



Timing Chain and Tensioner

REMOVAL & INSTALLATION

NOTE: After this service procedure is finished, changing the engine oil and oil filter is good preventive maintenance due to contamination of old gasket material.

Z24i and KA24E Engines

1. Before beginning any disassembly procedures, position the No. 1 piston at TDC on the compression stroke.
2. Disconnect the negative battery cable.
3. Remove the timing chain cover (place a suitable drain pan under cover assembly).
4. Remove the cylinder head cover.

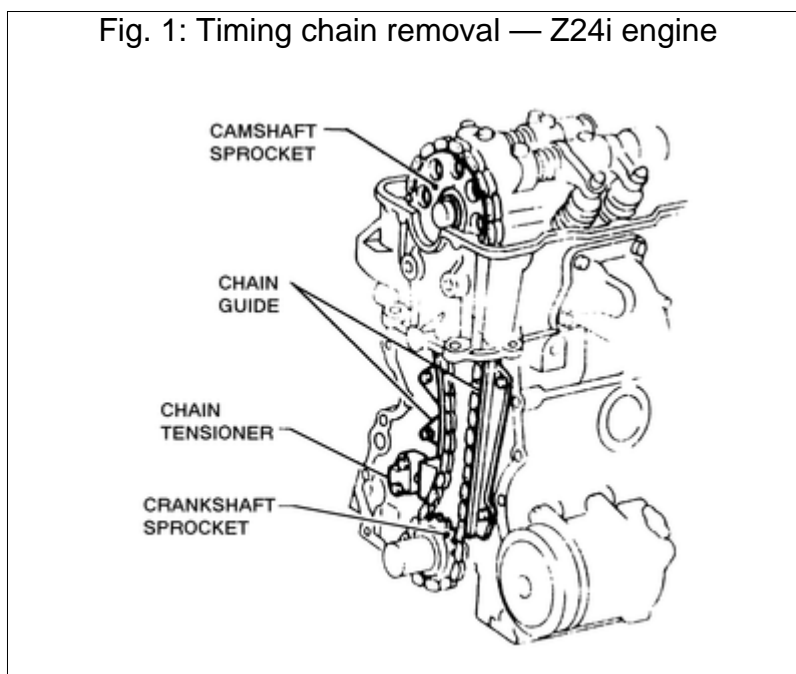


Fig. 2: Check timing chain for damage or excessive wear — Z24i engine

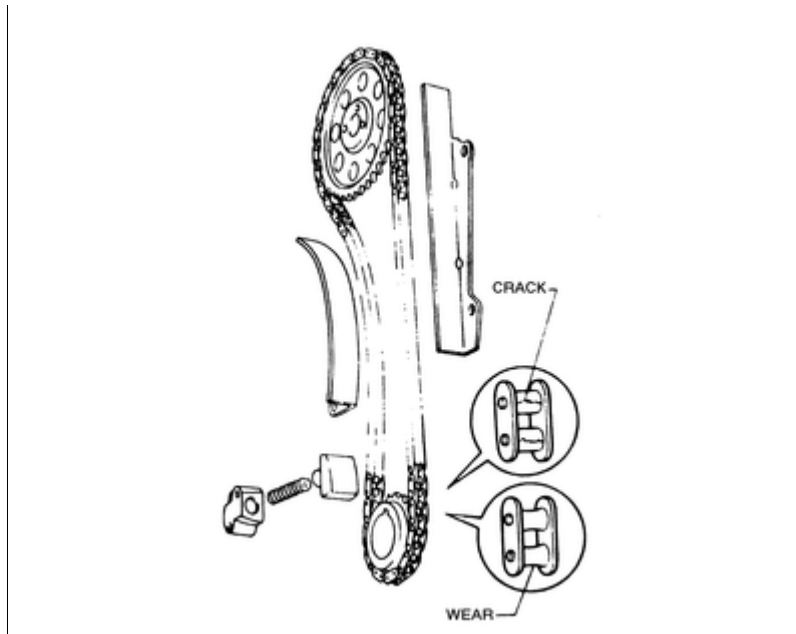


Fig. 3: Crankshaft sprocket mounting — Z24i engine

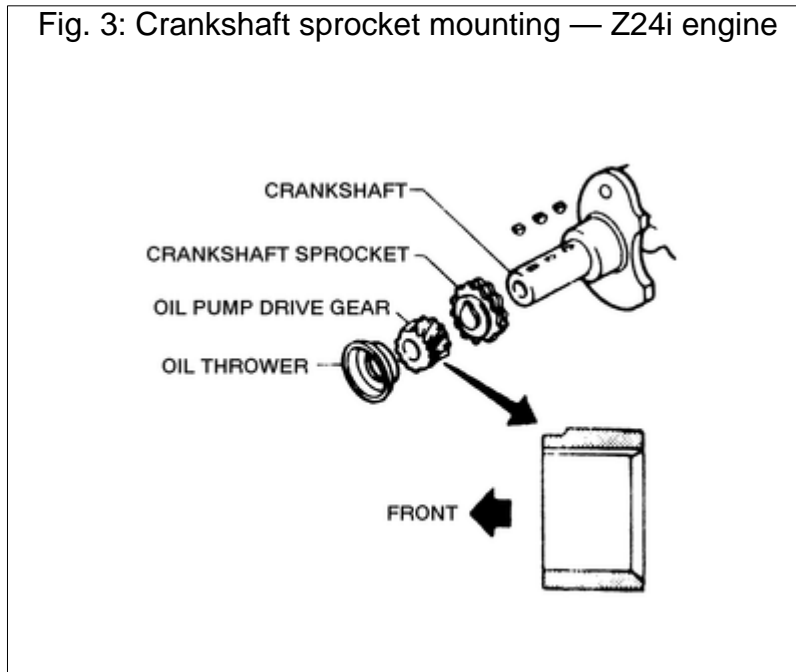


Fig. 4: Timing chain installation and alignment — Z24i engine

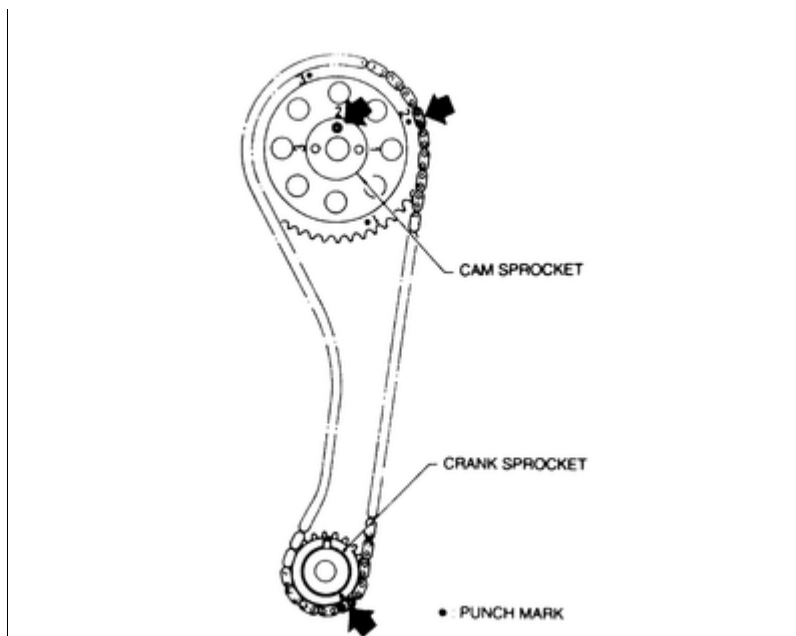


Fig. 5: Timing chain guide adjustment — Z24i engine

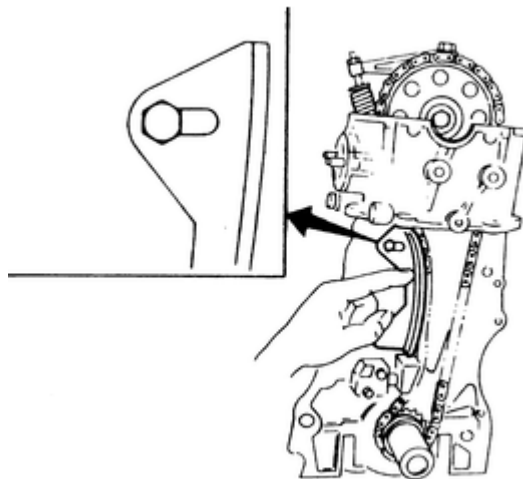
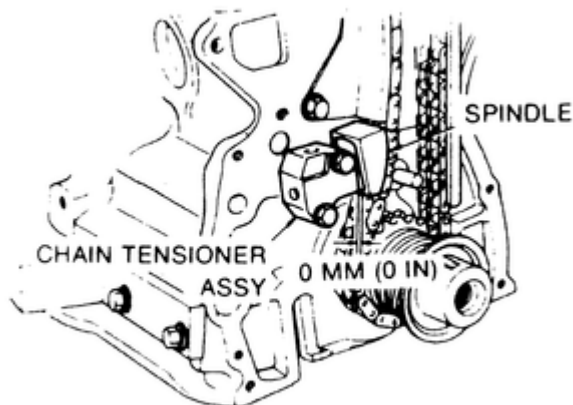


