

Special tools

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- Camshaft locking tool - No.KM-932.
- Injection pump locking pin - No.KM-927.
- Crankshaft locking pin - No.KM-929.

General precautions

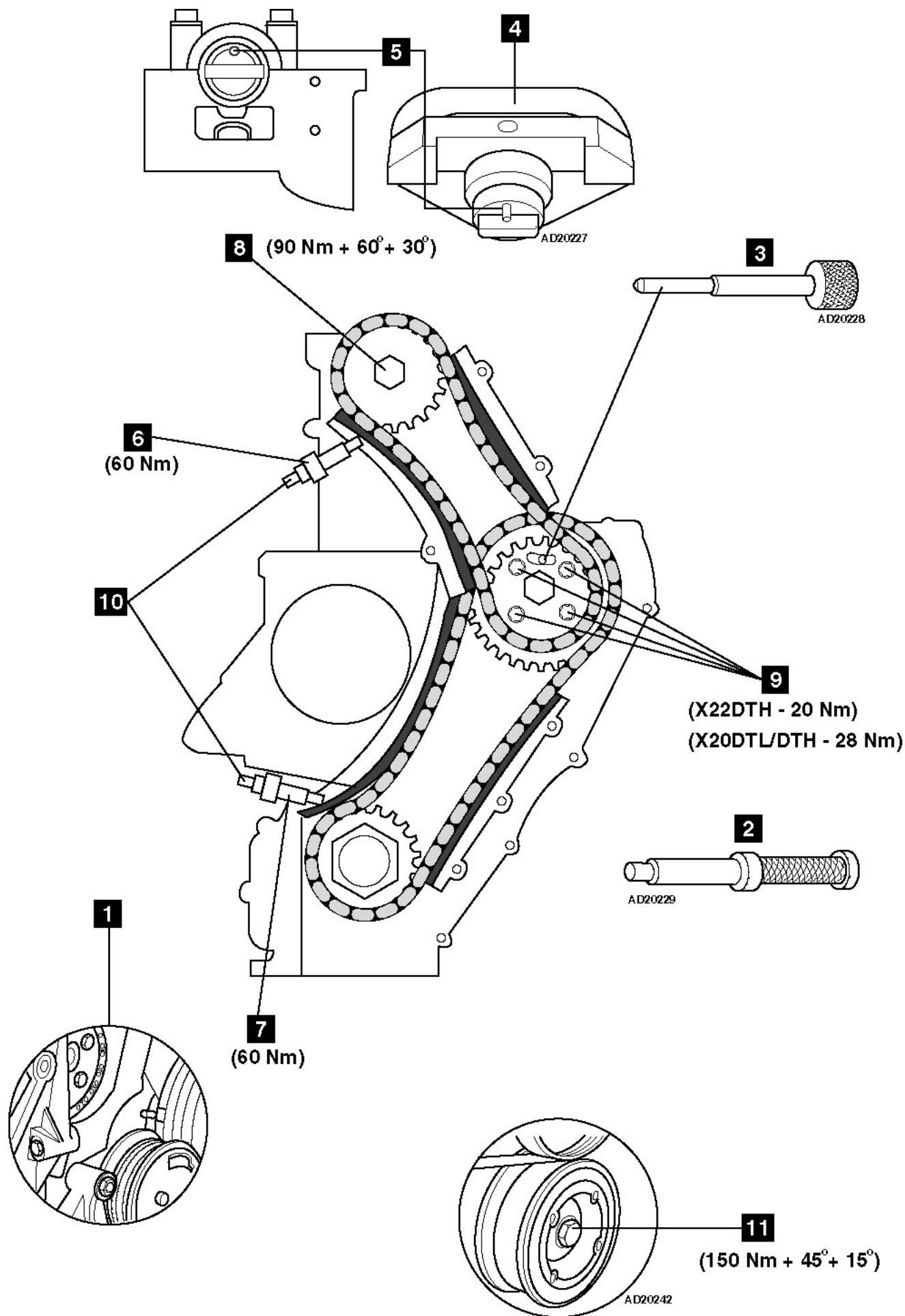
General precautions

- Disconnect battery earth lead.
- Remove glow plugs to ease turning engine.
- Turn engine in normal direction of rotation (unless otherwise stated).
- DO NOT use special tools listed above to lock engine when slackening sprocket bolts.
- Observe tightening torques.
- If fitted: Mark position of crankshaft position (CKP) sensor before removal.
- Do NOT turn crankshaft via camshaft or other sprockets.
- Do NOT turn crankshaft or camshaft with timing chain removed.
- Check diesel injection pump timing after resetting valve timing.

Valve timing procedures

Valve timing procedures

- Turn crankshaft until just before TDC mark on No.1 cylinder [1].
- Ensure No.1 cylinder camshaft lobes are facing upwards.
- Remove crankshaft position (CKP) sensor.
- Slowly turn crankshaft clockwise until locking pin can be inserted in crankshaft [2]. Tool No.KM-929.
- Insert locking pin in hole in injection pump [3]. Tool No.KM-927.
- Fit locking tool to rear of camshaft [4]. Tool No.KM-932.
- Ensure peg locates in camshaft [5].
- Remove chain tensioners [6] & [7].
- If necessary, slacken camshaft sprocket bolt and injection pump sprocket bolts to adjust valve timing position [8] & [9].
- If a new timing chain tensioner is fitted, release by pressing pin until click is heard [10].
- Ensure pin can be pushed in fully with thumb pressure and returns to original position [10].
- If slackened, fit new camshaft sprocket bolt [8].
- Fit new crankshaft pulley bolt.
- Tighten crankshaft pulley bolt to 150 Nm + 45° + 15° [11].



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