

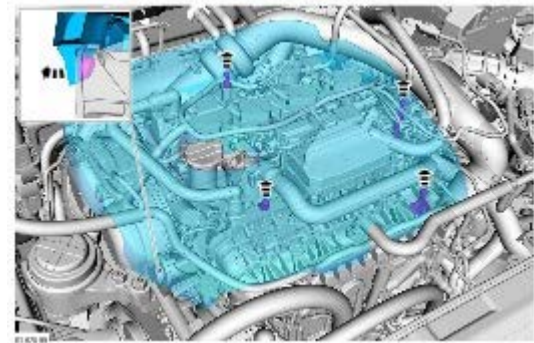
Removal and Installation

Special Tool(s) / General Equipment

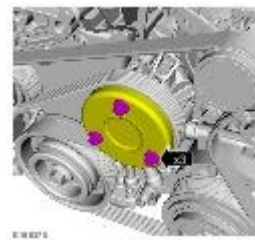
	303-1097 Locking Tool, Variable Camshaft Timing Oil Control Unit
	303-1550 Alignment Tool, Crankshaft Vibration Damper
	303-393-02 Adapter for 303-393
	303-393A Locking Tool, Flywheel
	303-748 Locking Tool, Crankshaft
4 mm Drill Bit	

Removal

1.

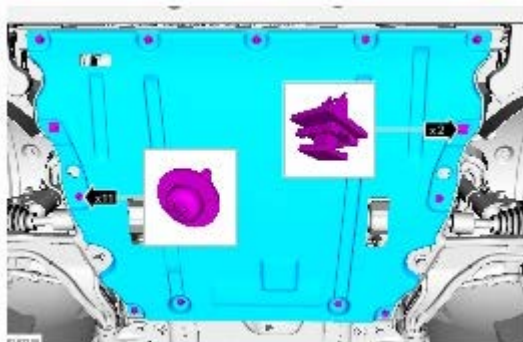


2. Loosen: 2 turn(s)

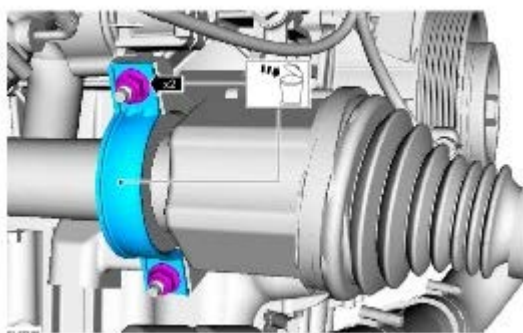


3. Refer to: [Jacking and Lifting](#) (100-02 Jacking and Lifting, Description and Operation).

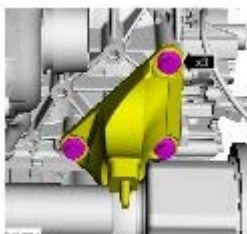
4.



5.



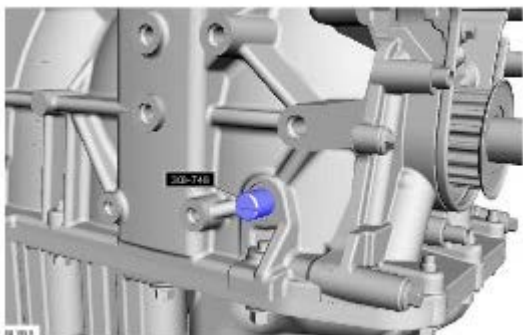
6.



7.



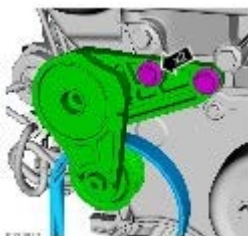
8. Install Special Service Tool: [303-748](#).



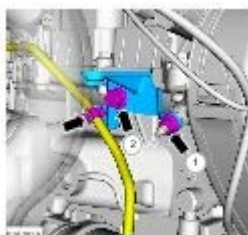
9. Remove the following items:

1. Refer to: [Starter Motor](#) (303-06B Starting System, Removal and Installation).
2. Refer to: [Wheel and Tire](#) (204-04A Wheels and Tires, Removal and Installation).
3. Refer to: [Crankshaft Position \(CKP\) Sensor](#) (303-14B Electronic Engine Controls, Removal and Installation).
4. Refer to: [Generator - 1.5L EcoBoost \(118kW/160PS\) – I4](#) (414-02 Generator and Regulator, Removal and Installation).
5. Refer to: [Engine Mount](#) (303-01B Engine, Removal and Installation).

