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**Datasheet for the decision  
of 14 July 2009**

**Case Number:** T 0191/07 - 3.2.01

**Application Number:** 97935976.7

**Publication Number:** 0923478

**IPC:** B60T 17/06

**Language of the proceedings:** EN

**Title of invention:**  
Compressed-air arrangement for trucks

**Patentee:**  
VOLVO LASTVAGNAR AB

**Opponent:**  
Scania CV AB

**Headword:**  
-

**Relevant legal provisions:**  
-

**Relevant legal provisions (EPC 1973):**  
EPC Art. 56

**Keyword:**  
"Inventive step (yes)"

**Decisions cited:**  
-

**Catchword:**  
-



Case Number: T 0191/07 - 3.2.01

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.01  
of 14 July 2009

**Appellants:** Scania CV AB  
(Opponents) S-151 87 Södertälje (SE)

**Representative:** Goetz, Rupert  
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**Respondents:** VOLVO LASTVAGNAR AB  
(Patent Proprietors) S-405 08 Göteborg (SE)

**Representative:** Hammond, Andrew David  
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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
21 November 2006 concerning maintenance of  
European patent No. 0923478 in amended form.

**Composition of the Board:**

**Chairman:** S. Crane  
**Members:** Y. Lemblé  
G. Weiss

## Summary of Facts and Submissions

I. The Opponents' appeal is directed against the interlocutory decision of the opposition division posted 21 November 2006 and according to which, account being taken of the amendments made by the Patent Proprietors during the opposition proceedings, European patent No. 0 923 478 and the invention to which it related were found to meet the requirements of the EPC.

II. In its decision, the opposition division held that the subject-matter of the amended claims met the requirements of novelty and of inventive step having regard, inter alia, to the following prior art documents

E1: DE-B-24 52 171;

E4: Scania Service Manual no 12-91 11 27 GT EN, 1992;

E7: GB-A-1 387 892;

E8: DE-A-31 33 963.

III. In the oral proceedings, held 14 July 2009, the Appellants requested that the decision under appeal be set aside and that the patent be revoked.

The Respondents (Patent Proprietors) requested that the decision under appeal be set aside and the patent be maintained on the basis of claim 1 filed at the oral proceedings, together with claims 2 to 5 and the description and drawings as granted.

IV. Using the subdivision proposed by the Respondents, claim 1 reads as follows:

1. "A compressed-air system for goods vehicles, comprising
  - 1.1 an air-suspension system, a brake system, and a brake protection valve (39),
  - 1.2 wherein the brake system is dimensioned to operate at a lower air pressure than the air-suspension system,
  - 1.3 and wherein the compressed-air supply system comprises at least one brake compressed-air tank (43,51) located downstream of said brake protection valve for supplying the brake system with compressed air characterized in that
  - 1.4 the brake compressed-air tank (43,51) is dimensioned for an air pressure which is greater than or equal to the air pressure which is demanded in the air-suspension system
  - 1.5 and further that the brake compressed-air tank is connected to both the air-suspension system and the brake system
  - 1.6 and comprises compressed-air conduits (40,40'; 52,52') through which compressed air can pass by way of one or more outlets in the brake compressed-air tank (43,51) to the brake system and the air-suspension system, respectively,
  - 1.7 wherein a pressure-limiting valve (44,55) is arranged downstream of the outlet to the compressed-air conduit(s) connecting the brake compressed-air tank (43,51) with the brake system."

V. The Appellants' submissions can be summarised as follows:

It was well known in the art before the priority date of the disputed patent that trucks could be equipped with compressed-air supply system for a brake system and an air-suspension system, wherein the brake system

is dimensioned to operate at a lower air pressure than the air-suspension system. This had been acknowledged in the introductory part of the disputed patent (see paragraph [0003]). Figure 1 of the disputed patent and document E4 also showed such systems and the Patent Proprietors had confirmed that what was disclosed therein belonged to the prior art. The skilled person, a mechanical engineer working in the technical field of compressed-air systems to be mounted on trucks, also knew that compressed-air systems could be adapted and implemented to supply compressed-air to the brake system and to the air-suspension system at two different pressure levels. The objective technical problem solved by the alleged invention was to efficiently use the system and to avoid unnecessary components. This object had, as such, no inventive character and was daily working practice of the person skilled in the art.

Document E1, for example, disclosed (see figure) a compressed-air brake system for goods vehicles, comprising a brake protection valve 5 and at least one brake compressed-air tank 6,7 located downstream of said brake protection valve for supplying the brake system with compressed air, wherein the brake compressed-air tank 6,7 was dimensioned for a higher level of air pressure than the brake system 8,9 and wherein a pressure-limiting valve 28,29 was arranged downstream of the outlet to the compressed-air conduit connecting the brake compressed-air tank with the brake system. Starting from document E1, the skilled person, who wanted to combine this compressed-air system with an air-suspension system operating, as well known, at a higher pressure level than the brake system, would

simply connect the air-suspension system to the main supply line through a derivation located upstream of the protection valve 5, as already shown in document E4, in which the line supplying the air-suspension system branched off the line feeding the brake system at a location upstream of the protection valve 60 (see air suspension supply circuit on page 10 of E4 and two first paragraphs in the right-hand column of page 11). With such an arrangement, the brake compressed-air tanks 6,7 would be able to feed both the air-suspension system and the brake system with compressed-air at a higher pressure level. This arrangement would correspond to the subject-matter of claim 1 which was therefore obviously derivable from a combination of the documents E1 and E4.

