REQUEST FOR INTER PARTES REVIEW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	**Docket No: PR00010**
C. Kumar N. Patel	**Issued: November 27, 2001**
U.S. Patent No. 6,324,463	**Application No. 09/310,527**
Filing Date: May 12, 1999	

For: CRUISE CONTROL INDICATOR

DECLARATION OF PAUL GREEN, PHD. IN SUPPORT OF TOYOTA MOTOR NORTH AMERICA, INC.'S REQUEST FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 6,324,463 UNDER 35 U.S.C. §§311-319, 37 C.F.R. § 42

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TABLE OF CONTENTS

EXHIBITS AND ATTACHMENTS

Exhibit	Description
1001	U.S. Patent No. 6,324,463
1002	File History of U.S. Patent No. 6,324,463
1003	Diamante Owner's Manual
1004	Certified English Translation of Diamante Owner's Manual (Cited Portions)
1005	Preview Distance Control Manual
1006	Certified English Translation of Preview Distance Control Manual
1007	Japanese Patent Application Publication No. JP 8-192663 ("Watanabe")
1008	Certified English Translation of Watanabe
1009	Celsior Owner's Manual
1010	Certified English Translation of Celsior Owner's Manual (Cited Portions)

ATTACHMENT A: CV of Paul A. Green, Ph.D.

I. INTRODUCTION AND BACKGROUND

1. I have been retained by counsel for Petitioner Toyota Motor North America, Inc. ("Toyota" or "Petitioner"), and asked to review and opine on the validity/patentability of claims 1-5, 12-16, 18, 19, 21, 22, 25-28, and 34-36 of U.S. Patent No. 6,324,463 (*Ex. 1001*, "the '463 Patent"). I am being reimbursed for my time at my normal consulting rate of $250 per hour. My pay is in no way contingent on the outcome of this proceeding.

2. My work concerns human factors engineering, which has to do with the design of equipment, facilities, products, systems, and tasks to make them safe and easy to do for a wide range of people, from experts to the "common man." Most of my research concerns motor vehicles, but I have worked on other applications.

3. Specifically, I have been conducting research and evaluations concerning driver interfaces, driver workload, driver distraction, and topics related to the use of motor vehicle controls and displays since the 1970s. I received my PhD in Industrial and Operations Engineering and Psychology, a joint PhD degree that allowed me to focus on human factors engineering. Since then I have been a researcher at the University of Michigan Transportation Research Institute,

conducting human factors/driver interface research. I have been promoted over time and now hold the position of research professor and head of the Driver Interface Group. I am the author or co-author of more than 250 journal articles, book chapters, proceedings papers and technical reports on those topics.

4. In addition, I hold a position in the Department of Industrial and Operations Engineering at the University of Michigan as an Adjunct Professor, currently teaching the Automotive Human Factors and Human-Computer Interaction courses. I have been teaching in the Department since about 1980. In addition, I am the leader and lead instructor in the University of Michigan Human Factors Engineering Short Course, the flagship continuing education course in the profession, now in its 55th year.

5. I have been very active professionally, having served as President of the Human Factors and Ergonomics Society, and currently a member of its Executive Council. I am also a member of the Board of Directors of the Board of Certification in Professional Ergonomics and I am a board certified by them. I am a fellow in the Human Factors and Ergonomics Society, a fellow in the Institute of Ergonomics and Human Factors, and a member of the Society of Automotive Engineers and the User Experience Professionals Association. I have been the lead

author of 4 Society of Automotive Engineers standards and recommended practices.

6. A more complete summary of my experience and expertise is set forth in my CV, which is attached as Attachment A to this Declaration.

II. Summary of my opinions

7. It is my opinion that claims 1-5, 12-16, 18, 19, 21, 22, 25-28, and 34-36 of U.S. Patent No. 6,324,463 (*Ex. 1001*, "the '463 Patent") are unpatentable. My opinions are based on my expertise in the technology of the '463 patent, as well as my review of the '463 patent, its file history, and the prior art asserted by the Petitioner. If the patent owner is allowed to submit additional evidence pertaining to the validity of the '463 patent, I intend to review that as well and update my analysis and conclusions as appropriate, and allowed under the rules of this proceeding.

A. Instructions

8. I am not an attorney. My analysis and opinions are based on my expertise in this technical field, as well as the instructions I have been given by counsel for the legal standards relating to patent validity.

9. The materials I have reviewed in connection with my analysis include the '463 patent, its file history, and the cited references and exhibits.

10. I understand that patents are presumed to be valid. I understand that invalidity in this proceeding must be proven by a preponderance of evidence, and that is the standard I have used throughout my report. Further, I understand that each patent claim is considered separately for purposes of invalidity.

11. I am informed that a patent claim is invalid as "anticipated" if each and every feature of the claim is found, expressly or inherently, in a single prior art reference or product. Claim limitations that are not expressly found in a prior art reference are inherent if the prior art necessarily functions in accordance with, or includes, the claim limitations. It is acceptable to examine evidence outside the prior art reference (extrinsic evidence) in determining whether a feature, while not expressly discussed in the reference, is necessarily present in it.

12. I understand that a patent claim is invalid as "obvious" if, in view of a prior art reference or a combination of prior art references, it would have been obvious to a person of ordinary skill in the art at the time of the invention, taking into account:

- the scope and content of the prior art;

- the differences between the prior art and the claim under consideration
- the level of ordinary skill in the art.

13. A person of ordinary skill in the art of control systems and their display capabilities at the time of the alleged invention would have had a Bachelor's degree in engineering or equivalent coursework and at least two years of experience in the area of automotive control systems and user interfaces for vehicles.

14. I am informed that legal principles regarding invalidity of a claim due to obviousness were addressed by the U.S. Supreme Court. I am informed that the principles relating to a "motivation," "suggestion," or "teaching" in the prior art to combine references to produce the claimed alleged invention remain an appropriate approach in a validity analysis. I am informed that the suggestion or motivation may be either explicit or implicit, may come from knowledge generally available to one of ordinary skill in the art, and may come from the nature of the problem to be solved. The test for an implicit motivation, suggestion, or teaching is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. The problem examined is not the specific problem solved by the

invention, but the general problem that confronted the inventor before the invention was made.

15. I am informed, however, that the U.S. Supreme Court clarified that additional principles may also be applied in such an analysis. I set forth some such additional principles below.

16. As I understand it, it is no longer always required to present evidence of a teaching, suggestion, or motivation to combine prior art references for purposes of determining whether an invention is obvious. Prior art can be combined based on either a teaching, suggestion, or motivation from the prior art itself, or from a reasoned explanation of an expert or other witness.

17. A patent claim composed of several elements, however, is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. In order to prove obviousness, it must be shown that the improvement is not more than the predictable use of prior-art elements according to their established functions. To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple pieces of prior art, to the effects of demands known to the design community or present in the marketplace,

and to the background knowledge possessed by a person having ordinary skill in the art. Also, in determining obviousness, one must be aware of the distortion caused by hindsight bias and be cautious of arguments reliant upon hindsight reasoning. An obviousness argument cannot be sustained by mere conclusory statements. Instead, it must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

18. In an obviousness analysis, it is my understanding that there are "secondary considerations" that should be analyzed if they apply. I am told that these considerations include (1) whether the prior art teaches away from the claimed invention, (2) whether there was a long felt but unresolved need for the claimed invention, (3) whether others tried but failed to make the claimed invention, skepticism of experts, (4) whether the claimed invention was commercially successful, (5) whether the claimed invention was praised by others, and (6) whether the claimed invention was copied by others.

19. I have also been instructed that ultimately claims are construed in light of how one of ordinary skill in the art would understand the claims. It is my understanding that what is to be considered includes the claims, the patent specification and drawings, and the prosecution history, including any art listed by

the Examiner or the applicant. It is my understanding that information external to the patent, including expert and inventor testimony and unlisted prior art, are to be considered in construing the claims only if ambiguities remain. However, expert testimony may be useful in helping to explain the technology. I further understand technical dictionaries, encyclopedias, and treatises may also be used in claim construction, as long as these definitions do not contradict any definition found in or ascertained by a reading of the patent documents. In my analysis, I have considered and applied the proposed claim constructions of the Petitioners, unless otherwise indicated.

20. I understand that an issued U.S. patent is presumed to be valid, and can be challenged in this proceeding on invalidity grounds only upon proof by a preponderance of evidence.

B. Prior Art Patents and Printed Publications

21. I am instructed to assume for the purpose of my analysis, that Claims 1-36 of the '463 patent have an earliest effective filing date of May 12, 1998, the filing date of U.S. Provisional Application No. 60/085,183. I am informed that the Petitioner relies upon the following patents and printed publications, none of which were considered during the original prosecution of the ‘463 patent:

Ex. 1003 - Diamante Owner's Manual, published in 1995 and therefore available as prior art under 35 U.S.C. § 102(b) (*Ex. 1004* - certified translation of cited portions of Diamante Owner's Manual);

Ex. 1005 - Preview Distance Control Manual, published in 1995 and therefore available as prior art under 35 U.S.C. § 102(b) (*Ex. 1006* - certified translation of cited portions of Preview Distance Control Manual);

Ex. 1007 - Japanese Patent Application Publication No. JP 8-192663 ("Watanabe"), published on July 30, 1996 and therefore available as prior art under 35 U.S.C. § 102(b) (*Ex. 1008* - certified translation of Watanabe); and

Ex. 1009 - Celsior Owner's Manual, published in 1997 and therefore available as prior art under 35 U.S.C. § 102(a) (*Ex. 1010* - certified translation of cited portions of Celsior Owner's Manual).

22. An explanation of how claims 1-5, 12-16, 18, 19, 21, 22, 25-28, and 34-36 are unpatentable under the statutory grounds identified below, including the identification of where each element is found in the prior art references and the relevance of each of the prior art references, is provided in the form of detailed claim charts.

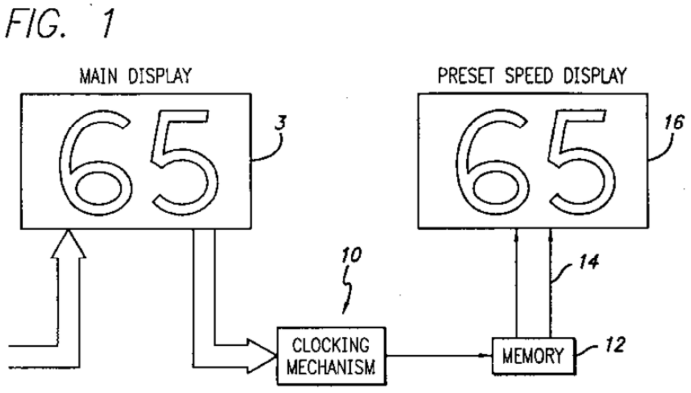
Request for Inter Partes Review
of U.S. Patent No. 6,324,463

Ground	'463 Patent Claims	Basis for Rejection
Ground 1	Claims 1-5, 12-16, 21, 25-28, and 34-36	Anticipated under 35 U.S.C. §102(b) by Diamante Owner's Manual (Ex. 1003)
Ground 2	Claims 15, 16, and 21	Obvious under 35 U.S.C. §103(a) by Diamante Owner's Manual (Ex. 1003) in view of Preview Distance Control Manual (Ex. 1005)
Ground 3	Claim 12	Obvious under 35 U.S.C. §103(a) by Diamante Owner's Manual (Ex. 1003) in view of Watanabe (Ex. 1007)
Ground 4	Claims 18 and 19	Anticipated under 35 U.S.C. §102(b) by Watanabe (Ex. 1007)
Ground 5	Claims 2-5, 26-28, and 34-36	Anticipated under 35 U.S.C. §102(a) by Toyota Celsior Owner's Manual, hereinafter "Celsior" (Ex. 1009)

III. SUMMARY OF THE '463 PATENT

A. Brief Description

23. The ‘463 patent is directed to a method and apparatus for indicating the operational status and parameters of a vehicle cruise control system. (Ex. 1001 at Abstract). As shown in FIG. 1 (reproduced below), a preset cruise control speed is displayed in display 16. Other embodiments include an analog display of the preset cruise control speed. (*See id.* at FIG. 2).



24. In the cruise control system of the ‘463 patent, the preset speed is continuously displayed after the system is disengaged, even when temporarily disengaged, *e.g.*, by pressing on the brakes or accelerating. (*See id.* at 3:60-4:14). As a result, the system provides the operator a clear indication of the preset speed

to which the vehicle will return when the command to resume speed is given or when the vehicle is no longer accelerating. (*See id.*).

B. Summary of the Prosecution History of the '463 patent

25. In the only Office Action of September 7, 2000, various claims were objected to for informalities, and rejected under 35 U.S.C. §112, second paragraph as being indefinite. (Office Action of September 7, 2000 (Ex. 1002) at 2-3). Additionally, claims 1-11 and 25-35 were rejected under 35 U.S.C. §102(e) as being anticipated by Suzuki et al. (US 5,949,346), while claims 12-24 and 36 were rejected under 35 U.S.C. §103(a) as being unpatentable over Suzuki in view of Tomecek (US 4,132,284). (*Id.* at 3 and 7). Suzuki was not directed to a cruise control system and the Applicant relied on that fact in distinguishing the claims from Suzuki.

26. In response to the Office Action, the applicant amended claims 2, 6, 7, 12, 22, 24, 26, and 34 to address the claim objections and the rejection under 35 U.S.C. §112, second paragraph, *e.g.*, to replace "capable of" with "for," and to provide proper antecedent support. (*See* Amendment filed March 12, 2001 (Ex. 1002) at 1-4). Furthermore, the applicant traversed the prior art rejections arguing that Suzuki displays actual speed information and speed limit information, but not a cruise

control system or a display of cruise control speed indicator. (*See id.* at 6-8). Thus, the file history is clear in distinguishing a display of a cruise control speed from an actual speed display. (*See id*). Thereafter, the '463 patent claims were allowed in the Notice of Allowance issued on June 11, 2011 (Ex. 1002).

IV. CLAIM CONSTRUCTION

27. I am informed that a claim subject to *Inter Partes* Review is given its "broadest reasonable construction in light of the specification of the patent in which it appears." 37 C.F.R. § 42.100(b). This means that the words of the claim are given their plain meaning from the perspective of one of ordinary skill in the art unless that meaning is inconsistent with the specification. I set forth below my construction of certain terms in the claims of the '463 patent, based on the above instructions.

A. "engaging the system" (claim 1) and "engaging the cruise control system" (claim 21)

28. The '463 patent uses numerous terms to describe various states of the cruise control system. Among them, the term "engaged" is used throughout the specification to specifically describe an operating state of the cruise control system to control the speed of vehicle to the preset speed. (*See, e.g.*, Ex. 1001 at FIG. 4).

For example, at column 5, lines 13-15, the ‘463 patent discloses that when the cruise control “is engaged,… the automobile accelerates to the preset speed.” Furthermore, at column 1, lines 46-48, the '463 patent describes a system "engaged at a set speed" to mean "the car's speed is automatically controlled to maintain the memorized speed." Thus, based on its plain meaning in light of the specification, one of ordinary skill in the art would consider “engaging the system” (claim 1) and “engaging the cruise control system” (claim 21) to mean “operating the cruise control system to automatically maintain the vehicle at the preset speed.”