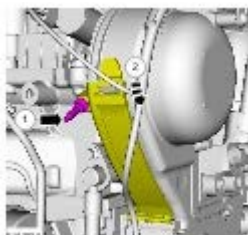
10.



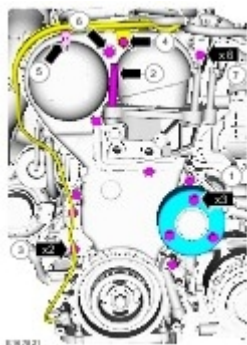
11.



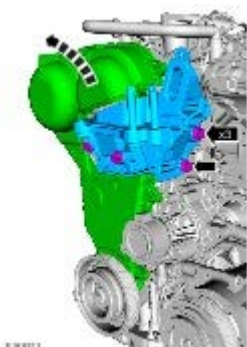
12.



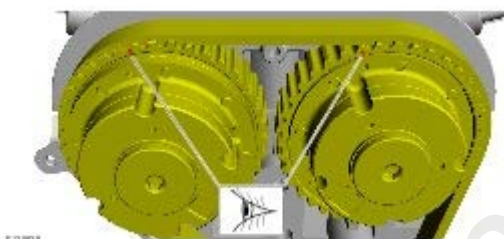
13.



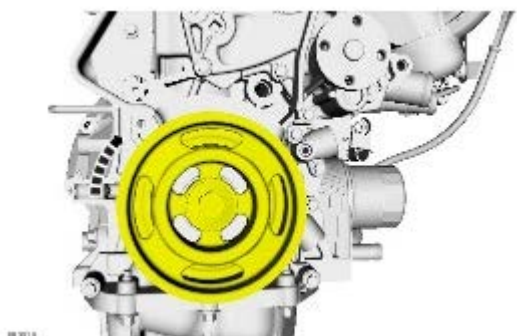
14. **NOTE:** Note the different lengths of the bolts.



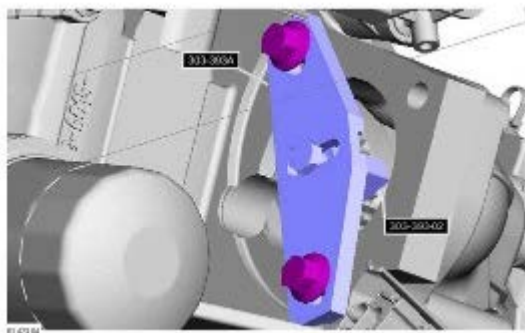
15. **NOTICE:** Only rotate the crankshaft clockwise.
Rotate the crankshaft until the markings on the VVT units are at the 11 o'clock position.



16. **NOTICE:** Only rotate the crankshaft clockwise.
Rotate the crankshaft slowly until the crankshaft stops.



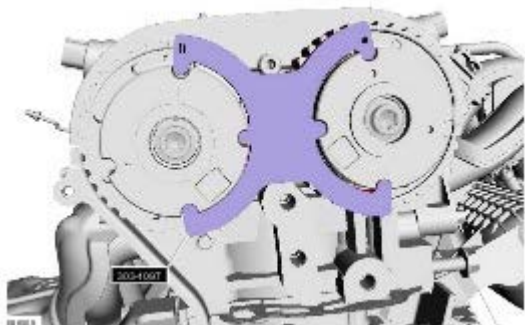
17. Install Special Service Tools: [303-393A](#), [303-393-02](#).



18.

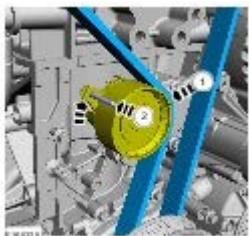


19. Install Special Service Tool: [303-1097](#).



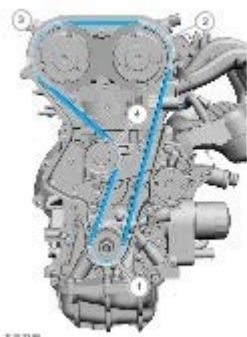
20.  **WARNING:** The tensioner is under spring tension. Be careful when handling the tensioner. Failure to follow this instruction may result in personal injury.

