

United States District Court,  
W.D. North Carolina, Asheville Division.

**MERITOR TRANSMISSION CORPORATION,**  
Plaintiff.

v.

**EATON CORPORATION,**  
Defendant.

Civil No. 1:04CV178

**Feb. 23, 2007.**

Brian Justin Sodikoff, Daniel R. Cherry, Richard Wellington McLaren, Jr, Welsh & Katz, Ltd., Chicago, IL, James Walker Williams, Roberts & Stevens, P.A., Asheville, NC, for Plaintiff.

Alan Leonard Briggs, Jeremy William Dutra, John A. Burlingame, Squire, Sanders & Dempsey, William Herbert Mandir, Sughrue Mion, PLLC, Washington, DC, Daniel R. Cherry, Richard Wellington McLaren, Jr, Welsh & Katz, Ltd., Chicago, IL, Donnie Lewis Kidd, Jr., Squire, Sanders & Dempsey Squire, Sanders & Dempsey L.L.P., Tysons Corner, VA Larry Stephen McDevitt, W. Carleton Metcalf, Van Winkle, Buck, Wall, Starnes and Davis, P.A., Asheville, NC, for Defendant.

### ***MEMORANDUM AND ORDER***

THORNBURG.

**THIS MATTER** is before the Court on the Defendant's motion for summary judgment which is opposed by the Plaintiff.

#### **I. PROCEDURAL HISTORY**

On August 27, 2004, Plaintiff Meritor Transmission Corporation (Meritor) initiated this action claiming infringement of its patent, United States Patent No. 5,573,477 (the '477 patent), by Defendant Eaton Corporation (Eaton). According to Meritor, Eaton, which is a manufacturer of truck transmissions, is infringing the '477 patent for a method and apparatus for shifting transmissions to neutral. By previous Order in this matter, the undersigned found that Eaton's claims of prior inventorship and invalidity have been determined adversely to Eaton by the Board of Patent Appeals and Interferences (Board). FN1 **Memorandum and Order, filed September 27, 2006.** Thus, that portion of the relief sought in the complaint has already been adjudicated. Id. The remaining relief sought by Meritor includes a declaration that Eaton's transmissions, specifically the AutoShift and UltraShift transmissions, infringe the ' 477 patent and that the infringement has been willful and deliberate. In addition to monetary damages, Meritor seeks injunctive relief.

FN1. Meritor did not seek such a declaration as a form of relief in the complaint, but raised the issue in a motion for summary judgment.

On December 2, 2004, the parties filed a Certification and Report of their Fed.R.Civ.P. 26(f) conference and a proposed discovery plan. **Certification and Report, filed December 2, 2004.** In that report, the parties stated that a Markman FN2 hearing was most likely unnecessary. *Id.* at 3. An initial pretrial conference was held in chambers on January 24, 2005, at which time the parties represented to the Court that a *Markman* hearing for claim construction was, in fact, unnecessary and that claim construction could be accomplished in the context of a motion for summary judgment based on the pleadings. As a result, there is no provision in the pretrial order for a *Markman* hearing. **Pretrial Order and Case Management Plan, filed January 25, 2005.** In fact, the parties stipulated in that Order that claim construction charts would be filed on May 16, 2005, by Meritor and June 16, 2005, by Eaton. *Id.* at 2 ("**Plaintiff shall produce a claim chart applying the claims to the accused product(s) or stating in what manner it is unable to do so no later than May 16, 2005. The Defendant's opposition claim chart shall be produced no later than June 16, 2005.**").

FN2. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

On June 14, 2005, Eaton moved to compel the production of a claim chart by Meritor because Meritor had failed to comply with the May 16, 2005, deadline. FN3 **Defendant's Motion to Compel, filed June 14, 2005.** Meritor had failed to produce a final claim chart, characterizing its chart as "interim." This posture was not what was contemplated by the Pretrial Order entered, in large part, based on the agreement of the parties. Thus, by Order entered July 12, 2005, the undersigned noted that Meritor's attorneys were taking an overly strident posture and ordered the parties to attempt to resolve the matter, report their results to the Court, and, in the event resolution could not be achieved, appear at a hearing. **Order, filed July 12, 2005, at 2-3.** The parties advised *via* letters that the dispute had been resolved and, as a result, the Court denied the motion to compel as moot. **Defendant's Response to Order, filed July 22, 2005; Plaintiff's Response to Order, filed July 22, 2005; Order, filed July 22, 2005.**

FN3. In its motion to compel, Eaton stated that Meritor had refused, in part, to provide a final claim chart because claim construction issues had already been determined pursuant to the decision of the Board in the prior interferences proceedings. **Defendant's Memorandum in Support of Motion to Compel, filed June 14, 2005, at 4 .** This is pointed out to clarify for the record Meritor's position in regard to claim construction, *i.e.*, that claim construction was unnecessary because it had already been accomplished by the Board.

Four days later, Meritor filed a motion to compel concerning the same issue the parties had reported as resolved. **Plaintiff's Motion to Compel and Motion for Expedited Briefing and Consideration, filed July 26, 2005.** Attached to that motion was Meritor's "*First Supplemental Claim Charts*" (emphasis added), not the final claim charts contemplated by the Pretrial Order. **Exhibit A, attached to Plaintiff's Motion.** Of particular note, however, was Meritor's position concerning claim construction.

Meritor is guided by the claim construction decided by the [Board] in Interference Nos. 104,834 and 104,835. All of the parties' claim construction issues regarding the asserted claims that were raised by the parties in that proceeding, presented to the Board in that proceeding, and finally resolved between the

parties by the Board in that proceeding are final. *In following that claim construction, Meritor is adopting not only points on which Meritor prevailed in that proceeding, but also points on which Meritor did not prevail.*"

**Exhibit A, at 2 (emphasis added).**

Because Meritor persisted in producing claim charts which it designated as less than final or complete, a strategy at odds with its position that claim construction had already been determined by the Board, the undersigned ruled as follows:

The Court's resolution is simple. Both claim charts are hereby stricken as incomplete. The language FN4 of the Pretrial Order and Case Management Plan, filed January 25, 2005, is hereby amended to read as follows:

FN4. The Court notes that the language in the [January 2005] version of the Pretrial Order and Case Management Plan was provided by the parties.

F. Claim Charts: Plaintiff shall produce a final and complete claim chart applying the claims to the accused product(s) on or before September 9, 2005. The Defendant's opposition claim chart shall be produced no later than September 16, 2005. Both parties shall determine and advise opposing counsel no later than September 9, 2005, whether advice of counsel will be claimed and shall produce such advice no later than that date. **Neither party may produce a claim chart which contains a reservation as to completeness. Absent an extraordinary circumstance, neither party may amend the claim chart after the dates above prescribed. In the event that either party fails to comply with the full letter and spirit of this paragraph, appropriate sanctions may be entered. The parties are quite simply to comply with the Court's directive.**

**Order, filed August 29, 2005, at 2-3 (footnote and emphasis in original).**

On November 23, 2005, Eaton moved for summary judgment on the ground that its products do not infringe Meritor's patent because they do not include all of the required elements of the '477 patent. That is the motion which is the subject of this decision.

