




Timing Drive Components—Romeo Engine

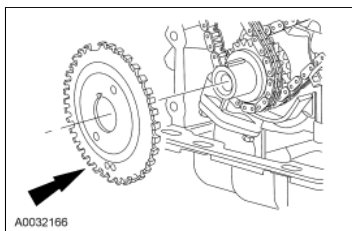
Special Tool(s)

 <p>ST1329-A</p>	<p>Aligner, Camshaft 303-380 (T91P-6256-A)</p>
 <p>ST1334-A</p>	<p>Aligner, Camshaft Pulley 303-413 (T92P-6256-A)</p>
 <p>ST1335-A</p>	<p>Holding Tool, Crankshaft 303-448 (T93P-6303-A)</p>

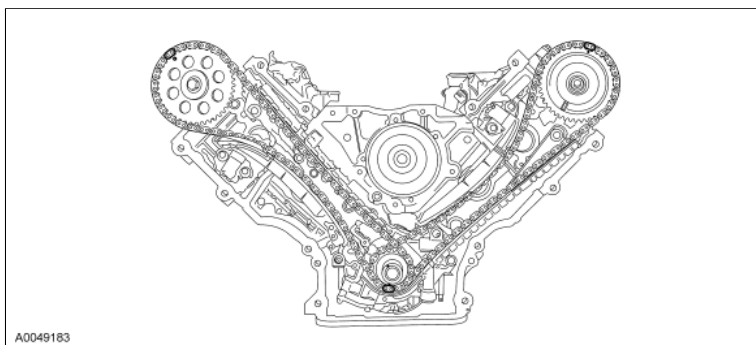
Removal

⚠ CAUTION: Since the engine is not free-wheeling, timing procedures must be followed exactly or piston and valve damage may occur.

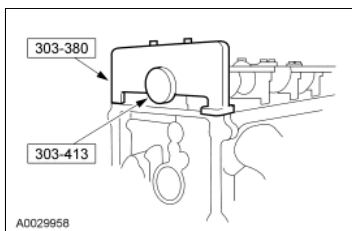
1. Remove the engine front cover. For additional information, refer to [Engine Front Cover—4.6L](#) in this section.
2. Remove the crankshaft sensor ring from the crankshaft.



3. Rotate the crankshaft until the timing mark on the RH camshaft sprocket is approximately at the 11 o'clock position, and the timing mark on the LH camshaft sprocket is approximately at the 12 o'clock position.

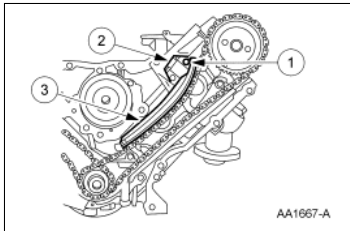


4. Install the special tools on the camshaft.

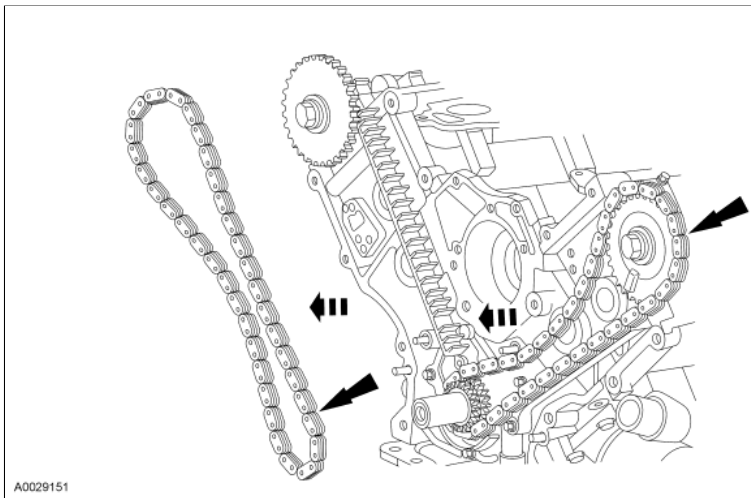


5. Remove the timing chain tensioning system from both timing chains.
 1. Remove the bolts.
 2. Remove the timing chain tensioners.

