

**Documents Presented by Center for Auto Safety
Mobile Sources Technical Review Subcommittee
EPA Clean Air Act Advisory Committee
May 13, 2009**

- P.1** Audi – Fuel Supply and Filling Your Tank

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- P. 3-5** Toyota – 2009 Toyota Corolla Fuel Information

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 - 2006-08 Lexus IS
 - 2006-08 Lexus GS
 - 2007-08 Lexus LS

Blend of gasoline and ethanol (grain alcohol or ethyl alcohol)

- Anti-knock index must be 87 AKI or higher.
- Blend must not contain more than 10% ethanol.

Blend of gasoline and MTBE

- Anti-knock index must be 87 AKI or higher.
- Blend must contain not more than 15% MTBE.

Seasonally adjusted gasoline

Many gasoline grades are blended to perform especially well for winter or summer driving. During seasonal change-over, we suggest that you fill up at busy gas stations where the seasonal adjustment is more likely to be made in time.

! Note

- Methanol fuels which do not meet these requirements may cause corrosion and damage to plastic and rubber components in the fuel system.
- Do not use fuels that fail to meet the specified criteria in this chapter.
- If you are unable to determine whether or not a particular fuel blend meets the specifications, ask your service station or its fuel supplier.
- Do not use fuel for which the contents cannot be identified.
- Fuel system damage and performance problems resulting from the use of fuels different from those specified are not the responsibility of Audi and are not covered under the New Vehicle or the Emission Control System Warranties.
- If you experience a loss of fuel economy or driveability and performance problems due to the use of one of these fuel blends, we recommend that you switch to unblended fuel. ■

Gasoline additives

A major concern among many auto manufacturers is carbon deposit build-up caused by the type of gasoline you use.

Although gasoline grades differ from one manufacturer to another, they have certain things in common. All gasoline grades contain substances that can cause deposits to collect on vital engine parts, such as fuel injectors and intake valves. Although most gasoline brands include additives to keep engine and fuel systems clean, they are not equally effective.

Audi recommends using TOP TIER Detergent Gasoline. For more information on TOP TIER Detergent Gasoline, please go to the official website (www.toptiergas.com).

After an extended period of using inadequate fuels, built-up carbon deposits can rob your engine of peak performance.

! Note

Damage or malfunction due to poor fuel quality is not covered by the Audi New Vehicle Limited Warranty. ■

Fuel tank**Fuel filler neck**

The fuel filler neck is located on the right rear side panel behind the fuel filler flap.

If the power locking system should fail, you can still open the flap manually - for detailed instructions see ⇒ *page 259*.

You can find the fuel tank capacity of your vehicle in **Technical Data** ⇒ *page 325*. ▶

Fuel and Engine Exhaust Precautions

Fuel Requirements

Vehicles with catalytic converters or oxygen sensors must use **ONLY UNLEADED FUEL**, which will reduce exhaust emissions and keep spark plug fouling to a minimum.

Your Mazda will perform best with fuel listed in the table.

Fuel	Octane Rating* (Anti-knock index)
Regular unleaded fuel	87 [(R+M)/2 method] or above (91 RON or above)

* U.S. federal law requires that octane ratings be posted on gasoline station pumps.

Fuel with a rating lower than 87 octane (91 RON) could cause the emission control system to lose effectiveness. It could also cause engine knocking and serious engine damage.

CAUTION

➤ **USE ONLY UNLEADED FUEL.**

Leaded fuel is harmful to the catalytic converter and oxygen sensors and will lead to deterioration of the emission control system and or failures.

- *Your vehicle can only use oxygenated fuels containing no more than 10% ethanol by volume. Damage to your vehicle may occur when ethanol exceeds this recommendation, or if the gasoline contains any methanol. Stop using gasohol of any kind if your vehicle engine is performing poorly.*
- *Never add fuel system additives. Never add cleaning agents other than those specified by Mazda. Other cleaning agents and additives may damage the system. Consult an Authorized Mazda Dealer.*

Gasoline blended with oxygenates such as alcohol or ether compounds are generally referred to as oxygenated fuels. The common gasoline blend that can be used with your vehicle is ethanol blended at no more than 10%. Gasoline containing alcohol, such as ethanol or methanol, may be marketed under the name “Gasohol”.

Vehicle damage and drivability problems resulting from the use of the following may not be covered by the Mazda warranty.

- Gasohol containing more than 10% ethanol.
- Gasoline or gasohol containing methanol.
- Leaded fuel or leaded gasohol.

6-1. Specifications

Fuel information

You must only use unleaded gasoline in your vehicle.

Unleaded gasoline with an Octane Rating of 87 (Research Octane Number 91) or higher is required for optimum engine performance.