Inexplicably, after the time for discovery and dispositive motions had expired, in direct contrast to clear representations that no *Markman* hearing was necessary and despite repeated representations that the decision of the Board resolved claim construction issues, Meritor sought a *Markman* hearing and a separate decision concerning claim construction.FN5 **Plaintiff's Motion for a *Markman* Hearing, a *Markman* Briefing Schedule, to Schedule the Trial, and for a Scheduling Conference, filed January 6, 2006.**

Eaton objected, noting that the claim construction issues had been fully briefed and could be determined in the context of the pending motion for summary judgment. **Defendant's Response to Plaintiff's Motion for a *Markman* Hearing, filed January 13, 2006.** Eaton noted that Meritor's position was "entirely contrary to its previous representations to this Court. Meritor asserted during the January 2005 Scheduling Conference that the Court need not conduct a *Markman* hearing." *Id.* at 2. Indeed, the parties did represent to the Court during that conference that claim construction need not be the subject of separate proceedings. As a result, the undersigned ruled against Meritor's request, noting that in the event claim construction was required, it would be done without a formal hearing and, most likely, in the context of ruling on the motion for summary judgment. **Order, filed February 1, 2006, at 3; see e.g.,** *Exigent Tech., Inc. v. Atrana Solutions, Inc.*, 442 F.3d 1301, 1310 (Fed.Cir.2006) .

FN5. The Court is compelled to note that Meritor persistently "waffled" on issues concerning claim construction. Despite an agreed upon Pretrial Order that required Meritor, as the party bringing this suit, to first file its claim construction chart, Meritor argued it could not file a final chart until after Eaton did so. Meritor's so-called "supplemental" chart, as well as the final one ultimately produced, stated that claim construction had already occurred by the Board and was binding herein. And yet, those charts contained language that in the event the undersigned "were to reopen the claim construction issues," Meritor would seek a different construction as to claims adversely decided by the Board. **Exhibit 11, Meritor's September 9, 2005, Claim Charts, attached to Plaintiff's Brief in Opposition to Defendant's Motion for Summary Judgment, filed under seal December 12, 2005, at 1.** Four months later, Meritor sought to completely reverse course, insisting that a *Markman* hearing and claim construction were necessary. **Plaintiff's Motion for a *Markman* Hearing, supra.**

On the same date that Eaton moved for summary judgment of non-infringement, Meritor moved for summary judgment as to the defense of patent invalidity. The Court having ruled on Meritor's motion for summary judgment concerning the issues of prior inventorship and validity, the remaining motion for summary judgment is ripe for consideration.

## II. STANDARD OF REVIEW

A determination of infringement involves a two-step analysis, the first step being to properly construe the asserted claims. Claim construction is a question of law[.] ... There is a "heavy presumption" that the terms used in claims "mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art." *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202 (Fed.Cir.2002). Moreover, dictionaries are often helpful in ascertaining the plain and ordinary meaning of claim language.... Specifically:

claim terms take on their ordinary and accustomed meanings unless the patentee demonstrated an intent to deviate from the ordinary and accustomed meaning of a claim term by redefining the term or by characterizing the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope. *Teleflex, Inc. v. Ficoso N. Am. Corp.*, 299 F.3d 1313, 1327 (Fed.Cir.2002). The written description, however, is not a substitute for, nor can it be used to rewrite, the chosen claim language. "Specifications teach. Claims claim." *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1121 n. 14 (Fed.Cir.1985).... [Finally,] "[a]lthough [it] is correct that the prosecution history is always relevant to claim construction, it is also true that the prosecution history may not be used to infer the intentional narrowing of a claim absent the applicant's clear disavowal of claim coverage." *Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1327 (Fed.Cir.2003).

*SuperGuide Corp. v. DirecTV Enter., Inc.*, 358 F.3d 870, 874-75 (Fed.Cir.2004) (**other internal citations omitted**).

"In order for a court to find infringement, the plaintiff must show the presence of every '[limitation]' or its substantial equivalent in the accused device. Claim construction is an issue of law[.] ... The determination of infringement, whether literal or under the doctrine of equivalents, is a question of fact." *Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 1364 (Fed.Cir.2001) (**quotations and internal citations omitted**). Here, Meritor claims literal infringement and, in the alternative, equivalence.

"Summary judgment on the issue of infringement is proper when no reasonable jury could find that every limitation recited in a properly construed claim either is or is not found in the accused device either literally

or under the doctrine of equivalents." *PC Connector Solutions, LLC v. SmartDisk Corp.*, 406 F.3d 1359, 1364 (Fed.Cir.2005). In a patent case, "nothing more is required [of the moving party] than the filing of a summary judgment motion stating that the patentee ha[s] no evidence of infringement and pointing to the specific ways in which [the] accused systems d[o] not meet the claim limitations." *Exigent Tech.*, 442 F.3d at 1309.

### III. FACTUAL BACKGROUND

Eaton and Meritor are competitors in the market for heavy-duty truck transmissions. Heavy-duty trucks such as eighteen-wheelers often have ten or more gears, requiring considerable skill by a driver to manually shift. The driver shifts by first depressing a clutch pedal to disengage a master clutch. Then the driver manually moves the shift lever out of the present gear and releases the clutch pedal. At the same time, the driver depresses the fuel pedal, causing the gears of the engine to rotate at a speed that will allow the driver, using the shift lever, to smoothly shift into the new gear. An experienced driver can manually shift without depressing the clutch pedal by manipulating the gas pedal so that the gears reach a zero torque point, at which time the driver shifts. Both Eaton and Meritor have attempted to design transmissions that simplify and improve the shifting process.

*Eaton Corp. v. Rockwell Int'l. Corp.*, 323 F.3d 1332, 1334-35 (Fed.Cir.2003). The transmission designs of each company are at issue in this case. Meritor owns the patent for an invention designed to allow the driver of a truck to eliminate torque and move the gear into neutral without using a clutch. The abstract and background of the patent describe the invention.

Heavy vehicles, such as trucks typically have an engine driving the wheels of the vehicle through a multi-speed transmission.FN6 The transmission is moveable through several speed ratios at the control of a manual stick shift. FN7 A **manual transmission** typically slides toothed members relative to different gears to engage one of the gears. To complete a shift [of the gears], the operator must first typically move the gear that is presently-engaged out of engagement to a "neutral" position.

FN6. A transmission is "an assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an engine to a live axle." **Merriam-Webster, Inc. Online Dictionary available at <http://www.m-w.com/dictionary>**. Obviously, these definitions are provided for context only and do not constitute any part of the claim construction.

FN7. A stick shift is "a manually operated gearshift for a motor vehicle usually mounted on the floor." **Merriam-Webster, *supra***.

...

When the transmission is engaged and rotational drive is being transmitted from the engine to the transmission, there is a large torque FN8 load holding the gears and the toothed member at a particular axial position. This torque load makes it quite difficult for an operator to manually move the toothed member out of engagement. This so-called "torque lock" typically makes it impossible to move a transmission to neutral without somehow reducing the torque load. To this end, vehicles with **manual transmissions** are equipped with clutches.FN9 An operator actuates the clutch which breaks the drive transmission from the engine to the transmission. The torque load goes to zero, and the operator is able to move the gear out of engagement. FN8. Torque is a "force that produces or tends to produce rotation or torsion;" for example, "an automobile engine delivers torque to the drive shaft[.]" **Merriam-Webster, *supra***.

FN9. A clutch is "a coupling used to connect and disconnect a driving and a driven art (as an engine and a transmission)[.]" **Merriam-Webster, *supra***.

...

[The invention of the '477 patent allows] the operator to move the gear out of engagement for a shift without having to actuate the clutch.

