# TIMING CHAIN: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

| Equipment required |
| --- |
| component support |

| parts always to be replaced: |
| --- |
| Timing chain |

**WARNING**

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

**WARNING**

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Engine: Precautions for the repair ,
- Vehicle: Precautions for the repair .

**CAUTION**

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

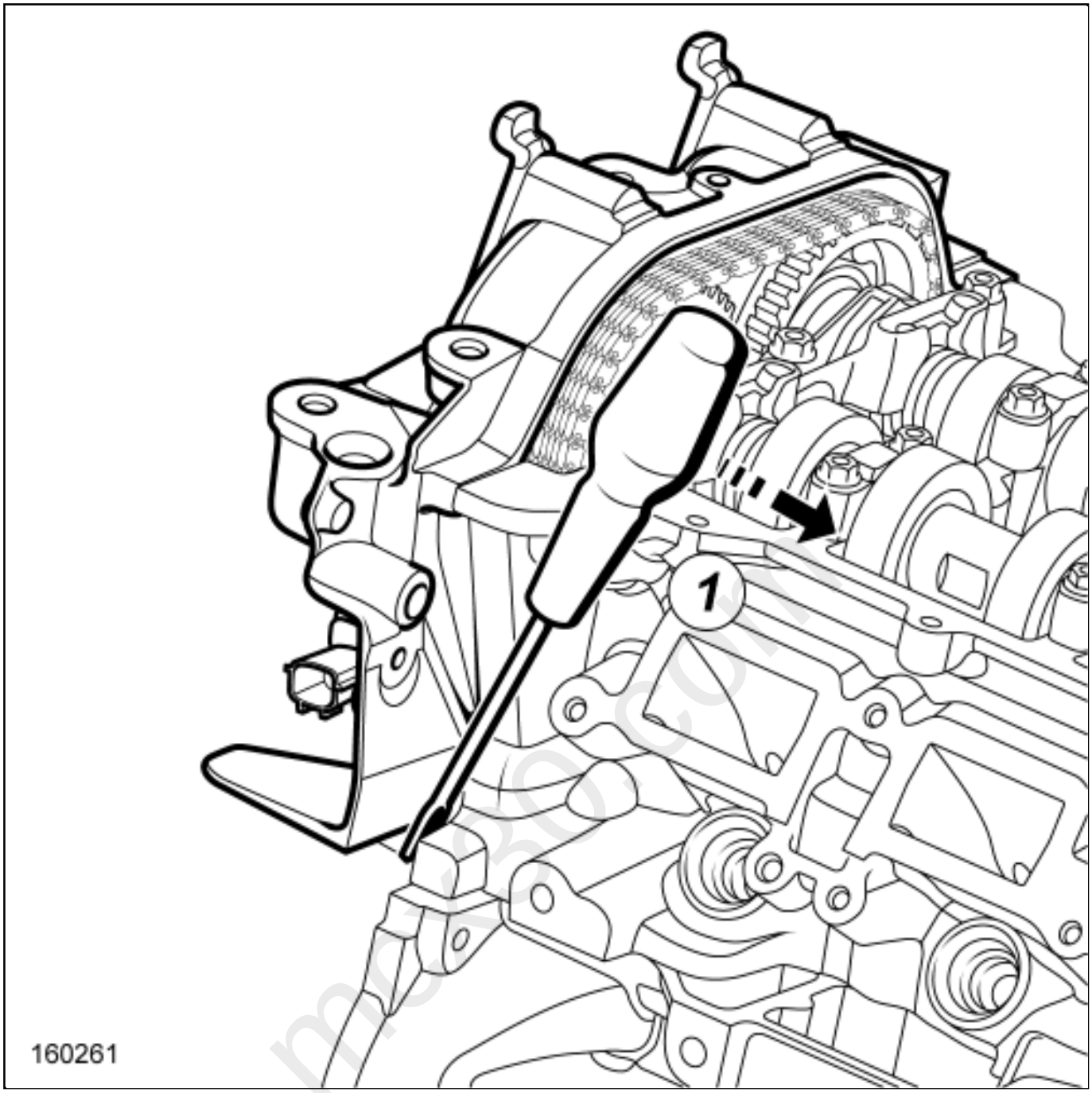
## REMOVAL

### 1. REMOVAL PREPARATION OPERATION

- Remove the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .
- Separate the manual gearbox from the engine (see **Manual gearbox: Removal - Refitting**) .
- Separate the automatic gearbox from the engine Automatic gearbox: Removal - Refitting .
- Position the engine on the component support Engine support equipment: Use .
- Drain the engine (see **Engine oil: Draining - Refilling**) .
- Loosen the bolts of the coolant pump pulley Cylinder block assembly: Exploded view .
- Remove:
  - the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,

- the coolant pump pulley bolts Cylinder block assembly: Exploded view ,
- the coolant pump pulley Cylinder block assembly: Exploded view ,
- the design cover bolts (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the design cover (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the ingnition coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the upstream oxygen sensor Exhaust assembly in engine compartment: Exploded view ,
- the upper turbo-manifold heat shield, rear bolt Exhaust assembly in engine compartment: Exploded view ,
- the upper turbo-manifold heat shield, upper bolts Exhaust assembly in engine compartment: Exploded view ,
- the upper turbo-manifold heat shield Exhaust assembly in engine compartment: Exploded view ,
- the gasoline inlet high pressure pipe to high pressure rail bolt Petrol injection ,
- the gasoline inlet high pressure pipe to high pressure rail Petrol injection ,
- the gasoline high pressure pump bolts Petrol injection ,
- the gasoline high pressure pump Petrol injection ,
- the gasoline high pressure pump lifter Petrol injection ,
- the gasoline high pressure pump seal Petrol injection ,
- the inlet camshaft position sensor bolt (see 11A, Top and front of engine, Cylinder head assembly: Exploded view ) ,
- the inlet camshaft position sensor (see 11A, Top and front of engine, Cylinder head assembly: Exploded view ) ,
- the exhaust position sensor bolt (see 11A, Top and front of engine, Cylinder head assembly: Exploded view ) ,

