

Installation Instructions: Subaru STI Cylinder Heads

Part Number: KK3670

Applications: Subaru STI EJ25 (2.5L)

Disclaimer

To properly install this part, you **MUST** have access to a genuine Subaru factory service manual.

The installation of these parts on a vehicle intended for use on public streets or highways may violate laws and regulations relating to motor vehicle safety standards or emission regulations. Additionally, these parts are sold “as is,” without warranty of any kind whatsoever, express or implied, (including all warranties of merchantability or fitness for a particular purpose). The installation of these parts could also void vehicle warranty coverage.

For your own safety “**DO NOT**” use this product unless suitable high speed rated tires, suspension and brake modifications have been fitted.

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Parts List

- 2 - Complete Subaru STI Cylinder Heads
- 2 - Cam Bore End Plugs

Required Tools

- 10mm boxed end wrench
- Torque Wrench
- Bent Blade Feeler Gauges
- Engine Oil or Assembly Lube
- Test Bucket Subaru Part #13228AB101
- Shop Towels

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General Installation

Congratulations, you are the new proud owner of a set of Subaru STI Cylinder Heads. Your Cosworth “Big Valve” CNC Ported Cylinder Heads are brand new Subaru castings. They feature a 4-angle intake, and radiused exhaust valve job. They are pressure tested, deburred, ultrasonically cleaned, serialized, and assembled with the highest quality valve train components available. Many hours have been invested in engineering the port design and valve seat angles providing you the highest flowing and most complete Subaru Cylinder Head assemblies available. Your Cosworth “Big Valve” Subaru Cylinder Heads are capable of supporting over 1000hp.

It is recommended that these heads be set up and installed by a professional engine builder. Cosworth “Big Valve” CNC ported Cylinder Heads are intended for racing applications only and are not intended for use on street operated or emissions controlled vehicles.

Specific applications (STI) –Since these cylinder heads are Subaru factory castings, they are designed to be a direct bolt-on replacement for OEM stock cylinder heads. Therefore, the assembly procedures and torque specifications depicted in your Subaru factory service manual must be followed.

Cosworth Subaru “Big Valve” CNC Cylinder heads are recommended for 2.5L DOHC EJ25 STI engines with variable valve timing (VVT) only. Our cylinder heads are not compatible with a standard WRX (or non-VVT) type engine system. These heads use a different means of camshaft lubrication, and may not include provisions to run a single camshaft sensor type engine management. If your specific application calls for anything other than an STI configuration, your cylinder heads may need to be modified. Contact Cosworth if you have any questions or seek more information.

Please take a few minutes to inspect the Cylinder Heads for any sign of damage from shipping. Pay special attention to the flat, machined surfaces, especially the deck.

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Valve Clearance Setup

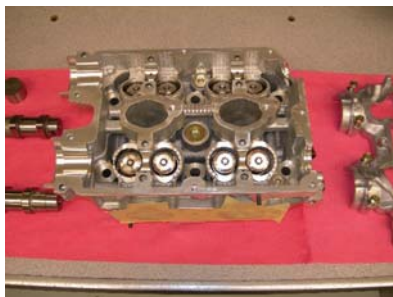
These cylinder heads will require the use of new camshaft lifters (a.k.a., “buckets”), because the valve stem heights differ from those of a Subaru factory cylinder head. Proper valve lash is necessary to prevent premature camshaft wear and to prevent the valves from not sealing when heat expansion sets in. The following section will help you set up the proper valve lash on the bench, before the cylinder head assembly is installed.

To bench set the valve clearance, you will need: A clean bench, 10mm boxed end wrench, torque wrench, bent blade feeler gauges, clean shop towels, engine oil or assembly lube, your camshafts, and Subaru p/n# 13228AB101 to use as a test bucket (available from your local dealership or Cosworth).



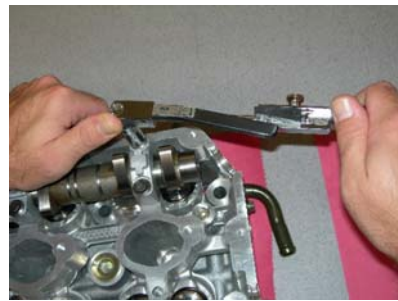
In order for the Valve Clearance Worksheet to accurately calculate the proper lash, your camshafts must be stock, and/or must have a base circle diameter of 1.455” (\pm .0015”). If they do not, follow the Valve Clearance procedures from a factory service manual.

1. Cover the intake and exhaust ports with masking tape to prevent any foreign debris from falling in during the assembly process. Set the cylinder head (deck face down) on a clean shop towel. Remove the cam caps and VVT girdle and set aside.



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2. Apply some oil to the cam journals, and all round the outside of the test bucket. Carefully slide the test bucket over the valve spring, into its bore. Install the camshaft with the **lobes pointed upward**, followed by the cam caps and girdle. Apply oil to the bolt threads and the under sides of the bolt heads. Torque the two girdle bolts to 75 in/lbs. (6.2 ft/lbs.), and the four cam cap bolts to 150 in/lbs (14.5 ft/lbs.). **Do not** attempt to rotate the camshaft while the head is sitting on the bench.