**Exhibit A, the '477 Patent, *attached to Defendant's Motion for Summary Judgment, at col.1 ll.11-19, 25-38, 54-56 (footnotes and emphasis added)***. In other words, this invention allows the operator of a vehicle to shift into neutral without using a clutch.

The abstract of the patent states that instead of using a clutch, the patent allows the operator to use a switch which "send[s] a torque elimination request." Id. **at "Abstract."** Then, "an engine control adjusts engine fueling to achieve a zero torque load" which allows the shifting of gears without using the clutch. Id.

#### IV. DISCUSSION

At issue is Claim 1 FN10 of the patent with the disputed language italicized and bolded:

FN10. In the filings before the Court, the parties have limited the issues to Claim 1 although Meritor's claim chart referenced as well the dependent Claims 2 through 4 and 8.

1. A vehicle drive comprising: an engine having an output shaft;  
a ***transmission*** selectively connected to said engine output shaft, said transmission having several selectively actuated speed ratios, said transmission having a transmission output shaft, said selected speed ratios controlling the ratio of the input speed from said engine output shaft to the output speed of said transmission output shaft; and

an engine control to control a parameter of said engine, said engine control including ***an operator input to allow an operator to signal a desire to eliminate torque*** between said engine output shaft and said transmission output shaft, ***said operator signal requesting said engine control determine a zero torque parameter value*** for said engine output shaft that approximates a zero torque load on the connection between said engine and said transmission, and ***said engine control being operable to control said engine to achieve said zero torque parameter value.***

Id. **col.7 ll. 38-58**. The parties agree that the claim construction provided by the Board should be applied here. **Defendant's Memorandum of Law in Support of Motion for Summary Judgment, filed November 23, 2005, at 8-9 ("Here, the '477 patent, its prosecution history and the record from the Interference, and the prosecution history of the '477 patent's foreign counterpart establish the proper construction of claim 1."); Exhibit 11, Meritor's September 9, 2005, Claim Charts, attached to Plaintiff's Brief in Opposition to Defendant's Motion for Summary Judgment, filed under seal December 12, 2005, at 1 ("In the claim charts that follow, Meritor is guided by the claim construction decided by the [Board] ... in Interference Nos. 104,834 and 104,835. All of the parties' claim construction issues regarding the asserted claims that were raised by the parties in that proceeding, presented to the Board in that proceeding and finally resolved between the parties by the Board in**

**that proceeding are final as between Meritor and Eaton.**"). However, they disagree as to the meaning of the Board's construction.

The first element of the claim which is in dispute is the "transmission" element.

[A] *transmission* selectively connected to said engine output shaft, said transmission having several selectively actuated speed ratios, said transmission having a transmission output shaft, said selected speed ratios controlling the ratio of the input speed from said engine output shaft to the output speed of said transmission output shaft[.]

**Exhibit A, supra, col.7 ll.41-47.** Eaton argues that the transmission of the invention is of necessity a manual one. Meritor states that the specification of the patent discloses that "[t]he transmission may be of any type known in the art." *Id. col.3 ll.15-16.* However, this statement is followed by the further specification that, "[a] manual stick shift is operable to shift the transmission between any one of several speed ratios." *Id. col.3 ll.17-18.* The use of a "manual stick shift" would be required with a manual transmission. Although not dispositive, the background of the patent discloses "[a] **manual transmission** typically slides toothed members relative to different gears to engage one of the gears.... To this end, vehicles with manual transmissions are equipped with clutches." *Id. col.1 ll.15-16, 33-34.* And, in its answers to requests for admissions, Meritor admitted that "the intended purpose of the invention disclosed in the '477 patent is to enable the driver of a **manual transmission** vehicle to shift an engaged gear into neutral without need to use the clutch." **Exhibit P, Meritor's Response to Eaton's Requests for Admission, attached to Defendant's Motion, at 4 (emphasis added).**

The Board also interpreted this element. "Based on the specification of both parties' involved application or patent, the intended purpose of the invention as defined by the [claim] is to enable the driver of a **manual transmission** vehicle to shift an engaged gear into neutral without need to use the clutch." **Exhibit D, Decision on Priority, Patent Interference No. 104,835, attached to Defendant's Motion, at 6 (emphasis added).** "If actual zero torque at the flywheel is achieved, a driver may shift a **manually operated transmission** from an engaged gear into neutral *without* need to activate a clutch." *Id. (bolding added).* On numerous occasions in this litigation, Meritor represented that the claim construction provided by the Board should control, whether or not Meritor agreed therewith. The Court, therefore, concludes that the claim language of the patent claims a manual transmission.

As would be expected in a patent case, a determination that the invention is limited to a manual transmission does not completely resolve the issue. The parties also dispute the meaning of a "manual transmission." Meritor argues that any transmission which requires the driver to make a *selection* of gear by use of his or her body is a manual one. Eaton notes that a manual transmission is one which requires the operator to make the *actual gear shift*.

There are two types of transmissions commonly used in automotive applications; the manual transmission and the automatic transmission. Both transmissions require a device to disconnect the engine from the driveline when the vehicle is brought to a stop, or else the engine will stall. In a conventional manual transmission the device is the main clutch. In a conventional automatic transmission the device is a torque converter.

...

The words "manual" and "automatic" are also sometimes used to describe the process used to implement a

gear shift. In this context the word manual implies that the driver must take some action to cause the shift to occur, for instance by moving a lever or pushing a button, and *automatic (or automated) implies that the transmission will shift itself at the appropriate time.*

**Exhibit Q, Expert Report of Craig J. Hoff, Ph.D., attached to Defendant's Motion, filed under seal, at 7-8 (emphasis added).**

This description of a manual transmission, made by Meritor's expert, Dr. Hoff, uses virtually identical language to that contained in the patent. For example, the abstract of the patent describes the invention as providing an alternative to using the clutch, while envisioning that the vehicle would also be equipped and used with a clutch. **Exhibit A, supra, at "Abstract" ("An operator of a vehicle may request torque reduction on the connection between a transmission and an engine, or may use a clutch .").** "A switch is provided to send a torque elimination request." *Id.* Obviously, this request is sent by the operator of the vehicle: "said engine control including an operator input to allow an operator to signal a desire to eliminate torque between said engine output shaft and said transmission output shaft[.]" *Id. col.7 ll.49-52.* And, the language of the patent describes a manual transmission versus the description of an automatic transmission provided by Meritor's own expert: "automatic (or automated) implies that the transmission will shift itself at the appropriate time." **Exhibit Q, supra.**

[I]t is an object of this invention **to allow an operator to shift** the transmission to a new speed without operating the clutch. To achieve the ability to shift the gear without clutching, the present invention incorporates a switch on the shift knob... When **an operator actuates [the] switch**, a signal is sent to [the engine] requesting a zero torque load on the connection between the engine and transmission.... **[T]he operator is able to request the torque elimination function.**

**Exhibit A, col.3 ll.62-66; col.4 ll.3-5, 10-11 (emphasis added).**

The fact that Meritor's own expert limited the invention to a manual transmission is obvious from a complete reading of his expert report. Hoff explains the differences between a manual and automatic transmission as including different types of gears used in manual versus automatic transmissions.

