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OFFICE OF DEFECTS
INVESTIGATION

Thomas Z. Cooper, Chief
Vehicle Integrity Division
Office of Defects Investigation
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington D.C. 20590

Re: NVS-212mbs, PE05-007 2000-2001 Mitsubishi Eclipse Headlamp Connector

Dear Mr. Cooper:

Below is Mitsubishi Motors North America, Inc.'s (MMNA) response to your above referenced investigation.

Some of the information in MMNA's response was provided by Mitsubishi Motors (MMC) in Japan. The production of such information should not be construed as an admission that NHTSA, or any other governmental agency, or court, has any jurisdiction of MMC, or that MMNA in anyway controls or has the ability to control MMC or its documents. Any jurisdictional or related objections in any future proceedings, investigations, or court action are hereby reserved.

As requested, each request is repeated verbatim above each response. The data files corresponding to each question are contained in the enclosed CD and labeled according to your request, i.e. PRODUCTION DATA, REQUEST NUMBER TWO DATA, WARRANTY DATA.

Should you have any questions or comments regarding this matter, please contact me at one of the contact points listed below.

Sincerely,

Kent Reeves, Manager
Technical Compliance & Quality Engineering
Tele: 714-372-6362
Fax: 714-934-4858
Email: kreeves@mmsa.com



PE05-007 2000-2001 Eclipse Headlamp Connector Response

Q1. State, by model and model year, the number of subject vehicles Mitsubishi has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by Mitsubishi, state the following:

- Vehicle identification number (VIN);
- Make;
- Model;
- Model Year;
- Date of manufacture;
- Date warranty coverage commenced; and
- The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease).

Provide the table in Microsoft Access 2000, or a compatible format, entitled "PRODUCTION DATA."

A. 1. The numbers of vehicles produced by model year are included on the following chart; items (a) through (g) are included on the attached CD entitled PRODUCTION DATA.

Make	Model	Model Year	Number Mfg.
Mitsubishi	Eclipse	2000	65,775
		2001	78,859

Note: The 2001 Eclipse Spyder Convertible is also included in the above chart.

Q2. State the number of each of the following, received by Mitsubishi, or of which Mitsubishi is otherwise aware, which relate to, or may relate to, the alleged defect in the subject vehicles:

- a. Consumer complaints, including those from fleet operators;
 - b. Field reports, including dealer field reports;
Reports involving a crash, injury, or fatality, based on claims against the manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports;
Reports involving a fire, based on claims against the manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports;
- Property damage claims; and
Third-party arbitration proceedings where Mitsubishi is or was a party to the arbitration; and

Lawsuits, both pending and closed, in which Mitsubishi is or was a defendant or codefendant.

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A.2.

- (a.) Mitsubishi is aware of 50 customer complaints that may relate to the alleged defect. 14 of these are VOQs supplied with this PE and an additional 36 that were located in the MMNA customer relation database.**
- (b.) Mitsubishi is aware of 3 Non-dealer field reports and 4 dealer field reports that may relate to the alleged defect.**
- (c.) None**
- (d.) None**
- (e.) None**
- (f.) None**
- (g.) None**

For subparts "a" through "e," state the total number of each item (e.g., consumer complaints, field reports, etc.) separately. Multiple incidents involving the same vehicle are to be counted separately. Multiple reports of the same incident are also to be counted separately (i.e., a consumer complaint and a field report involving the same incident in which a crash occurred are to be counted as a crash report, a field report and a consumer complaint).

There are 50 individual customer complaints and 7 individual field reports; none of the reports are for the same vehicle.

In addition, for items "c" through "g," provide a summary description of the alleged problem and causal and contributing factors and Mitsubishi's assessment of the problem, with a summary of the significant underlying facts and evidence. For items f and g, identify the parties to the action, as well as the caption, court, docket number, and date on which the complaint or other document initiating the action was filed.

There are no items responsive to items "c" through "g" of question 2.