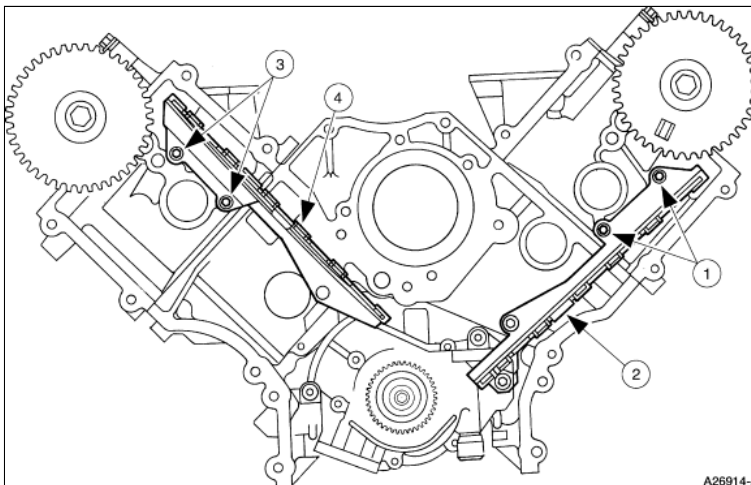
3. Remove the timing chain tensioner arms.




6. Remove the timing chains and the crankshaft sprockets.




7. Remove the timing chain guides.
 1. Remove the bolts.
 2. Remove the LH timing chain guide.
 3. Remove the bolts.
 4. Remove the RH timing chain guide.

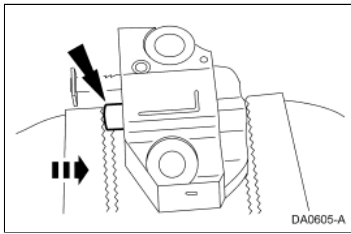


Installation

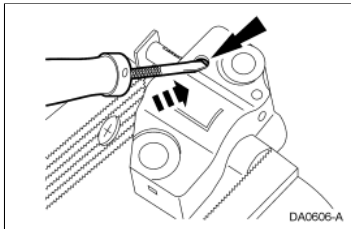
1.  **CAUTION:** The timing chain procedures must be followed exactly or damage to valves and pistons will result.

 **CAUTION:** Do not compress the ratchet assembly. This will damage the ratchet assembly.

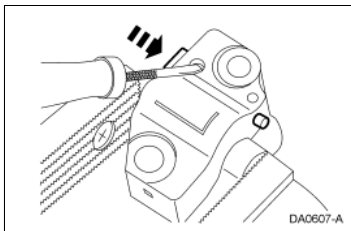
Compress the tensioner plunger, using an edge of a vise.



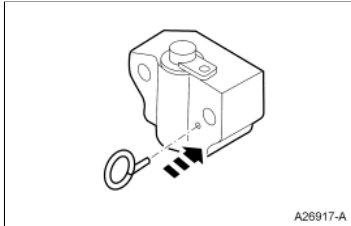
2. Using a small screwdriver or pick, push back and hold the ratchet mechanism.



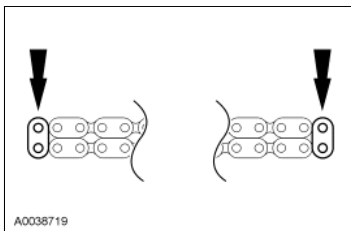
3. While holding the ratchet mechanism, push the ratchet arm back into the tensioner housing.



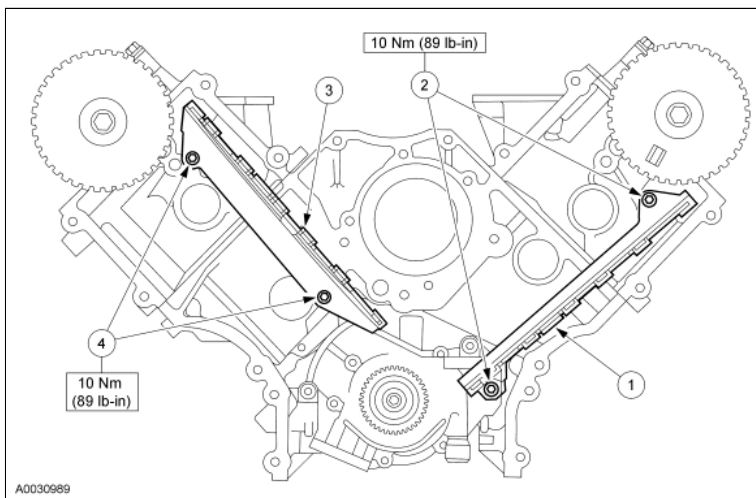
4. Install a paper clip into the hole in the tensioner housing to hold the ratchet assembly and plunger in during installation.



