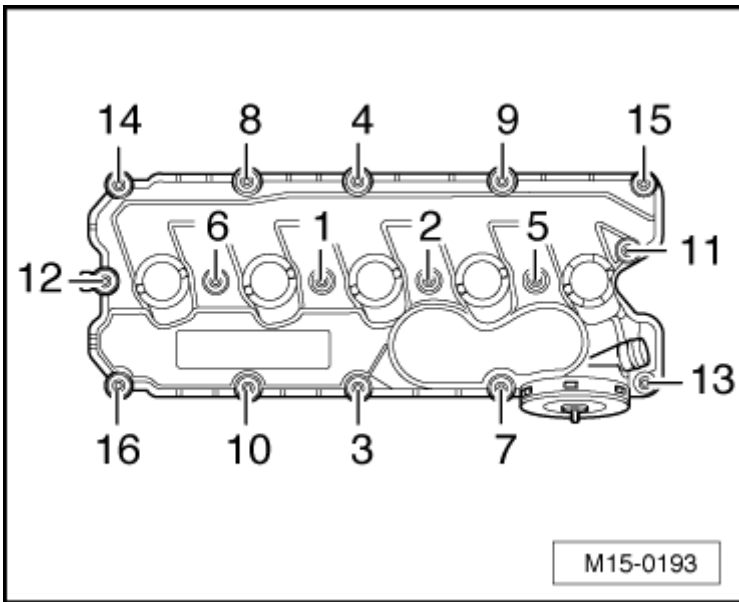


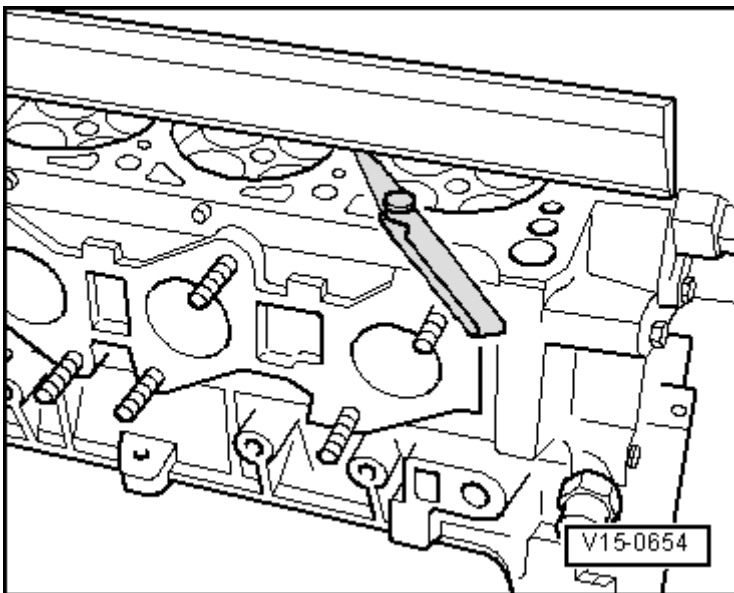
## 2010 Volkswagen New Beetle

ENGINE 2.5 Liter - Cylinder Head, Valvetrain - Engine Code(s): BPR & BPS (Convertible)

23. Bolt, 40 Nm + 180° (1/2) additional turn
  - Replace
  - Follow the sequence for loosening and tightening. Refer to **CYLINDER HEAD**.
24. Wire Bracket
  - For the Heated Oxygen Sensor (HO2) -G39-.



