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**Datasheet for the decision
of 25 May 2022**

Case Number: T 0318/20 - 3.2.01

Application Number: 07835089.9

Publication Number: 2074004

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B60T8/24

Language of the proceedings: EN

Title of invention:

METHOD AND ARRANGEMENT FOR MEASURING AND ESTIMATING A BRAKE
FACTOR IN A VEHICLE BRAKE SYSTEM

Patent Proprietor:

Volvo Lastvagnar AB

Opponent:

WABCO Europe BVBA

Headword:

Relevant legal provisions:

EPÜ Art. 54(1)
EPC Art. 56

Keyword:

Inventive step - main request (no) - auxiliary request 1 (no)
- auxiliary request 2 (yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0318/20 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 25 May 2022

Appellant II: Volvo Lastvagnar AB
(Patent Proprietor) 405 08 Göteborg (SE)

Representative: Valea AB
Box 1098
405 23 Göteborg (SE)

Appellant I: WABCO Europe BVBA
(Opponent) Chaussee de la Hulpe 166
1170 Brussels (BE)

Representative: Meyer, Ralph
Dr. Jesgarzewski & Kollegen Rechtsanwälte
Lange Strasse 3
27711 Osterholz-Scharmbeck (DE)

Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
2 December 2019 concerning maintenance of the
European Patent No. 2074004 in amended form.**

Composition of the Board:

Chairman H. Geuss
Members: W. Marx
O. Loizou

Summary of Facts and Submissions

- I. The appeals by the opponent (appellant I) and the patent proprietor (appellant II) are directed against the decision of the opposition division to maintain European patent No. 2 074 004 in amended form on the basis of the claims of the auxiliary request 2 filed with letter of 16 August 2019.
- II. The appellant I (opponent) relied on the following evidence filed before the first instance:
- E2: DE 195 17 708 B4;
 - E3: DE 103 09 933 A1;
 - E5: Commission Directive 98/12/EG relating to the braking devices of certain categories of motor vehicles and their trailers of 27 January 1998
- III. In its decision the opposition division held, *inter alia*, that the subject-matter of claim 1 as granted and the subject-matter of claim 1 of auxiliary request 1 was new over document E2 but did not involve an inventive step in view of E2 and the common technical knowledge of the skilled person.
- IV. Oral proceedings before the Board took place on 25 May 2022.

The appellant I (opponent) requested that the decision under appeal be set aside and the patent be revoked. The appellant II (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained as granted (main request), or in the alternative, that the patent be maintained according to one of the auxiliary requests 1 to 16 filed with its reply.

V. Claim 1 as granted (main request) reads as follows (broken into a feature analysis adopted by the parties):

Claim Matrix – Claim 1 as granted	
M1.1	A method for measuring and estimating a brake factor (B_i) in a vehicle brake system, said vehicle (1) comprising a towing vehicle (2) and a trailer (3) having a plurality of wheel axles (4, 5, 6, 7), wherein said method comprises:
M1.2	initiating a controlled braking manoeuvre involving at least a first wheel axle (4) and a second wheel axle (5); and
M1.3	obtaining values representing said brake factor (B_{f1} ; B_{f2}) for said first wheel axle (4) and said second wheel axle (5)
M1.4	by means of a control unit (13) which is provided with a brake adaptation function to obtain a brake balance between said towing vehicle (2) and said trailer (3);
	c h a r a c t e r i z e d i n that said method furthermore comprises the following steps:
M1.5	braking (17), in a forced manner, said first wheel axle (4) when retardation of said vehicle (1) is requested;
M1.6	estimating (18) the brake factor (B_{f1}) for said first wheel axle (4) by determining the brake pressure (P_{cyl1}) and braking torque (T_{brake1}) for said first wheel axle (4);
M1.7	providing a transition phase (19) after which said second wheel axle (5) is braked, in a forced manner, and
M1.8	estimating (20) the brake factor (B_{f2}) for said second wheel axle (5) by determining the brake pressure (P_{cyl2}) and braking torque (T_{brake2}) for said second wheel axle (5).