Fig. 6: Timing chain tensioner — Z24i engine



5. With the No. 1 piston at TDC, the timing marks on the camshaft sprocket and the timing chain should be visible. Mark both of them with paint. Also mark the relationship of the camshaft sprocket to the camshaft. There are three sets of timing marks and locating holes in the sprocket; they are for making adjustments to compensate for timing chain stretch.
6. With the timing marks on the camshaft sprocket clearly indicated, locate and label (for easier reference) the timing marks on the crankshaft sprocket. Also label the chain timing mark. Of course, if the chain is not to be reused, marking it is useless.
7. Unbolt and remove the sprocket, along with the chain. As you remove the chain, hold it where the chain tensioner contacts it. When the chain is removed, the tensioner is going to come apart. Hold on to it and you won't lose any of the parts. The crankshaft sprocket can be removed with a puller, if necessary. There is no need to remove the chain guide unless it is being replaced.

To install:

8. Install the timing chain and camshaft sprocket together after first positioning the chain over the crankshaft sprocket. Position the sprocket so that the marks made previously line up. (This is assuming that the engine has not been disturbed.) The camshaft and crankshaft keys should both be pointing upward. If a new chain and/or gear is being installed, position the sprocket so that the timing marks on the chain align with the marks on the sprocket (with both keys pointing up). The marks are on the right-hand side of the sprockets as you face the engine.

NOTE: The Z24i and KA24E engines do not use the pin counting method for finding correct valve timing. Instead, set the timing chain by aligning its mating marks with those of the crankshaft sprocket and camshaft sprocket. The camshaft sprocket should be installed by fitting the knock pin of the camshaft into its No. 2 hole. On the Z24i engine, the No. 2 timing mark must also be used.

