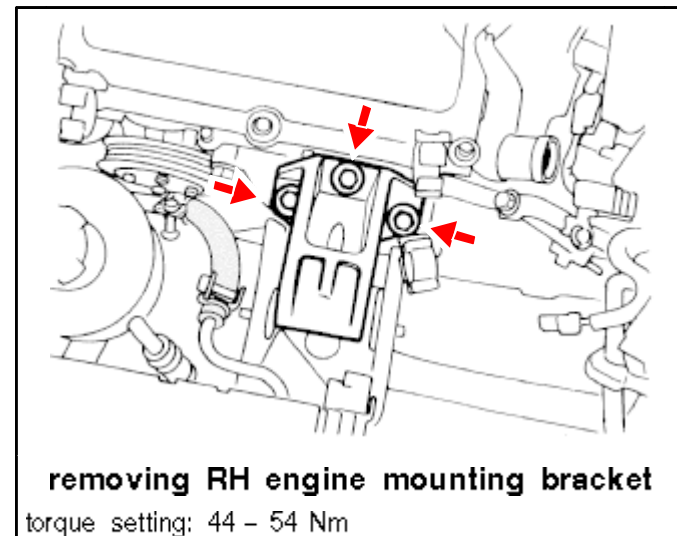
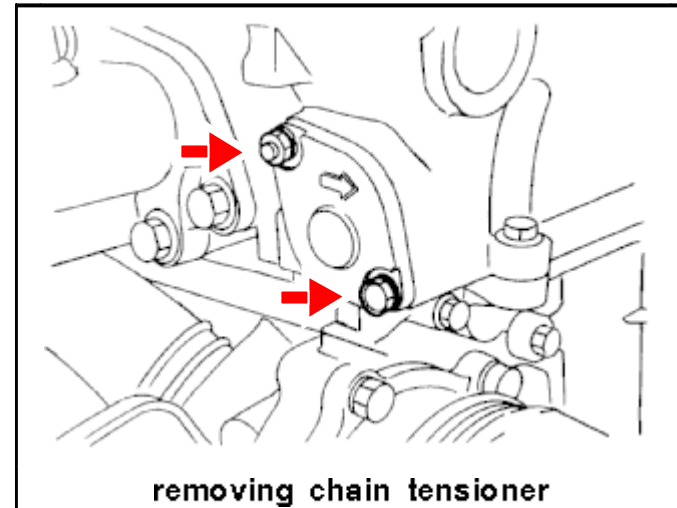
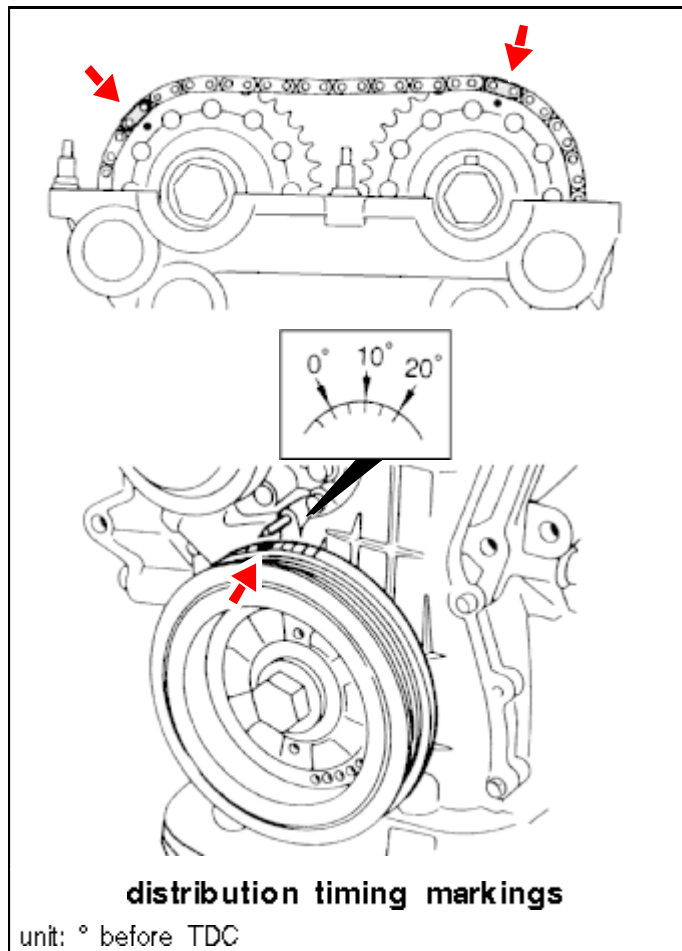