**Fig. 11: Removing Bolts For Cylinder Head Cover In Sequence**  
Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.



**Fig. 12: Checking Cylinder Head For Distortion**  
Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

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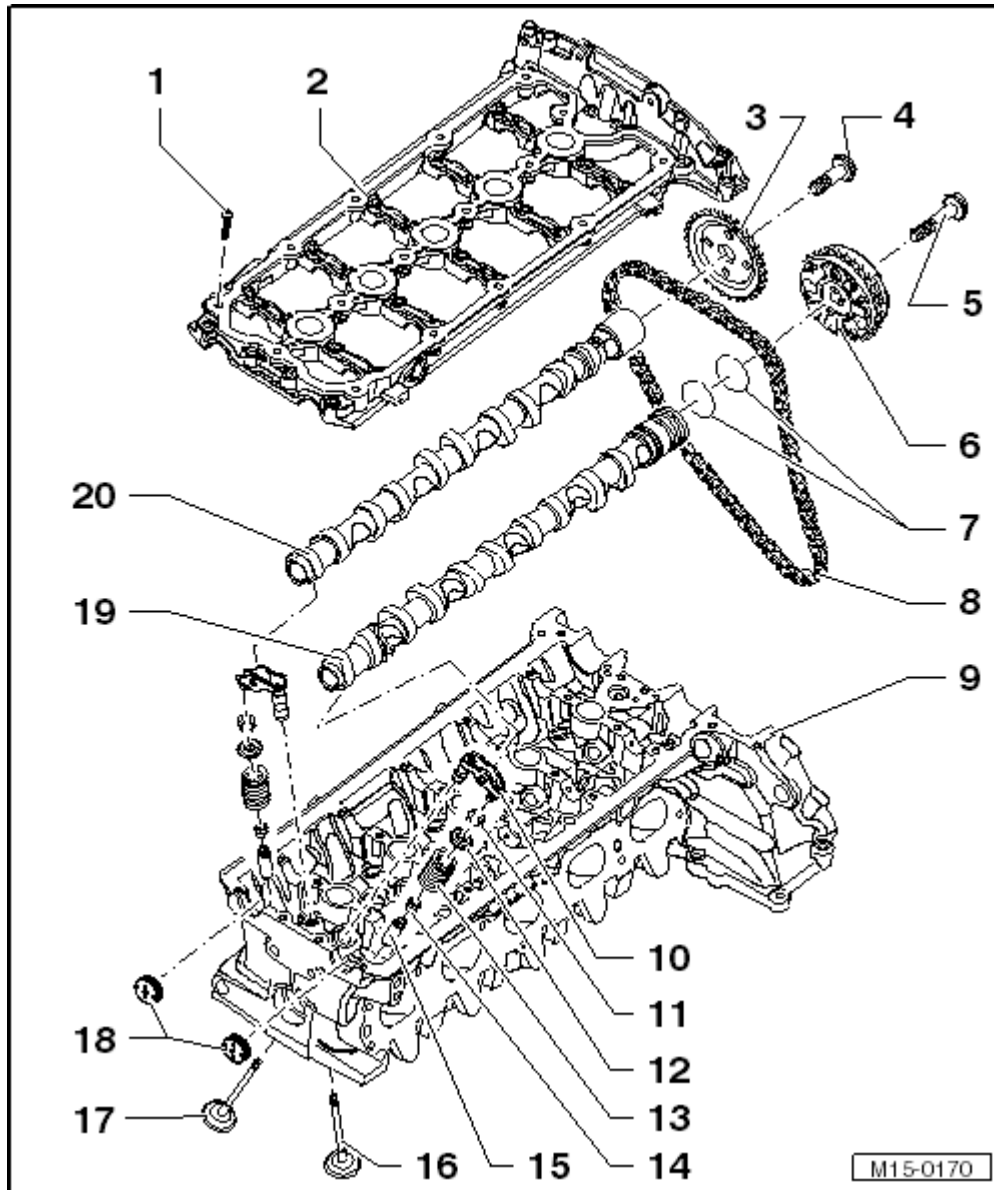
ENGINE 2.5 Liter - Cylinder Head, Valvetrain - Engine Code(s): BPR & BPS (Convertible)

-- Check the cylinder head at multiple points for distortion with a straight edge 500 mm VAS 6075 and feeler gauges.

- Max. permissible distortion: 0.05 millimeters (mm)

If this value is exceeded, the cylinder head must be replaced. It is not permissible to rework the sealing surface.

