Suspension Dyno DB4

Technical Specification

General Specifications	Power requirements
• *Adjustable speed-range:* 0-2000 mm/s • *Max load*: 5.000 N (optional 10.000 N load cell available) • *Max load @ 2000 mm/s:* 1800 N • *Adjustable stroke (10 fixed options):* range 15-100 mm • Plug-and-play control and acquisition software • Advanced data processing and export functions • Optical temperature sensor (optional)	*Supply voltage:* 240 VAC 50Hz – Single phase *Nominal current:* 16 A *Peak current:* 20 A Color code *Blue:* Neutral *Black, Brown or Gray:* Phase (400VAC between each phase – 240 VAC between Neutral and Phase) *Yellow-Green:* Ground

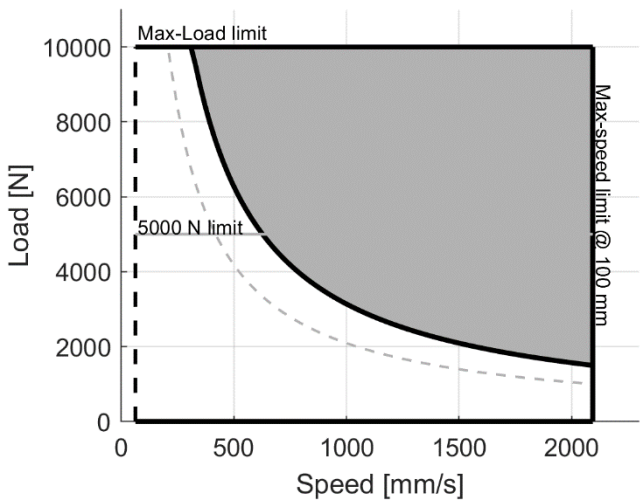


Figure 1: Power-envelope of Suspension Dyno DB4. The white area is the allowed combinations of Speed requested to the DB4 and Load produced by the damper.

