MITSUBISHI
MOTORS R & D OF AMERICA, INC.

6430 KATELLA AVE.
CYPRESS, CA 90630
TEL: (714) 895-7763
FAX: (714) 891-0036

June 24, 2009
CL09-0076

Mr. James Goldstene
Executive Officer
Air Resources Board
1001 I Street
Sacramento, CA 95812-2815

Subject: Mitsubishi Motors Comments Regarding the Cool Car Standards and Test Procedures Regulation – May 8, 2009 Staff Report: Initial Statement of Reasons

Dear Mr. Goldstene:

On behalf of Mitsubishi Motors North America and Mitsubishi Motors Corporation, Mitsubishi Motors R&D of America (Mitsubishi Motors) submits the following comments regarding the Cool Car Standards and Test Procedures Regulation – May 8, 2009 Staff Report: Initial Statement of Reasons.

Mitsubishi Motors appreciates the time and effort expended by the ARB Staff to develop a proposal to help reduce greenhouse gas emissions in light- and medium-duty vehicles. Specifically, we thank the Staff and the Board for the opportunities to express our views and receive direct feedback. Over the past year, we have worked closely with Staff to develop a regulation that reduces interior vehicle temperature with minimal consumer inconvenience and cost.

Generally, our comments address six specific issues:

1. Evaluation of the regulation's benefits and how to measure these benefits.
2. The need for delayed implementation and technology review.
3. Request a performance standard as a compliance goal.
4. For short term action, we propose a 60% Total Solar Transmittance (Tts) standard for windshield, side, and rear windows.
5. Increase the rooflite (sunroof) standard from 30% to 45% Tts.
6. Allow exemptions for zero emission vehicles (ZEVs).

Mitsubishi Motors provides the following specific comments:

1. Evaluation of the regulation's benefits and how to measure these benefits.

The focus of this proposed regulation is to reduce the automotive A/C system's GHG emissions by reducing engine power consumption. Staff should evaluate the actual benefits of their proposed regulation and the metric for determining these benefits. They theorize that lower interior temperatures will reduce the use of mobile air conditioners. Staff also believes this reduction in usage will occur mostly during shoulder months, or the spring and fall periods when the temperature is moderate (64-75ºF). The reduced usage of mobile air conditioners during shoulder months from specific technology like solar reflective glazing will then allow manufacturers to downsize their A/C system and reduce GHG emissions throughout the year.

Staff makes several assumptions and requirements that do not coincide with real-world applications.

- To begin, auto manufacturers such as Mitsubishi Motors do not design their A/C systems based on shoulder month usage. Automotive A/C systems are optimized for worst-case conditions, such as Death Valley during July. The assumption that manufacturers would downsize their A/C systems based on shoulder month usage must be reconsidered as well as the emissions reduction benefits based on this assumption.

- Staff also assumes that consumers would reduce their A/C usage in shoulder months if vehicle interiors were cooled by solar reflective glazing. This assumption does not account for consumers who purchase vehicles equipped with automatic climate control. Vehicle owners with automatic climate control pay a premium for this option and are unlikely to switch off this feature even with "cool" interior. Continued auto A/C system usage during shoulder months will reduce the perceived benefits of solar reflective glazing.

- Additionally, Staff requires convertibles to comply with this regulation, but do not take convertible owners' preferences into consideration. Convertible vehicle owners are likely to lower their convertible tops, especially during shoulder months, and not use their air conditioners. Staff should account for this likelihood when calculating the benefits.

Staff could modify their benefits calculation metric to consider benefits from allowing alternative technologies besides solar reflective glazing. Alternative technologies such as improved A/C systems and solar absorbing glass can provide additional benefits and GHG emissions reductions through improved efficiency and vehicle weight reductions.

2. The need for delayed implementation and technology review.

Implementation should be delayed until 2014MY and four-year phase-in times added for each standard level. More time is needed when new technology is involved or known challenge exists, such as electromagnetic interference of wireless devices while using solar reflective glazing.

Assuming this regulation is finalized by January 2010:

- 2010MY vehicles are nearing the end of production.
- 2011MY models are beginning mass production.
- 2012MY have completed the design process and are undergoing final production planning
- 2013MY models are in the final design stages.

As significant time is needed to implement existing technologies into vehicles, the first year for implementation should be 2014MY.

Staff's proposed 2012MY implementation leaves no time to evaluate interference of all wireless devices in all vehicles equipped with solar reflective glazing and to design around these challenges. An implementation delay until 2014MY and minimum four-year phase-in time for each standard level will allow time to address interference concerns and minimize problems with each model before sale to customers.