The subject-matter of claim 1 was also obvious from a combination of the documents E7 and E1. Document E7 was similar to document E1 and disclosed (see figure 1) a compressed-air brake system for goods vehicles, comprising a brake protection valve 54 and at least one brake compressed-air tank 55,56 located downstream of said brake protection valve for supplying the brake system with compressed air. As was explicitly mentioned in the passage of page 2, lines 55-60 in E7, the outlet of the protection valve was connected to a supply circuit IV for feeding a secondary load such as a pneumatic shock absorber with compressed air. A pneumatic shock absorbing system was nothing else than an air suspension system as claimed in claim 1. Considering this explicit disclosure of document E7 and considering the knowledge of the skilled person, namely that an air suspension system usually be supplied with compressed air at a higher pressure level than a brake

system, it was obvious to operate the compressed-air tanks at a higher pressure level and simply add the pressure limiting valves 28 and 29 according to document E1 to the system according to document E7. The skilled person would thereby obtain a system where the brake compressed air tank would provide compressed-air at a limited pressure level to the brakes and compressed air at a higher pressure level to the air-suspension system.

Finally the subject-matter of claim 1 was also obvious from a combination of the documents E8 and E7. Document E8 also disclosed (see especially figure 2) a compressed-air brake system for goods vehicles, comprising a brake protection valve 4 and at least one brake compressed-air tank 6,7 located downstream of said brake protection valve for supplying the brake system 5,9,13,14 with compressed air, wherein the brake compressed-air tank 6,7 was dimensioned for a higher level of air pressure than the brake system and wherein a pressure-limiting valve 21,21 was arranged downstream of the outlet to the compressed-air conduit connecting the brake compressed-air tank with the brake system. On the basis of the suggestion made on page 2, lines 55-60 of document E7, it would have been obvious to the skilled person to connect a pneumatic air-suspension system to the additional circuit line which started from the protection valve 4 and led to the pressure limiting valve 29, since this additional line was already at the higher pressure level that was needed for such an air-suspension system. Thus, the mere application of the teaching of document E7 to the brake system of document E8 led in an obvious manner to the claimed subject-matter.

VI. The Respondents countered essentially as follows:

The documents E1,E7,E8 referred to by the Appellants were solely concerned with brake systems and could not therefore constitute the closest prior art. Moreover, the combinations of documents proposed by the Appellants were arbitrary and would not result in a compressed-air supply system as claimed in claim 1. There was no indication whatsoever in the prior art that the storage tanks downstream of the protection valve could or should be used to supply an air-suspension system. The Appellants arguments are purely speculative and based on hindsight.

### **Reasons for the Decision**

1. Admissibility of the amendments (Article 123 (2) and (3) EPC)

In order to settle an extensive discussion on the novelty of the subject-matter of claim 1 as maintained by the opposition division, the Respondents completed the claim in specifying that the brake system comprises a brake protection valve and that the brake compressed-air tank is located downstream of the brake protection valve.

These amendments, which further limit the scope of the claim as maintained by the opposition division, have a clear basis in the application as originally filed (see page 4, lines 1-6 and figure 1 in combination with page 6, lines 4 to 10 and figure 2 of WO-A-98/09859). The Board also notes, that the concept of "protection



valve" is well known to the person skilled in the art, a mechanical engineer working in the technical field of compressed-air systems mounted on goods vehicles.

The Appellants, who had originally no formal objection to the amendments made in the claim, objected to the term "protection valve" as being an intermediate generalisation of the particular "seven port protection valve" disclosed in the patent specification. The Board, considering that the above mentioned amendments were on file from the beginning, i.e. with the response to the grounds of appeal, and that the objection of the Appellants was formulated for the first time in the oral proceedings, exercises its discretion under Article 13(1) of the RPBA not to consider this issue in any further detail.

2. Novelty

The subject-matter of independent claim 1 is novel since none of the documents cited by the Appellants discloses in combination all the features of this claim. As novelty was not contested any more by the Appellants, it is not necessary to substantiate this in any detail.

3. Inventive step

The multiple lines of argumentation of the Appellants relative to the combination of the documents E1/E4, E7/E1 and E8/E7 have not convinced the Board.

### 3.1 Combination E1/E4

The Board notes first of all that document E1 only describes a brake system and is not concerned with air-suspension system. The problem that E1 proposes to solve is to reduce the size of the pressure tanks of this brake system (column 1, lines 31-36) by dimensioning the tanks 6,7 to operate at a higher pressure level than usual and by using pressure reducing valves 28,29 at the outlet of the tanks, so that the brake circuits I,II and the auxiliary circuits III,IV can be supplied at the normal pressure level (7 bar).