There are two distinct steps in shifting to another gear in a manual gearbox [transmission]. The first step is to move the transmission from in-gear to neutral. The second step is to synchronize the speeds of the two halves of the transmission (input side and output side) so that the transmission can be engaged in the new gear. If there is a large torque being transmitted through the dog clutch [in the manual transmission], there will be significant friction developed between the dog teeth and it will be impossible to move the dog clutch out of engagement. This condition is referred to as "torque lock." In order to disengage the dog teeth it is necessary to remove the torque from the driveline. Conventionally, this is done by depressing the clutch pedal and breaking the connection between the engine and the transmission. Once the connection is broken the engine speed is controlled to match the appropriate speed of the transmission output shaft in the new gear. This allows the dog clutch to be moved into contact with the new gear.

The shifting process in an automatic gearbox is different and much more complex. The most important difference is that an automatic gearbox can be shifted with power being transmitted through the gearbox. This is sometimes referred to as "continuous power" shifting. This is possible because of the nature of planetary gears and the clutches used to control them.

There are advantages and disadvantages to each type of transmission. Compared to automatic gearboxes, manual gearboxes are more efficient, less costly, lighter, and more durable. Hence manual transmissions are



desirable to the trucking industry. The main advantages of automatic transmissions are convenience for the driver and the ability to do continuous power shifting, which results in a smoother feeling shift. Hence automatic transmissions are desirable in the U.S. passenger car industry. Automated manual transmissions have the potential to combine the advantages of the manual gearbox with the convenience of automated shifting.FN11

FN11. It is telling that Dr. Hoff did not describe the invention as relating to an automated manual transmission but only to a manual transmission.

**Exhibit Q, *supra*, at 9-10 (footnote added).**

By comparison, the specifications of the patent read:

*A manual stick shift is operable to shift the transmission between any one of several speed ratios. Transmission includes a gear which is driven by the output of the engine when the clutch is closed. Gear engages and drives a pair of gears each mounted on a countershaft.... Gears engage and rotate a plurality of gears that are mounted to freely rotate on a main output shaft. A shift yoke slides a shift collar as directed by the vehicle operator to change the speed ratio of the transmission.... Collar also has external teeth that are selectively received within an inner peripheral bore on a gear. When the shift collar is in the position shown, ... the teeth engage the gear such that the gear rotates the collar, and hence the shaft.*

...

In moving the collar to shift to another speed ratio, the initial step is to move the teeth out of engagement from the inner peripheral bore of the gear. When the drive train is transmitting rotation to the shaft through the arrangement, ... however, there is a high torque load on the connection between the teeth and the gear and between collar and shaft. This high torque load makes it difficult, if not impossible, *for an individual to manually slide the collar relative to the gear*. For this reason, vehicles have traditionally incorporated a clutch. An operator who wishes to shift a transmission to a new speed, initially actuates the clutch. This breaks the torque transmission discussed above, and allows the operator to disengage the transmission and move to neutral.

**Exhibit A, *supra*, col.3 ll.17-61 (emphasis added).** This description, which repeatedly refers to the action of the driver as causing the gear shift, clearly describes a manual transmission. **See, e.g., Marshall Brain, "How Manual Transmissions Work," available at <http://www.howstuffworks.com/transmission.htm>.**FN12

"[T]here are two big differences between an automatic transmission and a manual transmission: There is no clutch pedal in an automatic transmission [vehicle]. There is no gear shift in an automatic transmission [vehicle]. Once you put the transmission into drive, everything else is automatic." **Karim Nice, "How Automatic Transmissions Work," available at <http://www.howstuffworks.com/transmission.htm>.** Again, this is virtually identical to Dr. Hoff's description of an automated transmission: "automatic (or automated) implies that the transmission will shift itself at the appropriate time." **Exhibit Q, *supra*, at 8.**

FN12. It is also noteworthy that Meritor's expert cites this same website in his expert opinion. **See Exhibit Q, *supra*, at 9.**

In addition to the fact that the transmission described in the patent is identical to Dr. Hoff's definition of a

manual transmission, he also opines that the '477 patent "can be applied to any transmission subject to 'torque lock.' " Id. at 10. In an automatic or automated manual transmission, the torque converter eliminates torque so that the transmission is not subject to torque lock. **Nice, "How Automatic Transmissions Work," *supra*.**

Finally, Dr. Hoff makes the following conclusions about the '477 patent:

Claim 1 does not say that it applies to a "manual transmission." In fact, ... the patent specifications [state] that the "transmission may be of any type known in the art." However, *the patent is particularly applicable to manual transmissions.... The requirement of breaking the "torque lock" by "actuating the clutch" is a necessary step in shifting a conventional manual gearbox....* The shift process described by [the patent] is initiated by an "operator input." This input occurs "when an operator actuates [a] switch." Consequently, the transmission that [the patent] describe[s] has the two key features of a manual transmission; a Manual Gearbox ( *i.e.*, a gearbox susceptible to torque lock ... ) and a Manual Shift ( *i.e.*, a shift in response to a drivers' input ... ).

...

In developing this opinion, I have taken "transmission" to mean "manual transmission" and I have applied the definition of "manual transmission" as it is commonly used in the automotive industry. Eaton's interpretation that "manual transmission" means "a transmission in which the driver's energy causes the disengagement and engagement of the gears" is not a commonly used definition in the automotive industry.FN13

FN13. Despite this observation by Dr. Hoff, Eaton's position is identical to his position: "automatic (or automated) implies that the transmission will shift itself at the appropriate time" as opposed to a transmission in which the driver's energy causes the disengagement and engagement of gears.

**Exhibit Q, *supra*, at 18-19 (footnote and emphasis added) (citations omitted).**

Regardless of the position attributed to Eaton by Dr. Hoff, it is clear that he considered the transmission described in the patent to be a manual transmission. *Mass. Inst. of Tech. & Elec. for Imaging, Inc. v. Abacus Software*, 462 F.3d 1344, 1353 (Fed.Cir.2006) (**construing court has an "obligation to give the words of a claim 'their ordinary and customary meaning, [which] ... is the meaning that the [words] would have to a person of ordinary skill in the art in question at the time of the invention' " (quoting Phillips v. AWH Corp., 415 F.3d 1303, 1312-13 (Fed.Cir.2005))**). The Court recognizes that the claim language does not limit the transmission to a manual one by using the word "manual" in the actual claim. *See, e.g.*, *SuperGuide*, 358 F.3d at 878 ("**The claim language does not limit the disputed phrases to any particular type of technology or specify a particular type of signal format, such as analog or digital.**"). However, the claim does clearly define a method of eliminating "torque between said engine output shaft and said transmission output shaft, said operator signal requesting said engine control determine a zero torque parameter value[.]" **Exhibit A, *supra*, col.7 ll.50-53.** This description is different than an automated transmission in which the transmission will shift itself at the appropriate time without a request from the operator. Thus, the Court is not adding the modifier "manual" to the claim; the language of the claim describes a transmission which is, of necessity, manual. "Unless there is an express intent to impart a novel meaning to the claim terms, the words of the claim are presumed to take on 'the ordinary and customary meanings attributed to them by those of ordinary skill in the art.' " *Mars, Inc. v. H.J. Heinz Co.*,

L.P., 377 F.3d 1369, 1373 (Fed.Cir.2004) (**quoting** Int'l Rectifier Corp. v. IXYS Corp., 361 F.3d 1363, 1369 (Fed.Cir.2004)). And, Meritor's own expert described the transmission as manual, both by operation and nomenclature. *Id.*; SuperGuide, 358 F.3d at 874 ("**There is a 'heavy presumption' that the terms used in claims 'mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art.'**" (**quoting** *Tex. Digital, supra*, at 1202)). Neither party disputes that Dr. Hoff is a person skilled in the art. "Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." Cook Biotech, Inc. v. Acell, Inc., 460 F.3d 1365, 1373 (Fed.Cir.2006) (**quoting** Pfizer, Inc. v. Teva Pharms, USA, Inc., 429 F.3d 1364, 1372-73 (Fed.Cir.2005)); **accord, Phillips v. AWH Corp., supra**; Application of Nelson, 280 F.2d 172, 181 (C.C.P.A.1960) ("**The descriptions in patents are not addressed to the public generally, to lawyers or to judges, but, as section 112 says, to those skilled in the art to which the invention pertains or with which it is most nearly connected.**").