Fig. 7: Removing the crankshaft pulley — KA24E engine

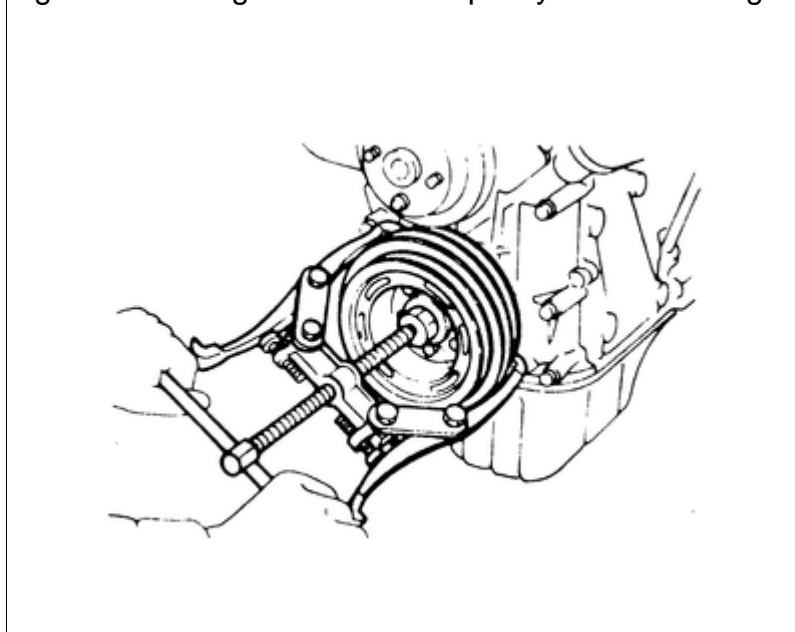


Fig. 8: Timing chain removal — KA24E engine

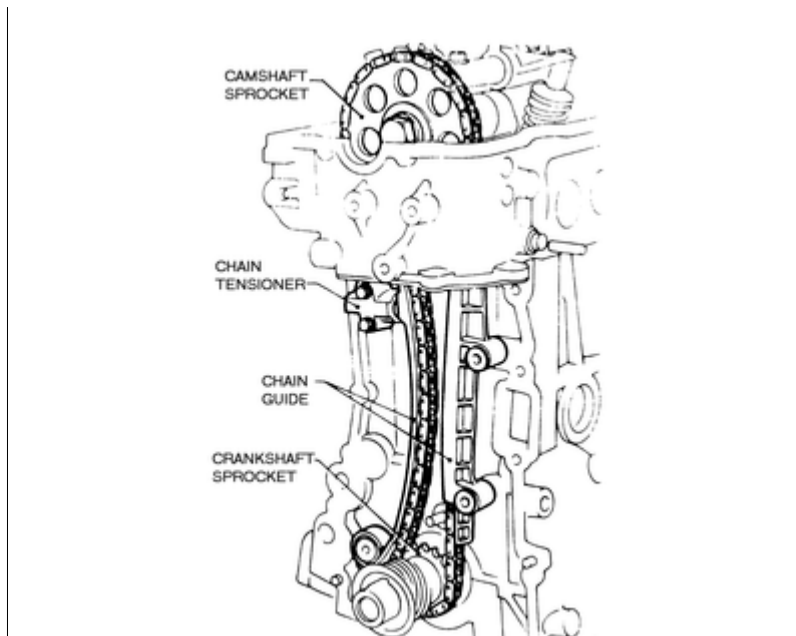


Fig. 9: Crankshaft sprocket installation — KA24E engine

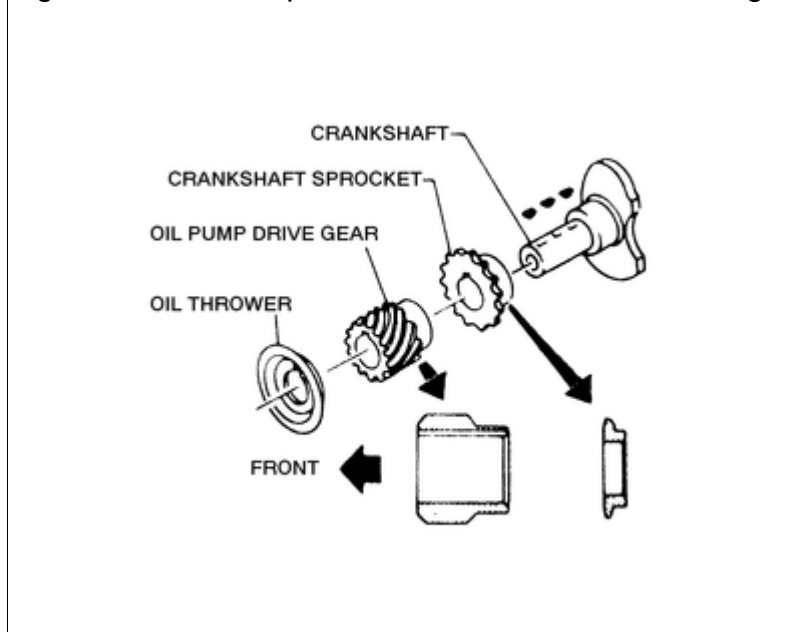


Fig. 10: Check the timing chain for cracks or excessive wear — KA24E engine

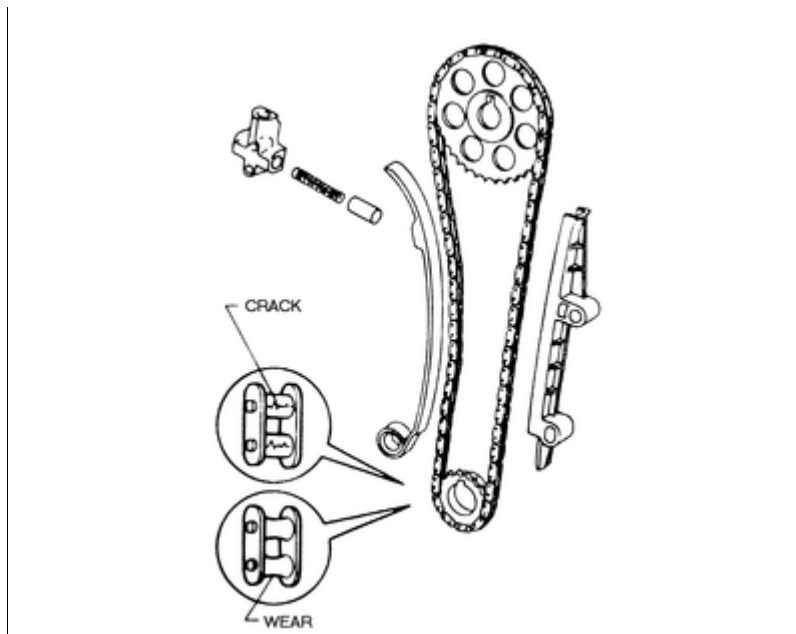