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Q. 3. Separately, for each item (complaint, report, claim, notice, or matter) within the scope of your response to Request No. 2, state the following information:

- a. Mitsubishi's file number or other identifier used;**
- b. The category of the item, as identified in Request No. 2 (i.e., consumer complaint, field report, etc.);**
- c. Vehicle owner or fleet name (and fleet contact person), address, and telephone number;**
- d. Vehicle's VIN;**
- e. Vehicle's make, model and model year;**
- f. Vehicle's mileage at time of incident;**
- g. Incident date;**
- h. Report or claim date;**
- i. Whether a crash is alleged;**
- j. Whether a fire is alleged;**
- k. Whether property damage is alleged;**
- l. Number of alleged injuries, if any; and**
- m. Number of alleged fatalities, if any.**

Provide this information in Microsoft Access 2000, or a compatible format, entitled "REQUEST NUMBER TWO DATA."

A.3. The response to items a. through m. are included as an Access database on the enclosed CD titled "REQUEST NUMBER TWO DATA."

Q.4. Produce copies of all documents related to each item within the scope of Request No. 2. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method Mitsubishi used for organizing the documents.

A.4. Copies of all documents related to each customer complaint and field report are included on the enclosed CD titled "COPIES OF CUSTOMER COMPLAINTS AND FIELD REPORTS". The copies of the customer relations files are organized by model year then by file number. The field reports are organized by Non-dealer reports and Dealer field reports.

Q5. State, by model and model year, a total count for all of the following categories of claims, collectively, that have been paid by Mitsubishi to date that relate to, or may relate to, the alleged defect in the subject vehicles: warranty claims; extended warranty claims; claims for good will services that were provided; field, zone, or similar adjustments and reimbursements; and warranty claims or repairs made in accordance with a procedure specified in a technical service bulletin or customer satisfaction campaign.

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Separately, for each such claim, state the following information:

- a. Mitsubishi's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) and telephone
- c. number;
- d. VIN;
- e. Repair date;
- f. Vehicle mileage at time of repair;
- g. Repairing dealer's or facility's name, telephone number, city and state
- h. or ZIP code;
- i. Labor operation number;
- j. Problem code;
- k. Replacement part number(s) and description(s);
- l. Concern stated by customer; and
- m. Comment, if any, by dealer/technician relating to claim and/or repair.

Provide this information in Microsoft Access 2000, or a compatible format, entitled "WARRANTY DATA."

A.5. The Mitsubishi warranty system contains the records of all payments paid to dealers for all types of repairs including warranty claims, extended warranty claims, goodwill claims, field adjustments and reimbursements, whether or not the repair is related to a normal warranty repair or one as a result of a technical service bulletin or customer satisfaction campaign. Mitsubishi has identified 4,570 claims on 2000-2001 Eclipse vehicles that may relate to the alleged defect. Not included in the above counts are 428 warranty claims for replacement of the bulb part number MS820970. The comments section of the warranty claim lists the bulb in most cases as "burnt" or "burnt out", however, Mitsubishi does not view the replacement of the bulb without other associated parts (i.e., the connector) responsive to the alleged defect of "overheating and melting of the headlight connector." The response to Question 5, (a) through (k) are included in the attached CD titled "WARRANTY DATA" and "WARRANTY DATA BULBS ONLY."

Q. 6. Describe in detail the search criteria used by Mitsubishi to identify the claims identified in response to Request No. 5, including the labor operations, problem codes, part numbers and any other pertinent parameters used. Provide a list of all labor operations, labor operation descriptions, problem codes, and problem code descriptions applicable to the alleged defect in the subject vehicles. State, by make and model year, the terms of the new vehicle warranty coverage offered by Mitsubishi on the subject vehicles (i.e., the number of months and mileage for which coverage is provided and the vehicle systems that are covered). Describe any extended warranty coverage option(s) that Mitsubishi offered for the subject vehicles and state by option, model, and model year, the number of vehicles that are covered under each such extended warranty.

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A. 6. Warranty Claim Selection Logic:

A Warranty claim was included on the selection file when the following 6 selection steps where found true.