At minimum, the gasoline you use should meet the specifications of ASTM D4814 in the U.S.A. and CGSB3.5-M93 in Canada.

n **Fuel tank opening for unleaded gasoline**

To help prevent incorrect fueling, your Toyota has a fuel tank opening that only accommodates the special nozzle on unleaded fuel pumps.

n **If your engine knocks**

l Consult your Toyota dealer.

l You may occasionally notice light knocking for a short time while accelerating or driving uphill. This is normal and there is no need for concern.

n **Gasoline quality**

In very few cases, driveability problems may be caused by the brand of gasoline you are using. If driveability problems persist, try changing the brand of gasoline. If this does not correct the problem, consult your Toyota dealer.

n **Gasoline quality standards**

l Automotive manufacturers in the U.S., the Europe and Japan have developed a specification for fuel quality called World-Wide Fuel Charter (WWFC) that is expected to be applied worldwide.

l The WWFC consists of four categories that are based on required emission levels. In the U.S., category 4 has been adopted.

l The WWFC improves air quality by lowering emissions in vehicle fleets, and improves customer satisfaction through better performance.

n Toyota recommends the use of gasoline containing detergent additives

- l Toyota recommends the use of gasoline that contains detergent additives to avoid build-up of engine deposits.
- l All gasoline sold in the U.S. contains detergent additives to clean and/or keep clean intake systems.

n Toyota recommends the use of cleaner burning gasoline

Cleaner burning gasoline, including reformulated gasoline that contains oxygenates such as ethanol or MTBE (Methyl Tertiary Butyl Ether) is available in many areas.

Toyota recommends the use of cleaner burning gasoline and appropriately blended reformulated gasoline. These types of gasoline provide excellent vehicle performance, reduce vehicle emissions and improve air quality.

n Toyota does not recommend blended gasoline

- l Toyota allows the use of oxygenate blended gasoline where the oxygenate content is up to 10% ethanol or 15% MTBE.
- l If you use gasohol in your Toyota, be sure that it has an octane rating no lower than 87.
- l Toyota does not recommend the use of gasoline containing methanol.

n Toyota does not recommend gasoline containing MMT

Some gasoline contains octane enhancing additive called MMT (Methylcyclopentadienyl Manganese Tricarbonyl).

Toyota does not recommend the use of gasoline that contains MMT. If fuel containing MMT is used, your emission control system may be adversely affected.

The malfunction indicator lamp on the instrument cluster may come on. If this happens, contact your Toyota dealer for service.

 NOTICE

n Notice on gasoline quality

I Do not use leaded gasoline.

Leaded gasoline can cause damage to your vehicle's catalytic converters causing the emission control system to malfunction.

I Do not use gasohol other than that stated here.

Other gasohol may cause fuel system damage or vehicle performance problems.

n Fuel-related poor driveability

If after using a different type of fuel, poor driveability is encountered (poor hot starting, vaporization, engine knocking, etc.), discontinue the use of that type of fuel.

n When refueling with gasohol

Take care not to spill gasohol. It can damage your vehicle's paint.

If you put things inside the vehicle — like suitcases, tools, packages, or anything else — they will go as fast as the vehicle goes. If you have to stop or turn quickly, or if there is a crash, they will keep going.

CAUTION

Things you put inside the vehicle can strike and injure people in a sudden stop or turn, or in a crash.

- Put things in the trunk of your vehicle. In a trunk, put them as far forward as you can. Try to spread the weight evenly.

(Continued)

CAUTION (Continued)

- Never stack heavier things, like suitcases, inside the vehicle so that some of them are above the tops of the seats.
- Do not leave an unsecured child restraint in the vehicle.
- When you carry something inside the vehicle, secure it whenever you can.
- Do not leave a seat folded down unless you need to.

Fuel

Use of the recommended fuel is an important part of the proper maintenance of this vehicle. To help keep the engine clean and maintain optimum vehicle performance, we recommend the use of gasoline advertised as TOP TIER Detergent Gasoline.

The 8th digit of the Vehicle Identification Number (VIN) shows the code letter or number that identifies the vehicle's engine. The VIN is at the top left of the instrument panel. See *Vehicle Identification Number (VIN)* on page 10-1.

Gasoline Octane

If the vehicle has a V8 engine, use regular unleaded gasoline with a posted octane rating of 87 or higher. If the octane rating is less than 87, you might notice an audible knocking noise when you drive, commonly referred to as spark knock. If this occurs, use a gasoline rated at 87 octane or higher as soon as possible. If you are using gasoline rated at 87 octane or higher and you hear heavy knocking, the engine needs service.

If the vehicle has the 3.6L V6 engine (VIN Code 7), use regular unleaded gasoline with a posted octane rating of 87 or higher. For best performance or trailer towing, you could choose to use middle grade 89 octane unleaded gasoline. If the octane rating is less than 87, you might notice an audible knocking noise when you drive, commonly referred

to as spark knock. If this occurs, use a gasoline rated at 87 octane or higher as soon as possible. If you are using gasoline rated at 87 octane or higher and you hear heavy knocking, the engine needs service.

Gasoline Specifications

At a minimum, gasoline should meet ASTM specification D 4814 in the United States or CAN/CGSB-3.5 or 3.511 in Canada. Some gasolines contain an octane-enhancing additive called methylcyclopentadienyl manganese tricarbonyl (MMT). We recommend against the use of gasolines containing MMT. See *Additives on page 8-36* for additional information.

