

- Using a spanner tool, rotate exhaust sprocket until stop on intake sprocket is contacted. See Fig. 36. Then slide control unit off front of cylinder head.

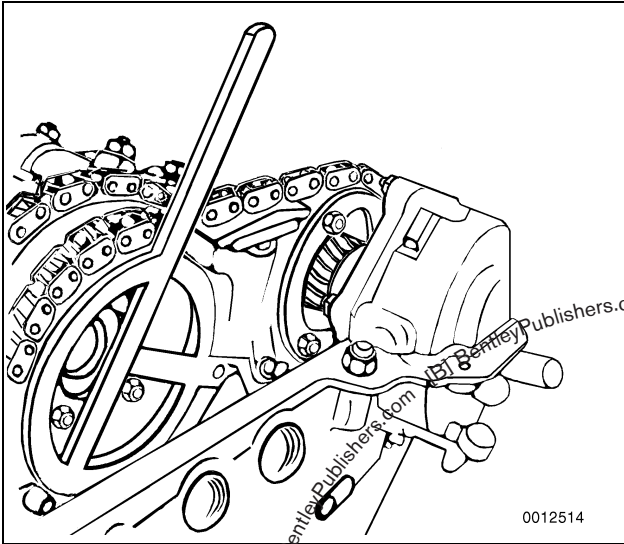


Fig. 36. Rotate exhaust camshaft sprocket clockwise until intake camshaft contacts stop. BMW special tool 11 5 490 shown.

VANOS control unit, installing

CAUTION —

Incorrect installation of the VANOS control may result in damage to the engine valvetrain.

- Lock the camshafts and the crankshaft in the TDC position with BMW special tools as described above in removal procedure.

CAUTION —

The camshafts and crankshaft must be locked in the TDC position with BMW special tools no. 11 2 300 and 11 3 240. If the camshafts and crankshaft are not positioned exactly at TDC, the valves can contact the pistons when the engine is turned over.

NOTE —

Be sure that the secondary timing chain tensioner is locked down and the exhaust camshaft mounting bolts are loose before proceeding.

- Remove primary timing chain tensioner from side of cylinder head. See Fig. 37.
- Install BMW special tool no. 11 3 390 into primary timing chain tensioner sleeve. Thread tool in finger tight until slack is removed from chain.



Fig. 37. Primary timing chain tensioner (arrow). Remove tensioner slowly to relieve spring tension beneath the end plug.

NOTE —

BMW special tool no. 11 3 390 is a dummy primary chain tensioner and simulates the function of the tensioner.

- Hand turn secondary sprockets clockwise (as viewed from front of engine) until sprockets contact stops.
- Apply a small amount of liquid gasket sealer (3-Bond 1209® or equivalent) to VANOS housing alignment dowels on front of cylinder head. Install a new gasket.
- Push VANOS piston gear cup into VANOS housing until it bottoms out in housing.
- Slide VANOS control unit into place, but do not engage splines on gear cup. Using a spanner tool (See Fig. 36), turn exhaust sprocket counterclockwise (as viewed from front of engine) **only enough** to mesh gear cup splines with camshaft gear. Slowly push VANOS control unit towards camshaft.
- Continue to slide VANOS unit in until it is fully seated, guiding chains in counterclockwise direction (as viewed from front of engine). Install and tighten control unit nuts and bolt.

CAUTION —

It is critical that the exhaust camshaft sprocket be turned only the minimum amount necessary to engage the gear cup. If this procedure is done incorrectly, the VANOS system may not function correctly and engine damage could result.