1. Select Paid Warranty Claims in the USA
 2. Select claims for the Model Name equal to ECLIPSE or ECL CONV
 3. Select claims for the Model Year equal to 2000 or 2001
 4. Select claims with the Primary Labor Operation (first 6 positions) equal to 541011(Headlamp unit, replace/repair) or 541013 (Bulb, headlamp, replace) or 541020 (light assembly, Front Combination, replace) or 543542 (Harness, body (front) wiring harness, replace/repair.
 5. Select claims that have a Part Number equal to MU800585 (Connector, Headlamp) or MB943536 (connector, headlamp) or MS820970 (bulb, headlamp) or MR275296 (Cover, headlamp bulb socket) or MR522579 (Body, headlamp, LH) or MR522580 (Body, headlamp, RH)
 6. Select claims that have a word equal to BURNT, SHORT or BURN or MELTED or CONNECTOR or OVRHEATED or OVERHEATED or HEATED or HOT or FAILURE or SOCKET or PIGTAIL or RESISTANCE or TERMINAL or REWIRE or CONTACTS or FIRE in the Condition Narrative, Cause Narrative or Remedy Narrative.
- Warranty nature and cause codes are included in the attached CD.

A 6 Part 2; WARRANTY COVERAGE:

Basic (aka Bumper to Bumper Coverage): 3 years or 36,000 miles whichever comes first
Powertrain: 5 years or 60,000 miles whichever comes first
Restraint Systems (air bags and seat belts): 5 years or 60,000 miles whichever comes first
Rust Perforation(for outer body panels) 7 years or 100,000 miles whichever comes first

In addition, these vehicles were also covered by the mandated Federal emission related coverage and where applicable, the California emissions coverage provisions.

Mitsubishi also endorses an extended service contract program that is administered by an outside company (AON). Information provided by AON indicated that 1257 extended service contracts were sold for 2000 and 2001 Eclipse and Eclipse Spyder vehicles. These various coverage type service contracts varied in terms from 1 year/12,000 miles to 7 years, 100,000 miles. Records of any claims that AON may have paid are not processed by or reported to Mitsubishi in any fashion.

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Q7. Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that Mitsubishi has issued to any dealers, regional or zone offices, field offices, fleet purchasers, or other entities. This includes, but is not limited to, bulletins, advisories, informational documents, training documents, or other documents or communications, with the exception of standard shop manuals. Also include the latest draft copy of any communication that Mitsubishi is planning to issue within the next 120 days.

A.7. Mitsubishi published an article in the monthly technician Newsletter known as Techtalk outlining the availability of a replacement headlamp connector socket. A copy of that Techtalk article is attached in the CD. No other notices were published nor are there currently any plans to publish any within the next 120 days.

Q8. Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the alleged defect in the subject vehicles that have been conducted, are being conducted, are planned, or are being planned by, or for, Mitsubishi. For each such action, provide the following information:

- A. Action title or identifier;**
- B. The actual or planned start date;**
- C. The actual or expected end date;**
- D. Brief summary of the subject and objective of the action;**
- E. Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and**
- F. A brief summary of the findings and/or conclusions resulting from the action.**

A. 8. Attached please find a list of documents outlining the extensive meetings, investigations and testing that was completed by Mitsubishi and its suppliers to determine the root cause of melting of the headlamp wiring harness connector. The original Japanese and the English translation of the documents are included. In some cases a separate English version of a Japanese document is supplied, in others, especially when referring to a picture or diagram, the English translation is included on the original document next to the Japanese language for better clarification. This list and copies of the listed documents can be found on the enclosed CD marked "Documents".

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Q 9. Describe all modifications or changes made by, or on behalf of, Mitsubishi in the design, material composition, manufacture, quality control, supply, or installation of the subject component, from the start of production to date, which relate to, or may relate to, the alleged defect in the subject vehicles. For each such modification or change, provide the following information:

- c. The date or approximate date on which the modification or change was incorporated into vehicle production;
- d. A detailed description of the modification or change;
- e. The reason(s) for the modification or change;
- f. The part numbers (service and engineering) of the original component;
- g. The part number (service and engineering) of the modified component;
- h. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
- i. When the modified component was made available as a service component; and
- j. Whether the modified component can be interchanged with earlier production components.