- the exhaust position sensor (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the cylinder head cover (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the crankshaft accessories pulley (see 11A, Top and front of engine, Engine accessories assembly: Exploded view ),
- the crankshaft seal on timing end (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the inlet timing dephaser bolt (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the inlet timing dephaser (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the exhaust camshaft dephaser solenoid valve bolt (see 11A, Top and front of engine, Timing assembly: Exploded view ),
- the exhaust camshaft dephaser solenoid valve (see 11A, Top and front of engine, Timing assembly: Exploded view ),
- the camshaft dephaser oil supply cover bolts (see 11A, Top and front of engine, Timing assembly: Exploded view ),
- the camshaft dephaser oil supply cover (see 11A, Top and front of engine, Timing assembly: Exploded view ),
- the camshaft dephaser oil supply cover seal (see 11A, Top and front of engine, Timing assembly: Exploded view ),
- the timing cover bolts (see 11A, Top and front of engine, Timing assembly: Exploded view).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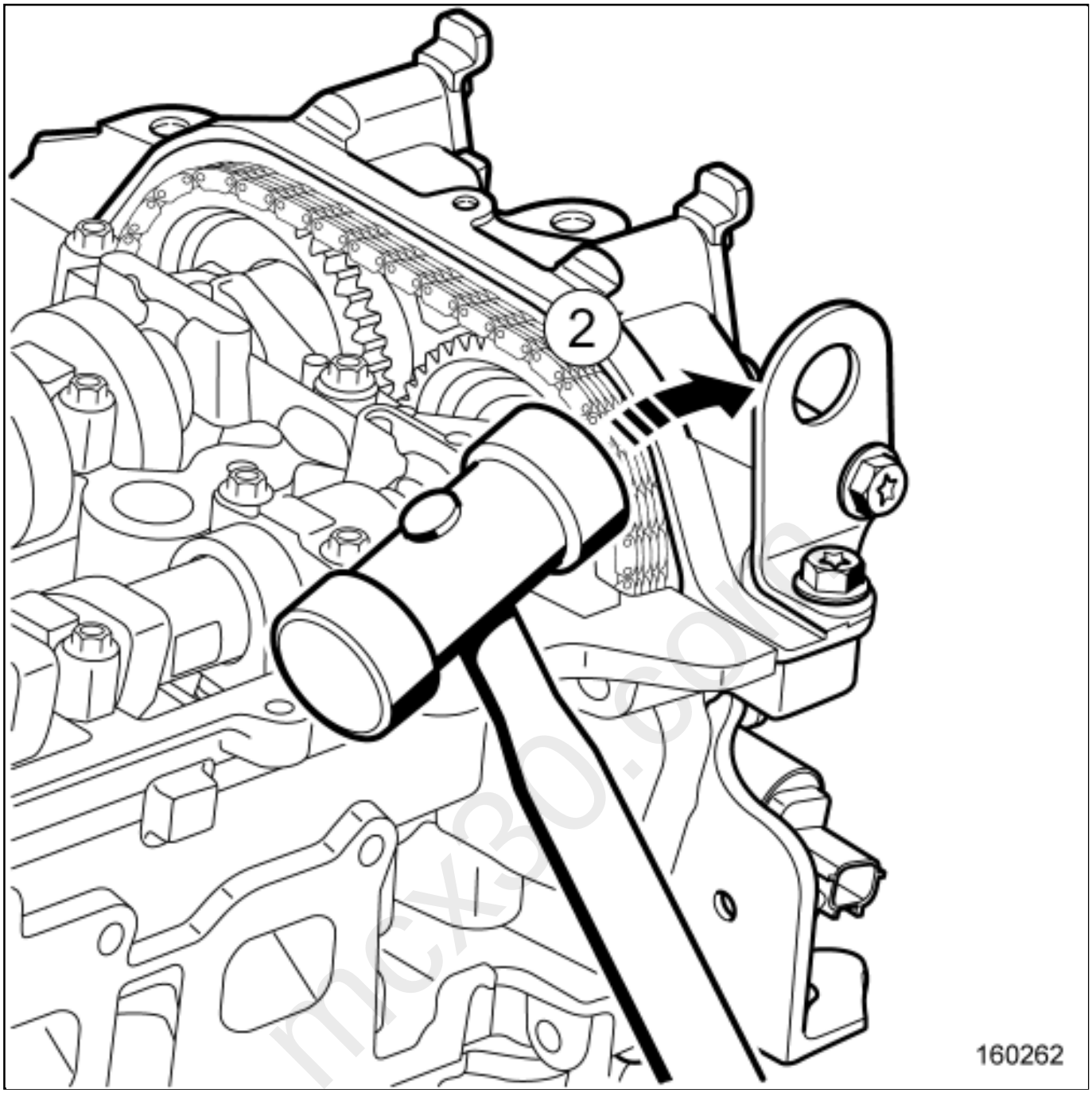
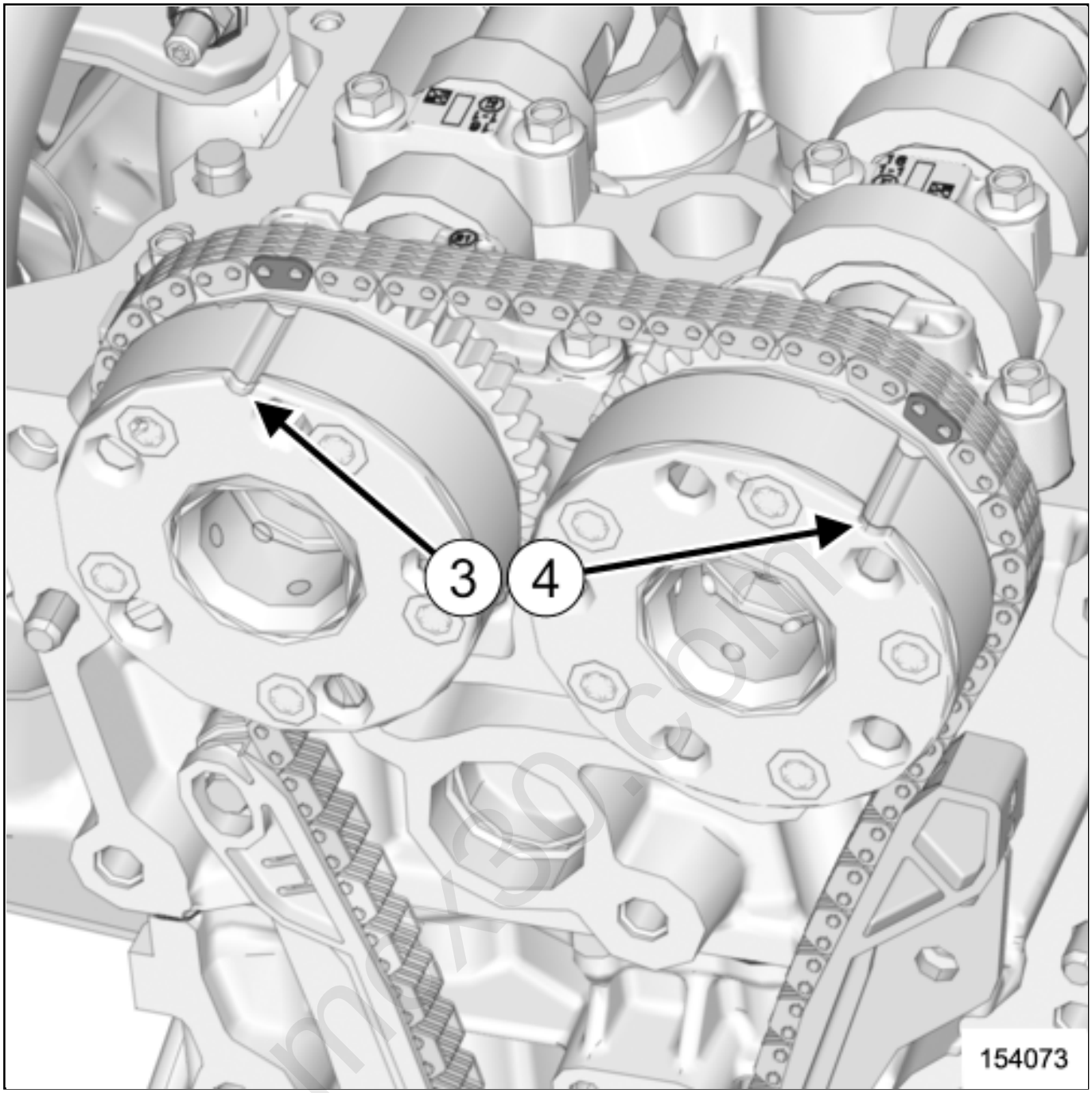
Very carefully separate the timing cover using a flat-blade screwdriver(1)



