

# **Component Procedures: Cylinder Head Assembly**

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# Component Procedures: Cylinder Head Assembly

## Parts and Labor (itype\_189)

### Parts

Qualifier	Part #	Name	Price	Note
Cylinder Head > Right	12629448	1 - Cylinder Head	613.62	
Cylinder Head > Left	12629445	1 - Cylinder Head	608.15	

### Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Remove & Replace	Cylinder Head & Valves > Cylinder Head, R&R >?	A	13.7	9.5
Remove & Replace	Cylinder Head & Valves > Cylinder Head, R&R >?	A	11.8	8.6
Remove & Replace	Cylinder Head & Valves > Cylinder Head, R&R >?	A	24.6	16.6
Remove & Replace	Cylinder Head & Valves > Head Gasket, R&R > L?	B	11.8	8.3
Remove & Replace	Cylinder Head & Valves > Head Gasket, R&R > R?	B	10.8	7.4
Remove & Replace	Cylinder Head & Valves > Head Gasket, R&R > B?	B	20.0	14.4
Remove & Replace	Cylinder Head & Valves > Rocker Arms, R&R > L?	B	4.2	2.8
Remove & Replace	Cylinder Head & Valves > Rocker Arms, R&R > R?	B	3.9	2.7
Remove & Replace	Cylinder Head & Valves > Valve Cover Gasket, ?	B	2.0	1.4
Remove & Replace	Cylinder Head & Valves > Valve Cover Gasket, ?	B	3.7	0.0
Remove & Replace	Cylinder Head & Valves > Valve Lifters, R&R >?	B	4.7	0.0
Remove & Replace	Cylinder Head & Valves > Valve Lifters, R&R >?	B	4.4	3.0
Remove & Replace	Cylinder Head & Valves > Valve Seals, R&R > L?	B	4.6	3.1
Remove & Replace	Cylinder Head & Valves > Valve Seals, R&R > L?	B	0.5	0.4
Remove & Replace	Cylinder Head & Valves > Valve Seals, R&R > L?	B	5.8	4.1
Remove & Replace	Cylinder Head & Valves > Valve Seals, R&R > R?	B	4.3	2.9
Remove & Replace	Cylinder Head & Valves > Valve Seals, R&R > R?	B	0.5	0.4
Remove & Replace	Cylinder Head & Valves > Valve Seals, R&R > R?	B	5.5	3.9
Remove & Replace	Cylinder Head & Valves > Valve Springs, R&R >?	B	4.6	3.1
Remove & Replace	Cylinder Head & Valves > Valve Springs, R&R >?	B	0.5	0.4
Remove & Replace	Cylinder Head & Valves > Valve Springs, R&R >?	B	5.8	4.1
Remove & Replace	Cylinder Head & Valves > Valve Springs, R&R >?	B	4.3	2.9
Remove & Replace	Cylinder Head & Valves > Valve Springs, R&R >?	B	0.5	0.4
Remove & Replace	Cylinder Head & Valves > Valve Springs, R&R >?	B	5.5	3.9
Grind	Cylinder Head & Valves > Valves, Grind > One ?	A	12.8	0.0
Grind	Cylinder Head & Valves > Valves, Grind > One ?		0.1	
Grind	Cylinder Head & Valves > Valves, Grind > One ?		0.2	
Grind	Cylinder Head & Valves > Valves, Grind > One ?		0.1	
Grind	Cylinder Head & Valves > Valves, Grind > One ?		0.1	
Grind	Cylinder Head & Valves > Valves, Grind > One ?		0.2	
Grind	Cylinder Head & Valves > Valves, Grind > Both?	A	24.6	0.0
Grind	Cylinder Head & Valves > Valves, Grind > Both?		0.1	
Grind	Cylinder Head & Valves > Valves, Grind > Both?		0.2	
Grind	Cylinder Head & Valves > Valves, Grind > Both?		0.1	
Grind	Cylinder Head & Valves > Valves, Grind > Both?		0.1	
Grind	Cylinder Head & Valves > Valves, Grind > Both?		0.2	

## Cylinder Head Replacement - Left Side (Article 12167)

### Special Tools

EN-45059 - Angle Meter

For equivalent regional tools, refer to Special Tools .

### Removal Procedure

- Remove the camshaft cover . Refer to Camshaft Cover Replacement - Left Side .
- Remove the left bank secondary timing chain . Refer to Secondary Camshaft Intermediate Drive Chain Replacement - Left Side .
- Remove the fuel pump. Refer to Fuel Pump Replacement .
- Remove the oil filter adaptor. Refer to Oil Filter Adapter Replacement .

