

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

**In the Matter of**

**CERTAIN VARIABLE VALVE  
ACTUATION DEVICES AND  
AUTOMOBILES CONTAINING THE  
SAME**

**Inv. No. 337-TA-954**

**ORDER NO. 9: ORDER CONSTRUING THE TERMS OF THE ASSERTED  
CLAIMS OF THE PATENTS AT ISSUE**

(October 8, 2015)

**I. INTRODUCTION**

A *Markman* hearing was held August 25, 2015. Complainant Jacobs Vehicle Systems (“JVS”) and respondents FCA US LLC, FCA Mexico, S.A. de C.V., FCA Melfi S.p.A., FCA Serbia d.o.o. Kragujevac, and Fiat Chrysler Automobiles N.C. (collectively, “FCA”) participated in the *Markman* hearing.

Prior to the hearing, the parties filed opening and rebuttal claim construction briefs, establishing which terms required construing and offering various proposals for them. On September 4, 2015, JVS and FCA submitted a Joint Proposed Claim Construction Chart (“Jt. Claim Chart”).

**II. APPLICABLE LAW**

Pursuant to the Commission’s Notice of Investigation, this investigation is a patent-based investigation. (See 80 Fed. Reg. 20012 (April 14, 2015).) JVS asserts that FCA infringes various claims of the patents asserted in this investigation. A finding of infringement or non-infringement requires a two-step analytical approach. First, the asserted patent claims must be

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construed as a matter of law to determine their proper scope.<sup>1</sup> Claim interpretation is a question of law. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996); *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1455 (Fed. Cir. 1998). Second, a factual determination must be made as to whether the properly construed claims read on the accused devices. *Markman*, 52 F.3d at 976.

In construing claims, the ALJ should first look to intrinsic evidence, which consists of the language of the claims, the patent's specification, and the prosecution history, as such evidence "is the most significant source of the legally operative meaning of disputed claim language." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996); *see also Bell Atl. Network Servs., Inc. v. Covad Comm'n. Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The words of the claims "define the scope of the patented invention." *Id.* And, the claims themselves "provide substantial guidance as to the meaning of particular claim terms." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006). It is essential to consider a claim as a whole when construing each term, because the context in which a term is used in a claim "can be highly instructive." *Id.* Claim terms are presumed to be used consistently throughout the patent, such that the usage of the term in one claim can often illuminate the meaning of the same term in other claims. *Research Plastics, Inc. v. Federal Pkg. Corp.*, 421 F.3d 1290, 1295 (Fed. Cir. 2005). In addition:

... in clarifying the meaning of claim terms, courts are free to use words that do not appear in the claim so long as the resulting claim interpretation ... accord[s] with the words chosen by the patentee to stake out the boundary of the claimed property.

*Pause Tech., Inc. v. TIVO, Inc.*, 419 F.3d 1326, 1333 (Fed. Cir. 2005).

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<sup>1</sup> Only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int'l Trade Comm'n.*, 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

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Some claim terms do not have particular meaning in a field of art, in which case claim construction involves little more than applying the widely accepted meaning of commonly understood words. *Phillips*, 415 F.3d at 1314. Under such circumstances, a general purpose dictionary may be of use.<sup>2</sup> The presumption of ordinary meaning, however, will be “rebutted if the inventor has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.” *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1091 (Fed. Cir. 2003).

Sometimes a claim term will have a specialized meaning in a field of art, in which case it is necessary to determine what a person of ordinary skill in that field of art would understand the disputed claim language to mean, viewing the claim terms in the context of the entire patent. *Phillips*, 415 F.3d at 1312-14; *Vitronics*, 90 F.3d at 1582. Under such circumstances, the ALJ must conduct an analysis of the words of the claims themselves, the patent specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, as well as the meaning of technical terms and the state of the art. *Id.*

Claim terms should generally be given their ordinary and customary meaning unless “1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). “To act as its own lexicographer, a patentee must ‘clearly set forth a definition of the disputed claim term . . . .’” *Id.*; quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). And “[w]here the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside . . . the patent,” even if the terms might otherwise be

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<sup>2</sup> Use of a dictionary, however, may extend patent protection beyond that to which a patent should properly be afforded. There is also no guarantee that a term is used the same way in a treatise as it would be by a patentee. *Id.* at 1322.

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broad enough to cover that feature. *Id.* at 1366 (internal citation omitted). Thus, if a claim term is defined contrary to the meaning given to it by those of ordinary skill in the art, the specification must communicate a deliberate and clear preference for the alternate definition. *Kumar v. Ovonic Battery Co.*, 351 F.3d 1364, 1368 (Fed. Cir. 2003). In other words, the intrinsic evidence must “clearly set forth” or “clearly redefine” a claim term so as to put one reasonably skilled in the art on notice that the patentee intended to so redefine the claim term. *Bell Atl.*, 262 F.3d at 1268.

When the meaning of a claim term is uncertain, the specification is usually the first and best place to look, aside from the claim itself, in order to find that meaning. *Phillips*, 415 F.3d at 1315. The specification of a patent “acts as a dictionary” both “when it expressly defines terms used in the claims” and “when it defines terms by implication.” *Vitronics*, 90 F.3d at 1582. For example, the specification “may define claim terms by implication such that the meaning may be found in or ascertained by a reading of the patent documents.” *Phillips*, 415 F.3d at 1323. “The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Id.* at 1316. However, as a general rule, particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman*, 52 F.3d at 979.

The prosecution history “provides evidence of how the inventor and the PTO understood the patent.” *Phillips*, 415 F.3d at 1317. For example, the prosecution history may inform the meaning of the claim language by demonstrating how an inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it otherwise would be. *Vitronics*, 90 F.3d at 1582-83; *see also Chimie v. PPG Indus., Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) (stating, “The purpose of consulting the

prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.”); *Microsoft Corp. v. Multi-tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) (stating, “We have held that a statement made by the patentee during prosecution history of a patent in the same family as the patent-in-suit can operate as a disclaimer.”). The prosecution history includes the prior art cited, *Phillips*, 415 F.3d at 1317, as well as any reexamination of the patent. *Intermatic Inc. v. Lamson & Sessions Co.*, 273 F.3d 1355, 1367 (Fed. Cir. 2001).

Differences between claims may be helpful in understanding the meaning of claim terms. *Phillips*, 415 F.3d at 1314. A claim construction that gives meaning to all the terms of a claim is preferred over one that does not do so. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir.), *cert. denied*, 546 U.S. 972 (2005); *Alza Corp. v. Mylan Labs. Inc.*, 391 F.3d 1365, 1370 (Fed. Cir. 2004). In addition, the presence of a specific limitation in a dependent claim raises a presumption that the limitation is not present in the independent claim. *Phillips*, 415 F.3d at 1315. This presumption of claim differentiation is especially strong when the only difference between the independent and dependent claim is the limitation in dispute. *SunRace Roots Enter. Co., v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003). “[C]laim differentiation takes on relevance in the context of a claim construction that would render additional, or different, language in another independent claim superfluous.” *AllVoice Computing PLC v. Nuance Commc’ns, Inc.*, 504 F.3d 1236, 1247 (Fed. Cir. 2007).

Finally, when the intrinsic evidence does not establish the meaning of a claim, the ALJ may consider extrinsic evidence, *i.e.*, all evidence external to the patent and the prosecution history, including inventor testimony, expert testimony and learned treatises. *Phillips*, 415 F.3d at 1317. Extrinsic evidence may be helpful in explaining scientific principles, the meaning of

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technical terms, and terms of art. *Vitronics*, 90 F.3d at 1583; *Markman*, 52 F.3d at 980. However, the Federal Circuit has generally viewed extrinsic evidence as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Phillips*, 415 F.3d at 1318. With respect to expert witnesses, any testimony that is clearly at odds with the claim construction mandated by the claims themselves, the patent specification, and the prosecution history should be discounted. *Id.* at 1318.

If the meaning of a claim term remains ambiguous after a review of the intrinsic and extrinsic evidence, then the patent claims should be construed so as to maintain their validity. *Id.* at 1327. However, if the only reasonable interpretation renders a claim invalid, then the claim should be found invalid. *See Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999).

Section 112, paragraph 6 of the Patent Act states that:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112, ¶ 6 (2009).

“Section 112, paragraph 6 was intended to allow the use of means expressions in patent claims without requiring the patentee to recite in the claims all possible structures that could be used as means in the claimed apparatus.” *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1211 (Fed. Cir. 2003). The process of construing a means-plus-function term differs from the process of construing other claim language. “The first step in the construction of a means-plus-function claim element is to identify the particular claimed function. The second step in the analysis is to look to the specification and identify the corresponding structure for that function.” *Id.* at 1210 (citations omitted).

The construction of a means-plus-function term is thus limited by the disclosure of the

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corresponding structure in the specification. As explained by the Federal Circuit, “[t]he literal scope of a properly construed means-plus-function limitation does not extend to all means for performing a certain function. Rather, the scope of such claim language is sharply limited to the structure disclosed in the specification and its equivalents.” *J & M Corp. v. Harley-Davidson, Inc.*, 269 F.3d 1360, 1367 (Fed. Cir. 2001). Section 112, paragraph 6 has been described as representing “a *quid pro quo* by permitting inventors to use a generic means expression for a claim limitation *provided that* the specification indicates what structure(s) constitute(s) the means.” *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1381 (Fed. Cir. 1999).

The claim terms construed in this Order are for the purposes of this Section 337 investigation. Hereafter, discovery and briefing in this Section 337 investigation shall be governed by this construction of the claim terms. All other claim terms shall be deemed as undisputed and shall be interpreted by the ALJ in accordance with “their ordinary meaning as viewed by one of ordinary skill in the art.” *See Apex*, 325 F.3d at 1373.

### III. THE '277 PATENT

#### A. Background and Claims

U.S. Patent No. 6,474,277 (“the ’277 Patent”) is entitled “Method and Apparatus for Valve Seating Velocity Control.” The ’277 Patent issued on November 5, 2002. The named inventors are Richard Vanderpoel of Bloomfield, Connecticut and John A. Schwoerer of Storrs, Connecticut. JVS asserts claim 36 against FCA. Claims 1-5, 8-9, 11, 14-16, 22, 25-29 and 33 are asserted for domestic industry. The relevant claims are:

1. An engine valve seating system having a piston adapted to be bi-directionally displaced in response to the filling and draining of hydraulic fluid from an hydraulic chamber in communication with said piston, said system comprising:

means for guiding hydraulic fluid from said chamber during draining; and

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means for throttling hydraulic fluid flow through the guiding means at a preselected rate in response to a change in position of the guiding means relative to the throttling means during draining,

wherein the throttling means includes a central bore, and the guiding means includes a surface adapted to selectively occlude the central bore.