Claim 1 of the auxiliary request 1 differs from that of the main request in that the term "braking" in features M1.5 and M1.7 is replaced by "braking solely".

Claim 1 of the auxiliary request 2 is amended compared to granted claim 1 by adding the following feature:
M1.9 wherein said forced braking of said first wheel axle (4) generally corresponds to the brake force provided through actuation of an auxiliary brake in said vehicle (1).

All requests encompass an independent product claim showing corresponding features.

VI. The appellant I (opponent) essentially argued as follows:

Main request - novelty and inventive step over E2

E2 took away novelty of granted claim 1. The definition of the brake factor in E2 was not different from the definition of the contested patent (paragraph [0008]), according to which the brake factor characterised the efficiency of the braking. The patent made clear (see paragraph [0007]: "*The brake factor ... can be defined as a relation between the received brake torque and the applied brake pressure*") that not only the brake torque, but also other quantities - such as the braking force in E2 - could be used to define the brake factor. Both quantities described the braking effect and were set in proportion to the brake pressure describing the effort used for braking. Though E2 did not clearly describe that the braking torque could be used, it was implicitly disclosed for the skilled person when reading the term "brake factor" which described the brake's efficiency. The braking effect was determined in the patent (paragraph [0007]) and also in E2 (paragraphs [0031], [0032]) by measuring the vehicle deceleration, and the brake factor was equally characterised by measuring vehicle deceleration and brake pressure. The specific calculation in E2 used the braking force, but it was common knowledge that the quantities "braking force" and "braking torque" which described a braking effect could be mutually converted knowing the lever arm, so the skilled person would implicitly read in E2 the possibility of alternatively determining the brake factor based on the braking torque. It was not only an obvious alternative solution, since both the braking force and the braking torque characterised equally the efficiency of the

brake. The lever arm changes over time with the wear of the tires, so the "braking torque" was not an accurate quantity. However, crucial for characterising the efficiency of the brake were only the measured values. According to Newton's Law, the braking force was determined knowing the mass of the vehicle, whereas the determination of the braking torque required knowledge of the radius of the wheel or the lever arm and the moment of inertia. Specifically choosing one of these auxiliary quantities had no influence on the characterisation of the brake factor. E2 taught (paragraph [0027]) to estimate the brake factor based on a balance of forces between the braking force (product of brake factor and applied brake pressure) and the inertial force (product of vehicle mass and deceleration). However, the skilled person implicitly understood - irrespective of whether the physical background was discussed in E2 - that the efficiency of the brake could not only be seen in the linear deceleration of the vehicle, but also in the rotational movement of the wheel/axle when applying a braking torque, as suggested in E2 (paragraph [0018]: "... *das Bremsmoment reduziert die Drehgeschwindigkeit des jeweiligen Rades.*").

It was clear that the brake factor was estimated using the effective brake pressure (see paragraph [0007] of the patent: "*the pressure acting on a wheel brake disc by means of a corresponding brake pad*"), as known from E2 (paragraph [0032]: "... *der Druck linear bis zum Erreichen des Anlegedrucks erhöht ...*"; see also paragraph [0031], reciting "*Anlegedruck*"). Thus, the equations of motion at two points in time were provided and a ratio according to the definition of a brake factor was determined. As found in the contested decision, a pressure difference indicated a pressure.

E2 always referred (although the term "*weiterer Bremswunsch durch den Fahrer*" in paragraph [0031] was ambiguous) to the same braking operation, as derivable from the program loop in Fig. 5 or paragraph [0032] (reciting, in plural, the term "*Bremsenkennwerte*").

The subject-matter of claims 1 and 7 as granted did not involve an inventive step in view of E2 alone (as found by the opposition division), but also in view of E3, which explicitly defined the brake factor as the ratio of braking torque and brake pressure.