B. “enabling” (claims 1 and 2) and “enabled” (claims 2 and 4)

29. The claims distinguish an “enabling” of the cruise control system from an “engaging,” which is construed above. (*See, e.g.*, *id.* at claim 1). For example, according to claim 1, the cruise control system is "enabl[ed]" by an enable switch and "engag[ed]" by a set speed input. Furthermore, in claim 4, the controller is “initially enabled” and, in claim 2, the cruising speed is selected “when the controller is enabled.” The specification clearly uses the term “enabled” to mean a “system on” state for the cruise control system. (*See id.* at column 4, lines 39-46). Thus, “enabling” means “turning on” and “enabled” means “turned on.”

C. "unset status of the preset speed" (claim 15) and "unset state of the preset speed" (claim 21)

30. The terms "status" and "state" are used interchangeably in the claims and are therefore synonymous in the '463 patent. (*See, e.g., id.* at claims 15 and 22). As such, "unset state" and "unset status" of the preset speed have the same meaning for purposes of this proceeding, i.e., a state or status in which there is no preset speed for the cruise control system.

D."activating the cruise control" (claims 12 and 15) and "deactivated" (claims 12, 13, and 21)

31. Both claims 12 and 15 recite an "activating" of the cruise control system, with claim 15 clearly using this term to mean a turning on of the cruise control system ("before setting the preset speed, activating the cruise control system"). (*Id*. at claim 15). Furthermore, the specification utilizes the term "activated" to also refer to a turning on of the system ("When the cruise control system is first activated, the preset display 16 will blink the number zero indicating an 'unset' state of the cruise control"). (*Id*. at column 4, lines 4-6). Accordingly, in light of the specification and the plain meaning of this term, "activating the cruise control" means "turning on the cruise control." For similar reasons, "deactivated" as recited in claims 12, 13, and 21 means "turned off."

V. THE CLAIMS OF THE '463 PATENT ARE UNPATENTABLE

A. State of the Prior Art

32. The '463 Patent discusses the following functionality of prior art cruise control systems, which were "found in many automobiles" (Ex. 1001 at 1:11-12.) ("Admitted Prior Art" or "APA"):

(1) a cruise control system that can be turned "on" or "off" (*id.* at 1:43-45);

(2) a button that "turn[s] on the cruise control system" (*id.* at 1:18-20);

(3) a cruise control system that is either engaged or not engaged (*id.* at 1:45-47);

(4) a button that "engage[s], or set[s], the cruise control" (*id.* at 1:23-25);

(5) a "memory function that stores the set control speed" (*id.* at 1:26-27);

(6) "applying the brakes to temporarily slow down temporarily disengages the cruise control function" (*id.* at 1:28-29);

(7) a "'resume'" button to resume cruise control after disengaging it (*id.* at 1:30-32);

(8) a system that allows the vehicle to be accelerated without disengaging the cruise control (*id.* at 1:32-37);

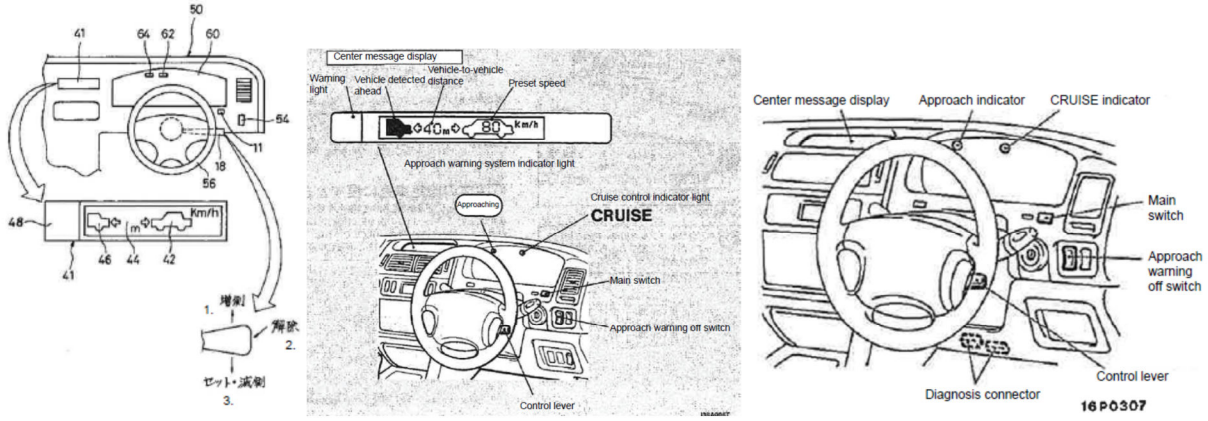
(9) a system that switches modes (*e.g.,* on/off or engaged/not-engaged) "based on human or machine intervention" (*id.* at 1:42-60); and

(10) "visual feedback indicating whether the cruise control system is enabled" (*id.* at 1:63-64).

B. Grounds 1-4 in view of Mitsubishi References

33. The disclosures of the Diamante Owner's Manual (Ex. 1003 and Ex. 1004 (certified translation)), the Diamante Preview Distance Control Manual (Ex. 1005 and Ex. 1006 (certified translation)), and Watanabe (Ex. 1007 and Ex. 1008 (certified translation)) (hereinafter "Mitsubishi References") are closely related, and therefore discussed together herein. In particular, Watanabe is a publication of a Japanese patent application assigned to Mitsubishi Motors Corporation, and the two manuals are for the same vehicle manufactured by Mitsubishi Motors Corporation. The Owner's Manual is a general manual for the 1995 Mitsubishi

Diamante, and the Preview Distance Control Manual is specific to the adaptive cruise control system included in the 1995 Mitsubishi Diamante.



(L-R: Watanabe (Ex. 1008 at FIG. 2), Diamante Owner's Manual (Ex. 1004 at p. 88), Preview Distance Control Manual (Ex. 1006 at p. 0-2)).

34. The cruise control systems commonly described in the Mitsubishi References include a displayed cruise control screen that is displayable at all times by use of a mode switch (Ex. 1004 at p. 52) and displays a pre-set cruise control speed. (*Id*. at pp. 52 and 88; *See also* Ex. 1006 at p. 0-11 and Ex. 1008 at FIG. 5). Moreover, "[w]hen the speed is not set" (e.g., "after activating the cruise control system, but before setting the preset speed," claims 15 and 16), the Mitsubishi References provide that "the speed (three digits) and 'km/hr' are not displayed; only the symbol is displayed." (Ex. 1006 at p. 0-11). Thus, the Mitsubishi References disclose the subject matter in claims 4, 15 and 16 by displaying, at any

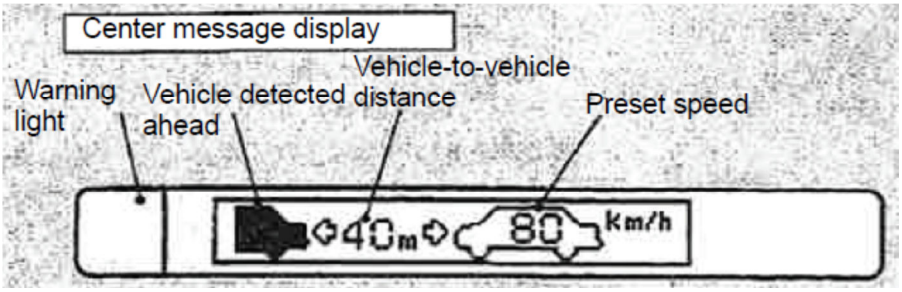
time, a contour of a vehicle with no speed included therein to indicate an unset state when the controller is initially enabled (claim 4) and to "indicat[e] to the operator the unset status of the preset speed" (claim 15) as a "visual symbol" (claim 16).

1. Ground 1: Claims 1-5, 12-16, 21, 25-28, and 34-36 of the '463 patent are anticipated under 35 U.S.C. §102(b) by Diamante Owner's Manual

35. As detailed in the discussion and claim charts below, the disclosure in the Diamante Owner's Manual (Ex. 1003 and Ex. 1004 (certified translation)), which was not before the Examiner during the original prosecution of the '463 patent, meets all of the limitations of claims 1-5, 12-16, 21, 25-28, and 34-36.

36. Specifically, the Diamante Owner's Manual discloses a cruise control system for vehicles that automatically maintains the vehicle speed at a set cruise control speed (claims 1-5, 12-16, 21, 25-28, and 34-36), a center message display for displaying a cruise control screen (*i.e.*, preview distance control display) including the set cruise control speed (claims 1-5, 12-16, 21, 25-28, and 34-36), a cruise control indicator light for indicating whether the cruise control system is operating to maintain the vehicle at the set cruise control speed (claims 26 and 27) and therefore activated (claim 34(g)), and a main switch to turn the system on and

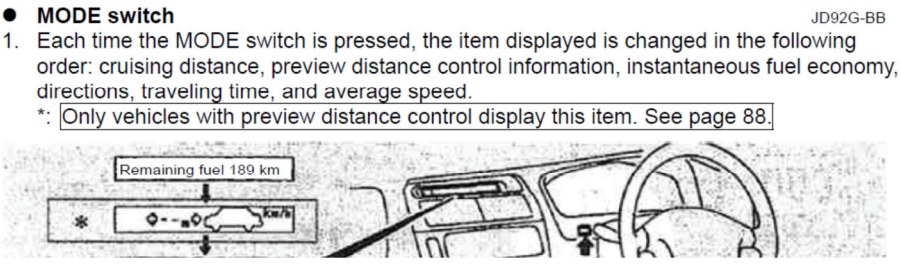
to indicate an on/off status of the system (claims 1, 2, 4, 15, 21, and 34). (*See* Ex. 1004 at pp. 86, 88, and 89).



37. One skilled in the art would understand that the Diamante Owner's Manual inherently includes a memory to store the pre-set speed (claims 1, 2, 26, and 34) by virtue of controlling the vehicle according to a pre-set speed and continuously displaying the pre-set speed. (*See id*). The fact that the Diamante Owner's manual discloses a pre-set speed value that is displayed and used by the control system to keep the vehicle at that preset speed when the cruise control system is engaged, indicates that the disclosed system must have a memory to store that pre-set speed value. Furthermore, the Diamante Owner's Manual states that cruise control can be canceled and then re-engaged to "return[] to the preset speed prior to the cancellation." (Id. at p. 87). For the preset speed to be returned to at a later time after cancelation, the preset speed would have to be stored in a memory. Anyway, the '463 patent itself admits that "the conventional cruise control system

is provided with a memory function that stores the set control speed." (Ex. 1001 at 1:26-27).

38. Additionally, the Diamante Owner's Manual discloses a combination of different indicators and visual symbols that can alert the operator of the vehicle to different statuses of the cruise control system. For example, as described and shown on page 52 of the Diamante Owner's Manual, a mode switch is provided so that an operator can display the cruise control screen on the center message display at any time, including after the cruise control system is initially turned on (claims 4 and 15). The screen includes a contour of a vehicle with no speed therein if there is no set cruise control speed, e.g., when the cruise control system is initially turned on by operation of the main switch (claims 4 and 15):



(*Id*. at p. 52)

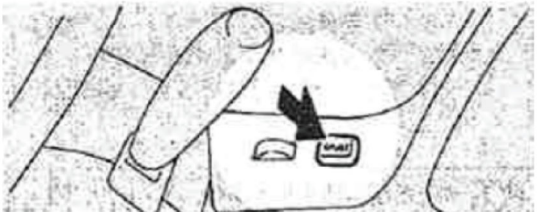
39. Accordingly, if the cruise control system is turned on by operation of the main switch, the main switch is illuminated and the cruise control screen is displayed with no speed included in the contour of the vehicle, thereby indicating

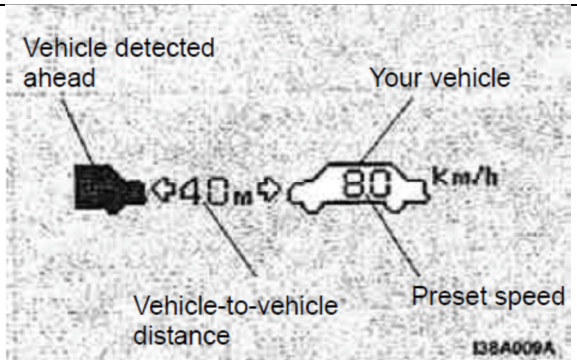
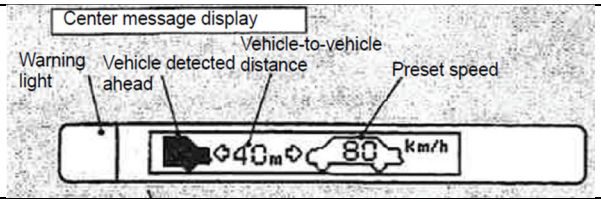
that the cruise control system is on and no cruise control speed has been set (claims 4, 12, 15, 16, and 21). (*See id.* at pp. 52, 86, and 89).

40. Furthermore, according to the Diamante Owner's Manual, the set cruise control speed is saved/stored after cruise control is temporarily disengaged by pressing the brakes (claim 12). (See *id*. at p. 87). As such, the cruise control screen would display the saved cruise control speed at the "Preset speed" portion of the interface (*i.e.*, within the contour of the vehicle) even if the system is temporarily disengaged. (*See id*. at p. 88). Thus, the set cruise control speed is displayed at a time after braking during which the vehicle is not being maintained at substantially the set speed (claim 12).

41. The tables below show how each limitation of claims 1-5, 12-16, 21, 25-28, and 34-36 is met by the Diamante Owner's Manual.

Claim 1 of the '463 patent	**Anticipated by Diamante Owner's Manual**
1. A cruise control system for vehicle having a human operator, comprising:	**Cruise control★** **(automatic fixed-speed cruising system)** JI10B-DB Cruise control is a system that allows the vehicle to cruise at a constant speed (from approximately 40–100 km/h) without depressing the accelerator pedal. *Id.* at p. 86.

