



Iberográfica

Capa Rota - Portugal

Comparison Whip Reaction

Compressibility Indentation

Doc. PROC - LAB - 016

Data: 08 - 07 - 2011

Folha. 1 de 21 Rev. 0

Item #	Brand /Model	Sample #/ / Job #	D0	D01	D04	Thickness		D1	D4	D5	Indentation		Ip1 %	Ip5 %	Comp. Loss %	Gauge Loss @			Hysteresis		Elastic Energy EENmm	Damping Capacity (DC)%	Test Time s	HW /T N/s	D ₀₄ -H _w /T N/s	LW /T N/s	L _w -D ₅ /T N/s	
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				μm	μm	1 st cycle μm	60kPa 1 st % μm	1060kPa μm								Wk/3 μm
1	B / III	57F/-	1,74	1,72	1,71	1,64	1,65	1,57	1,57	1,57	170	144	9,7	8,4	15,3	24	82,6	29	3	6,9	0,03	6,7	0,5	84,8	-2,5	-11,33	2,19	11,57
2	D / V	23F/889311	1,98	1,95	1,95	1,89	1,90	1,82	1,82	1,82	152	127	7,7	6,5	16,4	27	87,8	30	5	9,6	0,50	6,7	8,1	73,8	-5,86	-12,96	2,44	13,55
3	K / II	64F/-	1,98	1,93	1,92	1,86	1,88	1,80	1,79	1,79	175	130	8,8	6,8	25,6	49	85,8	57	12	19,6	1,10	7,1	15,6	77	-7,16	-12,24	3,91	12,94
4	J / I	19F/-	1,98	1,93	1,92	1,83	1,86	1,76	1,75	1,74	226	175	11,4	9,1	22,4	50	79,8	62	12	32,6	1,96	9,4	20,8	102,9	-7,01	-9,24	3,36	9,33
5	I / I	65F/-	1,93	1,85	1,82	1,56	1,68	1,41	1,37	1,38	518	450	26,9	24,6	13,1	75	74,3	101	33	121,0	6,50	24,3	26,7	252	-6,74	-3,51	2,75	3,6

LEGEND
Test Details

Standard:
ISO 12636 section 4.5

Equipment:
Lloyd LR 10K Plus

Speed: 1 mm/min
Test Time: (D5-D0) s

Thickness (mm)

D0; D01; D04: @ 60kPa
D4k/3; D5k/3: @ 393kPa
D1; D4, D5: @ 1060kPa

Indentation

I1 = (D0 - D1) mm
I5 = (D04 - D5) mm

Ip1 = $[(D0 - D1) / D0] * 100$ %
Ip5 = $[(D04 - D5) / D04] * 100$ %

Compressive Loss

Indentation reduction @ 1060kPa:
from the 1st to the 5th
compression cycles.
CL = $[(Ip1 - Ip5) / Ip1] * 100$ %

Gauge Loss @

60kPa 1stCycle: (D0 - D01) μm
1st%; 1stCycle/Full Test %
 $[(D0 - D01) / (D0 - D04)] * 100$ %
Full Test: (D0 - D04) μm
1060kPa: (D1 - D5) μm