11. The system of claim 1 further comprising means for automatically taking up lash between said system and an engine valve component.

36. An engine valve seating system having an outer tappet adapted to be bi-directionally directionally displaced in response to the filling and draining of hydraulic fluid from an hydraulic chamber in communication with said outer tappet, said system comprising:

a housing having a bore formed therein for receipt of the outer tappet, said bore having an end wall;

an outer tappet disposed in the bore, said outer tappet being adapted to contact a valve train element, and having an end proximate to the bore end wall;

an hydraulic chamber formed between the bore end wall and the end of the outer tappet proximate to the bore end wall;

a hydraulic fill and drain passage communicating with the hydraulic chamber, said passage being adapted to be selectively occluded by displacement of the outer tappet in the bore.



**B. Disputed Claim Terms****1. “outer tappet” (claim 36)<sup>3</sup>**

<b>JVS’s Proposed Construction</b>	<b>FCA’s Proposed Construction</b>
A slidable component that transmits motion that originates from the cam to the engine valve	An external component configured to receive an inner tappet

The parties do not dispute the meaning of “tappet,” which both parties agree is a slidable component that receives and transmits motion. (COB at 20; ROB at 9.)<sup>4</sup> The parties’ disagreement, however, centers around the meaning of “outer.”

JVS argues that “outer tappet” means “a slidable component that transmits motion that originates from the cam to the engine valve.” (COB at 20.) JVS argues that the “outer” tappet is the tappet on the outer/valve end of the valvetrain. (*Id.*) JVS notes that its proposed construction reads on the preferred embodiments set forth in Figures 17 and 18 and corresponding specification. JVS further asserts that the claim language itself supports its construction. (*Id.* at 21-22.)

FCA argues that “outer tappet” means “an external component configured to receive an inner tappet.” (ROB 9.) FCA argues that its construction gives meaning to the modifier “outer” and is supported in the specification. (*Id.* at 9-10.) FCA argues that the specification clearly describes an “outer tappet” configured to receive an inner tappet in the lost motion systems described in Figures 17 and 18. (*Id.* at 10-11.) FCA further argues that the plain and ordinary

<sup>3</sup> On October 2, 2015, FCA filed a motion for leave to supplement the Markman record as to the term “outer tappet” and request for shortened response time. (Motion No. 954-008.) On October 5, 2015, JVS filed a response opposing the motion. FCA seeks to supplement the record with deposition testimony of the inventors of the ’277 patent and argues that good cause exists because the depositions of the inventors was not taken until after the *Markman* hearing. JVS argues that FCA has failed to show good cause; the deposition testimony is not worthy of satisfying the good cause standard or probative of the point FCA asserts; and it would be prejudicial to JVS. Motion No. 954-008 is hereby **DENIED**. The ALJ finds that FCA has failed to show good cause as to why the *Markman* record should be reopened.

<sup>4</sup> The following abbreviations are used throughout this order: Complainant Jacobs Vehicle Systems, Inc.’s Opening Claim Construction Brief (“COB”); Respondents’ Opening Claim Construction Brief (“ROB”); Complainant’s Rebuttal Claim Construction Brief (“CRB”); Respondents’ Reply Claim Construction Brief (“RRB”).

meaning of “outer” as used in the claim language supports their construction as it is used to describe the spatial relationship between the outer and inner tappet. (ROB at 10.) Finally, FCA asserts that extrinsic evidence, namely contemporaneous patents that include those filed by JVS, used the term “outer” to describe a spatial relationship between components. (ROB at 11-12.)

The ALJ finds that the claim term “outer tappet” means an external slidable component that transmits motion that originates from the cam to the engine valve.

The claim language supports such a construction as it repeatedly uses the term “*outer* tappet” (emphasis added) rather than just the term “tappet” thereby indicating that “outer” must be given some meaning. (’277 patent at Claim 36.) The specification sheds some light as to what meaning “outer” must be given as it describes an “outer tappet 820” located external to an “inner tappet 810” in Figures 17 and 18:

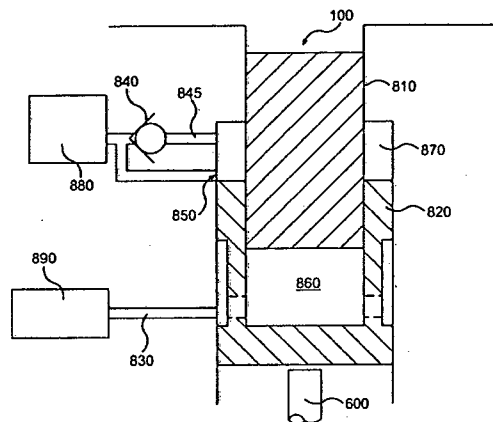


FIG. 17

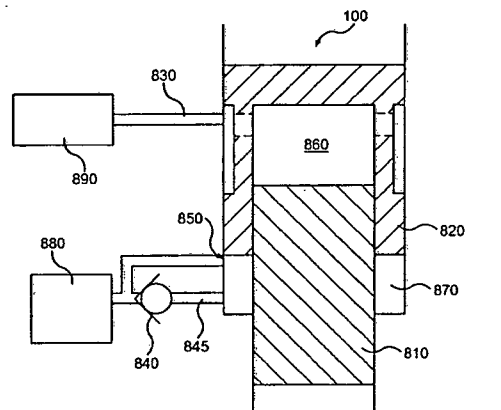


FIG. 18

The specification describes the “inner tappet 810” and “outer tappet 820” as sliding relative to one another as “hydraulic chamber 860” is filled and emptied:

During engine valve opening, both the inner tappet 810 and the outer tappet 820 may move downward following the engine valve. During this time the valve seating plenum 870 may be filled with hydraulic fluid through the check valve 840 and the orifice 850. . .

[...]

The system 100 shown in FIG. 17 may also be used to provide VVA in an alternative embodiment. In a VVA embodiment, the inner tappet 810 is displaced by a valve train element such as a cam (not shown). The outer tappet 820 follows the engine valve/contact stem 600. Variable valve timing may be achieved by opening the trigger valve 890, which permits the flow of oil from the inter-tappet plenum 860. ...

(’277 patent at 13:56-14:29; *see also* 14:30-39 (*describing* Figure 18).) Thus, the specification describes two tappets – one that is internal (“inner”) and moves relative to a tappet that is external (“outer”).

The ALJ finds that neither parties’ proposed construction is sufficient. JVS’s construction, namely “a slidable component that transmits motion that originates from the cam to the engine valve” could encompass both the inner tappet and outer tappet as it merely describes the function of a “tappet” but gives no meaning to the modifier “outer.” Indeed, JVS describes inner tappet as “a slidable component that transmits motion from the cam onward through the valvetrain toward the engine valve,” which almost indistinguishable from its construction for outer tappet, *i.e.*, “a slidable component that transmits motion that originates from the cam to the engine valve.” (COB at 20.) As for FCA’s construction, it includes a reference to an inner tappet, which as JVS correctly points out, is not included anywhere in claim 36.

Therefore, the ALJ finds that “outer tappet” means an external slidable component that transmits motion that originates from the cam to the engine valve.

## 2. “bore end wall” (claim 36)

JVS’s Proposed Construction	FCA’s Proposed Construction
A wall that defines an end boundary of a hydraulic chamber in a bore	No construction necessary

## “having an end proximate to the bore end wall” (claim 36)

JVS’s Proposed Construction	FCA’s Proposed Construction
Having an end that defines an end boundary of a hydraulic chamber in a bore	No construction necessary

JVS argues that “bore end wall” should be construed to mean “a wall that defines an end boundary of a hydraulic chamber in a bore” and that “having an end proximate to the bore end wall” means “having an end that defines an end boundary of a hydraulic chamber.” (COB at 23-24.) JVS asserts that construction is necessary under *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) and because they are not “plain meanings of one of ordinary skill in the art,” then construction is necessary. (CRB at 6-7.)

FCA argues that the claim term needs no construction and that JVS’s attempt to import limitation from other claims is unnecessary. (ROB at 13-14.) Specifically, FCA argues that JVS relies on portions of the specification that define another claim term, namely “hydraulic chamber,” and that those portions also relate to a different embodiment than that described and claimed in claim 36. (RRB at 7-8.)

The ALJ finds that these claim terms need no construction. First, the ALJ agrees with FCA that the language of claims is clear as to what “bore end wall” and “having an end

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proximate to the bore end wall” would mean to one of ordinary skill in the art in the context of the claims:

36. An engine valve seating system having an outer tappet adapted to be bi-directionally directionally displaced in response to the filling and draining of hydraulic fluid from an hydraulic chamber in communication with said outer tappet, said system comprising:

a housing having a bore formed therein for receipt of the outer tappet, said bore having an end wall;

an outer tappet disposed in the bore, said outer tappet being adapted to contact a valve train element, and having an end proximate to the bore end wall;

an hydraulic chamber formed between the bore end wall and the end of the outer tappet proximate to the bore end wall;

a hydraulic fill and drain passage communicating with the hydraulic chamber, said passage being adapted to be selectively occluded by displacement of the outer tappet in the bore.

(’277 Patent at Claim 36.) The ALJ finds that JVS summarily states that construction is “necessary” in view of *Phillips*. However, the ALJ finds that such a conclusory statement fails to show why construction is necessary, especially since the plain meaning of the terms is readily apparent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (“In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.”); *Power Integrations, Inc. v. Fairchild Semiconductor Intern., Inc.*, 711 F.3d 1348, 1361 (Fed. Cir. 2013) (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996)) (“In construing a claim term, we look to the words of the claim itself. If the claim term has a plain and ordinary meaning, our inquiry ends.”); see also *O2 Micro Intern. Ltd. v. Beyond Innovation Technology Co., Ltd.*, 521 F.3d 1351, 1362-1363 (Fed. Cir. 2008) (citing *U.S. Surgical Corp. v. Ethicon, Inc.*,

103 F.3d 1554, 1568 (Fed.Cir.1997)) (“[C]laim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement.”).

Moreover, the ALJ finds that the definitions proposed by JVS are circular as the “hydraulic chamber” that JVS uses to define the “bore end wall” and “having an end proximate to the bore end wall” are already set forth in the “hydraulic chamber” limitation, *e.g.*, “an hydraulic chamber formed between the bore end wall and the end of the outer tappet proximate to the bore end wall.” (’277 Patent at Claim 36.)