DB4 Power envelope

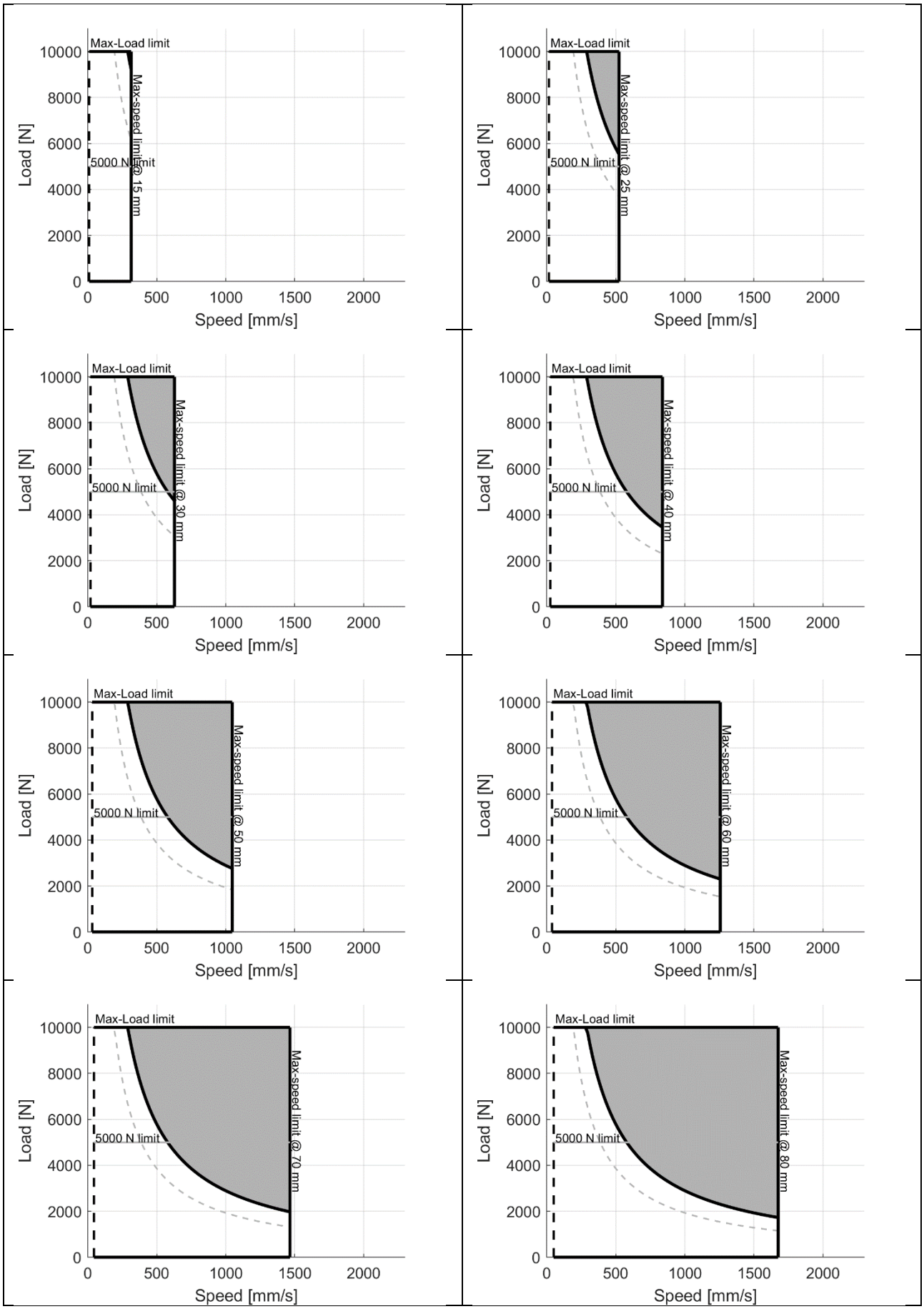
- *Horizontal axis:* linear speed of the Dyno
- *Vertical axis:* load produced by the damper
- *Horizontal black line:* ultimate maximum load
- *Horizontal gray line:* max load with standard load cell (5.000 N)
- *Vertical black line:* max speed limit allowed by stroke setting
- *Vertical dotted line:* minimum linear speed allowed by stoke setting
- *Curved black line:* power-limited curve (Heavy duty)
- *Curved dotted line:* power-limited curve (Normal operation)
- *Gray area:* power-limited area (Dyno stops)

How to read this chart?

The white area is the operative region of the dyno, while the gray highlights the power-limited region.

- To know the max speed achievable at any given load, trace a horizontal line and see the speed at which you cross a thick black line (envelope limit)
- To know the maximum load achievable at any given speed trace a vertical line until you hit the envelop limit.

