Engine Fastener Guidelines for 2007-2016 Hyundai/Kia Automotive Engines

The AERA Technical Committee offers the following guidelines for major engine fasteners for 2007-2016 Hyundai/Kia automotive engines. These guidelines should be considered before the heads, crankshafts or connecting rods are being serviced.

As Hyundai and Kia automotive companies share most engine platforms, this information applies regardless of previously published information. Refer to the charts and information below keeping in mind obtaining new fasteners is required before final assembly is attempted.

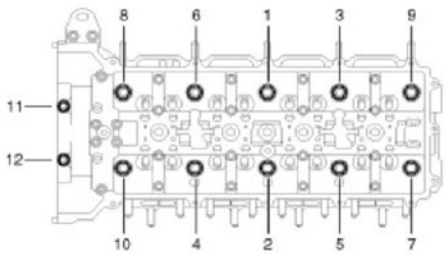
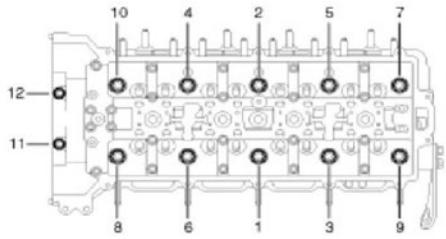
This bulletin provides information regarding the appropriate tightening torques of the cylinder head, connecting rod and main bearing bolts that must be fastened by the torque-angle method. When performing engine repairs on the models listed below, a torque wrench and torque angle gauge must be used to ensure accurate tightening of the bolts.

Engine		Affected Model
Alpha	1.6L	Accent (MC)
Beta	2.0L	Elantra (HD), Elantra Touring (FD), Tucson (JM)
Theta	2.0L	Genesis coupe (BK)
	2.4L	Sonata (NF)
Mu	2.7L	Santa Fe (CM), Tucson (JM)
Lambda	3.3L	Sonata (NF), Genesis (BH), Santa Fe (CM)
	3.8L	Genesis (BH), Genesis Coupe (BK), Veracruz (EN), Entourage (EP), Azera (TG)
Tau	4.6L	Genesis (BH)

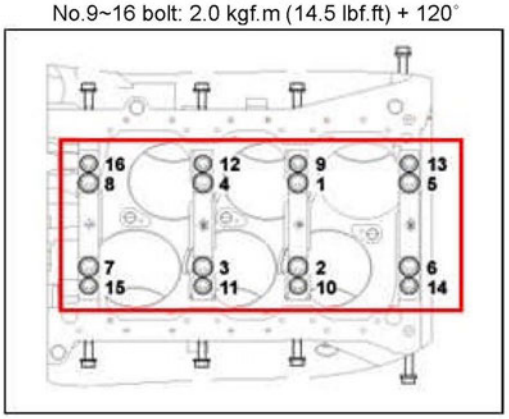
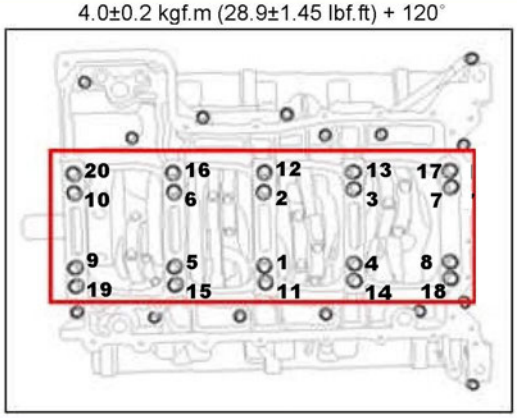
Connecting Rod Cap Bolts:

Engine		Tightening Torque	Remarks
Theta	2.0L	2.0±0.2 kgf.m (14.5±1.45 lbf.ft) + 90±2°	Once a connecting rod cap bolt is removed, be sure to replace it with new one.
	2.4L		
Mu	2.7L	2.0±0.2 kgf.m (14.5±1.45 lbf.ft) + 90~94°	
Lambda	3.3L	2.0±0.2 kgf.m (14.5±1.45 lbf.ft) + 90±2°	
	3.8L		
Tau	4.6L	2.5±0.2 kgf.m (18.1±1.45 lbf.ft) + 100±2°	

Cylinder Head Bolts:

Engine		Tightening Torque	Remarks
Alpha	1.6L	3.0kgf.m (21.7 lbf.ft) + 90°→ Loosen → 3.0kgf.m (21.7 lbf.ft) + 90°	Once a cylinder head bolt is removed, be sure to replace it with new one.
Beta	2.0L	M10 bolt: 2.5±0.2 kgf.m (18.1±1.45 lbf.ft) + 60~65°+ 60~65° M12 bolt: 3.0±0.2 kgf.m (21.7±1.45 lbf.ft) + 60~65°+ 60~65°	
Theta	2.0L 2.4L	3.5±0.2 kgf.m (25.3±1.45 lbf.ft) + 90~95°+ 90~95°	
Mu	2.7L	2.5±0.2 kgf.m (18.1±1.45 lbf.ft) + 60±2°+ 45±2°	
Lambda	3.3L 3.8L	4.0±0.2 kgf.m (28.9±1.45 lbf.ft) + 120±2°+ 90±2°	
Tau	4.6L	3.5±0.2 kgf.m (25.3±1.45 lbf.ft) + 90±2°+ 120±2° LH  RH 	

Main Bearing Cap Bolts:

<table>
<tr><th colspan="2">Engine</th><th>Tightening Torque</th><th>Remarks</th></tr>
<tr><td>Beta</td><td>2.0L</td><td>3.0±0.2 kgf.m (21.7±1.45 lbf.ft) + 60~64°</td><td rowspan="5">Once a main bearing cap bolt is removed, be sure to replace it with new one.</td></tr>
<tr><td rowspan="2">Theta</td><td>2.0L</td><td rowspan="2">1.5+3.0±0.2 kgf.m (10.9+21.7±1.45 lbf.ft) + 120~125°</td></tr>
<tr><td>2.4L</td></tr>
<tr><td>Mu</td><td>2.7L</td><td>M8 bolt: 1.6±0.3 kgf.m (11.6±2.17 lbf.ft)+ 90~95°
M10 bolt: 3.0±0.3 kgf.m (21.7±2.17 lbf.ft) + 90~95°</td></tr>
<tr><td rowspan="2">Lambda</td><td>3.3L</td><td rowspan="2">No.1~8 bolt: 5.0 kgf.m (36.2 lbf.ft) + 90°,
No.9~16 bolt: 2.0 kgf.m (14.5 lbf.ft) + 120°
 
</td></tr>
<tr><td>3.8L</td></tr>
<tr><td>Tau</td><td>4.6L</td><td>4.0±0.2 kgf.m (28.9±1.45 lbf.ft) + 120°
 
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