Thus, the ALJ finds that the claim terms “bore end wall” and “having an end proximate to the bore end wall” need not be construed and should be given its plain and ordinary meaning.

### 3. “selectively occluded” (claim 36)

JVS’s Proposed Construction	FCA’s Proposed Construction
Progressively blocked	Selectively blocked

The parties do not dispute that “occluded” means blocked. (COB at 23; ROB at 14.) The parties dispute, however, the construction of “selectively.” JVS argues that “selectively occluded” means “progressively blocked” based on the specification’s description of the action of moving the piston in blocking the hydraulic fill and drain passage. (COB at 25.) JVS further argues that the claim language supports this interpretation as dependent claim 12 and 13, which depends on claim 1, are narrower in scope than independent claim 1 based on additional limitations not related to “occlud[ing],” and that the use of “progressively occluded” in the claims means that it is the same as “selectively occluded” in claim 1. (CRB at 9.)

FCA argues that “selectively occluded” means “selectively blocked” because “selectively” is not the same as “progressively” as asserted by JVS. (ROB at 14.) Rather, FCA argues that the claims show that “progressively occluded” is narrower than “selectively

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occluded.” (ROB at 14.) Furthermore, the specification specifically uses the words distinctly with two separate meanings and not interchangeably as JVS suggests. (ROB at 14-15.)

The ALJ finds that “selectively occluded” means progressively occluded. First, the specification repeatedly describes “progressively” blocking the hydraulic fill and drain passage using the piston:

The velocity of the engine valve is reduced as it approaches its seat by **progressively** throttling the escape of hydraulic fluid from a chamber. The chamber is pressurized as a result of the valve approaching its seat. ('277 Patent at Abstract) (emphasis added);

As the engine valve closes (i.e. element 600 moves upward), the check valve 840 closes and hydraulic fluid is forced through the partially occluded orifice 850 from the valve catch plenum 870 back to the low pressure reservoir 880. The partially occluded orifice 850, formed by the upper edge of the outer tappet 820 and the hole in the side wall of the plenum 870, is designed to **progressively** restrict the flow of hydraulic fluid from the plenum 870 as the engine valve approaches its seat. The ideal orifice flow area profile would maintain a constant valve catch plenum pressure between the point at which the orifice starts to occlude, at typically, but not limited to, 1 mm engine valve lift, to the point of valve seating. (*Id.* at 14:7-19) (emphasis added);

As the open space decreases, the rate of hydraulic fluid flow from the chamber 740 to the recess 320 decreases in like proportion. The **progressively** decreased drain or flow of hydraulic fluid from the chamber 740 as a result of the disk 500 riding up the fluted end 420 of the elongated stop brings the slave piston 300 (and thus the engine valve) to a soft landing against the elongated stop 400. (*Id.* at 12:34:40) (emphasis added);

It is still another object of the present invention to provide a method and system for controlling valve seating that **progressively** restricts hydraulic fluid flow as the valve approaches its seat. (*Id.* at 5:64-67) (emphasis added);

Applicants have additionally developed a method of controlling the seating velocity of an engine valve and providing automatic lash take up, the said method comprising the steps of providing leakage filling of a first fluid chamber to automatically take up lash; filling a fluid chamber responsive to an opening motion of the engine valve; expelling fluid from the fluid chamber responsive to a closing motion of the engine valve; and **progressively** throttling the expulsion of fluid from the fluid chamber during at least a portion of the engine valve closing motion. (*Id.* at 7:61-8:3) (emphasis added).

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*See also id.* at 12:64-13:3 (“In these embodiments of the invention, [. . .]the tapered end of the flutes produces progressive throttling of the hydraulic fluid flow between the disk and the elongated stop...). Thus, the specification repeatedly describes the valve seating event as one where the flow of hydraulic fluid is “progressively” throttled.

Moreover, claim language supports this construction. Claims 12 and 13, which depend from claim 1, shows that “progressively occluded” and “selectively occluded” are synonymous. Dependent claims 12 and 13 specifically describe the “throttling means” and “guiding means” of claim 1, but they do not further limit or narrow the manner in which the throttling occurs, *i.e.*, through “selective” or “progressive” blocking:

12. The system of claim 1 wherein said throttling means comprises a pin shaped end formed on said piston, said pin shaped end being adapted to progressively occlude a flow opening.

13. The system of claim 12 wherein said guiding means comprises a disk, said disk being positioned in said chamber, and said disk having a central flow opening adapted to be progressively occluded by the throttling means and an off-center flow opening adapted to remain unoccluded.

(’277 patent at Claims 12 and 13.)<sup>5</sup> Indeed, in arguing that “selectively” and “progressively” are not the same because the patentee used two different claim terms in the independent and dependent claims, FCA summarily states that the claim terms must mean something else, but it fails to explain the specific difference between the two claim terms. In other words, FCA has

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<sup>5</sup> Claim 1 states:

1. An engine valve seating system having a piston adapted to be bi-directionally displaced in response to the filling and draining of hydraulic fluid from an hydraulic chamber in communication with said piston, said system comprising:

means for guiding hydraulic fluid from said chamber during draining; and

means for throttling hydraulic fluid flow through the guiding means at a preselected rate in response to a change in position of the guiding means relative to the throttling means during draining,

wherein the throttling means includes a central bore, and the guiding means includes a surface adapted to selectively occlude the central bore.



failed to explain how they do not mean the same thing and why “progressively” is narrower in meaning aside from its appearance in dependent claims. While the axiom relied up on by FCA is certainly true, the ALJ finds that the repeated descriptions in the specification coupled with the additional limitations of the dependent claims (which is limited to what each respective means is “comprised of” and not the actual occluding action) supports the ALJ’s construction that “progressively” and “selectively,” as read in light of the ’277 Patent, are synonymous.

Therefore, the ALJ finds that “selectively occluded” means progressively occluded.

**4. “means for automatically taking up lash between said system and an engine valve component” (Claim 11)**

<b>JVS’s Proposed Construction</b>	<b>FCA’s Proposed Construction</b>
<p><b>Function:</b> Automatically taking up lash between the engine valve seating system and the engine valve component</p> <p><b>Structure:</b> Elongated stop, slave piston and associated chamber/recess, and spring</p>	Indefinite.

The parties agreed that the claimed function is “automatically taking up lash between the engine valve seating system and the engine valve component.” (COB at 25-26; ROB at 15.) The parties dispute, however, whether the specification discloses the requisite structure that performs the function.

JVS argues that the specification links the elongated stop, a slave piston and associated chamber or recess and a spring to the function. (COB at 26.) FCA argues that the specification merely teaches that automatic lash adjustment is accomplished through the leakage of oil, but

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fails to identify a specific structure. (ROB at 15-16.) Rather, that function (leakage of oil) can be performed by many different structures. (*Id.*)

The ALJ finds that “means for automatically taking up lash between said system and an engine valve component” is indefinite as the specification fails to identify a specific structure. The specification repeatedly describes automatic lash adjustment through the act of leaking oil, but it fails to identify a specific structure that performs that function:

Applicants have additionally developed a method of controlling the seating velocity of an engine valve and providing automatic lash take up, the said method comprising the steps of **providing leakage** filling of a first fluid chamber to automatically take up lash; filling a fluid chamber responsive to an opening motion of the engine valve; expulsing fluid from the fluid chamber responsive to a closing motion of the engine valve; and progressively throttling the expulsion of fluid from the fluid chamber during at least a portion of the engine valve closing motion. ('277 Patent at 7:61-8:3);

The low pressure hydraulic fluid in the chamber 740 causes the slave piston 300 to move down and eliminates the lash between the slave piston and the contact stem 600. The elimination of the lash initially creates a gap between the elongated stop 400 and the upper end of the housing recess 750. After this initial period, the elongated stop 400 slowly moves upward under the action of the spring 440 and eliminates this gap as a result of leakage flow into the recess 350. **Leakage flow into the recess 350 provides constant self-adjusting lash take-up for the system.** (*Id.* at 10:4-13);

Auto-lashing of the elongated stop is also provided by **means of leakage** to the slave piston recess 350. While the slave piston 300 and the elongated stop 400 move nearly together during valve actuation, the stop actually moves slowly upward relative to the slave piston as hydraulic fluid leaks into the slave piston recess 350. (*Id.* at 10:37-42);

In between valve events **oil will leak in or out** of the lash chamber 910 through the clearance 902 at a rate fast enough to adjust for any changes in valve length due to thermal growth (tens of seconds) and component wear (months). (*Id.* at 15:2-5);

In this version the stroke of the seating piston 300 is not affected by lash adjustment. Automatic lash take up is **provided by the flow of leakage oil** to the lash chamber 910. Leakage flow to the chamber 910 causes the entire assembly packaged within the tube 304 to move downward and take up any lash. (*Id.* at 15:26-31).

(emphases added). Thus, the specification repeatedly discloses the means for automatic lash adjustment by leaking oil. It does not, however, disclose a specific structure to do so.

JVS argues that the elongated stop 400, slave piston and associated chamber/recess 750 and spring 440 is the associated structure. However, as shown above, the specification clearly describes the actual act of automatic lash adjustment is through the leakage of oil. The structures identified by JVS are part of the valve seating system and there is nothing in the specification that “clearly links or associates” those structures to the automatic lash adjustment. *B. Braun Medical, Inc. v. Abbott Laboratories*, 124 F.3d 1419, 1424 (Fed. Cir. 1997) (“We hold that, pursuant to [Section 112, paragraph 6], structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.”); *see also Triton Tech of Texas, LLC v. Nintendo of America, Inc.*, 753 F.3d 1375, 1378 (Fed. Cir. 2014) (“In exchange for using this form of claiming, the patent specification must disclose with sufficient particularity the corresponding structure for performing the claimed function and clearly link that structure to the function.”) (citations omitted). The portions of the specification identified by JVS describe leaking of oil into a recess – the disclosure focuses on “means of leakage” or the act of leaking into a recess, it does not describe or disclose a specific structure. *Atmel Corp. v. Information Storage Devices, Inc.*, 198 F.3d 1374, 1382 (Fed. Cir. 1999) (“Fulfillment of the §112, ¶6 tradeoff cannot be satisfied when there is total omission of structure. There must be structure in the specification.”) In other words, automatic lash adjustment, according to the specification, is accomplished through the leakage of oil. The specification does not identify a specific structure linked to the function claimed -- automatically taking up lash between the engine valve seating system and the engine valve component. Consequently, the claim is indefinite. *In re. Aoyama*, 656 F.3d 1293,

1298 (Fed. Cir. 2011) (“Because the means-plus-function limitation of claims 11 and 21 lacked sufficient disclosure of structure under 35 U.S.C. §112, ¶6, these claims are unpatentable as indefinite under 35 U.S.C. §112, ¶2.”) (citations omitted).

