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File Number: T 377/89 - 3.2.1

Application No.: 86 109 379.7

Publication No.: 0 209 075

Title of invention: Control valve system for a four speed automatic power transmission transaxle

Classification: F16H 5/40

DECISION
of 18 December 1991

Applicant: Ford-Werke AG

Headword:

EPC Article 54(3)

Keyword: "Lack of novelty based on a drawing in an earlier European patent application (yes)"

Headnote



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Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number : T 377/89 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 18 December 1991

Appellant :

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Decision under appeal :

**Decision of Examining Division 2.3.07.117 of the
European Patent Office dated 8 February 1989
refusing European patent application
No. 86 109 379.7 pursuant to Article 97(1) EPC.**

Composition of the Board :

Chairman : F. Gumbel
Members : F.J. Pröls
W. Moser

Summary of Facts and Submissions

- I. European patent application No. 86 109 379.7 filed on 9 July 1986 and published on 21 January 1987, was refused by a decision of the Examining Division dated 8 February 1989.

- II. The reason given for the refusal was that in view of EP-A-0 195 295, which represents prior art according to Article 54(3) EPC the subject-matter of the then Claims 1 to 4 was not novel. The Examining Division argued that the hydraulic circuitry in the combined Figure 4A-D of the aforementioned prior art document had to be compared with the identical combined Figure 4A-D of the application and that the skilled person would have recognised in Figure 4B of EP-A-0 195 295 the backout valve 396 and its functioning.

- III. On 8 March 1989 a Notice of Appeal was filed and the appeal fee was paid at the same time. The Statement of Grounds of Appeal was submitted on 5 May 1989.

The Appellant requested that the Examining Division rectify its decision according to Article 109(1) EPC and continue the examination on the basis of amended claims.

- IV. With a communication of 26 January 1990 the Board gave its provisional opinion about formal issues and, in respect of patentability, pointed out that the skilled man is able to derive a practical technical teaching from the prior art drawing.

- V. In response to the communication the Appellant, with letter of 23 March 1990, filed further amended Claims 1 to 4.

The valid independent Claim 1, received on 26 March 1990, reads as follows:

"1. In a control system for an automatic transmission for motor vehicles, having a driving shaft (10), a hydrokinetic torque converter (16), a driven shaft (36), multiple ratio gearing (42, 44 and 46) establishing multiple torque delivery paths between said driving (36) and a driven shaft (38) and

fluid pressure operated clutches (CL₁, CL₂, and CL₃) and brakes (B₁, B₂ and B₃) adapted to control the relative motion of the elements of said gearing (42, 44 and 46);

a fluid pressure pump (39), and clutch and brake actuator servos for activating and deactivating said clutches and brakes to effect speed ratio changes, conduit structure (Fig. 4A-D) connecting said pressure pump (39) via a main regulator valve (114) with said servos, multiple ratio shift valve structure including a 1-2 shift valve (118), a 2-3 shift valve (120) and a 3-4 shift valve (122) in said conduit structure for controlling distribution of line pressure to servos for (CL₁ resp. B₂), (CL₃) and (CL₃ resp. B₁) resp. to effect ratio changes between a first and second, a second and third and a third and fourth speed ratio and vice versa; a 3-4 backout valve (396) for controlling the rate of response of those servos during different operating conditions;

a throttle pressure signal means (136) and a governor pressure signal means (124); said signal means being in communication with said shift valve means;

characterized in,

said backout valve (396) comprising a valve element (398) having four valve lands (616, 618, 620 and 622) and being held in a first (left) position against the force of a spring (624) by actuating pressure from passage (298)

acting on intermediate lands (616 and 618) the first being larger than the second and

throttle pressure signal acting on said valve element (398) whereby the latter is urged to its second (right) position;

flow control orifices (630 and 632) in said conduit structure communicating with said backout valve (396) in parallel relationship, one with respect to the other, said orifices (630 and 632) being located in the pressure distribution path of said conduit structure position that feeds said third clutch (CL₃) apply and second brake (B₂) release side;

both control orifices (630 and 632) being effective to control actuator pressure for said third clutch (CL₃) and second brake (B₂) when said valve element (398) assumes its second (right) position and one orifice (632) being effective to control actuator pressure for each third clutch (CL₃) apply and second brake means (B₂) release side when said valve element (398) assumes its first (left) position."

