Published : Nov 2, 2004

Camshaft Timing

Special Service Tools

Camshaft timing checking tool
303-1146

Crankshaft TDC timing/locking tool
303-573

Camshaft Bolt Tool
303-575

Camshaft Bolt Socket
303-565

Camshaft locking tool adaptor
303-576

Camshaft sprocket adjusting/locking tool
303-597-01

Camshaft timing chain tensioning tool
303-571

1 . Check the camshaft timing.

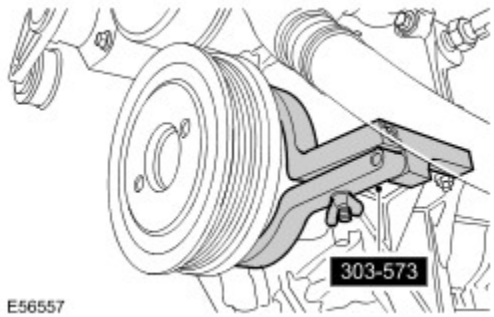
2 . Disconnect the battery ground cable.
Specifications

3 . Remove both valve covers.

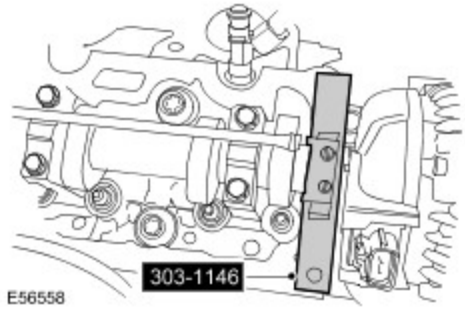
4 . Rotate the crankshaft clockwise, until number one cylinder is on TDC. Check the camshaft lobes are on the back of the cam.

5 . Lock the crankshaft.

- Install the special tool.
- Tighten the screw.



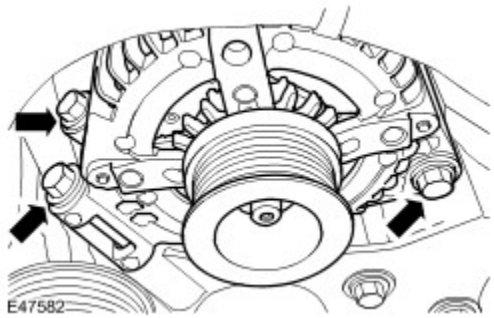
6 . Install the special tool to the slot in the camshaft, the base of the special tool must remain in contact with the cylinder head. If the special tool can be passed from one side of the cylinder head to the other without resistance then the camshaft is correctly timed. Repeat the procedure on the other camshaft. If both camshafts are found to be correct, then no further action is required.



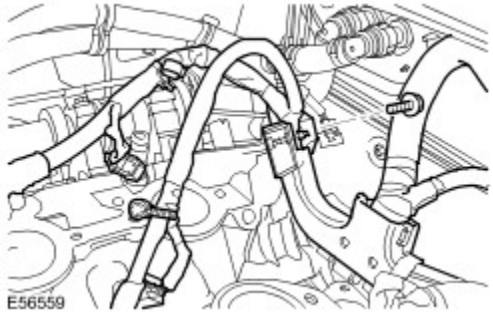
7 . If the camshaft timing is found to be incorrect, proceed with the adjustment. Note both camshafts must be re-timed with the camshaft roller followers removed.

8 . Remove the camshaft roller followers.
Camshaft Roller Follower (12.29.57)

9 . Position the generator aside for access.
- Remove the 3 bolts.



10 . Remove the RH cylinder head harness carrier bolt.
- Position the harness carrier aside for access.



11 .

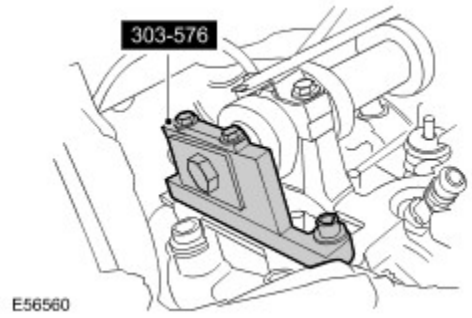
CAUTION: Damage to the camshaft will occur if the alignment tool is used to release the camshaft sprocket bolt.

NOTE :

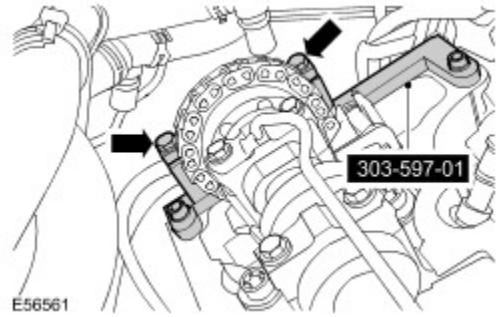
The camshaft timing slot is off center. Correctly timed the slot will be horizontal and below the center line.

Install the camshaft alignment special tool.

- Clean the component mating faces.
- Tighten the bolts to 10 Nm (7 lb.ft).
- Lock the camshaft, tighten the special tool bolt to 45 Nm (33 lb.ft).