#### IV. THE '282 PATENT

##### A. BACKGROUND AND DISPUTED CLAIMS

U.S. Patent No. 7,059,282 (“the '282 patent”) is entitled “Variable Lost Motion Valve Actuator and Method,” was filed September 23, 2002 and claims partial priority from provisional application No. 60/069,270 filed December 11, 1997.<sup>6</sup> The '282 patent issued on June 13, 2006. The named inventors are Joseph M Vorih of Suffield, Connecticut; Jeffrey Mossberg of Windsor, Connecticut; Richard Vanderpoel of Bloomfield, Connecticut; Steven Ernest of Windsor, Connecticut; Guy Paterson of Simsbury, Connecticut; John A. Schwoerer of Storrs, Connecticut; AND Edward T. Leitkowski of Colechester, Connecticut. JVS asserts infringement of claims 1, 4, 10, 13, 15-18, 25 and 27-30. Claims 1, 13, and 25 are independent claims and claims 4, 10, 15-18, and 27-30 are dependent claims. The relevant claims are:

1. A valve actuation system for controlling the operation of an engine valve, said system comprising:

means for hydraulically varying the amount of engine valve actuation;

a solenoid actuated trigger valve operatively connected to the means for hydraulically varying; and

means for determining trigger valve actuation and deactuation times based on a selected engine mode, and engine load and engine speed values.

4. The system of claim 1 wherein the means for determining trigger valve actuation and deactuation times determines such times based further on engine oil temperature value.

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<sup>6</sup> The '282 Patent also claims partial priority from and is a divisional of U.S. Application No. 09/749,907 filed on December 29, 2000 (now U.S. Patent No. 6,510,824), which is in turn a continuation-in-part of application No. 09/594,791 (now U.S. Patent No. 6,293,237), which shares a specification with the '270 provisional application. The '237 patent is discussed further below in connection with claim construction.

10. The system of claim 1, further comprising:

means for determining a present temperature of an engine fluid; and

means for modifying engine valve actuation in response to the determined temperature.

13. A hydraulic valve actuation system for controlling the operation of at least one valve of an engine at different operating temperatures, said valve actuation system including a trigger valve adapted to control hydraulic fluid flow in the valve actuation system, and said valve actuation system comprising:

means for determining a present temperature of an engine fluid;

means for modifying the operation of the trigger valve in response to the determined temperature; and

means for actuating the engine valve responsive to the operation of the trigger valve.

15. The valve actuation system of claim 13, wherein the means for modifying advances an opening time of the trigger valve.

16. The valve actuation system of claim 13, wherein the means for modifying delays a closing time of the trigger valve.

17. The valve actuation system of claim 13, wherein the means for modifying delays an opening time of the trigger valve.

18. The valve actuation system of claim 13, wherein the means for modifying advances a closing time of the trigger valve.

25. A method of modifying the timing of the operation of a trigger valve used to control the actuation of at least one engine valve, said method comprising the steps of:

determining a current temperature of an engine fluid;

determining a timing modification for the operation of the trigger valve based on the determined current temperature;

modifying the timing of the operation of the trigger valve in response to the determined timing modification; and

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transmitting a valve actuation motion to the engine valve responsive to the operation of the trigger valve.

27. The method according to claim 25, wherein the step of modifying the timing includes the step of advancing the opening of said trigger valve.

28. The method according to claim 25, wherein the step of modifying the timing includes the step of delaying the opening of said trigger valve.

29. The method according to claim 25, wherein the step of modifying the timing includes the step of advancing the closing of said trigger valve.

30. The method according to claim 25, wherein the step of modifying the timing includes the step of delaying the closing of said trigger valve.

**B. DISPUTED CLAIM TERMS**

**1. “trigger valve” (claims 1, 4, 13, 15-18, 25, 27-30)**

<b>JVS’s Proposed Construction</b>	<b>FCA’s Proposed Construction</b>
An electronically-actuated valve that directly moves a blocking/unblocking member to control the flow of hydraulic fluid	A valve configured to block and unblock a hydraulic fluid passage [responsive to an activating signal]*  *Bracketed text added by reply brief. FCA Reply Br. at 11 n.3.

The parties agree that the trigger valve is a valve for blocking and unblocking the flow of hydraulic fluid in a passage in response to an activating signal. (JVS *Markman* Presentation (“JMP”) at 52; ROB at 17; *see also* RRB at 11.) The parties also agree that the term “trigger valve” takes on the same meaning in both the ’282 and ’492<sup>7</sup> patents. (*See* JMP at 52.) However, the parties dispute whether the activating signal must be electronic (i.e., “electronically-actuated”) and whether the activating signal directly moves the member. (JMP at 52; COB at 17; RRB at 11.)

<sup>7</sup> On this same day, the ALJ granted JVS’s motion for partial termination of the investigation based on the withdrawal of the allegations as to U.S. Patent No. 6, 883, 492 (“the ’492 patent”). *See* Order No. 8. However, even in view of the partial termination as to the ’492 patent, the ALJ’s analysis, which relies on the ’492 patent, remains applicable to the meaning of the term “trigger valve” in the ’282 patent.

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JVS contends that the '492 patent makes clear that the movement of the blocking/unblocking member is controlled electronically, such as by a solenoid, because the specification references energizing the member in order to open it. (COB at 28.) Additionally, JVS argues that “[b]ecause the '492 Patent states that U.S. Patent No. 5,680,841 (the “'841 Patent”) (also owned by JVS) ‘contemplates the use of a high speed trigger valve,’ '492 Patent at 2:29-30, one of skill in the art would also look to the '841 patent to understand the meaning of ‘trigger valve.’” (*Id.*) Then, JVS points out that the '841 patent discloses “Valve 100 is controlled by electronic control circuitry 110 associated with engine 10.” (*Id.*; quoting '841 col. 4 ll. 38-39.) JVS argues that “[t]hus, the '841 Patent (and, in turn, the '492 Patent) establishes that a ‘trigger valve’ is a valve that is directly controlled by electronic control circuitry. (COB at 28.)

JVS also contends that the prosecution history of the '282 patent limits the blocking member to be electronically responsive such as by a solenoid. (COB at 29.) Specifically, JVS points out that during prosecution of U.S. Patent No. 6,293,237 (“the '237 patent”), which is a grandparent of the '282 patent, the trigger valve was limited to a valve in which an electronic device directly controls a blocking member. (COB at 30; *citing* '237 patent prosecution amendment/response, April 5, 2001 (“The use of a mechanically actuated valve, which inherently provides fixed-time actuation, is completely inconsistent with the concept of ‘variable lost motion,’ and thus is inconsistent with the concept of a ‘trigger valve.’”).)

FCA contends that the “trigger valve” need not be electronically actuated (such as by a solenoid) as the '282 patent specification explains by stating that “the trigger valve 330 need not be a solenoid activated trigger, **but could instead be hydraulically or mechanically activated.**” (RRB at 11; *quoting* the '282 patent at 15:22-24 (emphasis added).) Next, FCA submits that the

blocking/unblocking member does not need to be moved directly but the member only has to be moved as a result of activation. (RRB at 12.) Specifically, FCA points out that the specification teaches that the member is responsive to a signal but does not require direct movement of the member. (*Id.* at 13.)

The ALJ finds the term “trigger valve” to mean a valve configured to block and unblock hydraulic fluid responsive to an activating signal. The ALJ finds that the language of the claims coupled with the specification articulate the meaning of the term “trigger valve.” First, the ALJ points out that the term “trigger valve” appears in independent claims 1 and 13: claim 1 states “solenoid activated trigger valve,” in other words electronically actuated, while claim 13 states “a trigger valve” as well as “the trigger valve.” (’282 patent at 47:28 and 48:22-30.) The record shows that if the term “trigger valve” had to be “electronically-actuated,” then the extra term “solenoid activated,” again in other words electronically actuated, in claim 1 would be superfluous. *See Merck & Co. v. Teva Pharm., USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005), *cert denied* 546 U.S. 972 (2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”) As such, JVS proposed construction including the phrase “electronically-actuated” is incorrect for at least this reason. The record shows the language of the claims with respect to “trigger valve” only requires the “trigger valve” to control the flow of hydraulic fluid. (*See e.g.*, ’282 patent at 48:22 (“a trigger valve adapted to control hydraulic fluid flow”).) Furthermore, besides the additional language of “solenoid activated” in claim 1, the language of the claims do not limit the term to being moved only electronically, and, in fact, do not limit the movement of the “block/unblocking member” to anything specific.

Second, the ALJ points out that a preferred embodiment in the specification does disclose the “trigger valve” having a solenoid actuator, in other words electronically actuated. (’282



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patent at 14:22-24 (“Preferably, the trigger valve 330 may include a solenoid actuator similar to the one shown in Fig. 7.”).) However, the ALJ points out that another embodiment in the specification states that “the trigger valve 330 need not be a solenoid activated trigger, but could instead be hydraulically or mechanically activated.” (’282 patent at 15:22-24.) Further, the ALJ points out that the limitations from the various embodiments within the specification cannot be imported in the claims. *See Markman*, 52 F.3d at 979-80.

The ALJ finds JVS’s arguments are unpersuasive and incorrect. First, the ALJ finds JVS’s argument disclaiming all but the electronically-actuated trigger valves during prosecution of a parent application (the ’237 patent) is incorrect. The record shows the disclaimer in this parent application only disclaims mechanical valves with fixed timing without disclaiming hydraulic or other non-fixed timing activated triggers for the valve. (COB, Ex. 9 (’237 Patent Prosecution History, Amendment and Response) at 4.) In other words, the record shows that the subject matter disclaimed is a mechanically actuated valve that provides fixed time actuation because it is actuated by the “mechanically actuated closure member 14 of Happel.” (*Id.* at 7.)