Auxiliary request 1

The brake factor in E2 was identified successively for each axle (see paragraph [0031]: "*an einer anderen Achse*"), i.e. estimated for a single axis (see paragraph [0026]).

E2 did not mean (paragraph [0031], last sentence: "*bei weiterem Bremswunsch*") a separate braking demand. The term "*braking solely, in a forced manner, said first wheel axle*" according to feature M1.5 even allowed that a further axle was braked. However, E2 clearly showed (see paragraph [0032]) one embodiment in which one axle was not braked but maintained at application pressure PA ("*Anlegedruck*") while increasing the pressure at the other axle.

Auxiliary request 2

Claim 1 was a combination of granted claims and not open to an objection under Article 84 EPC. The term "*forced braking*" of the first wheel axle in feature M1.9 meant (according to the German version) a braking force as provided when actuating the auxiliary brake. The term "*auxiliary brake*" had been discussed in

opposition proceedings. E2 showed an auxiliary brake (see E5 in this respect), but according to the patent proprietor's understanding claim 1 meant a retarder requested by the driver, i.e. an additional braking system.

It was not clear from the wording of claim 1 how feature M1.9 had to be interpreted, whether it merely defined a level of braking force to be applied, or a situation in which an additional brake was requested by the driver and braking pressure was build up instead. Both interpretations were possible, so claim 1 did not require that the auxiliary brake was requested, but only a quantity of the braking force such that the forced braking corresponded to the braking force of an auxiliary brake when actuated. Feature M1.9 did not specify a specific quantity of the braking force. The level of braking force provided in the contested patent did not differ from the level proposed in E2.

Considering the description of the contested patent and the braking effect of an auxiliary brake, a lower range of braking forces was meant, as also known from E2 (paragraphs [0024], [0032]). Studying E2 it was clear for the skilled person that, for stability reasons, the braking force had to be in a safe (i.e. low) range when braking only one axle. Feature M1.9 did neither require an estimation of the brake factor only in case an auxiliary brake was requested, nor specify a forced braking through the braking system instead of actuating an auxiliary brake with exactly the same braking force as requested by the driver for the auxiliary brake.

E2 did not teach away from the claimed approach by proposing to actuate the brake factor estimation routine arbitrarily (paragraph [0032]: "*willkürlich*"), as found by the opposition division. This embodiment

only concerned the particular case that no suitable braking operation was found. E2 clearly taught (see paragraph [0031]) what was meant by "suitable braking operation", namely a driver commanding only a slight increase of braking effect and an estimation of the brake factor initiated during stationary, non-critical operating conditions. Moreover, even an arbitrary brake actuation was characterised by a low level braking demand (see last sentence of paragraph [0032]).

VII. The appellant II (patent proprietor) essentially argued as follows:

Main request - novelty and inventive step over E2

A prior art document anticipating claim 1 as granted had to disclose the procedure as claimed, in which one wheel axle was braked at a time and a brake factor for the relevant wheel axle was estimated (features M1.6 and M1.8). E2 disclosed two embodiments:

(a) Paragraphs [0026]-[0027] of E2 disclosed (see also Fig. 4) that a first brake pressure P_0 firstly was applied to a wheel axle for a time range from T_0 to T_1 , and then increased by an additional pressure dp while keeping the brake pressure on the other axles constant. A contact pressure PA was derived during the process of controlled build-up of pressure, so the first brake pressure P_0 was larger than the contact or application pressure PA . E2 failed to disclose features M1.6 and M1.8, since changes in brake pressure and inertial forces or decelerations at times T_1 and T_2 were used to determine a characteristic brake value. A pressure increase dp did not correspond to an "applied brake cylinder pressure" (as clarified in paragraph [0007] of the patent).

Similarly, paragraph [0032] disclosed a procedure to determine an application pressure PA and a characteristic brake value for the selected wheel axle on the basis of a pressure increase dp , which was successively carried out on all other axles. According to paragraph [0033] of E2, the procedure also could be performed during pressure release.