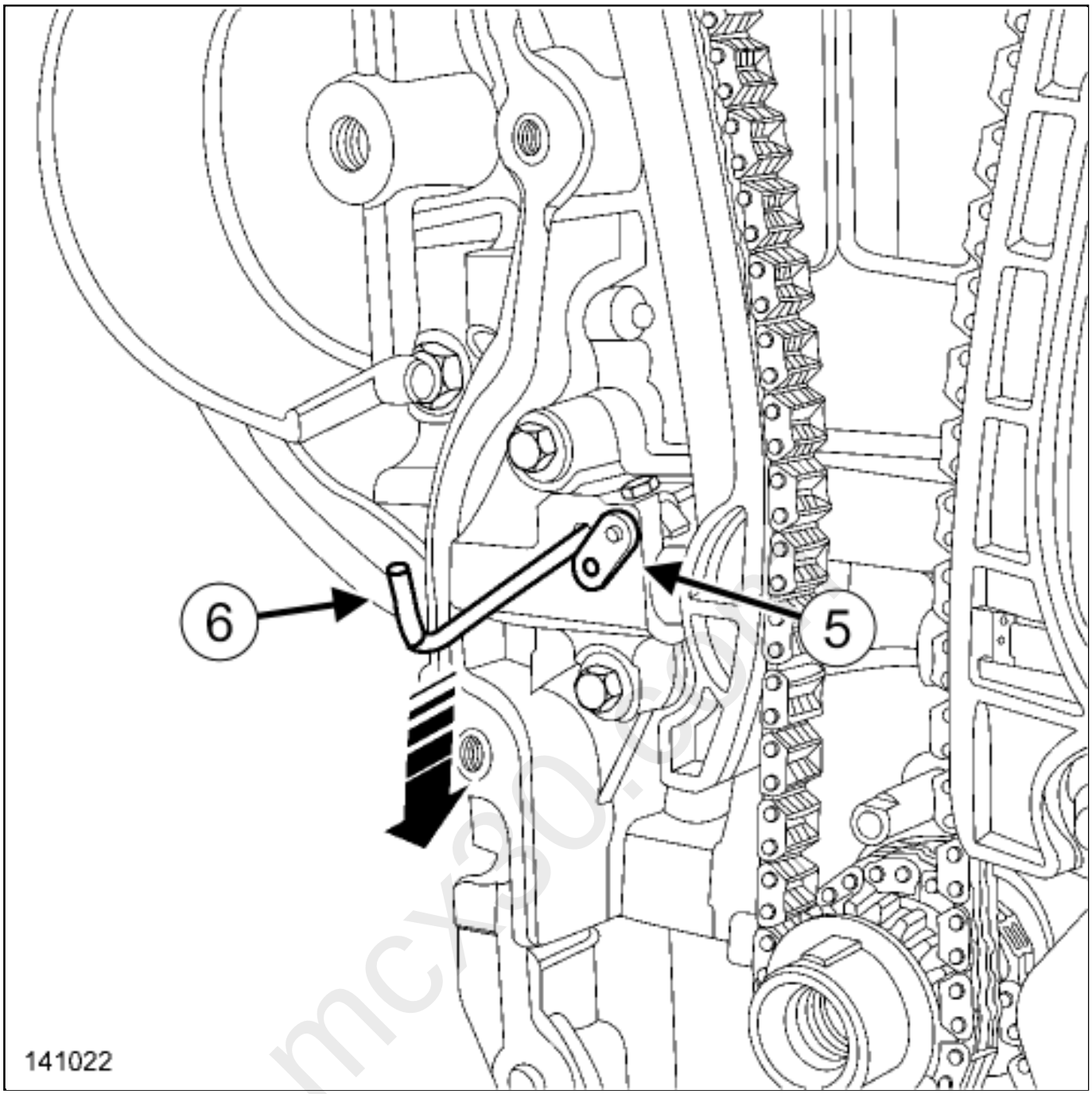

- Tap the lifting eye using a mallet(2) to detach the timing cover.

- Remove the timing cover(see 11A, Top and front of engine, Timing assembly: Exploded view) .

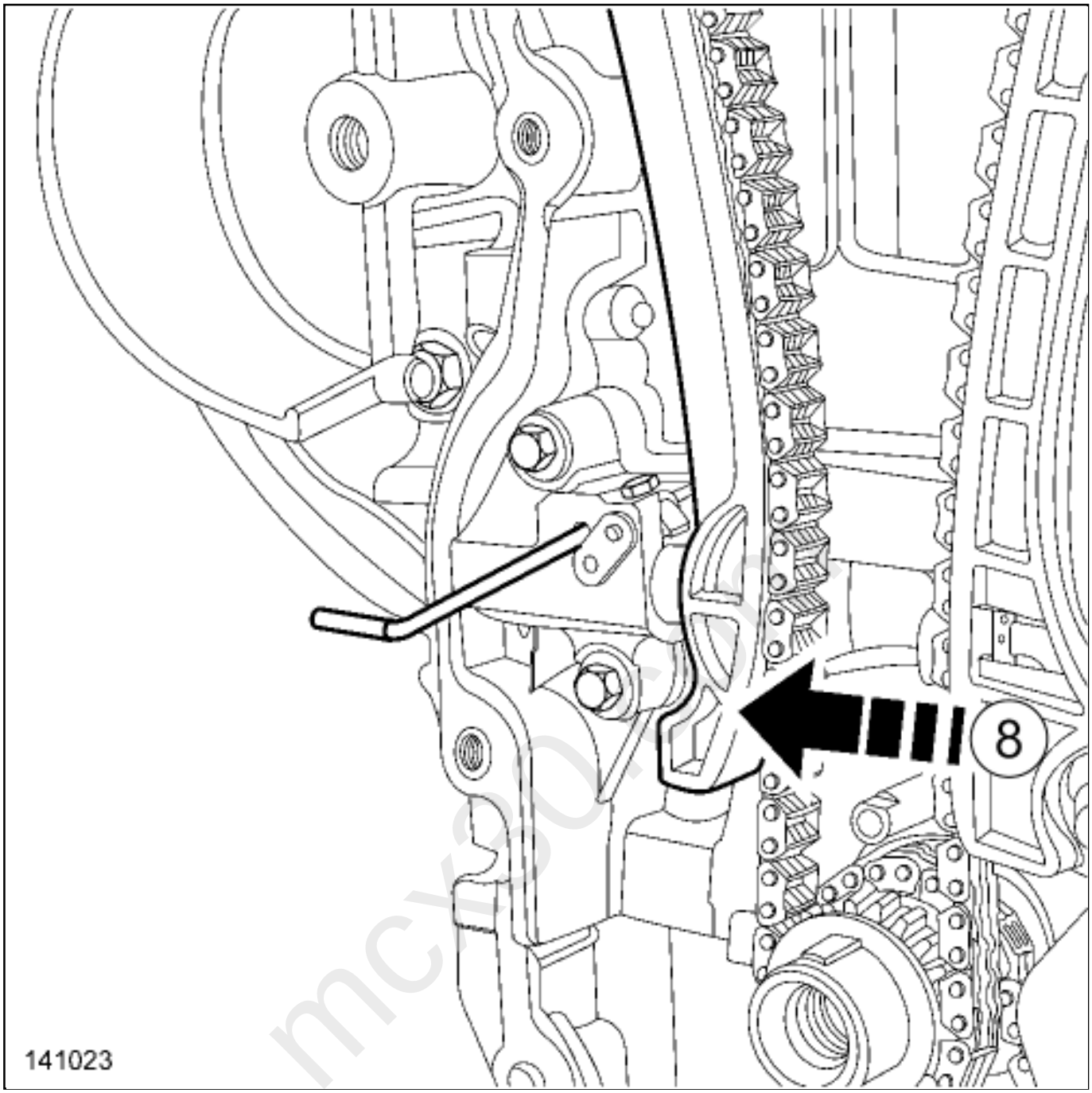



Check that the mark(3) of the exhaust camshaft timing sprocket and the mark(4) of the inlet camshaft timing sprocket are in the same position as shown in the illustration.