## - SR20DE

## Timing chain

## Removal



Before removing the timing chain first take off the cylinder head.

Remove:

- the shields; below the engine
- the RH front wheel
- the RH inner wing panel.

Drain: the coolant.

Remove:

- the radiator
- the air intake channel
- the poly-V-belts
- the water pump pulley.

Lay aside:

- the alternator
- the power steering pump.

Detach / disconnect: all cables and hoses between the cylinder head and the rest of the vehicle.

Remove:

- the spark plugs
- the valve cover
- the inlet manifold mountings
- the power steering pump mounting
- the oil filter mounting.

Rotate the crankshaft clockwise until the timing marks are aligned.

**Note:** It is possible that the crankshaft will require several turns.

Remove:

- the chain tensioner; see illustration
- the distributor
- the upper chain guide
- the camshaft timing gears.

**Note:** Hang the timing chain aside.

Remove:

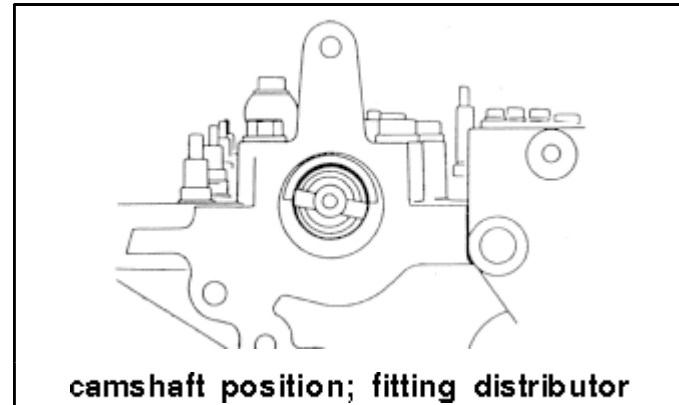
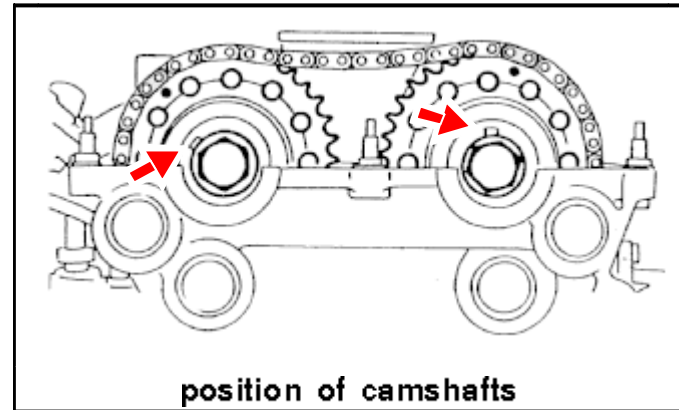
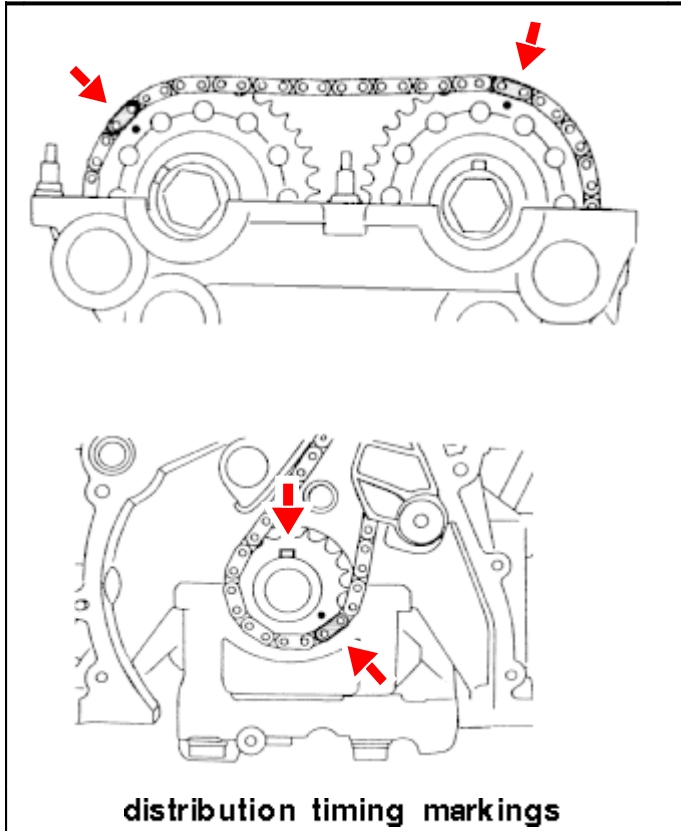
- the camshafts
- the starter motor
- the cylinder head; together with the inlet manifold and exhaust manifold
- the engine sump
- the pick-up screen
- the crankshaft pulley.