(b) Paragraphs [0028]-[0031] of E2 disclosed (see also Fig. 5) that a characteristic brake value was determined in response to the driver requesting a further pressure increase (box 108 of Fig. 5). However, any estimation of a characteristic brake value for another axle was only performed when the driver wished to brake the vehicle again (see last sentence of paragraph [0031]: "*bei weiterem Bremswunsch*"), i.e. at a subsequent braking operation or run of the program and not while initiating a braking manoeuvre (see feature M1.2), so E2 failed to disclose features M1.2, M1.6, M1.8. No definition of a brake factor was given in E2, and there was no disclosure of a braking torque being used. E2 relied on differences in pressure and braking force. Determining a braking force did not correspond to determining a braking torque. The braking torque took into account the lever arm which was not constant, depending on the wheel size. As regards the interpretation of the term "brake pressure", there seemed to be a consensus of opinion (see definition in paragraph [0007] of patent).

Feature M1.2 implied that the brake factors were determined under at least similar operating conditions. Features M1.6 and M1.8 implied that the brake factors were determined with an appropriate level of accuracy. The use of differences in pressures and inertial forces resulted in less reliable values of the characteristic

brake value of E2, since there was not necessarily a fully linear relationship between the pressure and the resulting inertial forces.

The objective technical problem could be formulated as how to increase the robustness of the E2 method. The skilled person, starting from E2 (which was ambiguous in its disclosure), would never contemplate modifying the E2 method such that the thus modified method would exhibit a combination of features M1.2, M1.6 and M1.8 of granted claim 1, in particular to use a braking torque instead of using a braking force (as mentioned in E2, paragraph [0027]). Moreover, nothing in E3 would prompt the skilled person to modify the E2 method.

Auxiliary request 1

The opposition division acknowledged that a braking pressure was applied to each one of the wheel axles in paragraphs [0028] and [0032] of E2 (embodiment (a)), but concluded at the same time that E2 disclosed a method in which a single wheel axle was solely braked. The skilled person would not depart from this explicit teaching that brake pressures were applied to all the wheel axles. According to paragraph [0027] a pressure P_0 higher than application pressure P_A (which seemed to be reached at time T_0 , compare Figs. 2 and 4) was applied on all wheel axles. The pressure applied was then increased at one axle while keeping it constant at the other axle (see paragraph [0028]). Claim 1 did not mean that only one axle was braked in a forced manner, but meant that only one axle at a time was braked. According to paragraph [0031] of E2 (embodiment (b)), the characteristic brake value was determined for one axle only. The other axle was evaluated at another moment in time, so features M1.2, M1.6, M1.8 were not shown.

There was no clear disclosure in E2 (which always required a pressure slope, i.e. a pressure increase or release, see paragraph [0033]) of one axle being braked **solely** at a time, which resulted in an improved accuracy of the brake factor estimation.

Auxiliary request 2

Feature M1.9 implied (see patent, paragraph [0034]) that estimation of at least the brake factor of the first wheel axle was performed during the operation of the vehicle at a non-critical situation. Feature M1.9 could not only be equated to a low level braking force, which did not entail a brake force of an auxiliary brake. Features M1.5 ("braking, **in a forced manner, ... when retardation of said vehicle is requested**") and M1.9 ("said **forced braking** ... generally corresponds to the brake force provided through **actuation of an auxiliary brake** in said vehicle") were linked to each other, making it clear that the forced braking of the first wheel axle generally corresponded to the braking that would have been the result of a requested auxiliary braking of the vehicle. Feature M1.9 (reciting "an auxiliary brake **in said vehicle**") required a vehicle furnished with an auxiliary brake, which was not disclosed in E2, and a brake force being produced that occurred when the auxiliary brake could be used. Linking "the brake force" and "an auxiliary brake" in feature M1.9 meant that a brake force was applied as if the auxiliary brake were used, which was applied in a safe situation (which depended on the downhill slope or road surface conditions). Auxiliary braking provided a brake force which was sufficiently high so that the estimation procedure could be carried out. The wording of claim 1 expressed that, when you were in a condition to apply the auxiliary brake with a

given brake load, the brakes were applied with this brake load level. This was fully supported by the disclosure of the patent specification (see paragraphs [0034], [0035], [0040]: if the driver intended to activate the auxiliary brake, a brake level was applied which corresponded to the level intended by an auxiliary brake being applied).

