

## **SECTION 6-2**

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### **SERVICE PROCEDURES AND SPECIFICATIONS**

#### **Engine**

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## ENGINE

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### SPECIFICATIONS

#### – GENERAL

Model	3UZ-FE
Type	8 cylinder V type, 4 cycle, gasoline
Bore and stroke	91.0 X 82.5 mm (3.58 X 3.25 in.)
Displacement	4293 cm <sup>3</sup> (262.0 cu.in.)
Valve clearance (engine cold)	
Intake	0.15 – 0.25 mm (0.006 – 0.010 in.)
Exhaust	0.25 – 0.35 mm (0.010 – 0.014 in.)
Drive belt tension	Automatic adjustment

#### – FUEL

Fuel type	Only UNLEADED
Octane rating	91 (Research octane number 96) or higher

**– LUBRICATION SYSTEM**

“Toyota Genuine Motor Oil” is filled in your Lexus vehicle. Use Lexus approved “Toyota Genuine Motor Oil” or equivalent to satisfy the following grade and viscosity.

Oil capacity  
Drain and refill  
    with filter  
    without filter

Oil grade

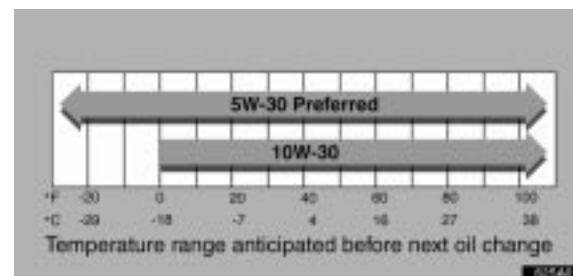
Recommended oil viscosity (SAE):

5.2 L (5.5 qt., 4.5 Imp.qt.)

4.6 L (4.9 qt., 4.0 Imp.qt.)

API grade SJ “Energy–Conserving”, SL

“Energy–Conserving” or ILSAC multigrade engine oil



Please contact your Lexus dealer for further details.

## ENGINE

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### – COOLING SYSTEM

“Toyota Genuine Long Life Coolant” is filled in your Lexus vehicle. In order to avoid technical problems, we strongly recommend using “Toyota Genuine Long Life Coolant” or equivalent.

Capacity	9.9 L (10.5 qt., 8.7 Imp.qt.)
Coolant type	“Toyota Genuine Long Life Coolant” or equivalent With ethylene–glycol type coolant for a proper corrosion protection of aluminum components Do not use alcohol type antifreeze or plain water alone.

Please contact your Lexus dealer for further details.

### – IGNITION SYSTEM

Spark plug	– Make	DENSO	SK20R11
		NGK	IFR6A11
	– Gap		1.1 mm (0.043 in.)

### – ELECTRICAL SYSTEM

Battery	Open voltage at 20°C (68°F):	12.8 V	Fully charged
		12.4 V	Half charged
		12.0 V	Discharged
		[Voltage that is checked 20 minutes after the key is removed with all the lights turned off]	
	Charging rates	5A max.	

## FUEL

### Fuel type

**Your vehicle must use only unleaded gasoline.**

To help prevent gas station mixups, your Lexus has a smaller fuel tank opening. The special nozzle on pumps with unleaded fuel will fit it, but the larger standard nozzle on pumps with leaded gas will not.

At a minimum, the gasoline you use should meet the specifications of ASTM D4814 in the U.S.A. and CGSB 3.5-M93 in Canada.

### **NOTICE**

***Do not use leaded gasoline. Use of leaded gasoline will cause the three-way catalytic converter to lose its effectiveness and the emission control system to function improperly. Also, this can increase maintenance costs.***

### Octane rating

**Select premium unleaded gasoline with an Octane Rating of 91 (Research Octane Number 96) or higher for optimum engine performance. However, if such premium type cannot be obtained, you may temporarily use unleaded gasoline with an Octane Rating as low as 87 (Research Octane Number 91).**

Use of unleaded fuel with an octane number or rating lower than stated above will cause persistent heavy knocking. If severe, this will lead to engine damage.

### **If your engine knocks ...**

If you detect heavy knocking even when using the recommended fuel, or if you hear steady knocking while holding a steady speed on level roads, consult your Lexus dealer.

However, now and then, you may notice light knocking for a short time while accelerating or driving up hills. This is no cause for concern.

