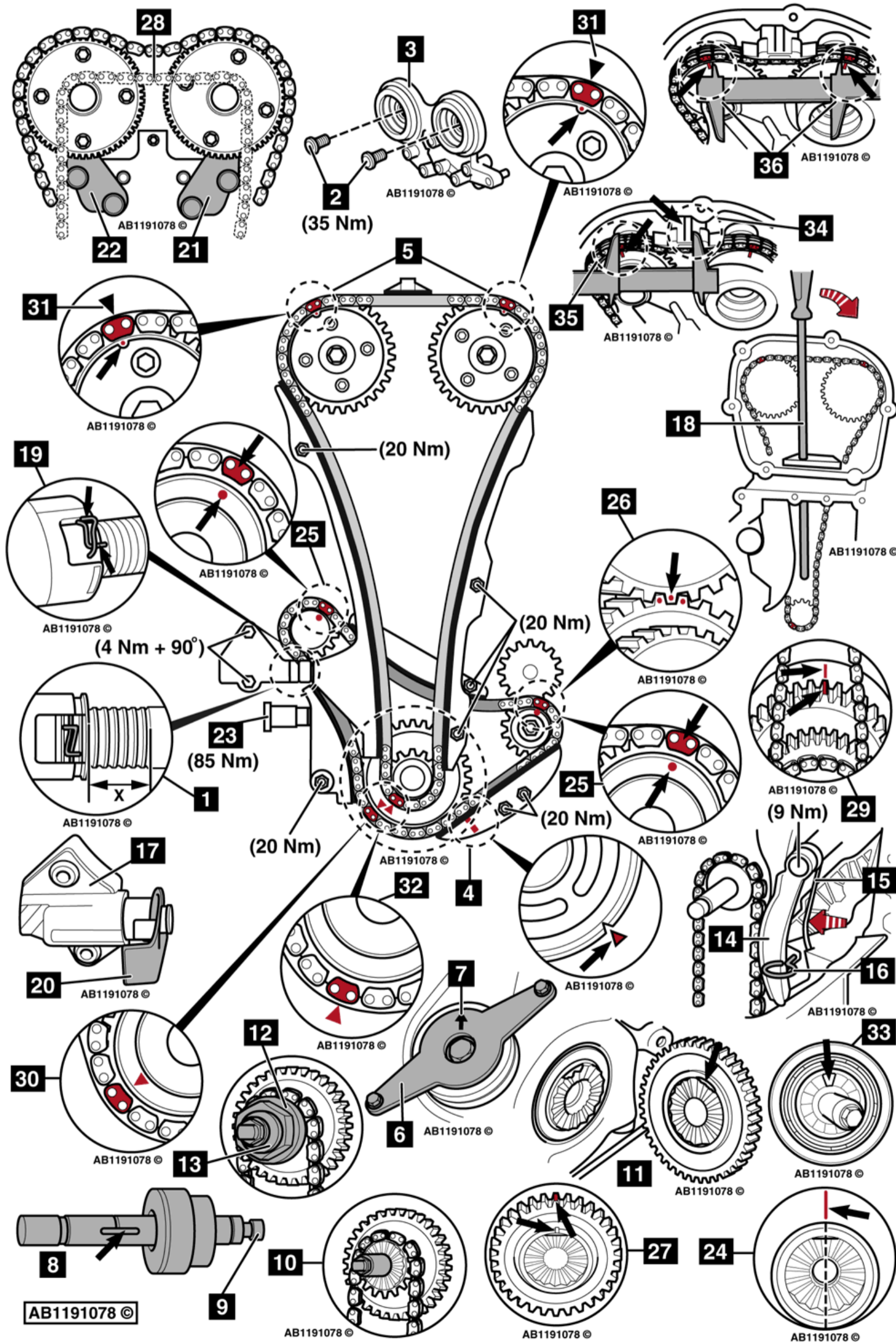


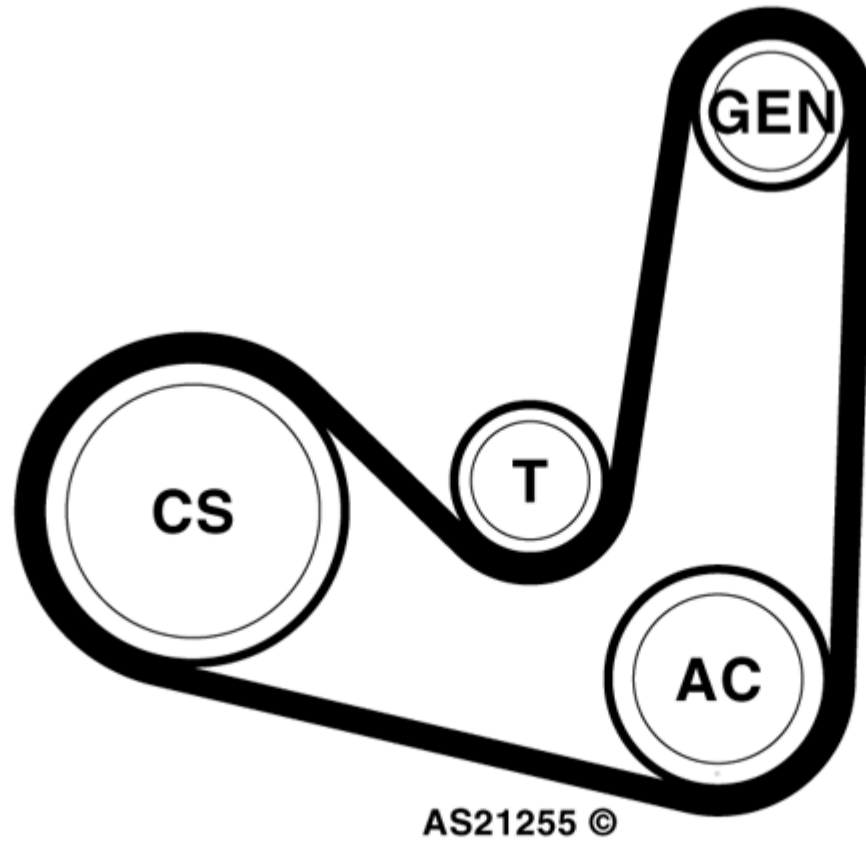
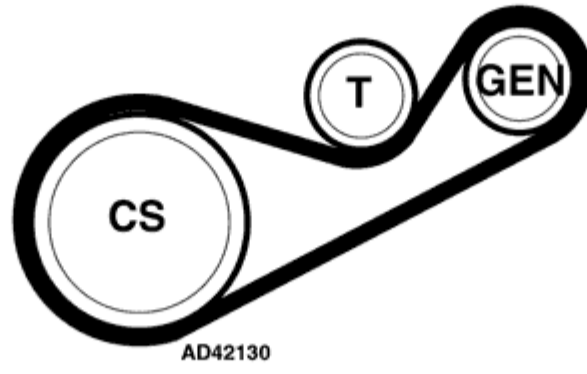
Timing chain

Audi A3 Saloon

CJSB/1.8 (8VS) (13-16)



Auxiliary drive belt



Special tools

- Camshaft adjuster control valve removal tool - No.T10352/1/2/3/4.
 - Camshaft adjuster holding/turning tool - No.T40266.
 - Camshaft adjuster holding tool - No.T40271/1/2.
 - Crankshaft sprocket holding tool - No.T10531/2.
 - Crankshaft sprocket holding tool adapter - No.T10531/3.
 - Crankshaft sprocket holding tool nut - No.T10531/4.
 - Crankshaft pulley holding spanner - No.T10355.
 - Crankshaft pulley holding tool - No.T10531/1.
 - Crankshaft turning tool 1 - No.T40263.
 - Crankshaft turning tool 2 - No.T40314.
 - Dial gauge - No.VAS 6341.
 - Dial gauge adapter - No.T10170 A.
 - Timing chain tensioner compressor tool - No.T40243.
 - Tensioner locking tool - No.T40267.
 - Oil pump chain tensioner locking pin - No.T40011.
-

General precautions

- Disconnect battery earth lead.
 - Remove spark plugs to ease turning engine.
 - Turn engine in normal direction of rotation (unless otherwise stated).
 - 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.
-

Valve timing procedures

Removal

Warning: Engines with variable valve timing: Mark camshafts, camshaft sprockets, camshaft adjusters and related camshaft drive system components (as applicable) with chalk or paint prior to removal or dismantling to assist alignment on installation.

