special Tdi focus

HOMEWORKSHOP

with Dave Barker

Tdi engines

Adjusting valve clearances

I must admit that after owning and servicing a V8 Range Rover for around 18 years, when I changed to the 300 Tdi Defender, the first service felt very much like a step back in time to the dark ages.

This old manual method of checking and adjusting tappets came as a shock after years of hydraulic lifters on the V8. But as Land Rover recommend you check and adjust as necessary every 6000 miles, you soon get used to the job again! I'm told by the experts who service Tdi engines every day that, if you change the oil regularly and check the tappets every 6000 miles, your engine should last "forever."

The valves need to be checked for the correct clearance and adjusted as needed in the correct order, starting with valve number one. Because you will be cranking the engine over (albeit slowly) to check the valve clearances, it is vital to make certain that the engine cannot start as you do so. Taking out the glow plugs will take a few extra minutes, but there's no way that the engine will start without them.

Fully open valve eight, counting from the front of the engine. Using a spanner or socket on the crankshaft pulley, turn the engine until valve eight is full open. If you are unsure whether the valve has fully opened, you can turn the crankshaft back and forwards until you are certain the valve is at the top of its travel. Another check is the rule of nine; when valve eight is fully open, valve one will be closed (8+1=9).

With valve eight now fully open, you can check the gap of valve one. Slide a feeler gauge blade between the valve tip and the rocker pad, and check the gap; this should be 0.20 mm when checked with the engine cold. If the gap needs adjusting, slacken the locknut with a ring spanner and turn the tappet adjusting screw with a screwdriver. Turning the screw clockwise reduces the clearance, turning anti-clockwise will increase the clearance. With the gap now correct, hold the adjusting screw with the screwdriver and tighten the locking nut with the ring spanner. Re-check the clearance to ensure the gap is correct and has not moved when you tightened the locknut.

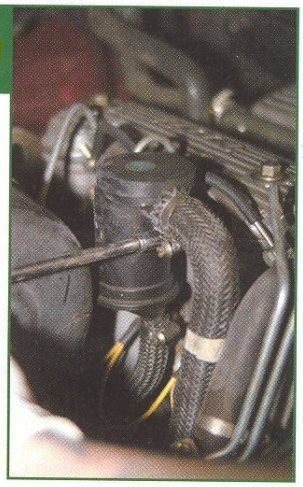
Move on to the next valve in the sequence, turning the crankshaft until the valve is fully open, so you can then check and adjust the corresponding closed valve. You should only need to turn the locknut by about a quarter or half a turn to loosen it, to allow you to adjust the tappet.

The sequence you should use to check the valves is:

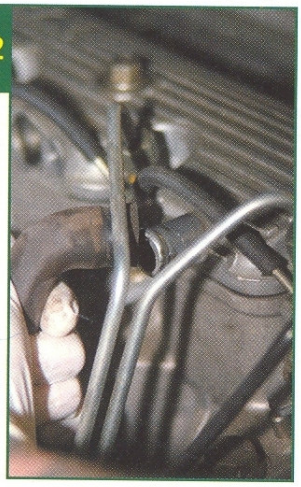
Valve fully open	Valve gap to be checked
8	1
6	3
4	5
7	2
1	8
3	6
5	4
2	7

You should also find that you don't need to turn the adjusting screw by more than an eighth of a turn to adjust the tappet under normal conditions.

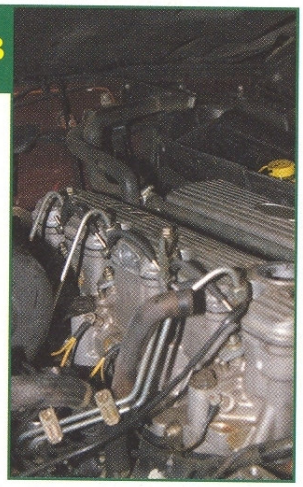
This work was carried out as part of a 6000 mile service to a 1996 300 Tdi Defender by Roberts Country Vehicles of Doncaster, Croft Court, Sandall Carr Road, Kirk Sandall, Doncaster DN3 1QL (tel: 01302 880001).