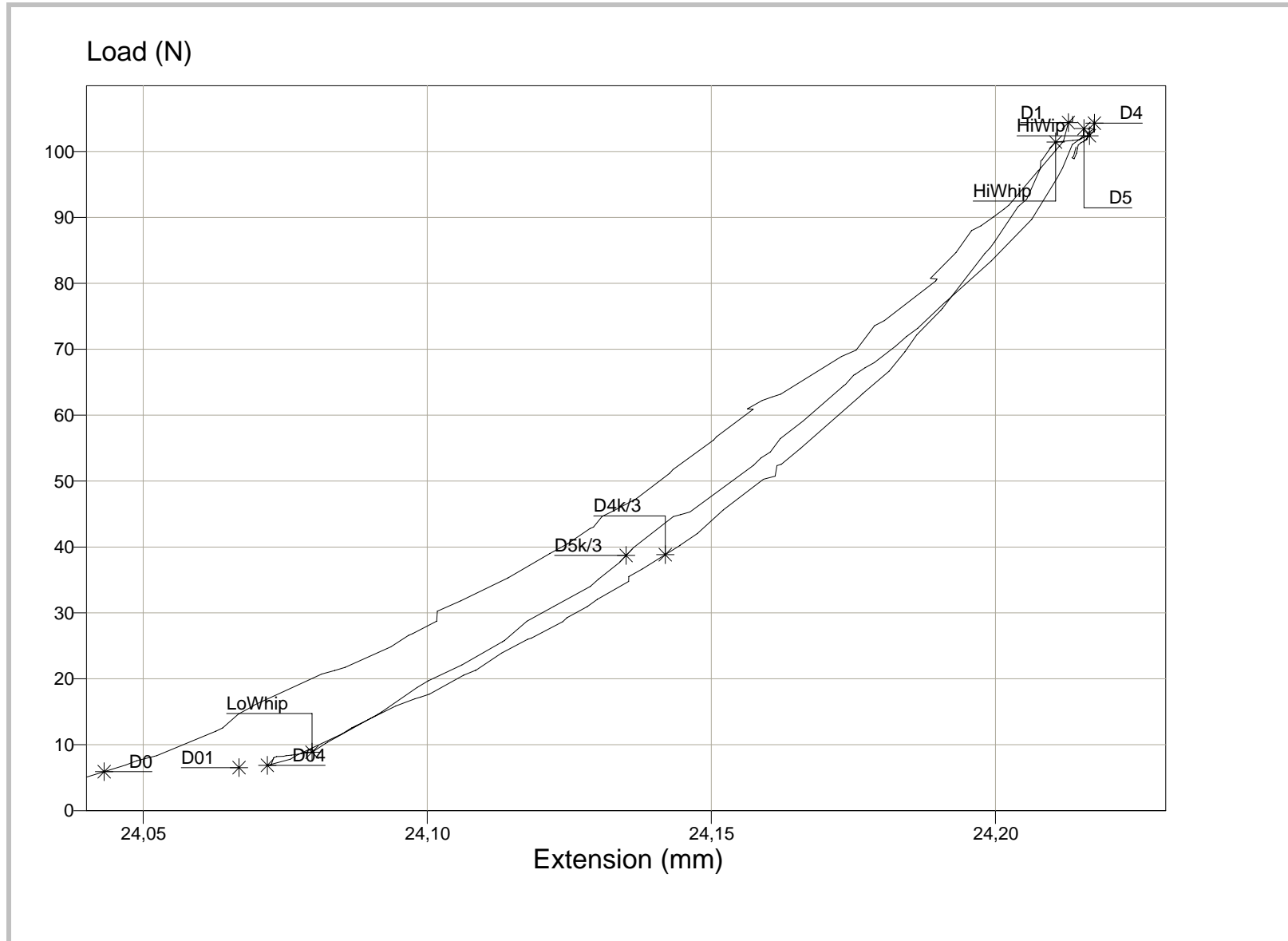
Hysteresis

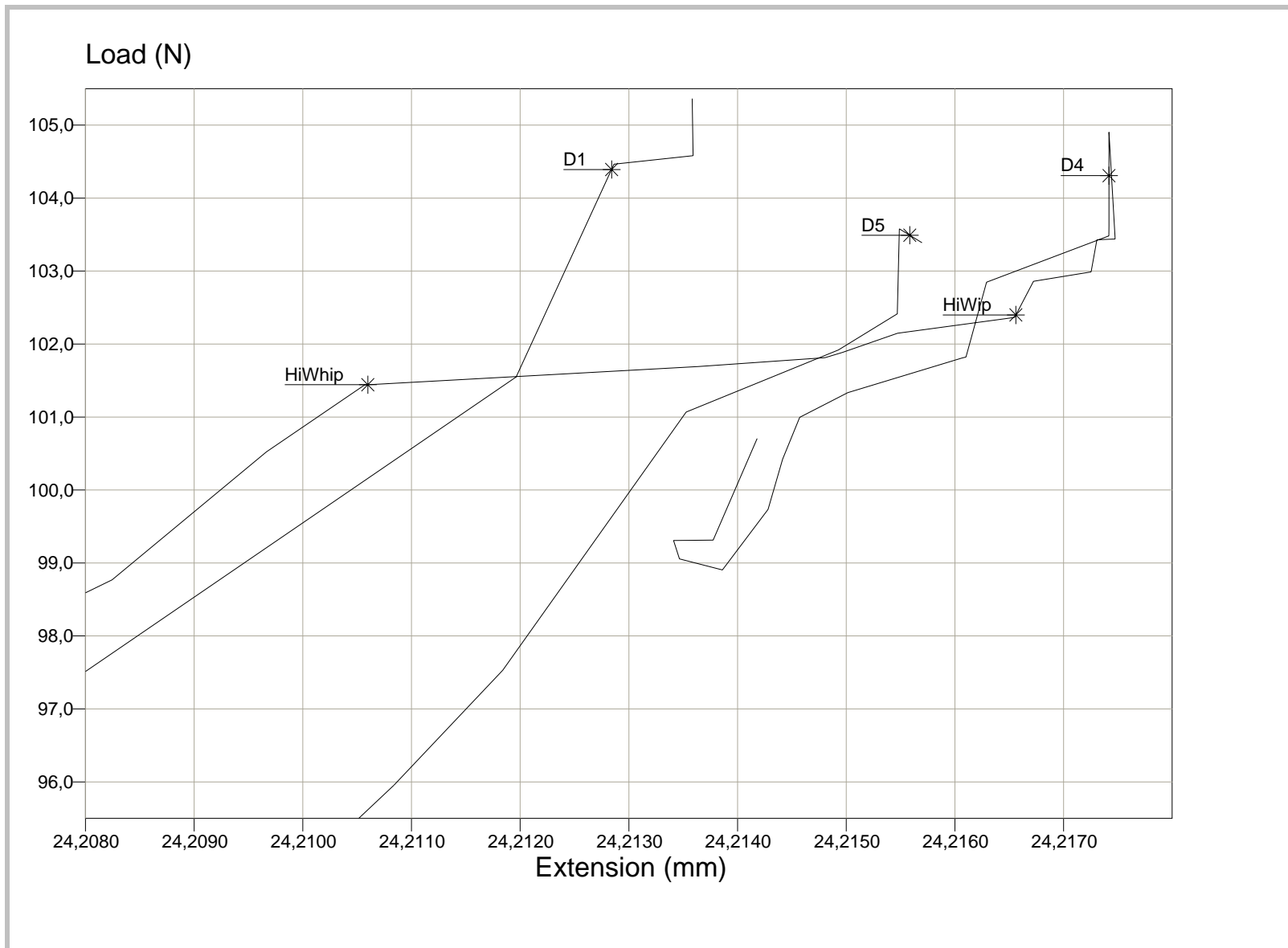
Values valid for a specific stress cycle
W(window):Gauge variation due to stress history
Wk/3: Gauge variation@393kPa (D5k/3-D4k/3) μm