Power envelopes and stroke settings



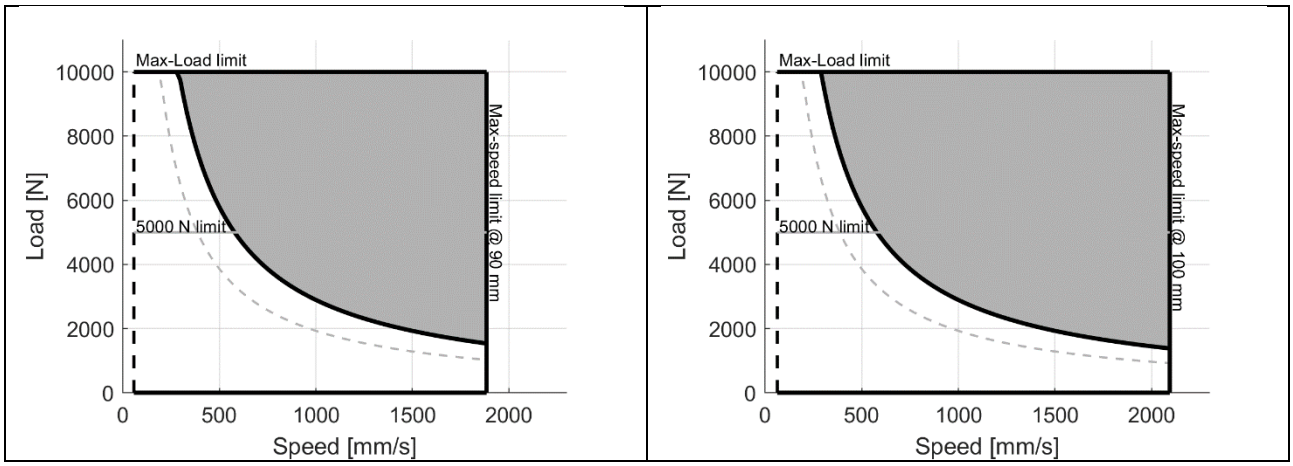


Figure 2: Power-envelope charts for all possible stroke settings for Suspension Dyno DB4 (15, 25, 30, 40, 50, 60, 70, 80, 90, 100 mm). Increasing the stroke, the maximum allowed speed increases, and the gray area, showing the power-limited region, increases.

Suspension Dyno DB4 – Performance summary

STROKE SETTING [MM]	MAX SPEED [MM/S]	MAX LOAD [N]
15	310	9.300*
25	520	5.300*
30	620	4.600
40	830	3.400
50	1000	2.800
60	1.200	2.400
70	1.400	2.000
80	1.600	1.800
90	1.800	1.600
100	2.000	1.400

*: Max load achievable only with optional load cell (10.000 N). With the standard load cell, the maximum load is limited to 5.000 N.

Suspension Dyno DB4-Plus

Technical Specification

General Specifications

- *Adjustable speed-range:* 0-2000 mm/s
- *Max load:* 5.000 N (optional 10.000 N load cell available)
- *Max load @ 2000 mm/s*: 5000 N

- *Adjustable stroke (10 fixed options):* range 15-100 mm
- Plug-and-play control and acquisition software
- Advanced data processing and export functions
- Optical temperature sensor (optional)

Power requirements

Supply voltage: 400 VAC 50 Hz– Three phase
Nominal current: 16 A
Peak current: 32 A

Color code
Blue: Neutral
Black, Brown or Gray: Phase
Yellow-Green: Ground

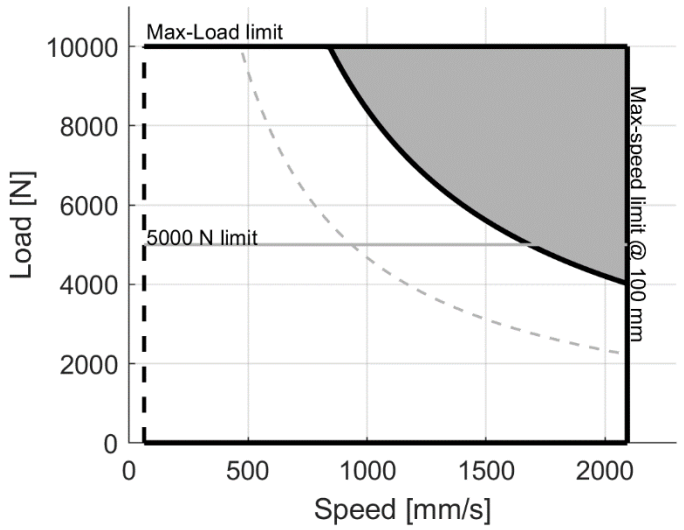


Figure 1: Power-envelope of Suspension Dyno DB4-Plus. The white area is the allowed combinations of Speed requested to the DB4-Plus and Load produced by the damper.