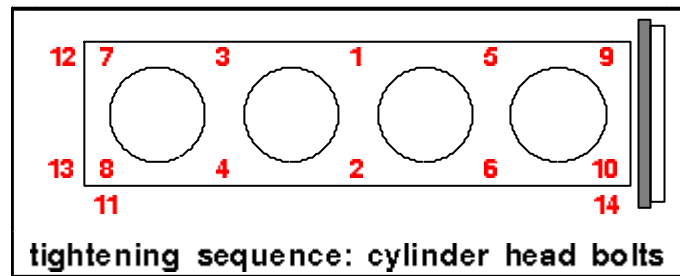
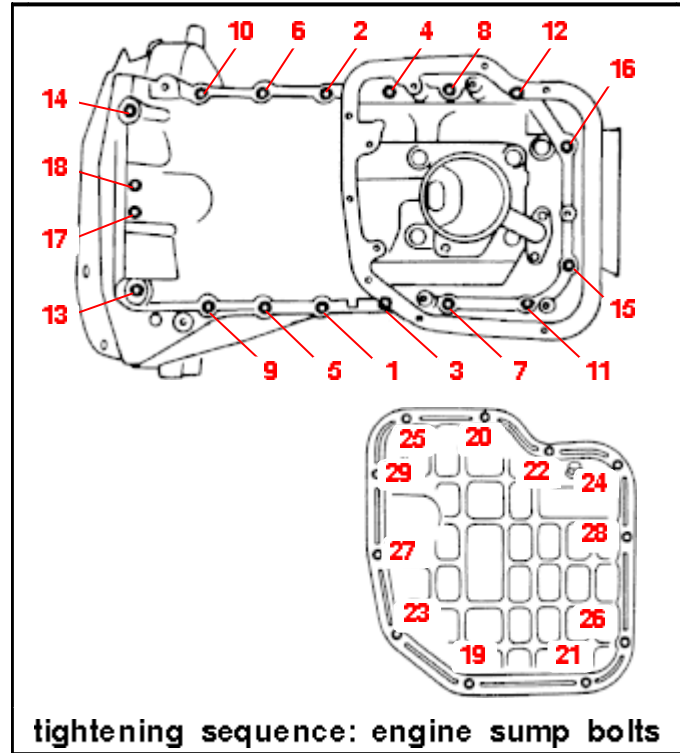
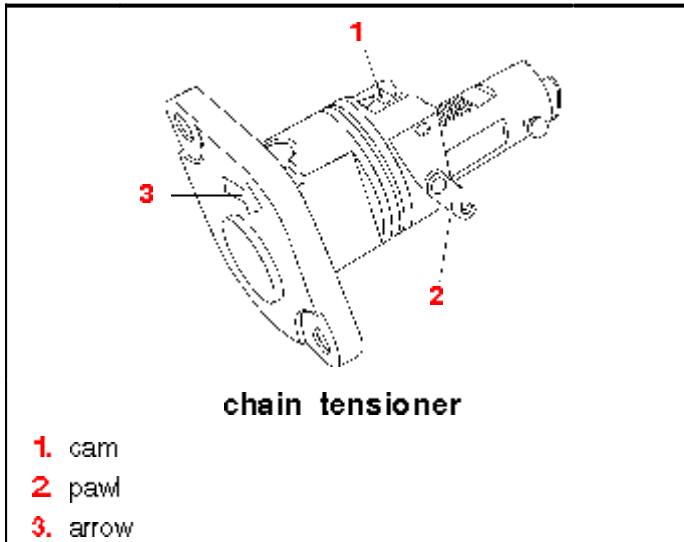
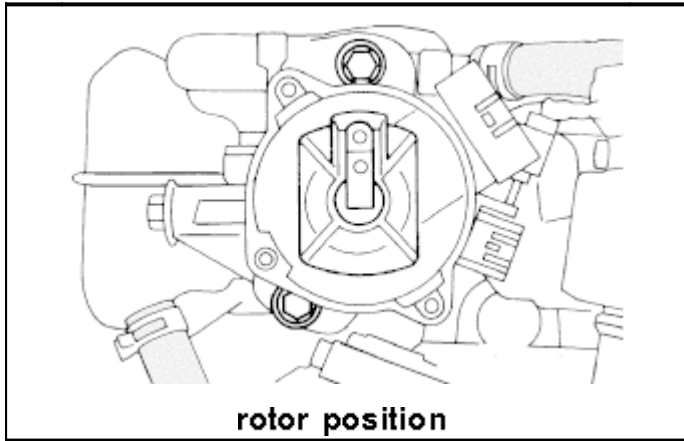
Support engine;

