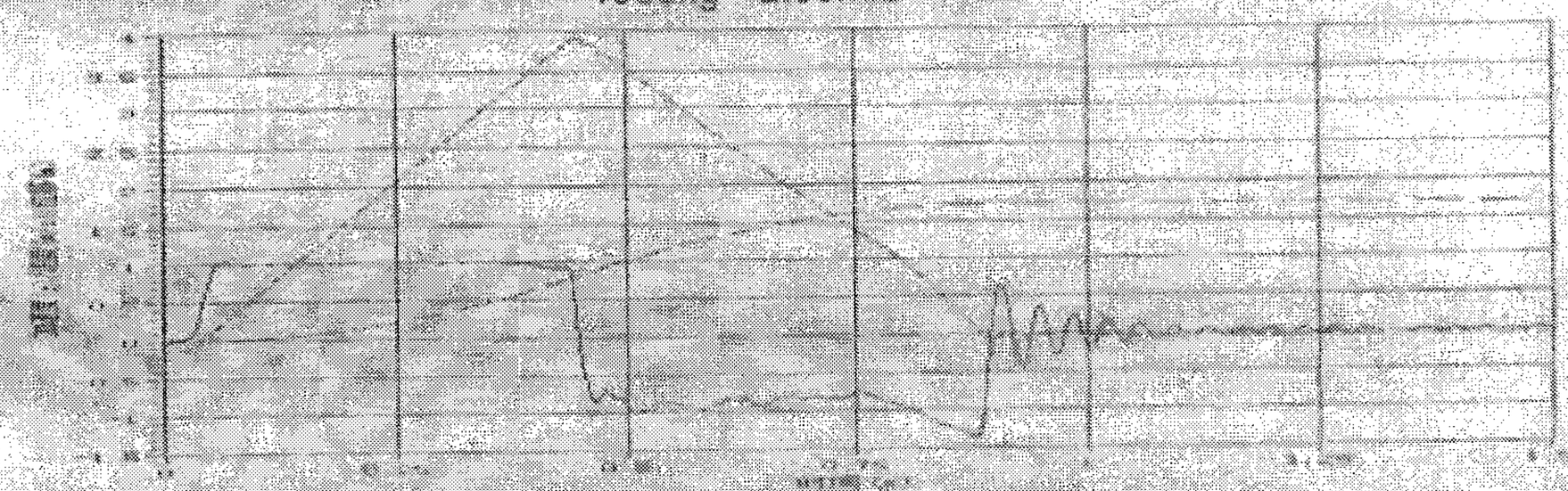
1900kg 2.50m/s No.1



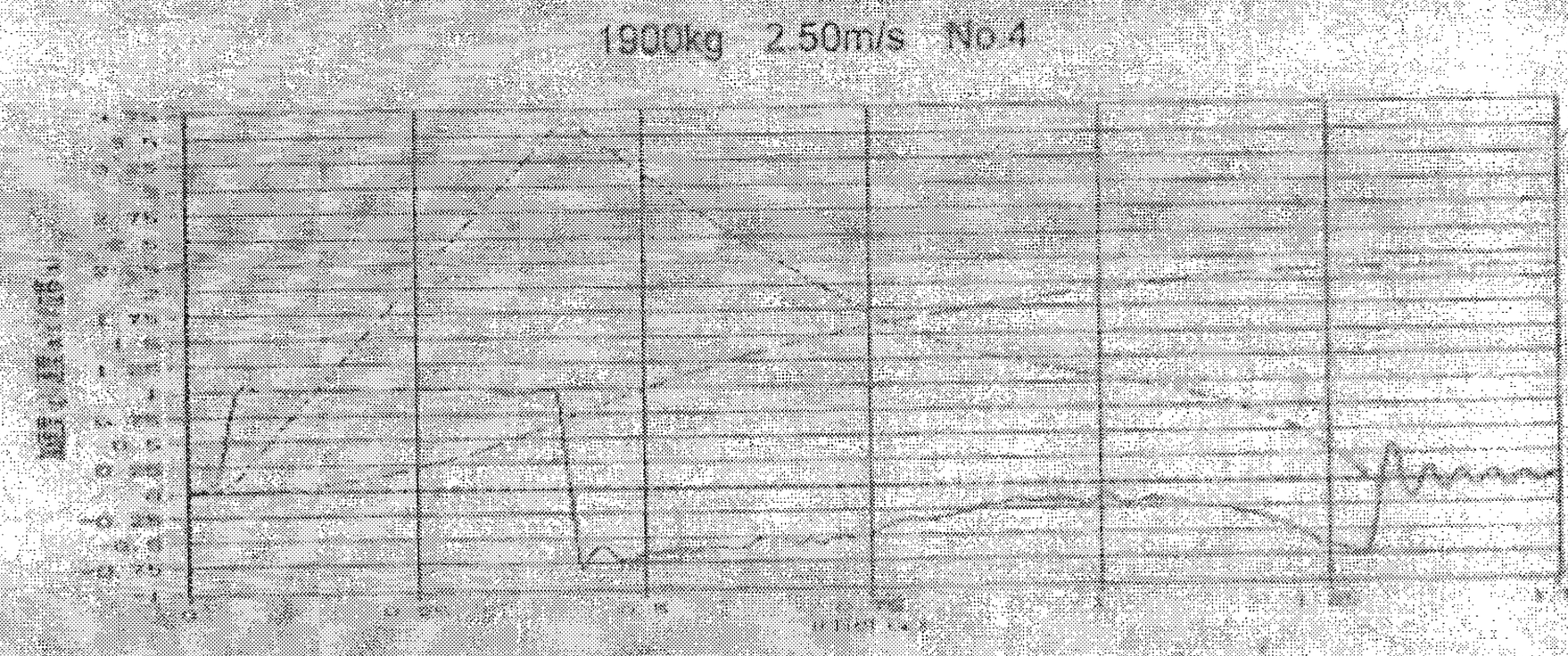
