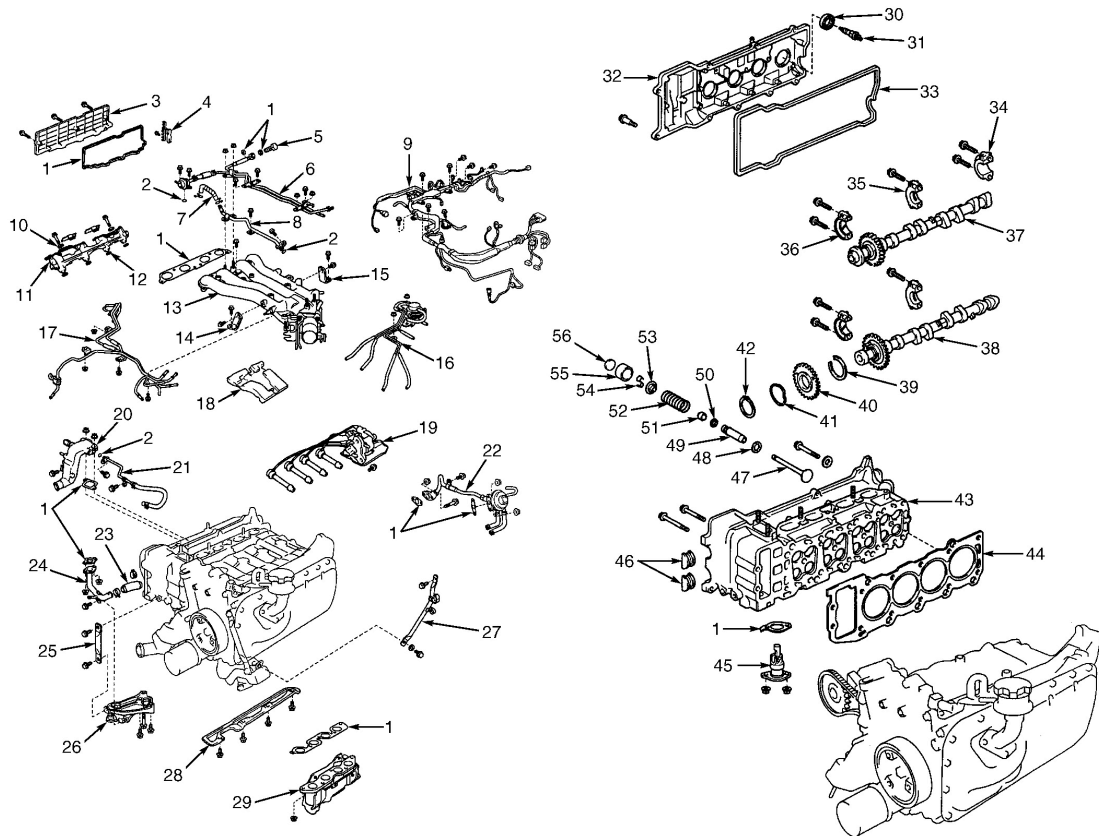


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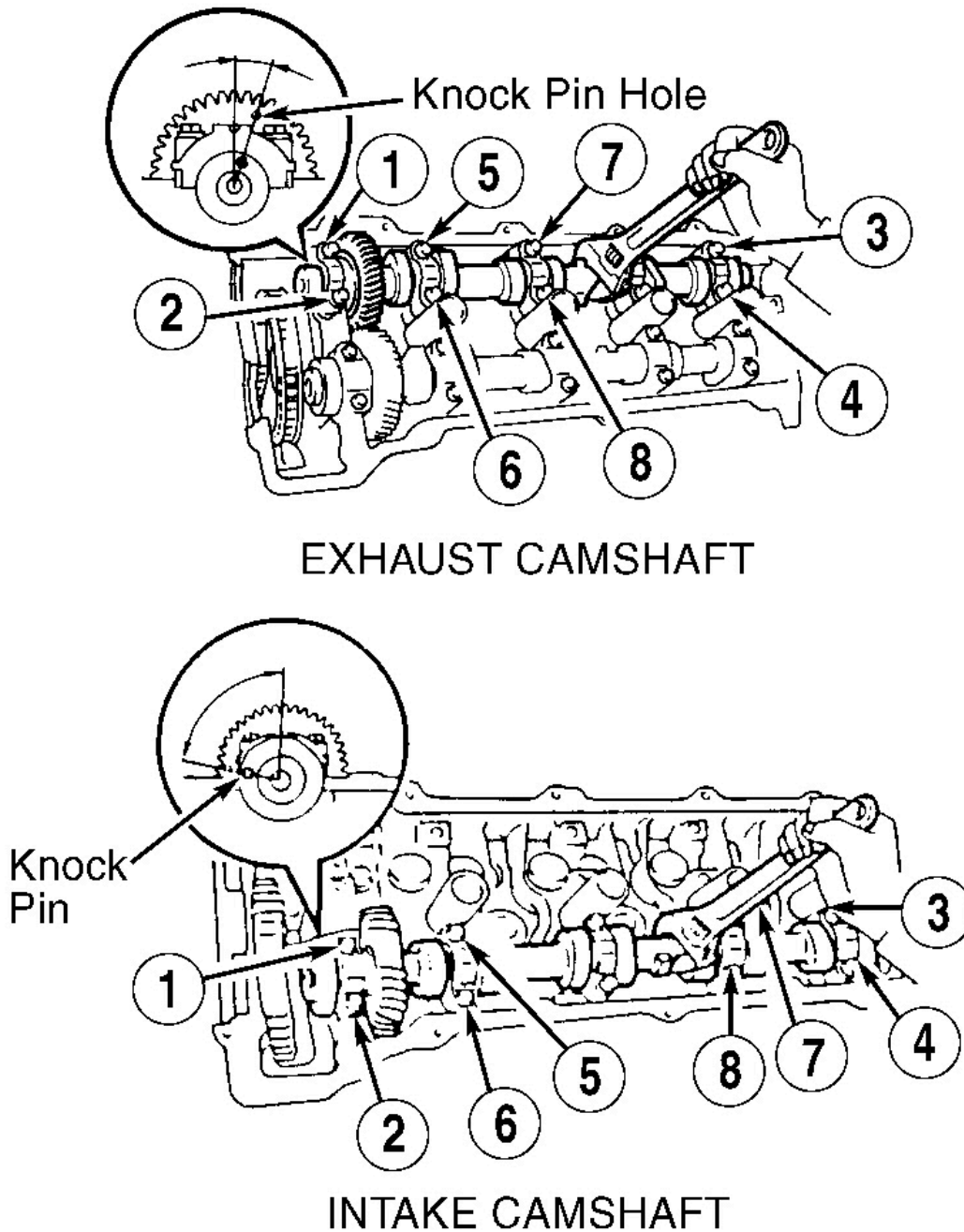
2.4L 4-CYL 1997 ENGINES Toyota 2.4L 4-Cylinder - Previa



- | | | | |
|--------------------------------|------------------------------------|--------------------------------------|---------------------------|
| 1. Gasket | 15. No. 1 Intake Manifold Stay | 29. Exhaust Manifold | 43. Cylinder Head |
| 2. "O" Ring | 16. EGR Vacuum Modulator w/Bracket | 30. Spark Plug Tube Gasket | 44. Head Gasket |
| 3. No. 2 Cylinder Head Cover | 17. Water By-Pass Pipe | 31. Spark Plug | 45. Chain Tensioner |
| 4. No. 2 Cord Clamp | 18. Cylinder Block Insulator | 32. No. 1 Cylinder Head Cover | 46. Half-Circular Plug |
| 5. Union Bolt | 19. Distributor | 33. No. 1 Cylinder Head Cover Gasket | 47. Valve |
| 6. Fuel Pipe | 20. Water Outlet | 34. No. 6 Bearing Cap | 48. Spring Seat |
| 7. PCV Hose | 21. No. 2 Water By-Pass Pipe | 35. Camshaft Bearing Cap | 49. Valve Guide Bushing |
| 8. PCV Pipe | 22. EGR Valve w/Pipe | 36. No. 1 Camshaft Bearing Cap | 50. Snap Ring |
| 9. Engine Wire Harness | 23. Oil Return Hose | 37. Intake Camshaft | 51. Oil Seal |
| 10. Spacer | 24. No. 1 Oil Return Pipe | 38. Exhaust Camshaft | 52. Valve Spring |
| 11. Delivery Pipe w/Injectors | 25. Right Engine Mounting Stay | 39. Spring | 53. Valve Spring Retainer |
| 12. Insulator | 26. Right Front Engine Mounting | 40. Sub-Gear | 54. Keeper |
| 13. Intake Manifold | 27. Manifold Stay | 41. Wave Washer | 55. Valve Lifter |
| 14. No. 1 Intake Manifold Stay | 28. Exhaust Manifold Insulator | 42. Snap Ring | 56. Shim |