And, as noted *infra*, the specification of the claim refers only to a manual transmission which is shifted into gear manually. "[T]he specification ... [u]sually, ... is dispositive; it is the single best guide to the meaning of a disputed term." Vitronics Corp. v. Conceptoronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996).

Th[e] two paragraphs of section 112 FN14 frame the issue of claim interpretation for [the Court]. The second paragraph requires [the construing court] to look to the language of the claims to determine what "the applicant regards as his invention." On the other hand, the first paragraph requires that the specification describe the invention set forth in the claims. [The Federal Circuit has recently explained] the extent to which [a construing court] should resort to and rely on a patent's specification in seeking to ascertain the proper scope of its claims.

FN14. Title 35 U.S.C. s. 112 states that the specification "shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains ... to make and use the same ... [.]" The second paragraph of the section provides that the specification "shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

...

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. 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.

...

It is therefore entirely appropriate for a court, when conducting claim construction, to rely heavily on the written description for guidance as to the meaning of the claims.

...

Assigning ... a limited role to the specification, and in particular requiring that any definition of claim language in the specification be express, is inconsistent with [the Federal Circuit's] rulings that the specification is "the single best guide to the meaning of a disputed term," and that the specification "acts as

a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." Phillips, 415 F.3d at 1312, 1316, 1317, 1320-21 (**quoting Vitronics, supra**) (**footnote added; other citations omitted**). Such is the case here: both Dr. Hoff and the patent specification describe a "manual" transmission.

Nor is this a case involving technology which had not yet been invented at the time of the patent, as was the case in *SuperGuide, supra*. Here, it is clear that at the time of the patent, automatic transmissions were included in the state of the art. However, manual transmissions were, according to Meritor's expert, preferable in the heavy trucking industry.

The element "transmission" in Claim 1 is thus construed to mean a manual transmission as described *infra*. It is not an automatic or automated transmission. Furthermore, it is noted that the above extensive discussion is also dispositive of other claim construction issues which are addressed below.

Having construed this element of the claim, the Court will determine whether the Eaton products infringe. According to the Board, Claim 1 of the '477 patent is an apparatus claim. **Exhibit E, Declaration of Donald Speranza, attached to Defendant's Motion, filed under seal, at 3**. The parties do not dispute this. "To prove direct infringement, [Meritor] must establish by a preponderance of the evidence that one or more claims of the patent read on the accused device literally or under the doctrine of equivalents." *Cross Med. Prod., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1310 (Fed.Cir.2005). "Literal infringement requires that the accused device embody each limitation of the asserted claim. The absence of any limitation of the asserted claim defeats literal infringement." *Research Plastics, Inc. v. Federal Packaging Corp.*, 421 F.3d 1290, 1297 (Fed.Cir.2005). If the Eaton products are not manual transmissions, there is no literal infringement because, "[t]o infringe an apparatus claim, the device must meet all of the structural limitations." ***Cross Med., supra, at 1311-12***. "[A]pparatus claims cover what a device *is*, not what a device *does*." ***Id. (quoting Hewlett-Packard Co. v. Bausch & Lomb, Inc.*, 909 F.2d 1464, 1468 (Fed.Cir.1990))**.

"However, '[a] device that does not literally infringe a claim may nonetheless infringe under the doctrine of equivalents if every element in the claim is ... equivalently present in the accused device.'" *Optical Disc Corp. v. Del Mar Avionics*, 208 F.3d 1324, 1335 (Fed.Cir.2000) (**quoting Sage Prods., Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1423 (Fed.Cir.1997)). " 'A claim element is equivalently present in an accused device if only 'insubstantial differences' distinguish the missing claim element from the corresponding aspects of the accused device.' " ***Id. (quoting Sage Prods., supra)***. But, just as with literal infringement, the accused product must embody every element of the claim by an equivalent. And, showing that the accused product is overall equivalent to the claimed invention is insufficient. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997). Conclusory allegations of infringement are also insufficient to support a finding of infringement under the doctrine of equivalents. *MicroStrategy, Inc. v. Business Objects, S.A.*, 429 F.3d 1344, 1353 (Fed.Cir.2005).**

Meritor's expert described the Eaton devices as "Automated Manual Transmissions (AMTs)." **Exhibit Q, Expert Report of Dr. Hoff, supra, at 11**. The description provided by Meritor's own expert shows that the transmissions do not literally infringe.

An [Eaton] AutoShift transmission is equipped with a conventional clutch that may be used by the driver to break the connection between the engine and the transmission. Hence it is referred to as a three-pedal system (clutch, brake, and accelerator). An UltraShift transmission is equipped with an automated clutch and operates as a two-pedal system (brake, accelerator). Both transmissions are designed so that they can be shifted without using the clutch. *Eaton AMTs are constructed from Eaton RoadRanger manual gearboxes by*

adding on additional components and features. These include:

1. The 'shift lever' is replaced with a 'XY Shift' unit. The shift unit consists of two electric motors that move a 'shift finger .' The shift finger sits into the same slot on the transmission as the lever. The X-Shift motor is used to position the finger on the desired rail. The Y-Shift motor is used to move the shift rail forward and back.
2. An electronic control system is added that can perform *automated shifts*. *The transmission control monitors* the vehicles (sic) speed, driver demand, current gear, and other variables from the SAE J1939 communication bus and *determines if a shift needs to be made*. *When the [electronic] controller decides that a shift is needed, the transmission controller takes over the control of the engine* so that it creates a near zero torque condition on the driveline. Once that is achieved th[e] electric motors are used to move the shift rail to the neutral position. The transmission controller then commands the engine to a speed that will allow the transmission to be engaged in the new gear.
3. Eaton AMTs have the ability to be operated in a 'Hold' or 'Manual' mode. In this mode the driver initiates a shift by pressing a button (up or down). *The transmission then completes the shift*.

***Id.* (emphasis added).** Thus, according to Meritor's expert, even when the Eaton product is being operated in a manual mode, the transmission completes the shifting into the new gear as opposed to the invention which requires the driver to make the shift into the new gear via the manual stick shift.

Nonetheless, Meritor's expert concluded:

Eaton's automated manual transmissions (AutoShift and UltraShift) behave in the same way [as Meritor's transmissions], when they are operated in the 'Hold' or 'Manual' mode during a power-on shift. The transmissions are based on manual gearboxes. The shift process is initiated by a driver input, specifically by the driver pressing the 'Upshift' or 'Downshift' button (i.e. a switch) on the driver control console. An engine control (which is comprised of the engine's electronic control unit controller and Eaton's transmission control unit working together during the shift) is used to ramp down the engine torque output to approximate a zero torque condition on the driveline and the transmission can then be moved from in-gear to neutral without requiring the driver to depress the clutch pedal. The shift process used in the AutoShift and UltraShift transmissions during power-on shifts, when operating in 'Hold' or 'Manual' mode, have the two features of a manual transmission; a Manual Gearbox and a Manual Shift.FN15 It is my opinion that Eaton AutoShift and UltraShift transmissions are "transmissions" with respect to Claim 1 of [the patent].