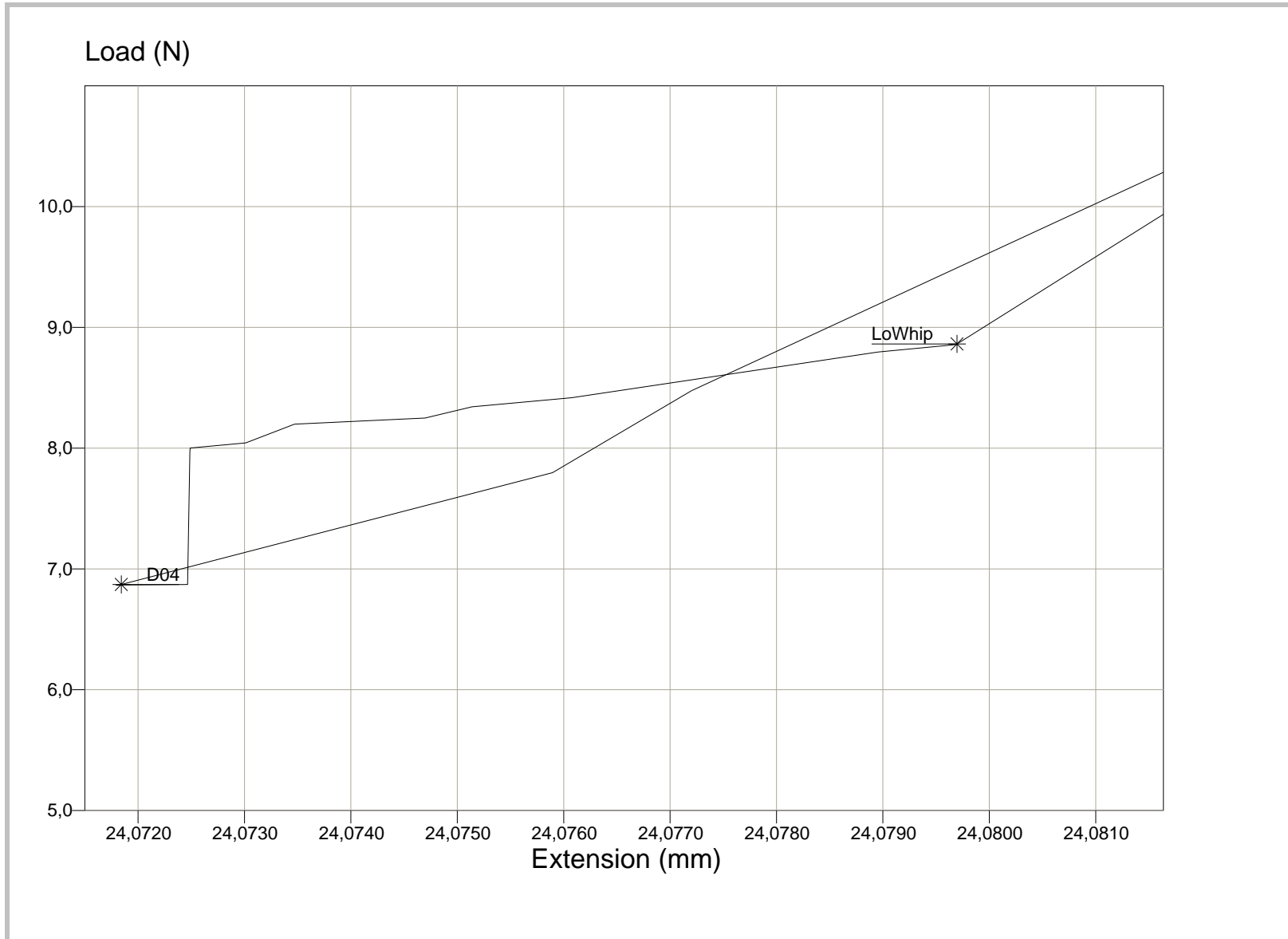
HE: Heat generated in one cycle (D5-D4) Nmm
EE: Elastic deformation energy (D5-D04) Nmm
DC: Damping Capacity $[(D5-D4) / (D5-D04)] * 100$ %