In the April 5, 2001 Amendment, JVS stated:

The use of a mechanically actuated valve, which inherently provides fixed-time actuation, is completely inconsistent with the concept of ‘variable lost motion,’ and thus is inconsistent with the concept of a “trigger valve.” It follows that the trigger valve recited in each of the pending claims does not read on the mechanically actuated closure member 14 of Happel.

(*Id.* at 7.)

Second, the ALJ finds JVS’s inclusion of “directly moves” with respect to the construction of the “trigger valve” to also be incorrect. The language of the claims, the specification and the prosecution history do not require the “blocking/unblocking member” to be moved in any specific way such as directly or indirectly. The ALJ finds that the only requirement is that the “blocking/unblocking member” is moved as a result of activation. The

specification itself states the “member responsive to ...” but not directly responsive. (’282 patent at 14:26.)

Accordingly, the ALJ finds the term “trigger valve” to mean “a valve configured to block and unblock hydraulic fluid responsive to an activating signal.”

2. **“means for hydraulically varying the amount of engine valve actuation” (Claim 1)**

JVS’s Proposed Construction	FCA’s Proposed Construction
<p><b>Function:</b> hydraulically varying the amount of engine valve actuation</p> <p><b>Structure:</b>  1. master/slave piston in communication through a hydraulic circuit  or  2. valvetrain with pivoting bridge and piston</p>	<p><b>Function:</b> hydraulically varying the amount of engine valve actuation</p> <p><b>Structure:</b> the components of system 300 of Figs. 1 or 4 (except for trigger valve 330), and pivoting bridge 200, as described at 13:29-67 and 15:30-54</p>

The parties agree that “means for hydraulically varying the amount of engine valve actuation” is a means-plus-function term to be construed pursuant to 35 U.S.C. § 112 ¶ 6. (COB at 35; ROB at 24.) The parties also agree that the function of the disputed term is “hydraulically varying the amount of engine valve actuation.” (*Id.*) While the parties use different words to describe the corresponding structure, the parties also agree that the specification discloses, as at least one structure associated with that function, a control piston arrangement involving a pivoting bridge and piston. (COB at 35 (“valvetrain with pivoting bridge and piston”); *see also* ROB at 24 (“the components of system 300 of Figs. 1 or 4 (except for trigger valve 330), and pivoting bridge 200, as described at 13:29-67 and 15:30-54”).) The dispute between the parties concerns whether the specification also discloses an alternate structure for performing this function; namely, a master-slave piston arrangement. (COB at 35; ROB at 24.)

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JVS contends that the '282 patent specification discloses a master/slave piston arrangement for hydraulically varying the amount of engine valve actuation. (COB at 36.) Specifically, JVS points out that the '282 patent specification discloses the master/slave arrangement as:

In some lost motion systems, an engine cam shaft may actuate a master piston which displaces fluid from its hydraulic chamber into a hydraulic chamber of a slave piston. The slave piston in turn acts on the engine valve to open it. The lost motion system may include a solenoid valve and a check valve in communication with a hydraulic circuit connected to the chambers of the master and slave pistons. The solenoid valve may be maintained in an open or closed position in order to retain hydraulic fluid in the circuit. As long as the hydraulic fluid is retained, the slave piston and the engine valve respond directly to the motion of the master piston, which in turn displaces hydraulic fluid in direct response to the motion of a cam. When the solenoid position is changed temporarily, the circuit may partially drain, and part or all of the hydraulic pressure generated by the master piston may be absorbed by the circuit rather than be applied to displace the slave piston.

('282 patent at 2:29-46.) Then, JVS points out that “[t]here is no requirement, however, that the structures linked to the claimed function themselves be novel or disclosed in the detailed description of the preferred embodiments.” (COB at 37.) JVS submits that “prior art structures disclosed in the background may be equally relevant.” (*Id.*; citing *Clearstream Wastewater Sys. v. Hydro-Action*, 206 F.3d 1440 (Fed. Cir. 2000).)

FCA argues that “[o]nly the structure in the specification that is ‘clearly linked’ to the claimed function forms the construction of a means plus function limitation.” (ROB at 24.) Then, FCA submits that the patentee has a duty to clearly link or associate the structure with the claimed function in order to satisfy the requirement of section 112, paragraph 6. (*Id.*) Further, FCA contends that “[t]he ‘clear link’ requirement ensure[s] the patent complies with 35 U.S.C. § 112, paragraph 2, which requires the invention to be particularly pointed out and distinctly claimed.” (*Id.*) FCA argues that “[t]he specification clearly links the structure in Figs. 1 and 4

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to the claimed function of hydraulically varying engine valve actuation.” (*Id.* at 25.) FCA then contends that the specification does not clearly link the master/slave piston arrangement described in the background section to the means-plus-function limitation because the specification’s background section describes the prior art master/slave piston arrangement and the problems associated with it. (*Id.* at 27.)

The ALJ finds that although the background section of the specification (’282 patent at 2:29-46) discloses a master/slave piston arrangement, this master/slave arrangement is not clearly linked to the claimed function within the ’282 patent. *See Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1211 (Fed. Cir. 2003) (“The duty of a patentee to clearly link or associate structure with the claimed function is the *quid pro quo* for allowing the patentee to express the claim in terms of function under section 112, paragraph 6.”). Also, the ALJ finds that JVS’s attempt to construe this claim term by using the master/slave arrangement is contrary to the scope of the invention because the master/slave arrangement is cited in the background section of the specification in order to show the problems with the prior art. (’282 patent at 2:46-64.)

The ALJ finds that the patent specification discloses the pivoting bridge and piston arrangement as the invention in contrast to the master/slave arrangement and therefore a person of ordinary skill in the art (“POSITA”) would have understood the structure for the claimed function to be the pivoting bridge and piston arrangement as opposed to the master/slave arrangement. *See ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 519 (Fed. Cir. 2012); *quoting Med. Instrumentation & Diagnostics Corp.*, 344 F.3d at 1212 (“We rather ‘look at the *disclosure* of the patent and determine if one of skill in the art would have understood that *disclosure* to encompass [the required structure].’”) Furthermore, the ALJ finds the patent

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specification as a whole describes the invention as the pivoting bridge and piston arrangement with only one mention of the master/slave arrangement in the background section. ('282 patent at 2:8-47.)

The ALJ finds JVS's arguments as unpersuasive. While the master/slave arrangement is in fact disclosed in the background section of the specification, JVS's argument that the term should be defined to include any structures disclosed in the specification that correspond to the claimed structure is not correct because the structure must be "clearly linked" with the claimed function and not just disclosed. *See Med. Instrumentation & Diagnostics Corp.*, 344 F.3d at 1211 (Fed. Cir. 2003) ("clearly link or associate structure with the claimed function"). Additionally, the ALJ finds JVS's reliance on *Clearstream Wastewater Sys. v. Hydro-Action*, 206 F.3d 1440 (Fed. Cir. 2000) to support its argument as not on point because the prior art system (*i.e.*, rigid hose) described in *Clearstream* was a second feature and did not go to the novelty of the claims. However, the ALJ finds that the master/slave prior art system disclosed in the background section of the '282 patent is not described as being used in the claimed invention but, in fact, was described as being completely replaced by the pivoting bridge and piston arrangement.

Accordingly, the ALJ finds the term "means for hydraulically varying the amount of engine valve actuation" as having the function of "hydraulically varying the amount of engine valve actuation" with corresponding structure of the components of system 300 of Figs. 1 or 4 (except for trigger valve 330), and pivoting bridge 200, as described at '282 at 13:29-67 and 15:30-54 (*i.e.*, "valvetrain with pivoting bridge and piston").

3. **"means for actuating the engine valve responsive to the operation of the trigger valve" (Claim 13)**

JVS's Proposed Construction	FCA's Proposed Construction
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<p><b>Function:</b> actuating the engine valve responsive to the operation of the trigger valve</p> <p><b>Structure:</b> a slave piston, or pivoting bridge or lever, or equivalents responsive to trigger valve to actuate engine valve</p>	<p><b>Function:</b> actuating the engine valve responsive to the operation of the trigger valve</p> <p><b>Structure:</b> the components of system 300 of FIGS. 1 or 4 (except for trigger valve 330), motion means 100, and pivoting bridge 200, as described at 13:4-18, 13:29-67 and 15:30-54</p>
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The parties agree that “means for actuating the engine valve responsive to the operation of the trigger valve” is a means-plus-function term to be construed pursuant to 35 U.S.C. § 112 ¶ 6. (COB at 39; ROB at 29.) The parties also agree that the function of the disputed term is “actuating the engine valve responsive to the operation of the trigger valve.” (*Id.*)

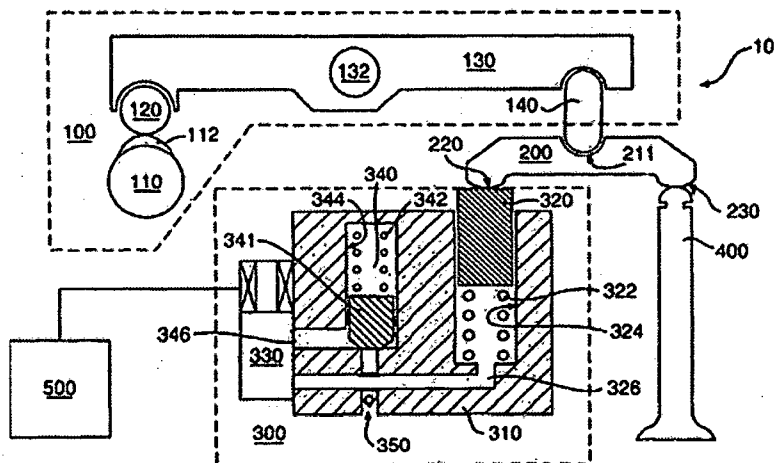
JVS submits that as with the “means for hydraulically varying the amount of engine valve actuation” discussed in the preceding section, the disagreement between the parties involves whether the associated structure is associated only with the control piston or may alternatively be associated with the disclosed master-slave arrangement. (COB at 39.) Then, JVS contends that there are alternative arrangements disclosed in the ’282 patent specification corresponding to the performance of the claimed function as discussed in JVS’s contentions regarding the “means for hydraulically varying the amount of engine valve actuation” terms as presented by JVS in the preceding section. (*Id.* at 39-30.) JVS argues that “[t]he structural elements responsible for actuating the engine valve responsive to the operation of the trigger valve are those elements that actually actuate the valve; i.e., a slave piston (in the master-slave architecture) or a pivoting bridge or lever or the like (in the control piston architecture).” (*Id.* at 40.)