A technology review in 2014 will allow Staff to evaluate the feasibility of the stricter 40% Tts standard and the progress of glass manufacturers in supplying compliant products.

3. Request a performance standard as a compliance goal.

A performance standard should be adopted as the compliance goal to maintain ARB's focus on performance based standards. This will also to enable the use of alternative technologies and encourage innovation. Currently, the proposed regulation only allows for one specific technology: solar reflective glazing. No options are given for other innovative methods to reduce interior temperature, A/C system usage, and associated emissions. Alternative technologies can be as effective (or more) and possibly at a lower overall cost. Several alternative technologies exist or can be developed, including solar absorbing glass, higher efficiency A/C systems, auto-closing sunroof shades, auto-venting sunroofs, and solar-powered sunroof vent fans.

An example of a possible technology, Mitsubishi Motors (with Mitsubishi Heavy Industries) won the 2007 U.S. EPA Climate Protection Award for its work on a new, high-efficiency automotive A/C system. The system includes a new scroll compressor and operation controls that reduce power consumption by 39% and improve cooling performance by 7%. The current Mitsubishi Outlander crossover utility vehicle utilizes this A/C system.

With the current proposal, the resources that would be used to further develop and implement this type of system would be diverted to designing, testing, and implementing expensive, unproven technology such as solar reflecting glazing. **We request a performance standard to allow continued development of innovative technologies such as our high-efficiency automotive A/C system.**

4. For short term action, we propose a 60% Total Solar Transmittance (Tts) standard for windshield, side, and rear windows.

Mitsubishi Motors requests a 60% Tts windshield, side, and rear window standard to avoid interference issues with electromagnetic wireless systems. Changing the

windshield standard from 50% to 60% Tts allows the use of solar absorbing glass. This glazing is currently available, costs a fraction of solar reflective glazing, and does not cause wireless system interference like solar reflective glazing. Manufacturers can also design and implement this proven technology in their future vehicles with shorter lead times than solar reflective glazing.

Additionally, 49 CFR Part 571 allows the use of glazing with visible light transmittance of less than 70% in certain glass locations (e.g., rear side and rear windows). In this case, Tts ≥ 45% could be achievable because privacy glass glazing could be used. However, adequate phase-in time is still required to ensure proper implementation in all model applications.

5. Increase the rooflite (sunroof) standard from 30% to 45% Tts

Staff's proposed rooflite (sunroof) standard should be increased from 30% to 45% Tts to avoid customer dissatisfaction and potential elimination of the sunroof option in CA vehicles. Compliant sunroofs will be very dark and useless for their intended purpose – allowing light and viewing through the roof.

Since glass sunroofs will be useless, Mitsubishi Motors will have to consider alternatives such as steel roof panels or elimination of the sunroof for all CA vehicles. By changing to a 45% Tts standard, current privacy glass can be used in the sunroof. Use of privacy glass will allow some light and viewing through the roof, provide some solar reflective benefits, minimize customer dissatisfaction, and avoid possible sunroof elimination.

6. Allow exemptions for zero emission vehicles (ZEVs)

Exemptions should be allowed for ZEVs that produce no associated GHG emissions from their A/C or propulsion systems. As stated earlier, the focus of the proposed regulation is to reduce GHG emissions by reducing engine power consumption. ZEVs do not produce GHG emissions from their A/C or propulsion systems. By exempting ZEVs from this regulation, development can be dedicated to the design, testing, and implementation of improved ZEV A/C and propulsion system efficiency technologies. Manufacturers can also focus more on overall vehicle weight reductions, which further reduce power consumption.

Conclusion

In summary, we propose the following changes:

- Delay implementation until 2014MY;
- Require 4 year phase-in time;
- Require technology review in 2014;
- Adopt a performance standard as the compliance goal;

- For short term implementation, adopt a 60% Total Solar Transmittance (Tts) standard for windshield, side, and rear windows;
- Increase the rooflite (sunroof) standard from 30% to 45% Tts; and
- Allow exemptions for zero emission vehicles (ZEVs).

Mitsubishi Motors believes that these measures will balance reasonable gains in emissions reductions with promotion of current and future innovation.

If you have any questions regarding these proposals, please feel free to contact me at (714) 372-9510 or david.patterson@na.mitsubishi-motors.com.

Sincerely,

David N. Patterson, P.E.
Senior Manager
Regulatory Affairs & Certification
Mitsubishi Motors R&D of America, Inc.

cc: Thomas Cackette, Chief Deputy Executive Officer of the Air Resources Board
Robert Cross, Chief, Mobile Source Control Division
Mary Nichols, Chairman
Air Resources Board Members
Lori Andreoni, ARB Clerk