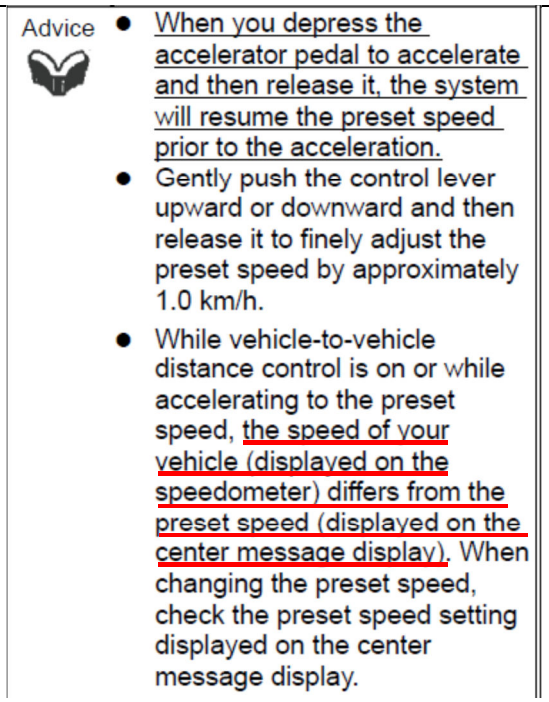
[1(a)] a speed controller that automatically maintains the vehicle speed at a preset speed;	**Cruise control★ (automatic fixed-speed cruising system)** JI10B-DB Cruise control is a system that allows the vehicle to cruise at a constant speed (from approximately 40–100 km/h) without depressing the accelerator pedal. *Id.* at p. 86.
[1(b)] an enable switch associated with said controller for enabling the system;	**Setting cruise control** 1. Push the main switch to turn cruise control on. The indicator light on the switch turns on.  Ex. 1004 at p. 86.
[1(c)] a set speed input in communication with said controller for manually setting the speed of the vehicle at said preset speed, thereby engaging the system;	2. Depress the accelerator pedal. When the vehicle reaches the desired speed, push the control lever downward and release it. When the system is set to automatic fixed-speed cruise mode, the indicator light on the meter turns on. *Id. at p. 86*

[1(d)] a memory which stores information indicative of said preset speed; and	 ● **When the vehicle ahead leaves the lane** While vehicle-to-vehicle distance control is on, when the vehicle ahead leaves the lane, your vehicle will gradually accelerate to the preset speed. *Id.* at p. 90. As explained above, the disclosed system *must* store speed values such as preset speed for it to operate as described. A preset is something set and kept in advance of using it; it necessarily must be stored in a memory to be kept for future use. Therefore a memory that stores information as claimed, is inherently dislcosed in this reference. See also, page 93: "When the vehicle-to-vehicle distance control system is set, the approach warning system indicator light turns on. However, if the vehicle-to-vehicle distance control system is canceled, the original setting of the switch is restored."
[1(e)] a feedback system for communicating said information in said memory to the operator	

of the vehicle.	*Id.* at p. 88. Feedback is information about the status/state of a process or what to do about it. The preset speed display shows the information in memory that the driver can use to control the cruise control. As explained above, the disclosed system must store speed values such as preset speed for it to operate as described. A preset is something set and kept in advance of using it; it necessarily must be stored in a memory to be kept for future use. Therefore a memory that stores information as claimed, is inherently dislcosed in this reference.
Claim 2 of the '463 patent	**Anticipated by Diamante Owner's Manual**
2. A cruise control system for a variable speed vehicle controlled by a human operator, comprising:	*See* disclosures cited in response to claim 1 preamble.
[2(a)] a speed controller for automatically maintaining the vehicle at a substantially constant cruising speed selected by the operator;	**Cruise control★** **(automatic fixed-speed cruising system)** JI10B-DB Cruise control is a system that allows the vehicle to cruise at a constant speed (from approximately 40–100 km/h) without depressing the accelerator pedal. Ex. 1004 at p. 86.

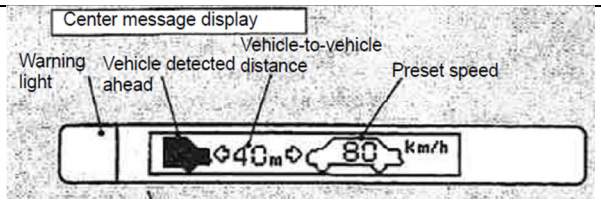
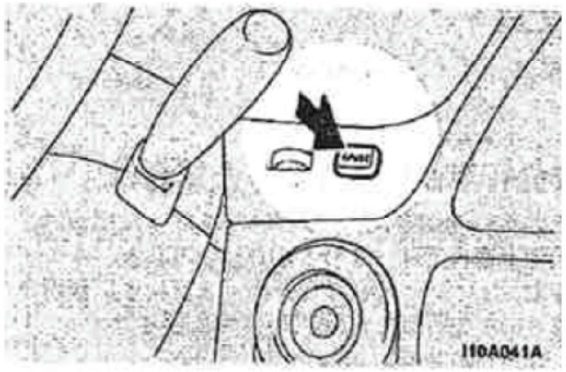
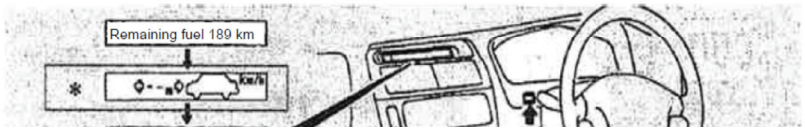
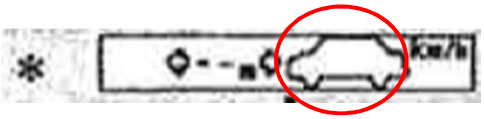
[2(b)] a cruise control enable switch associated with the controller for enabling and disabling the controller;	**Setting cruise control** 1. Push the main switch to turn cruise control on. The indicator light on the switch turns on.  *Id*. at p. 86. *See also*: **Canceling cruise control** To cancel cruise control, use one of the following methods. · Pull the control lever forward. · Turn the main switch off. *Id*. at p. 87.
[2(c)] a set speed input in communication with the controller for selecting the cruising speed of the vehicle when the controller is enabled;	2. Depress the accelerator pedal. When the vehicle reaches the desired speed, push the control lever downward and release it. When the system is set to automatic fixed-speed cruise mode, the indicator light on the meter turns on. *Id. at 86.*
[2(d)] a memory that stores information representative of the selected cruising speed; and	*See* disclosures cited in response to claim [1(d)]. As explained above, the disclosed system must store speed values such as preset speed for it to operate as described. A preset is something set and kept in advance of using it; it necessarily must be stored in a

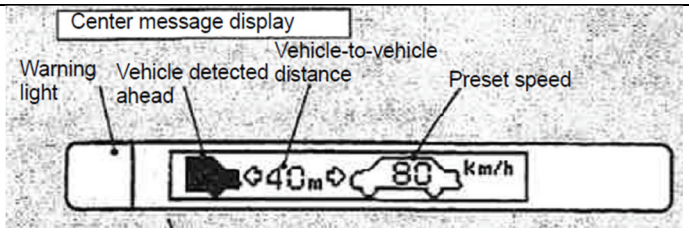
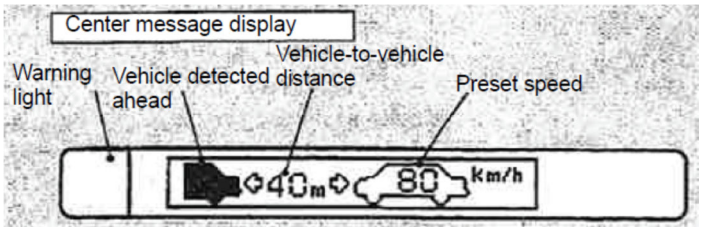
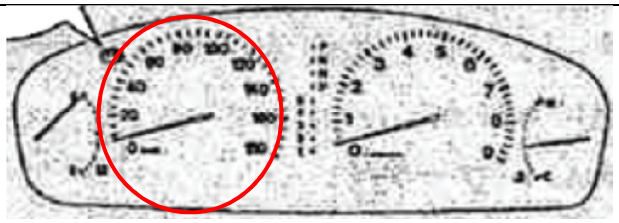
	memory to be kept for future use. Therefore a memory that stores information as claimed, is inherently dislcosed in this reference.
[2(e)] a feedback system that substantially continuously communicates the selected cruising speed information to the operator of the vehicle until either the operator selects a subsequent cruising speed or the controller is disabled.	*See* disclosures cited in response to claim [1(e)]. *See also*: ● **With the control lever** During fixed-speed cruising, operate the control lever to the desired speed and then release it. While vehicle-to-vehicle distance control is on or while accelerating to the preset speed after the vehicle ahead has left the lane, operate the control lever until the preset speed displayed on the center message display reaches the desired speed and then release it. Ex. 1004 at p. 91. *See also*:

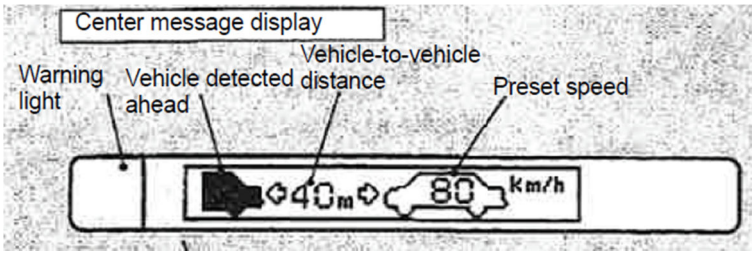

Advice
When you depress the accelerator pedal to accelerate and then release it, the system will resume the preset speed prior to the acceleration.
Gently push the control lever upward or downward and then release it to finely adjust the preset speed by approximately 1.0 km/h.
While vehicle-to-vehicle distance control is on or while accelerating to the preset speed, the speed of your vehicle (displayed on the speedometer) differs from the preset speed (displayed on the center message display). When changing the preset speed, check the preset speed setting displayed on the center message display.

Id. at p. 91.

	Cruise control is automatically canceled in the following cases. (1) When you depress the brake pedal (2) If the vehicle speed falls below the preset speed by 15 km/h or more (3) If the vehicle speed falls below 40 km/h Caution ● While changing the selector lever to N also automatically cancels cruise control, do not set the lever to N while cruising. Since engine brakes are not applied, serious injury or death could result. **Returning to the preset speed prior to the cancellation** After pulling the control lever forward to cancel cruise control or after cruise control has automatically been canceled for one of the reasons described in (1) to (3) above, if the vehicle speed is 40 km/h or more, pushing the control lever upward will return the vehicle to the preset speed prior to the cancellation. *Id*. at p. 87. Advice ● If the vehicle speed falls below 35 km/h or you turn the main switch off, the vehicle speed displayed on the center message display disappears. In such a case, the system will not restart even if you push the control lever upward, so set the system again. *Id.* at p. 92.
Claim 3 of the '463 patent	**Anticipated by Diamante Owner's Manual**

3. The cruise control system of claim 2, wherein the feedback system includes a digital display.	 *Id.* at p. 88.
Claim 4 of the '463 patent	**Anticipated by Diamante Owner's Manual**
4. The cruise control system of claim 3, wherein the digital display displays a predetermined signal when the controller is initially enabled to indicate the state of the controller.	2. Push the main switch to turn it on. The indicator light on the switch turns on.  *Id.* at p. 89. ● **MODE switch** JD92G-BB 1. Each time the MODE switch is pressed, the item displayed is changed in the following order: cruising distance, preview distance control information, instantaneous fuel economy, directions, traveling time, and average speed. *: Only vehicles with preview distance control display this item. See page 88.  *Id.* at p. 52. *See also*: 

	Id.
Claim 5 of the '463 patent	**Anticipated by Diamante Owner's Manual**
5. The cruise control system of claim 3, wherein the digital display displays information indicative of the selected cruising speed of the vehicle.	 *Id.* at p. 88.
Claim 12 of the '463 patent	**Anticipated by Diamante Owner's Manual**
12. A method for visually communicating to the human operator of a vehicle having a cruise control system a cruising speed at which the vehicle is set, comprising:	*See* disclosures cited in response to claim 1 preamble. *See also*:  Ex. 1004 at p. 88.
[12(a)] determining the speed at which the vehicle is traveling;	 *Id.* at p. 93 (emphasis added).

[12(b)] activating the cruise control system at a desired cruising speed;	*See* disclosures cited in response to claim [1(b)]. *See also*: 2. Depress the accelerator pedal. When the vehicle reaches the desired speed, push the control lever downward and release it. When the system is set to automatic fixed-speed cruise mode, the indicator light on the meter turns on. Ex. 1004 at 86.
[12(c)] displaying a symbol indicative of the speed at which the cruise control system is activated;	*See* disclosures cited in response to claim [1(e)]. *See also*:  Ex. 1004 at p. 88.
[12(d)] maintaining the activated cruise control speed symbol upon temporary acceleration or deceleration of the vehicle;	*See* disclosures cited in response to claim [2(e)]. *See also*:

Advice

- When you depress the accelerator pedal to accelerate and then release it, the system will resume the preset speed prior to the acceleration.
- Gently push the control lever upward or downward and then release it to finely adjust the preset speed by approximately 1.0 km/h.
- While vehicle-to-vehicle distance control is on or while accelerating to the preset speed, the speed of your vehicle (displayed on the speedometer) differs from the preset speed (displayed on the center message display). When changing the preset speed, check the preset speed setting displayed on the center message display.

Ex. 1004 at p. 91 (emphasis added).

Cruise control is automatically canceled in the following cases.

(1) When you depress the brake pedal
(2) If the vehicle speed falls below the preset speed by 15 km/h or more
(3) If the vehicle speed falls below 40 km/h

Caution

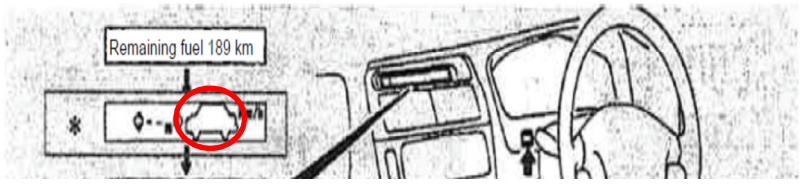
- While changing the selector lever to N also automatically cancels cruise control, do not set the lever to N while cruising. Since engine brakes are not applied, serious injury or death could result.

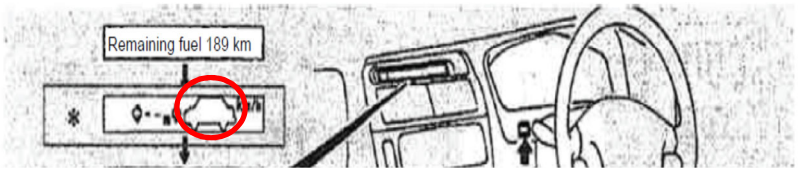
Returning to the preset speed prior to the cancellation

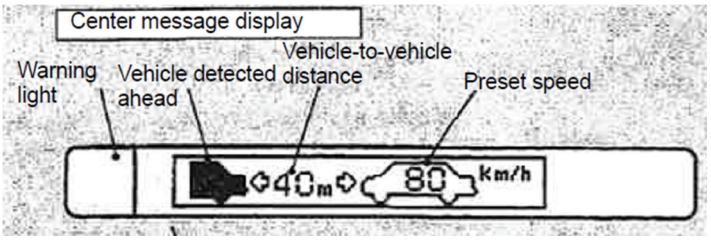
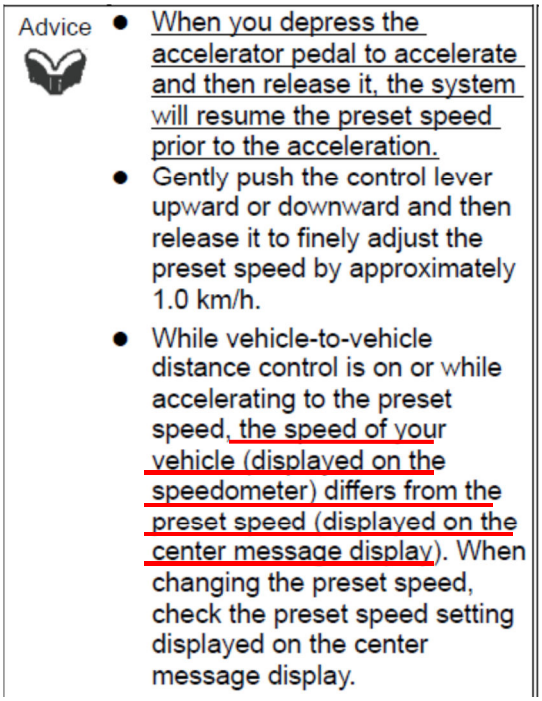
After pulling the control lever forward to cancel cruise control or after cruise control has automatically been canceled for one of the reasons described in (1) to (3) above, if the vehicle speed is 40 km/h or more, pushing the control lever upward will return the vehicle to the preset speed prior to the cancellation.