California Fuel

If the vehicle is certified to meet California Emissions Standards, it is designed to operate on fuels that meet California specifications. See the underhood emission control label. If this fuel is not available in states adopting California emissions standards, the vehicle will operate satisfactorily on fuels meeting federal specifications, but emission control system performance might be affected. The malfunction indicator lamp could turn on and the vehicle might fail a smog-check test. See *Malfunction Indicator Lamp on page 4-18*. If this occurs, return to your authorized dealer/retailer for diagnosis. If it is determined that the condition is caused by the type of fuel used, repairs might not be covered by the vehicle warranty.

Additives

To provide cleaner air, all gasolines in the United States are now required to contain additives that help prevent engine and fuel system deposits from forming, allowing the emission control system to work properly. In most cases, you should not have to add anything to the fuel. However, some gasolines contain only the minimum amount of additive required to meet U.S. Environmental Protection Agency regulations. To help keep fuel injectors and intake valves clean, or if the vehicle experiences problems due to dirty injectors or valves, look for gasoline that is advertised as TOP TIER Detergent Gasoline. Also, your dealer/retailer has additives that will help correct and prevent most deposit-related problems.

Gasolines containing oxygenates, such as ethers and ethanol, and reformulated gasolines might be available in your area.

We recommend that you use these gasolines, if they comply with the specifications described earlier. However, E85 (85% ethanol) and other fuels containing more than 10% ethanol must not be used in vehicles that were not designed for those fuels.

***Notice:* This vehicle was not designed for fuel that contains methanol. Do not use fuel containing methanol. It can corrode metal parts in the fuel system and also damage plastic and rubber parts. That damage would not be covered under the vehicle warranty.**

Some gasolines that are not reformulated for low emissions can contain an octane-enhancing additive called methylcyclopentadienyl manganese tricarbonyl (MMT); ask the attendant where you buy gasoline whether the fuel contains MMT.

We recommend against the use of such gasolines. Fuels containing MMT can reduce the life of spark plugs and the performance of the emission control system could be affected. The malfunction indicator lamp might turn on. If this occurs, return to your dealer/retailer for service.

Fuels in Foreign Countries

If you plan on driving in another country outside the United States or Canada, the proper fuel might be hard to find. Never use leaded gasoline or any other fuel not recommended in the previous text on fuel. Costly repairs caused by use of improper fuel would not be covered by the vehicle warranty.

To check the fuel availability, ask an auto club, or contact a major oil company that does business in the country where you will be driving.

Special Service Campaign 9LA
Certain 2006 - 2007 GS, 2006 - 2008 IS and 2007 - 2008 LS vehicles
Fuel Delivery Pipe Replacement (Safety Recall)

Dear Lexus Customer:

This notice is being sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act. Lexus has decided that a defect, which relates to motor vehicle safety, exists in certain 2006 through 2007 GS 300/350, 2006 through 2008 model year IS 250/350, and 2007 through 2008 LS 460/LS 460L vehicles.

What is the condition?

Your vehicle is equipped with aluminum Fuel Delivery Pipes (Fuel Rails). Lexus has determined that ethanol fuels with a low moisture content will corrode the internal surface of the fuel rails. As this condition progresses, the engine Malfunction Indicator Light may illuminate. Over time, the corrosion will create a pinhole resulting in fuel leakage. In the worst case, fuel leakage in the presence of an ignition source could result in a fire.

What will Lexus do?

Your Lexus dealer will replace the involved Fuel Delivery Pipes with newly designed ones at **NO CHARGE**.

What should you do?

This is an important Safety Recall

Please make an appointment with your authorized Lexus dealer to replace the involved Fuel Delivery Pipes as soon as possible. The repair will take approximately three hours for GS and IS vehicles. LS vehicles will require approximately seven hours for the repair. However, depending upon the dealer's work schedule, it may be necessary to make your vehicle available for a longer period of time.

We request that you present this notice to the dealer at the time of your service appointment.

If you would like to update your vehicle ownership or contact information, you may do so by registering at www.lexus.com/owners. You will need your full 17-digit Vehicle Identification Number (VIN) to input the new information.

What if you have other questions?

Your local Lexus dealer will be more than happy to answer any of your questions and set up an appointment to perform the repair. If you require further assistance, you may contact the Lexus Customer Assistance Center at 1-800-255-3987 Monday through Friday, 5:00 am to 6:00 pm, Saturday 7:00 am through 4:00 pm Pacific Standard Time.

If you believe that the dealer or Lexus has failed or is unable to remedy the defect within a reasonable time, you may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue S.E., Washington, D.C. 20590, or call the toll free Vehicle Safety Hot Line at 1-888-327-4236 (TTY: 1-800-424-9153), or go to <http://www.safercar.gov>.

If you are a vehicle lessor, Federal law requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten days.

We have sent this notice in the interest of your continued satisfaction with our products, and we sincerely regret any inconvenience this condition may have caused you.

Thank you for driving a Lexus.

Sincerely,

Lexus Division
TOYOTA MOTOR SALES, U.S.A., INC.