DB4-Plus Power envelope

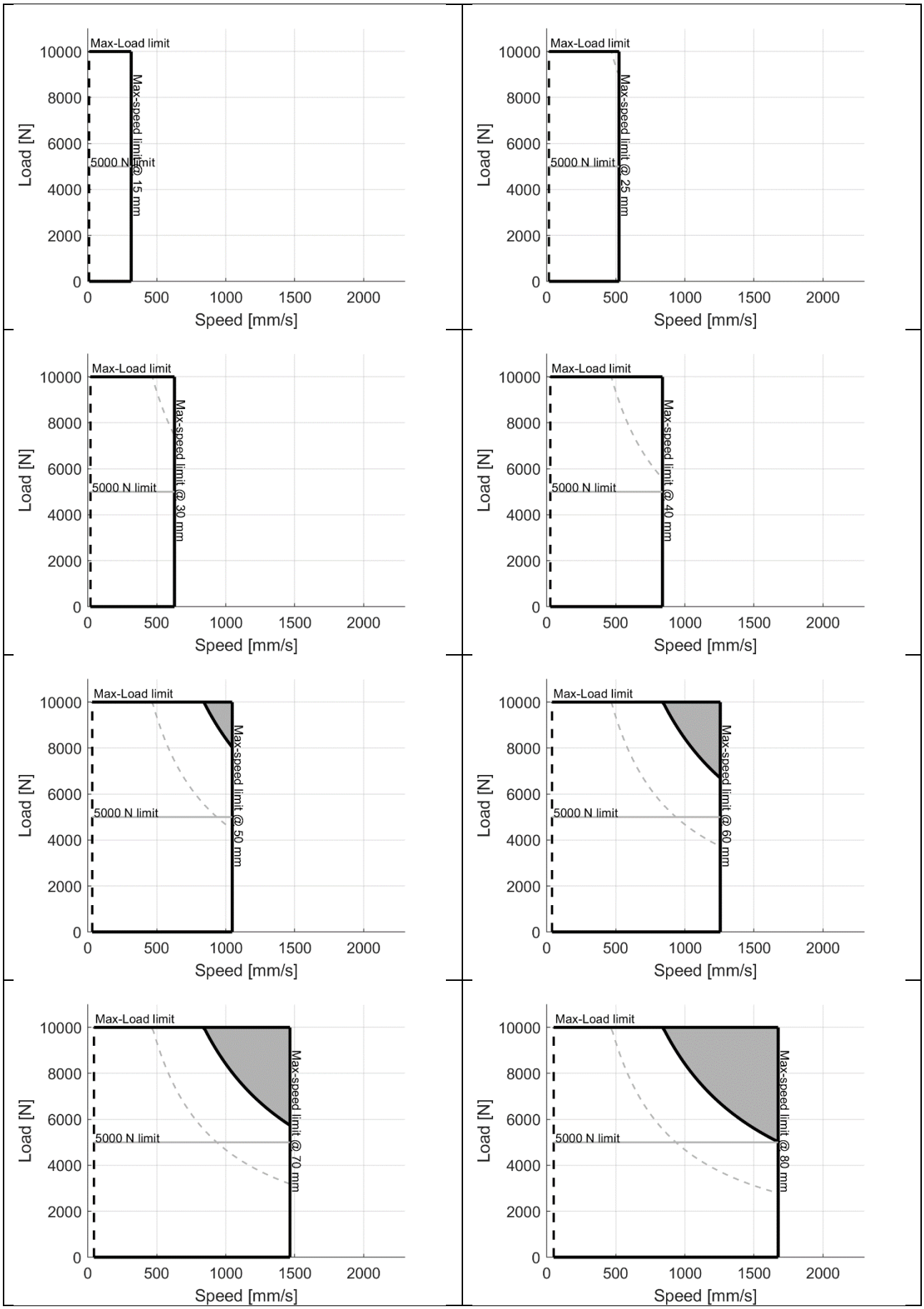
- *Horizontal axis:* linear speed of the Dyno
- *Vertical axis:* load produced by the damper
- *Horizontal black line:* ultimate maximum load
- *Horizontal gray line:* max load with standard load cell (5.000 N)
- *Vertical black line:* max speed limit allowed by stroke setting
- *Vertical dotted line:* minimum linear speed allowed by stoke setting
- *Curved black line:* power-limited curve (Heavy duty)
- *Curved dotted line:* power-limited curve (Normal operation)
- *Gray area:* power-limited area (Dyno stops)

How to read this chart?