	Id. at p. 87 (emphasis added).
[12(e)] removing said symbol when the cruise control system is deactivated or a new cruising speed is selected.	*See* disclosures cited in response to claim [2(e)]. *See also*: ● **With the control lever** During fixed-speed cruising, operate the control lever to the desired speed and then release it. While vehicle-to-vehicle distance control is on or while accelerating to the preset speed after the vehicle ahead has left the lane, operate the control lever until the preset speed displayed on the center message display reaches the desired speed and then release it. Ex. 1004 at p. 91. *See also*: Advice ● If the vehicle speed falls below 35 km/h or you turn the main switch off, the vehicle speed displayed on the center message display disappears. In such a case, the system will not restart even if you push the control lever upward, so set the system again. *Id.* at p. 92.
Claim 13 of the '463 patent	**Anticipated by Diamante Owner's Manual**
13. A method for indicating to a human operator of a vehicle having a cruise control system a preset speed for which the cruise control system is set, the method comprising:	*See* disclosures cited in response to claim 12 preamble.

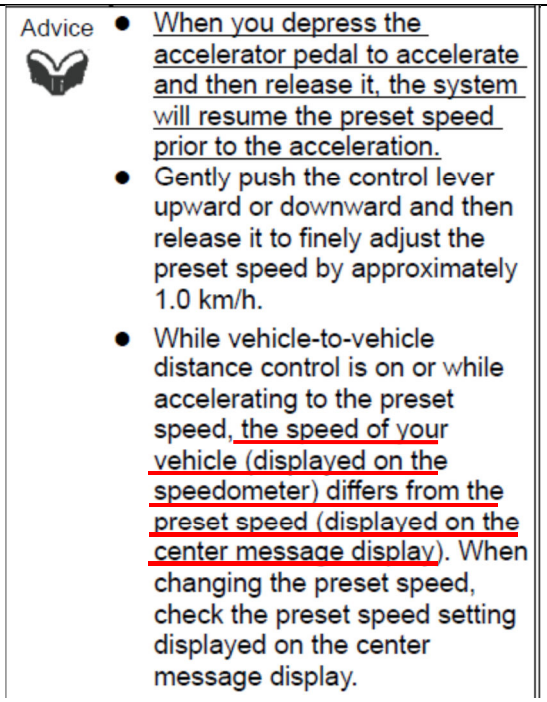
[13(a)] setting the preset speed;	2. Depress the accelerator pedal. When the vehicle reaches the desired speed, push the control lever downward and release it. When the system is set to automatic fixed-speed cruise mode, the indicator light on the meter turns on. Ex. 1004 at p. 89.
[13(b)] displaying to the operator a symbol indicative of the preset speed;	*See* disclosures cited in response to claim [12(c)].
[13(c)] maintaining the display of the symbol indicative of the preset speed; and	*See* disclosures cited in response to claim [12(d)].
[13(d)] discontinuing display of the symbol indicative of the preset when the cruise control system is deactivated or a new preset speed is selected.	*See* disclosures cited in response to claim [12(e)].
Claim 14 of the '463 patent	**Anticipated by Diamante Owner's Manual**
14. The method of claim 13, further comprising: displaying a second symbol upon the selection of a new preset speed, said second symbol indicative of the new preset speed.	● **With the control lever** During fixed-speed cruising, operate the control lever to the desired speed and then release it. While vehicle-to-vehicle distance control is on or while accelerating to the preset speed after the vehicle ahead has left the lane, operate the control lever until the preset speed displayed on the center message display reaches the desired speed and then release it. Ex. 1004 at p. 91. The "second symbol" must indicate

	the new preset speed, and therefore covers a numerical indicator.
Claim 15 of the '463 patent	**Anticipated by Diamante Owner's Manual**
15. The method of claim 13, further comprising:	*See* disclosures cited in response to claim 13.
[15(a)] before setting the preset speed, activating the cruise control system; and	**Setting cruise control** 1. Push the main switch to turn cruise control on. The indicator light on the switch turns on.  Ex. 1004 at p. 86. 2. Depress the accelerator pedal. When the vehicle reaches the desired speed, push the control lever downward and release it. When the system is set to automatic fixed-speed cruise mode, the indicator light on the meter turns on. *Id.* at p. 87.
[15(b)] after activating the cruise control system, but before setting the preset speed, indicating to the operator the unset status of the preset speed.	● **MODE switch** JD92G-BB 1. Each time the MODE switch is pressed, the item displayed is changed in the following order: cruising distance, preview distance control information, instantaneous fuel economy, directions, traveling time, and average speed. *: Only vehicles with preview distance control display this item. See page 88.  *Id.* at p. 52 (emphasis added).

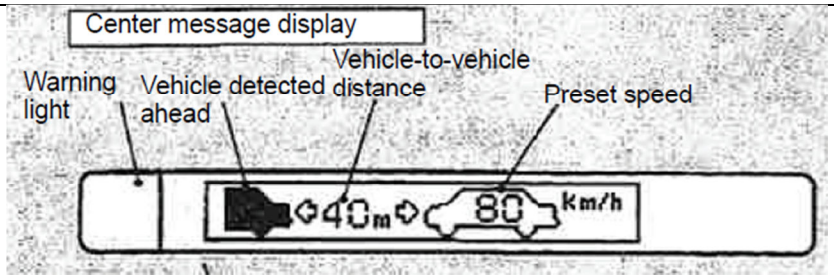
Claim 16 of the '463 patent	**Anticipated by Diamante Owner's Manual**
16. The method of claim 15, wherein indicating the unset status of the preset speed includes displaying a visual symbol to the operator.	● **MODE switch** JD92G-BB 1. Each time the MODE switch is pressed, the item displayed is changed in the following order: cruising distance, preview distance control information, instantaneous fuel economy, directions, traveling time, and average speed. *: Only vehicles with preview distance control display this item. See page 88.  *Id.* (emphasis added).
Claim 21 of the '463 patent	**Anticipated by Diamante Owner's Manual**
21. A method for indicating to a human operator of a vehicle having a cruise control system a preset speed for which the cruise control system is set, the method comprising:	*See* disclosures cited in response to claim 12 preamble.
[21(a)] engaging the cruise control system;	2. Depress the accelerator pedal. When the vehicle reaches the desired speed, push the control lever downward and release it. When the system is set to automatic fixed-speed cruise mode, the indicator light on the meter turns on. Ex. 1004 at 86. *See also* disclosures cited in response to claim [1(c)] or, in the alternative, in response to claim [1(b)].
[21(b)] setting the preset speed;	*See* disclosures cited in response to claim [21(a)].

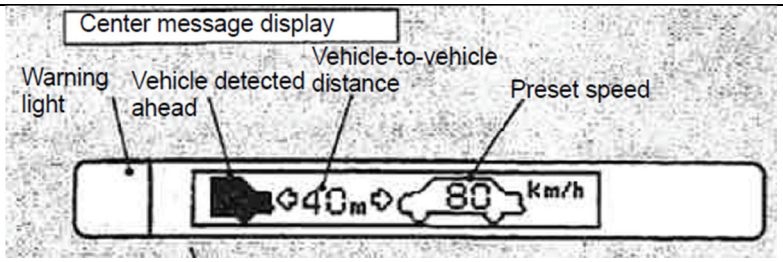
[21(c)] displaying to the operator a symbol indicative of the preset speed;	*See* disclosures cited in response to claim [1(e)]. *See also*:  Ex. 1004 at p. 88.
[21(d)] maintaining the display of the symbol indicative of the preset speed;	*See* disclosures cited in response to claim [2(e)]. *See also*:  Ex. 1004 at p. 91.

[21(e)] discontinuing display of the symbol indicative of the preset speed after the cruise control system is deactivated or a new preset speed is selected; and	*See* disclosures cited in response to claim [2(e)]. *See also*: ● **With the control lever** During fixed-speed cruising, operate the control lever to the desired speed and then release it. While vehicle-to-vehicle distance control is on or while accelerating to the preset speed after the vehicle ahead has left the lane, operate the control lever until the preset speed displayed on the center message display reaches the desired speed and then release it. Ex. 1004 at p. 91. *See also*: Advice ● If the vehicle speed falls below 35 km/h or you turn the main switch off, the vehicle speed displayed on the center message display disappears. In such a case, the system will not restart even if you push the control lever upward, so set the system again. *Id.* at p. 92.
[21(f)] after the cruise control system is deactivated, displaying a symbol indicative of an unset state of the preset speed.	Advice ● If the vehicle speed falls below 35 km/h or you turn the main switch off, the vehicle speed displayed on the center message display disappears. In such a case, the system will not restart even if you push the control lever upward, so set the system again. *Id.* at p. 92.
Claim 25 of the '463	**Anticipated by Diamante Owner's Manual**

patent	
25. A method for indicating to a human operator of a vehicle having a cruise control system a preset speed for which the cruise control system is set, the method comprising:	*See* disclosures cited in response to claim 12 preamble.
[25(a)] setting the preset speed;	*See* disclosures cited in response to claim [21(b)].
[25(b)] displaying to the operator a symbol indicative of the preset speed;	*See* disclosures cited in response to claim [21(c)].
[25(c)] accelerating the vehicle to a speed above the preset speed; and	 Ex. 1004 at p. 91.

[25(d)] maintaining the display of the symbol indicative of the preset speed while the vehicle is at the speed above the preset speed.	*See* disclosures cited in response to claim [25(c)].
Claim 26 of the '463 patent	**Anticipated by Diamante Owner's Manual**
26. A cruise control system for a variable speed vehicle controlled by a human operator, comprising:	*See* disclosures cited in response to claim 1 preamble.
[26(a)] a speed controller for automatically maintaining the vehicle at a substantially constant preset speed;	**Cruise control★ (automatic fixed-speed cruising system)** JI10B-DB Cruise control is a system that allows the vehicle to cruise at a constant speed (from approximately 40–100 km/h) without depressing the accelerator pedal. Ex. 1004 at p. 86.
[26(b)] a set speed input in communication with the controller for selecting the preset speed;	**Cruise control★ (automatic fixed-speed cruising system)** JI10B-DB Cruise control is a system that allows the vehicle to cruise at a constant speed (from approximately 40–100 km/h) without depressing the accelerator pedal. *Id*. at p. 86.

[26(c)] a memory device operable to store information representative of the preset speed;	*See* disclosures cited in response to claim [1(d)]. As explained above, the disclosed system must store speed values such as preset speed for it to operate as described. A preset is something set and kept in advance of using it; it necessarily must be stored in a memory to be kept for future use. Therefore a memory that stores information as claimed, is inherently dislcosed in this reference.
[26(d)] first visual display apparatus operable to display the [symbol] indicative of the actual speed of the vehicle; and	• While vehicle-to-vehicle distance control is on or while accelerating to the preset speed, the speed of your vehicle (displayed on the speedometer) differs from the preset speed (displayed on the center message display). When Ex. 1004 at p. 91; *see also id.* at p. 89.
[26(e)] second visual display apparatus operable to display the visual information indicative of an operation status of the speed controller, wherein the visual information displayable by the second visual display apparatus includes visual information indicative of the preset speed.	 *Id.* at p. 88.
Claim 27 of the '463 patent	**Anticipated by Diamante Owner's Manual**

27. The cruise control system of claim 26, wherein the visual information displayed by the second visual display apparatus includes information reflecting whether the speed controller is operating to maintain the vehicle at the cruising speed at the time the display is made.	● **Cruise control indicator light** Stays on during automatic cruising at a fixed speed. Ex. 1004 at p. 86. *See also*: Once the system has been canceled, the cruise control indicator light on the meter turns off. *Id*. at p. 92
Claim 28 of the '463 patent	**Anticipated by Diamante Owner's Manual**
28. The cruise control system of claim 26, wherein the second visual display apparatus comprises a digital numerical indicator.	 *Id*. at p. 88. See also, page 52: ""MODE switch 1. Each time the MODE switch is pressed, the item displayed is changed in the following order: cruising distance, preview distance control information, instantaneous fuel economy, directions, traveling time, and average speed." Cruising distance is a numerical value.
Claim 34 of the '463 patent	**Anticipated by Diamante Owner's Manual**

34. A method for providing an operator of a vehicle equipped with a cruise control device with information reflecting the operating status of the cruise control device, comprising: providing a cruise control device including:	*See* disclosures cited in response to claim 12 preamble.
[34(a)] a speed controller for automatically maintaining the vehicle at a substantially constant preset speed;	*See* disclosures cited in response to claim [26(a)].
[34(b)] a set speed input in communication with the controller for selecting the preset speed;	*See* disclosures cited in response to claim [26(b)].
[34(c)] a memory device operable to store information representative of the preset speed;	*See* disclosures cited in response to claim [1(d)]. As I explained above, the disclosed system must store speed values such as preset speed for it to operate as described. A preset is something set and kept in advance of using it; it necessarily must be stored in a memory to be kept for future use. Therefore a memory that stores information as claimed, is inherently dislcosed in this reference.
[34(d)] first visual display apparatus operable to display the indicative of the actual speed of the vehicle; and	*See* disclosures cited in response to claim [26(d)].

[34(e)] second visual display apparatus operable to display the visual information indicative of an operation status of the speed controller, wherein the visual information displayable by the second visual display apparatus includes visual information indicative of the preset speed;	*See* disclosures cited in response to claim [26(e)].
[34(f)] activating the cruise control device; and	**Setting cruise control** 1. Push the main switch to turn cruise control on. The indicator light on the switch turns on.  Ex. 1004 at p. 86.
[34(g)] operating the second visual display apparatus to indicate the active status of the cruise control device.	*See* disclosures cited in response to claim [26(e)]. *See also*: ● **Cruise control indicator light** Stays on during automatic cruising at a fixed speed. Ex. 1004 at p. 86. Once the system has been canceled, the cruise control indicator light on the meter turns off.