FCA submits that this term and claim construction issue is similar to the term “means for hydraulically varying the amount of engine valve actuation” discussed in the previous section; however, FCA contends that in addition to “varying actuation,” this term requires actually

“actuating” the engine valve. (ROB at 30.) FCA therefore argues that the motion means 100 of Fig. 1 of the ’282 patent (cam and rocker arm) must be included along with the pivot bridge 200 and system 300, as those structures are necessary to “actuate” the engine valve. (*Id.*) FCA argues that “[t]he other components of system 300, including hydraulic fluid in the passage 326 and the control piston 320, along with the motion means 100, including cam and rocker arm, are necessary to achieve actuation of the engine valve and must be included as corresponding structure.” (*Id.*) Additionally, FCA submits that JVS’s construction is also incorrect, as discussed in the previous section, because it includes, as an alternative, a “slave piston” which is not included in the Fig. 1 structure. (*Id.*)

As explained in section IV.B.2. *supra*, the ALJ finds that the patent specification clearly discloses the pivoting bridge and piston arrangement as the invention in contrast to the master/slave arrangement and therefore a person of ordinary skill in the art (“POSITA”) would have understood the structure for the claimed function to be the pivoting bridge and piston arrangement as opposed to the master/slave arrangement.

The ALJ finds JVS’s argument that the relevant component for the structure of this means-plus-function term is only the downstream component (*i.e.*, pivoting bridge) affected by the opening and closing operations of the trigger valve is incorrect because the pivoting bridge alone cannot actuate the engine valve. In other words, the “pivoting bridge” alone without other components (*i.e.*, motion means 100 and the components of system 300) as shown in Fig. 1 of the ’282 patent (*see below*) would not be able to “actuate the engine valve” and, therefore, could not carry out the claimed function of “actuating the engine valve responsive to the operation of the trigger valve.”

**FIG. 1**

('282 Patent, Fig. 1.)

Accordingly, the ALJ finds the term “means for actuating the engine valve responsive to the operation of the trigger valve” as having the function of “actuating the engine valve responsive to the operation of the trigger valve” with corresponding structure of the components of system 300 of FIGS. 1 or 4 (except for trigger valve 330), motion means 100, and pivoting bridge 200, as described at '282 patent col.13 ll. 4-18, col.13 ll.29-67 and col.15 ll.30-54.



4. “means for modifying the operation of the trigger valve in response to the determined temperature” (Claim 13)

JVS’s Proposed Construction	FCA’s Proposed Construction
<p><b>Function:</b> modifying the operation of the trigger valve in response to the determined temperature</p> <p><b>Structure:</b> an electronic valve controller including a microprocessor and a nonvolatile memory programmed to receive temperature information that directly controls the position of the movable portion of a trigger valve based on temperature information as described, for example, at 44:50-45:45; Tables 6, 7</p>	<p><b>Function:</b> modifying the operation of the trigger valve in response to the determined temperature</p> <p><b>Structure:</b> electronic valve controller including a microprocessor and a nonvolatile memory programmed to receive temperature information and modify trigger valve timing based on temperature information as described at 44:50-45:45; Tables 6, 7</p>

The parties agree that “means for modifying the operation of the trigger valve in response to the determined temperature” is a means-plus-function term to be construed pursuant to 35 U.S.C. § 112 ¶ 6. (COB at 40-41; ROB at 31.) The parties also agree that the function of the disputed term is “modifying the operation of the trigger valve in response to the determined temperature.” (*Id.*)

JVS contends that the proper construction for this term with respect to the structure must provide that the electronic valve controller “directly controls the position of the moveable portion of the trigger valve.” (COB at 41.) Further, JVS contends that the ’282 patent specification explicit discloses that the electronic valve controller communicates valve timing information directly to the electro-hydraulic trigger valve. (*Id.* at 42.) JVS submits that “direct communication, without intermediate valves and other devices to slow down the operation of the system, is necessary to achieve the object of the invention ‘to provide a system and method for providing high speed control of the lost motion in a valve train.’” (*Id.*; *internal quote* from ’282 patent at 8:30-32.)

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In response, FCA argues that JVS's construction is incorrect because it requires that the "electronic valve controller . . . directly controls the position of [a] movable portion of a trigger valve based on temperature information." (ROB at 31.) Specifically, FCA argues that JVS's proposed construction incorrectly adds "directly controls" which is not required to perform the claimed function nor clearly linked to the claimed function within the specification. *Id.* FCA contends that "the structure associated with the means for modifying is a controller programed with the control algorithm [which] the specification discloses to perform the claimed function and it cannot be any parts of the other separate claimed elements." (*Id.* at 32.)

The ALJ disagrees with the structures proposed by both parties for the agreed-upon function of "modifying the operation of the trigger valve in response to the determined temperature." The ALJ finds that the structure necessary to perform the agreed-upon function is "an electronic valve controller including a microprocessor and a nonvolatile member programmed to receive temperature information and communicate valve timing information to an operating assembly to control the moveable portion of the trigger valve." The ALJ points out that claim 13 of the '282 patent in conjunction with the specification link the claimed function to the correct structure. First, the ALJ points out that the claim language must be construed to ensure meaning and coherence of the claim. Claim 13 includes the following three means-plus-function limitations in this order:

- means for determining a present temperature of an engine fluid;
- means for modifying the operation of the trigger valve in response to the determined temperature; and
- means for actuating the engine valve responsive to the operation of the trigger valve.

The ALJ finds that these three limitations must be construed coherently in order to ensure the overall claim correctly provides the metes and bounds of the invention. Together, these claim limitations include determining a present temperature of an engine fluid, using this temperature

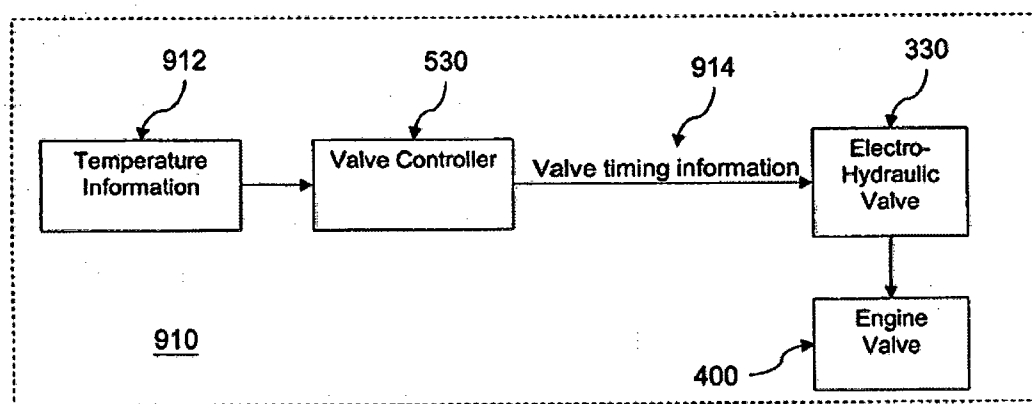
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to modify the operation of the trigger valve, and then the engine valve is actuated in response to the modification of the operation of the trigger valve. Since each of these limitations is means-plus-function, each must have corresponding structure within the specification. Further, the structure of this limitation in view of the other limitations must ensure a coherent meaning to the overall claim.

Second, the ALJ finds that the specification does disclose the necessary structure for this means-plus-function limitation in view of the overall claim language. Specifically, the specification, including Fig. 76 (*see below*), discloses the following structure:

the control algorithm 910 (FIGS. 76 and 77) controls the operation of the at least one valve 400 (FIG. 6) based upon information contained in a valve opening modification table, an example of which is shown in FIG. 79, and a valve closing modification table, an example of which is shown in FIG. 80. The opening modification and closing modification tables define the relationship between the current temperature ...and the corresponding amount of timing modification.... The control assembly 530 determines the required timing modification based on the information stored in the opening modification table and closing modification table.

('282 patent at 45:19-33.)



('282 patent Fig. 76.)

Furthermore, the specification discloses structure for the function as:

In response to the received temperature or viscosity information, the control assembly 530 determines and communicates valve timing information 914 to the operating assembly 330, which may be an electrohydraulic trigger valve.

(’282 patent at 44:53-55.) Additionally, the specification discloses “[a]n electronic valve controller 500 may be used to control the position of the moveable portion of the trigger valve 330.” (’282 patent at 14:33-34.)

The ALJ finds JVS’s reliance on Fig. 76 as showing that the electronic valve controller “directly controls” to be unpersuasive. The ALJ notes that the specification never discloses this “directly controls” limitation for the structure of the means-plus-function claim element. (’282 patent at 45:19-33; *see also* ’282 patent at 44:53-55.) Even if Fig. 76 depicts a “dedicated” communications signal path (despite not being described that way in the specification), FCA’s argument still fails because Fig. 76 only shows a signal path to “communicate” valve timing information 914 without showing specific “direct control.” Further, the pertinent language from the specification (’282 patent at 44:53-55) does not require any “direct control” but only requires that the “control assembly 530 determines and **communicates** valve timing information 914 to the operating assembly 330.” (’282 patent at 44:53-55 (emphasis added).) Last, the ALJ finds the disclosure of “which may be an electrohydraulic trigger valve” to be informative in that the “operating assembly 330” may but does not need to be “electrohydraulic.” Therefore, “direct control” does not make sense in view of the specification disclosure of an operating assembly 330.

The ALJ finds that FCA’s proposed construction is incomplete and therefore incorrect because it does not provide sufficient structure to perform the recited function. Specifically, FCA’s proposed construction limits the structure to the programmed electronic valve controller while leaving out the communication of the valve timing information to an operating assembly to control the moveable portion of the trigger valve. *See Cardiac Pacemakers v. Pacesetter, Inc.*, 296 F.3d 1106, 1119 (Fed. Cir. 2002) (“corresponding structure must include all structure that

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actually performs the recited function”). In other words, FCA’s proposed construction does not provide the necessary structure to communicate the valve timing information in order to control the moveable portion of the trigger valve and therefore would make this claim limitation meaningless and the claim itself inoperative because the function (“modifying the operation of the trigger valve in response to the determined temperature”) could not be carried out. Thus, FCA’s proposed construction is also incorrect because its omission of structure disclosed in the specification would in effect result in a failure to particularly point out and distinctly claim the invention as required by 35 U.S.C. § 112 ¶ 2. *See In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc).

