

# INA Belt Academy

## Freelander 2.2 TD4



Alistair Mason, Schaeffler

This month, Schaeffler REPXPERT Alistair Mason replaces the timing belt and water pump on a Land Rover Freelander 2, which was fitted with a 2.2 TD4 engine and had covered more than 124,000 miles.

The 2.2 common rail turbo diesel Ford Duratorq was co-developed with the Peugeot/Citroën PSA group. Car manufacturers that use this engine include Citroën, Fiat, Ford, Jaguar, Lancia, Land Rover, Mitsubishi and Peugeot. Many vehicles are fitted with this type of engine.

On this occasion, the engine was identified as an 'interference engine', so in the event of timing belt failure, consequential engine damage is likely. It is important to install the new timing belt system on an engine at ambient room temperature, and always turn the engine in the normal direction of rotation, unless otherwise advised by the OEM installation instructions.

Recommended torque values should be used, and all the tensioners and pulleys should be replaced at the same time as the timing belt.

### Step-by-step process

For this repair, a two-post ramp, a locking pin for the crankshaft and locking pins for the camshaft are required. Before starting the repair, it is advised to obtain the locking wheel bolt tool and the radio code.

With the vehicle placed on the ramp, open the bonnet and raise the ramp to waist height. Remove the RF wheel and wheel arch liner and the engine under shield.

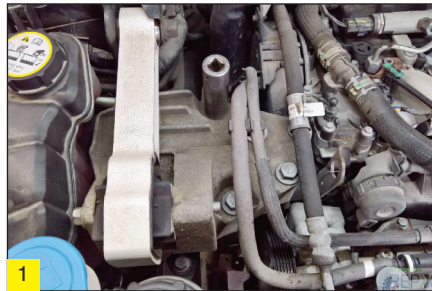
Remove the auxiliary drive belt and inspect for any wear – it is always advisable to replace the auxiliary belt when replacing the timing belt. Also, check the operation of the one-way clutch on the alternator, called an over-running alternator pulley (OAP), as this can seize. Check the operation and condition of the tensioner and idler.

Disconnect the air intake pipe from the turbo, lower the ramp, remove the engine cover and disconnect the intermediate top air intake pipe/baffle unit.

Remove the air filter assembly, coolant expansion tank, top engine torque arm and mounting (Fig 1).

Remove the air intake hose that runs down the back of the engine to the turbo, by unclipping the power steering pipes and then removing the small retaining bolt at the top of the hose.

Take off the starter motor and plastic plate. Lock the flywheel using the ring gear, then

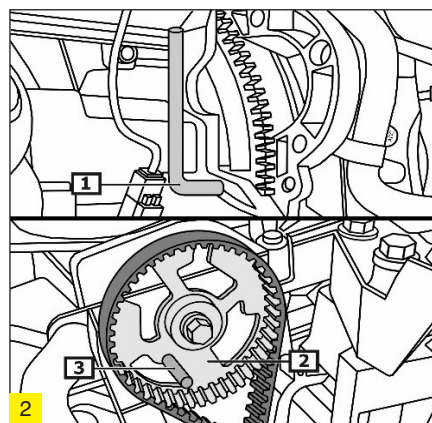


slacken and remove the crankshaft pulley and timing sensor ring. The pulley bolt can be refitted and used to rotate the engine as required.

Disconnect the crankshaft speed/position sensor multiplug and wiring loom. Unscrew the four bolts from the lower timing belt cover, remove the lower timing belt cover, unclip and remove the upper timing belt cover.

Rotate the engine in a clockwise direction until the cambelt timing pin holes align (Fig 2).

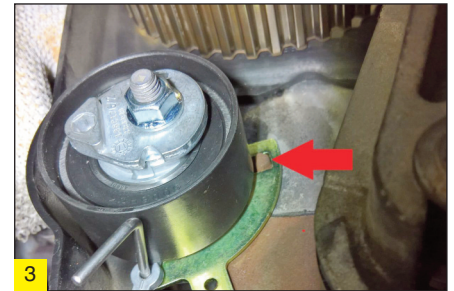
Lock the flywheel and camshaft with locking pins one and three, then slacken the tensioner, remove the tension from the timing belt and disconnect it.



Detach and replace the timing belt tensioner, tensioner stud, idler pulley and bolt. Next, drain the coolant, and remove the water pump.

Clean the mating face, fit the new coolant pump and gasket, and tighten to the manufacturer's specification.

Ensure the timing belt tensioner is located correctly on the location dowel (Fig 3). Fit the new timing belt in a clockwise direction, starting at the camshaft. Once installed, adjust the



tensioner so that the pointer is just to the left of the notch on the base plate.

Tighten the tensioner, remove the camshaft and crankshaft locking pins, and fully rotate the engine 10 times. After the engine has been fully rotated, refit the camshaft and crankshaft locking pins, and set the tensioner to the start position, with the pointer in the centre of the notch on the base plate (Fig 4).



Rotate the engine two more revolutions, and check the tensioner pointer is still in the start position. With the timing belt now fitted and tensioned correctly, assemble in reverse order of removal and refill the cooling system with the correct grade and strength of coolant. Run the vehicle to operating temperature, remember to recode the radio, reset all electrical systems and clear control unit fault memories.

Once the cooling system has been refilled, give the vehicle an extended road test to ensure the coolant level is correct.

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