- Check timing chain for wear:
 - Remove blanking plug from lower timing cover.
 - Turn crankshaft clockwise until tensioner plunger at maximum protrusion.
 - Count tensioner plunger notches **1**.
 - If six or fewer notches on tensioner plunger visible through hole in timing chain cover: Reset position adaptation for camshaft drive system. Engine control module (ECM) parameters can only be reset using diagnostic equipment.
 - If seven notches or more on tensioner plunger visible through hole in timing chain cover: Renew timing chain.

Note: If renewing timing chain: Reset position adaptation for camshaft drive system. Engine control module (ECM) parameters can only be reset using diagnostic equipment.

- Remove upper timing chain cover.
- Remove camshaft adjuster control valves (LH thread) **2**.
- Remove camshaft support bracket **3**.

- Ensure engine at TDC. Use dial gauge.
- Ensure crankshaft pulley timing mark aligned with timing mark on chain cover **4**.
- Ensure timing mark on each camshaft adjuster positioned as shown **5**.
- Secure crankshaft sprocket to crankshaft as follows:
 - Slacken crankshaft pulley bolt 180°.
 - Install crankshaft pulley holding tool **6**.

Note: Ensure arrow at 12 o'clock **7**.

- Remove crankshaft pulley bolt.
- Ensure crankshaft sprocket holding tool adapter slides over locking tabs **8**.
- If necessary, slacken bolt of crankshaft sprocket holding tool **9**.
- Install crankshaft sprocket holding tool **10**.
- Tighten crankshaft sprocket holding tool bolt finger tight **9**.
- Remove crankshaft pulley holding tool **6**.
- Remove crankshaft pulley.

Note: Crankshaft sprocket not keyed to crankshaft **11**.

- Install crankshaft sprocket holding tool adapter **12**.
- Install crankshaft sprocket holding tool nut **13**. Tighten crankshaft sprocket holding tool nut finger tight.
- Remove lower timing chain cover.
- Lock oil pump chain tensioner in retracted position **14**:
 - Push tensioner rail spring in direction of arrow **15**.
 - Insert oil pump chain tensioner locking pin **16**.
- Remove oil pump chain tensioner **14**.
- Reset timing chain tensioner **17**:
 - Install timing chain tensioner compressor tool **18**.
 - Release tensioner plunger retaining clip **19**.
 - Push timing chain tensioner compressor tool in direction of arrow **18**.
 - Insert tensioner locking tool **20**.
- Fit camshaft adjuster holding tool to inlet camshaft adjuster **21**.
- Rotate inlet camshaft adjuster clockwise or anti-clockwise using camshaft adjuster holding/turning tool until camshaft adjuster holding tool can be fitted.
- Fit camshaft adjuster holding tool to exhaust camshaft adjuster **22**.
- Rotate exhaust camshaft adjuster clockwise using camshaft adjuster holding/turning tool until camshaft adjuster holding tool can be fitted.
- Remove timing chain tensioner, tensioner rail and chain guides.
- Remove balancer shaft chain tensioner **23**.
- Remove balancer shaft chain guides and tensioner rail.
- Remove crankshaft sprocket holding tool nut **13**.
- Remove crankshaft sprocket holding tool adapter **12**.
- If necessary, slacken bolt of crankshaft sprocket holding tool **9**.
- Remove crankshaft sprocket holding tool **10**.
- Remove crankshaft sprocket.
- Remove oil pump chain.
- Remove timing chain.
- Remove balancer shaft chain.