No passage in E2 or the cited prior art provided a pointer to link an auxiliary braking, or a brake force provided through actuation of an auxiliary brake, to a method for estimating brake factors. Moreover, the prior art cited by the appellant I remained completely silent about the link between the lower range of braking forces and the actuation of an "auxiliary brake". Thus, there was nothing on file evidencing an assumption that the skilled person studying e.g. paragraph [0032] of E2 would realise that the brake command of small value as indicated therein could be realised by a forced braking of a wheel axle that corresponded to the brake force provided through actuation of an auxiliary brake. In E2, it was the actual actuation of the brake pedal (with an appropriate actuation speed, see paragraph [0024]) which decided on whether to apply the brake factor estimation.

Paragraph [0032] of E2, teaching that a brake factor estimation procedure could be carried out arbitrarily if no suitable brake process had been identified (i.e. a brake factor estimation procedure was not necessarily linked to a certain brake request), appeared to teach away from feature M1.9. In fact, the low braking force mentioned in paragraph [0032] of E2 referred to a situation (see top of this paragraph) when a brake pressure was applied in response to a brake pedal actuation and not arbitrarily.

Reasons for the Decision

1. *Main request (patent as granted)*
- 1.1 The subject-matter of claim 1 as granted is new over document E2 (Article 54(1) EPC) but does not involve an inventive step (Article 56 EPC).
- 1.2 The Board concurs fully with the reasoning given in the contested decision, points 14.1 to 14.4, regarding lack of novelty of the subject-matter of granted claim 1.

As found by the opposition division, the subject-matter of claim 1 is new over E2 solely in view of the missing determination of the braking torque as required by features M1.6 and M1.8 in estimating the brake factor. Both parties agreed on the how the sub-step of "determining the brake pressure" in features M1.6 and M1.8 had to be understood, namely - in accordance with the contested patent, paragraph [0007] - the effective brake pressure acting on a wheel brake disc, which is also known from E2 (paragraph [0032], as reflected by the term "*Anlegedruck*"). The Board shares this view.

As admitted by the appellant I, E2 does not clearly describe an estimation of the brake factor using the quantity "braking torque". Claim 1 specifies a method for measuring and estimating a brake factor in a vehicle brake system. In order for a prior art document to anticipate the sub-step of "determining the braking torque" in method steps M1.6 and M1.8, the document has to disclose clearly and unambiguously a determination of the braking torque when estimating the brake factor. Similarities in a more general definition of the

characteristic value "brake factor" in E2 and the contested patent (allegedly characterising the efficiency of braking), or the fact that the braking effect was measured both in E2 and in the contested patent by measuring the vehicle deceleration, do not anticipate the specific determination of a braking torque as required by features M1.6 and M1.8.

The Board does not follow the argument of appellant I that these features were implicitly disclosed in E2 when reading the term "brake factor". E2 only discloses that the brake factor is estimated on the basis of the measured deceleration and brake pressure, but remains silent on how the calculation is being performed. Moreover, the specific calculation of the brake factor recited in E2 based on the balance of forces between braking force and inertial force characterising linear deceleration, i.e. based on the braking force, does not disclose implicitly the possibility of determining the brake factor alternatively based on the braking torque and considering the rotational movement of the wheel/ axle. As noted by the appellant I, determination of the braking torque requires additional knowledge of the wheel radius or the wear of the tire (which changes the lever arm) and the moment of inertia.

