UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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VOLKSWAGEN GROUP OF AMERICA, INC.,
Petitioner,

v.

ADVANCED SILICON TECHNOLOGIES LLC
Patent Owner

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Case IPR2016-00894
U.S. Patent No. 8,933,945 B2

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**DECLARATION OF JOHN C. HART, PH.D. IN SUPPORT OF PATENT
OWNER ADVANCED SILICON TECHNOLOGIES LLC'S
<u>PRELIMINARY RESPONSE</u>**

I.   INTRODUCTION

1.   I have been retained by counsel for Patent Owner Advanced Silicon Technologies LLC ("Patent Owner" or "AST") as an expert to provide this declaration and certain opinions regarding claims 1-11 and 21 of United States Patent No. 8,933,945 ("the '945 Patent"). More specifically, I have been asked to form opinions on whether Claims 1-11 and 21 of the '945 patent are rendered obvious by certain combinations of prior art references, including U.S. Patent No. 5,757,385 to Narayanaswami et al. ("Narayanaswami"), U.S. Patent No. 6,070,003 to Gove et al. ("Gove"), portions of "Computer Graphics Principles and Practice: Second Edition in C," by Foley et al. ("Foley"), and U.S. Patent No. 5,794,016 to Kelleher ("Kelleher"). All of the opinions and conclusions found in this declaration are my own and I have personal knowledge of all the facts set forth herein. If called to testify, I would competently testify and verify that contained herein.

2.   I am being compensated at my hourly rate of $550. I am also being separately reimbursed for out of pocket expenses. My compensation does not depend in any way on the outcome of these cases or the particular testimony or opinions I express.

AST Exhibit 2001

3.   I understand that Volkswagen has filed a petition in this proceeding contending claims 1-11, and 21 of the '945 Patent are obvious over certain multi-reference combinations of Narayanaswami, Gove, Foley and Kelleher.

II.   EXPERT QUALIFICATIONS

4.   I have been a professor of computer graphics since 1992. I am currently a tenured Professor in the Department of Computer Science at the University of Illinois at Urbana-Champaign, a department consistently ranked in the top-5 by US News and World Report. I am also the Executive Associate Dean of the Graduate College of the University of Illinois at Urbana-Champaign.

5.   I received a Bachelor's of Science degree in Computer Science from Aurora University in 1987, a Master's of Science in Electrical Engineering and Computer Science from the University of Illinois at Chicago in 1989, and a Ph.D. in Electrical Engineering and Computer Science from the University of Illinois at Chicago in 1991.

6.   I worked as an intern in 1998 at the IBM TJ Watson Research Center in Hawthorn, New York, and in 1999 at AT&T Pixel Machines in Holmdel, New Jersey. I worked as a postdoc in 1991-1992 at the Electronic Visualization Laboratory at the University of Illinois at Chicago with funding from the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign. I worked as a visiting researcher in the summer of 2007 for the

Graphics Research Group of Adobe Systems in Seattle, Washington.

7.   From 1997-2000, I designed, simulated and patented graphics hardware for Silicon Reality and the Evans & Sutherland Computer Corp. I have also consulted for visual effects companies (e.g., Kleiser-Walczak, Blue Sky VIFX), defense contractors (e.g., SAIC, Pratt & Whitney) and medical imaging companies (e.g., Intrinsic Medical Imaging).

8.   My research in computer graphics has been supported by Adobe, DARPA, Intel, Nokia, NVIDIA, NSF and Microsoft. I have published over 75 reviewed papers on computer graphics, including papers in the most rigorous and prestigious venues, including the SIGGRAPH Annual Conference Proceedings, the ACM Transactions on Graphics, and the IEEE Transactions on Visualization and Computer Graphics. From 2002-2008, I was the longest-serving Editor-in-Chief of ACM Transactions on Graphics, the top journal in the field of computer graphics.

9.   I was an Executive Producer for the ACM SIGGRAPH documentary "The Story of Computer Graphics" in 1999. I served from 1996-2000 on the ACM SIGGRAPH Executive Committee. I am currently the computer graphics area editor of the ACM Books series, and oversaw the recent publication of "The VR Book: Human Centered Design for Virtual Reality."

10.   I co-authored the book "Real-Time Shading" in 2002 on the implementation of procedural shaders on graphics processors became they became

fully user programmable GPU's. I contributed two chapters to the book "Modeling and Texturing: A Procedural Approach" in 2002, including a chapter on procedural texturing using rasterization and texturing operations.

11.   My CV is attached as Exhibit A.

III.   MATERIALS CONSIDERED

12.   In forming the opinions set forth in this declaration, I have considered and relied upon my education, knowledge of the relevant field, and experience. I have also reviewed and considered Volkswagen's petition, the '945Patent, its prosecution history, the prior art cited by Volkswagen above, Volkswagen's proposed claim constructions for certain terms, and the parties' Joint Claim Construction Chart submitted in ITC Proceeding Investigation No. 337-TA-984, and other materials expressly cited.

IV.   PERSON OF ORDINARY SKILL IN THE ART

13.   The field of the '945 Patent is computer graphics hardware. Professionals in the field of computer graphics hardware will generally be electrical engineers, computer engineers, or computer scientists.

14.   It is my opinion that a POSITA of computer graphics hardware would have a degree in electrical engineering, computer engineering, computer science, or a related field. Such a person would also have at least 3-5 years' experience working in computer graphics hardware/computer architecture or related fields, or

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