**2. REMOVAL OPERATION**

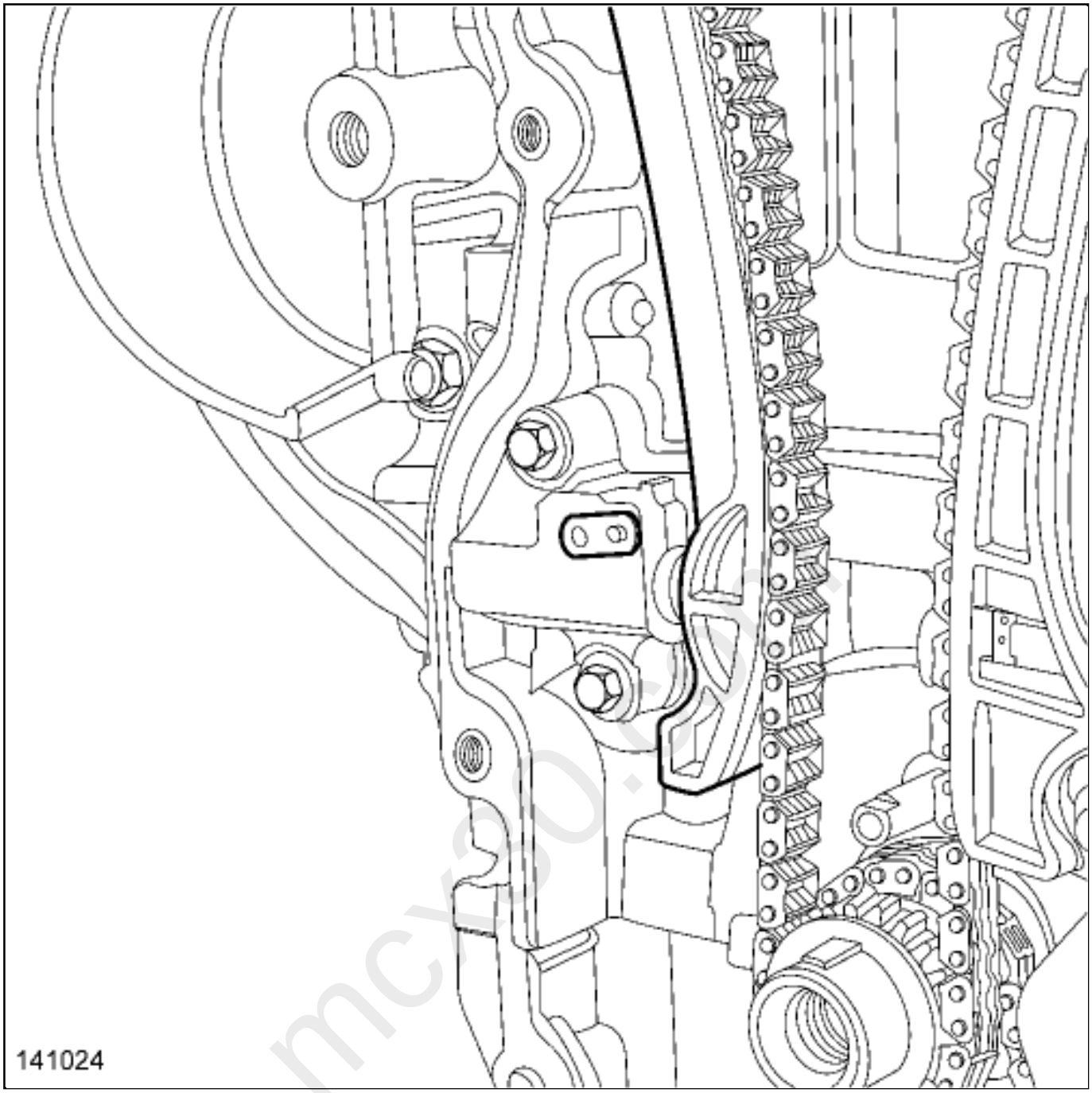



Lower the lever(5) of the timing hydraulic tensioner(see 11A, Top and front of engine, Timing assembly: Exploded view ) as far as possible using a 2.5 mm Allen key(6) to release the tensioner piston.

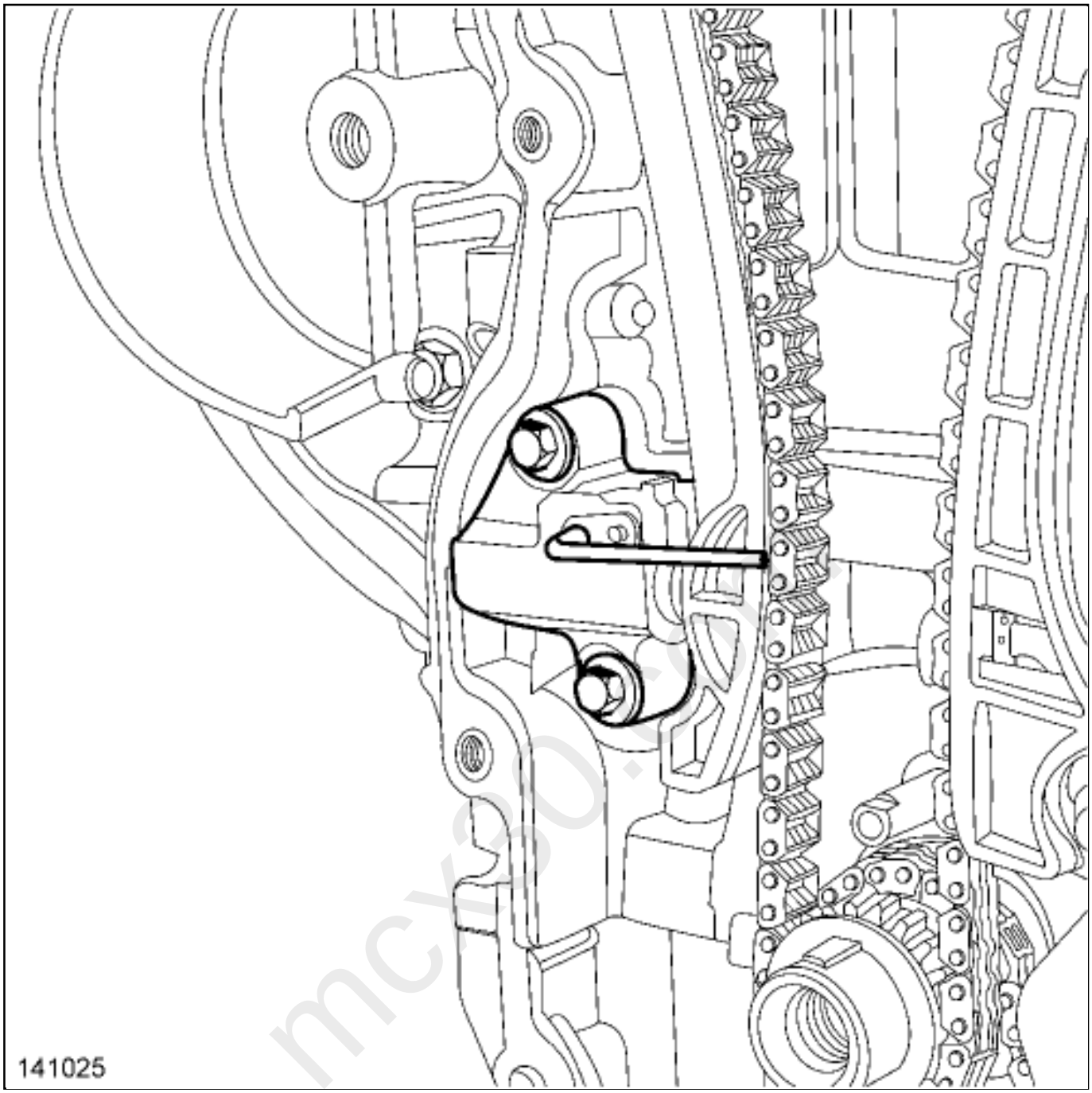



Push on the timing chain tensioning guide (see 11A, Top and front of engine, Timing assembly: Exploded view ) until the timing hydraulic tensioner piston is fully depressed(7) .

Remove the 2.5 mm Allen key from the timing hydraulic tensioner.




Carefully release the timing chain tensioning guide until the tensioner lever is aligned with the opening on the tensioner casing.