Install the General Equipment: [4 mm Drill Bit](#)



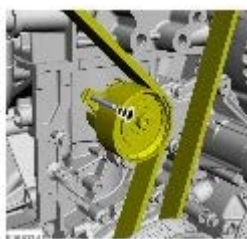
Installation

1.



2.  **WARNING:** The tensioner is under spring tension. Be careful when handling the tensioner. Failure to follow this instruction may result in personal injury.

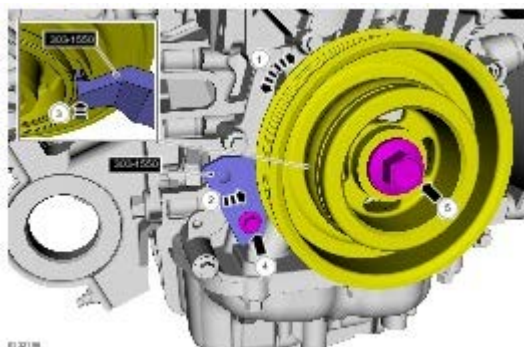
Remove the General Equipment: 4 mm Drill Bit



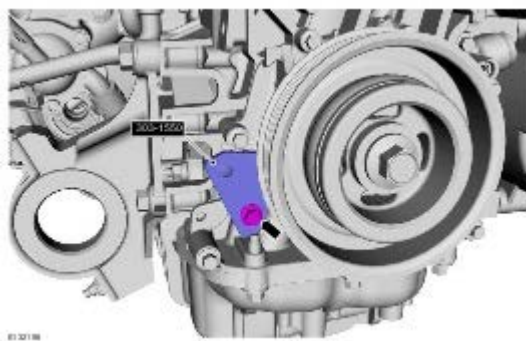
3.



- 4.
- 1.
 2. Install Special Service Tool: [303-1550](#).
 3. Install Special Service Tool: [303-1550](#).
 4. **NOTE:** Only tighten the bolt finger tight at this stage.
 5.  **NOTICE:** Make sure that a new bolt is installed.
NOTE: Only tighten the bolt finger tight at this stage.

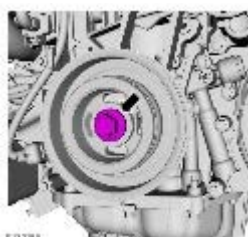


5. Remove Special Service Tool: [303-1550](#).

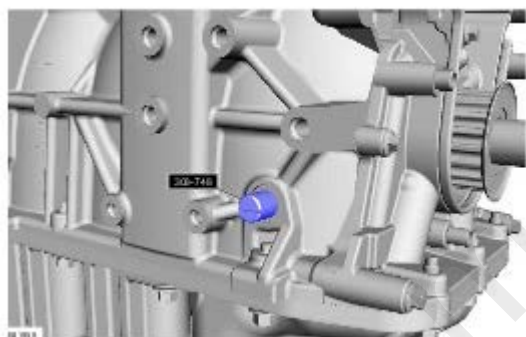


6. Torque:

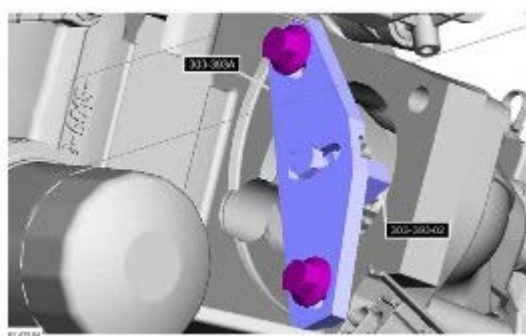
- Stage 1: 100 Nm
- Stage 2: 90°
- Stage 3: Wait 10 s
- Stage 4: 15°



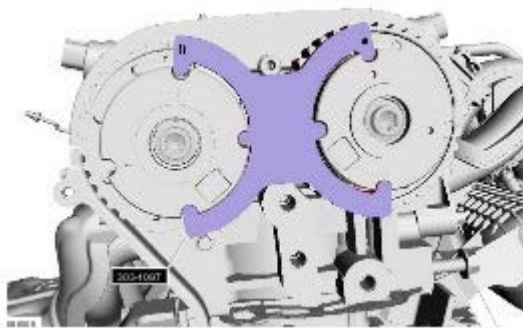
7. Remove Special Service Tool: [303-748](#).



