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Datasheet for the decision of 14 July 2025

Case Number: T 0203/24 - 3.2.01

Application Number: 17754149.7

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Language of the proceedings: EN

Title of invention:
ELECTRIC SYSTEM FOR A VEHICLE

Patent Proprietor:
KNORR-BREMSE Systeme für Nutzfahrzeuge GmbH

Opponent:
ZF CV Systems Europe BV

Headword:

Relevant legal provisions:
EPC R. 80
EPC Art. 84, 123(2), 56

Keyword:
Amendment occasioned by ground for opposition - (yes)
Claims - clarity (yes)
Amendments - extension beyond the content of the application as filed (no)
Inventive step - (yes)

Decisions cited:
T 0610/95, T 2063/15, G 0003/14

Catchword:

Europäisches Patentamt
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Beschwerdekammern

Boards of Appeal

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Case Number: T 0203/24 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 14 July 2025

Appellant: (Opponent)	ZF CV Systems Europe BV Chaussée de la Hulpe 166 1170 Brussels (BE)
Representative:	Bremer, Ulrich Advopat Patent- und Rechtsanwälte Theaterstraße 6 30159 Hannover (DE)
Respondent: (Patent Proprietor)	KNORR-BREMSE Systeme für Nutzfahrzeuge GmbH Moosacher Strasse 80 80809 München (DE)
Representative:	Wiedemann, Markus Ziegeleistraße 16 86399 Bobingen (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 8 December 2023 concerning maintenance of the European Patent No. 3509922 in amended form.**

Composition of the Board:

Chairman	G. Pricolo
Members:	J. J. de Acha González
	S. Fernández de Córdoba

Summary of Facts and Submissions

I. The opponent's appeal is directed against the interlocutory decision of the Opposition Division, according to which the patent, as amended according to auxiliary request 2 filed during the oral proceedings, complied with the requirements of the EPC.

II. The following evidence is relevant for the present decision:

D4: US 6264289 B1;
D5: DE 102014006613 A1;
D11: EP 2254779 B1;
D14: EP 2454135 B1;
D26: US 2015/232075 A1;
D27: EP 2077215 B1; and
D28: DE 102008003380 A1.

III. The Opposition Division decided among others that the subject-matter of granted claim 1 did not extend beyond the content of the application as originally filed.

IV. Oral proceedings before the Board were held on 14 July 2025.

The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed as the main request, or, in the alternative, that the patent be maintained in amended form on the basis of one of the auxiliary requests 1 to

11, filed with their reply to the statement of grounds of appeal.

V. Claim 1 of the main request reads as follows (feature numbering according to the contested decision):

1. *Electric system (10) of a vehicle (200) which includes an electronically controlled brake system EBS, comprising:*

1.1 *a steering angle sensor unit (109) that measures the steering angle of a steering wheel;*

1.4 *at least one control module (20);*

1.2 *at least one first inertia sensor (11 0); and*

1.3 *an electronic braking system central control unit EBS ECU (101) of the electronically controlled brake system EBS;*

1.4.1 *wherein, the at least one control module (20) is external to the steering angle sensor unit (109); and*

1.4.2 *wherein, the at least one control module (20) is external to the electronic braking system central control unit EBS ECU (101);*

characterised in that,

1.4.3 *at least one of the at least one control module (20) has mounted in it, within it or on it one of the at least one first inertia sensor (110), and in that*

1.4.4 *the at least one control module (20) in, on or within which is mounted the one of the at least one first inertia sensor (110) is configured to be in communication contact with the electronic braking system central control unit EBS ECU (101), and in that*

a) *the one of the at least one first inertia sensor (111) is mounted in, within or on an electronic air processing unit (100) which is the at least one of the at least one control module (20) and at least incorporates an air dryer and a multi-circuit protection valve, or*

b) *the one of the at least one first inertia sensor (112) is mounted in, within or on a foot brake module (102) which is the at least one of the at least one control module (20) and incorporates at least one pneumatic channel with a foot brake control valve that generates a pneumatic control signal depending upon the actuation of a foot brake actuation member, and an electric channel with at least one electric position or angle sensor that measures the actuation position or the actuation angle of the foot brake actuation member for generating an electric control signal, or*

c) *the one of the at least one first inertia sensor (114) is mounted in, within or on a trailer control module (105) which is the at least one of the at least one control module (20) and controls the service brake pressure for a trailer within a control loop.*

Reasons for the Decision

Main request

1. *Rule 80 EPC*

1.1 The amendments made to the granted patent according to the main request are occasioned by a ground for opposition.

1.2 The appellant argued that, according to established case law, it was inadmissible to pursue several alternative, further-developed embodiments in parallel in opposition proceedings, if one of these preferred embodiments was further delimited by reformulation.