FN15. Meritor's expert opines that the "manual shift" is comprised of the driver pressing the button.

***Id.* at 19 (footnote added).** Meritor's expert does not opine that the Eaton transmissions infringe when operated in any mode other than manual. Eaton's expert, however, clarifies an important distinction between Eaton's transmissions and that of the invention: although one generation of the AutoShift transmission has a clutch pedal, it is used only for starting and stopping. **Exhibit E, Speranza Declaration, supra, at 2.** The UltraShift transmission does not have a clutch. ***Id.*** And, in all the allegedly infringing transmissions, the actual shift into gear is made by the transmission not the driver using a manual stick shift. In fact, Meritor recognizes this distinction in its brief: "Persons skilled in this art use the word 'manual' to describe a transmission that requires the driver to 'take some action to cause the shift to occur, for instance by moving

a lever or pushing a button,' as opposed to an 'automatic' transmission that 'will shift itself at the appropriate time.' " **Plaintiff's Brief in Opposition to Eaton's Motion for Summary Judgment of Noninfringement, filed December 12, 2005, at 3.** In the Eaton transmissions, even when operated in manual mode, the driver makes the selection of the gear but the transmission automatically makes the shift into that gear. **Exhibit Q, supra, at 11** ("Eaton AMTs have the ability to be operated in a 'Hold' or 'Manual' mode. In this mode the driver initiates a shift by pressing a button (up or down). *The transmission then completes the shift.*" (emphasis added)).

According to Eaton, the purpose of the manual mode in the AutoShift and UltraShift transmissions is to allow "the driver to hold the current gear and select another gear for changing road conditions using the up/down buttons (provided the engine speed is not outside of defined limits)." FN16 **Defendant's Memorandum, supra, at 5.** As described in the operator's manual,

FN16. "One disadvantage of automatic shifting is that an unexpected shift can cause the driver to lose control of the truck, particularly when the truck is traveling on slippery roads." Eaton Corp., 323 F.3d at 1335.

Manual mode should be used whenever you want to select the shifts instead of letting AutoShift select them for you. For example, when you are moving around the yard and on some grade conditions.

#### **Selecting from Neutral:**

-> As described above for Drive Mode, the starting gear can be changed in exactly the same way in Manual Mode.

-> If Manual mode is selected from a stop, the starting gear is maintained-no shifts are performed, except for condition noted below.

-> *The driver can request shifts* using the proper shift button (up for upshifts, down for downshifts). *The upshift or downshift is performed by the AutoShift* provided the result in engine speed is not outside of defined limits. For upshifts, the resulting engine speed must be greater than 800 RPM; for downshift, the resulting engine speed must be less than engine rated speed. By pressing the button twice, the driver can request a skip shift.

#### **Selecting Manual from Drive or Low while Moving:**

-> If Manual mode is selected while moving, the current gear is maintained-no shifts are performed, except for conditions noted below.

-> As described above, the driver can request shifts using the proper shift button (up for upshifts, down for downshifts) within the same limits described.

#### **Transmission Manual Override:**

-> If the vehicle is being back driven and the engine is approaching a higher than normal level (approximately 300 RPM above rated speed), the AutoShift overrides the Manual position and performs an upshift to prevent engine damage.

-> If the gear being maintained is higher than starting gear and the vehicle come[s] to a stop, the AutoShift overrides the Manual mode and performs a shift into starting gear.

**Exhibit F, Roadranger Driver Instructions, attached to Defendant's Motion, at 9 (emphasis added).** In this transmission, the manual mode operation is used when the driver wants to select the gear being shifted into instead of having the automated transmission do so automatically. However, after the driver requests a different gear, the transmission makes the actual shift automatically. *Id.*; **Exhibit Q, supra** ("**[T]he driver initiates a shift by pressing a button (up or down). The transmission then completes the shift.**" (emphasis added)).

In Meritor's transmission, the sole purpose of the invention is to allow the gear to be placed into neutral without using a clutch; *i.e.*, there is no automated transmission capability. In fact, the driver thereafter has to use the manual stick shift to move the transmission into the new gear. *Id.* at 19 ("**[The '477 patent] describes a method to shift the transmission without using the main clutch.... [The invention allows the transmission to] be moved from in-gear to neutral without requiring the driver to depress the clutch pedal.**"). Eaton's transmissions never use the clutch to shift gears; the clutch is only utilized when starting or stopping the vehicle. **Exhibit E, supra, at 2 (In the AutoShift three-pedal transmission, "[t]he clutch pedal is used only for starting and stopping.**").

According to Meritor's expert, the '477 invention is to be used with manual transmissions. Eaton's transmissions are, according to Meritor's expert, automated manual transmissions. Even when operated in the manual mode, Eaton transmissions automatically shift into the new gear whereas the '477 invention allows torque elimination so that the gear can be moved into neutral. At issue is whether the two things are the same. That is, is a transmission which is otherwise automatic but which allows for an operator-selected gear shift to accommodate road conditions the equivalent of an invention which allows an operator to select a switch which eliminates torque and thus allows the gear to be moved into neutral without the use of a clutch. Or, as Meritor has acknowledged, "the intended purpose of the ['477] invention ... is to enable the driver of a manual transmission vehicle to shift an engaged gear into neutral without need to use the clutch." **Exhibit P, supra.** The Court concludes that the Eaton transmissions do not literally infringe and are not the equivalent of the invention.FN17

FN17. The Court will not undertake an extensive analysis of equivalency because Meritor in its brief made "only conclusory statements regarding equivalence, without any particularized evidence and linking argument as to the 'insubstantiality of the differences' between the claimed invention and the accused device, or with respect to the 'function, way, result' test[.]" *PC Connector Solutions, LLC v. SmartDisk Corp.*, 406 F.3d 1359, 1364 (Fed.Cir.2005). "The evidence and argument on the doctrine of equivalents cannot merely be subsumed in plaintiff's case of literal infringement." *Id.* (quoting *Lear Siegler, Inc. v. Sealy Mattress Co.*, 873 F.2d 1422, 1425 (Fed.Cir.1989)). "Moreover, conclusory statements regarding equivalence ... do not raise any genuine issues of material fact." *Id.* (citing *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1389 (Fed.Cir.1992)).

The next element of Claim 1 to which construction must be applied is:

[A]n engine control to control a parameter of said engine, said engine control including ***an operator input to allow an operator to signal a desire to eliminate torque*** between said engine output shaft and said transmission output shaft[.]

**Exhibit A, col.7 ll.48-52 (emphasis added).** Again, the Court looks first to the decision of the Board which noted:

The subject matter [of this invention] concerns ... a vehicle drive having an engine control which *in response to an operator signal* determines a zero torque parameter value for the engine and which is operable to control the engine to achieve the zero torque parameter value[.] *The significance of the zero torque parameter value is that when it is achieved, the transmission of the motor vehicle is free to be shifted to neutral without engagement of a clutch.*

**Exhibit D, supra, at 3 (emphasis added).** The Board clearly stated that the operator signal resulted in the engine achieving zero torque parameter value. The Board did not go further and find that the operator signal also caused the shifting of gears after that zero torque parameter value had been met. In fact, the Board was quite specific: (1) the invention caused the transmission to achieve zero torque parameter in response to an operator signal; and (2) that torque elimination allowed the vehicle to be shifted to neutral without use of a clutch.