Accordingly, the ALJ finds that the structure necessary to perform the function of “modifying the operation of the trigger valve in response to the determined temperature” is “an electronic valve controller including a microprocessor and a nonvolatile member programmed to received temperature information and communicate valve timing information to an operating assembly to control the moveable portion of the trigger valve.”

5. “means for determining the present temperature of an engine fluid”  
(Claims 10 and 13)

JVS’s Proposed Construction	FCA’s Proposed Construction
<b>Function:</b> determining a present temperature of an engine fluid  <b>Structure:</b> Any conventional means for measuring temperature of hydraulic fluid in a VVA	Indefinite

The parties agree that “means for determining a present temperature of an engine fluid” is a means-plus-function term to be construed pursuant to 35 U.S.C. § 112 ¶ 6. (COB at 43-44; ROB at 34-35.) While the parties disagree as to disclosure of structure in the ’282 patent

specification, the parties and the ALJ concur that the function is “determining the present temperature of an engine fluid.” (*Id.*)

JVS contends that the specification discloses sufficient structure by stating “[t]his temperature determination may be made using any conventional means for measuring temperature.” (COB at 43; *quoting* ’282 patent at 43:62-64 (emphasis omitted).) Also, JVS submits that a POSITA would certainly know that any conventional means for measuring temperature simply refers to conventional temperature sensors known and used in the art for many years. (COB at 43.) Last, JVS argues that “[b]ecause the temperature sensing means claimed in the ’282 Patent was ‘conventional’ ’282 Patent at 43:63 and well known to those of skill in the art in 1997, the ‘means for determining a present temperature of an engine fluid’ should be construed to refer to a conventional means for measuring the temperature of hydraulic fluid in the VVA.” (COB at 44; *citing, e.g., Lighting Ballast Control LLC v. Philips Elecs. N. Am. Corp.*, No. 2012-1014, 2015 U.S. App. LEXIS 10535 (Fed. Cir. June 23, 2015) (affirming judgment of district court that “voltage source means” was a structural term as it would be understood by one of skill in the art).)

FCA argues that this term is indefinite because the specification fails to provide any structure for the claimed means for determining temperature. (ROB at 34.) Specifically, FCA contends that JVS’s proposed construction defines the means-plus-function term with another means-plus-function (“means for measuring temperature”) and thus is conclusive evidence of the specification’s failure to disclose any corresponding structure. (*Id.*)

The ALJ finds that this means-plus-function term is indefinite because the specification is not clear, and in fact does not provide any structure, for the claimed function and thus the patentee is trying to claim in only functional terms unbounded by any reference to structure. *See*

*Medical Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1211 (Fed. Cir. 2003); *see also Aristocrat Techs. Austl. PTY Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008). In other words, the patentee of the '282 patent did not clearly link or associate any structure with the claimed function and therefore did not pay the price (*quid pro quo*) for being allowed to express the claim in terms of a function under 35 U.S.C. § 112 ¶ 6 and therefore the claim is indefinite under 35 U.S.C. § 112 ¶ 2 for failing to particularly point out and distinctly claim the invention. *See Med. Instrumentation & Diagnostics Corp.*, 344 F.3d at 1211.

The ALJ finds that JVS's arguments are incorrect and unpersuasive. The ALJ finds JVS's first argument that the sentence "[t]his temperature determination may be made using any conventional means for measuring temperature" in the specification is sufficient structure as unpersuasive because the phrase does not contain any structure and discloses a functional term ("conventional means") for the claimed function of "means for determining a present temperature of an engine fluid." *See Med. Instrumentation & Diagnostics Corp.*, 344 F.3d at 1211. ("If the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid the price but is attempting to claim in functional terms unbounded by any reference to structure in the specification.")

The ALS finds JVS's second argument that a POSITA "would certainly know that 'any conventional means for measuring temperature' simply refers to conventional temperature sensors known and used in the art for many years" is incorrect because a means-plus-function term must be linked to a specific structure in the specification and cannot simply be any conventional means for measuring temperature as known by a POSITA. *Id.* Additionally the ALJ notes "that consideration of the understanding of one skilled in the art in no way relieves the patentee of adequately disclosing sufficient structure in the structure." *See Biomedino, LLC v.*

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*Waters Technologies Corp.*, 490 F.3d 946, 952 (Fed. Cir. 2007); *quoting Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1380 (Fed. Cir. 1999).

In JVS's third argument, JVS seems to argue that U.S. Patent No. 5,140,955 ("the '955 patent"), filed 6 years before the first application from which the '282 patent claims priority was filed, referred simply to an oil temperature sensor and therefore a temperature sensor was well understood in the art. (COB at 43-44.) However, the ALJ finds JVS's third argument is incorrect because a disclosure in the '955 patent cannot be used for structure for the means-plus-function term at issue because the corresponding structure must be disclosed in the '282 patent specification. *See Atmel Corp.*, 198 F.3d at 1383 ("The district court properly concluded that the statutory requirement of disclosure of **structure** corresponding to the high-voltage means limitation can only be met by **reference** to those **structures disclosed** in the specification.")

The ALJ finds JVS's last argument to also be unpersuasive. JVS's last argument relies on *Lighting Ballast Control LLC v. Philips Elecs. N. Am. Corp.*, No. 2012-1014, 2015 U.S. App. LEXIS 10535 (Fed. Cir. June 23, 2015) to support its contention that the structure for performing the claimed function is sufficiently disclosed in the specification as a "conventional means for measuring temperature." (COB at 44-45 FN9.) In *Lighting Ballast*, the Federal Circuit construed the term "voltage source means" as a structure term and not a means-plus-function term. Thus, the ALJ finds that *Lighting Ballast* is not on point to the issue at hand because the parties have already agreed that the term at hand is a means-plus-function term. However, even if *Light Ballast* was considered on point, the ALJ finds the term "any conventional means for measuring temperature" still does not satisfy the means-plus-function limitation because allowing the use of "conventional means" would violate the 35 U.S.C. § 112 ¶ 6 by covering every means for determining temperature and in effect allow the claim to be unbounded. *See*



*Medical Instrumentation & Diagnostics Corp.*, 344 F.3d at 1211 (claiming in functional term unbounded by reference to structure in the specification is impermissible).

6. “engine fluid” (Claims 10, 13, 25 and 26)

JVS’s Proposed Construction	FCA’s Proposed Construction
Hydraulic fluid which is used in the VVA	a fluid in or used by an engine, including oil and coolant

JVS submits that the claim language is the place to start in understanding the meaning of “engine fluid” for the ’282 patent. (COB at 45.) Specifically, JVS contends that “engine fluid” as used in the claims of the ’282 patent only specifies the place for measuring temperature. (*Id.*; *see also* CRB at 29.) Furthermore, JVS argues that the inventors acted as their own lexicographers in stating that “the engine fluid for which temperature and/or viscosity is measured is hydraulic fluid.” (*Id.* at 45-46; *quoting* ’282 patent at 44:39-40; *see also* CRB at 29.)

FCA contends that “engine fluid” within the ’282 patent has its plain and ordinary meaning of “any fluid in or used by an engine, including oil and coolant.” (ROB at 35.) First, FCA argues that nothing in the claim language with respect to “engine fluid” suggest any limitation to hydraulic fluids or any other particular type of fluid used in an engine. (*Id.* at 36.) FCA submits that the use of the broad term “engine fluid” was intentional. (*Id.*) Next, FCA contends its construction is supported by the specification’s description of a use of a number of engine fluids such as hydraulic fluid and coolant. (*Id.*) Additionally, FCA argues that limiting the term “engine fluid” to “hydraulic fluid” contradicts the specification’s broader use of “engine fluid” and therefore cannot be the correct construction. (*Id.* at 37.) And, FCA points out that the term “hydraulic fluid” vice “engine fluid” is used in other parts of the specification and therefore shows the patentee used “engine fluid” and hydraulic fluid” as two distinct terms. (RRB at 28.)

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The ALJ finds that the claim language coupled with the specification show the term “engine fluid” has its plain and ordinary meaning of “a fluid in or used by an engine, including oil and coolant.” First, the ALJ finds the use of the term “engine fluid” vice “hydraulic fluid” within claims 10, 13, 25, and 26 as instructive because the term “engine fluid” is broader on its face than the term “hydraulic fluid.” Next, the ALJ finds the disclosures of the terms “engine fluid” and “hydraulic fluid” within the specification provide an understanding of the terms. Specifically, the ALJ finds that the specification does not redefine the term “engine fluid” as “hydraulic fluid” because the following passage from the specification states that “other temperatures, such as the temperature of a coolant” can be used.

With continued reference to FIGS. 76 and 77, the engine fluid for which temperature and/or viscosity is measured is hydraulic fluid. The present control algorithms, however, are not limited to the measurement of hydraulic fluid to control the operation of at least one valve. It is contemplated that other temperatures, such as the temperature of a coolant, the engine itself, and/or some other temperature may be used to calculate a valve actuation timing modification called for due to variation in the viscosity of the hydraulic fluid.

(’282 patent at 44:38-50.)

The ALJ finds that the patentee did not disclose a clear intent to define the term “engine fluid” to mean “hydraulic fluid” because the specification describes engine fluid as hydraulic fluid with respect to Figs. 76 and 77 only while other parts of the specification use the term “hydraulic fluid” instead of “engine fluid.” This disparate use of the terms would lead to inconsistency if “engine fluid” was defined as “hydraulic fluid.” (*See e.g.* ’282 patent at 20:38-39 (“The VVA systems shown in FIGS. 6-19 each need to be charged with hydraulic fluid in order to operate properly.”).) Thus, if “engine fluid” is “hydraulic fluid” for the ’282 patent, then the patentee should be able to use “engine fluid” and “hydraulic fluid” interchangeably throughout the specification and claims, and have consistency of meaning of the overall invention in view of the claims and the specification. However, to interchangeably use

“hydraulic fluid” and “engine fluid” after this alleged redefinition and in view of their usages within the specification would cause confusion. In other words, the patentee’s use of the terms “engine fluid” and “hydraulic fluid” within the specification does not equate to a clear and expressed intent to redefine a term for the entire patent. *See GE Lighting Solutions, LLC v. Agilight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“To act as its own lexicographer, a patentee must ‘clearly set forth a definition of the disputed claim term,’ and ‘clearly express an intent to define the term’”; *internal quotes from Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).)