	Id. at p. 92
Claim 35 of the '463 patent	**Anticipated by Diamante Owner's Manual**
35. The method of claim 34, further comprising: operating the second visual display apparatus to display visual information indicative of the preset speed.	*See* disclosures cited in response to claim [26(e)].
Claim 36 of the '463 patent	**Anticipated by Diamante Owner's Manual**
36. The method of claim 35, further comprising: operating the cruise control device to change the preset speed from a first preset speed to a second preset speed; operating the second visual display apparatus to display visual information indicative of the second preset speed.	● **With the control lever** During fixed-speed cruising, operate the control lever to the desired speed and then release it. While vehicle-to-vehicle distance control is on or while accelerating to the preset speed after the vehicle ahead has left the lane, operate the control lever until the preset speed displayed on the center message display reaches the desired speed and then release it. Ex. 1004 at p. 91.

2. Ground 2: Claims 15, 16 and 21 of the '463 patent are obvious under 35 U.S.C. §103(a) by Diamante Owner's Manual in view of Preview Distance Control Manual

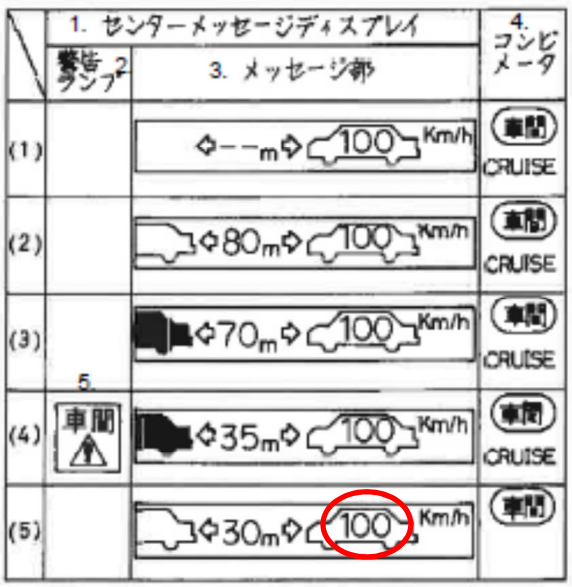
42. As described above, the Diamante Owner's Manual (Ex. 1003) discloses all of the limitations of claims 15, 16, and 21. With respect to the indicating of an unset state of the preset speed as recited in these claims, the Diamante Owner's

Manual discloses displaying a symbol indicative of an unset state of the preset speed, i.e., a contour of a vehicle with no speed included therein. (Ex. 1004 at p. 52). Notwithstanding, to the extent that any deficiency is alleged in this disclosure of the Diamante Owner's Manual as applied to claims 15, 16, and 21, the corresponding Preview Distance Control Manual (Ex. 1005 and Ex. 1006 (certified translation)) at p. 0-11 (Ex. 1006) states, "When the speed is not set, the speed (three digits) and 'km/hr' are not displayed; only the symbol is displayed." Thus, the Preview Distance Control Manual explicitly discloses displaying a "symbol," i.e., a contour of a vehicle with no speed therein, indicative of an unset state of the preset speed.

43. The two manuals are for the same vehicle, and relate to the exact same cruise control and display system. Accordingly, it would have been obvious to one skilled in the art to combine the teachings of these two related manuals. For these reasons, the Diamante Owner's Manual in view of the Preview Distance Control Manual renders claims 15, 16, and 21 obvious.

3. Ground 3: Claim 12 of the '463 patent is obvious under 35 U.S.C. §103(a) by Diamante Owner's Manual in view of Watanabe

44. As described above, the Diamante Owner's Manual (Ex. 1003) discloses all limitations of claim 12. In this regard, the Diamante Owner's Manual discloses "maintaining the activated cruise control speed symbol upon temporary acceleration or deceleration of the vehicle" at least by teaching that the displayed preset speed differs from the actual vehicle speed when the accelerator pedal is depressed. However, to the extent that the Patent Owner alleges any deficiency in the disclosure of the Diamante Owner's Manual with respect to claim 12(d), Watanabe discloses, "When the brake pedal is operated during the cruise control…, as shown in (5), the cruise control operation display lamp 62 is put out along with the cancellation of the cruise control." (Ex. 1008 at para. [0036]). Additionally, in this state, display of the preset speed is maintained:



(*Id.* at FIG. 5)

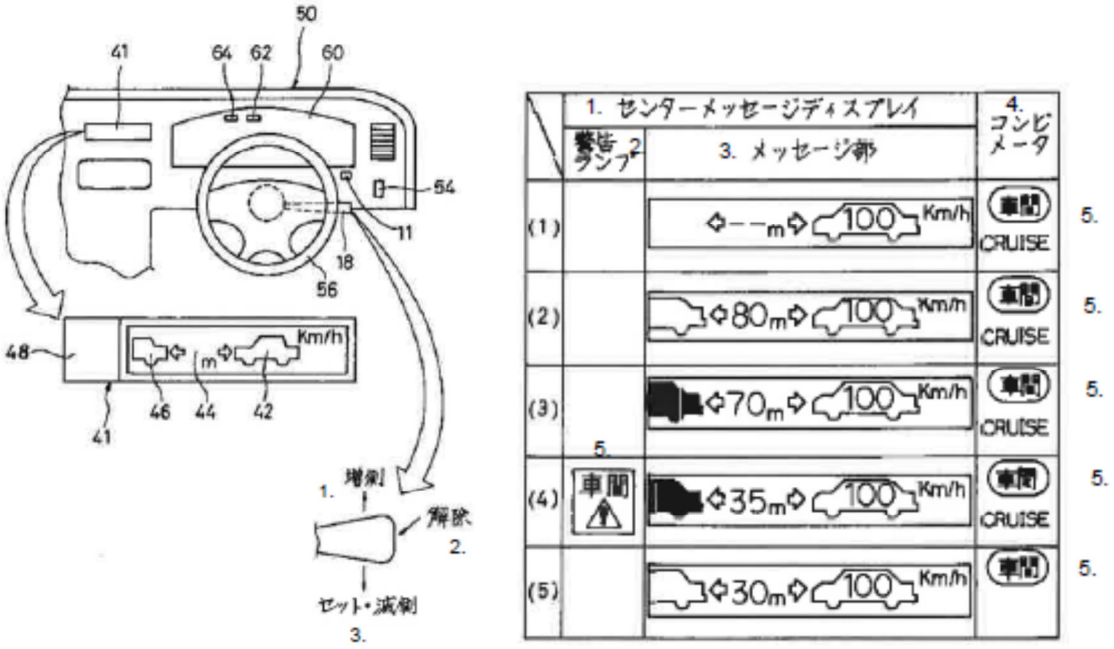
45. Thus, Watanabe more clearly discloses maintaining the display of the preset speed during temporary deceleration of the vehicle (claim 12).

46. As stated above, the Diamante Owner's Manual and Watanabe relate to the exact same cruise control and display system. Accordingly, it would have been obvious to one skilled in the art to combine the teachings of these two related publications so that the "driver can detect the set vehicle speed Vm as an arrival target, thus being able to reliably continue traveling without feeling unintended acceleration." Id. at paragrph 0040. For these reasons, the Diamante Owner's Manual in view of Watanabe renders claim 12 obvious.

4. Ground 4: Claims 18 and 19 of the '463 patent are anticipated under 35 U.S.C. §102(b) by Watanabe

47. As detailed in the discussion below, the disclosure in Watanabe (Ex. 1007 and Ex. 1008 (certified translation)), which was not before the Examiner during the prosecution of the '463 patent, discloses all of the limitations of claims 18 and 19.

48. Watanabe discloses indicating, to an operator of a vehicle, a preset speed for which a cruise control system is set (claims 18 and 19). (Ex. 1008 at paras. [0001] and [0015] and FIG. 2). As shown in FIGs. 2 and 5 (reproduced below), the cruise control device includes a feedback system 41 that digitally and continuously displays the preset speed and an indication 62 of whether cruise control is engaged:



49. The cruise control device of Watanabe includes an operation switch 18 to set the preset speed (claims 18 and 19). (*Id*. at paras. [0010], [0014], and [0025]).

50. According to Watanabe, if the vehicle decelerates by pressing the brakes, the cruise control is disengaged, although the preset speed remains displayed ((5) of FIG. 5, as shown above). As a result, when the cruise control is re-set (i.e., reengaged), "the driver can detect the set vehicle speed Vm as an arrival target, thus being able to reliably continue traveling without feeling unintended acceleration." (*Id*. at para. [0040]). Furthermore, the display of the preset speed when engaged is distinguishable from the display of the preset speed when

disengaged by virtue of the cruise operation display lamp 62 (claim 19), which is lit during the engaged stated and not lit during the disengaged state. (*Id*. at para. [0036] and FIG. 5).

51. Thus, as set forth above, it is my opinion that if the Examiner were aware of Watanabe, claims 18 and 19 of the '463 patent would not have issued because these claims are anticipated by Watanabe.

C. Ground 5: Claims 2-5, 26-28, and 34-36 of the '463 patent are anticipated under 35 U.S.C. §102(a) by Celsior (Ex. 1009)

52. As detailed in the discussion and claim charts below, the disclosure in Celsior (Ex. 1009 and Ex. 1010 (certified translation)), which was not before the Examiner, meets all of the limitations of claims 2-5, 26-28, and 34-36.

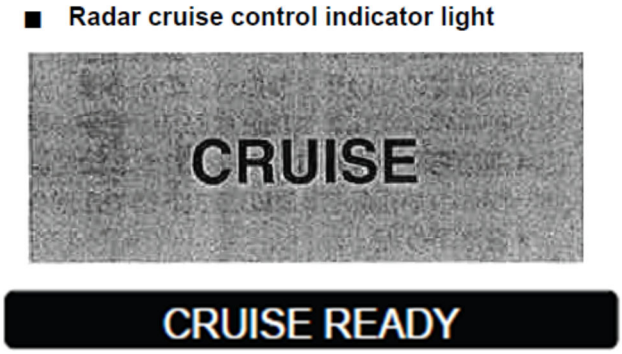
53. Celsior discloses a cruise control system for vehicles that automatically maintains the vehicle speed at a set cruise control speed (claims 2-5, 26-28, and 34-36), a main switch to turn the system on (claims 2, 4, and 34), a control lever for setting the cruise control speed and engaging the system (claims 2, 26, and 34), a radar cruise control indicator light for indicating whether the cruise control system is on (claims 26(e) and 34(g)), and a multi-information display for displaying a cruise control screen including the set cruise control speed and for

indicating whether the system is operating to maintain the vehicle at a set cruise control speed (claims 2-5, 26-28, and 34-36). (Id at pp. 130-134).

54. In further detail, Celsior discloses a multi-information display which displays a "CRUISE READY" symbol when the cruise control system is enabled (i.e., turned on) but not engaged (not operating the cruise control system to automatically control the vehicle at the preset speed), *e.g.,* when the system is initially turned on (claim 4) or when the system is temporarily disengaged by depressing the brakes (*Id*. at pp. 133 and 134). Furthermore, the multi-information display of Celsior displays the preset speed when the cruise control system is engaged (claims 2, 26, 34, and 35). (*Id*. at p. 133). Thus, since the preset speed is only displayed when the system is engaged, the display of the preset speed indicates that "the speed controller is operating to maintain the vehicle at the cruise speed" (claim 27).

55. One skilled in the art would have understood that Celsior necessarily includes a memory to store the pre-set speed in order to control the vehicle according to a pre-set speed, return the vehicle to the preset speed upon temporary acceleration or deceleration, and continuously display the pre-set speed (claims 2, 26, and 34). (*See id.* at pp. 133 and 134). Furthermore, Celsior states that cruise control can be canceled and then re-engaged to "return to the control prior to the deceleration." (*Id*. at p. 134). In order for the preset speed to be returned to at a later time after cancelation, the preset speed would have to be stored in a memory. Anyway, the '463 patent itself admits that "the conventional cruise control system is provided with a memory function that stores the set control speed." (Ex. 1001 at 1:26-27).

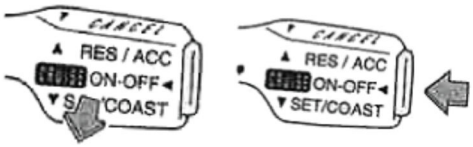
56. Additionally, Celsior discloses a combination of different indicators and visual symbols that can alert the operator of the vehicle to different statuses of the cruise control system. For example, as described and shown on pages 132 and 133 of Celsior (Ex. 1010), when the cruise control system is initially turned on, a cruise control indicator light turns on and the "CRUISE READY" symbol appears on the multi-information display, thereby indicating the state of the cruise control system when initially enabled (claim 4):

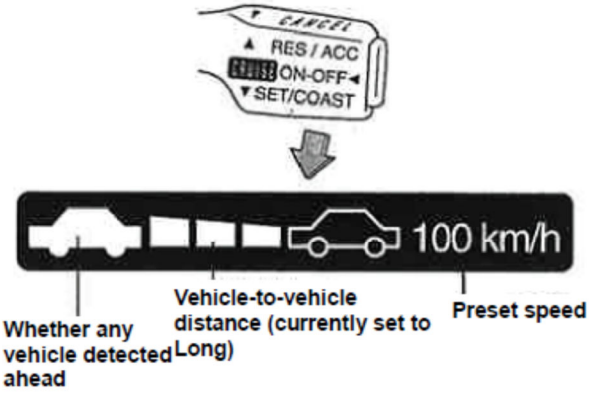


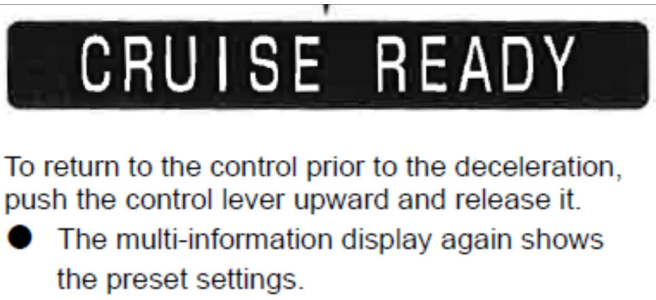
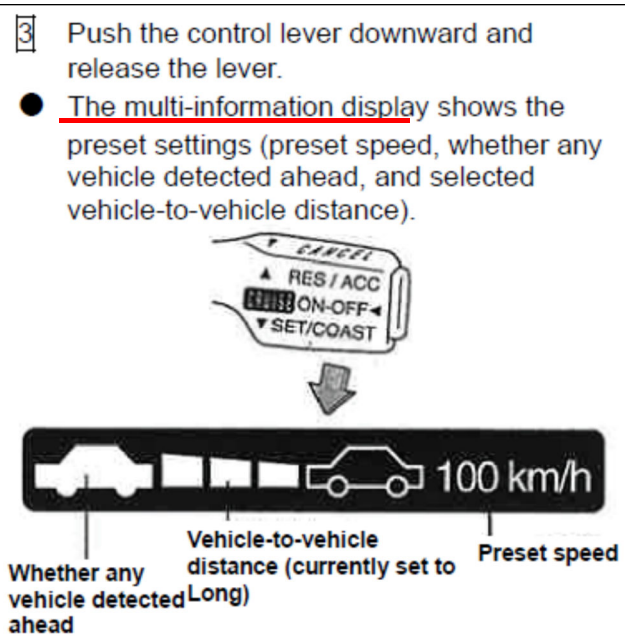
57. Thus, to the extent that the Patent Owner alleges that the Mitsubishi References' disclosure of displaying, at any time, an empty contour of a vehicle to indicate an unset state (*See* disclosure cited in response to claim 4 (Ground 1 chart)) does not sufficiently teach the subject matter of claim 4, Celsior clearly discloses this feature by displaying a "CRUISE READY" symbol in response to the cruise control system being initially turned on. Moreover, although Celsior better discloses the subject matter of claim 4 as compared to the Mitsubishi References, Petitioners respectfully request that the two grounds not be deemed redundant at least because Celsior qualifies as prior art under 35 U.S.C. 102(a) (and therefore subject to potential antedating) while the Mitsubishi References are 35 U.S.C. 102(b) publications.