### **Gasoline containing detergent additives**

**Lexus recommends the use of gasoline that contains detergent additives to avoid build-up of engine deposits.**

However, all gasoline sold in the U.S. contains detergent additives to keep clean and/or clean intake systems.

## ENGINE

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### Quality gasoline

Automotive manufacturers in the U.S., Europe and Japan have developed a specification for quality fuel named World-Wide Fuel Charter (WWFC) that is expected to be applied world wide. The WWFC consists of three categories that depend on required emission levels. In the U.S., category 3 has been adopted. The WWFC improves air quality by providing for better emissions in vehicle fleets, and customer satisfaction through better vehicle performance.

### Cleaner burning gasoline

**Cleaner burning gasoline, including reformulated gasoline that contains oxygenates such as ethanol or MTBE is available in many areas.**

Lexus 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.

### Oxygenates in gasoline

Lexus allows the use of oxygenate blended gasoline where the oxygenate content is up to 10% ethanol or 15% MTBE. If you use gasohol in your Lexus, be sure that it has an octane rating no lower than 87.

Lexus does not recommend the use of gasoline containing methanol.

### Gasoline containing MMT

**Some gasoline contain an octane enhancing additive called MMT (Methylcyclopentadienyl Manganese Tricarbonyl).**

Lexus 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 Lexus dealer for service.

### Gasoline quality

In a very few cases, you may experience driveability problems caused by the particular gasoline that you are using. If you continue to have unacceptable driveability, try changing gasoline brands. If this does not rectify your problem, then consult your Lexus dealer.

#### **NOTICE**

- ***Do not use gasohol other than stated above. It will cause fuel system damage or vehicle performance problems.***
- ***If drivability problems are encountered (poor hot starting, vaporizing, engine knock, etc.), discontinue its use.***

- *Take care not to spill gasohol during refueling. Gasohol may cause paint damage.*

**Fuel tank capacity**

75 L (19.8 gal., 16.5 Imp.gal.)

**FUEL PUMP SHUT OFF SYSTEM**

The fuel pump shut off system stops supplying fuel to the engine to minimize the risk of fuel leakage when the engine stalls or an airbag inflates upon collision. To restart the engine after the fuel pump shut off system activates, turn the ignition switch to “ACC” or “LOCK” once and start it.

**CAUTION**

**Inspect the ground under the vehicle before restarting the engine. If you find that liquid has leaked onto the ground, it is the fuel system that has been damaged and it is in need of repair. In this case, do not restart the engine.**

## ENGINE

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### FACTS ABOUT ENGINE OIL CONSUMPTION

#### Functions of engine oil

Engine oil has the primary function of lubricating and cooling the inside of the engine, and plays a major role in maintaining the engine in proper working order.

#### Engine oil consumption

**It is normal that an engine should consume some engine oil during normal engine operation. The causes of oil consumption in a normal engine are as follows.**

- Oil is used to lubricate pistons, piston rings and cylinders. A thin film of oil is left on the cylinder wall when a piston moves downwards in the cylinder. High negative pressure generated when the vehicle is decelerating sucks some of this oil into the combustion chamber. This oil as well as some part of the oil film left on the cylinder wall is burned by the high temperature combustion gases during the combustion process.
- Oil is also used to lubricate the stems of the intake valves. Some of this oil is sucked into the combustion chamber together with the intake air and is burned along with the fuel. High temperature exhaust gases also burn the oil used to lubricate the exhaust valve stems.

**The amount of engine oil consumed depends on the viscosity of the oil, the quality of the oil and the way the vehicle is driven.**

More oil is consumed by high-speed driving and frequent acceleration and deceleration.

A new engine consumes more oil, since its pistons, piston rings and cylinder walls have not become conditioned.

**When judging the amount of oil consumption, keep in mind that the oil may have become diluted, making it difficult to judge the true level accurately.**

For example, if a vehicle is used for repeated short trips and consumes a normal amount of oil, the dipstick may not show any drop in the oil level at all, even after 1000 km (600 miles) or more. This is because the oil is gradually becoming diluted with fuel or moisture, making it appear that the oil level has not changed.

The diluting ingredients evaporate out when the vehicle is then driven at high speeds, as on an expressway, making it appear that oil is excessively consumed after driving at high speeds.



### Importance of engine oil level check

One of the most important points in proper vehicle maintenance is to keep the engine oil at the optimum level so that oil function will not be impaired. Therefore, it is essential that the oil level be checked regularly. Lexus recommends that the oil level be checked every time you refuel the vehicle.