The Board does not see that E2 reflects or implicitly discloses a method determining the braking torque, which would require knowledge of further parameters or physical quantities of the vehicle brake system.

- 1.3 The Board also concurs fully with the reasoning given in the contested decision, see points 16.2 to 16.4, as regards lack of inventive step of the subject-matter of claim 1 as granted.

As stated in the contested decision, E2 suggests (see paragraph [0018]) different control strategies, which include control of vehicle deceleration, braking force and braking torque. Therefore, the Board cannot follow the argument of the appellant II that starting from E2 the skilled person would not be prompted, in particular when applying a braking torque control strategy, to use actual values of a braking torque for estimating the brake factor.

Moreover, E2 is silent on how the brake factor is exactly defined, such that the skilled person looking for a definition of the brake factor would find document E3 which discloses a method for determining a brake characteristic value in a vehicle. As argued by the appellant I, E3 teaches that the brake factor is defined as the ratio of braking torque to braking pressure. Thus, determining the brake factor as specified by features M1.6 and M1.8 is also obvious in view of E2 and the teaching of E3.

2. *Auxiliary request 1*

2.1 The subject-matter of claim 1 of auxiliary request 1, which has been amended by introducing the term "solely" in features M1.5 and M1.7, does not involve an inventive step (Article 56 EPC).

2.2 The Board fully concurs with the reasoning given in the contested decision under point 21.2 which relates to the embodiment described in paragraph [0032] of E2 (see page 6, lines 2-12: "... *bei Bremsbetätigung zunächst der Druck linear bis zum Erreichen des Anlegedrucks erhöht. ... Daraufhin wird der Druck an einer Achse erhöht, an allen anderen konstant gehalten.*"), contemplating a situation in which only one axle is

braked in a forced manner whereas the other axles are kept at a constant pressure corresponding to the application/contact pressure ("Anlegedruck"). The contact pressure or "Anlegedruck" in E2 is considered to be the pressure needed to bring the brake pad in contact with the brake disc, without providing a significant braking effect or transmitting a braking torque. Thus, the additional requirement of braking **solely** one axle, in a forced manner, according to amended features M1.5 and M1.7 of claim 1 of auxiliary request 1 is met. In fact, this understanding of the teaching in E2 is confirmed by claim 7 of E2 ("*... daß während eines Bremsvorgangs zunächst die Bremskraft bis zum Anlegezeitpunkt erhöht, danach zeitlich versetzt für jede einzelne Achse zur Bestimmung der Bremsenkennwerte erhöht wird*"), which is also referred to in the contested decision.

Since at least one embodiment of E2 falls under the wording of claim 1 of auxiliary request 1, arguments put forward by the appellant II with regard to further embodiments of E2 (according to paragraph [0027] and [0028], or paragraph [0031]) need not be addressed.

3. *Auxiliary request 2*

3.1 The subject-matter of claim 1 of auxiliary request 2 involves an inventive step over document E2 as the closest prior art (Article 56 EPC).

3.2 The Board concurs with the reasoning in the contested decision, point 24.5, insofar as the term "an auxiliary brake" in feature M1.9 is considered to include auxiliary or emergency brake circuits as known from E2 (see paragraph [0016]: "*Not- oder Hilfsbremskreise*"),

intervening when the the service brake fails; as referred to in directive E5).

- 3.3 In appeal proceedings, the appellant I argued additionally that the wording of claim 1 left open whether feature M1.9 merely defined a level of braking force to be applied (such that the forced braking corresponded to the braking force of an auxiliary brake when actuated), or a situation in which an auxiliary brake, meaning an additional brake, was requested by the driver and brake pressure (with exactly the same braking force as requested by the driver) was build up instead.

Claim 1 of auxiliary request 2 is a combination of granted claims 1 and 5 and as such cannot (e.g. in case of ambiguity) be objected to under Article 84 EPC. Considering the arguments that were brought forward, the Board finds that feature M1.9 needs interpretation, in particular since the terms "said forced braking" and "the brake force provided ..." refer to parameters which have not been used - at least not with identical wording - before. Therefore, the wording of claim 1 has to be given a technically meaningful interpretation, which is also supported by the overall teaching of the patent in suit, before a comparison with the prior art can take place.