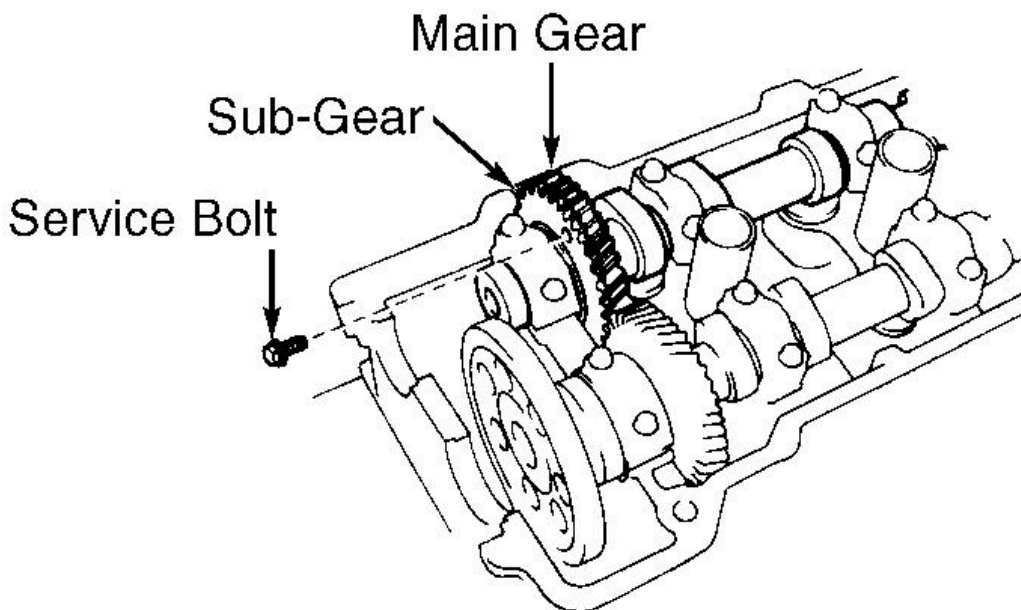
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Fig. 11: Exploded View Of Cylinder Head & Components (2.4L)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 12: Positioning Camshafts For Removal & Identifying Camshaft Bearing Cap Bolt Removal Sequence
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 13: Securing Sub-Gear On Exhaust Camshaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. On exhaust camshaft, evenly loosen and remove No. 1, 2, 3 and 5 camshaft bearing cap bolts in sequence. See **Fig. 12**. DO NOT loosen No. 4 camshaft bearing cap bolts. Remove No. 1, 2, 3 and 5 camshaft bearing caps.
13. Alternately loosen No. 4 camshaft bearing cap bolts. Ensure exhaust camshaft is lifted upward evenly as No. 4 camshaft bearing cap bolts are loosened. Remove bolts, No. 4 camshaft bearing cap and exhaust camshaft.