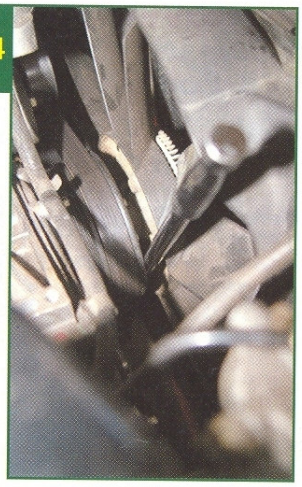
First remove the engine cyclone breather from the side of the valve (rocker) cover



Next, carefully remove the breather pipe from the valve (rocker) cover

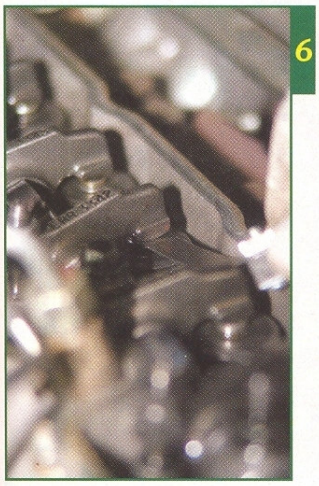


Remove the oil filler cap and undo the three nuts holding the cover

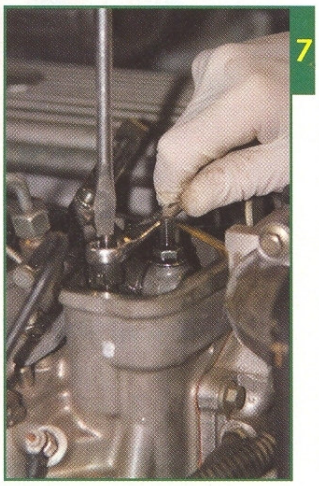


Using a spanner or socket on the crankshaft pulley bolt, turn the engine over

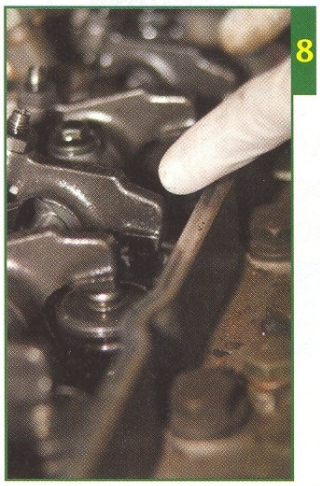
You can see when the valve is fully open. Pictured is valve five



With valve eight fully open, check that the clearance of valve one is 0.20 mm

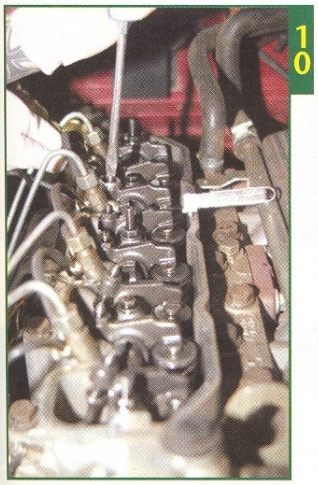


Using a ring spanner, loosen the locknut and adjust the clearance with a screwdriver

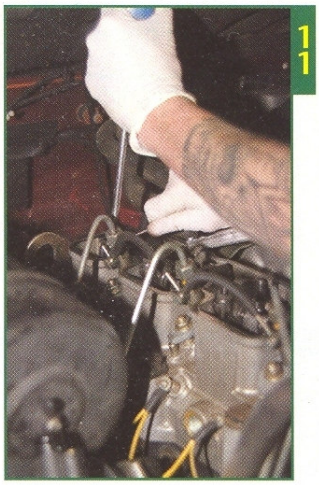


Turn the crank until valve six is fully open; valve three will be closed and can be checked