Also, provide the above information for any modification or change that Mitsubishi is aware of which may be incorporated into vehicle production within the next 120 days.

A. 9.

- a. **November 1, 2001**
- b. **The individual connector as well as the terminal of the front harness were changed as follows:**
 - **A terminal protective guide was added to the connector housing while the terminal structure was changed from a Faston to a plate spring type.**
 - **The terminal material was changed from brass to copper alloy.**
- c. **The reason for the modification was to prevent the headlamp connector terminals from being wiggled during installation.**
- d. **The part numbers for the connectors are as follows:**
 - **Original equipment: MU810309 (AMP part number 0-177720-2).**
 - **Service Part Number: MB943536**
- e. **The part number (service and engineering) of the modified component are:**
 - **Original equipment: MU810310 (Yazaki part number) 7323-3233-30)**
 - **Service part number: MU800585**
- f. **The original unmodified was withdrawn from production on November 1, 2001 and from service parts sales in July 2002.**
- g. **The modified service part MU800585 was made available as a service component in July 2002.**
- h. **The modified component can be interchanged with earlier production components.**

There are no modifications or changes planned for production for the next 120 days.

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Q. 10. List all Mitsubishi models that have the same or similar headlight design, and/or same or similar subject components as the subject vehicle.

A. 10. The following are all models that use the same connector structure (Faston terminal manufactured by AMP) as the subject vehicles. However, the headlamp design for each model is unique for vehicle design.

- 1999-2002 Galant produced prior to November 1, 2001
- 2002 Eclipse and Eclipse Spyder produced prior to November 1, 2001
- 1997-1999 Montero Sport
- 1992-2002 Montero
- 1997-2002 Diamante

In addition, the following vehicle uses a similar connector structure (Faston terminal type manufactured by Mitsubishi Cable Industries, Ltd.

- 1997-2001 Mirage

Q. 11. Produce each of the following:

- a. Parts schematics of the headlight assembly for each design version of the subject components;
- b. A diagram of the headlight assembly showing how the system works.

A. 11. Document 32 in response to Question number 8 contains two drawings that show the headlamp components and the way these parts are oriented on the vehicle (Parts schematics). Also shown is a drawing of the vehicle headlamp and side marker electric circuits showing how the system works(circuit diagram).

Q. 12 State the number if each of the following that Mitsubishi has sold that may be used in the subject vehicles by component name, part number (both service and engineering/production), model and model year of the vehicle in which it is used and month/year of sale(including the cut-off date for sales, if applicable):

- a. Subject Component; and
- b. Any kits that may have been released, or developed, by Mitsubishi for use in service repairs to the subject components/assembly.

A. 12. Below are the parts that Mitsubishi understands to be the subject components by part number and name, parts sales totals are listed on the CB titled "Parts Sales".

Connector, headlamp MU800585 (service part)
Connector, headlamp MB943536 (service part)
Bulb, Headlamp MS820970
Cover, Bulb Socket MR275296
Body, Headlamp LH MR522579
Body, Headlamp RH MR522580

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For each component part number, provide supplier's name address and appropriate point of contact (name, title and telephone number) also identify by make, model and model year, any other vehicles of which Mitsubishi is aware that contain the identical component, whether installed in production or in service, and the applicable dates of production or service usage.