The white area is the operative region of the dyno, while the gray highlights the power-limited region.

- To know the max speed achievable at any given load, trace a horizontal line and see the speed at which you cross a thick black line (envelope limit)
- To know the maximum load achievable at any given speed trace a vertical line until you hit the envelop limit.

Power envelopes and stroke settings



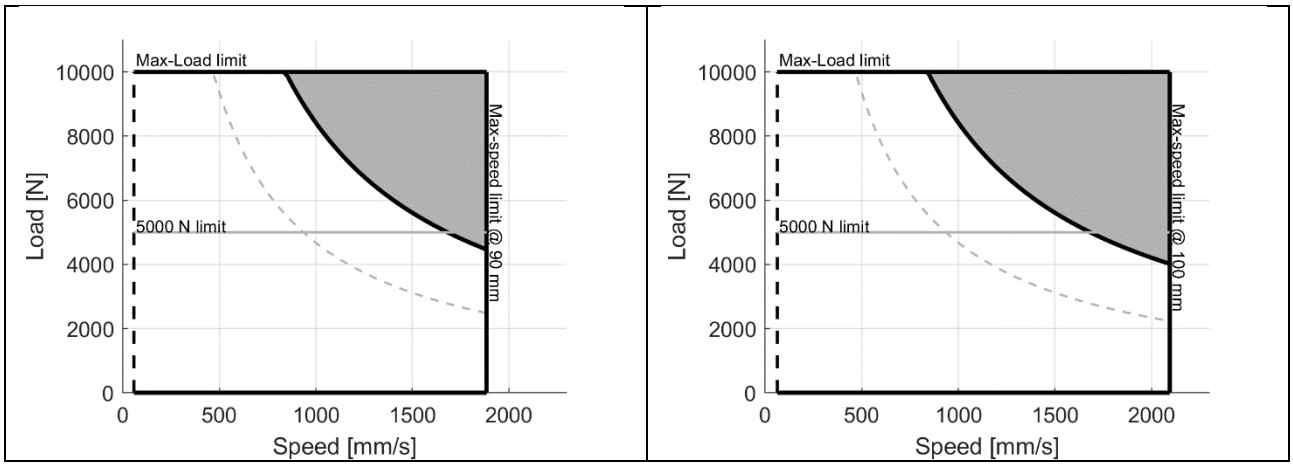


Figure 2: Power-envelope charts for all possible stroke settings for Suspension Dyno DB4-Plus (15, 25, 30, 40, 50, 60, 70, 80, 90, 100 mm). Increasing the stroke, the maximum allowed speed increases, and the gray area, showing the power-limited region, increases.

Suspension Dyno DB4-Plus – Performance summary

STROKE SETTING [MM]	MAX SPEED [MM/S]	MAX LOAD [N]
15	310	10.000*
25	520	10.000*
30	620	10.000*
40	830	10.000*
50	1000	8.400*
60	1.200	6.900*
70	1.400	6.000*
80	1.600	5.200*
90	1.800	4.600
100	2.000	4.200

*: Max load achievable only with optional load cell (10.000 N). With the standard load cell, the maximum load is limited to 5.000 N.

DB4 or DB4-Plus?

How to choose your Dyno

General Description (for both DB4 and DB4-Plus)

- *Adjustable speed-range:* 0-2000 mm/s
- *Max load:* 5.000 N (optional 10.000 N load cell available)

- *Adjustable stroke (10 fixed options):* range 15-100 mm
- Plug-and-play control and acquisition software
- Advanced data processing and export functions
- Optical temperature sensor (optional)

Main differences between DB4 and DB4-Plus

Supply voltage

DB4-Plus require a three-phase electric supply (see Power requirements).