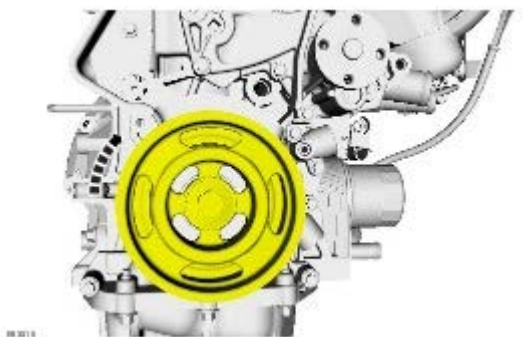
8. Remove Special Service Tools: [303-393A](#), [303-393-02](#).



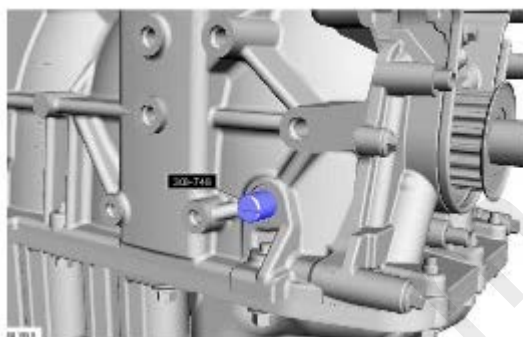
9. Remove Special Service Tool: [303-1097](#).



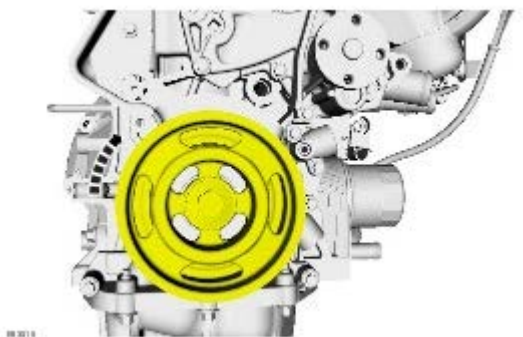
10.  **NOTICE:** Only rotate the crankshaft clockwise.
Rotate the crankshaft 1 and 3/4 revolutions and continue until piston No. 1 is approximately 45° before top dead center (BTDC).



11. Install Special Service Tool: [303-748](#).



12.  **NOTICE:** Only rotate the crankshaft clockwise.
Rotate the crankshaft slowly until the crankshaft stops.

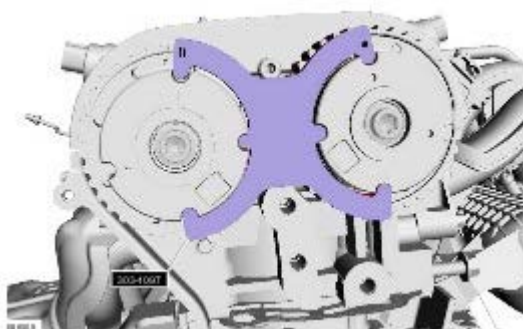


13. **NOTE:** The special tool can only be installed if the valve timing is correct.

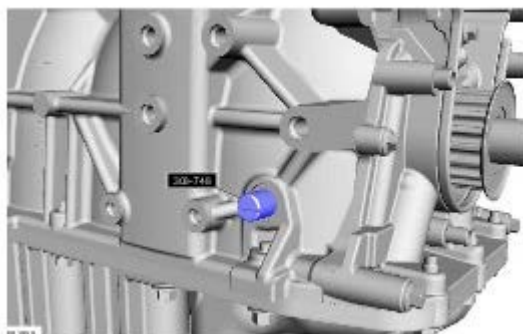
If the special tool cannot be installed, repeat the adjustment.

Install Special Service Tool: [303-1097](#).