58. The tables below show how each limitation of claims 2-5, 26-28, and 34-36 is met by Celsior.

Claim 2 of the '463 patent	**Anticipated by Celsior**
2. A cruise control system for a variable speed vehicle controlled by a human operator, comprising:	**Radar cruise control (with vehicle-to-vehicle distance control)** When the shift lever is in "D" or "4," you can use the radar control system to drive your vehicle without depressing the accelerator pedal as described below. The laser radar sensor in this system primarily detects the reflectors of the vehicle ahead of you to determine the presence of any vehicle ahead as well as to measure the vehicle-to-vehicle distance. The detection range of the sensor is about 100 m ahead. **When no vehicle is detected ahead:** Your cruising speed is maintained at the preset speed (from about 50–100 km/h). Ex. 1010 at p. 130.
[2(a)] a speed controller for automatically maintaining the vehicle at a substantially constant cruising speed selected by the operator;	**Radar cruise control (with vehicle-to-vehicle distance control)** When the shift lever is in "D" or "4," you can use the radar control system to drive your vehicle without depressing the accelerator pedal as described below. The laser radar sensor in this system primarily detects the reflectors of the vehicle ahead of you to determine the presence of any vehicle ahead as well as to measure the vehicle-to-vehicle distance. The detection range of the sensor is about 100 m ahead. **When no vehicle is detected ahead:** Your cruising speed is maintained at the preset speed (from about 50–100 km/h). *Id.*
[2(b)] a cruise control enable switch associated with the controller for enabling and disabling the controller;	**Setting the radar cruise control** 1 Press the main switch to turn the radar cruise control on. ● The radar cruise control indicator light on the meter turns on. "CRUISE READY" appears on the multi-information display and the system enters ready mode (you can now set the desired cruising speed and vehicle-to-vehicle distance). 

	Id. at p. 133 (emphasis added). *See also*: **Canceling radar cruise control** Pull the control lever forward or press the main switch to turn radar cruise control off. ● When using the control lever to cancel cruise control, the multi-information display screen switches to ready mode (showing "CRUISE READY"). ● When using the main switch to cancel cruise control, the cruise control indicator light on the meter turns off and the multi-information display screen switches to another screen. Control lever Main switch  *Id*. at p. 137 (emphasis added).
[2(c)] a set speed input in communication with the controller for selecting the cruising speed of the vehicle when the controller is enabled;	**Setting the radar cruise control** 1 Press the main switch to turn the radar cruise control on. ● The radar cruise control indicator light on the meter turns on. "CRUISE READY" appears on the multi-information display and the system enters ready mode (you can now set the desired cruising speed and vehicle-to-vehicle distance).  *Id*. *See also*:

	2 Accelerate or decelerate to the desired speed. 3 Push the control lever downward and release the lever. ● The multi-information display shows the preset settings (preset speed, whether any vehicle detected ahead, and selected vehicle-to-vehicle distance).  ... This commences radar cruise control. *Id.* (emphasis added).
[2(d)] a memory that stores information representative of the selected cruising speed; and	3 Push the control lever downward and release the lever. ● The multi-information display shows the preset settings (preset speed, whether any vehicle detected ahead, and selected vehicle-to-vehicle distance).  *Id.* *See also*:

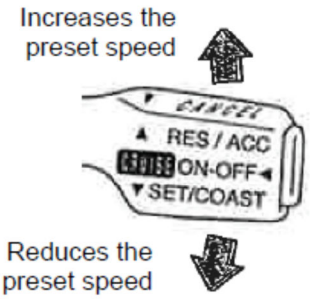
	 *Id.* at p. 134. As I explained above, the disclosed system must store speed values such as preset speed for it to operate as described. A preset is something set and kept in advance of using it; it necessarily must be stored in a memory to be kept for future use. Therefore a memory that stores information as claimed, is inherently dislcosed in this reference.
[2(e)] a feedback system that substantially continuously communicates the selected cruising speed information to the operator of the vehicle until either the operator selects a subsequent cruising speed or the controller is disabled.	 Ex. 1010 at p. 133 (emphasis added).

Changing the preset speed

There are two methods: change the preset speed according to the procedures described in 2 and 3 of "Setting the radar cruise control," or use the control lever as described below.

1 Operate the control lever.

- Press the control lever upward and hold it there to increase the preset speed.
- Press the control lever downward and hold it there to reduce the preset speed.

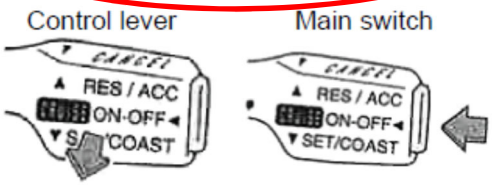


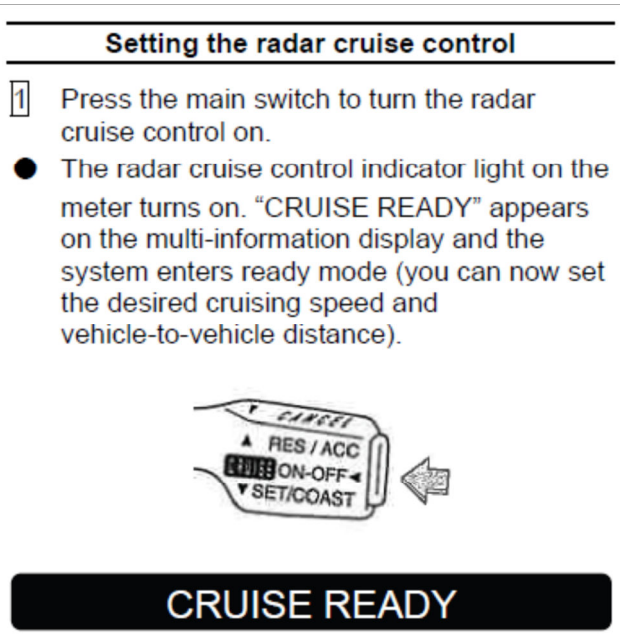
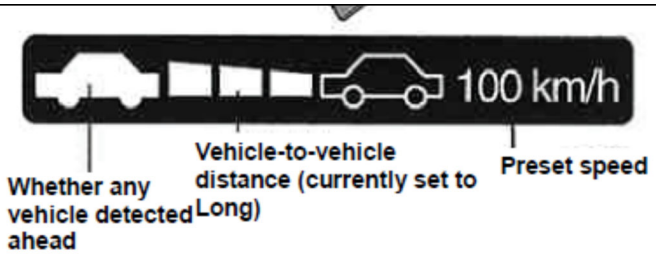
2 When the preset speed displayed on the multi-information display reaches the desired speed, release the control lever.

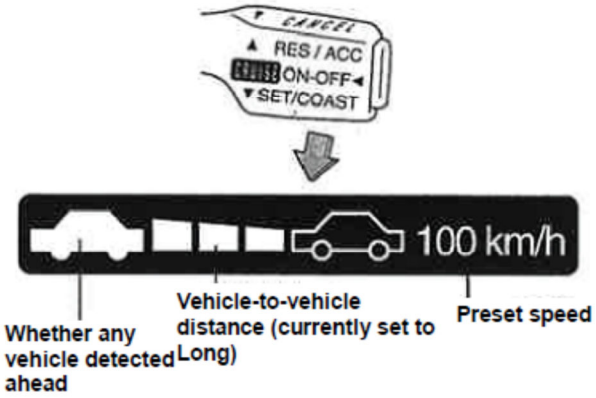
The displayed preset speed increases or decreases.

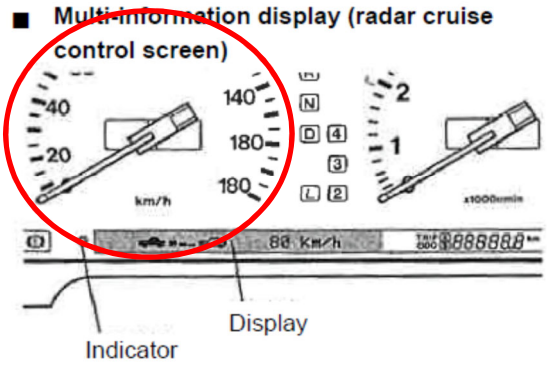
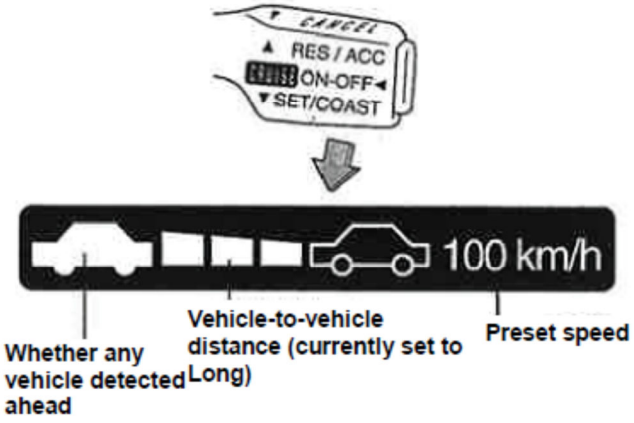
Id. at p. 135 (emphasis added).

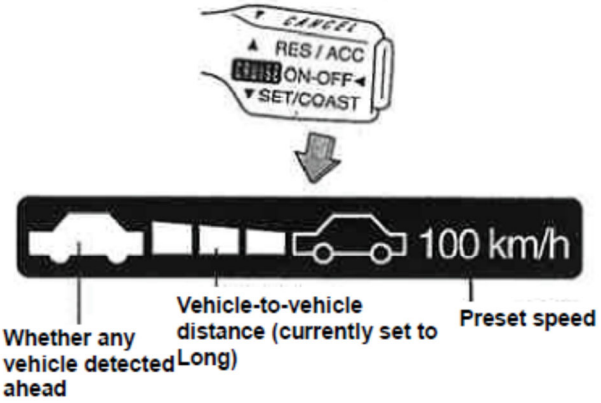
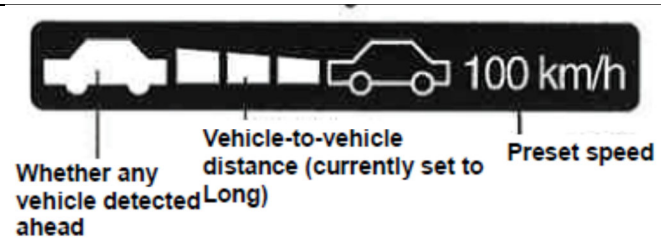
See also:

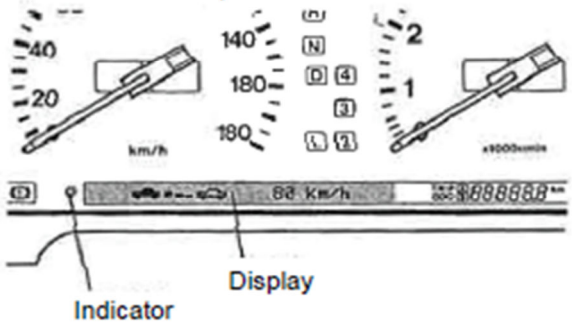
	Canceling radar cruise control Pull the control lever forward or press the main switch to turn radar cruise control off. ● When using the control lever to cancel cruise control, the multi-information display screen switches to ready mode (showing "CRUISE READY"). ● When using the main switch to cancel cruise control, the cruise control indicator light on the meter turns off and the multi-information display screen switches to another screen.  *Id.* at p. 137 (emphasis added).
Claim 3 of the '463 patent	**Anticipated by Celsior**
3. The cruise control system of claim 2, wherein the feedback system includes a digital display.	 *Id.* at p. 133.
Claim 4 of the '463 patent	**Anticipated by Celsior**
4. The cruise control system of claim 3, wherein the digital display displays a predetermined signal when the controller is initially enabled to indicate the state of the controller.	**Setting the radar cruise control** 1 Press the main switch to turn the radar cruise control on. ● The radar cruise control indicator light on the meter turns on. "CRUISE READY" appears *Id.* at p. 133 (emphasis added). *See also*:

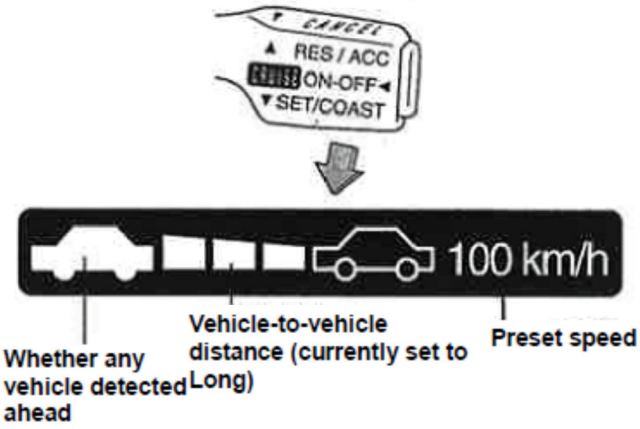
	 *Id.* at p. 134.
Claim 5 of the '463 patent	**Anticipated by Celsior**
5. The cruise control system of claim 3, wherein the digital display displays information indicative of the selected cruising speed of the vehicle.	 *Id.* at p. 133.
Claim 26 of the '463 patent	**Anticipated by Celsior**
26. A cruise control system for a variable speed vehicle controlled by a human operator, comprising:	*See* disclosures cited in response to claim 2 preamble.

[26(a)] a speed controller for automatically maintaining the vehicle at a substantially constant preset speed;	**Radar cruise control (with vehicle-to-vehicle distance control)** When the shift lever is in "D" or "4," you can use the radar control system to drive your vehicle without depressing the accelerator pedal as described below. The laser radar sensor in this system primarily detects the reflectors of the vehicle ahead of you to determine the presence of any vehicle ahead as well as to measure the vehicle-to-vehicle distance. The detection range of the sensor is about 100 m ahead. **When no vehicle is detected ahead:** Your cruising speed is maintained at the preset speed (from about 50–100 km/h). Ex. 1010 at p. 130.
[26(b)] a set speed input in communication with the controller for selecting the preset speed;	3 Push the control lever downward and release the lever. ● The multi-information display shows the preset settings (preset speed, whether any vehicle detected ahead, and selected vehicle-to-vehicle distance).  *Id.* at p. 133 (emphasis added).
[26(c)] a memory device operable to store information representative of the preset speed;	*See* disclosures cited in response to claim [2(d)]. As I explained above, the disclosed system must store speed values such as preset speed for it to operate as described. A preset is something set and kept in advance of using it; it necessarily must be stored in a memory to be kept for future use. Therefore a memory that stores information as claimed, is inherently dislcosed in this reference.