See, in particular, decision T 610/95, which referred to decision G 1/84. According to the latter, opposition proceedings were not designed as an extension of the examination procedure, and must not be misused as such. In this context, it was generally inadmissible to include an additional independent claim that had no equivalent in the granted patent (see also T 2063/15).

1.3 However, the present case does not fall under the appellant's considerations.
In case T 610/95, two independent claims were formulated: one combining granted claim 1 with a granted dependent claim, and another combining granted claim 1 with features from the description. Similarly, in case T 2063/15, two independent claims were formulated as a combination of granted claims; however, one was further specified by features taken from the description.
Consequently, the present case does not correspond to either of these situations, since — as the Opposition Division correctly reasoned — independent claim 1 of the main request includes the three alternatives specified in dependent granted claims 2, 3 and 5, corresponding to the three specific embodiments disclosed in the granted patent. It is true that when introducing the features of dependent claims 2, 3 and 5 in claim 1 as granted their wording has been amended. These amendments however represent changes necessary to specify the link between the at least one control module and the at least one inertia sensor defined in the preamble, and the respective at least one control module and at least one inertia sensor defined in the characterising portion for each alternative (see also point 3 below). The amendment of claim 1 was proposed as an appropriate and necessary response to avoid revocation of the patent (see points 21 and 22.1 of the

decision under appeal), and was consequently and correctly regarded as occasioned by a ground for opposition (see Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, IV.C.5.1.2 c)(ii)).

2. *Wording of claim 1 - interpretation*

2.1 The following wordings of claim 1 do not particularly add any limitations to the claim and its broadest subject-matter corresponds to reading those as follows:

- "at least one" equates to "one" or "a" (it does not mean "only one" or "only a");
- "at least one of the at least one" equates to "the";
- "the at least one" equates to "the";
- "one of the at least one" and "the one of the at least one" equates to "the";
- "the at least one of the at least one" equates to "the".

3. *Article 84 EPC*

3.1 Claim 1 of the main request is clear.

3.2 The appellant objected to the following wordings of the claim as being incomprehensible:

(i) "*the one of the at least one first inertia sensor*"; and

(ii) "*the at least one of the at least one control module*".

Regarding i, the appellant argued that at least one inertia sensor was specified in feature 1.2. Consequently, the use of the definite article "the" for the inertia sensor should read "the first inertia sensor". "*one of the at least one*" was unclear and did

not represent a clear assignment or unmistakable reference.

Analogously the wording ii was not comprehensible since it was not clear whether it referred back to the expression "*the at least one control module*" of feature 1.4.4.

3.3 The wording i clearly makes reference to the "*one of the at least one first inertia sensor*" of feature 1.4.3. Additionally, this latter wording is not open for a clarity examination since it was already present in granted claim 1 (see G 3/14). In any case and bearing in mind the explanations above under point 2.1, the wording i is clear to the skilled person.

The wording ii clearly refers to the "*at least one of the at least one control module*" of feature 1.4.3, which also corresponds to the at least one control module of feature 1.4.4 by means of the features "*in, on or within which is mounted the...first inertia sensor*".

Consequently, the conclusions of the Opposition Division in its decision under point 23.5 are correct.

4. *Article 123(2) EPC*

4.1 The subject-matter of claim 1 does not extend beyond the content of the application as originally filed.

4.2 The subject-matter of claim 1 is based on claims 1, 2, 3, 5 and 6, as well as on the disclosure of pages 11, 12 and 15 of the application as originally filed.

4.3 The appellant argued that the wordings i and ii above were not disclosed as such in the application as originally filed. Claims 2, 3 and 5, as originally filed, could not form the basis for the amendment i, since they clearly referred to an inertia sensor that did not necessarily correspond to that of feature 1.2. Regarding ii, features 1.4 ("*at least one first inertia sensor*") and 1.4.4 ("*the at least one first inertia sensor*") were related, but the wording ii was not, as it referred back to an undisclosed broadening wording.

Lastly, the appellant upheld the objection relating to the change in wording from "*comprises*", which was used in the description application as originally filed, to "*is*" for the at least one control module of features a to c (see point 23.3 of the decision under appeal). The basis for the amendments to features a to c were the disclosure of specific embodiments, which could not, however, be included in claim 1 in such a generalized form. This constituted intermediate generalisations of the specific embodiments of the application as originally filed.

4.4 With regard to the wordings i and ii, the appellant's objection is purely linguistic and does not explain what subject-matter is claimed that goes beyond the content of the application as originally filed. The amendments to claim 1 are directly and unambiguously derivable from claims 1, 2, 3, 5 and 6, as well as from pages 11, 12 and 15 of the application as originally filed.