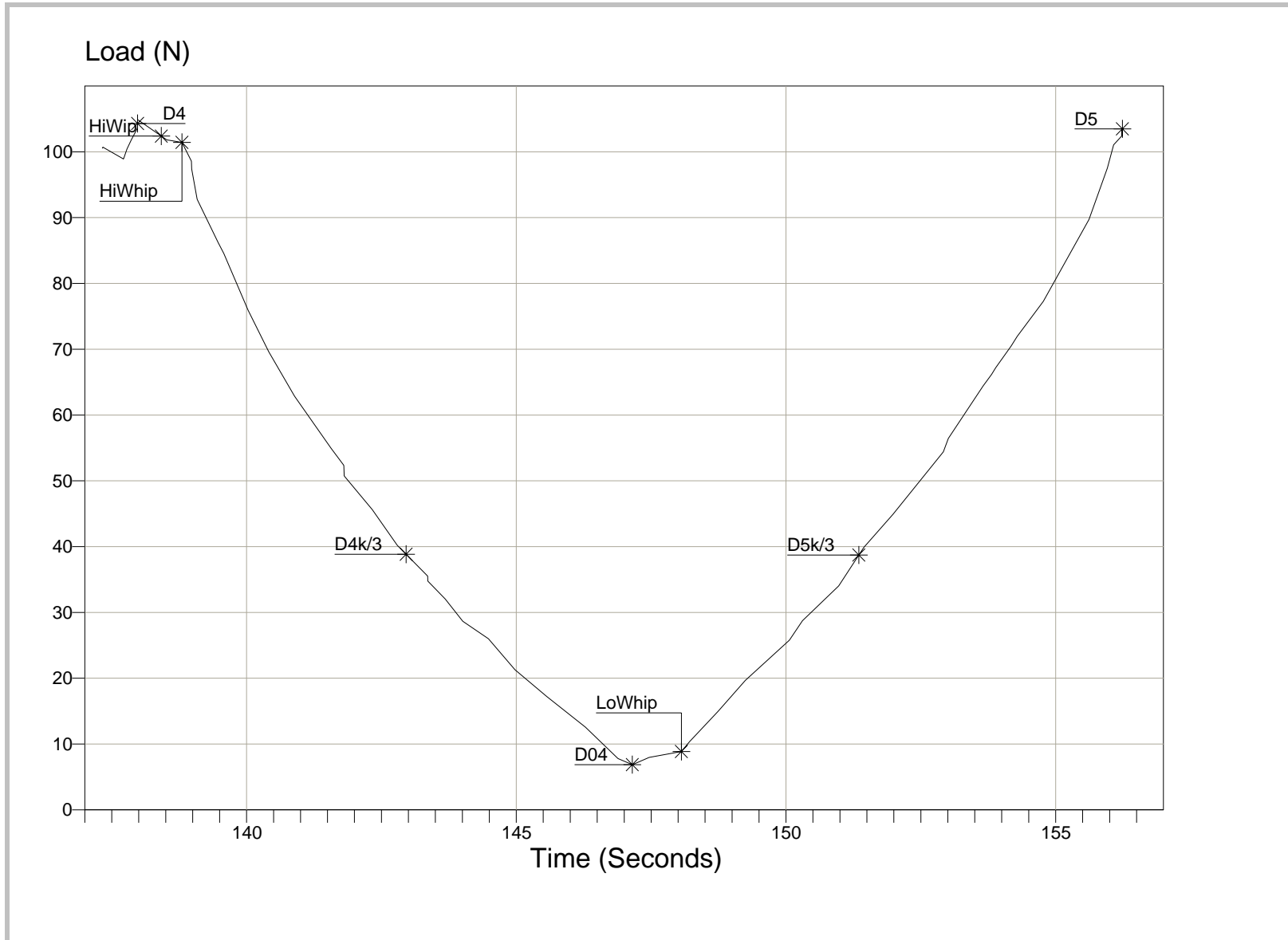
Whip Reaction

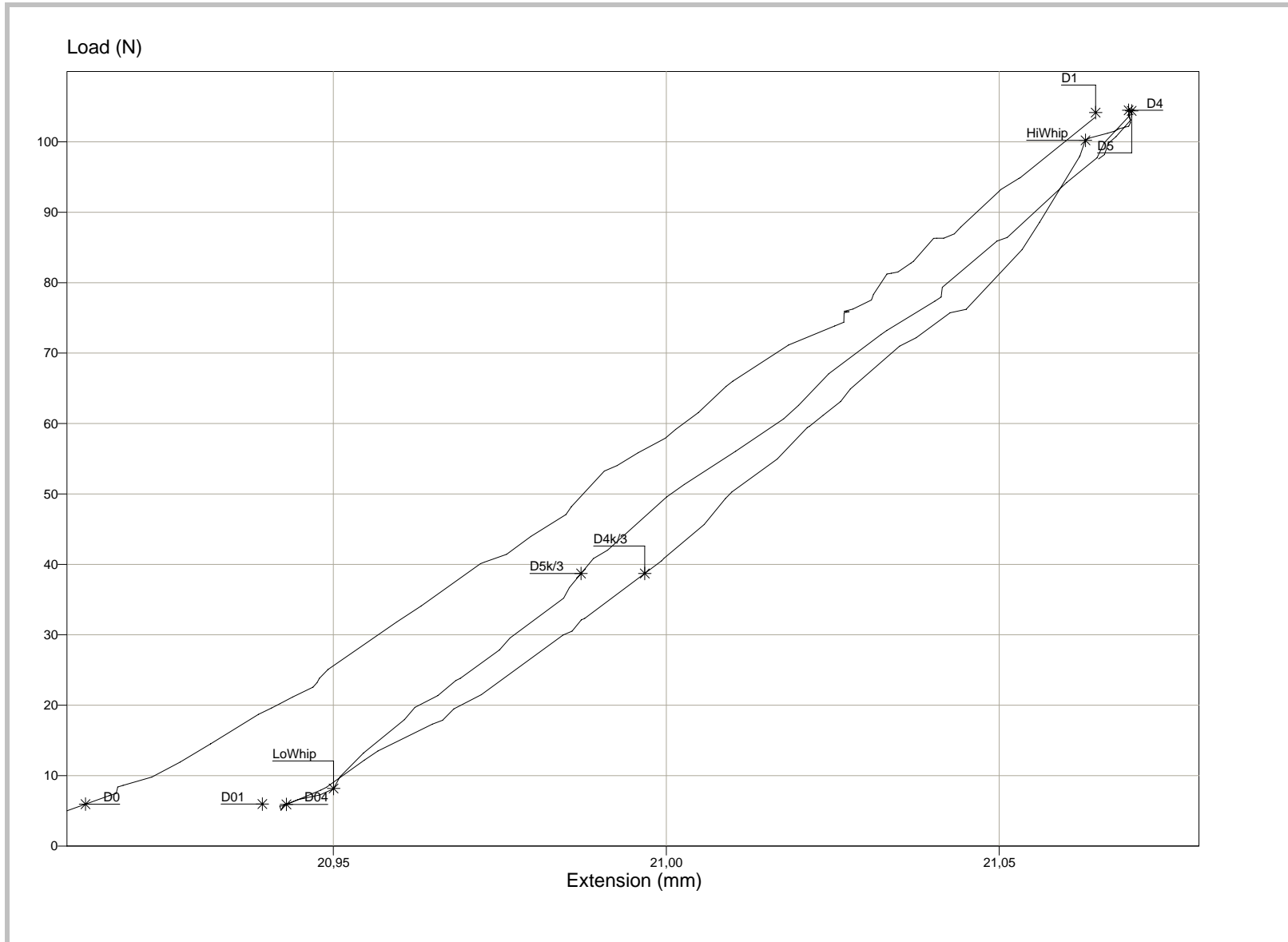
HW: Blanket reaction (HiWhip) @ maximum cycle load
HW/T: Load variation rate with time during HiWhip reaction N/s
D₀₄-H_w/T: Load variation rate with time during decompression N/s
LW: Blanket reaction (LoWhip) @ minimum cycle load
LW/T: Load variation rate with time during LoWhip reaction N/s
L_w-D₅/T: Load variation rate with time during compression N/s

