

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ROBERT BOSCH LLC and DAIMLER AG,  
Petitioner,

v.

ORBITAL AUSTRALIA PTY LTD,  
Patent Owner.

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Case IPR2015-01258  
Patent 5,655,365

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Before KEN B. BARRETT, HYUN J. JUNG, and  
JEREMY M. PLENZLER, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION  
Institution of *Inter Partes* Review  
37 C.F.R. § 42.108

## I. INTRODUCTION

Robert Bosch LLC and Daimler AG (collectively “Petitioner”) filed a Petition requesting *inter partes* review of U.S. Patent No. 5,655,365 (“the ’365 patent”). Paper 3 (“Pet.”). The Petition challenges the patentability of claims 1, 2, 5, 9, 10, 12–14, and 18 of the ’365 patent on the grounds of anticipation under 35 U.S.C. § 102(b) and obviousness under 35 U.S.C. § 103. Orbital Australia Pty Ltd, the owner of the ’365 patent, filed a Preliminary Response to the Petition. Paper 10 (“Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314(a).

Our factual findings and conclusions at this stage of the proceeding are based on the evidentiary record developed thus far. This is not a final decision as to patentability of claims for which *inter partes* review is instituted. Any final decision would be based on the record as fully developed during trial.

After considering the information presented in the Petition and Patent Owner’s Preliminary Response, we are persuaded there is a reasonable likelihood Petitioner would prevail with respect to at least one of the claims challenged in the Petition. We institute an *inter partes* review of all of the challenged claims, claims 1, 2, 5, 9, 10, 12–14, and 18, of the ’365 patent.

### A. Related Proceedings

Both parties identify, as matters involving the ’365 patent, a district court case *Orbital Australia Pty Ltd. and Orbital Fluid Technologies, Inc., v. Daimler AG, Mercedes-Benz USA LLC, Mercedes-Benz US International Inc., Robert Bosch GmbH, and Robert Bosch LLC*, Case No. 3:14-cv-808-REP (E.D. Va.), and Patent Trial and Appeal Board case IPR2015-01259.

Pet. 58–59; Paper 5. Additionally, we note that Petitioner filed a Petition in IPR2016-00083 challenging claims of the '365 patent.

*B. The '365 Patent*

The '365 patent pertains to “a method of operating an internal combustion engine in order to produce high exhaust gas temperatures” in the context of catalytic treatment of exhaust gases to reduce contaminants.

Ex. 1001, col. 1, ll. 4–9. The patent explains that the catalyst, to effectively reduce contamination levels, must attain a minimum operating temperature, the “light-off” temperature. *Id.*, col. 1, ll. 10–17. The patent is directed to a method to reduce the time required to raise the catalyst to a light-off temperature condition, for example, upon engine start-up after a period of non-operation, and to maintain that condition. *Id.*, col. 1, ll. 19–25, 49–55.

The '365 patent describes a method where the ignition of the air/fuel mixture within at least one engine cylinder is retarded to after top dead centre<sup>1</sup> (ATDC) and, while the ignition is retarded, increasing the fueling rate to that cylinder to a level higher than required when operating normally. *Id.*, col. 1, ll. 56–64. The Specification, explaining why there is a need to increase the fueling rate during the disclosed method of operation, states:

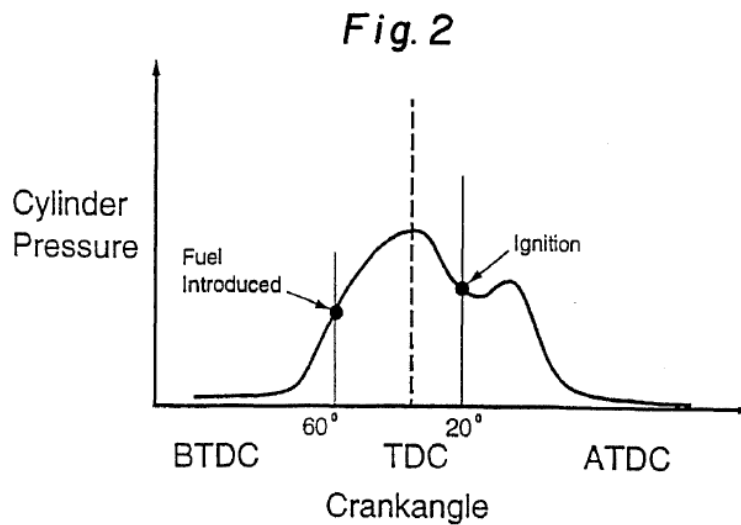
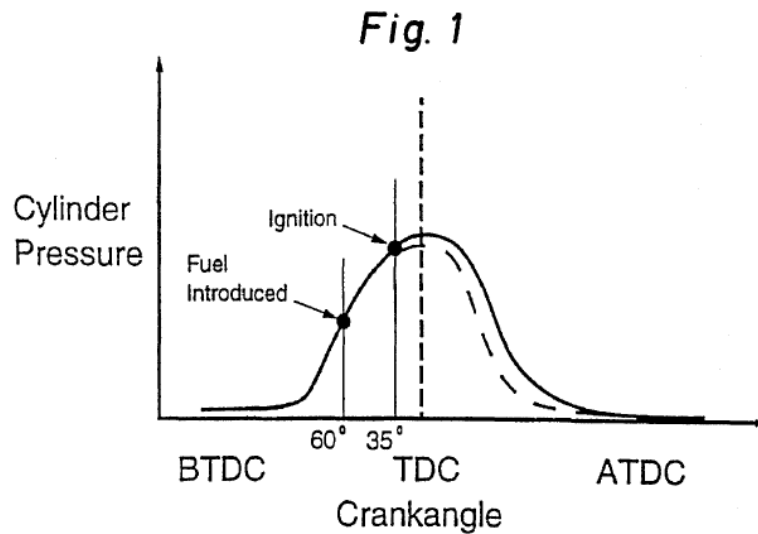
[A]t startup the engine typically will operate at a relatively low load and speed, such as is termed “engine idle”, and therefore the amount of fuel being delivered to the engine is comparatively small and hence, only a relatively small amount of heat is available for raising the temperature of the exhaust gases and hence the temperature of the catalytic material to its “light-off” temperature.

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<sup>1</sup> The '365 patent uses Australian spelling for certain words such as “centre” and “fuelling.” We use in this decision both the Australian and American spellings interchangeably.

*Id.*, col. 1, ll. 26–32. The timing of the introduction of fuel is maintained at before top dead centre (BTDC). *Id.*, col. 6, ll. 16–18 (claim 1).

Figures 1 and 2 of the '365 patent are reproduced below:



Figures 1 and 2 depict graphs showing the cylinder pressure-crankangle characteristics for a typical direct injected two-stroke internal combustion engine and for such an engine operated according to the method of the '365 patent, respectively. *Id.*, col. 2, ll. 46–52.

*C. Illustrative Claim*

Claim 1 is an independent claim. Claims 2, 5, 9, 10, 12–14, and 18 depend directly or indirectly from independent claim 1. Claim 1, reproduced below with paragraphing added, is illustrative:

1. A method of operating an internal combustion engine comprising

retarding the ignition of a gas/fuel mixture within at least one cylinder of the engine to after top dead centre (ATDC) in respect of the combustion cycle of said at least one cylinder of the engine and,

while said ignition is so retarded, increasing the fuelling rate of said at least one cylinder to a level higher than that required when the engine is operating normally to thereby assist in increasing the exhaust gas temperature of the engine,

the timing of the introduction of fuel into the at least one cylinder being maintained at before top dead centre (BTDC).

Ex. 1001, col. 6, ll. 7–18.

*D. Applied References*

W E. Bernhardt and E. Hoffman, <i>Methods for Fast Catalytic System Warm-Up During Vehicle Cold Starts</i> , Society of Automotive Engineers (1972) (“Bernhardt”)			Ex. 1002
Eichler et al. (“Eichler ’791”)	GB 1 447 791	Sept. 2, 1976	Ex. 1003
Griese	US 3,799,134	Mar. 26, 1974	Ex. 1004
Onishi	US 3,572,298	Mar. 23, 1971	Ex. 1005

Petitioner relies also on the Declaration of Dr. Ron Matthews, dated June 15, 2015, (Ex. 1006) in support of Petitioner’s arguments.

*E. Asserted Grounds of Unpatentability*

Petitioner asserts the following grounds of unpatentability:

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