VI. In support of their present request that the case be remitted to the Examining Division for further examination the Appellant put forward the following arguments:

The earlier application EP-A-0 195 295 indeed contains a hint that a backout valve 396 is provided, however, no details on such a backout valve are given. The skilled person therefore would have read this hint without taking particular notice of the functions of this backout valve and in a general view it would not represent a subject of concern of this application. In particular the correlation of valve lands in cooperation with the line passages and exits together with differences in land diameters could

not be merely derived from a view on the overall control circuit according to Figures 4A-4D of EP-A-0 195 295 as the representation of these details is in a small scale and the very poor description of the area of the particular backout valve 396 in the earlier application could not remedy this lack of clarity. Thus, even a person skilled in the art would need an explanation as given with respect to the enlarged drawing of Figure 5 and the detailed description on pages 36-40 of the present application.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is admissible.
2. Present amended Claim 1 has in essence been rendered consistent with the original description and the drawings except that a reference sign "B₃" not mentioned therein is used in line 11 of the claim. For the rest no formal objections as to Articles 84 and 123 EPC arise.

3. Novelty

Present Claim 1 defines in its preamble the main elements of the transmission control circuit and in its characterising part the structure of the backout valve 396 and its actuation into its two end positions where it controls the pressure distribution path for applying the third clutch (= Direct Clutch) CL₃ and for releasing the second brake (= Low-Inter Servo) B₂. In a first (left)

position of the backout valve 396 one orifice 632 is effective in the pressure distribution path 298 and in the second (right) position two orifices 630, 632 are effective in parallel relationship in the paths 298, 300. These two operations as defined in Claim 1 concern the 2/3 upshift of the transmission whereby the parallel orifices 630, 632 in the pressure distribution paths cause a low flow restriction during "heavy throttle upshift" and a high flow restriction during "light throttle upshift" when only one orifice 632 is available (see also column 2, lines 24 to 40 and column 24, line 8 to column 25, line 4 of EP-A-0 209 075).

- 3.1 Article 54 EPC lays down that the state of the art comprises everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application. For the purposes of this Article the disclosure of the prior art may also take the form of a drawing. When a feature is shown solely in a drawing without a detailed and clarifying description a careful check should, however, be made to establish whether the mere diagrammatic representation enables a person skilled in the art to derive a practical technical teaching therefrom.
- 3.2 In EP-A-0 195 295, which represents an earlier application of the Appellant and constitutes prior art according to Article 54(3) EPC, the Figures 1 to 4H correspond to the Figures 1 to 4H of the present application (EP-A-0 209 075) and so the control valve circuitry as shown in the drawings, particularly in Figure 4B, already discloses the backout valve 396 and all the details of its structural design and its control circuit as set out in

Claim 1 of the present application. Furthermore, the text of the particular description of EP-A-0 195 295, page 4, line 10 to page 32 literally corresponds to the text of the description of EP-A-0 209 975, column 3, line 39 to column 22, line 50.

Hence, EP-A-0 195 295 already discloses in its description the details of the flow paths for engaging and releasing the shifting clutches and brakes of the transmission in the first, second, third (= direct ratio) or fourth (= overdrive) gear ratio. The operation of the 2/3 upshift as concerned by the teaching of present Claim 1 is mentioned on page 16, line 7 to page 17, line 9.

The present application is distinguished therefrom by the fact that an additional Figure 5 is provided which represents a partial and enlarged view of Figure 4B, wherein several additional reference numerals have been placed to designate structural details of the backout valve 396 and some fluid paths connected to this valve. For the rest the present application additionally describes the functioning of this valve in column 22, line 51 to column 26 of the description.

Given this literal disclosure wherein the functioning of the backout valve is indeed not mentioned in detail the skilled person can derive directly from the circuitry in Figures 4A-D:

- (a) the structure of the backout valve 396 and
- (b) the manner how it influences the flow of servo fluid in the flow paths during the shifting processes.

3.3 In the Board's opinion Figure 4B of EP-A-0 195 295 contains a representation of all structural details of the

backout valve 396 and this representation is as clear and complete as that in the additional Figure 5 of the present application.