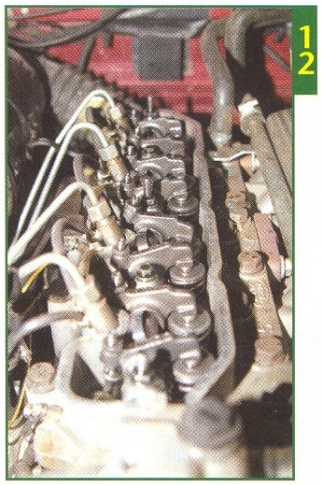
Adjust the gap on valve three if necessary, using the same method as in step seven



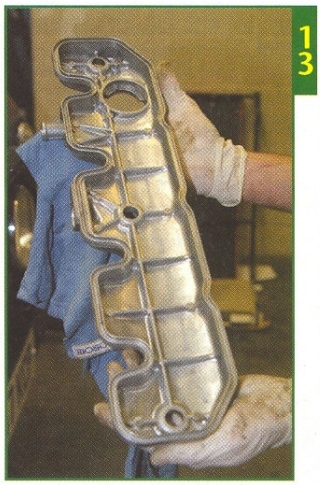
Repeat the process in the correct order on all the valves; number six is shown here



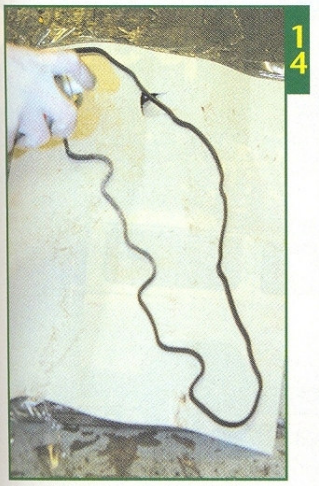
Here, the clearance on valve eight has been checked and is being adjusted



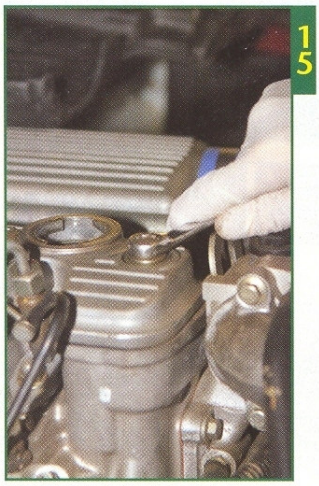
Check the clearance on all the valves in the correct sequence, adjusting as necessary



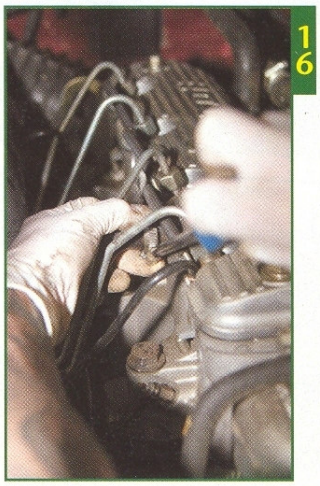
Before refitting the rocker cover, remove all traces of old gasket and clean the cover



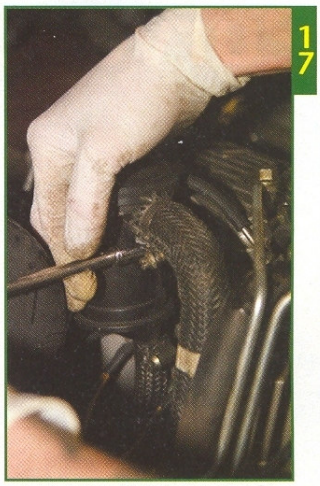
Fit a new gasket. Use a glue to hold it in place while you refit the cover



Replace these washers if damaged. Refit the three bolts and tighten to 10 Nm



Refit the breather pipe to the side of the rocker cover where it came from



Refit the breather cyclone unit, and tighten the bolt to 9 Nm ■