#### **NOTICE**

***Failure to check the oil level regularly could lead to serious engine trouble due to insufficient oil.***

For detailed information on oil level check, see "Checking the engine oil level" on page 296.

### USED ENGINE OIL



#### **CAUTION**

- Used engine oil contains potentially harmful contaminants which may cause skin disorders such as inflammation or skin cancer, so care should be taken to avoid prolonged and repeated contact with it. To remove used engine oil from your skin, wash thoroughly with soap and water.
- Do not leave used oil within the reach of children.
- Dispose of used oil and used oil filters only in a safe and acceptable manner. Do not dispose of used oil and used oil filters in household trash, in sewers or onto the ground. Call your Lexus dealer or a service station for information concerning recycling or disposal.

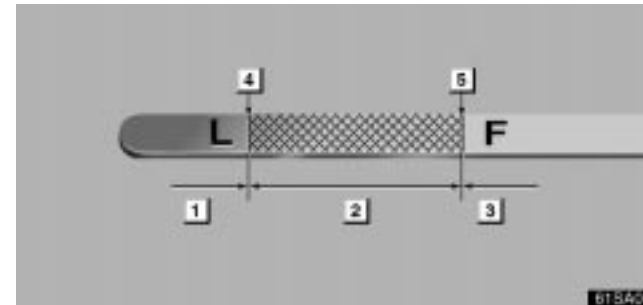
## ENGINE

### CHECKING THE ENGINE OIL LEVEL



**With the engine at operating temperature and turned off, check the oil level on the dipstick.**

1. To get a true reading, the vehicle should be on a level spot. After turning off the engine, wait a few minutes for the oil to drain back into the bottom of the engine.
2. Pull the dipstick out, hold a rag under the end and wipe it clean.
3. Standing up on the left side of the vehicle, reinsert the dipstick in the direction so that the "ENGINE OIL" on top should be read correctly and push it in as far as it will go, or the reading will not be correct.



**1 Add oil 2 O.K. 3 Too full**

4. Pull the dipstick out and look at the oil level while holding a rag under the end. If it is between the full line ( **5** ) and the low line ( **4** ), it is O.K.

#### **NOTICE**

***Be careful not to drop the engine oil on the vehicle components.***



**If the oil level is below or only slightly above the low level mark, add engine oil of the same type as already in the engine.**

Remove the oil filler cap and add engine oil a little at a time, checking the dipstick. We recommend that you use a funnel when adding oil. The approximate quantity of oil needed to fill between the low level mark and the full level mark on the dipstick is indicated below for reference.

When the level reaches within the correct range, return the filler cap and turn the cap clockwise until you hear a click.

Oil quantity. L (qt., Imp. qt.)

1.5 (1.6, 1.3)

**NOTICE**

- *Be careful not to spill the engine oil on the vehicle components.*
- *Avoid overfilling, or the engine could be damaged.*
- *Check the oil level on the dipstick once again after adding the oil.*

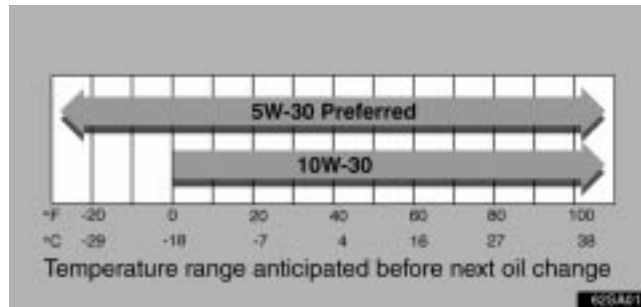
## ENGINE

### Engine oil selection

"Toyota Genuine Motor Oil" is filled in your Lexus vehicle. Use Lexus approved "Toyota Genuine Motor Oil" or equivalent to satisfy the following grade and viscosity.

Oil grade: API grade SJ "Energy-Conserving", SL "Energy-Conserving" or ILSAC multigrade engine oil.

Recommended viscosity (SAE):



**SAE 5W-30 is the best choice for your vehicle, for good fuel economy, and good starting in cold weather.**

**If you use SAE 10W-30 engine oil in extremely low temperatures, the engine may become difficult to start, so SAE 5W-30 engine oil is recommended.**

### Oil identification marks



#### ► API Service Symbol

#### ► ILSAC Certification Mark

Either or both API registered marks are added to some oil containers to help you select the oil you should use.

- The API Service Symbol is located anywhere on the outside of the container.