14. Remove Special Service Tool: [303-1097](#).



15. Remove Special Service Tool: [303-748](#).

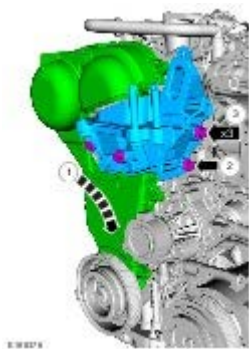


16. Torque: 20 Nm

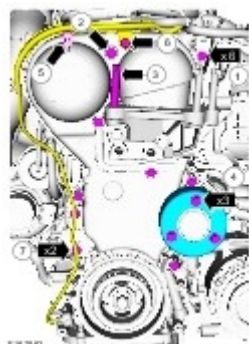


17. NOTE: Note the different lengths of the bolts.
NOTE: Install all the bolts finger tight before final tightening.

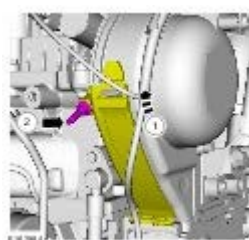
Torque: 55 Nm



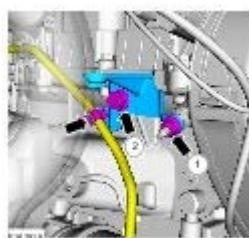
- 18.
1. Torque: 10 Nm
 2. Torque: 10 Nm
 3. Torque: 8 Nm
 4. NOTE: Only tighten the bolts finger tight at this stage.



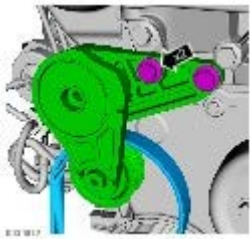
19. Torque: 10 Nm



- 20.
1. Torque: 7 Nm
 2. Torque: 23 Nm



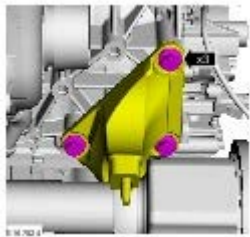
21. Torque: 48 Nm



22. Install the following items:

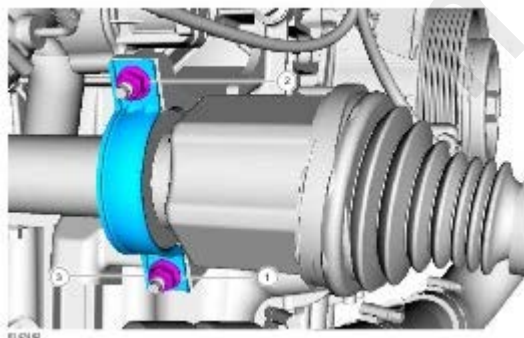
1. Refer to: [Engine Mount](#) (303-01B Engine, Removal and Installation).
2. Refer to: [Generator - 1.5L EcoBoost \(118kW/160PS\) – I4](#) (414-02 Generator and Regulator, Removal and Installation).
3. Refer to: [Starter Motor](#) (303-06B Starting System, Removal and Installation).
4. Refer to: [Wheel and Tire](#) (204-04A Wheels and Tires, Removal and Installation).
5. Refer to: [Crankshaft Position \(CKP\) Sensor](#) (303-14B Electronic Engine Controls, Removal and Installation).

23. Torque: 48 Nm

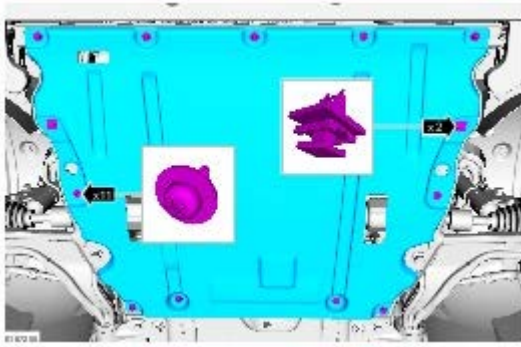


24. NOTE: Make sure that a new component is installed.

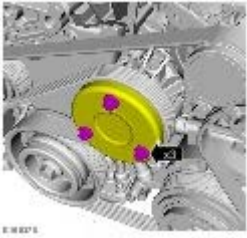
1. Torque: 5 Nm
2. Torque: 25 Nm
3. Torque: 25 Nm



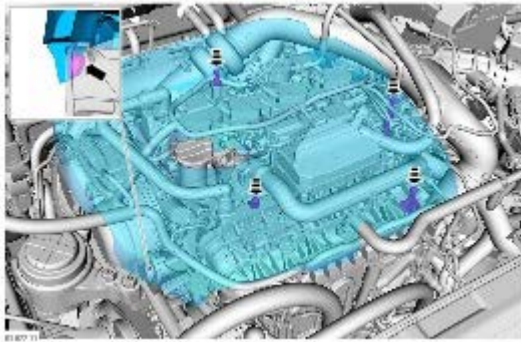
25.



26. Torque: 24 Nm



27.



28. NOTE: Use the Powertrain Control Module (PCM) Misfire Monitor Profile Correction routine in the diagnostic scan tool.