3.4 When considering the functioning of the backout valve being shifted to its right or left position it can be directly identified in Figures 4A and 4B of EP-A-0 195 295 that the valve position is dependent from the signal pressure in the passage line which pressurises the left side of the outermost left land of the backout valve 396 (which is additionally loaded by the force of a spring) against a resulting force caused by the actuating pressure delivered from passage 298 and acting against the right side of said outermost left land and the left side of the adjacent intermediate land; these adjacent lands clearly have different diameters so that the resulting force is directed to the left. The line pressure in passage 298 is delivered from the 2/3 shift valve 120 (Figure 4C) which is in its left upshift position so that the line pressure in passage 134 (during D and OD mode of the manual shift valve 116) can pass (see page 16, lines 26-29 and page 11, lines 14-23 of EP-A-0 195 295). The presence of the signal pressure in the above-mentioned passage line pressurising the left side of the outermost left land of the valve 396 can be derived from Figure 4A and the description of the throttle plunger and control valve 136, see page 23, lines 1-15 of EP-A-0 195 295. The throttle valve plunger 448 pressurises the afore-mentioned passage line by connecting it (at the land 450) to the limited throttle pressure line 142 when a driver-operated throttle linkage (not shown) acts in a left hand direction on the plunger 448 during a heavy throttle operation. The backout valve 396 is then shifted to the right. Thus, at low or idle throttle operation the control pressure in the afore-mentioned passage line disappears since the throttle valve

plunger 448 closes said connection to the pressure line 142 by the land 450, and the backout valve is shifted to its left position by the afore-mentioned actuating pressure delivered from the passage 298. Thus, the characterising features as concern the structure of the backout valve and the shifting into its first and second working positions can be directly derived from the document EP-A-0 195 295.

This is also valid for the further characterising features of Claim 1 as concern the influence of the backout valve in its working positions on the control of the pressure distribution path 298, which is responsible for the application of the third clutch CL_3 , and the release of the second brake B_2 . EP-A-0 195 295 describes on page 16, line 22 to page 17, line 9 how the line pressure in the passage 134 (see the left upper area of Figure 4C) pressurises the control passages 298, 302 and 304 (Figure 4D) leading to the third clutch CL_3 and the second brake B_2 (Figure 4C)). According to Figure 4B the passage 302 is fed from passage 298 through two connection passages. One of these connection passages is controlled by the backout valve 396 and the other is designated by the reference numeral 300. Both connection passages comprise one flow restriction orifice arranged near the conjunction of both connection passages with the passage 302.

These orifices correspond to the orifices 630, 632 as mentioned in Claim 1 of the patent.

- 3.5 In the Board's judgement, the study of the prior art document in paragraphs 3.3 and 3.4 above shows that, contrary to the Appellant's opinion, the skilled person in the field of shifting control circuits of automatic transmissions certainly can recognise in EP-A-0 195 295

all details of the structure and the functioning of the backout valve 396 which is arranged within an exactly described extensive control circuit including a plurality of further valves and control means.

Accordingly, the Board comes to the conclusion, in agreement with the essential grounds set forth in the impugned decision, that the control system of EP-A-0 195 295 already discloses all features of present Claim 1.

3.6 In view of the above the subject-matter of Claim 1 lacks novelty and Claim 1 cannot be allowed (Articles 52(1) and 54 EPC).

4. Since the Board is bound by the request of the Appellant it is unnecessary in the present case, in which the main claim does not satisfy the requirements of the EPC, to consider the merits of dependent Claims 2 to 4. These claims must therefore fall with Claim 1.

Order

For these reasons, it is decided that:

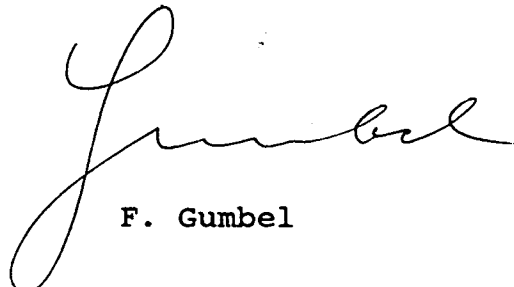
The appeal is dismissed.

The Registrar:



S. Fabiani

The Chairman:



F. Gumbel