Despite the Board's conclusion, Meritor argues that the patent is not so limited, that is, there is nothing in the patent which excludes the signal from also accomplishing the gear shift. Eaton claims there is a distinction between eliminating torque and moving the gear into neutral versus selecting a gear and an automatic shift into that gear without further operator input. For the same reasons as discussed above, the Court finds that Eaton's position is well taken.

Moreover, Meritor's expert, Dr. Hoff, opined that "[t]here are two distinct steps in shifting to another gear in a manual gearbox. The first step is to move the transmission from in-gear to neutral. The second step is to synchronize the speeds of the two halves of the transmission ... so that the transmission can be engaged in a new gear." **Exhibit Q, at 9.** "The ['477] patent describes an apparatus to move transmission from in-gear to neutral without using the clutch, so the portion of shift ... which is of primary interest occurs between the start of the shift ... and the point when neutral is achieved[.]" **Id. at 15.**

By contrast, Eaton's expert, Mr. Speranza, opined:

Eaton's AutoShift and UltraShift transmissions are automated mechanical transmissions used on medium and heavy trucks .... Both AutoShift and UltraShift operate with a control console ("console"), which is the principal driver interface for these products.

...

The function of the consoles used in AutoShift and UltraShift is similar to that of the selector in a car having an automatic transmission.... In AutoShift and UltraShift, pressing the "D" button or moving the selector to "D" causes actuators in the transmission to put the truck transmission into drive mode and the transmission will shift to an appropriate starting gear[,] depending upon the start gear selected by the driver. The same is true for the other modes of operation: pushing the buttons or moving the selector to "R", "N" or "L" will cause actuators in the transmission to put the truck transmission into reverse, neutral or the selected starting gear, respectively. *Pressing the "Manual" button or moving the selector to "Manual" on the AutoShift and UltraShift console permits the driver to hold the current gear.* Provided the engine speed is not outside of defined limits, and other conditions related to the ability to perform the requested shift, *the*



*driver then may select the appropriate gear for road conditions using the up/down buttons.... Pressing the up/down button on the console while in "Manual" mode causes electronics in the console, transmission, and engine to evaluate whether a shift requested by the driver is allowable under the conditions.*

...

The transmissions have an electric motor controlled by a computer that moves the dog clutch when disengaging from the currently engaged gear.... The net engine torque is a value that is continuously computed every 10 ms based on values broadcast over the J1939 data link-irrespective of any input from the driver or whether the driver has requested an upshift or downshift in Manual mode.... When the driver has requested a shift, the software routine will set a flag to true or false depending on whether the net engine torque is less than the "full on" torque thresholds. If net engine torque is less than the "full on" torque threshold during a software cycle after a shift request has been made, the flag will be set to "true" and the electric motor turned to "full on" power.

**Exhibit E, at 2, 4-6 (emphasis added).**

Despite the conclusion argued for by Meritor, its expert did not describe the '477 patent as including (1) torque elimination; (2) disengagement of the gear into neutral; and also (3) shifting by the transmission into a new gear. Indeed, the patent, both in the specification and claim language, refers to elimination of torque, followed by moving the gear into neutral with no description of a further shifting into gear except through the driver's use of the manual stick shift. *See, e.g., Exhibit A, col.8 ll.17-19 (Claim 9-"A vehicle drive as recited in claim 1, wherein a manual stick shift allows an operator to manually shift said transmission speed ratios." (emphasis added)); id. col.8 ll. 23-39 (Claim 11-"A method of operating a vehicle drive comprising the steps of: ... allow[ing] the operator to move said transmission to begin a speed ratio shift; ... indicating a desire to eliminate torque by actuating said input switch; ... manually moving said transmission out of engagement to a neutral position."); id. col.7 ll. 5-14.FN18*

FN18. Lest Meritor argue that the Court is importing definitions from other claims, the Court notes that it is appropriate to consult "[o]ther claims of the patent in question, both asserted and unasserted, [which] can also be valuable sources of enlightenment as to the meaning of a claim term." Phillips, 415 F.3d at 1314. Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims. Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.

***Id.* at 1314-15 (internal citations omitted).**

Referring again to the specification, an operator requests the torque elimination feature through button 48. The ECU [electronic control unit] varies the engine fueling as shown[.] The *operator applies force to the manual stick shift*, attempting to move the collar and disengage the gear. As the actual engine fueling saw tooth profile crosses the actual zero torque value, the operator will be able to disengage the collar. A signal is sent to the ECU that the transmission is in neutral. Once a signal is received that the transmission is in neutral, *control is either returned to the operator or an engine synchronization system as described generally in this application is then actuated to synchronize the speed to that which will be necessary at the next expected gear.*

...

[A]fter the transmission is in the position shown[,], the operator must now engage a new selected gear. The present invention is preferably utilized with a system that then synchronizes engine speed with the speed necessary fo a smooth transition to the new transmission speed.

**Exhibit A, col.6 ll. 41-53; col.7 ll. 3-8 (emphasis added).** The patent does not claim the engine

synchronization system, only the invention which allows the gear to be moved into neutral without a clutch. Cook Biotech, 460 F.3d at 1373. The Court concludes that Meritor's invention claims only the operator input to signal torque elimination without use of a clutch. Vitronics, 90 F.3d at 1582; *Phillips, supra*. It does not claim the further effecting of gear shift stemming from the initial operator signal. *Id*. Once the torque is eliminated, the transmission may be shifted into neutral and thereafter, into a new gear. *Id*. But, this requires further operator input. Thus, "operator input to allow an operator to signal a desire to eliminate torque" is so construed.

It is also clear that even when the Eaton transmissions are operated in manual mode, the operator input selects a gear but the transmission both effects the torque elimination and shifting into the next gear without further operator input. Thus, the Court finds the accused products do not literally or equivalently infringe. *Cross Medical, 424 F.3d 1310*; Research Plastics, 421 F.3d at 1297; MicroStrategy, 429 F.3d at 1353.

The next portion of Claim 1 for construction is as follows:

*[S]aid operator signal requesting said engine control determine a zero torque parameter value for said engine output shaft that approximates a zero torque load on the connection between said engine and said transmission, and said engine control being operable to control said engine to achieve said zero torque parameter value.*

**Exhibit A, col.7 ll.52-58 (emphasis added).**

According to the Board, "[t]he significance of the zero torque parameter value is that when it is achieved, the transmission of the motor vehicle is free to be shifted to neutral without engagement of a clutch."

**Exhibit D, supra, at 3.**

The parties do not dispute that the zero torque referred to in the [claim] is the engine's flywheel or net torque rather than gross torque. Flywheel or net torque does not include torque necessary to overcome an engine's own internal friction or to drive the vehicle's accessories such as water pump, oil pump, air conditioning, lights, etc.

...

If actual zero torque at the flywheel is achieved, a driver may shift a manually operated transmission from an engaged gear into neutral *without* need to activate a clutch.... [T]he intended purpose of the invention ... is to enable the driver of a manual transmission vehicle to shift an engaged gear into neutral without need to use the clutch. In the context of determining the zero torque parameter value and then achieving the determined value, ... the determination is a prediction, something done before the condition has been caused to occur.