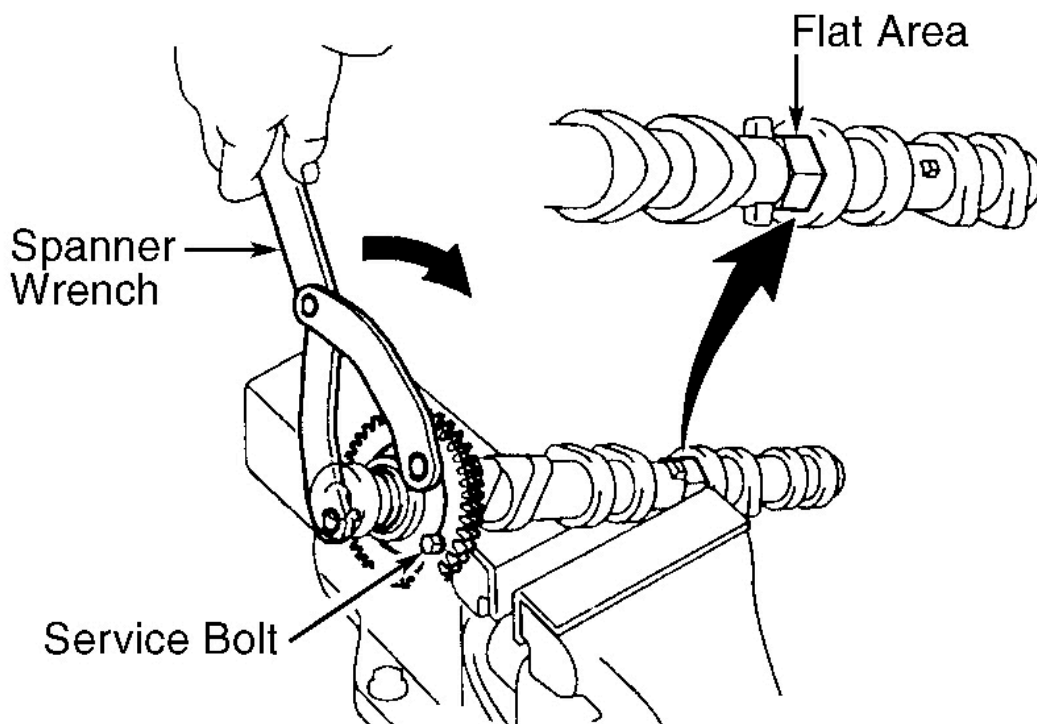
NOTE: If exhaust camshaft is not lifted upward evenly when loosening No. 4 camshaft bearing cap bolts, retighten No. 4 camshaft bearing cap bolts. Reinstall all camshaft bearing caps and reposition knock pin hole. Repeat procedure and remove camshaft.

14. For intake camshaft removal, rotate intake camshaft so knock pin is 75-100 degrees BTDC. See **Fig. 12**. This aids in intake camshaft removal by using lobes on cylinders No. 1 and 3 to push on valve lifters.

15. Evenly loosen and remove No. 1, 2, 4 and 5 camshaft bearing cap bolts in sequence. See **Fig. 12**. DO NOT loosen No. 3 camshaft bearing cap bolts. Remove No. 1, 2, 4 and 5 camshaft bearing caps.
16. Alternately loosen No. 3 camshaft bearing cap bolts. Ensure intake camshaft is lifted upward evenly as No. 3 camshaft bearing cap bolts are loosened. Remove bolts, No. 3 camshaft bearing cap and intake camshaft.

NOTE: If intake camshaft is not lifted upward evenly when loosening No. 3 camshaft bearing cap bolts, retighten No. 3 camshaft bearing cap bolts. Reinstall all camshaft bearing caps and reposition knock pin. Repeat procedure and remove camshaft.

17. If removing sub-gear from exhaust camshaft, mount flat area on exhaust camshaft in soft-faced vise. Using spanner wrench, rotate sub-gear clockwise and remove service bolt. See **Fig. 14**.