Regarding the objection "*comprises vs is*", the appellant fails to provide reasons why the Opposition Division is incorrect in point 23.3 of the contested decision (see point III.3 on page 8 of the statement of

grounds of appeal). The Opposition Division's assessment is correct because the final sentence on page 15 of the description of the application as originally filed directly and unambiguously discloses that the control modules 100 to 108 can be considered to be, i.e. "are", a control module 20.

5. *Article 56 EPC*

5.1 The subject-matter of claim 1 is not rendered obvious by the following combinations of prior art:

(a) in the a) variant of claim 1 with the following combinations:
- D5 with D11, D14 or D27;

(b) in the b) variant with the combination of:
- D5 with D28.

(c) in the c) variant with the combination of:
- D5 or D4 with D26.

5.2 It is common ground that the subject-matter of claim 1 differs from the systems of D4 and D5 at least on account of features a), b) and c).

5.3 *Variant c) - trailer control module*

5.3.1 The subject-matter of claim 1 differs from the system of D5 at least on account of feature c). This merely amounts to say that the difference is that the control module is a trailer control module.

5.3.2 The control module having the inertia sensor in D5 is the control unit 23 which comprises the rear axle service brake control module 25, the parking brake control module 29 and the driving dynamics sensor unit 27 (which has the inertia sensor).

5.3.3 Paragraph [0014] of the patent explains the advantage of providing an inertia sensor in any individual module (without specifying the module), in that it provides information accurately captured with respect to the functionality of the specific control module. Accordingly, the appellant is correct that the problem posed in that paragraph is already solved by the system of D5. Consequently, the formulation of the objective technical problem by the Opposition Division is too broad (see point 24.3 of the decision).

5.3.4 According to paragraph [0029] of the patent the trailer control modules are generally fixed to the vehicle chassis. By locating an inertia sensor within the trailer control module inertia information is provided with respect to movement of the vehicle chassis.
The control unit 23 in D5 is mounted on the rear axle 7 (see paragraph [0042]) or on the support frame of the vehicle, i.e. the chassis (see paragraphs [0007] and [0054]).

The appellant specified further their formulation of the objective technical problem as made before the Opposition Division (see point 24.6 of the decision) by stating that the finding of a suitable position for the first inertia sensor is to improve dynamic control, in line with the formulation done by the Opposition Division (see point 24.3).

5.3.5 The appellant also argued that the parking brake module and the trailer control module (TCM) were usually combined in the same module because the trailer was controlled via the parking brake system. Therefore, a skilled person in this field would recognise that the integration of the parking brake control module 29 and the rear axle service brake control module 25 described

in D5 would also be suitable for incorporating a trailer control module or transferring it to a trailer control module.
D26, which related to the same technical field as D5, disclosed a vehicle train comprising a towing vehicle and a towed vehicle/trailer 11. The brake controller 10 for the trailer was located in the towing vehicle (see e.g. paragraph [0018]). As in D5, the inertia sensor for dynamic control was provided in the towing vehicle in D26.
Therefore, in D26, brake controller 10 acted as the trailer control module, incorporating an inertial sensor, i.e. accelerometer 14. D26 identified an issue in the prior art whereby the accelerometer took inaccurate measurements due to imprecise positioning and susceptibility to interference. Therefore, D26 proposed positioning the accelerometer in the trailer brake controller in order to provide the precise compensation described in this position.
Starting from D5, the skilled person would take this suggestion from D26 in order to improve the trailer control and provide the inertia sensor or accelerometer in the brake controller for the trailer, thereby arriving at the subject matter of claim 1.

5.3.6 However, as the respondent pointed out, D5 does not disclose a separate trailer control module, and the trailer's brakes are controlled by the central control module 17 (see figure 1 and paragraph [0047] of D5) which is the EBS ECU. The appellant's considerations when starting from D5 are tainted by hindsight.

As explained by the appellant, D26 teaches that an inertia sensor should be located in the trailer control module in order to provide such information.
Accordingly, in view of such teachings, the skilled

person would be prompted to integrate an inertia sensor in the trailer control module of D5, which is located in the EBS ECU unit. Therefore, they would not arrive at the subject matter of claim 1, variant c). D26 gives no indication to the skilled person that the trailer brake control function should be extracted from the central module 17 and placed in a separate control module, since it generally refers to a trailer brake controller.

5.3.7 Starting from D4, the appellant formulated the same objective technical problem as starting from D5, since the differences with respect to the subject matter of claim 1 were identical. The appellant argued that D4 did not specify what the vehicle train with a trailer would look like, since it expressly stated that the embodiment of D4 initially described the towing vehicle only, but that this also applied to the vehicle train with a trailer.
Thus, the skilled person starting from D4 had a reason to develop the possibility of controlling the braking system of a vehicle train with a trailer in more detail, as this was initially described in general terms in D4. In doing so, they would also come across D26, which provided a more detailed description of the control of the towed vehicle or trailer (see D26, claim 1), according to which the brake controller for the trailer was to be installed in the towing vehicle. Starting from D4, the skilled person would therefore obtain from D26 (claim 1 and abstract) the information that the inertial sensor was to be installed in the control unit for the trailer or in the trailer brake controller. In a further development of D4 with a trailer control module, they would therefore also install the inertial sensor in the trailer control

module, thus arriving at the subject matter of claim 1 in an obvious manner.