### VALVETRAIN ASSEMBLY OVERVIEW



**Fig. 13: Valvetrain, Assembly Overview**

Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

1. Bolt, 8 Nm + 90° (1/4) additional turn

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- Replace
2. Guide Frame
    - Removal and installation, refer to **CAMSHAFTS**.
    - With integrated camshaft bearings.
    - Clean the sealing surface, reworking is not permitted.
    - Remove old sealant residue.
  3. Exhaust Camshaft Sprocket
  4. Bolt, 60 Nm + 90° (1/4) additional turn
    - Replace
  5. Bolt, 60 Nm + 90° (1/4) additional turn
    - Replace
  6. Intake Camshaft Adjuster
  7. Seals
    - For the camshaft adjuster.
    - Note the installed position, refer to **CAMSHAFTS**.
  8. Timing Chain
    - Removing from the sprocket/actuator, refer to **VALVE TIMING, ADJUSTING**.
  9. Cylinder Head
    - Do not grind the valve seats, only lapping is permitted.
  10. Hydraulic Valve Play Balancing Element
    - Do not interchange
    - Lubricate the contact surface.
  11. Valve Keepers
  12. Top Valve Spring Retainer
  13. Valve Spring
  14. Valve Stem Seal
    - Replacing, refer to **VALVE STEM SEALS**.
  15. Valve Guide
    - Checking, refer to **VALVE GUIDES, CHECKING**.
  16. Intake Valve
    - Do not grind, only lapping is permitted.
    - Valve dimensions, refer to **VALVE DIMENSIONS**.
    - Checking valve guides, refer to **VALVE GUIDES, CHECKING**.
  17. Exhaust Valve
    - Do not grind, only lapping is permitted.
    - Valve dimensions, refer to **VALVE DIMENSIONS**.
    - Checking valve guides, refer to **VALVE GUIDES, CHECKING**.

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### 18. Sealing Plugs

- Replace
- Installing, refer to **CAMSHAFTS**.

### 19. Intake Camshaft

- Removal and installation, refer to **CAMSHAFTS**.
- Check radial clearance using Plastigage (roller rocker lever removed).

Wear limit: 0.1 millimeter (mm)

- Runout: Max. 0.035 mm
- Axial clearance: Max. 0.17 mm

### 20. Exhaust Camshaft

- Removal and installation, refer to **CAMSHAFTS**.
- Check radial clearance using Plastigage (roller rocker lever removed).

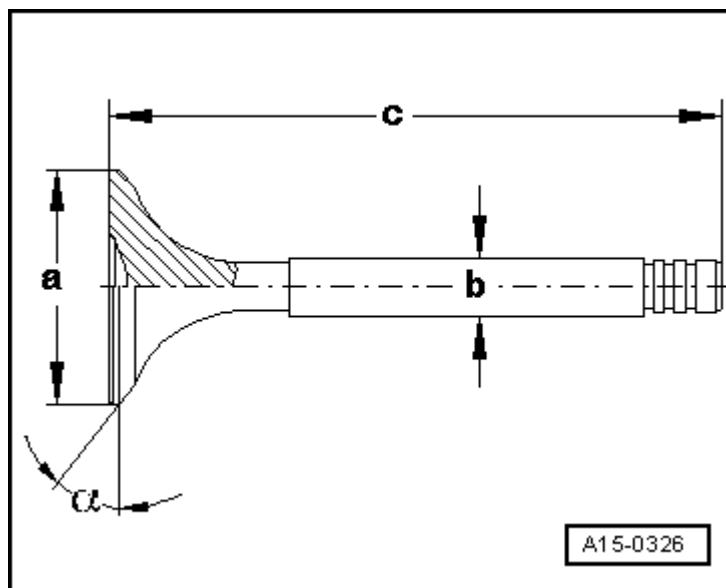
Wear limit: 0.1 mm

- Runout: Max. 0.035 mm
- Axial clearance: Max. 0.17 mm

## SPECIFICATIONS

### VALVE DIMENSIONS

**NOTE:** Intake and exhaust valves must not be refaced by grinding. Only lapping is permitted.



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ENGINE 2.5 Liter - Cylinder Head, Valvetrain - Engine Code(s): BPR & BPS (Convertible)

**Fig. 14: Identifying Valve Dimensions**  
**Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.**

Dimension		Intake valve	Exhaust valve
Diameter a	mm	26.80 to 27.00	29.80 to 30.00
Diameter b	mm	5.95 to 5.97	5.94 to 5.95
c	mm	104.84 to 105.34	103.64 to 104.14
a	Angle°	45	45