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Fig. 14: Disassembling Exhaust Camshaft Gears

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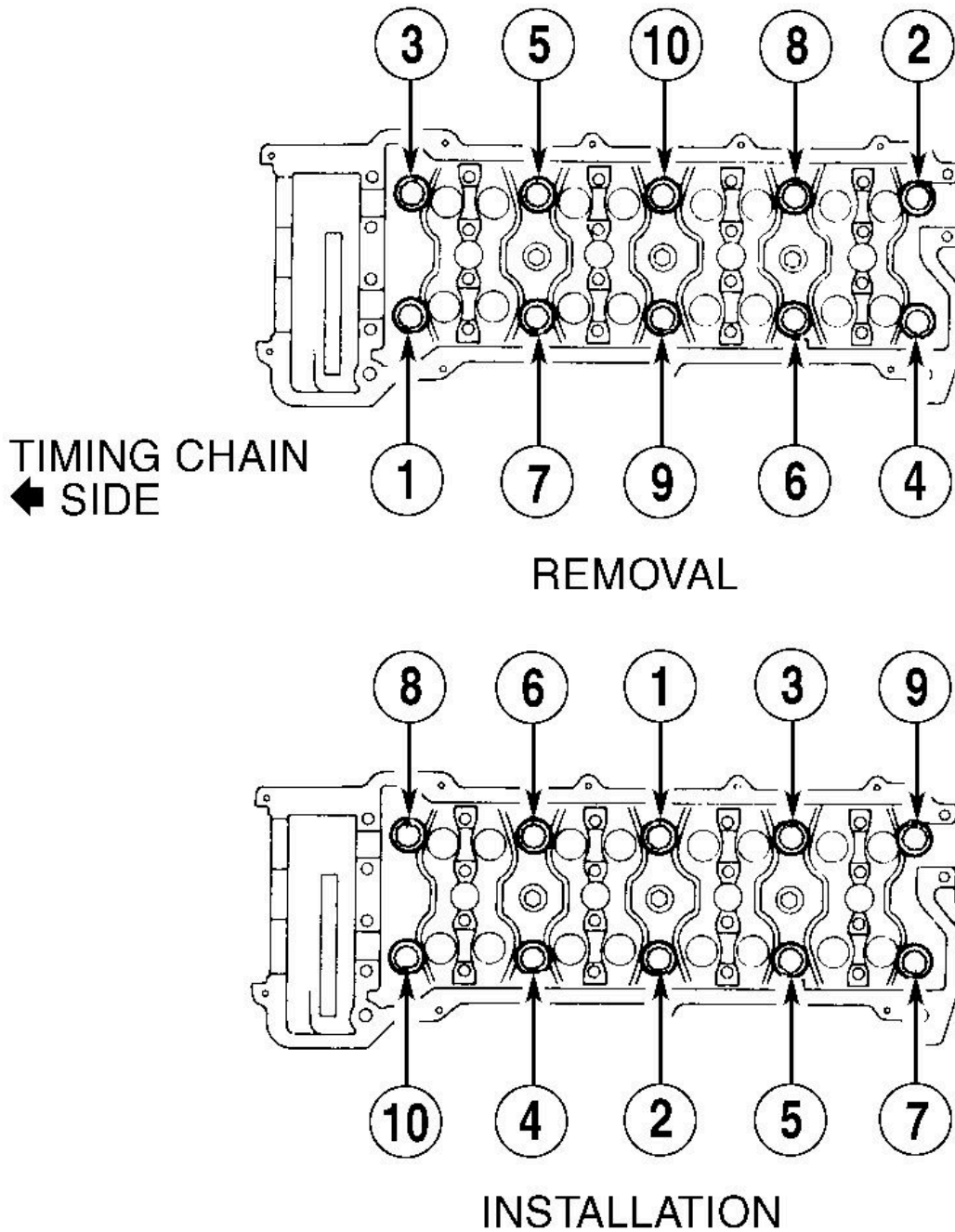
18. Remove snap ring, wave washer, sub-gear and spring from exhaust camshaft. See **Fig. 11**. For cylinder head removal, remove 2 cylinder head-to-front cover bolts, located in front of camshaft sprocket area.

CAUTION: Cylinder head bolts must be removed in proper sequence to prevent cylinder head warpage.

19. Remove cylinder head-to-cylinder block bolts in sequence using several steps. See **Fig. 15**. Remove cylinder head and gasket. If removing valve lifters and adjusting shims from cylinder head, ensure component location is marked for reassembly reference.

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Fig. 15: Cylinder Head Bolt-To-Cylinder Block Removal & Installation Sequence

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Inspection