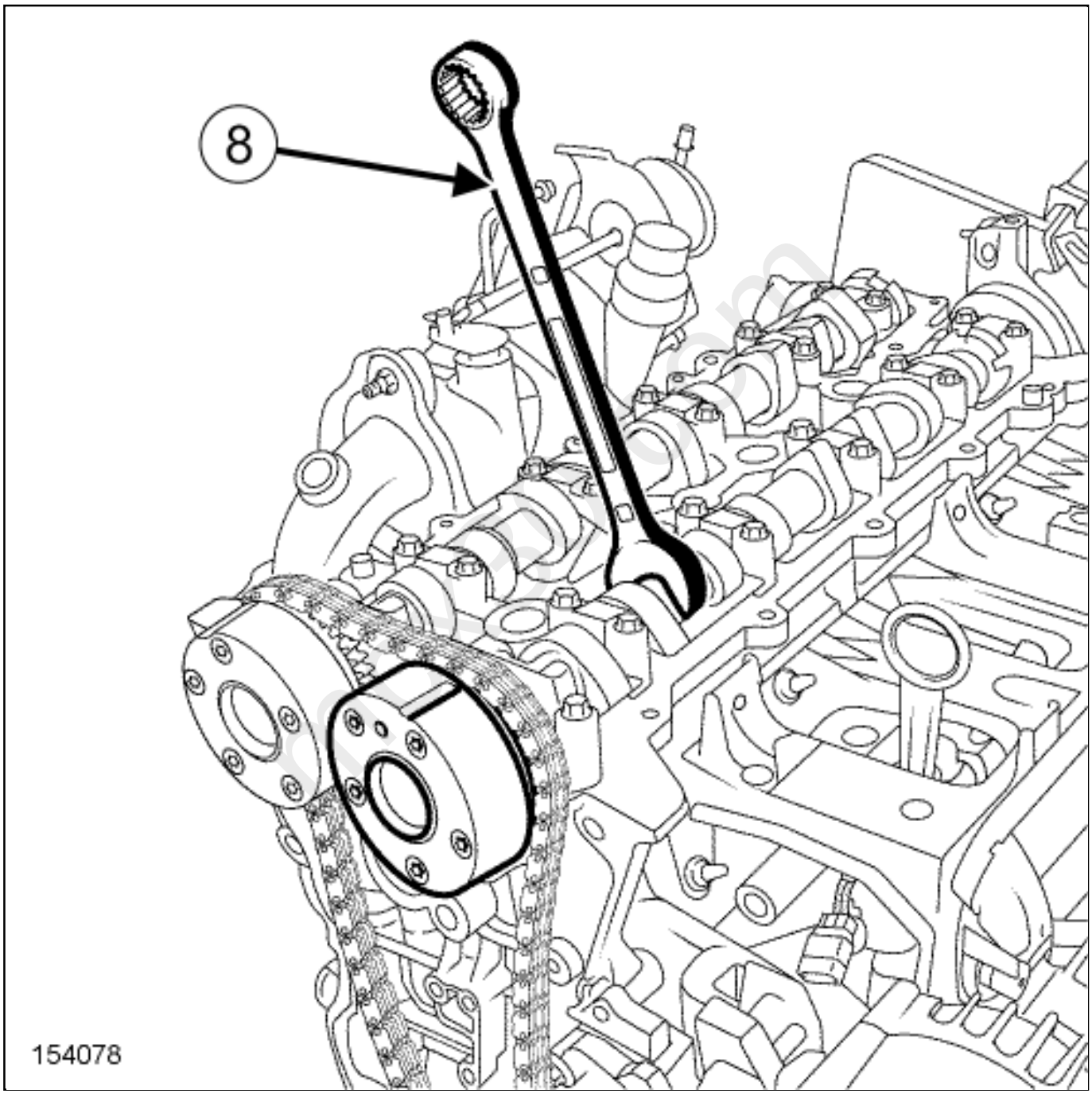


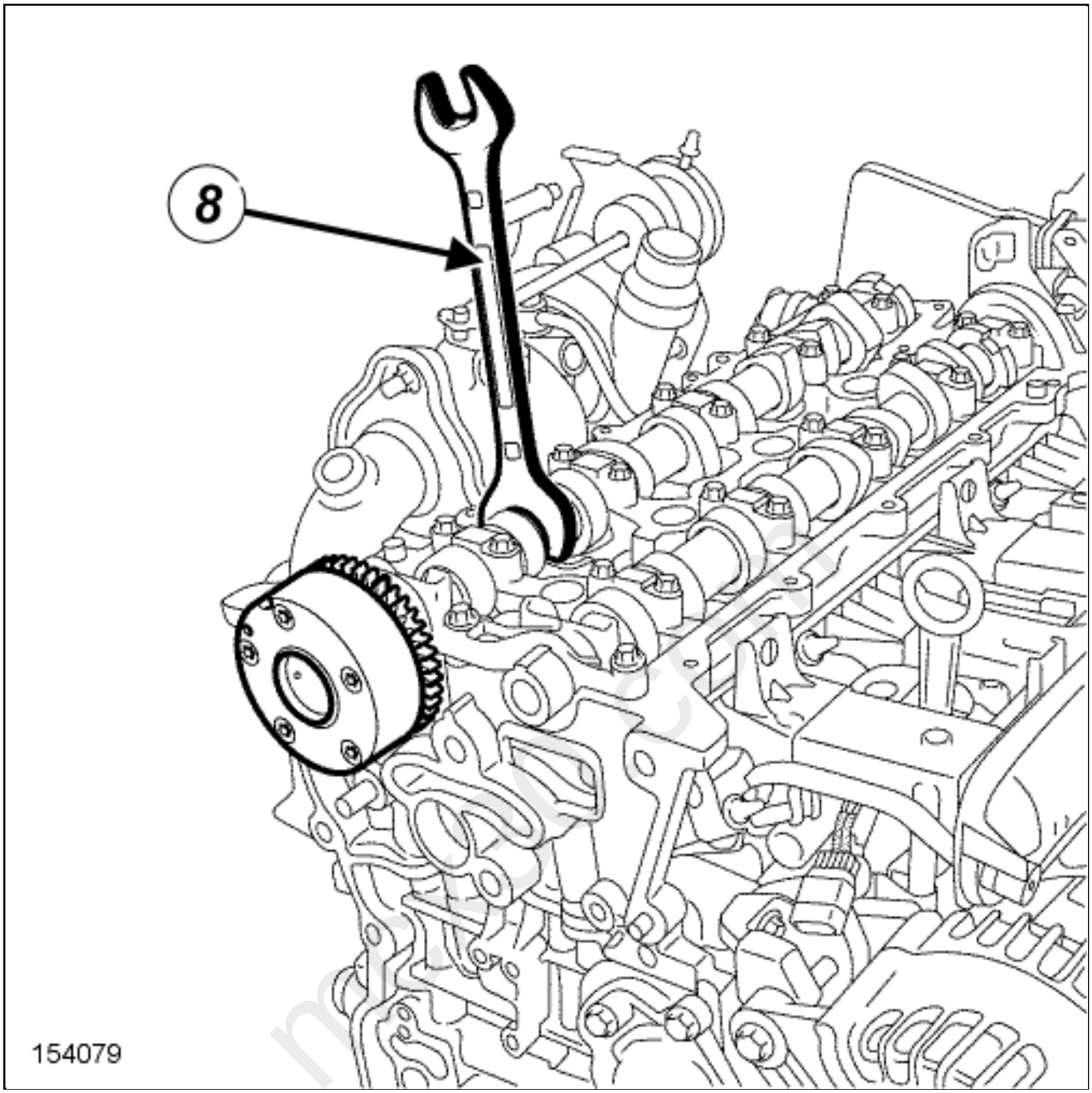

Fit the 2.5 mm Allen keyin the hole on the timing hydraulic tensioner casing to lock the timing chain tensioner lever in the locking position.

Remove: **(see 11A, Top and front of engine, Timing assembly: Exploded view)**

- the timing hydraulic tensioner bolts,
- the timing chain tensioner, taking care not to unlock it,

- the timing chain tensioning guide from its shaft,
- the timing chain guide bolts,
- the timing chain guide.






To loosen the timing sprocket bolts, hold the camshafts using an open-jawed spanner(8) .

Remove : **(see 11A, Top and front of engine, Timing assembly: Exploded view)**

- the timing sprocket bolts,
- the exhaust camshaft timing sprocket,

- the inlet camshaft timing sprocket,
- the timing chain.

## REFITTING

### 1. REFITTING PREPARATION OPERATION

Remove the silicone adhesive sealant residues from the joint faces using a plastic spatula.

**CAUTION**

Do not scrape the aluminium joint faces, any damage caused to the joint face will result in a risk of leaks.

Note:

The groove pattern ensures proper bonding of the silicone adhesive sealant on the joint faces and must not be altered.

Clean using SUPER CLEANING AGENT FOR JOINT FACES Vehicle: Parts and consumables for the repair the joint faces of:

- the cylinder head,
- the cylinder block,
- the timing cover.

Finish cleaning the joint faces using a GREY ABRASIVE PAD Vehicle: Parts and consumables for the repair .

**CAUTION**

Do not use any kind of sandpaper.

Degrease using SURFACE CLEANER Vehicle: Parts and consumables for the repair the joint faces of:

- the cylinder head,
- the cylinder block,
- the timing cover.