1900kg 2.50m/s No.2



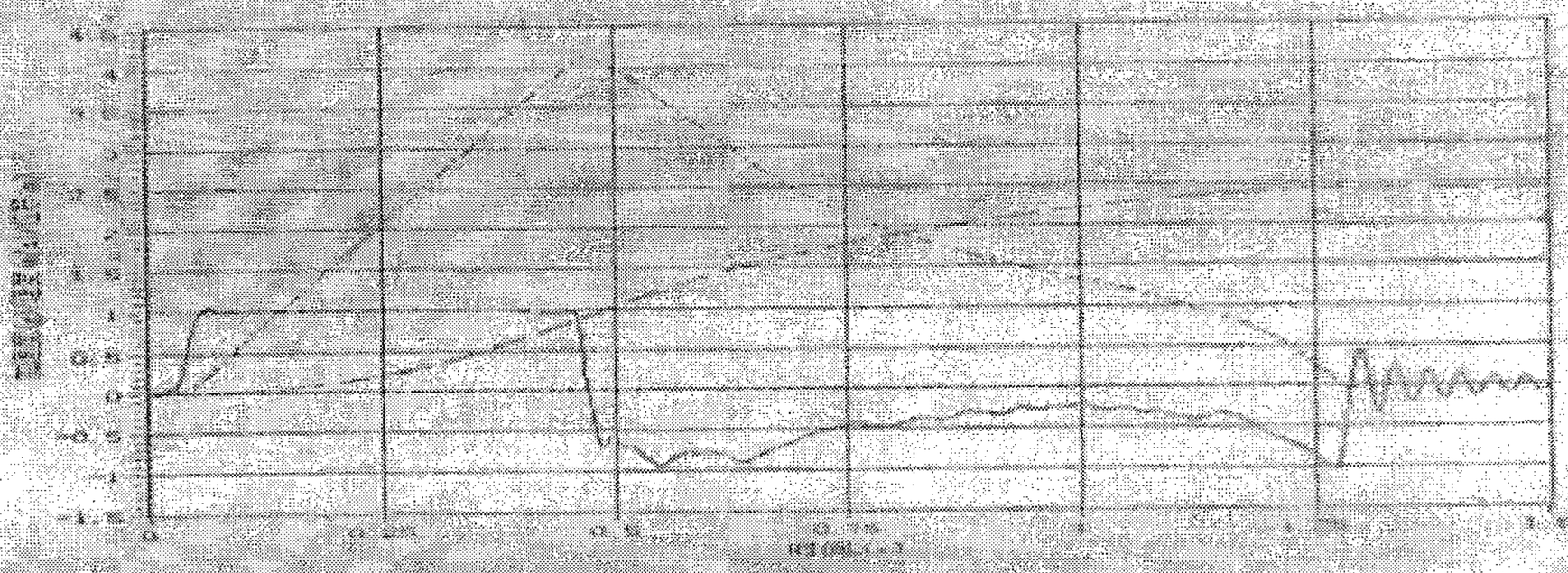
1900kg 2.50m/s No.3



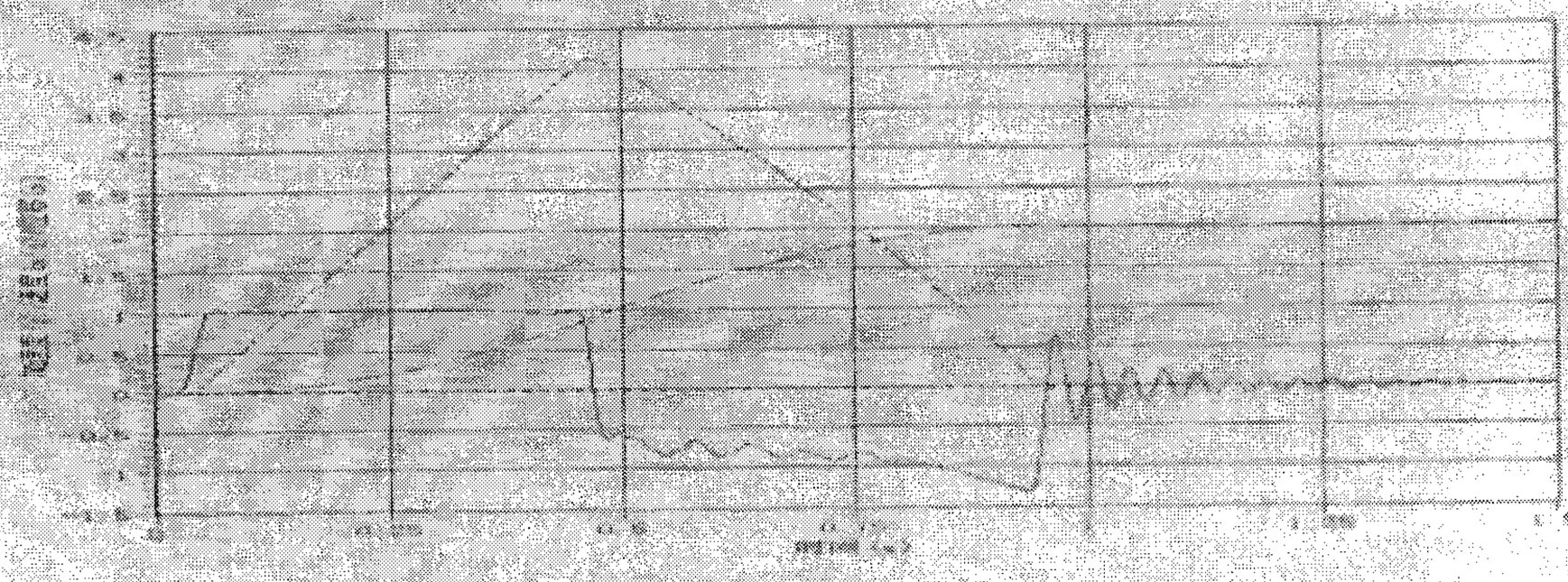
