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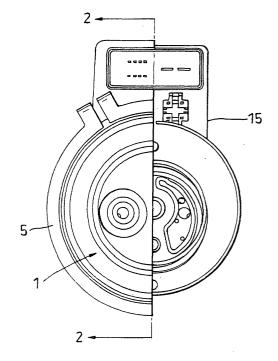
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(54) Electric motor driven hydraulic pump

(57) This invention relates to improvements in electric motor driven pumps, for example of the type used in hydraulic suspension systems for vehicles. In such a pump, the casing (3) of the motor is extended to include a chamber in which electronics can be housed. A lead-frame assembly (12) is described which retains and connects all the high power components. The casing may be split in order to define a pump rotor sub-assembly (1) and an electronics sub-assembly (2) which can be tested separately and then joined together by the use of simple interconnections.





EUROPEAN SEARCH REPORT

Application Number

EP 02 25 1514

	DOCUMENTS CONSID	ERED TO BE RELEVAN	IT				
Category	Citation of document with it of relevant pass	ndication, where appropriate, sages	Relevar to claim				
Х	US 6 091 174 A (GEN 18 July 2000 (2000-		1-5,8-	13 F04B17/03 F04B49/20			
Y	* the whole documen		14,15	F04C15/00 F04D13/06			
Υ	EP 0 733 803 A (MIC 25 September 1996 (* the whole documen * page 9, line 30 -	1996-09-25)	14,15	1 04013/ 00			
X	US 6 065 946 A (LAT 23 May 2000 (2000-0 * the whole documen	5-23)	1-5,7-	10			
A	EP 0 481 423 A (MIC 22 April 1992 (1992 * the whole documen	1-15					
Α	DE 44 11 960 A (PIERBURG GMBH) 12 October 1995 (1995-10-12) * the whole document *						
				TECHNICAL FIELDS SEARCHED (Int.CI.7)			
				F04D			
				F04C			
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	The present search report has	been drawn up for all claims					
	Place of search	Date of completion of the sea	rch	Examiner			
	THE HAGUE	5 November 20	03 I	ngelbrecht, P			
С	ATEGORY OF CITED DOCUMENTS		principle underlying				
Y:part	icularly relevant if taken alone icularly relevant if combined with anot ument of the same category	after the fil ther D : document	ent document, but p ing date cited in the applicat cited for other reaso	tion			
A : tech O : non	nnological background i-written disclosure rmediate document		& : member of the same patent family, corresponding				

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 02 25 1514

This annex lists the patent family members relating to the patent documents cited in the above–mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-11-2003

Patent document cited in search report		Publication date			Patent family member(s)		
US	6091174	Α	18-07-2000	DE AU DE WO EP		A D1 A1	08-01-1998 07-01-1998 10-01-2002 24-12-1997 07-04-1999
EP	0733803	Α	25-09-1996	US CA EP JP	5670852 2172453 0733803 8319956	A1 A2	23-09-1997 23-09-1996 25-09-1996 03-12-1996
US	6065946	Α	23-05-2000	AU EP HU WO		A1 A2	25-01-1999 21-07-1999 28-09-2000 14-01-1999
EP	0481423	A	22-04-1992	US AT DE DE DK EP ES GR JP US	115243 69105695 69105695 481423 0481423 2065597 3015287	A	17-03-1992 15-12-1994 19-01-1995 13-04-1995 13-02-1995 22-04-1992 16-02-1995 30-06-1995 18-08-1992 30-03-1993
DE	4411960	Α	12-10-1995	DE	4411960	A1	12-10-1995

FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82