Available power

DB4-Plus is more powerful and thus allows you to explore a wider range of Speed-Load combination. However, DB4 might be the best quality-to-price option for your needs.

See the power-envelope maps to make the best choice for you!

Power requirements	
DB4 *Supply voltage:* 240 VAC 50 Hz– Single phase *Nominal current: 16 A* *Peak current:* 20 A	***DB4-Plus*** *Supply voltage:* 400 VAC 50 Hz– Three-phase *Nominal current: 16 A* *Peak current:* 32 A
Color code *Blue:* Neutral *Black, Brown or Gray:* Phase (400VAC between each phase – 240 VAC between Neutral and Phase) *Yellow-Green:* Ground	Color code *Blue:* Neutral *Black, Brown or Gray:* Phase *Yellow-Green:* Ground

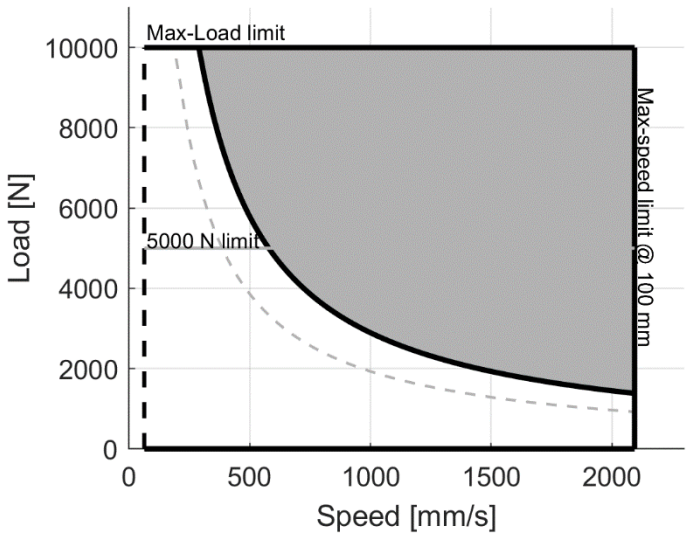


Figure 1: Power-envelope of Suspension Dyno DB4. The white area is the allowed combinations of Speed requested to the DB4 and Load produced by the damper.

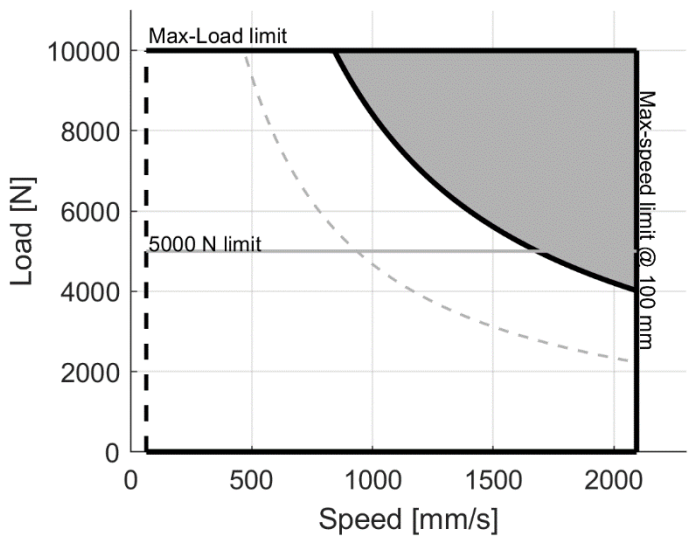


Figure 2: Power-envelope of Suspension Dyno DB4-Plus. The white area is the allowed combinations of Speed requested to the DB4-Plus and Load produced by the damper.