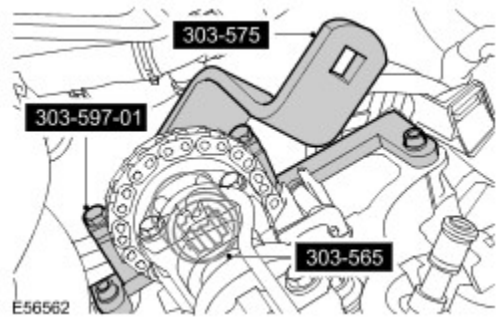
12 . Install the special tool to the RH cylinder head.
- Clean the component mating faces.
- Tighten the bolts to 10 Nm (7 lb.ft).
- Tighten the saddle clamp bolts to 10 Nm (7 lb.ft).



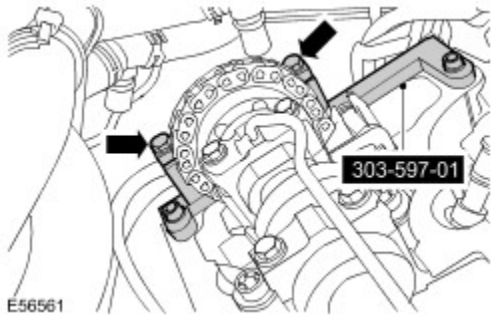
13 .

CAUTION: The RH camshaft sprocket bolt has a left hand thread.

Using the special tool, loosen the RH camshaft sprocket bolt.
- Remove and discard the bolt.



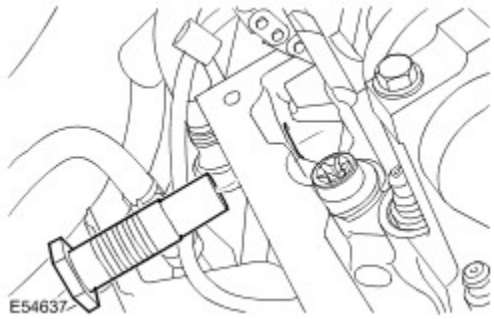
14 . Loosen the special tool saddle clamp bolts.



15 .

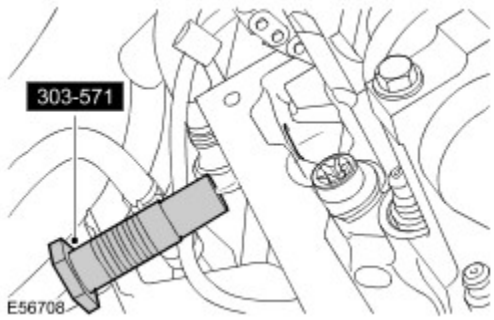
CAUTION: Before disconnecting or removing the components, ensure the area around the joint faces and connections are clean. Plug open connections to prevent contamination.

Remove the RH hydraulic timing chain tensioner.

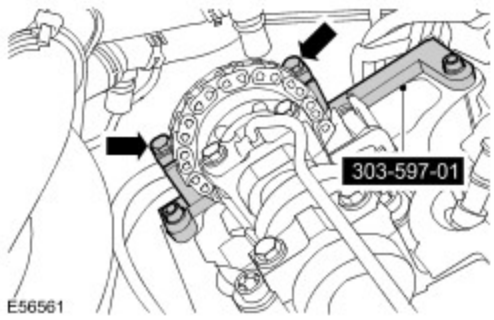


16 . Install the special tool.

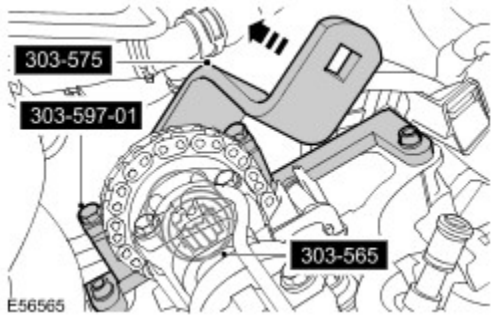
- Clean the component mating faces.



17 . Tighten the saddle clamp bolts to 10 Nm (7 lb.ft).



18 . Using the special tool, tighten the camshaft sprocket bolt to 20 Nm (15 lb.ft), then a further 100 degrees.



19 . Remove the special tools.

20 . Install the RH hydraulic timing chain tensioner.

- Install a new seal.
- Clean the component mating faces.
- Tighten the tensioner to 44 Nm (32 lb.ft).

21 . **NOTE :**
If either camshaft is disturbed, both camshafts MUST be retimed.

NOTE :
The LH camshaft sprocket bolt has a right hand thread.

Repeat the above procedure to adjust the LH camshaft timing.

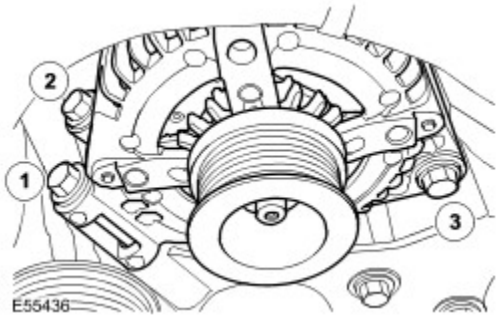
22 . Install the camshaft roller followers.
Camshaft Roller Follower (12.29.57)

23 .

CAUTION: Tighten the bolts in the sequence shown.

Install the generator.

- Clean the component mating faces.
- Tighten the bolts to 45 Nm (33 lb.ft).



24 . Connect the battery ground cable.
Specifications