5.3.8 However, as in D5, the trailer control module in D4 is the EBS central control unit 40 (see figures 3 to 6). For the same reasons as in the attack above starting from D5, the skilled person would be hinted by D26 to integrate the inertia sensor into the the EBS central control unit 40, which is also the trailer control module. This would prevent them from arriving at the subject matter of claim 1, variant c).

5.4 *Variant a) - electronic air processing unit*

5.4.1 The subject-matter of claim 1 differs from the system of D5 at least on account of feature a). This merely amounts to say that the difference is that the control module is an electronic air processing unit with an air dryer and a multi-circuit protection valve.

5.4.2 The Opposition Division took the view that D11 did not disclose feature a) (see point 24.9). This is correct for the following reasons.

The appellant essentially argued that claim 1 of D11 would disclose a combination within a module of a driving dynamics controller with an inertia sensor and an air processing unit, i.e. feature a) of claim 1.

This is not the case because, as the respondent argued, claim 1 gives examples of the devices (driving dynamics controlling device, air processing device) that have a second function which is different from the parking brake function. However, claim 1 of D11 does not disclose that the vehicle dynamics control module, which includes the sensors, and the air treatment

device form a single module. Consequently, since D11 does not disclose feature a) of claim 1, it cannot render its subject-matter obvious when starting from D5.

5.4.3 The Opposition Division took the view that D14 did not disclose an electronic air processing unit comprising an inertia sensor and being external to and in communication contact with an electronic braking system central control unit (see point 24.5 of the contested decision).

The appellant argued that paragraphs [0011] and [0012] of D14 disclosed the above mentioned feature.

However, as pointed out by the respondent, these paragraphs disclose that the air processing unit and the inertia sensor are integrated in the braking central unit EBS ECU. Consequently, D14 does not disclose feature a) of claim 1 and therefore it cannot hint at the solution proposed in variant a of claim 1.

5.4.4 The appellant considered that the newly filed D27 disclosed feature a) in paragraphs [0012] and [0031]. As with D14, D27 teaches how to integrate the air processing unit and an inertia sensor into the electronic braking system central control unit EBS ECU (the "*electronische Steuereinrichtung*"). D27 does not disclose feature a) of claim 1 and therefore cannot render it obvious.

5.5 *Variant b) - foot brake module*

5.5.1 The subject-matter of claim 1 differs from the system of D5 at least on account of feature b). This merely amounts to say that the difference is that the control

module is a foot brake module with a pneumatic channel with a foot brake control valve that generates a pneumatic control signal depending upon the actuation of a foot brake actuation member and an electric channel with a electric position or angle sensor that measures the actuation position or the actuation angle of the foot brake actuation member for generating an electric signal.

5.5.2 Essentially, the appellant argued that the newly filed D28 would explain how to implement feature b) in the system of D5 in paragraphs [0031], [0034] and [0060]. In particular, D28 taught that the first module, which controlled the service brakes of the front axle of the vehicle, could be integrated into the brake pedal device, providing an effective, space-saving solution. Accordingly, the skilled person would be motivated to integrate the rear axle brake module 23 of D5 — which included the inertia sensor 27 — into the brake pedal device 19. This would result in the subject matter of claim 1, variant b), being achieved in an obvious manner.

5.5.3 These paragraphs of D28 however only disclose that:

- the brakes are controlled by a single module, which can be integrated in the brake pedal device;
- the front brakes are controlled by a separated module, which is structurally integrated into the brake pedal device; or
- none of the modules has to be integrated into the brake pedal device.

However, it is not disclosed anywhere in D28 that an inertia sensor is mounted within the brake pedal device (i.e. the foot brake module).

The brake module 15 for the front brakes (i.e. the front axle) in D5 does not have an inertia sensor. Accordingly, in view of D28, the skilled person would at most be prompted to mount all the brake modules (15, 17 and 23) into the foot brake module or only the front one. This would not result in the subject matter claimed according to variant b, as there is no teaching in D28 hinting at mounting only the rear module 23 together with the inertial sensor into the foot brake module.

6. The question of the admissibility of the evidence submitted for the first time in the statement of grounds of appeal (D26 to D28), and of the admissibility of the new line of attack combining D5 and D14, can be left aside, since the objections on the inventive step, supported by that evidence, are not persuasive on their own merits, as discussed above.

7. The above implies that the opponent's appeal is not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Wille G. Pricolo

Decision electronically authenticated