E4 refers to a compressed-air system for goods vehicles, comprising indeed an air-suspension system, a brake system, and a brake protection valve 60. It is to be noted, however, that the low pressure brake system of E4 uses brake compression air tanks which are located downstream of the brake protection valve 60 and which are clearly dedicated to the brake system (see reference numerals 7c "compressed air tank for front circuit" and 7d "compressed air tank for front circuit" on page 10). E4 also mentions optional load holding tank 7h (see page 11, right-hand column, first three paragraphs) which may act as high pressure air capacities for a manual control of the chassis height (see E4, page 13, left-hand column, first three paragraphs).

In the claimed compressed-air supply system, air from the brake compressed-air tank 43,51 passes through the protection valve to supply the air suspension system located upstream of the protection valve with air under

high pressure (see paragraphs [0019] and [0020] of the patent specification: specific overflow valves 41,53 in the protection valve are provided to allow backflow to the suspension system at a pressure exceeding approximately 5.0 bar).

Considering the argumentation of the Appellants in respect of the combination E1/E4, there is no suggestion, let alone any disclosure, in these two documents and in the whole prior art cited by the Appellants of an air brake system where air from the air brake circuit can be drawn back through the protection valve to supply another compressed air system located upstream of the brake protection valve.

None of the protection valves of the prior art documents are conceived to allow such a backflow. The known protection valves open when a predetermined pressure is attained at their inlet (E7: page 1, lines 51-60) and isolate the different brake circuits from one-another to ensure that air does not flow into a defective brake circuit (E7: column 3, lines 59-69). They also assure protection against a leakage at the inlet (E7: page 4, lines 53-55). The prior art relied upon by the Appellants tells the skilled person that, if he wants air to be drawn from the brake system, he should do so downstream of and under the control of the brake protection valve.

This confirms that the skilled person is reluctant to any changes which could be perceived as compromising the integrity, and thereby the safety, of the brake system.

3.2 Combination E7/E1

Like document E1, document E7 only refers to a brake system and does not concern an air-suspension system. The brake system operates at a single, relatively low pressure level (page 4, lines 39-43) and the structure of this system is similar to the brake system described in figure 1 of the patent specification.

Considering the argumentation of the Appellants that it would have been obvious, on the basis of the passage of page 2, lines 55-60 of E7, to connect an air-suspension system to the additional circuit IV of E1, the skilled person has no reason to assume that the shock absorbing system mentioned in E7 is an air-suspension system within the meaning of the claim. The figure on the top of page 4 of E4 shows, for example, a shock-absorber 1 which is distinguished from the air suspension 2. Moreover, even if a pneumatic shock absorbing system was part of the suspension system, it would not have the same volumetric requirements as the claimed air-suspension system which demands very high compressed-air supply capacity to allow quick and efficient loading and unloading cycles (see paragraph [0002] of the patent specification).

Owing to the protective function to be fulfilled by the various components of the protection valve which have to close when a pressure drop occurs (see E7: column 3, lines 59-69 and page 4, lines 53-55), it has not been demonstrated to the satisfaction of the Board that air in high volumetric quantities can be drawn from the compressed air tank and pass through the protection

valve to supply an hypothetical air-suspension system connected to the auxiliary circuit IV.

Finally, E7 mentions in column 3, lines 34-36 that, in the protection valve described, the supplying of the two service brake circuits I,II has priority over the supplying of the auxiliary circuits III and IV. Such a prioritisation and the limitations induced by the feeding through the protection valve does not appear to be adapted to the needs of an air-suspension system with high volumetric requirements, as mentioned above.

### 3.3 Combination E8/E7

Document E8 also refers exclusively to a brake system for motor vehicles. The system of figure 2 comprises a high-pressure apparatus and brake actuators 5,9,13,14 operating at normal (lower) pressure. The brake pressure is reduced with the aid of pressure limiters 21,22 from high pressure to normal pressure. In order to attain rapid filling of the brake cylinders, one relay valve is disposed before each group of brake cylinders, the relay valves being triggered with normal pressure and very rapidly directing the high pressure into the brake cylinders with a large pressure drop. Upon attaining the maximum pressure level of the normal pressure, the supply of high pressure in the relay valve is cut off.

It is questionable whether E8 is an objective starting point for the question of inventive step, since the brake system of this document is not a normal brake system dimensioned to operate at normal (lower) air pressure, as required by feature 1.2 of claim 1. In any case, the considerations made by the Board in respect

of the combination E7/E1 equally apply to the combination E8/E7, since this combination also implies that the air-suspension system would have to be connected to an auxiliary circuit which is fed through the protection valve 4.

4. The Board concludes from the above that the subject-matter of claim 1 is novel and involves an inventive step.

Dependent claims 2 to 5 relate to further developments of the inventive concept disclosed in claim 1 and contain all of the features of claim 1. The above conclusions regarding novelty and inventive step apply equally to these claims which likewise meet the requirements of the EPC.

**Order**

**For these reasons it is decided that:**

1. The decision under appeal is set aside.
  
2. The case is remitted to the first instance with the order to maintain the patent on the basis of claim 1 filed at the oral proceedings, together with claims 2 to 5 and the description and drawings as granted.

The registrar:

The Chairman:

D. Sauter

S. Crane