1900kg 2.50m/s No.4



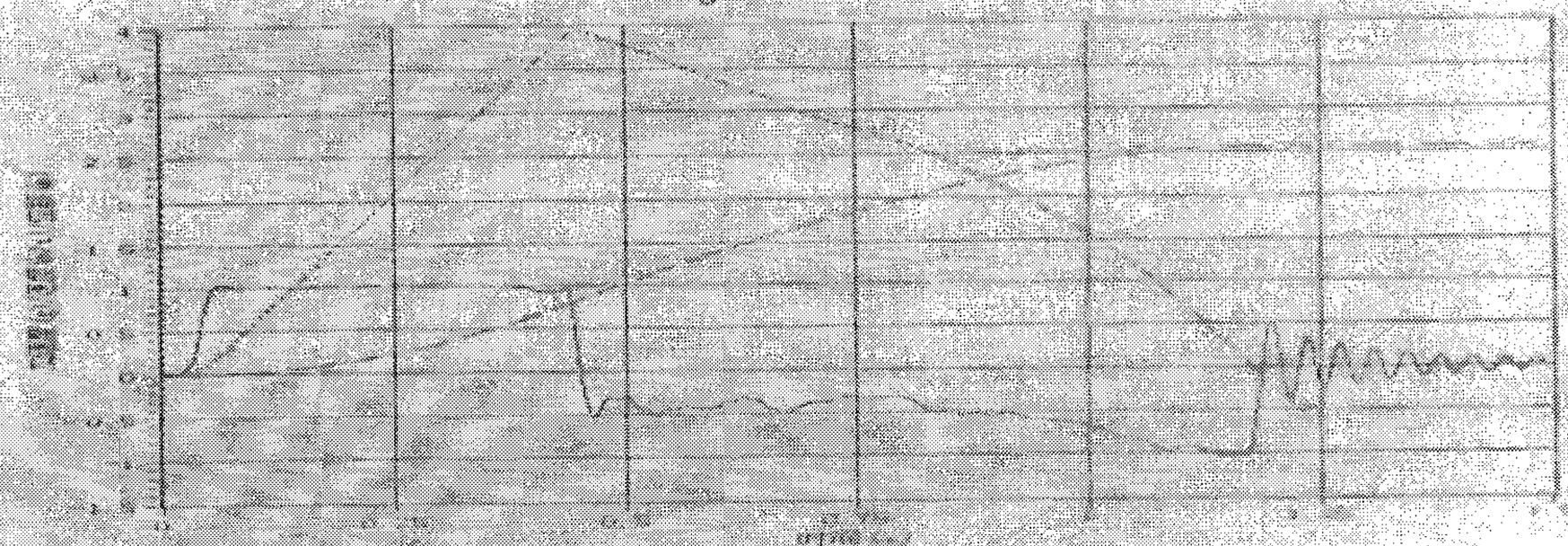
1000kg 2.50m/s No.1