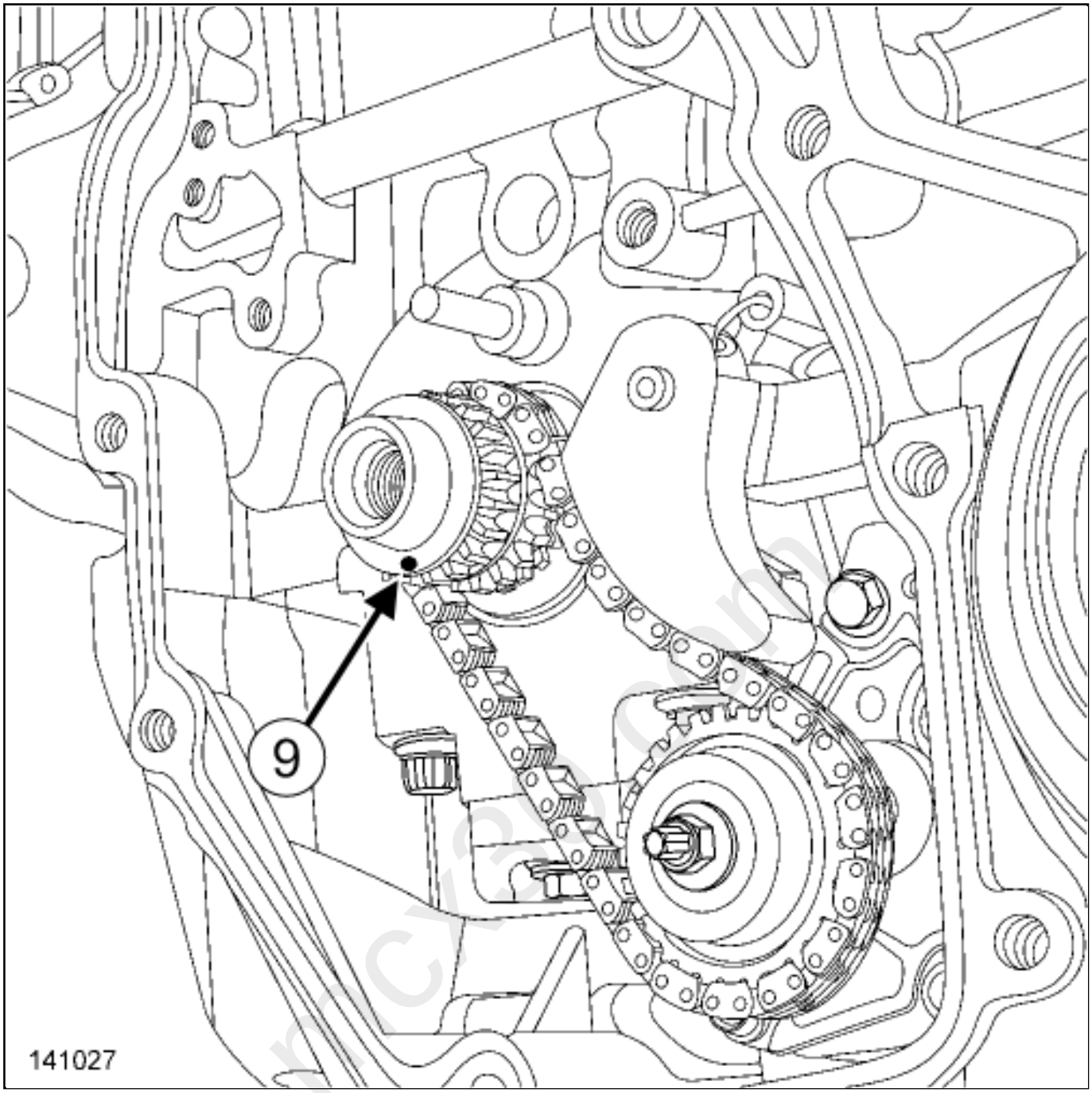
**CAUTION**

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

parts always to be replaced: Timing chain .

Always replace:

- the timing chain hydraulic tensioner,
- the timing chain tensioning guide,
- the timing chain guide.




Check that the crankshaft mark(9) is positioned vertically pointing downwards.

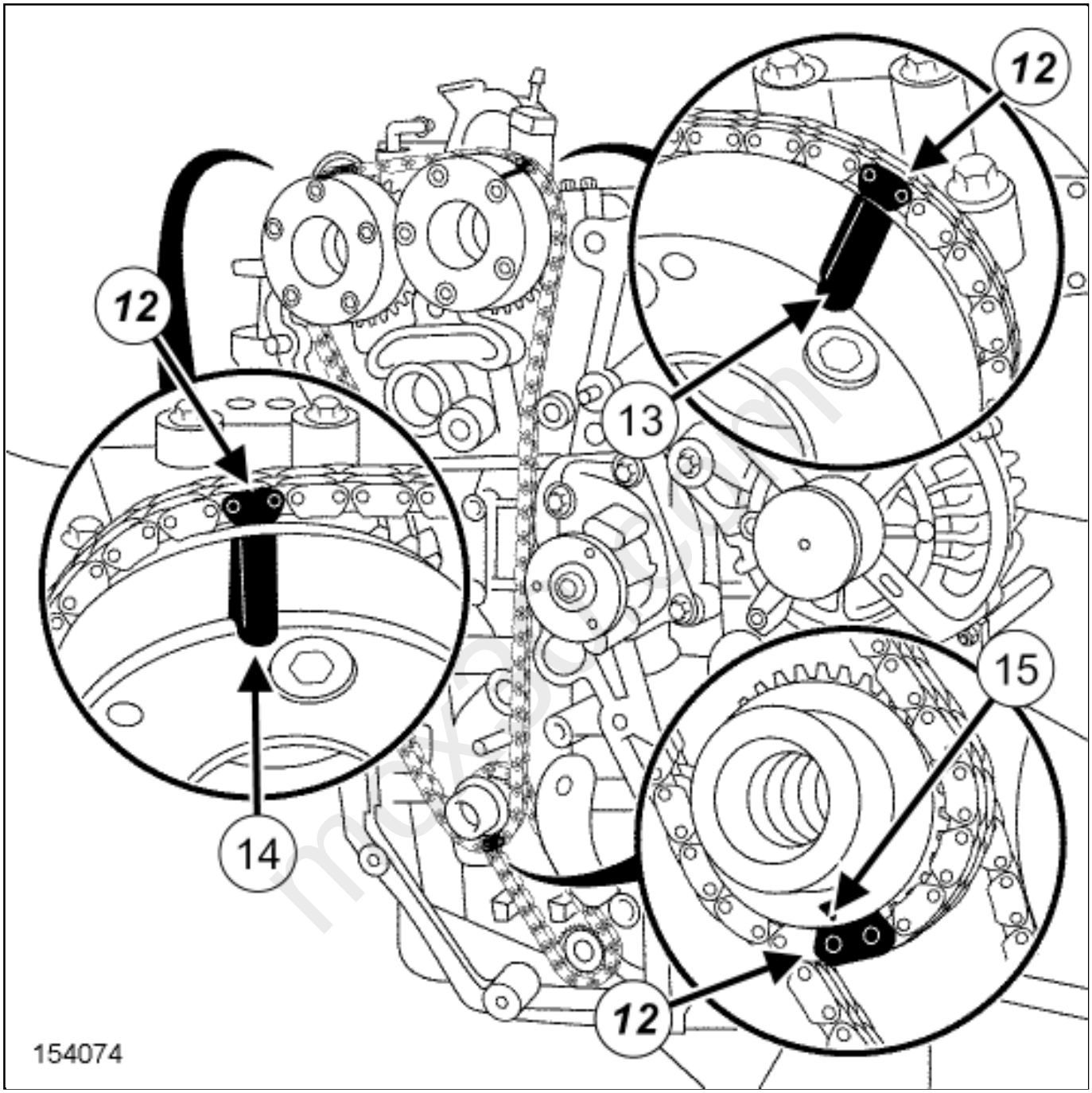
## 2. REFITTING OPERATION

Refit (see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the inlet camshaft timing sprocket,

the exhaust camshaft timing sprocket,

the timing sprocket bolts.