Part number MU800585 and MB943536 are specified in the Mitsubishi part system as service parts to repair wiring harness connectors that may be damaged in use. These connectors are used on almost all vehicle models. Those vehicles are identified in response number 10. In addition the bulb MS820970 and bulb cover MR275296 are used on various models other than the subject vehicles. It is therefore impossible for Mitsubishi to tell which parts are used on which of the various models. The part numbers may be used on the following vehicles:

ST24S bulb (part No. MS820970) is also used for the following vehicles:

- 1999-2003 Galant
- 2001-2005 Eclipse Spyder
- 1997-1999 Montero Sports
- 1998-2002 Montero

ST24S cover (Part No. MR275296) is also used for the following vehicles:

- 1999-2003 Galant
- 2001-2005 Eclipse Spyder

The supplies of the connectors are;

MU810309;

TYCO ELECTRONICS AMP Co. Ltd (Connector Supplier)

Address: MAIN OFFICE

3-5-8 HISAMOTO TAKATSU WARD,

KAWASAKI-CITY, KANAGAWA PREFECTURE

213-8535 JAPAN

Appropriate contact person:

Mr. Hitoshi Baba, Assistant General Manager

TEL: + 81-44-844-8079

MU800585 (service parts)

YAZAKI NORTH AMERICA, INC. (Wiring Harness Supplier)

Address: BLOOMINGTON-NORMAL OFFICE

2002 EAGLE ROAD NORMAL,

IL 61761 U.S.A.

Appropriate contact person:

Mr. Jeff Coon, Quality Engineer

TEL: 309-452-8100

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Q13. Furnish Mitsubishi's assessment of the alleged defect in the subject vehicle; including:

- a. The causal or contributory factor(s);
- b. The failure mechanism(s);
- c. The failure mode(s);
- d. The risk to motor vehicle safety that it poses;
- e. What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and
- f. The report identified in this inquiry.

A. 13.

- a. According to investigations of recovered parts, reconstruction testing, and FTA analysis, the cause was determined to be poor workability of the headlamp connector with the potential for wiggling to occur for the subject vehicle when the connector is connected to the headlamp bulb. When the terminal is wiggled once, the terminal gap widens from body vibration in-use, increases the terminal gap, increasing the resistance between terminals, resulting in temperature increases.
- b. The mechanism for connector melting damage is as follows:
Terminal wiggling at installation > Low terminal contact pressure > Contact resistance increase > Temperature increase at contact points > Terminal opening widens from vibration > Arcing occurs between contact points > Contact resistance increase > Temperature increase > Melting damage.
When the terminal is not wiggled when installed melting damage does not occur.
- c. Since the headlamp connector fitting is done independently for left and right, if there were any headlamp connector melting damage, the lamp on only one side would eventually go out. The mode is such that when the terminal gap widens, resistance increases, and the headlamps gradually dim before any melting damage occurs.
- d. Mitsubishi determined that this issue does not pose a risk to vehicle safety for much the same reasoning as NHTSA found in PE04-020 for the Nissan Quest /Mercury Villager. Our reasoning is as follows:

Wiggling when fitting the connector constitutes the major cause and therefore simultaneous loss of both headlamps does not occur.

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Each bulb and lamp (high and low) has its own independent fuse. If one headlamp goes out, the function of the other side is not affected. It would be complete coincidence if both headlamps were to go out at the same time. Thus, the resulting condition from a bulb going out due to this issue and normal burning out of a bulb is the same.

Mitsubishi acknowledges that some customers opined both headlamps were inoperative at the time of repair. However, in those cases, since the technical probability of both headlamps going out simultaneously is for all intents and purposes zero, it is likely one headlamp was already inoperative, not repaired, and then the second headlamp went out some time later.

The surrounding parts are made of fire-retardant materials and therefore fires will not occur. Document 34 in response to question 8 shows testing conducted at MMC supporting this conclusion.

There is no impact on side marker lamp function when a headlamp on either side goes out since both left and right side marker lamps are on independent fuses and have independent circuits. Therefore, side marker lamps remain functional such that oncoming drivers or those approaching from either side are still fully aware of the presence of the vehicle. Refer to Document No.32 with illustrations of the subject vehicle lamp structure and major circuits.

The headlamp does not go out all at once, but gradually dims over time. It would take approximately 1,000 hours for any melting damage to occur with continuous use under such conditions.

There have been no reported instances of accidents or injury as a result of inoperative headlamps on these vehicles ever since their sales launch approximately 5 years ago.

- e. Refer to response for item d.**
- f. Refer to the documents identified in Answer 8.**