Installation

- Ensure crankshaft at TDC.
- Flat section on crankshaft must be in horizontal position **24**.
- Ensure timing mark on each camshaft adjuster positioned as shown **5**.
- Ensure timing mark on each balancer shaft sprocket positioned as shown **25**.
- Ensure timing marks of balancer shaft gears aligned **26**.
- Mark 12 o'clock position on cylinder block **24**.
- Mark tooth on crankshaft sprocket that aligns with mark on rear of crankshaft sprocket **27**.
- Install balancer shaft chain.
- Ensure coloured or painted chain links aligned with timing mark on each balancer shaft sprocket **25**.
- Install balancer shaft upper chain guide.
- Place timing chain on ends of camshafts as shown **28**.
- Install crankshaft sprocket and oil pump chain as an assembly.
- Ensure timing mark on crankshaft sprocket aligned with timing mark on cylinder block **29**.
- Install crankshaft sprocket holding tool **10**.
- Tighten crankshaft sprocket holding tool bolt finger tight **9**.
- Install crankshaft sprocket holding tool adapter **12**.
- Install crankshaft sprocket holding tool nut **13**. Tighten crankshaft sprocket holding tool nut finger tight.
- Fit balancer shaft chain to crankshaft sprocket.
- Ensure coloured or painted chain link aligned with timing mark on crankshaft sprocket **30**.
- Install balancer shaft lower chain guide and tensioner rail.
- Install balancer shaft chain tensioner **23**.
- Install timing chain to camshaft adjusters.
- Ensure coloured or painted chain links aligned with timing mark on each camshaft adjuster **31**.

- Fit timing chain to crankshaft sprocket.
- Ensure coloured or painted chain link aligned with timing mark on crankshaft sprocket **32**.
- Fit timing chain guides.
- Remove exhaust camshaft adjuster holding tool **22**.
- Rotate exhaust camshaft adjuster clockwise using camshaft adjuster holding/turning tool until camshaft adjuster holding tool can be removed.
- Rotate exhaust camshaft adjuster anti-clockwise using camshaft adjuster holding/turning tool until timing chain in contact with upper chain guide.
- Install timing chain tensioner and tensioner rail.
- Remove inlet camshaft adjuster holding tool **21**.
- Rotate inlet camshaft adjuster anti-clockwise using camshaft adjuster holding/turning tool until camshaft adjuster holding tool can be removed.
- Install oil pump chain tensioner **14**.
- Remove oil pump chain tensioner locking pin **16**.
- Fit camshaft support bracket **3**.
- Remove tensioner locking tool **20**.
- Fit camshaft adjuster control valves (LH thread) **2**. Tightening torque: 35 Nm.
- Turn crankshaft two turns clockwise to TDC.
- Install lower timing chain cover.
- Install crankshaft pulley as follows:
 - Remove crankshaft sprocket holding tool nut **13**.
 - Remove crankshaft sprocket holding tool adapter **12**.
 - Ensure plain segment on crankshaft sprocket at 12 o'clock position **33**.
 - Install crankshaft pulley.

Note: Ensure plain segments on crankshaft sprocket and on crankshaft pulley aligned **33**.

- Install crankshaft sprocket holding tool adapter **12**.

Note: Install crankshaft sprocket holding tool adapter with hexagon facing crankshaft sprocket.

- Install crankshaft sprocket holding tool nut **13**. Tighten crankshaft sprocket holding tool nut finger tight.
- Install crankshaft pulley holding tool **6**.
- Remove crankshaft sprocket holding tool nut **13**.
- Remove crankshaft sprocket holding tool adapter **12**.
- Remove crankshaft sprocket holding tool **10**.
- Fit new crankshaft pulley bolt. Finger tighten bolt.
- Remove crankshaft pulley holding tool **6**.
- Tighten crankshaft pulley bolt to 150 Nm + 90°.
- Checking valve timing without cylinder head cover timing marks present:
 - Ensure engine at TDC. Use dial gauge.
 - Ensure crankshaft pulley timing mark aligned with timing mark on chain cover **4**.
 - Ensure timing mark on each camshaft adjuster positioned as shown **5**.
 - Check measurement between outer edge of raised cast section on upper chain guide and timing mark on exhaust camshaft adjuster is 74-77 mm **34** & **35**.

Note: If measurement outside tolerance, repeat timing chain installation procedure.

- Check measurement between inlet camshaft adjuster timing mark and exhaust camshaft adjuster timing mark is 124-127 mm **36**.

Note: If measurement outside tolerance, repeat timing chain installation procedure.

- Checking valve timing with cylinder head cover timing marks present:
 - Ensure engine at TDC. Use dial gauge.
 - Ensure crankshaft pulley timing mark aligned with timing mark on chain cover **4**.
 - Ensure timing mark on each camshaft adjuster aligned with timing marks on cylinder head **31**.

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