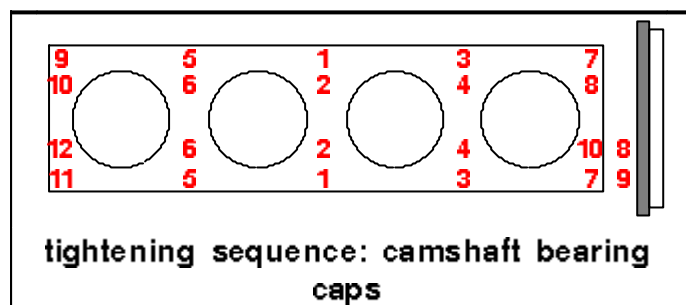
Remove:

- the RH engine mounting bracket; see illustration
- the timing cover
- the chain guides
- the timing chain.

Installation







## torque settings

cylinder head bolts

**Note:** Renew bolts with a bolt length > 158,2 mm.**Note:** Lubricate bolts

- step 1	bolts 1 to 10 inclusive: 39 Nm
- step 2	bolts 1 to 10 inclusive: 78 Nm
- step 3	bolts 1 to 10 inclusive: slacken
- step 4	bolts 1 to 10 inclusive: 34 - 44 Nm
- step 5	bolts 1 to 10 inclusive: angle turn: 90° - 95°
- step 6	bolts 1 to 10 inclusive: angle turn: 90° - 95°
- step: 7	bolts 11 to 14 inclusive: 9 - 12 Nm

camshaft bearing caps

**Note:** Tighten bolts in the specified sequence**Note:** Lubricate bolts

- step: 1	2 Nm
- step: 2	6 Nm
- step: 3	<b>inlet camshaft:</b> 9 - 12 Nm <b>exhaust camshaft:</b> bolts 1 to 7 inclusive: 9 - 12 Nm bolts 8 and 9: 18 - 25 Nm bolts 10 to 12 inclusive: 9 - 12 Nm
wheel nut	98 - 118 Nm
water pump pulley	6 - 8 Nm
alternator	
- adjustment bolt	16 - 21 Nm
- bolt	37 - 50 Nm
power steering pump	
- adjustment bolt	16 - 22 Nm
- bolt	26 - 36 Nm
spark plugs	20 - 29 Nm
valve cover	8 - 10 Nm
inlet manifold mountings	16 - 21 Nm
power steering pump mounting	45 - 60 Nm

