

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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NAVISTAR, INC.,  
Petitioner,

v.

FATIGUE FRACTURE TECHNOLOGY, LLC,  
Patent Owner.

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Case IPR2018-00853  
Patent 7,143,915 B2

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Before LINDA E. HORNER, BENJAMIN D. M. WOOD, and  
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

HORNER, *Administrative Patent Judge*.

DECISION  
Institution of *Inter Partes* Review  
35 U.S.C. § 314(a)

## I. INTRODUCTION

Navistar, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1, 7, 9, and 10 of U.S. Patent No. 7,143,915 B2 (Ex. 1001, “the ’915 patent”). Paper 1 (“Pet.”). Fatigue Fracture Technology LLC (“Patent Owner”) filed a Preliminary Response. Paper 9 (“Prelim. Resp.”).

We have authority under 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” Moreover, a decision to institute under 35 U.S.C. § 314 may not institute on less than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018).

Upon consideration of the Petition and the Preliminary Response, we conclude the information presented shows there is a reasonable likelihood that Petitioner would prevail in showing the unpatentability of at least one challenged claim. Accordingly, we authorize an *inter partes* review to be instituted as to all challenged claims of the ’915 patent, i.e., claims 1, 7, 9, and 10, on all grounds raised in the Petition. Our factual findings and conclusions at this stage of the proceeding are based on the evidentiary record developed thus far (prior to Patent Owner’s Response). This is not a final decision as to patentability of claims for which *inter partes* review is instituted. Any final decision will be based on the record, as fully developed during trial.

### A. Related Matters

The parties indicate that the ’915 patent is asserted in the United States District Court for the Northern District of Illinois, in a case captioned

*Fatigue Fracture Technology, LLC v. Navistar, Inc.*, Case No. 1:15-cv-5667 (N.D. Ill.). Petitioner's Second Updated Mandatory Notices (Paper 7); Patent Owner's Mandatory Notices (Paper 5). The parties also indicate that related U.S. Patent No. 7,497,361, which is a divisional of the '915 patent, is the subject of a reexamination proceeding (Appl. No. 90/014,120) before this Office. *Id.*

### *B. Real Parties in Interest*

Petitioner identifies only itself as a real party in interest. Pet. 83; Paper 7. Patent Owner identifies only itself as a real party in interest. Paper 5.

### *C. The '915 Patent*

The '915 patent relates to a method to fracture connecting rods. Ex. 1001, 3:3–4. The patent describes that most known methods for fracturing connecting rods apply an outward pressure to the crank bore until the generated stresses are high enough to fracture the connecting rod. *Id.* at 1:3–33. The patent teaches that the large magnitude forces required to fracture connecting rods made of high strength materials have a negative effect on quality of the fractured connecting rod. *Id.* at 1:39–43. The patent also teaches that such forces cause disadvantages, such as plastic deformation, lack of flexibility in adapting the same technique to different sizes of connecting rods, repeated breakage of force exertion elements of the machine, and poor quality of the fractured connecting rod. *Id.* at 1:43–48. The '915 patent recognizes that some fracture methods attempted to overcome these difficulties by reducing or weakening the cracking area using techniques such as cryogenic cooling and electronic beam hardening.

*Id.* at 1:34–38. According to the patent, however, these techniques have “a deleterious effect on material performance.” *Id.* at 1:38.

The process of the ’915 patent uses several small magnitude forces to raise the stress intensity factor in the connecting rod up to the fracture point to avoid the use of a single large force to fracture the rod. *Id.* at 3:4–8. The ’915 patent describes that this approach eliminates many problems associated with the use of large forces and provides better control over the fracturing process, because the contribution of each factor is optimized to achieve the best results. *Id.* at 3:8–11.

In the method described in the ’915 patent, time varying forces, such as harmonic forces, are applied to a pre-notched connecting rod to cause the pre-existing crack to grow incrementally depending on the range of fluctuation in the stress intensity factor. *Id.* at 3:16–20. “[A]s the crack grows, the absolute value of the stress intensity factor will increase.” *Id.* at 3:22–24. The ’915 patent describes that the time varying forces are applied simultaneously to two sides of the connecting rod and act along a straight line parallel to the predetermined fracture plane and perpendicular to the axis of the bore cylindrical surface. *Id.* at 3:54–58. “The crack extends, and fracture may occur, depending on the relative magnitude of stress intensity factor and material fracture toughness.” *Id.* at 3:49–52. Alternatively, the time varying force can be applied in a direction perpendicular to the predetermined fracture plane. *Id.* at 6:41–44.

In addition, a primary pre-stressing force can be applied in a direction perpendicular to, and away from, the predetermined fracture plane by moving an upper jaw of a clamping arrangement away from the fracture plane. *Id.* at 4:3–7. A secondary pre-stressing force can be applied by two

static forces equal in magnitude and acting on the same straight line in opposite directions, using the same mechanism used to apply the time varying forces. *Id.* at 4:14–18. Specifically, two contacts advance until they slightly press the part applying the secondary pre-stressing forces, and then they move forward and backward applying the time varying forces. *Id.* at 4:18–21. Application of these pre-stressing forces is optional in that elimination of these pre-stressing forces is not a departure from the scope of the invention. *Id.* at 6:45–48.

The '915 patent describes that in the process a dynamic force is applied at a time instant  $T_f$  by increasing the primary pre-stressing force suddenly as an impulsive force at  $T_f$ , or at a slower rate within a period centered on  $T_f$ . *Id.* at 4:35–38. “The time instant  $T_f$ , to be determined by performing several simple tests, by applying the fracturing force during different cycles at different time instants such as  $T_0$  (minimum deformation) or  $T_{max}$  (maximum  $K_I$ ) and comparing the quality of the fractured connecting rods.” *Id.* at 4:38–43. “[A] longer period before applying the dynamic force, increases the fatigue effect [imparted by the time varying force].” *Id.* at 4:55–56.

The '915 patent describes one implementation of the process as follows, with reference to Figure 3 reproduced below.

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