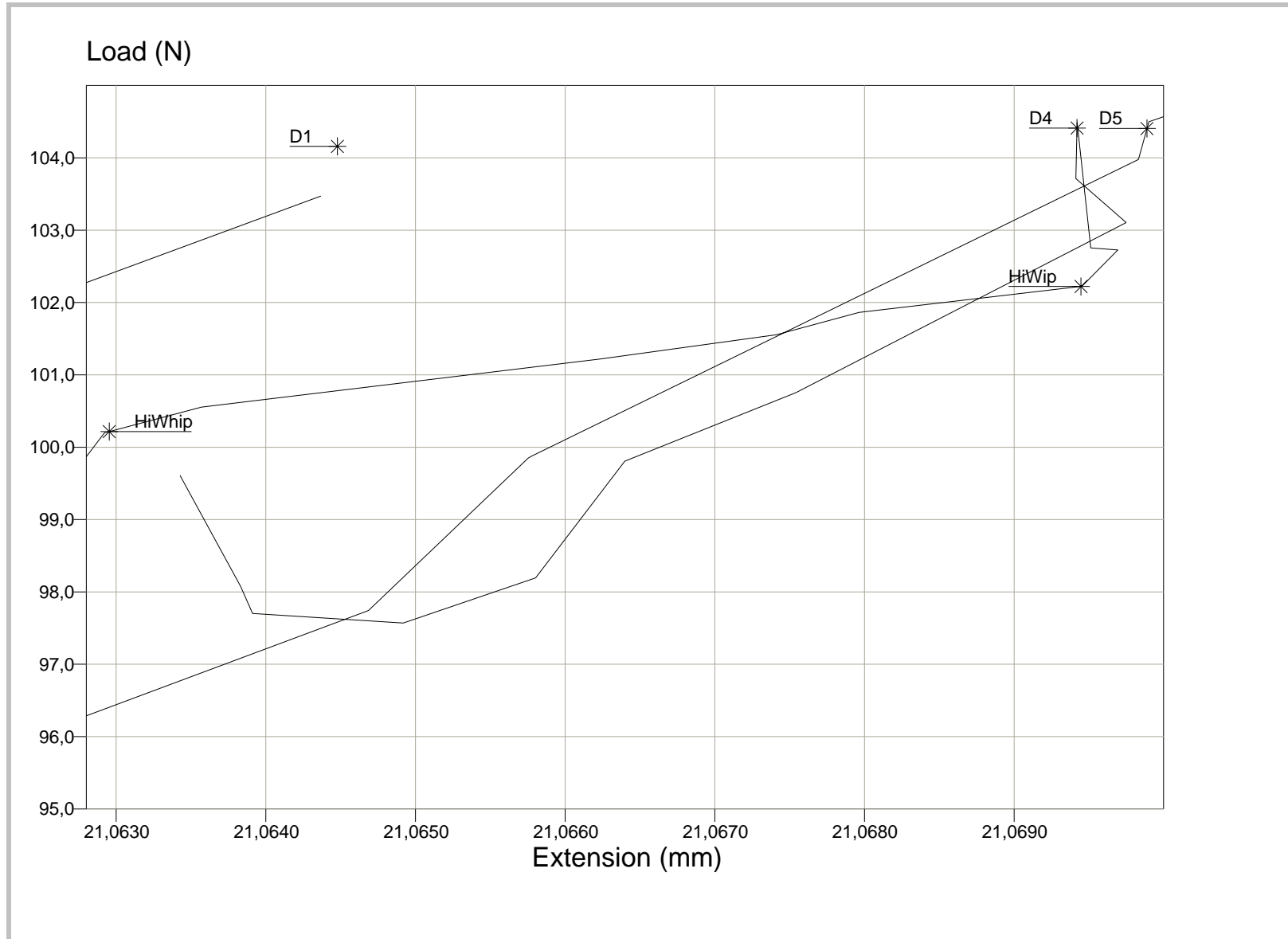


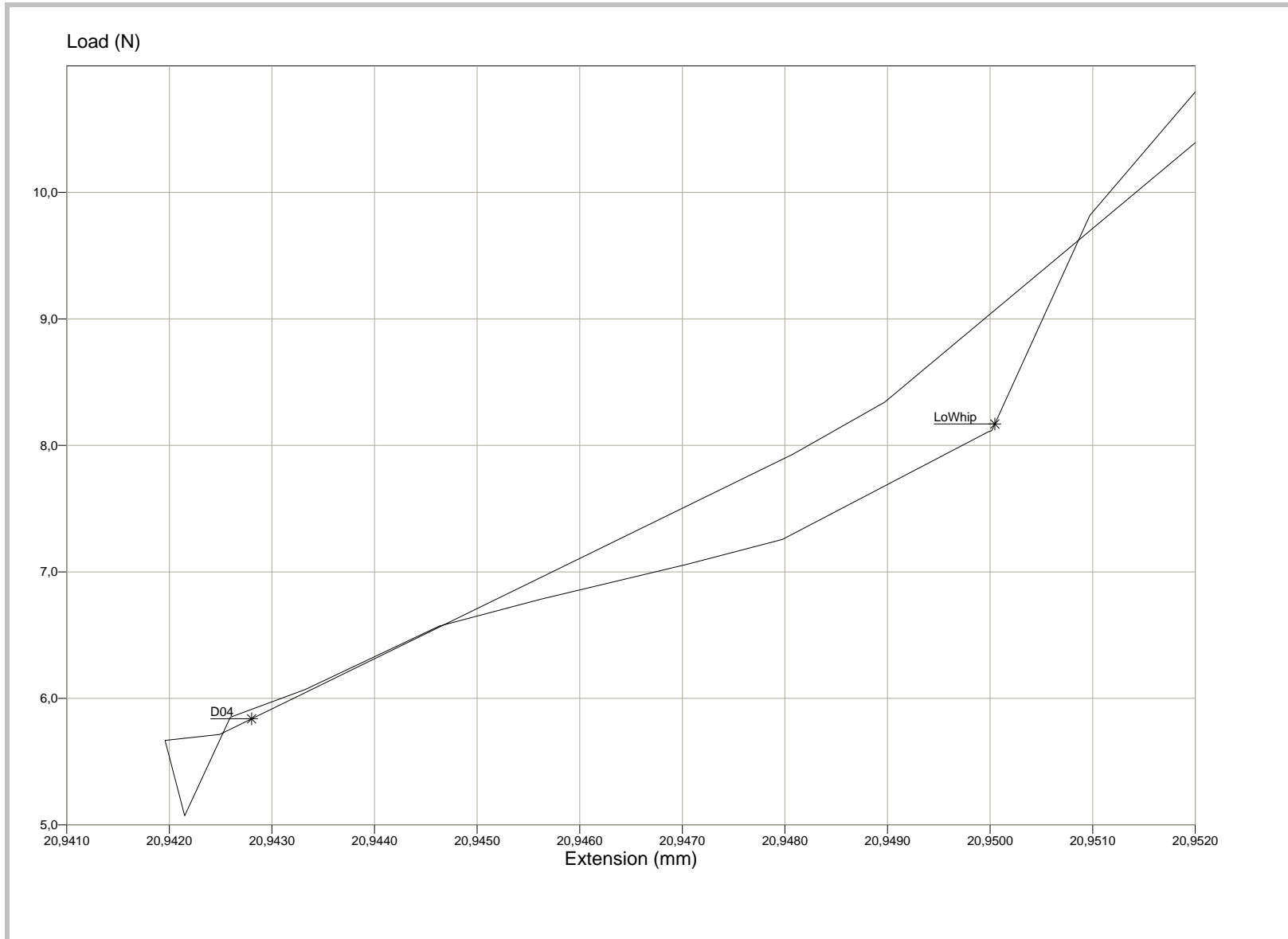


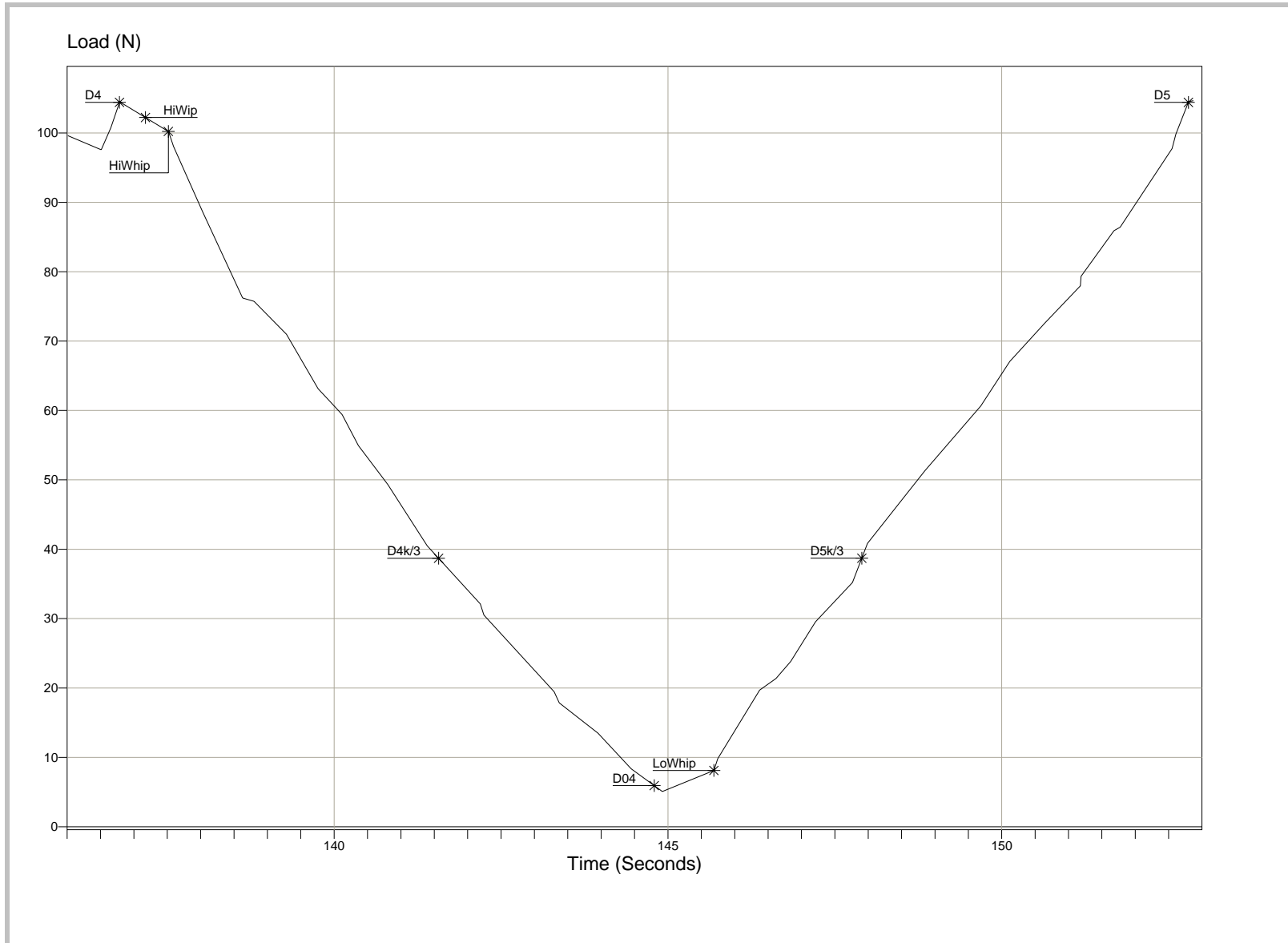