5. Remove the tensioner from the vise.
6. If the copper links are not visible, mark one link on one end and one link on the other end, and use as timing marks.

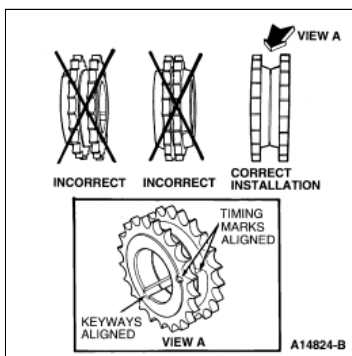


7. Install the timing chain guides.
 1. Position LH timing chain guide.
 2. Install and tighten the bolts.
 3. Position the RH timing chain guide.
 4. Install and tighten the RH bolts.



8. **NOTE:** Crankshaft sprockets are identical. They may only be installed one way. Refer to the following illustration for correct crankshaft sprocket installation.

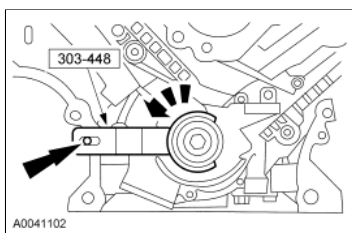
If removed, install the LH and RH crankshaft sprockets.



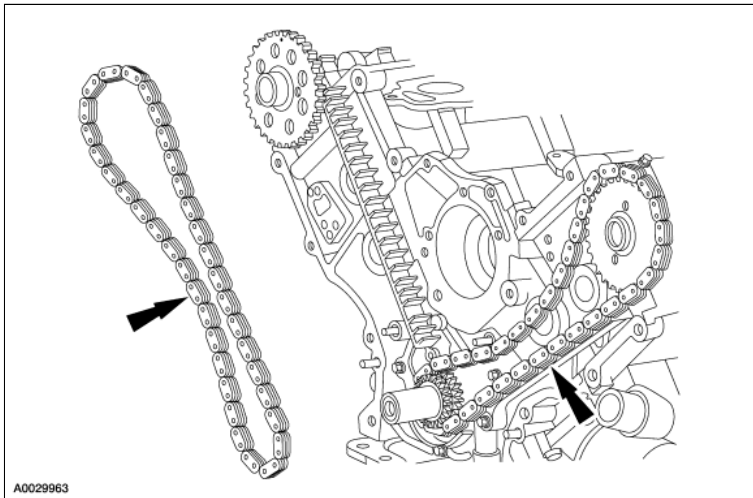
9. **⚠ CAUTION:** Unless otherwise instructed, do not rotate either the crankshaft or the camshafts when timing chains are removed and the cylinder heads are installed. Severe piston and valve damage will occur.

NOTE: The number one cylinder is at top dead center (TDC) when the stud on the engine block fits into the slot in the handle of the special tool.

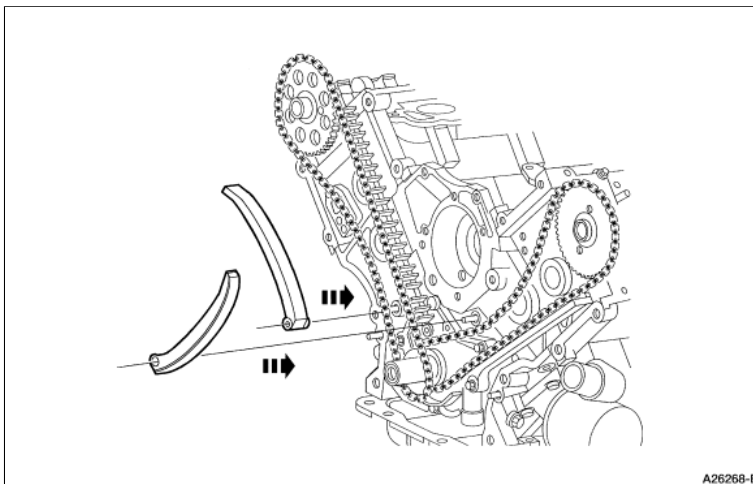
Using the special tool, position the crankshaft so the number one cylinder is TDC.