**Id. at 5-6.** These phrases mean that "the engine control actually determined a zero torque parameter value and also that the engine achieved the determined zero torque parameter value, assuming that there had been an operator signal to begin the process." **Id. at 9.** This claim does not require "that the condition of actual zero flywheel torque be achieved, but that the determined zero torque parameter value be reached." **Id. at 23.** That is, "a zero torque parameter value was first determined and then the engine was controlled and actually reached the 'determined' zero torque value." *Id.* The claim "specifically requires that the engine control be operable to achieve 'said' zero torque parameter value, which refers back to the determined zero torque parameter value, and not that the engine shall reach the condition of actual zero flywheel torque." **Id. at 30.** "Performance of the [claim] feature at issue requires the engine to meet the determined zero torque

parameter value, not that the engine be made to provide zero flywheel torque. This difference cannot be ignored." *Id.* at 36. Moreover, the entire purpose of the invention is that no use of the clutch is required. *Id.* at 36-37. The Court construes this claim language in the same manner as the Board. By contrast, the Eaton transmissions use net engine torque FN19 for shifting and this is a condition constantly evaluated by the engine itself, not by operator input.

FN19. Because the Court finds that the Eaton transmissions constantly evaluate this condition, not solely in response to an operator request, the Court does not find it necessary to determine whether net engine torque is the equivalent of zero torque parameter value.

*At all times, including when evaluating a shift request, the transmission and engine electronics communicate over an industry standard network (known as the J1939 data link). It is important to note that The Electronic Controls In The Engine Continuously Broadcast Values Over The J1939 Data Link Irrespective Of An Operator Signal Or Whether The Driver Has Pressed A Button.* For example, the engine continuously broadcasts the nominal friction percent torque value over the J 1939 datalink every 250 milliseconds. If the system determines that a requested shift is allowable under the conditions, the engine is commanded to modify torque and "ramp" down to zero gross engine torque ("ramp to zero"). When this process begins, the frictional forces in the engaged gears due to the torque in the driveline generally prevent the transmission actuators from moving the dog clutch (component that engages and disengages the gears) out of its currently engaged gear and into neutral. After an initial step, the "ramp to zero" occurs at a constant rate of 1 % of reference torque per 10 ms, and except for the value from which it starts (which is the net engine torque at the start of the shift) is identical for each and every shift requested by the driver in Manual mode. This ramp to zero is necessary to reduce the torque in the driveline to allow the transmission actuators to disengage the dog clutches, while at the same time not "jolting" the driver by an immediate or overly rapid decrease in driveline torque.

As the "ramp to zero" begins, AutoShift and UltraShift initiate a "preload" to prepare for moving the dog clutch out of its currently engaged gear. *The transmissions have an electric motor controlled by a computer that moves the dog clutch when disengaging from the currently engaged gear.* During the "preload" phase, the electric motor is pre-loaded with approximately 25-50 lbs. of force to bias the dog clutch to pull out of the currently engaged gear to neutral....

During the "ramp to zero," the electric shift select (or "Y") motor for the shift actuator will increase from preload power to "full on" power to push the dog clutch out of the currently engaged gear. *The turn to "full on" power occurs (1) when sensors detect movement of the shift finger which is connected to the dog clutch, irrespective of the amount of net torque, or (2) when the net engine torque, derived from values continuously broadcasted over the J1939 data link, falls below 150 ft-lbs (for AutoShift Generation I) and 75 ft-lbs (all other versions of AutoShift and UltraShift).*

*The net engine torque is a value that is continuously computed every 10 ms based on values broadcast over the J1939 data link-irrespective of any input from the driver or whether the driver has requested an upshift or downshift in Manual mode. Additionally, net engine torque is a value that is not only used for the condition under which the Y motor is fired to "full on" power, but also for shift point decisions and shiftability determinations in Drive mode, shiftability determinations in Manual or Hold mode when the upshift or downshift buttons are depressed and, in the case of UltraShift, during the initial engagement of the master clutch during a launch.*

Likewise, the software routine continuously compares the value of net engine torque with the "full on" torque thresholds of 150 ft-lbs or 75 ft-lbs. When the driver has requested a shift, the software routine will set a flag to true or false depending on whether the net engine torque is less than the "full on" torque thresholds. If net engine torque is less than the "full on" torque threshold during a software cycle after a shift request has been made, the flag will be set to "true" and the electric motor turned to "full on" power.

**Exhibit E, at 4-6 (emphasis added).**

In addition to the fact that the Eaton transmissions do not respond solely to operator input, another of Meritor's experts opined that they also do not predict zero torque.

It is my opinion that the [Eaton product] does not describe an algorithm for predicting zero engine output torque and further, one skilled in the art cannot derive an algorithm for predicting zero engine output torque from the description [of the Eaton product]. It is also my opinion that the [Eaton product] provides an inadequate description of a method for predicting a zero torque, because it only describes the prior art "forced torque reversal [.]"... In my opinion, the "forced torque reversal" technique [used in the Eaton products] is nothing more than the automation of the clutchless shifting technique used by experienced drivers [by alternately depressing and releasing the fuel pedal]. In the [Eaton transmissions] a fuel controller adjusts the fueling to create the "forced torque reversals," and *a mechanical shift actuator automatically shifts the transmission out of gear during the torque reversals without the driver manually moving the gearshift lever. In the ['477 patent], there is no mechanical shift actuator to automatically move the gears, and the fuel controller does not create "forced torque reversals."* Instead ..., the controller uses an algorithm to accurately predict a zero torque value[.] ... [T]he controller then adjusts the fueling so that the torque value is precisely modified within a narrow range of the algorithm-derived zero torque value, thereby ensuring proximity to the actual zero torque value. *This relieves torque-lock allowing the driver to manually move the gearshift lever[.]*

**Exhibit U, First Declaration of Dr. Gregory W. Davis, attached to Defendant's Motion, at 1-3.** "In the preferred embodiment [of the '477 patent], the controller ... dithers the fueling so that the torque value is precisely modified within a narrow range of the determined zero torque value, thereby ensuring proximity to the actual zero torque value, *when the driver manually moves the gearshift lever.*" **Exhibit O, Second Declaration of Dr. Davis, attached to Defendant's Motion, para. 22 (emphasis added).** Thus, once again, the expert opinion of Meritor's own expert verifies the claim construction: the operator signal requests torque elimination which is effected by the engine achieving a zero torque parameter value. Thereafter, the driver manually moves the gear into neutral. Based on this claim construction and the description of the manner in which the Eaton transmissions operate provided by Meritor's own expert, the Eaton products do not literally or equivalently infringe.

Moreover, based on the discussion *infra*, "no reasonable juror could find that the accused [products] use[ ] the entire claimed apparatus." *Cross Medical*, 424 F.3d at 1312. As a result, summary judgment is appropriate.

## V. ORDER

**IT IS, THEREFORE, ORDERED** that the claims of the '477 patent are hereby construed in accordance with this opinion; and

**IT IS FURTHER ORDERED** that the Defendant's motion for summary judgment is hereby **GRANTED**.  
A Judgment is filed herewith.

W.D.N.C.,2007.

Meritor Transmission Corp. v. Eaton Corp.

Produced by Sans Paper, LLC.