- 3.4 The Board agrees with appellant II that feature M1.9 is linked to feature M1.5. In particular, the term "said force braking of said first wheel axle" in feature M1.9 can reasonably only refer to feature M1.5, which introduces a forced braking operation by reciting "braking, in a forced manner, said first wheel axle". At the same time, feature M1.5 specifies a timely condition for the forced braking to take place, namely

"when retardation of said vehicle is requested", which implies that the driver or a control unit in the vehicle provides a retardation request. Feature M1.5 therefore requires that at least a retardation must have been requested as a pre-condition to initiating said forced braking operation.

Feature M1.9 further specifies that the forced braking operation according to feature M1.5, i.e. the forced braking of the first wheel axle, "generally corresponds to the brake force provided through actuation of an auxiliary brake in said vehicle". By using the definite article "the" (although not previously defined), a specific brake force is meant, which is characterised in feature M1.9 by referring to the brake force provided through actuation of an auxiliary brake, i.e. as if an auxiliary brake were actuated. Moreover, feature M1.9 does not refer to an auxiliary brake in general, but to "an auxiliary brake in said vehicle".

Thus, when reading feature M1.5 in conjunction with feature M1.9, claim 1 of auxiliary request 2 specifies a forced braking of the first wheel axle in reaction to a retardation request and with a brake force as if an auxiliary brake in said vehicle were actuated. In the Board's view, this implies **an intention to actuate an auxiliary brake in said vehicle** (an additional brake that can be actuated independently from an emergency situation, as held in the contested decision), and applying a brake force to brake the first wheel axle which corresponds to the brake force as if the auxiliary brake would be actuated. This interpretation is fully supported by the description of the contested patent (see paragraphs [0034], [0035] and [0040]), according to which the estimation of the brake factor is carried out when the driver intends or needs to

activate the vehicle's auxiliary brakes with a brake force which corresponds to the intended auxiliary brake torque. Thus, the Board concurs with the appellant II that feature M1.9 can only mean that the brakes are applied, in a condition to apply the auxiliary brake with a given brake load or force, with a brake force as if the auxiliary brake were used.

- 3.5 As set out above, the Board does not agree with the appellant I that feature M1.9 only meant a lower range or a low level of braking forces, unrelated to any request or intention to actuate an auxiliary brake in the vehicle. According to the Board's understanding, features M1.5 and M1.9 specify a forced braking of the first wheel axle in reaction to an intention to actuate an auxiliary brake in the vehicle, with the same brake force as if the vehicle were braked with the auxiliary brake, i.e. instead of actuating an auxiliary brake.
- 3.6 Document E2 does not provide any pointer to link a brake force provided through actuation of an auxiliary brake in the vehicle to the method known from E2 for estimating brake factors, so the skilled person would not arrive in an obvious manner at the subject-matter of claim 1 of auxiliary request 2. As found in the contested decision, E2 is silent on any auxiliary brake which is different from emergency or auxiliary brake circuits used in case of a failure of the service brake. Moreover, what is lacking is a link between the lower range of brake forces recited in E2 and the intention to actuate an "auxiliary brake in said vehicle" as required by claim 1 of auxiliary request 2, according to the Board's interpretation of the wording of claim 1 set out above.

3.7 With similar argumentation, the subject-matter of claim 6 of auxiliary request 2, which is directed to an arrangement for measuring and estimating a brake factor comprising a control unit adapted for carrying out a method steps M1.5 to M1.9, is considered inventive over the teaching of document E2 (Article 56 EPC).

No further arguments had been brought forward in this respect.

Order

For these reasons it is decided that:

Both appeals are dismissed.

The Registrar:

The Chairman:



A. Vottner

H. Geuss

Decision electronically authenticated