Further, the ALJ finds JVS’s argument unpersuasive because JVS only points to one partial sentence from the specification (e.g., “... the engine fluid for which temperature and/or viscosity is measured is hydraulic fluid.”) to support its position that the patentee acted as its own lexicographer in redefining the term “engine fluid.” However, JVS’s argument does not address the reference to FIGS. 76 and 77 for this definition of “engine fluid” and thus JVS fails to address the definition to only cover an embodiment shown by these two figures. ( ’282 patent at 38-40 (“With continued reference to FIGS. 76 and 77, the engine fluid for which temperature and/or viscosity is measured is hydraulic fluid.” (emphasis added)).) Additionally, JVS’s argument does not consider the use of both terms, e.g. “engine fluid” and “hydraulic fluid,” in other parts of the specification. The ALJ points out that the patentee cannot have it both ways by inconsistently using “hydraulic fluid” in some places and “engine fluid” in other places of the specification while claiming to expressly redefine “engine fluid” to be “hydraulic fluid” for the ’282 patent. *See GE Lighting Solutions, LLC*, 750 F.3d at 1309. Particularly, the specification states that “[t]he present control algorithms, however, are **not limited to** the measurement of hydraulic fluid to control the operation of at least one valve.” ( ’282 patent at 40-42 (emphasis

added).) Thus, the ALJ finds JVS's proposed construction to lack support within the specification to redefine the broad term "engine fluid" to be the narrow term "hydraulic fluid."

Accordingly, the ALJ finds that the term "engine fluid" has its plain and ordinary meaning of "a fluid in or used by an engine, including oil and coolant."

## **V. THE '276 PATENT**

### **A. BACKGROUND AND DISPUTED CLAIMS**

U.S. Patent No. 8,820,276 ("the '276 patent") is entitled "Variable Lost Motion Valve Actuator and Method." The '276 Patent issued on September 2, 2014. The named inventors are Joseph M Vorih of Suffield, Connecticut; Jeffrey Mossberg of Windsor, Connecticut; Richard Vanderpoel of Bloomfield, Connecticut; Steven Ernest of Windsor, Connecticut; Guy Paterson of Simsbury, Connecticut; John A. Schwoerer of Storrs, Connecticut; Edward T. Leitkowski of Colechester, Connecticut; Andrew Brzoska of Bristol, Connecticut; and Gheorge Cosma of Windsor, Connecticut. JVS asserts claim 6-10, 17, 21-22, and 26-17 against FCA. Claims 7-12 and 26-27 are asserted for domestic industry. The relevant claims are:

1. A valve actuation system for controlling at least one engine valve, comprising:
  - a) a hydraulic lost motion system having:
    - (i) a first piston disposed in a first piston chamber, being moveable by an engine cam shaft,
    - (ii) a second piston disposed in a second piston chamber;
    - (iii) at least one engine valve being moveable by the second piston; and
    - (iv) a hydraulic circuit configured to permit hydraulic communication between the first piston chamber and the second piston chamber;
  - b) a solenoid valve in hydraulic communication with the hydraulic circuit;
- and

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c) a controller configured to selectively actuate the solenoid valve to permit a flow of fluid within the hydraulic circuit for controlling the operation of the at least one engine valve in response to (i) a temperature proximate a portion of the hydraulic lost motion system, (ii) an engine load value, (iii) at least one engine operating mode and (iv) an engine speed value.

5. The valve actuation system of claim 1, wherein the controller is configured to operate the valve actuation system in response to a plurality of engine operating modes.

6. The valve actuation system of claim 5, wherein the plurality of engine operating modes include at least two of (i) a warm up mode, (ii) a normal mode and (iii) a transient mode.

17. The valve actuation system of claim 1, wherein the controller is configured to access timing information for a normal mode of engine operation based on at least one of (i) engine speed and (ii) percent change in engine load.

**B. DISPUTED CLAIM TERMS**

**1. “normal mode” (Claims 6 and 17)**

<b>JVS’s Proposed Construction</b>	<b>FCA’s Proposed Construction</b>
An engine mode selected and implemented for steady state positive power operation of the engine above a warm-up mode temperature or engine speed threshold	An engine mode selected and implemented for steady state power operation of the engine

The parties are in general agreement as to the meaning of “normal mode,” but dispute whether the additional limitation “above a warm-up mode temperature or engine speed threshold” provided by JVS is necessary. (COB at 48; ROB at 39-40.)

JVS argues that FCA’s definition is too broad and would include a vehicle that is barely above idle. (COB at 48.) JVS asserts that its proposed construction is drawn directly from the specification and is the more accurate description since it would exclude certain steady-state conditions that are not within the sense of “normal mode.” (COB at 48.) JVS further asserts that

the additional limitations are necessary to avoid inconsistent or overlapping mode definition and to ensure proper demarcation. (CRB at 32.)

FCA argues that the additional limitation proposed by JVS is inconsistent with the specification. (ROB at 39-40.) Specifically, FCA argues that JVS's proposed construction arbitrarily limits the "normal mode" to two parameters (*i.e.*, temperature or engine speed) rather than the four parameters (*i.e.*, load, braking, temperature, or engine speed) described in the specification. (ROB at 39-40.) FCA further argues that since the parties have an agreed upon construction for "engine mode," it is not necessary to distinguish "normal mode" from "warm-up mode." (*Id.*)

The ALJ finds that "normal mode" means an engine mode selected and implemented for steady state positive power operation of the engine above a warm-up mode temperature and/or engine speed threshold. The specification directly supports such a construction:

The map sets associated with the normal mode 512 are used to provide the trigger valve timing information for steady state positive power operation of the engine above the warm-up mode oil temperature threshold and/or engine speed threshold.

('276 patent at 35:66-36:3.) FCA argues that this arbitrarily limits the normal mode to only two parameters instead of the four listed in the specification. However, the ALJ finds that the choice of these two parameters is not arbitrary – rather the specification specifically calls them out as part of the "normal mode." The addition of the other parameters in the following sentence in the specification ("The engine parameters that may be used to determine whether the normal mode 512 operation will begin are percent change in load, engine braking request information, oil temperature, and engine speed.") (*id.* at 36:3-6) does not change the specification's explicit description of "normal mode" in the preceding sentence.

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Therefore, the ALJ finds that “normal mode” means an engine mode selected and implemented for steady state positive power operation of the engine above a warm-up mode temperature and/or engine speed threshold.

2. “transient mode” (Claim 6)

JVS’s Proposed Construction	FCA’s Proposed Construction
An engine mode selected and implemented for positive power accelerations or changes in engine load above a preset threshold	An engine mode selected and implemented for positive power accelerations

As with the previous claim term, the parties are in general agreement as to the meaning of “transient mode,” but dispute whether the additional limitation “changes in engine load above a present threshold” provided by JVS is necessary. (COB at 49; ROB at 39-40.)

JVS argues that “transient mode” means an engine mode selected and implemented for positive power accelerations or changes in engine load above a preset threshold. (COB at 49.) JVS argues that its additional limitation accounts for instances when the driver steps on the accelerator even if the car does not go faster such as maintaining speed on an incline. (*Id.*) JVS argues that this additional limitation is supported by the specification and necessary for proper claim scope.

FCA argues that the additional limitation added by JVS is not necessary. (ROB at 40.) Specifically, FCA argues that there are two parameters set forth in the specification, namely percent change in load and engine brake request information and that there is no reason for JVS to arbitrarily choose one parameter over the other. (*Id.*)

The ALJ finds that “transient mode” means an engine mode selected and implemented for positive power accelerations. The specification directly supports such a construction:

The map sets associated with the transient mode 516 are used to provide the trigger valve timing information during positive power accelerations to increase

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the speed at which the engine moves from one steady state operating point to another steady state operating point.

(’276 patent at 36:16-20.) The ALJ finds however, that unlike the specification’s description of “normal mode” which directly calls out two parameters (temperature and engine speed) in its description of “normal mode,” the description for “transient mode” does not call out one parameter in favor of the other. In other words, the ALJ finds that JVS fails to provide an adequate explanation as to why the percent change load parameter is necessary for the “transient mode,” but not for the “normal mode.” The description for each mode describes the percent change load parameter as affecting the engine mode,<sup>8</sup> but it is not clear why JVS includes that parameter in one mode, but not the other.

Therefore, the ALJ finds that “transient mode” means an engine mode selected and implemented for positive power accelerations.

Within seven days of the date of this document, each party shall submit to the Office of the Administrative Law Judges a statement as to whether or not it seeks to have any portion of this document deleted from the public version. Any party seeking to have any portion of this document deleted from the public version thereof shall also submit to this office a copy of this document with red brackets indicating any portion asserted to contain confidential business information. The parties’ submissions may be made by facsimile and/or hard copy by the

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<sup>8</sup> For the “normal mode,” the specification states:

If the oil temperature is above the warm-up mode threshold and the percent change in load is below the delta load lower threshold and braking mode is not being requested, then the normal mode 512 is used.

(’276 Patent at 36:6-9)

For the “transient mode,” the specification states:

If the percentage change in load is equal to or above the delta load upper threshold and engine braking is not being requested, then the transient mode 516 is used.


(’276 Patent at 36:23-26.)



[REDACTED]

aforementioned date. The parties' submissions concerning the public version of this document need not be filed with the Commission Secretary.

**SO ORDERED.**

  
Theodore R. Essex  
Administrative Law Judge

**CERTAIN VARIABLE VALVE ACTUATION DEVICES  
AND AUTOMOBILES CONTAINING THE SAME**

**Inv. No. 337-TA-954**

**PUBLIC CERTIFICATE OF SERVICE**

I, Lisa R. Barton, hereby certify that the attached **ORDER NO. 9** has been served on the following parties as indicated on **October** 26, 2015.



Lisa R. Barton, Secretary  
U.S. International Trade Commission  
500 E Street, SW, Room 112  
Washington, DC 20436

**On Behalf of Complainant Jacobs Vehicle Systems, Inc.:**

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☒ Via First Class Mail  
☐ Other: \_\_\_\_\_

**On Behalf of Respondents FCA US LLC, FCA Mexico, S.A. de C.V., FCA Melfi S.p.A.,  
FCA Serbia d.o.o. Kragujevac, and Fiat Chrysler Automobiles N.V. :**

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