oil filter mounting	16 - 19 Nm
chain tensioner	6 - 8 Nm
distributor	13 - 16 Nm
upper chain guide	16 - 19 Nm
camshaft timing gear	137 - 157 Nm
<b>Note:</b> Lubricate bolt	
starter motor	31 - 42 Nm
engine sump	
<b>Note:</b> Tighten bolts in the sequence shown.	
- bolts 1 to 16 inclusive	16 - 19 Nm
- bolts 17 and 18	6,5 - 7,5 Nm
- bolts 19 to 29 inclusive	6,5 - 7,5 Nm
crankshaft pulley	142 - 152 Nm
<b>Note:</b> Lubricate bolt	
front exhaust pipe to exhaust manifold	60 - 70 Nm
RH engine mounting bracket	44 - 54 Nm
timing cover	6,5 - 7,5 Nm
chain guide	13 - 19 Nm

Check that the key in the crankshaft is pointing upwards.

Fit / apply:

- the chain guides
- the timing chain; over the crankshaft gear. Ensure that the timing marks are aligned.
- the timing cover.

**Note:** Ensure that the timing chain doesn't slip over the crankshaft gear.

Fit / apply:

- the RH engine mounting bracket
- the crankshaft pulley
- the pick-up screen
- the engine sump; see illustration
- the cylinder head; together with the inlet manifold and exhaust manifold
- the starter motor
- the camshafts; see illustration
- the camshaft timing gears; together with the timing chain.

Check that the distribution timing markings are aligned.

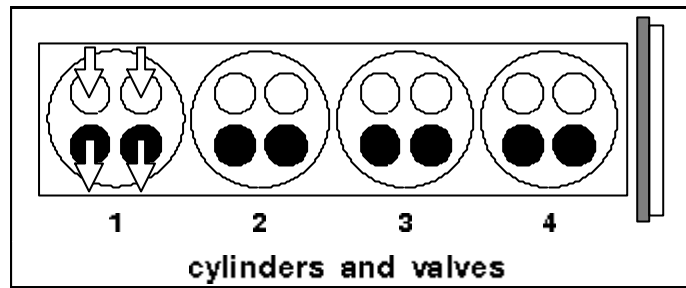
Fit / apply:

- the upper chain guide
- the distributor; check that the camshaft and rotor are in the position illustrated.
- the chain tensioner; see illustration:
  - push the cam down
  - push in the chain tensioner piston until it can be secured with the hook
  - check that the arrow is pointing to the timing side.

**Note:** The chain tensioner is automatically released.

Complete the installation in reverse order of removal.

**Valves, rocker arms and tappets**

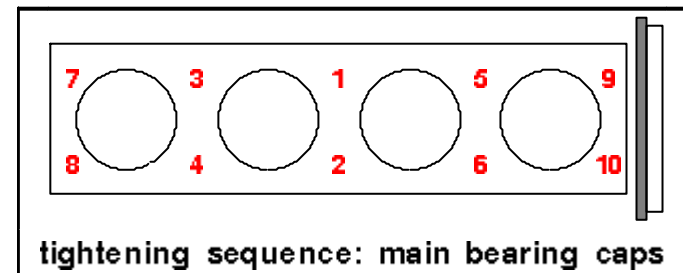
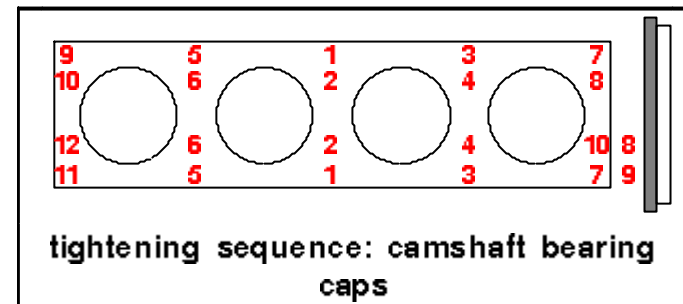
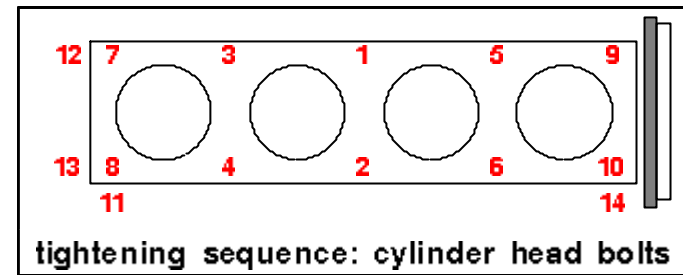