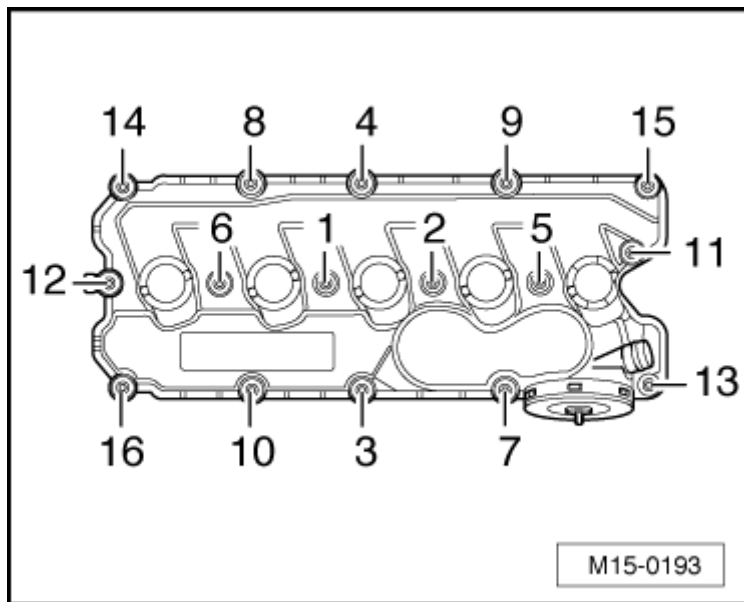
### FASTENER TIGHTENING SPECIFICATIONS

Component	Fastener Size	Nm
Camshaft Adjustment Valve 1 Bolt	-	2
Camshaft Clamp T40070 to Camshaft Bolt	-	20
Camshaft Position Sensor Bolt	-	10
Chain Compartment Cover to Cylinder Head Bolt	-	10
Thermostat Housing to Chain Compartment Cover Bolt	-	10
Exhaust Camshaft Sprocket Bolt <sup>(1)</sup>	-	60 + 90° turn
Intake Camshaft Adjuster Bolt <sup>(1)</sup>	-	60 + 90° turn
<b>Locking Bolt</b>	-	30
Secondary Air Injection Connecting Pipe at Cylinder Head Bolt	-	10
Transport Strap Bolt	-	25
Wire Bracket Bolt	-	10
(1) Always replace		

Cylinder Head Cover Bolt Tightening Sequence and Specification

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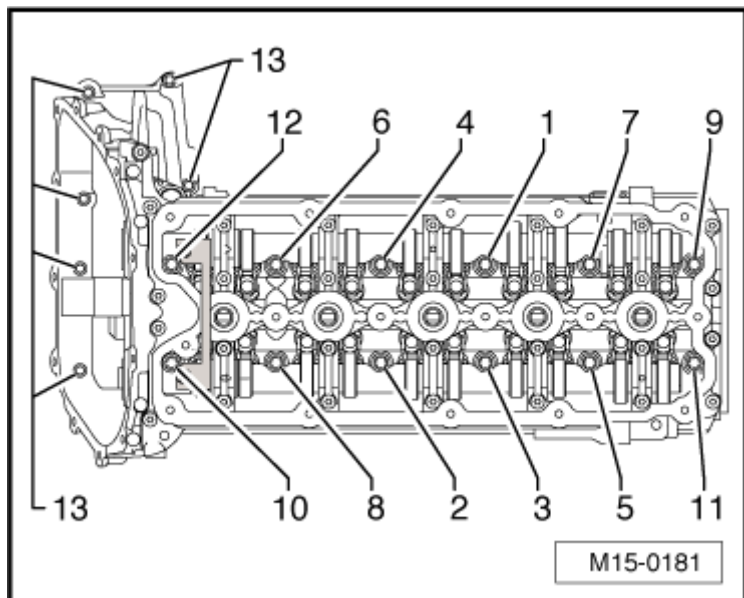
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**Fig. 15: Removing Bolts For Cylinder Head Cover In Sequence**  
Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

-- Tighten the cylinder head cover bolts -1 through 16- in the sequence shown to 10 Nm.

### Cylinder Head Bolt Tightening Sequence and Specification



**Fig. 16: Identifying Cylinder Head Bolts Tightening Sequence**  
Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

-- Then tighten the cylinder head bolts -1 through 12- in the sequence shown as follows:

Step	Tighten
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