[26(d)] first visual display apparatus operable to display the indicative of the actual speed of the vehicle; and	■ Multi-information display (radar cruise control screen)  Ex. 1010 at p. 132 (emphasis added).
[26(e)] second visual display apparatus operable to display the visual information indicative of an operation status of the speed controller, wherein the visual information displayable by the second visual display apparatus includes visual information indicative of the preset speed.	3 Push the control lever downward and release the lever. ● The multi-information display shows the preset settings (preset speed, whether any vehicle detected ahead, and selected vehicle-to-vehicle distance).  *Id.* at p. 133. ■ Radar cruise control indicator light 

	Id. at p. 132.
Claim 27 of the '463 patent	**Anticipated by Celsior**
27. The cruise control system of claim 26, wherein the visual information displayed by the second visual display apparatus includes information reflecting whether the speed controller is operating to maintain the vehicle at the cruising speed at the time the display is made.	3 Push the control lever downward and release the lever. ● The multi-information display shows the preset settings (preset speed, whether any vehicle detected ahead, and selected vehicle-to-vehicle distance).  *Id.* at p. 133.
Claim 28 of the '463 patent	**Anticipated by Celsior**
28. The cruise control system of claim 26, wherein the second visual display apparatus comprises a digital numerical indicator.	 *Id.* at p. 133.
Claim 34 of the '463 patent	**Anticipated by Celsior**

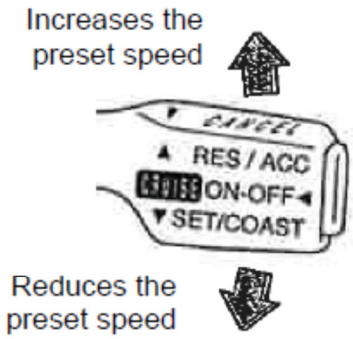
34. A method for providing an operator of a vehicle equipped with a cruise control device with information reflecting the operating status of the cruise control device, comprising: providing a cruise control device including:	*See* disclosures cited in response to claim 2 preamble. *See also*: ■ **Multi-information display (radar cruise control screen)**  Ex. 1010 at p. 132.
[34(a)] a speed controller for automatically maintaining the vehicle at a substantially constant preset speed;	*See* disclosures cited in response to claim [26(a)].

[34(b)] a set speed input in communication with the controller for selecting the preset speed;	3 Push the control lever downward and release the lever. ● The multi-information display shows the preset settings (preset speed, whether any vehicle detected ahead, and selected vehicle-to-vehicle distance).  Ex. 1010 at p. 133 (emphasis added).
[34(c)] a memory device operable to store information representative of the preset speed;	*See* disclosures cited in response to claim [2(d)]. As I explained above, the disclosed system must store speed values such as preset speed for it to operate as described. A preset is something set and kept in advance of using it; it necessarily must be stored in a memory to be kept for future use. Therefore a memory that stores information as claimed, is inherently dislcosed in this reference.
[34(d)] first visual display apparatus operable to display the indicative of the actual speed of the vehicle; and	*See* disclosures cited in response to claim [26(d)].

[34(e)] second visual display apparatus operable to display the visual information indicative of an operation status of the speed controller, wherein the visual information displayable by the second visual display apparatus includes visual information indicative of the preset speed;	*See* disclosures cited in response to claim [26(e)].
[34(f)] activating the cruise control device; and	**Setting the radar cruise control** 1 Press the main switch to turn the radar cruise control on. ● The radar cruise control indicator light on the meter turns on. "CRUISE READY" appears on the multi-information display and the system enters ready mode (you can now set the desired cruising speed and vehicle-to-vehicle distance).  Ex. 1010 at p. 133 (emphasis added).

[34(g)] operating the second visual display apparatus to indicate the active status of the cruise control device.	**Setting the radar cruise control** 1 Press the main switch to turn the radar cruise control on. ● The radar cruise control indicator light on the meter turns on. "CRUISE READY" appears on the multi-information display and the system enters ready mode (you can now set the desired cruising speed and vehicle-to-vehicle distance).  CRUISE READY *Id.* at p. 134 (emphasis added). ■ Radar cruise control indicator light  *Id.* at p. 132.
Claim 35 of the '463 patent	**Anticipated by Celsior**
35. The method of claim 34, further comprising: operating the second visual display apparatus to display visual information indicative of the preset speed.	*See* disclosures cited in response to claim [34(b)].

Request for Inter Partes Review
of U.S. Patent No. 6,324,463

Claim 36 of the '463 patent	**Anticipated by Celsior**
36. The method of claim 35, further comprising: operating the cruise control device to change the preset speed from a first preset speed to a second preset speed; operating the second visual display apparatus to display visual information indicative of the second preset speed.	**Changing the preset speed** There are two methods: change the preset speed according to the procedures described in 2 and 3 of "Setting the radar cruise control," or use the control lever as described below. 1 Operate the control lever. ● Press the control lever upward and hold it there to increase the preset speed. ● Press the control lever downward and hold it there to reduce the preset speed.  2 When the preset speed displayed on the multi-information display reaches the desired speed, release the control lever.  The displayed preset speed increases or decreases. Ex. 1010 at p. 135 (emphasis added).

VI. CONCLUSION

59. I declare that the foregoing is true and accurate to the best of my knowledge, and I will testify as such if called to do so.

Respectfully submitted,

Paul A. Green, Ph.D.

DATE: December 20, 2013

ATTACHMENTS

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2008-present	**Leader, Driver Interface Group**
2008-present	**Research Professor, Driver Interface Group**
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2007-2008	Adjunct Associate Professor, School of Information
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1998-2004	Senior Research Scientist, Human Factors Div., UMTRI
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1993-2010	Adjunct Associate Professor, Industrial & Ops. Eng.
1993-1996	Adjunct Associate Professor, Dept. of Mechanical Eng. and Applied Mechanics
1992-1993	Adjunct Assistant Professor, Dept. of Mechanical Eng. and Applied Mechanics
1988-1997	Assoc. Research Scientist, Human Factors Div., UMTRI
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Ph.D. (joint), 1979, Industrial & Operations Engineering and Psychology, University of Michigan
M.A., 1979, Psychology, University of Michigan
M.S.E., 1974, Industrial & Operations Engineering, U. of Michigan
B.S., 1972, Mechanical Engineering (co-op program), Drexel University

AWARDS/ HONORS

2013	Fellow, Human Factors and Ergonomics Society
1990	Society of Automotive Engineers, SAE Oral Presentation Award
1984	Society of Automotive Engineers, SAE Oral Presentation Award

MEMBERSHIP IN SOCIETIES

Human Factors and Ergonomics Society (Fellow)
Member, Executive Council
Member, Executive Committee
Board of Certification in Professional Ergonomics (member)
Member, Board of Directors
Institute of Ergonomics and Human Factors (Fellow)
Society of Automotive Engineers (member)
Member Safety and Human Factors Committee
Leader, SAE J2944 Subcommittee
Member, SAE J2364/J2365 Subcommittee
User Experience Professionals Association (member)

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30. Klinich, K.D., Manary, M.A. Flannagan, C.A.C., Ebert, S.M., Malik, L.A., Green, P.A. and Reed, M.P. (2013, in press). Effect of Child Restraint Features on Installation Errors, *Applied Ergonomics.*

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Books and Book Chapters

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11. Green, P. (2012). Motor Vehicle Driver Interfaces (Chapter 32) in Jacko, J. (ed.) *Handbook of Human-Computer Interaction (3rd ed.)*, Boca Raton, FL: CRC Press.

10. Green, P. (2012). *Motor Vehicle Driver Interfaces (Chapter 58),* in Savendy, G. (ed), *Handbook of Human Factors and Ergonomics* (4th. ed.), New York, NY: Wiley

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Other Publications

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13. Sweet, R.E. and Green, P. (1993). UMTRI's Instrumented Car, *UMTRI Research Review*, January-February, 1-11.

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RESEARCH FUNDING

Provide a numbered list of contracts, grant, or project titles in reverse chronological order, including the grant, contract, or project title as appropriate, the year/years covered, the total funding level, and your role. Keep it simple and **don't** give a description about the contract, project, etc.

- If you are the for **overall "Principal Investigator" a contract/grant that has multiple investigators and possibly multiple subaccounts/projects** (i.e., you are the faculty person who's name is listed with the contract/grant at the U-M), **list the total amount of the contract/grant**, the year or years covered (in parenthesis)**, and your role as "Principal Investigator."** If you list yourself here, don't list any projects or tasks that fall under the contract/grant even if you are the PI of those projects and they have a separate subaccount.
- If you are the **lead researcher for a project or task that is part of a larger contract/grant and you are not the overall contract/grant PI, list the title of your project/task,** the funding for your project/task, the years covered in parentheses, and your role as **"Principal Investigator."** You should do this even if there is not a subaccount for this project or task to take credit for your PI role but, in the future, **it is important to set up subaccounts for separate parts of a larger contract grant to both**

keep track of the funding allocated to that project/task as well as to give the PI credit for leading the research effort.

- If **you are contributing significantly to a contract/grant**, or to one or more projects/tasks of a contract/grant that have specific and identifiable goals and separate budgets, **but you are not the primary faculty leader of the contract, grant, project, or task**, list the title of the contract, grant, project, or task as appropriate, the total dollar amount allocated to that contract/project, etc., the year/years covered in parentheses, and your role as **"co- Principal Investigator."**

Proposal Title	Award Start Date	Award End Date	Award Total Dollars	Role
CPS: Synergy: Collaborative Research: Formal Design of Semi-autonomous Cyberphysical Transportation Systems	11/01/2012	10/31/2015	$350,000	Principal Investigator
Ergonomics Research on Driver Distraction and Warnings	09/01/2012	06/30/2013	$60,000	Principal Investigator
Evaluation of Driver State Monitoring and Active HMI Features	05/01/2012	01/31/2014	$299,403	Principal Investigator
Usability Evaluation of the Hyundai-Kia/Mobis Gen 4 Driver Interface	05/01/2012	04/30/2013	$160,000	Principal Investigator
Crash Avoidance Braking - Driver Reactions (Chrysler Challenge Fund)	09/03/2011	06/30/2012	$98,457	Principal Investigator
Training Service Agreement	07/18/2011	04/30/2012	$57,000	Principal Investigator
Human Factors Support	06/01/2011	04/30/2012	$3,960	Principal Investigator
Human Factors Evaluation of New Driver Interfaces (Project No. 201005)	03/01/2011	07/31/2013	$99,999	Principal Investigator
Develop a Syllabus and Outline for a Course on Human Factors Engineering and Patient Safety	02/15/2011	12/31/2011	$14,164	Principal Investigator
In-Vehicle Text Messaging via Speech Recognition	12/19/2010	12/31/2011	$94,655	Principal Investigator
Experimental Research on the Effect of Teenage Passengers on Teenage Driving Performance	09/22/2010	09/21/2015	$1,538,430	Participating Investigator with Specified Effort
Human Factors Evaluation of a Lane Departure Warning System and Lane Departure Protection System	07/01/2010	04/30/2011	$40,000	Principal Investigator
Lane Departure Warning Project-Human Factors Evaluation	07/01/2010	08/31/2011	$9,863	Principal Investigator
Usability of a New Driver Interface	05/17/2010	12/31/2010	$69,999	Principal Investigator
Human Factors Research - CAB (Crash Avoidance Brake)	04/01/2010	03/31/2012	$47,999	Principal Investigator
Human Factors Training	02/26/2010	12/31/2010	$36,564	Principal Investigator
Evaluating Effects of CRS and Vehicle Features on CRS Installation Errors	09/10/2009	09/09/2010	$216,650	Co-Investigator

University Transportation Centers Program 2009 Award - Michigan Center for Advancing Safe Transportation throughout the Lifespan (M-CASTL)	08/01/2009	07/31/2010	$926,700	Co-Investigator
University Transportation Centers Program 2008 Award	08/01/2008	09/30/2011	$843,000	Co-Investigator
University Transportiation Centers Program 2008 SAFETEA-LU Corrections Act Funds	08/01/2008	07/31/2009	$71,000	Co-Investigator
Development and Testing of Scenarios for the GM DriveSafety Simulator	05/01/2008	06/19/2009	$218,690	Principal Investigator
Human Factors Research Phase 2	03/31/2008	03/31/2011	$225,000	Principal Investigator
Human Factors Research on Intersections	10/30/2007	12/31/2008	$237,354	Principal Investigator
Human Factor Study	06/12/2007	06/11/2012	$1	Co-Investigator
Safety and Comfort of the EVS: On the Road Evaluation	06/01/2007	12/31/2007	$137,000	Principal Investigator
Safety and Comfort of the EVS: Literature Review and EVS Installation	03/14/2007	06/30/2007	$23,000	Principal Investigator
Behavioral, Technology, and Human Factors Research	02/06/2007	02/05/2010	$0	Co-Investigator
Rapid Road Edge Detection Based On Biomimetic Image Processing	12/01/2006	08/30/2009	$120,000	Principal Investigator
Human Factors Lab, Field and Simulator and Evaluation Support: Task Order--Factors Projects for Vehicle Safety/UMTRI	09/01/2006	10/12/2007	$126,800	Principal Investigator
Driver Evaluation of "Wiser Brain" Speech Interfaces - Phase II	04/26/2006	03/31/2007	$182,398	Principal Investigator
Human Factors for "Wiser Brain" Speech Interfaces: Interface Development	10/01/2005	03/15/2007	$159,441	Principal Investigator
Evaluation of Industry Safety Principles for In-Vehicle Information and Communication	01/10/2005	03/31/2006	$5,100	Principal Investigator
Effectiveness of In-Vehicle Warning Systems and Methods for Evaluating Them	01/10/2005	03/31/2005	$6,000	Principal Investigator
Audio/Visual Data Acquisition System Research Project Specifications	09/01/2004	09/30/2005	$39,998	Principal Investigator
ITR: Multithreaded Dialogues for Real-Time Applications	11/01/2003	10/31/2005	$9,570	Principal Investigator
AVM and Low Speed Maneuvers: Human Factors Issues	10/01/2003	03/31/2005	$199,999	Principal Investigator
SAfety VEhicle(s) Using Adaptive Interface Technology (SAVE-IT)	09/01/2002	09/30/2006	$1,514,067	Participating Investigator with Specified Effort
Safety Vehicles(s) Using Adaptive Interface Technology (SAVE-IT)	09/01/2002	05/31/2008	$5,800	Participating Investigator with Specified Effort
InfoMAN Project: Phase 2 Proposal	04/01/2002	12/31/2003	$289,998	Principal Investigator
Design Solutions to Reduce the Risk of Cell Phone Use Involving Head-Up Displays (HUDS)	01/01/2002	12/31/2002	$99,681	Principal Investigator
Intelligent Vehicle Initiative Road Departure Crash Warning Field Operational Test	11/01/2001	12/31/2004	$11,182,552	Participating Investigator with Specified Effort
Technical Support and Assistance for the Federal Highway Administration's (FHWA's) Human-Centered Systems Team	10/01/2001	09/30/2007	$15,893,296	Participating Investigator with Specified Effort