technical specifications	
firing order	1 - 3 - 4 - 2
valve operation	DOHC; rocker arms; hydraulic valve clearance adjusters

**Hydraulic valve clearance adjusters**

The hydraulic valve clearance adjusters are non-adjustable.

**Torque settings**



<b>cylinder head</b>	
cylinder head bolts	
<b>Note:</b> Renew bolts with a bolt length > 158,2 mm.	
<b>Note:</b> Lubricate bolts	
- step 1	bolts 1 to 10 inclusive: 39 Nm
- step 2	bolts 1 to 10 inclusive: 78 Nm
- step 3	bolts 1 to 10 inclusive: slacken
- step 4	bolts 1 to 10 inclusive: 34 - 44 Nm
- step 5	bolts 1 to 10 inclusive: angle turn: 90° - 95°
- step 6	bolts 1 to 10 inclusive: angle turn: 90° - 95°
- step: 7	bolts 11 to 14 inclusive: 9 - 12 Nm

camshaft bearing caps	
<b>Note:</b> Tighten bolts in the specified sequence	
<b>Note:</b> Lubricate bolts	
- step: 1	2 Nm
- step: 2	6 Nm
- step: 3	<b>inlet camshaft:</b> 9 - 12 Nm <b>exhaust camshaft:</b> bolts 1 to 7 inclusive: 9 - 12 Nm bolts 8 and 9: 18 - 25 Nm bolts 10 to 12 inclusive: 9 - 12 Nm
exhaust manifold	37 - 48 Nm
inlet manifold	18 - 21 Nm
valve cover	8 - 10 Nm
<b>engine block</b>	
big end bearing caps	
<b>Note:</b> Lubricate bolts	
- step: 1	14 - 16 Nm
- step: 2	38 - 44 Nm



main bearing caps	
<b>Note:</b> Tighten bolts in the sequence shown.	
<b>Note:</b> Lubricate bolts	
– step: 1	26 - 32 Nm
– step: 2	angle turn: 75° - 80°
– step: 3	slacken
– step: 4	32 - 38 Nm
– step: 5	angle turn: 45° - 50°
drive plate	83 - 93 Nm
<b>Note:</b> Lubricate bolts	
flywheel	83 - 93 Nm
<b>Note:</b> Lubricate bolts	
<b>timing</b>	
chain tensioner	6 - 8 Nm
upper chain guide	16 - 19 Nm
camshaft timing gear	137 - 157 Nm
<b>Note:</b> Lubricate bolt	
crankshaft pulley	142 - 152 Nm
<b>Note:</b> Lubricate bolt	
timing cover	6,5 - 7,5 Nm
chain guide	13 - 19 Nm
<b>lubrication system</b>	
engine sump	see 'Timing chain'
oil drain plug	29 - 39 Nm
oil pressure switch	no data available

<b>cooling system</b>	
coolant temperature sensor	20 - 29 Nm
coolant drain plug in engine block	8 - 12 Nm
thermostat housing	6 - 8 Nm
water pump	16 - 21 Nm
water pump pulley	6 - 8 Nm
<b>auxiliary units</b>	
starter motor	31 - 42 Nm
alternator	
– adjustment bolt	16 - 21 Nm
– bolt	37 - 50 Nm
power steering pump	
– adjustment bolt	16 - 22 Nm
– bolt	26 - 36 Nm
<b>ignition/fuel system</b>	
spark plugs	20 - 29 Nm
oxygen sensor	40 - 50 Nm
knock sensor	21 - 26 Nm