

March 2008

## Topic

Importance of using recommended tightening torque during spark plug installations.

## Issue

Applying excessive amounts of torque than specified for spark plug installation may result in expensive damage to the engine. The use of excessive tightening often compresses the plug's gasket beyond its normal operating thickness and minimizes the spark plugs heat dissipating functionality. This creates higher temperature buildups around the firing end of the plug and eventually can lead to the melting of the ground-electrode inside the cylinder. In addition to this, the use of excessive torque during installation may also result in breaking the spark plug below the hex or at the gasket and damaging the threads of the cylinder head.

On the contrary, insufficient torque of the plug can also cause damage to both the piston and spark plug. An insufficiently torqued plug often causes pre-ignition because heat-transfer is compromised and excessive looseness may damage the insulator (Top Portion) of the plug due to continuous vibrations.

## Solution

Always use OEM or manufacturer recommended tightening torques when available. Tighten the spark plug finger tight first, once the seat contacts the cylinder head, use a plug socket to tighten. Refer to recommended tightening torques and tightening angles as shown below.

### **Recommended Torque Specifications**

SPARK PLUG THREAD SIZE	CAST IRON HEADS		ALUMINUM HEADS	
	WITH TORQUE WRENCH	WITHOUT TORQUE WRENCH	WITH TORQUE WRENCH	WITHOUT TORQUE WRENCH
<b>FLAT SEAT w / GASKET</b>				
18mm	3.5 kg-m ~ 4.5 kg-m 25.3 lb-ft ~ 32.5 lb-ft	1/2-2/3 turn 180°-240°	3.5 kg-m ~ 4.0 kg-m 25.3 lb-ft ~ 28.9 lb-ft	1/2-2/3 turn 180°-240°
14mm	2.5 kg-m ~ 3.5 kg-m 18.0 lb-ft ~ 25.3 lb-ft	1/2-2/3 turn 180°-240°	2.5 kg-m ~ 3.0 kg-m 18.0 lb-ft ~ 21.6 lb-ft	1/2-2/3 turn 180°-240°
12mm	1.5 kg-m ~ 2.5 kg-m 10.8 lb-ft ~ 18.0 lb-ft	1/2-2/3 turn 180°-240°	1.5 kg-m ~ 2.0 kg-m 10.8 lb-ft ~ 14.5 lb-ft	1/2-2/3 turn 180°-240°
10mm	1.0 kg-m ~ 1.5 kg-m 7.2 lb-ft ~ 10.8 lb-ft	1/2-2/3 turn 180°-240°	1.0 kg-m ~ 1.2 kg-m 7.2 lb-ft ~ 8.7 lb-ft	1/2-2/3 turn 180°-240°
<b>TAPERED SEAT</b>				
18mm	2.0 kg-m ~ 3.0 kg-m 14.5 lb-ft ~ 21.6 lb-ft	1/12-1/8 turn 30°-45°	2.0 kg-m ~ 3.0 kg-m 14.5 lb-ft ~ 21.6 lb-ft	1/12-1/8 turn 30°-45°
14mm	1.5 kg-m ~ 2.5 kg-m 10.8 lb-ft ~ 18.0 lb-ft	1/12-1/8 turn 30°-45°	1.0 kg-m ~ 2.0 kg-m 7.2 lb-ft ~ 14.4 lb-ft	1/12-1/8 turn 30°-45°

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