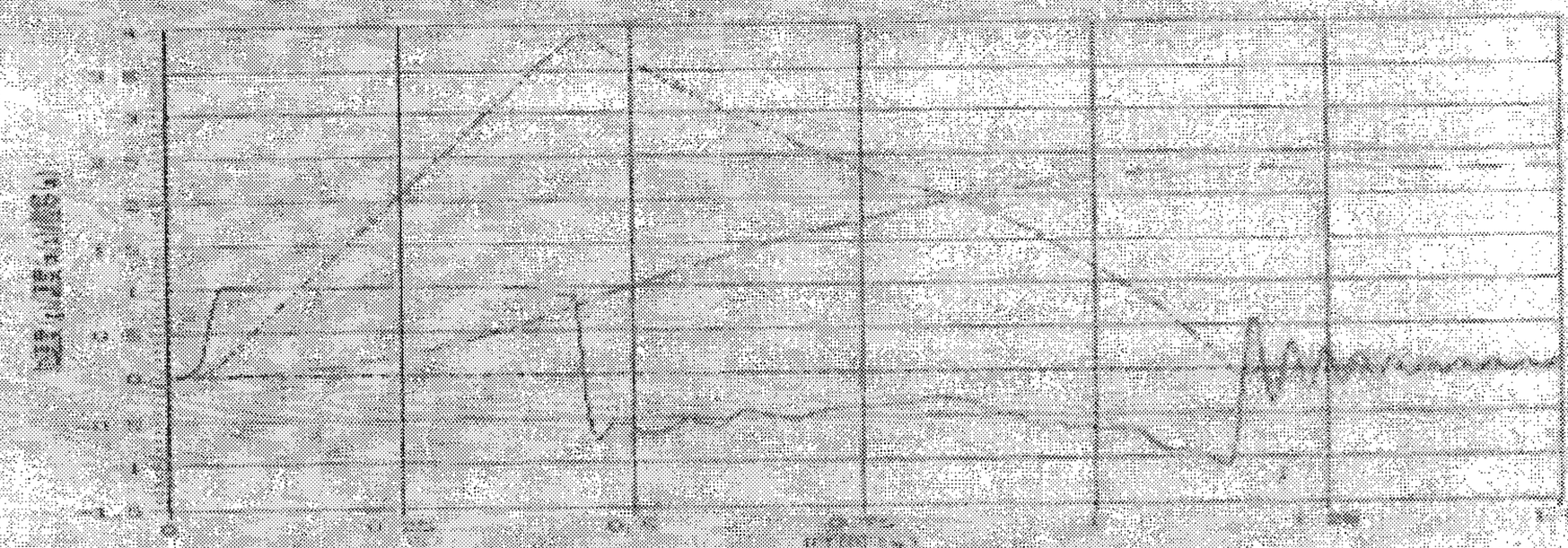
1000kg 2.50m/s No.2



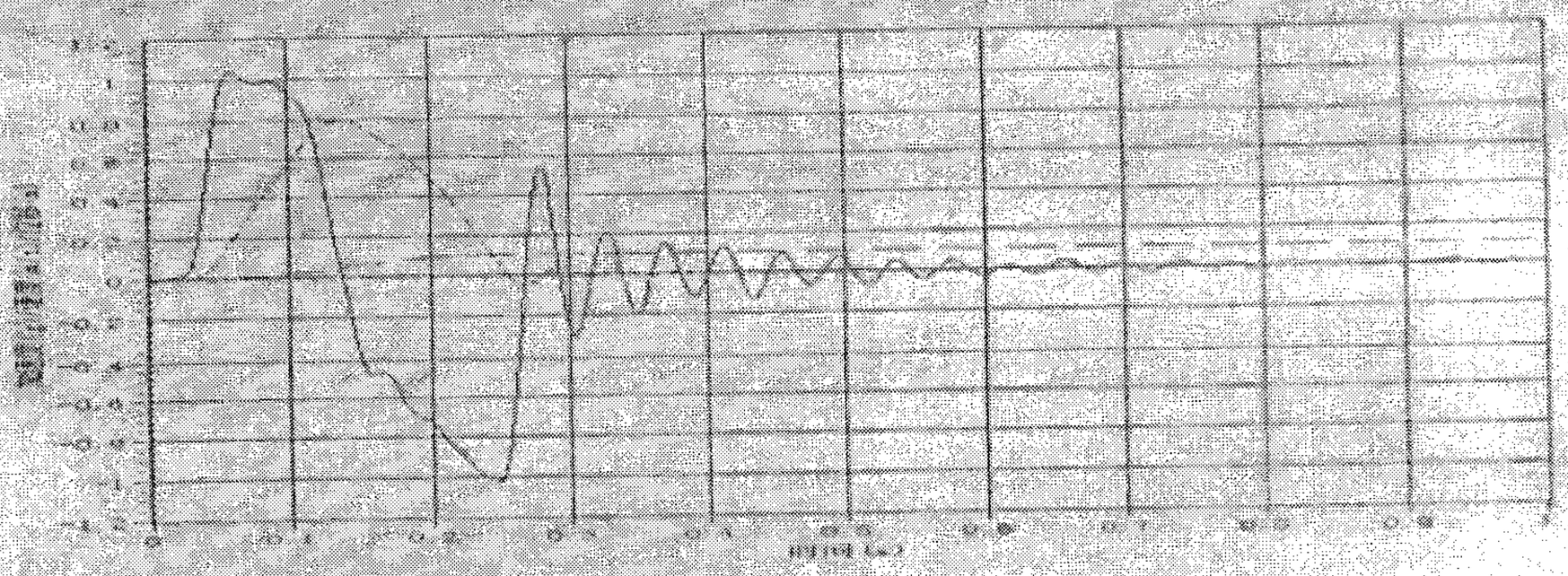