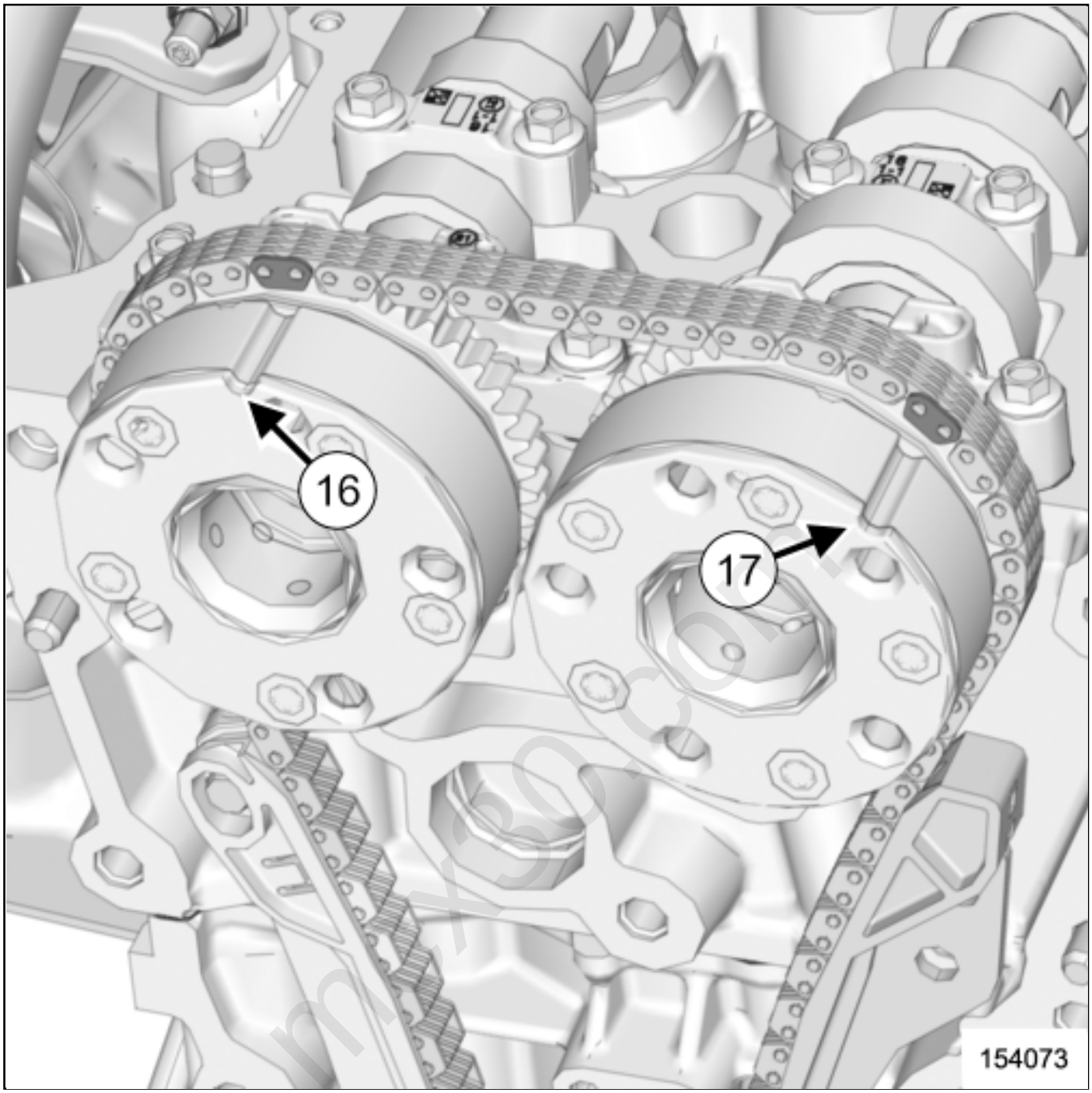

Refit:

a new timing chain, starting with the camshaft dephaser and by aligning the painted links(12) of the timing chain with the marks(13) on the inlet camshaft dephaser,(14) on the exhaust camshaft sprocket and(15) on the crankshaft sprocket,

- the new timing chain guide (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the timing chain guide bolts (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the new timing chain tensioning guide (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the new timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view).

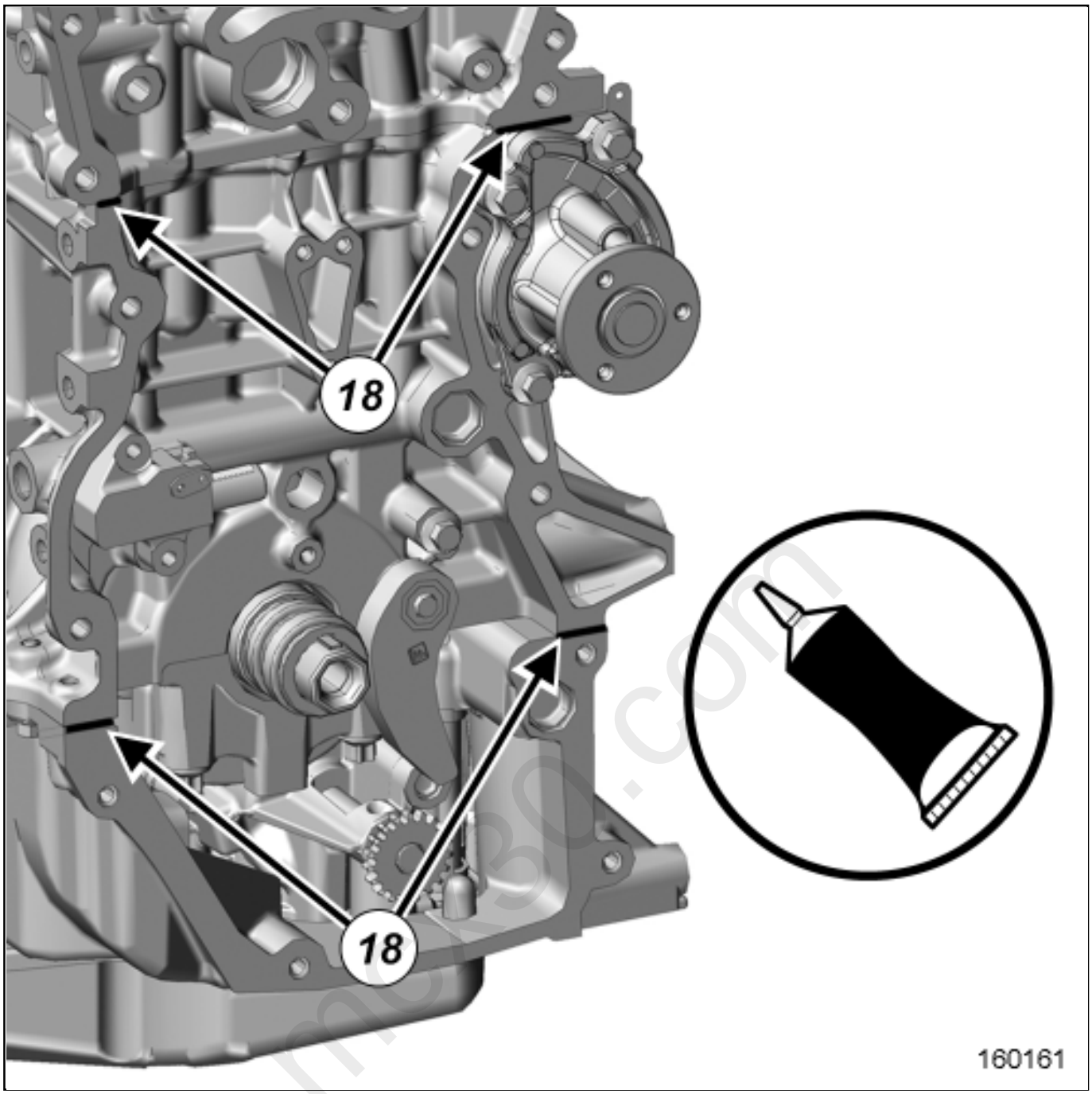
Unlock the timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view).

Rotate the crankshaft clockwise through two revolutions (timing end).




Check that the mark(16) of the exhaust camshaft timing sprocket and the mark(17) of the inlet camshaft timing sprocket are in the same position as shown in the illustration.