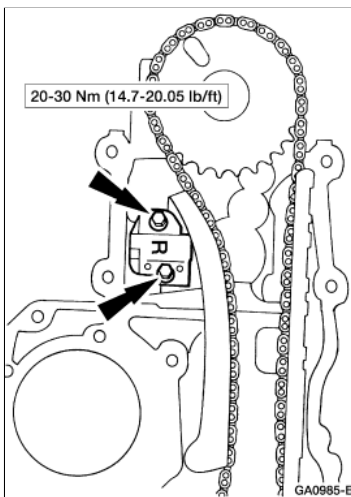
10. Remove the special tool.
11. Install the timing chains.
- Install the LH (inner) timing chain on the crankshaft sprocket, aligning the copper (marked) link with the dot on the crankshaft sprocket.
 - Install the LH (inner) timing chain on the camshaft sprocket, aligning the copper (marked) link with the dot on the camshaft sprocket.
 - Install the RH (outer) timing chain on the crankshaft sprocket, aligning the copper (marked) link with the dot on the crankshaft sprocket.
 - Install the RH (outer) timing chain on the camshaft sprocket, aligning the copper (marked) link with the dot on the camshaft sprocket.



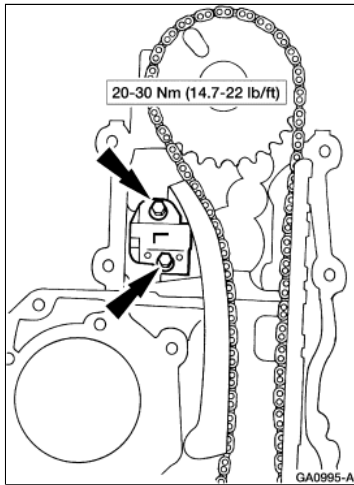
12. Position the LH and RH timing chain tensioner arm on the dowel pins.



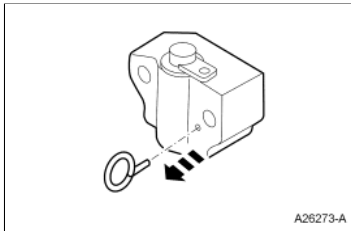
13. Position the RH timing chain tensioner and install the timing chain tensioner bolts.



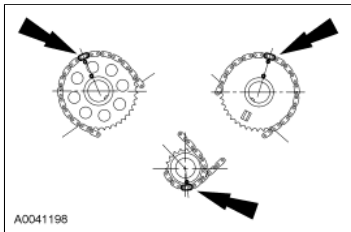
14. Position the LH timing chain tensioner and install the bolts.



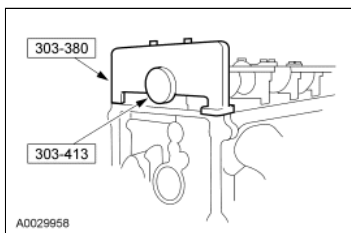
15. Remove both the RH and LH retaining pins from the timing chain tensioner.



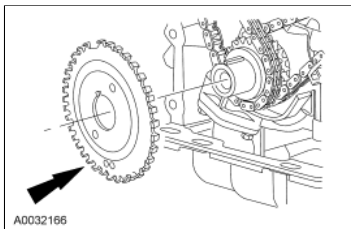
16. Make sure that the copper (marked) chain links are lined up with the dots on the crankshaft sprockets and the camshaft sprocket.



17. Remove the special tools from the camshaft.



18. Install the crankshaft sensor ring on the crankshaft sprocket.



19. Install the engine front cover. For additional information, refer to [Engine Front Cover—4.6L](#) in this section.