1000kg 2.50m/s No.3



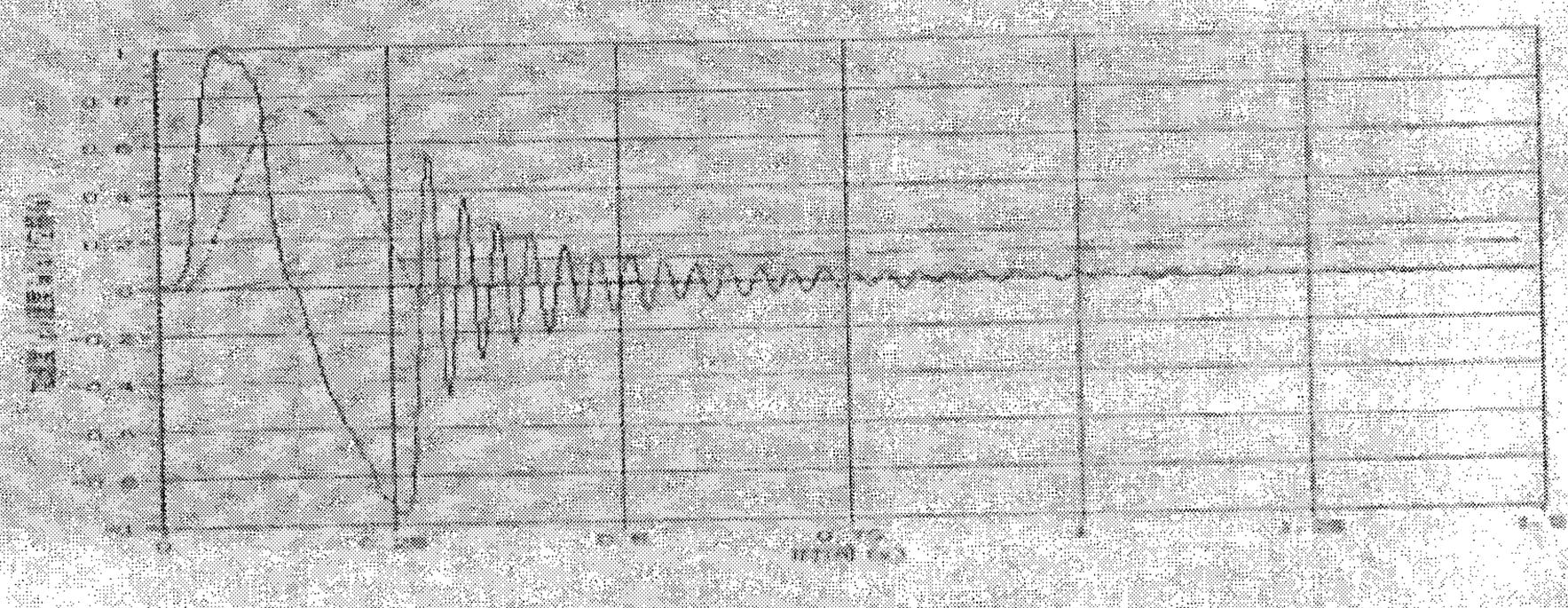
1000kg 2.50m/s No.4



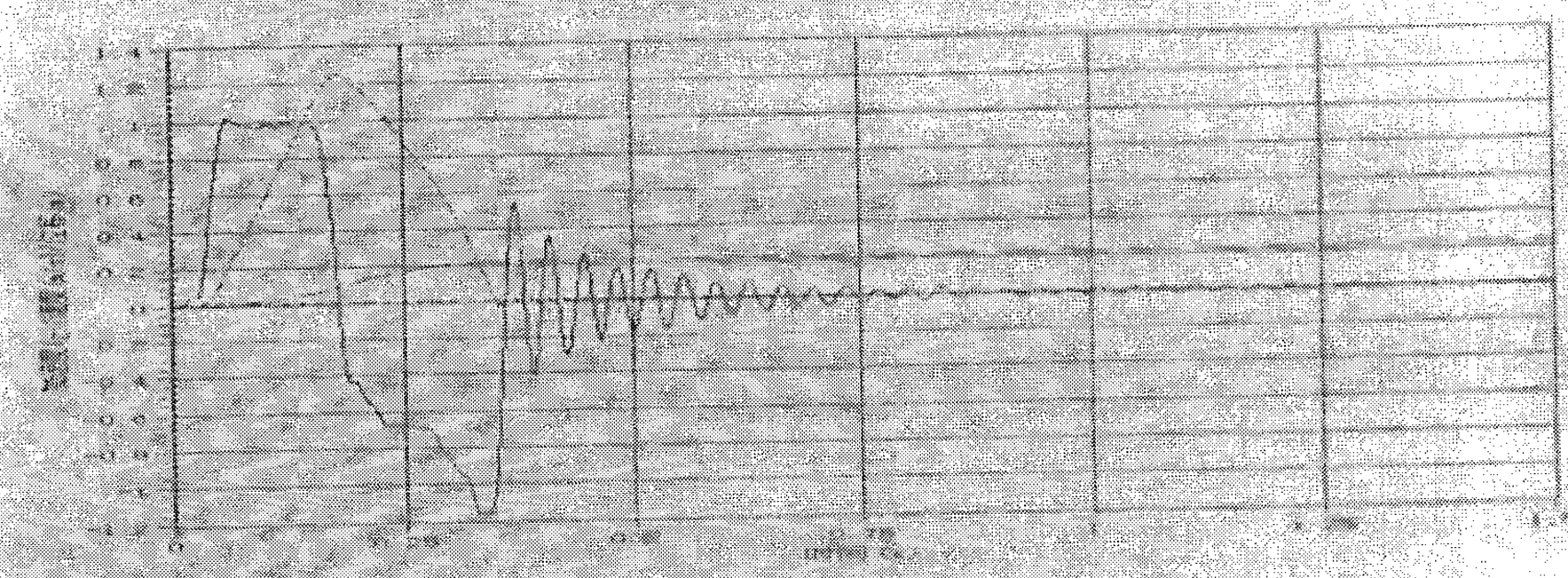
2800kg 0.25m/s No.1



1900kg 0.25m/s No.1



1000kg 0.25m/s No.1



Appendix 3 Sample photo