Driver Behavior and Performance - Task Order Optimizing the Performance and Use of Indirect Visibility Systems on Heavy Trucks	09/24/2001	09/24/2003	$508,224	Participating Investigator with Specified Effort
InfoMan Project: Phase I Proposal	09/01/2001	03/31/2003	$219,990	Principal Investigator
Driver Interface Affiliation Program	07/01/2001	06/30/2004	$40,000	Principal Investigator
RFSP for Scientific Services Program Task No. 01021: Human Factors Influence on Night Vision	03/09/2001	03/08/2002	$43,790	Principal Investigator
Human Factors Guidelines for Multimedia and Telematics Workplan	03/01/2001	05/31/2001	$10,000	Principal Investigator
Human-Machine Interface Research for Telematics Applications	01/01/2001	12/31/2001	$100,000	Principal Investigator
Heads-Up Display (HUD) Feedback to Minimize the Risk of Cellular Phone Use While Driving	11/01/2000	03/31/2002	$50,000	Principal Investigator
Driver Behavior and Performance Field/Simulation Test and Evaluation	09/30/2000	09/29/2001	$1	Principal Investigator
North American Intelligent Transportation System Trend Study	01/17/2000	04/14/2000	$30,000	Participating Investigator with Specified Effort
Destination Entry Using Voice and Manual Methods	01/01/2000	03/31/2001	$70,000	Principal Investigator
Comparison of Text-to-Speech and Recorded Speech for the Presentation of Messages to Drivers	01/01/2000	12/31/2000	$50,000	Principal Investigator
Human Factors Support of Voice-Based Driver Interface	09/30/1999	12/31/1999	$10,000	Principal Investigator
Auto Personal Computer (PC)	08/15/1999	09/15/1999	$1,000	Principal Investigator
Support for Society of Automotive Engineers (SAE) - Magellan/Magna Safety/Usability Efforts	07/01/1999	09/15/2000	$13,814	Principal Investigator
Usability of the Magellan 750 Navigation System Driver Interface	07/01/1999	10/31/2000	$10,000	Principal Investigator
Entry and Retrieval of Navigation Data into a Laptop Computer While Driving	05/11/1999	03/31/2000	$75,000	Principal Investigator
Multidisciplinary Alcoholism Research Training Program	07/01/1998	06/30/2003	$1,055,941	Participating Investigator with Specified Effort
U.S. Highway Attributes Relevant to Lane Tracking	05/01/1998	03/31/1999	$45,000	Principal Investigator
Development and Teaching of a Course on Human Factors and Driving Simulation	04/19/1998	08/31/1998	$10,000	Principal Investigator
Using Visual Occlusion to Assess Secondary Task Demands	01/01/1998	08/31/1999	$59,990	Principal Investigator
Chrysler Human Factors Course: Second Teaching Course	01/01/1998	12/31/1998	$9,847	Principal Investigator
Traffic Control Center Design Guidelines	12/01/1997	08/31/1999	$100,000	Principal Investigator
Development and Initial Teaching of a Two - Day Chrysler Human Factors Engineering Course	07/01/1997	12/31/1997	$45,976	Principal Investigator
Development of Human Factors Standards for Navigation	01/17/1997	06/30/1999	$75,600	Principal Investigator
Advanced Driver Interface Usability	12/01/1996	10/31/1997	$50,000	Principal Investigator

Message Understandability	12/01/1996	03/31/1998	$29,958	Principal Investigator
Intelligent Transportation Systems Research Center for Excellence	10/01/1996	09/30/1997	$1,000,000	Participating Investigator with Specified Effort
Driving Simulators and Driving Workloads	06/01/1996	05/31/1997	$70,868	Principal Investigator
Head Mounted Display Demonstration	02/15/1996	06/30/1996	$7,020	Principal Investigator
Intelligent Transportation Systems Research Center of Excellence	09/30/1995	09/30/1996	$1,000,000	Participating Investigator with Specified Effort
Design Consistency Evaluation Module for the Interactive Highway Safety Design	09/01/1995	08/31/1998	$125,221	Principal Investigator
Development and Evaluation of Communication Requirements for Low - Cost, Network - Based Driving Simulators for IVHS(Intelligent Vehicle - Highway Systems) Safety Research	03/01/1995	09/01/1996	$76,663	Principal Investigator
IVHS (Intelligent Vehicle Highway System) Architecture Project	02/10/1995	04/28/1997	$245,663	Participating Investigator with Specified Effort
Intelligent Vehicle Highway Systems (IVHS) Research Center for Excellence	09/30/1994	09/30/1995	$1,000,000	Participating Investigator with Specified Effort
Process Control User Interface Design Seminar	09/01/1994	10/31/1994	$7,520	Principal Investigator
Great Lakes Center for Truck Transportation Research	09/01/1994	08/31/1995	$1,000,000	Participating Investigator with Specified Effort
Heavy Truck Crash Avoidance Research - Task Order No. 3: Vehicle Induced Feedback Cues and Their Relationship to DriverPerformance and Safety	08/01/1994	10/31/1995	$150,000	Participating Investigator with Specified Effort
Modeling Driver Eye Fixation on Rural Roads: Insights into Safe Driving Behavior	06/29/1994	12/29/1995	$50,000	Principal Investigator
Research Plan on Compatibility Selection Time and Setting Time for Multiple - Switch Driver	05/01/1994	05/31/1996	$142,500	Principal Investigator
IVHS (Intelligent Vehicle - Highway Systems) System Architecture Project	10/11/1993	03/01/1995	$248,015	Participating Investigator with Specified Effort
Modeling Driver Eye Fixation on Rural Roads: Insights into Safe Driving Behavior	06/29/1993	06/28/1994	$50,000	Principal Investigator
Crash Avoidance Research Technology Support - Simulation Models	06/29/1993	06/28/1996	$2,500	Participating Investigator with Specified Effort
Human Factors and In - Vehicle Information Systems Short Course	03/29/1993	07/31/1993	$24,000	Principal Investigator
University Transportation Centers Programs	09/01/1992	08/31/1995	$1,000,000	Participating Investigator with Specified Effort
The Visual Demands of Driving and Viewing In-Vehicle Displays	07/01/1992	06/30/1994	$150,000	Principal Investigator
Modeling Driver Eye Fixation on Rural Roads: Insight into Safe Driving Behavior	06/29/1992	06/28/1993	$50,000	Principal Investigator

Experimental Test and Evaluation Requirements for the Direct Program	06/18/1992	06/30/1995	$59,851	Participating Investigator with Specified Effort
Great Lakes Center for Truck Transportation Research	10/01/1991	09/30/1992	$995,000	Participating Investigator with Specified Effort
Product Hazard Warning Label Study	09/16/1991	12/31/1991	$6,000	Principal Investigator
Potential Safety Applications of Advanced Technology	10/01/1990	04/30/1993	$213,790	Participating Investigator with Specified Effort
The Car Company of the Future	05/01/1990	10/31/1992	$239,328	Participating Investigator with Specified Effort
Driver Preferences for Instrument Panel Luminance Levels	10/30/1989	12/31/1989	$36,017	Principal Investigator
Assessment of Effect of In-Vehicle Display System on Driver Performance	10/02/1989	11/30/1994	$980,430	Principal Investigator
Development and Test of Warning Labels for Automotive Lifts	04/01/1989	12/31/1989	$40,865	Principal Investigator
NASA (National Aeronautics and Space Administration) Center of Excellence in Man-Systems Research	01/01/1989	12/31/1993	$100,000	Participating Investigator with Specified Effort
Automobile Driver Controls-Human Factors Considerations	09/01/1988	08/18/1989	$0	Principal Investigator
Center of Excellence in Man-Vehicle Systems	06/01/1984	12/31/1988	$0	Participating Investigator with Specified Effort

TEACHING/MENTORING

Dissertation Committees

9. Ei-Wen Lo, Environment Health, Co-chair (2009?-2013)

8. Zeljko Medenica, U. of New Hampshire, Electrical & Computer Engineering, committee member (2012-2013)

7. Lindgren, Anders, Chalmers University, Computer Science, opponent (2009)

6. Hongyi Cai, Architecture, committee/“ghost chair” (2005?-2007)

5. Kangwon “Wayne” Lee, Mechanical engineering, member (2002?-2004)

4. Omer Tsimhoni, Industrial and Operations Engineering, Co-chair (2000-2004)

3. Gary Burnett, University of Loughborough, Human Factors, opponent (1998)

2. Aaron Steinfeld, Industrial and Operations Engineering, committee member/“ghost chair”(1997?-1999)

1. Stanley Driskell, Urban Technology and Environmental Planning, committee member (?-1994)

Independent Study Supervision

Ei-Wen Lo
Sarah Miller
Kelly Comastro
Andrew Schanne
Tessa Elwart
Yuhao Gu
Jacob Durrah
Guofa Li
Heejin Jeong
Alex Bauman
Jamie Sookprasong
Samuel Pettinato
Andrea Best
Davis Lau
Anthony Mize
Je Sin (Jason) Kim
Helinda Ho
Matthew Alter
Adrienne Llanes
Hassan Hamid
Jin Seop Park
Jason Schweitzer
Anna Weiss
Katherine Stone
Michael Syty
Danielle Martinak
Benjamin Worrel
Edmur Pugliesi
Brian Lin
Te-Ping Kang
Samuel Jih
Christopher Demeniuk
Ashley Logan

Sean Michael Walls
Jessica Oberholtzer
Erin Baragar
Norman Chao
Takahiro Wada
Adriana Baron
Baylee Millier
Ed Hegedus
Serge Yee
Hong Jun Eoh
Lan Nguyen
Julia Angstrom Diebold
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Minoru Sumie
Patrick Wei
Tandi Bagian
Hideki Hada
Colleen Serafin
Kellie George
Brian Davis
Eileen Hoekstra
Marie Williams
Gretchen Paekle-Zobel
Sylvia Kim
Cathy Wen
Bernice Lin
John Boreczky
Paula Finnegan
Steve Goldstein
Kim Clack
Julie Eberhard
Kara Heinrichs
Henry Kim
Todd Bos
Cam Beattie
Jim Sayer
Sue Adams
Kris Zeltner
Pach Ratanaproeksa
Joshua Kerst
Mike Schiller
Barb Glover
Mark Glaza
Chris Turner

Don Ottens
Herb Wesselman
Lisa Wei-Hass
David Miller
Stacy Reifeis
Russell Levine
Bill Burgess

Other Student Mentoring

Nicole Harvard
Jackie Reno
Tanesha Landesma
Edgar Kinnebrew
Wang Hao (Derick) Wang
Helinda Ho
Jennifer Wong
Jean Pharoan
Damita Burton
Unsure of many before about 2007, approximately1-2/year

Classroom Teaching

I have taught a class every regular semester since 1980 and the Human Factors Engineering Short Course every summer since about 1974. This is year **54** of the course.

2007	School of Information 860, 3 credits, Research Methods
2006-**present**	Industrial and Operations Engineering 491 (now IOE 437) (Automotive Human Factors), 3 credits
1998	professional collaborator/lecture, Iowa State University, ME/IE52X, Human Factors and Driving Simulation
1992	lecturer, ME 599, Vehicle Dynamics and Human Factors
1990-1994	lecturer, Intelligent Vehicle Highway Systems Short Course
1984	Art 391 (Industrial Design), fall semester, 3 credits
1983-**present**	Industrial and Operations Engineering 436 (Human Factors in Computer Systems), originally listed as IOE 491,winter semesters, 3 credits
1980-1982	Industrial and Operations Engineering 433 (Human Performance) winter semesters, 3 credits
1974-present	Human Factors Engineering Short Course (leader since 200x?) 8 credits (continuing education)
1979-2005	Industrial and Operations Engineering 334 (Ergonomics Laboratory) fall and winter semesters, 1 credit, 2 sections
1978, 1980	Psychology 560 (Human Performance and Technology)

winter semester, 3 credits

SERVICE

Within UMTRI/U-M

UMTRI Driving Simulator Committee (2012-)
UMTRI Safety Committee (1996-?)
UMTRI Public Relations Committee (1986-1989)
UMTRI Fellowship Committee (1982-1990)
University of Michigan International Volleyball Club, faculty advisor, (1980-1993)
Engineering College Committee on Computers & Video (1990-1992)
Michigan Sailing Club, instructor (1992-present)

External to UMTRI/U-M

Technical Committees/Journals

Human Factors and Ergonomics Society (Fellow)
President (2008-2009)
Member, Executive Council (2010-)
Member, Executive Committee (2011-)
Past President (2009-2010)
President-elect (2007-2008)
Chair, Policy and Planning Committee (2007-2008)
Member, Nominations and Elections Committee (2007-2008)
Chair, Publications Committee (2005-2007)
Faculty advisor, University of Michigan student chapter (2000?-)
Secretary-Treasurer (2002-2005)
Member of Executive Council (2002-2005) and Executive Committee
Member, Nominations and Elections Committee (2002-2003)
International Standards Organization
Technical Committee 22, Subcommittee 13 (Ergonomics of Road Vehicles)
Working Group 5 (Symbols) - former chair
member, Working Group 8 (TICS) (1995?-2005?)
Board of Certification in Professional Ergonomics
Member of Board of Directors (2011-)
ITS America
Safety and Human Factors Steering Committee (19xx-?)
Driver Focus Task Force (1995?-2005?)
Society of Automotive Engineers
Safety and Human Factors Steering Committee (1979-present)
Leader, SAE J2944 Subcommittee (2006?-)
SAE J2364/J2365/J2678 subcommittee/Navgation Subcommittee
ISO 15007 review committee
Many other SAE subcommittees

Organizer/Chair of Conferences, Technical Sessions, etc. (list role, years, and name of

conference/session)

many

Peer-Reviewed Journals (List your role, journal name, and years served)
Reviewer, *Human Factors* (1981?-)
Reviewer, *Applied Ergonomics* (1981?-)
Reviewer, *Ergonomics* (1981?-)
Special issue editor, *International Journal of Vehicular Technology* (2012-2013)
Review, many other journals
Editorial Board, *Transportation Human Factors Journal* (?)

Contract/Grant Reviewer
None that I remember, but I did something for NSF in the past

PEER-REVIEWED PRESENTATIONS

To be added

List in reverse chronological order presentations for which you submitted an abstract that required a decision by a conference or program chair or committee to accept or reject your presentation. Give title of presentation, name of conference/technical meeting, location, and date of presentation.

INVITED LECTURES AND PRESENTATIONS

There have been many. Those that I remember are:

2012 AutoUI conference, invited plenary speaker, Durham, New Hampshire
2011 Association of Canadian Ergonomists, invited speaker, London, Ontario, Canada
2006 Methods for Assessing the Safety and Usability of In-Vehicle Systems: Lessons form UMTRI Driver Interface Research (plenary address), *Proceedings of the International Workshop on Safety and Comfort in Vehicles*, Kyushu University, Fukuoka, Japan.