- Remove the catalytic converter . Refer to Catalytic Converter Replacement - Left Side .
  - Remove the oil level indicator tube . Refer to Oil Level Indicator Tube Replacement .
  - Remove the ground wire bolt and wire from the cylinder head .
  - Remove the 2 front M8 left cylinder head bolts (1). Click for full-size image
  - Remove the left cylinder head bolts (2).
  - Remove the left cylinder head (3).
  - Remove and discard the left cylinder head gasket (1). Click for full-size image
  - Clean and inspect the cylinder head and the engine block sealing surfaces. Refer to Cylinder Head Cleaning and Inspection and Engine Block Cleaning and Inspection .
  - Disassemble the cylinder head if needed. Refer to Cylinder Head Disassemble .
- Installation Procedure
- Ensure the cylinder head locating pins are securely mounted in the cylinder block deck face. Click for full-size image
  - Install a NEW left cylinder head gasket (1) using the deck face locating pins for retention.
  - Align the left cylinder head (3) with the deck face locating pins. Click for full-size image
  - Place the left cylinder head in position on the deck face.
  - DO NOT allow oil on the cylinder head bolt bosses.
  - DO NOT reuse the old cylinder head bolts.
  - Install the NEW M11 cylinder head bolts (1). Click for full-size image
  - Tighten the M11 cylinder head bolts a first pass in sequence to 30 Nm (22 lb ft) .
  - Tighten the M11 cylinder head bolts a second pass in sequence an additional 150 degrees using the EN-45059 - meter .
  - Install the 2 NEW front M8 left cylinder head bolts (2).
  - Tighten the M8 cylinder head bolts a first pass to 15 Nm (11 lb ft) .
  - Tighten the M8 cylinder head bolts a second pass in sequence an additional 75 degrees using the EN-45059 - meter .
  - Install the left bank secondary timing chain. Refer to Secondary Camshaft Intermediate Drive Chain Replacement - Left Side .
  - Install the camshaft cover . Refer to Camshaft Cover Replacement - Left Side .
  - Install the fuel pump. Refer to Fuel Pump Replacement .
  - Install the oil filter adaptor. Refer to Oil Filter Adapter Replacement .
  - Install the exhaust manifold. Refer to Catalytic Converter Replacement - Left Side .
  - Install the oil level indicator tube. Refer to Oil Level Indicator Tube Replacement .

## **Cylinder Head Replacement - Right Side (Article 12168)**

### Special Tools

EN-45059 - Angle Meter

For equivalent regional tools, refer to Special Tools .

### Removal Procedure

- Remove the camshaft cover . Refer to Camshaft Cover Replacement - Right Side .
- Remove the fuel feed pipe. Refer to Fuel Feed Pipe Replacement .
- Remove the fuel feed intermediate pipe. Refer to Fuel Feed Intermediate Pipe Replacement .
- Remove the right bank secondary timing chain . Refer to Secondary Camshaft Intermediate Drive Chain Replacement - Right Side .
- Remove the catalytic converter . Refer to Catalytic Converter Replacement - Right Side .
- Remove the heater inlet and outlet hoses. Refer to Heater Inlet Hose Replacement and Heater Outlet Hose Replacement .
- Remove the two ground wires attached to the front and rear of the cylinder head .
- Remove the right cylinder head bolts (1). Click for full-size image
- Remove the right cylinder head (2).
- Remove and discard the cylinder head gasket (1). Click for full-size image
- Clean and inspect the cylinder head and the engine block sealing surfaces. Refer to Cylinder Head Cleaning and Inspection and Engine Block Cleaning and Inspection .
- Disassemble the cylinder head if needed . Refer to Cylinder Head Disassemble .

### Installation Procedure

- Ensure the cylinder head locating pins are securely mounted in the cylinder block deck face. Click for full-size image
- Install a NEW right cylinder head gasket (1) using the deck face locating pins for retention.
- Align the right cylinder head (2) with the deck face locating pins. Click for full-size image
- Place the right cylinder head in position on the deck face.

- DO NOT allow oil on the cylinder head bolt bosses.
- DO NOT reuse the old cylinder head bolts.
- Install the NEW M11 cylinder head bolts (1). [Click for full-size image](#)
- Tighten the M11 cylinder head bolts a first pass in sequence to 30 Nm (22 lb ft) .
- Tighten the M11 cylinder head bolts a second pass in sequence an additional 150 degrees using the EN-45059 - meter .
- Install the NEW M8 cylinder head bolt (2).
- Tighten the M8 cylinder head bolt a first pass to 15 Nm (11 lb ft) .
- Tighten the M8 cylinder head bolt a second pass an additional 75 degrees using the EN-45059 - meter .
- Install the right bank secondary timing chain. Refer to Secondary Camshaft Intermediate Drive Chain Replacement - Right Side .
- Install the two ground wires to the front and rear of the cylinder head and tighten to 25 Nm (18 lb ft) .
- Install the heater inlet and outlet hoses. Refer to Heater Inlet Hose Replacement and Heater Outlet Hose Replacement .
- Install the catalytic converter. Refer to Catalytic Converter Replacement - Right Side .
- Install the fuel feed intermediate pipe. Refer to Fuel Feed Intermediate Pipe Replacement .
- Install the fuel feed pipe. Refer to Fuel Feed Pipe Replacement .
- Install the camshaft cover . Refer to Camshaft Cover Replacement - Right Side .

### **All New Technical Service Bulletins (itype\_432)**

Tsbs

- Information on Rough Idle, Crank No Start, Extended Crank or Misfire Due to Excessive Carbon on Top of Valves or Sticking Valves, Malfunction Indicator Light (MIL) Illuminated - DTC P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308 Set (16-NA-383, 2026/05/05)

### **All Technical Service Bulletins (itype\_100)**

Tsbs

- Fuel System - Cold Start Misfire After Engine/Fuel Sys Repair (PI1296, 2014/08/19)
- Information on Rough Idle, Crank No Start, Extended Crank or Misfire Due to Excessive Carbon on Top of Valves or Sticking Valves, Malfunction Indicator Light (MIL) Illuminated - DTC P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308 Set (16-NA-383, 2026/05/05)
- Engine Controls - Single Cylinder Misfire Diagnostics (PIP5062C, 2014/05/02)

### **Repair Tips (itype\_110)**

Tsbs

- Fuel System - Cold Start Misfire After Engine/Fuel Sys Repair (PI1296, 2014/08/19)
- Engine Controls - Single Cylinder Misfire Diagnostics (PIP5062C, 2014/05/02)