Power envelope

- *Horizontal axis:* linear speed of the Dyno
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Comparison between DB4 and DB4-Plus

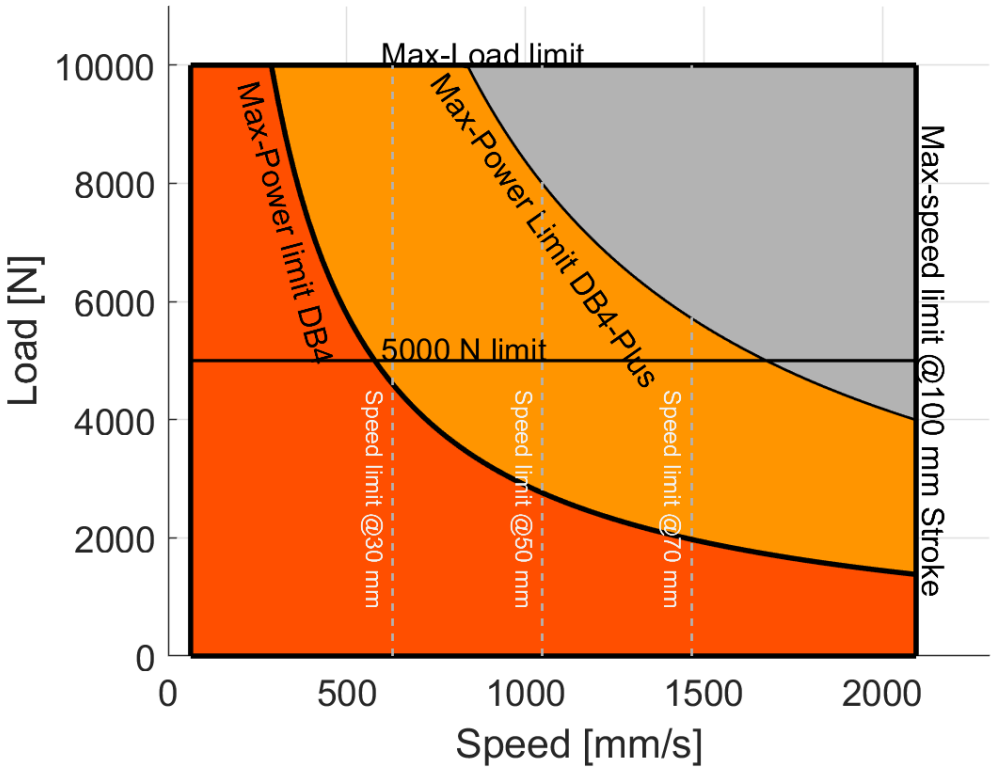

Figure 3: Power-envelope charts for all possible stroke settings for Suspension Dyno DB4/DB4-Plus (15, 25, 30, 40, 50 , 60, 70, 80, 90, 100 mm). Increasing the stroke, the maximum allowed speed increases, and the gray area, showing the power-limited region, increases.

You can choose which version of Suspension Dyno suits you best looking at Figure 3, just think about the shock absorbers and the forks you want to test.
Let's see some examples:

- Max stroke 30 mm (e.g. shocks for touring bikes): max velocity limited to 620 mm/s. DB4 is a suitable choice if you are interested in testing at short strokes.
- Max stroke 100 mm, but load produced is below 2.000 N. DB4 is OK if you want to test for example mountain bike forks or road shocks. You can test a wide range of forks and shocks with several travels, with pretty small loads at larger strokes.
- Stroke 50 mm or more (off-road shocks and forks) and heavy loads: DB4-plus is your choice.

Comparison summary

LOAD/MAX SPEED	DB4	DB4-PLUS
3.000 N	950 mm/s	2.000 mm/s
5.000 N	550 mm/s	1.650 mm/s
10.000 N	280* mm/s	850* mm/s

Table 1: Maximum speed achievable by DB4 and DB4-plus at 3.000, 5.000 and 10.000 N.

DB4	DB4-PLUS
1.400 N @ 2 m/s	4.200 N @ 2 m/s

Table 2: Maximum load achievable @ maximum speed (2 m/s and 100 mm Stroke) for DB4 and DB4-plus.

*: Max load achievable only with optional load cell (10.000 N). With the standard load cell, the maximum load is limited to 5.000 N.