3. Measure the gap between the bucket and camshaft base circle with feeler blades as shown. There should be a moderate resistance feel when sliding the feeler blade between the bucket and the camshaft base circle. Take note of the thickness feeler blade and record the number in the corresponding box (labeled "Measured Lash") on the Subaru Valve Clearance Worksheet provided.



4. Remove the cam caps, girdle, camshaft, and bucket. Repeat steps 2 and 3 for all valves; one at a time.

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Determining the correct bucket for proper Valve Clearance

Use the Subaru Valve Clearance Worksheet to help you determine which buckets should be selected to obtain the correct valve clearance for final assembly. When the suitable bucket sizes are determined, you will be required to purchase them from your local dealership separately. A part number list for most all available buckets (and their sizes) is provided. **Follow your camshaft manufacturer's recommended valve clearance. When installing Cosworth EJ25 camshafts, the recommended valve clearances are .008" +/- .001" for the intake and .010" +/- .001" for the exhaust.**

With all of the Measured Lash boxes filled in (from step 3), add the provided constants (.1773" for intake, .1713" exhaust) and record the sums in the Ideal Bucket Thickness column. Match the ideal bucket thickness with the nearest bucket from the list, and record the thickness and related part number for each in the related fields. Your completed worksheet should now be a helpful tool in ordering the correct buckets for your valves.

When all of your buckets have been purchased, recheck your clearances by repeating steps 2 and 3. The valve clearances for factory camshafts should measure between .005" and .009" for the intake valves, and .011" and .015" for the exhaust valves. Once again the recommended valve clearances for Cosworth EJ25 camshafts are .008" +/- .001" for the intake and .010" +/- .001" for the exhaust. If they are within specification, your cylinder heads are now ready for installation.

Clean all hardware and mating surfaces of the cylinder heads. Use all new gaskets and follow the installation procedures indicated in your factory Subaru service manual, including all proper torque specifications.

Recommended Valve Clearances

Factory Camshafts: .005-.009" Intake
 .011-.015" Exhaust

Cosworth EJ25 Camshafts: .008" +/- .001" Intake
 .010" +/- .001" Exhaust

Subaru Valve Clearance Worksheet

Right Hand Intake

select buckets from the parts list - (round ideal numbers **up** to the nearest sized bucket)

		Measured Lash	+ .1773	Ideal Bucket Thickness	Bucket Thickness	Subaru Part Number
(front)	1		↓	=		
	2			=		
	3			=		
(rear)	4			=		

Right Hand Exhaust

		Measured Lash	+ .1713	Ideal Bucket Thickness	Selected Bucket Thickness	Subaru Part Number
(front)	1		↓	=		
	2			=		
	3			=		
(rear)	4			=		

Left Hand Intake

		Measured Lash	+ .1773	Ideal Bucket Thickness	Selected Bucket Thickness	Subaru Part Number
(front)	1		↓	=		
	2			=		
	3			=		
(rear)	4			=		

Left Hand Exhaust

		Measured Lash	+ .1713	Ideal Bucket Thickness	Selected Bucket Thickness	Subaru Part Number
(front)	1		↓	=		
	2			=		
	3			=		
(rear)	4			=		

SUBARU TAPPET (BUCKET) LIST

PART NUMBER	THICKNESS (IN)
13228 AB101	0.1843
13228 AB111	0.1846
13228 AB121	0.1850
13228 AB131	0.1854
13228 AB141	0.1858
13228 AB151	0.1862
13228 AB161	0.1866
13228 AB171	0.1870
13228 AB181	0.1874
13228 AB191	0.1878
13228 AB201	0.1882
13228 AB211	0.1886
13228 AB221	0.1890
13228 AB231	0.1894
13228 AB241	0.1898
13228 AB251	0.1902
13228 AB261	0.1906
13228 AB271	0.1909
13228 AB281	0.1913
13228 AB291	0.1917
13228 AB301	0.1921
13228 AB311	0.1925
13228 AB321	0.1929
13228 AB331	0.1933
13228 AB341	0.1937
13228 AB351	0.1941
13228 AB361	0.1945
13228 AB371	0.1949
13228 AB381	0.1953
13228 AB391	0.1957
13228 AB401	0.1961
13228 AB411	0.1965
13228 AB421	0.1969
13228 AB431	0.1972
13228 AB441	0.1976
13228 AB451	0.1980
13228 AB461	0.1984
13228 AB471	0.1988
13228 AB481	0.1992
13228 AB491	0.1996
13228 AB501	0.2000
13228 AB511	0.2004
13228 AB521	0.2008
13228 AB531	0.2012
13228 AB541	0.2016
13228 AB551	0.2020
13228 AB561	0.2024
13228 AB571	0.2028

PART NUMBER	THICKNESS (IN)
13228 AB571	0.2028
13228 AB581	0.2031
13228 AB591	0.2035
13228 AB601	0.2039
13228 AB611	0.2043
13228 AB621	0.2047
13228 AB631	0.2051
13228 AB641	0.2055
13228 AB651	0.2059
13228 AB661	0.2063
13228 AB671	0.2067
13228 AB681	0.2071
13228 AB691	0.2075

13228 AB781	0.1787
13228 AB791	0.1795
13228 AB801	0.1803
13228 AB811	0.1811
13228 AB821	0.1819
13228 AB831	0.1827
13228 AB841	0.1835