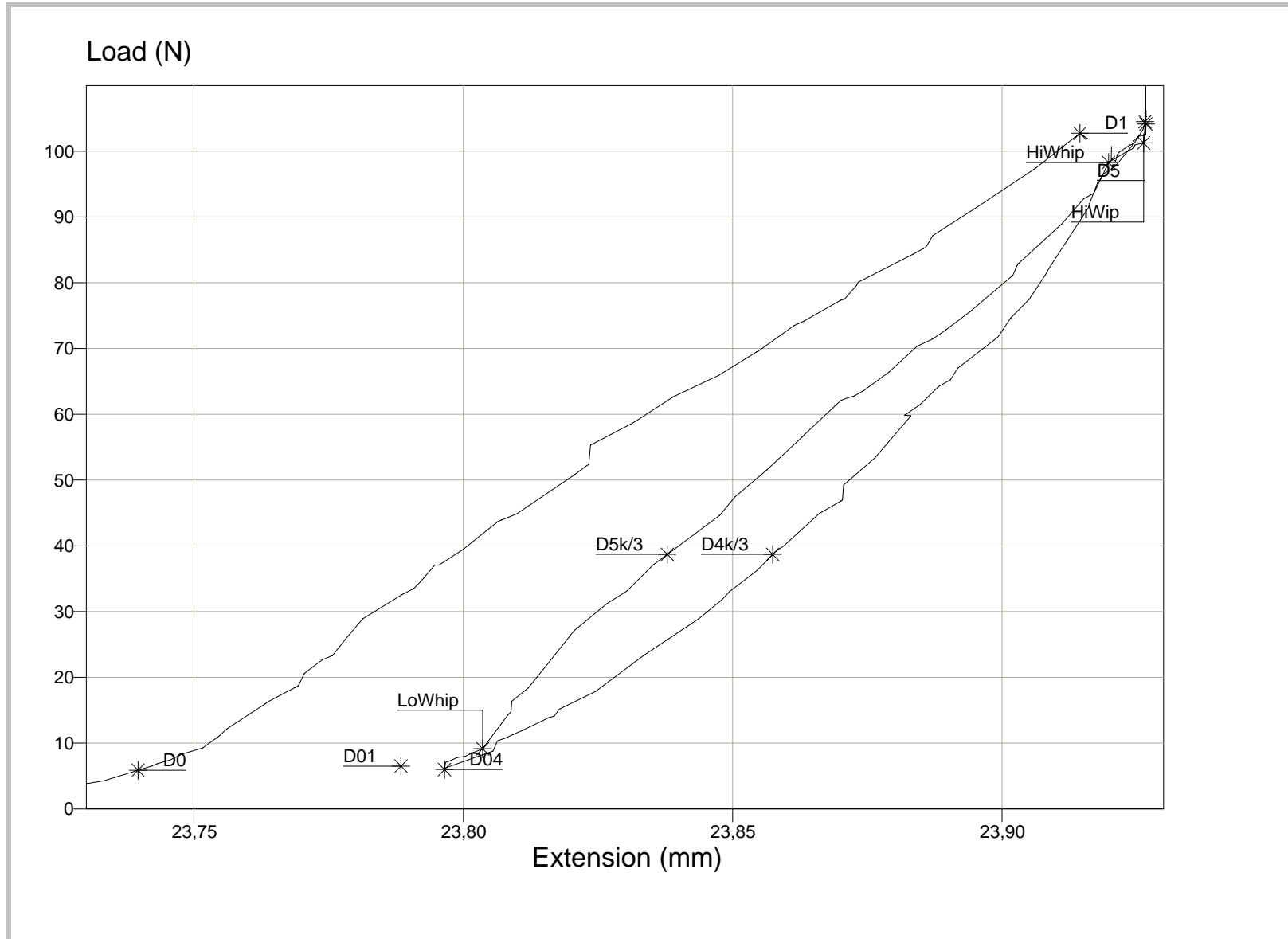


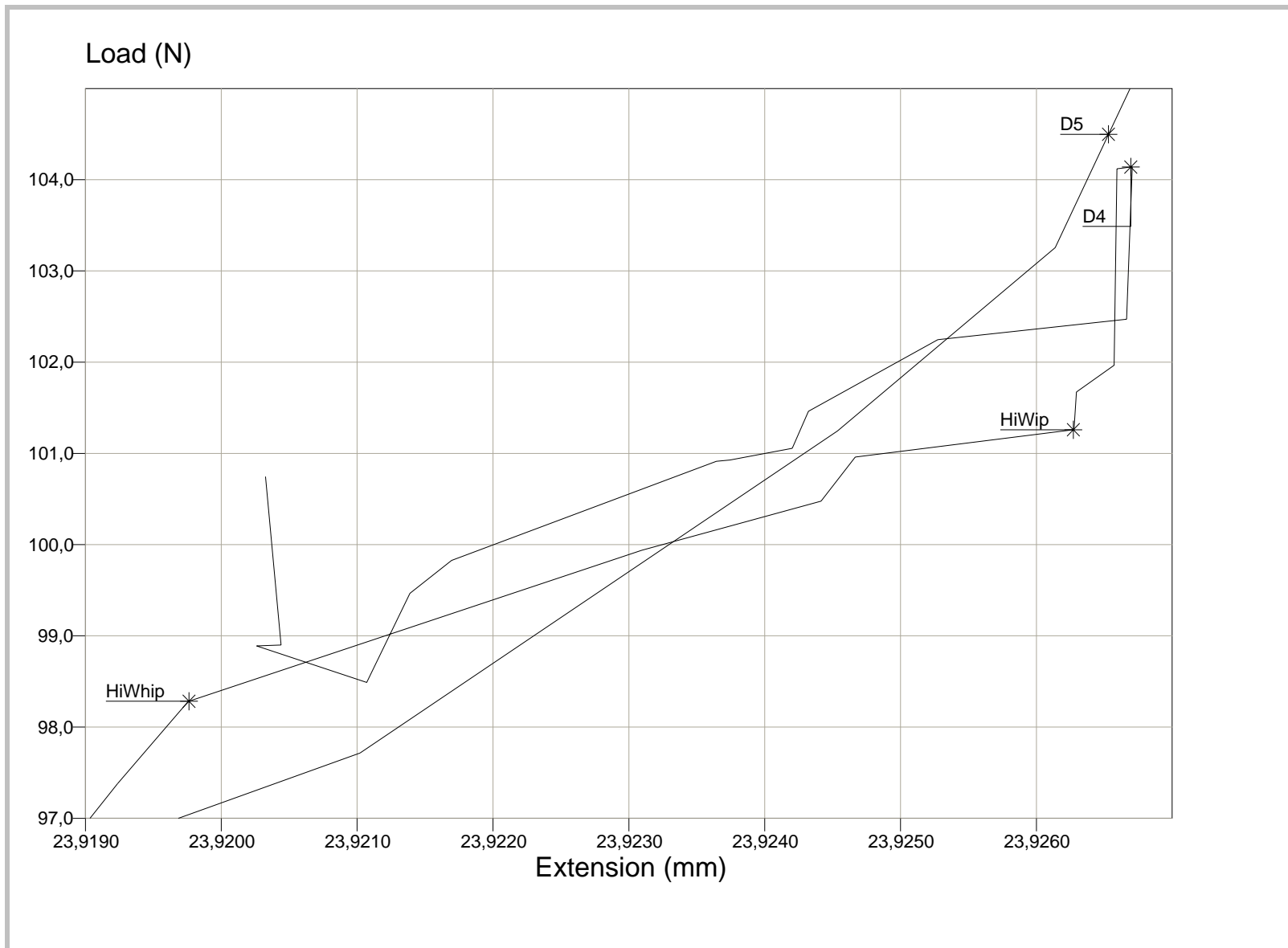