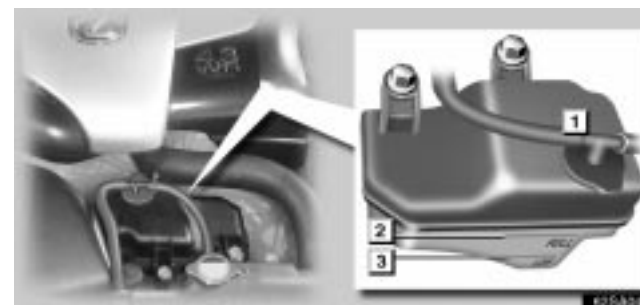
The top portion of the label shows the oil quality by API (American Petroleum Institute) designation such as SL. The center portion of the label shows the SAE viscosity grade such as SAE 5W-30. "Energy-Conserving", shown in the lower portion, indicates that the oil has fuel-saving capabilities.

- The ILSAC (International Lubricant Standardization and Approval Committee) Certification Mark is displayed on the front of the container.

To ensure the best possible lubrication performance for your engine, the "Toyota Genuine Motor Oil" range is available, which has been specifically tested and approved for all Lexus engines.

Please contact your Lexus dealer for further details of the "Toyota Genuine Motor Oil" range.

## CHECKING THE ENGINE COOLANT LEVEL



► **1** Reservoir cap **2** Upper line **3** Lower line

**Look at the see-through coolant reservoir when the engine is cold. The coolant level is satisfactory if it is between the "FULL" and "LOW" lines on the reservoir. If the level is low, add ethylene-glycol type coolant for a proper corrosion protection of aluminum components.**

The coolant level in the reservoir will vary with engine temperature. However, if the level is on or below the "LOW" line, add coolant. Bring the level up to the "FULL" line.

Always use ethylene-glycol type coolant for a proper corrosion protection of aluminum components. See information in the next column.

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If the coolant level drops within a short time after replenishing, there may be a leak in the system. Visually check the radiator, hoses, engine coolant filler cap, radiator cap and drain cock and water pump.

If you can find no leak, have your Lexus dealer test the cap pressure and check for leaks in the cooling system.



### **CAUTION**

**To prevent burning yourself, do not remove the radiator cap when the engine is hot.**

## **Coolant type selection**

Use of improper coolants may damage your engine cooling system. Your coolant must contain ethylene–glycol type coolant for a proper corrosion protection of your engine that contains aluminum components. We have used “Toyota Genuine Long Life Coolant” in your Lexus vehicle. In order to avoid technical problems, we strongly recommend using “Toyota Genuine Long Life Coolant” or equivalent.

In addition to preventing freezing and subsequent damage to the engine, this type of coolant will also prevent corrosion. Further supplemental inhibitors or additives are neither needed nor recommended.

Read the coolant container for information on freeze protection. Follow the manufacturer's directions for how much to mix with plain water (preferably demineralized water or distilled water). The total capacity of the cooling system is given on pages 290.

We recommend to use 50% solution for your Lexus, to provide protection down to about  $-35^{\circ}\text{C}$  ( $-31^{\circ}\text{F}$ ). When it is extremely cold, to provide protection down to about  $-50^{\circ}\text{C}$  ( $-58^{\circ}\text{F}$ ), 60% solution is recommended. Do not use more than 70% solution for better coolant performance.

### **NOTICE**

***Do not use alcohol type antifreeze or plain water alone.***

The engine cooling system is integral to maximizing performance of your Lexus vehicle. In line with this, it is strongly recommended that you use "Toyota Genuine Long Life Coolant" for protecting the system, as it is an ethylene-glycol based premium antifreeze coolant with excellent corrosion protection properties that has been specifically formulated for use in Lexus vehicles.

Please contact your Lexus dealer for further details of the "Toyota Genuine Long Life Coolant" range.

## CHECKING THE RADIATOR AND CONDENSER

If either of the above parts are extremely dirty or you are not sure of their condition, take your vehicle to Lexus dealer.



### CAUTION

**To prevent yourself from burning, be careful not to touch the radiator or condenser when the engine is hot.**

### NOTICE

***To prevent damage to the radiator and condenser, do not perform the work by yourself.***

## ENGINE

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### SPARK PLUGS



Your engine is fitted with iridium-tipped spark plugs.

#### **NOTICE**

*Use only iridium-tipped spark plugs and do not adjust gaps for your engine performance and smooth drivability.*