<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
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<tbody>
<tr>
<td>303-578 (T971-6256-A) or equivalent</td>
<td>ST1776-A</td>
</tr>
<tr>
<td>Adapter for 303-577 303-576 (T971-6256-D) or equivalent</td>
<td>ST1770-A</td>
</tr>
<tr>
<td>Holding Tool, Camshaft 303-577 (T971-6256-C) or equivalent</td>
<td>ST1778-A</td>
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<tr>
<td>Holding Tool, Camshaft Sprocket 303-564 (T971-6256-B) or equivalent</td>
<td>ST1777-A</td>
</tr>
<tr>
<td>Remover, Spark Plug Wire 303-106 (T74P-6666A)</td>
<td>ST1394-A</td>
</tr>
<tr>
<td>Socket, Camshaft Sprocket Nut 303-565 (T971-6256-G) or equivalent</td>
<td>ST1781-A</td>
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<table>
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<tr>
<th>Component</th>
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<tbody>
<tr>
<td>ST1774-A</td>
<td>Tensioner, Timing Chain 303-571 (T97T-6K254-A) or equivalent</td>
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<tr>
<td>ST1775-A</td>
<td>Timing Tool, Crankshaft TDC 303-573 (T97T-6303-A) or equivalent</td>
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<tr>
<td>ST1780-A</td>
<td>Torque Wrench Extension 303-575 (T97T-6256-F) or equivalent</td>
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</tbody>
</table>
CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

Both sides
1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Maintenance/Service and Repair.
2. Release the fuel system pressure. For additional information, refer to Fuel Delivery and Air Induction.
3. Drain the engine cooling system.
4. Remove the intake manifold.
5. Remove the hydraulic lash adjusters.
6. Rotate the accessory drive belt tensioner counterclockwise and remove the accessory drive belt.
RH side
7. Remove the 2 coolant tube bracket bolts.

8. Disconnect the generator electrical connector, remove the nut and detach the B+ terminal.
   Detach the pin-type retainer.
9. Remove the bolt and the accessory drive belt tensioner.

10. Remove the nut, the 2 bolts and the generator mounting bracket assembly.
11. Disconnect the heater hose from the thermostat housing.

12. Disconnect the upper radiator hose.
13. Position the coolant bypass hose clamp aside.

14. Remove the 3 bolts and the thermostat housing.
   ^ Disconnect the engine coolant temperature (ECT) sensor electrical connector.
15. Remove the bolt and the oil level indicator tube.

16. Remove the stud bolt and detach the ground strap.

^ Position the ground strap aside.
17. Remove the bolt and detach the power steering supply hose bracket from the front engine accessory drive (FEAD) bracket.

18. Remove the bolt and detach the power steering pressure (PSP) tube bracket from the crossmember.
19. Remove the 3 bolts and the power steering pump pulley.

20. Remove the 3 bolts and position the power steering pump aside.
21. Remove the 3 bolts, the nut and position the FEAD bracket and A/C compressor aside.

22. Remove the bolt and detach the starter motor wiring retainer bracket.
23. Remove the ground strap bolt and detach the wiring harness retainer from the backside of the cylinder head.

24. **CAUTION:** It is important to twist the spark plug wire boots while pulling upward to avoid possible damage to the spark plug wires.
25. Remove the 4 bolts and the fuel rail and injectors.

26. Separate the 6 fuel injectors from the fuel rail and discard the O-ring seals.
Remove the 4 catalytic converter-to-manifold nuts.
^ Discard the nuts.

28. NOTE: LH side shown, RH side similar.

Remove the 12 nuts and the exhaust manifolds and gaskets.
^ Discard the nuts and gaskets.
29. **NOTE:** LH side shown, RH side similar.

Remove and discard the 12 exhaust manifold studs.

**RH side**

30. Remove the RH side hydraulic chain tensioner.
31. Install the special tools.
   ^ Tighten the top clamp bolts to 10 Nm (89 lb-in).

32. **NOTE:** The RH camshaft sprocket bolt is a LH-threaded bolt.
33. Remove the RH side cassette bolt.

34. **NOTE:** Remove the camshaft sprocket from the timing chain to gain clearance to remove the cylinder head.
Remove the RH camshaft sprocket from the timing chain. Install a rubber band around the cassette and the timing chain.

LH side
35. Remove the LH side hydraulic chain tensioner.
36. Install the special tools.
   ^ Tighten to 10 Nm (89 lb-in).

37. Remove the LH side camshaft sprocket bolt.
38. Remove the LH side cassette bolt.

39. **NOTE:** Remove the camshaft sprocket from the timing chain to gain clearance to remove the cylinder head.

   **NOTE:** Hold the timing chain and cassette with a rubber band to aid in removal and to prevent the timing chain from falling into the cylinder block.
Both sides

40. **NOTE:** To avoid damage to the timing chain cassette, an assistant will be required to help lift the cylinder head from the vehicle.

**NOTE:** On the RH side, when lifting the cylinder head, be careful to avoid contacting the A/C tube.

**NOTE:** New cylinder head bolts must be installed. They are a torque-to-yield design and cannot be reused.

Remove the cylinder heads.

^ Remove the cylinder head bolts in the sequence shown. Discard all the bolts.

^ Remove and discard the head gaskets.
41. **CAUTION:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges that make leak paths. Use a plastic scraping tool to remove all traces of the head gasket.

   Clean and inspect the mating surfaces.

42. Inspect the cylinder head and the cylinder block for flatness.