### 3. FINAL OPERATION




Degrease using SURFACE CLEANER[Vehicle: Parts and consumables for the repair] the joint faces of:

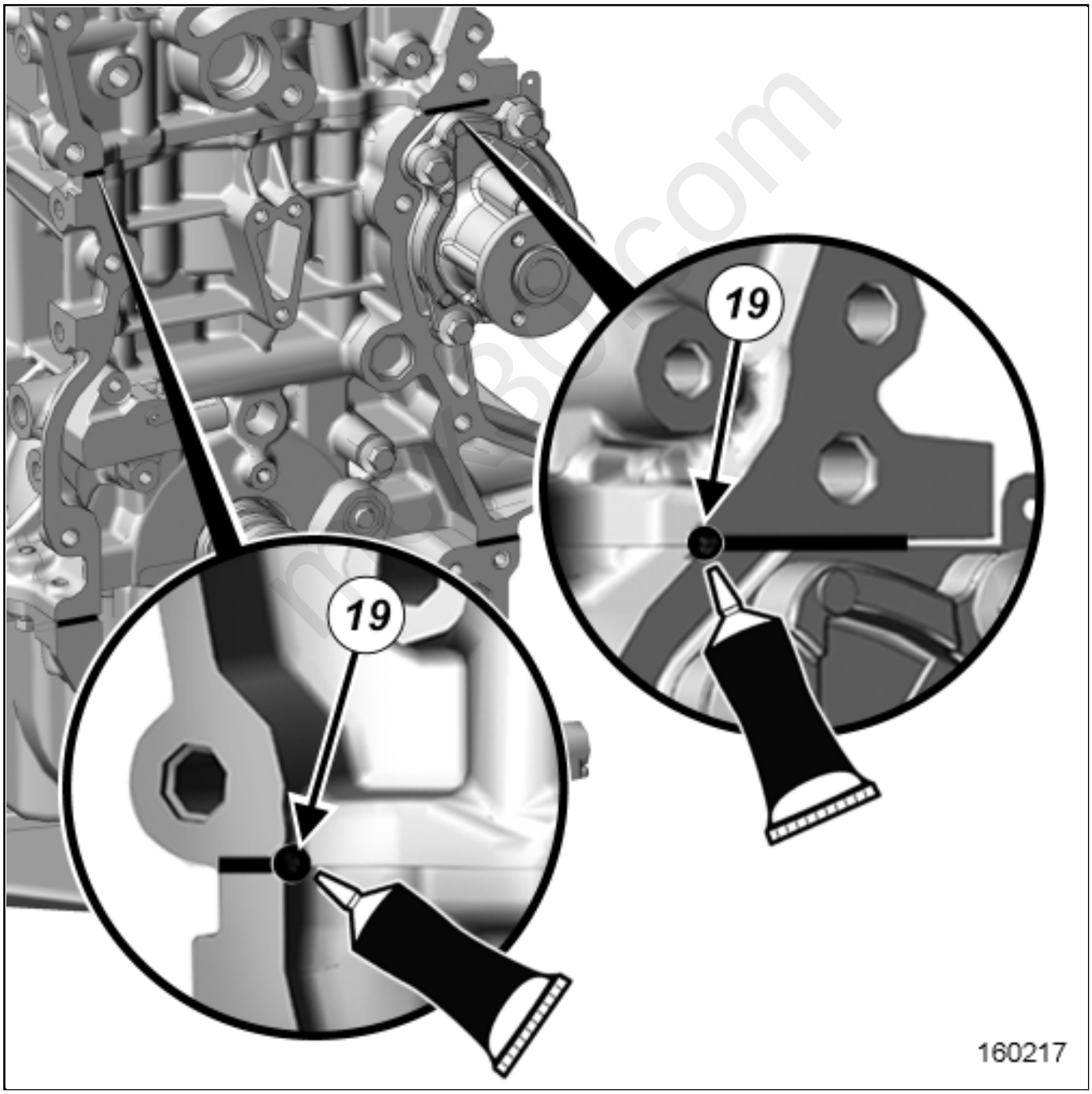
- the cylinder head,
- the cylinder block.

Apply 4 beads of SILICONE ADHESIVE SEALANT[Vehicle: Parts and consumables for the repair] at(18) with a diameter of 3 to 4 mmto fill the gaps between timing cover/cylinder head and timing cover/oil sump.

**CAUTION**

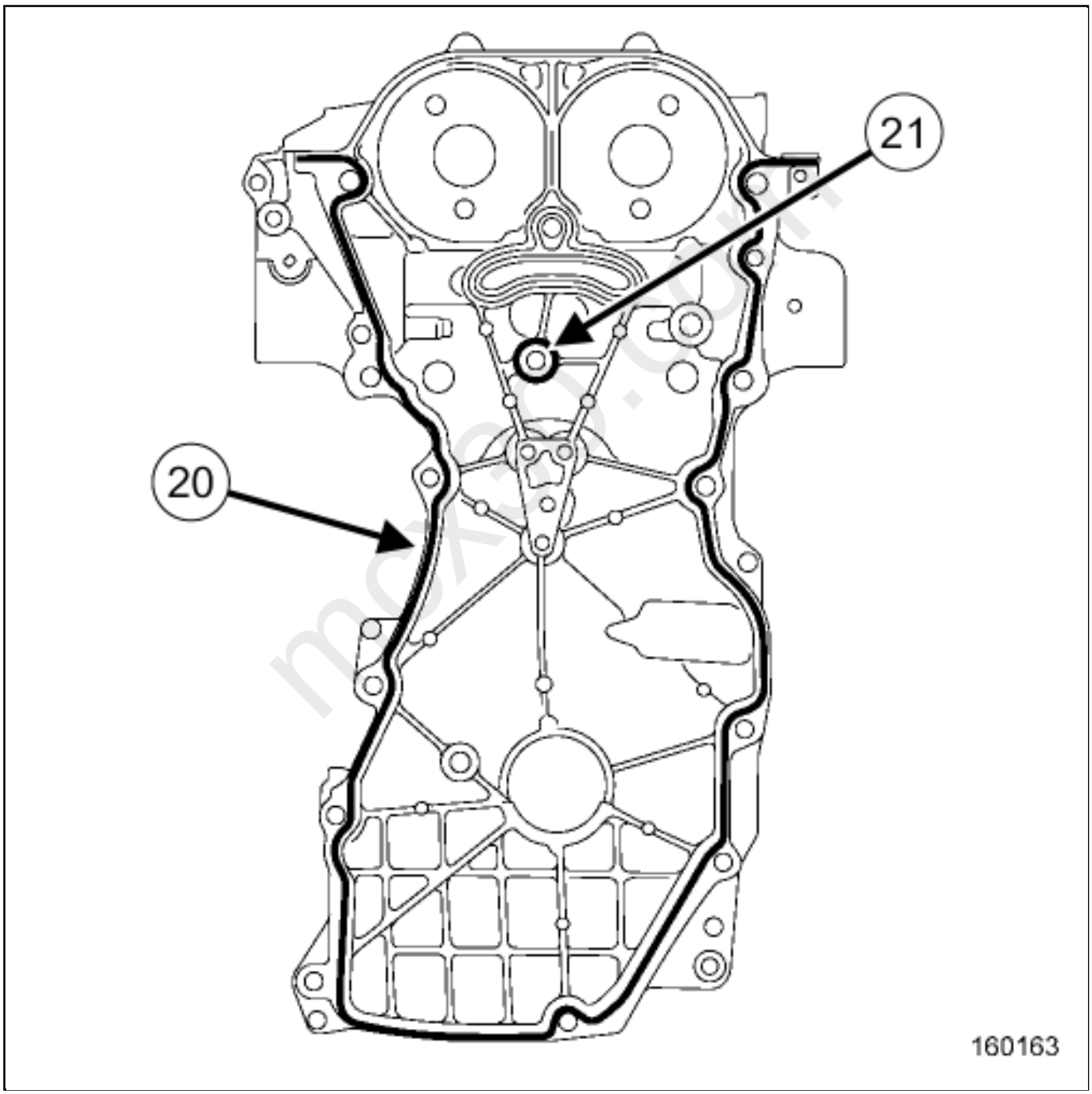
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Remove any excess of silicone adhesive sealant using a plastic spatula.



Apply a drop of SILICONE ADHESIVE SEALANT Vehicle: Parts and consumables for the repair with a minimum thickness of 5 mm in the slots (19) to ensure complete sealing of the timing cover / cylinder block / cylinder head.

Degrease the joint faces of the timing cover using SURFACE CLEANER Vehicle: Parts and consumables for the repair



Apply a bead of SILICONE ADHESIVE SEALANT Vehicle: Parts and consumables for the repair with a diameter of 3 to 4 mm:

- on the joint face of the timing cover(20) placed at a distance of 1 to 2 mm from the inside edge of the timing cover,
- on the center part(21) of the timing cover.

**CAUTION**

Applying excess sealant could cause it to be squeezed in when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Refit within 5 to 10 min (see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the timing cover,
- the timing cover bolts.

Torque tighten the timing cover bolts (see 11A, Top and front of engine, Timing assembly: Exploded view) .

Wipe off any excess of silicone adhesive sealant from the timing cover edges using a lint-free cloth Vehicle: Parts and consumables for the repair

### 4. FINAL OPERATION

Proceed in the reverse order to removal.