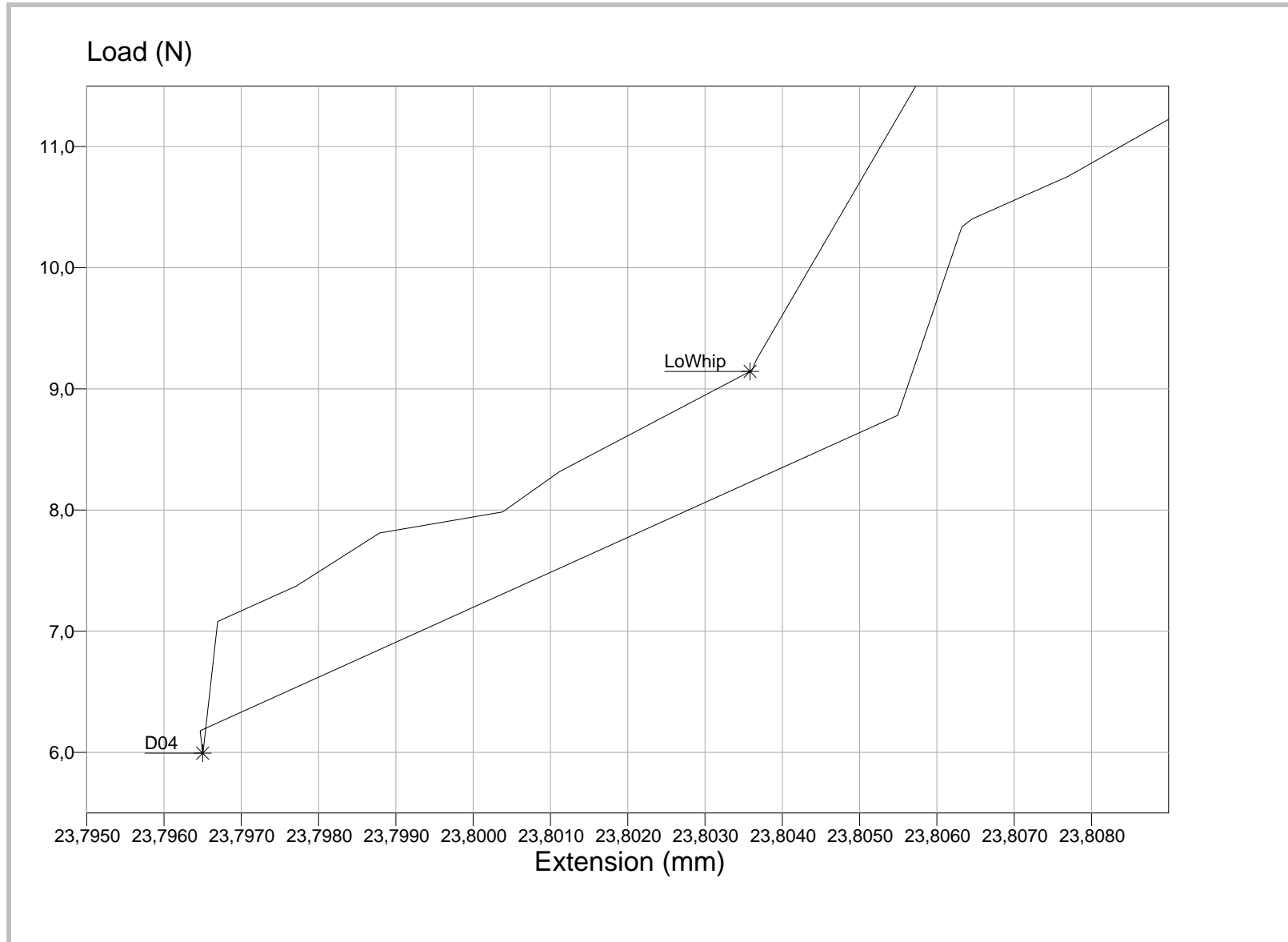


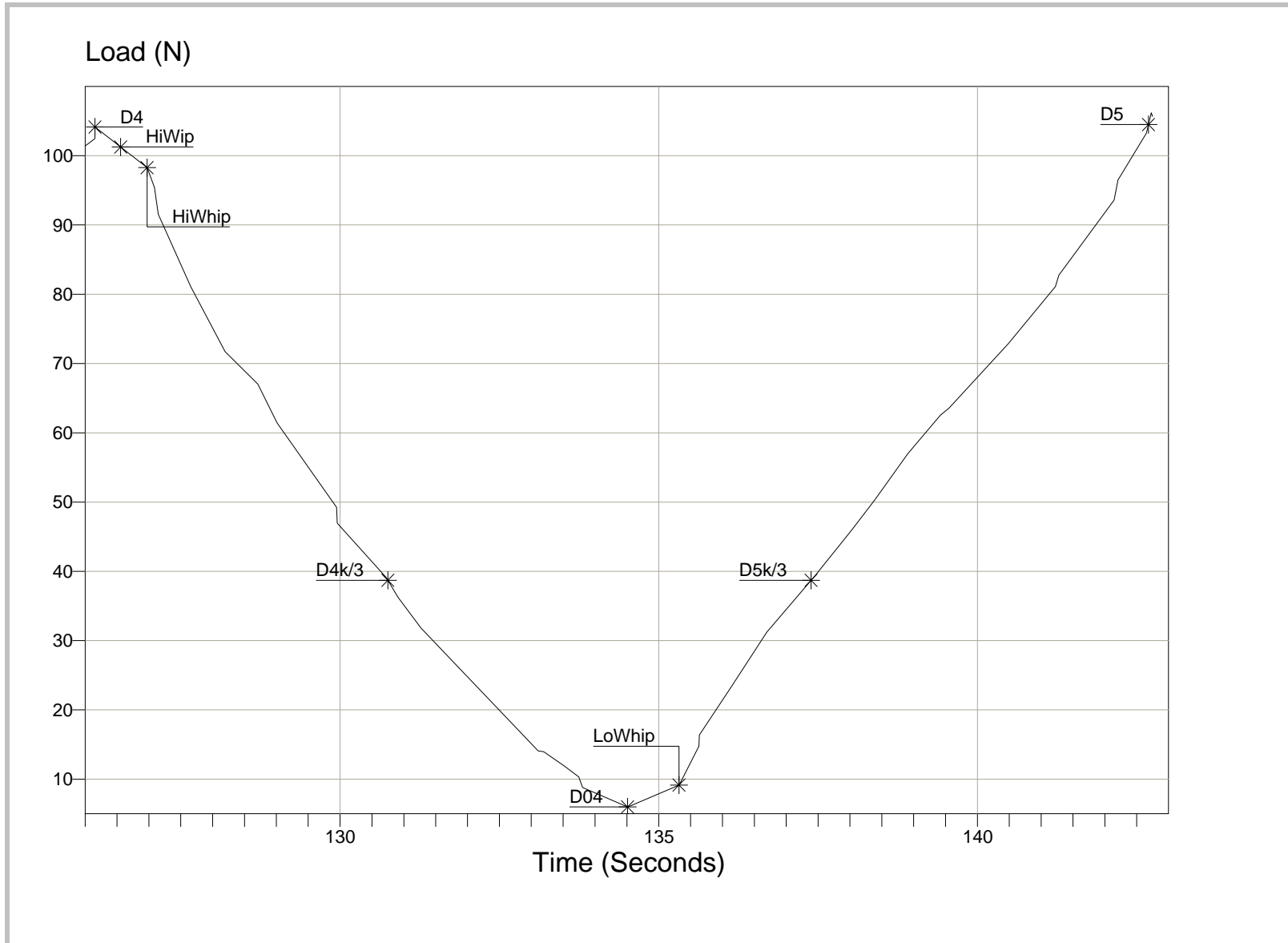














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“Whip” Reaction Distorted Hysteresis Cycle

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