Fig. 11: Timing chain installation and alignment — KA24E engine

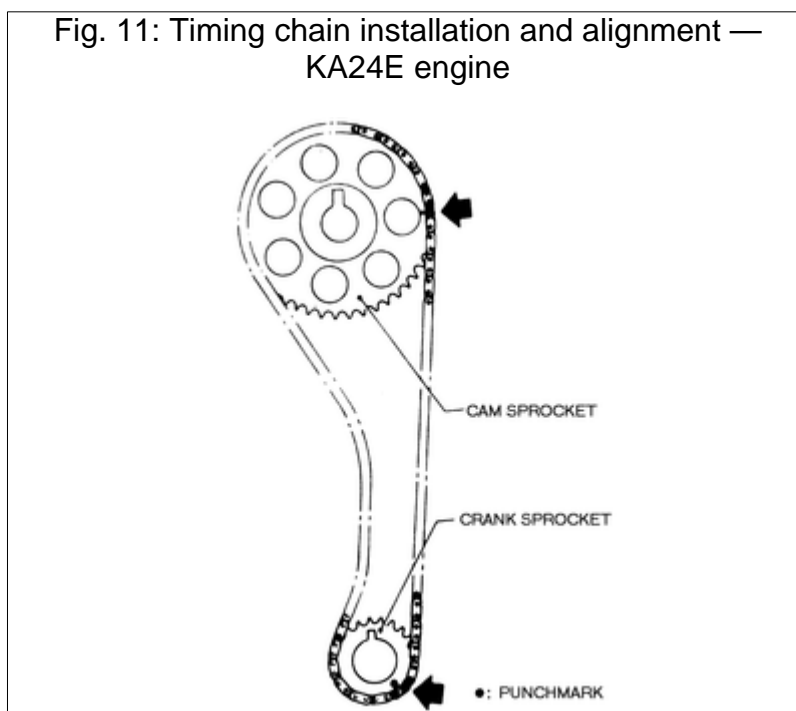


Fig. 12: Install the chain guide and chain tensioner — KA24E engine

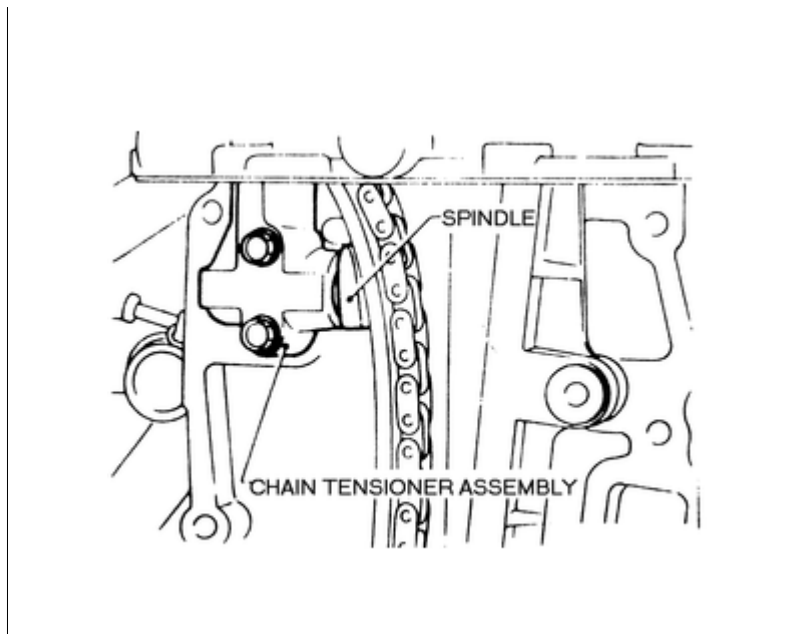
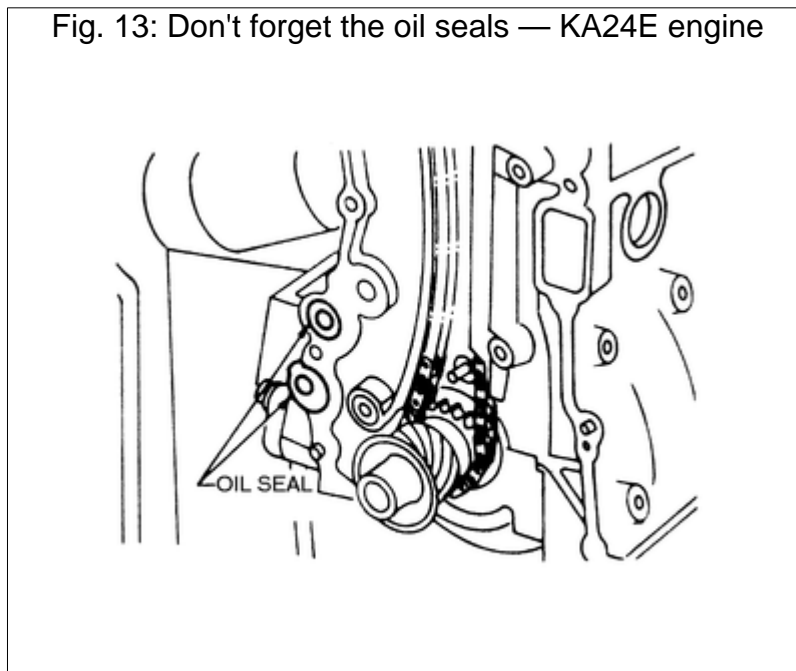


Fig. 13: Don't forget the oil seals — KA24E engine



9. Install the camshaft sprocket bolt and tighten it to 87–116 ft. lbs. (118–157 Nm).
10. Install the chain guide and tensioner. Adjust the protrusion of the chain tensioner spindle to zero clearance. Tighten the bolts to 4–7 ft. lbs. (6–10 Nm).
11. With a new seal installed in the timing chain cover and a light coat of oil applied to the seal, install the cover.
12. Install the cylinder head cover.
13. Connect the negative battery.
14. Check all fluids and add, as necessary.
15. Start the engine and check for any leaks. Check the ignition timing and adjust, as necessary.

