

Kiwi Cylinder Heads Ltd.



Installation Instructions

Ford/Mazda WEC Cylinder Head Kit
Part Number 11051193



**This instruction manual contains important installation and assembly instructions. Read these instructions carefully before use. Please contact us directly if you have any questions or concerns. Remember...
"Prevention is Better than Cure"**

Kiwi Cylinder Heads (NZ) Ltd.

3 D Edinburgh St, Onehunga, Auckland 1061

Call: 0800-549-429, email: info@kch.co.nz

www.cylinderheads.co.nz

Kiwi Cylinder Heads Pty Ltd

14 Waler Crescent, Smeaton Grange, NSW, 2567

Call: 1800-786-987, email: info@kch.co.nz

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Kiwi Cylinder Heads 12 Month, Unlimited Kilometer, Parts & Labor Warranty

This new cylinder head is subject to a **12 Month** (from date of purchase), **unlimited kilometer, parts & labor warranty**. This means in the rare event this product fails due to either a manufacturing or physical fault the purchaser is covered by this warranty for a period of 12 months from date of purchase, and it includes replacement parts & labor at a fair and reasonable rate to re-instate the vehicle to its pre-failure state. This excludes service items such as but not limited to, oil, coolant, filters etc. as well as any vehicle recovery costs and the cost of any replacement vehicle.

Responsibilities: To maintain this warranty the product is to be professionally installed & serviced in accordance to the vehicle manufacturers guidelines & service intervals. Ensure the vehicle is not used in an inappropriate manner for which it is designed or intended for. To minimize any further unnecessary damage once a fault is suspected or detected in the vehicles operation. To contact the installer or Kiwi Cylinder Heads Ltd at the very earliest opportunity after detecting or suspecting a fault. Proof of Purchase & service records will be requested in an event of a claim. The warranty will be voided if the vehicle to which it is fitted is used in off-road, competition or modified beyond the vehicle manufacturers original design.

How to make a claim: If there is a suspected warranty fault, Kiwi Cylinder Heads Ltd must be contacted before any repair work can commence. (Contact details below) A warranty claim form and claim number will be made available and must be completed & returned to Kiwi Cylinder Heads Ltd, along with any requested related documents and/or parts. The suspected failed parts supplied by Kiwi Cylinder Heads Ltd must be returned to a pre-determined location for inspection and analysis of the suspected failure. The cost of returning parts & documents is the responsibility of the claimant. Failure to adhere to these procedures may void any warranty.

This warranty does not exclude any rights to the claimant under the N.Z Consumer Guarantees Act 1993 or the Australian Consumer Law 2011.

**Kiwi Cylinder Heads Ltd, PO Box 132-189 Sylvia Park, Mt Wellington, Auckland 1644. 0800-549-429, info@kch.co.nz
Kiwi Cylinder Heads (Pty) Ltd, 14 Waler Crescent, Smeaton Grange, NSW 2567. Ph.1800-786-987, Fax 1800-786-535**

IMPORTANT

If this product is being fitted as a replacement for an item, which has failed in service? It is critical that the “real cause” of the failure has been identified and rectified. Failure to do so may result in this product also failing for the same reasons, which will not be covered under any warranty.

If the purchaser chooses to fit parts other than those supplied, this does not invalidate the Kiwi Cylinder Heads warranty other than to the extent that the replacement parts carry no warranty unless purchased from Kiwi Cylinder Heads. Additionally, any consequential damage to Kiwi Cylinder Heads products as a result of using these alternative parts is not covered by the Kiwi Cylinder Heads warranty.

Foreign Material / Debris Removal Procedure

Whilst every attempt is made to remove unwanted machining material, such as aluminum shavings or casting material at time of assembly. It is possible you may encounter some remaining material.

In most cases it can be cleaned by carefully standing the cylinder head on its end and using a compressed air gun and appropriate personal safety equipment, apply compressed air to the galleries to eliminate the foreign material. You may need to move the cylinder head around to assist in the removal. If this is not acceptable please contact us directly.

NZ- 0800-549-429

AUST- 1800-786-987

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Seven Steps to Success

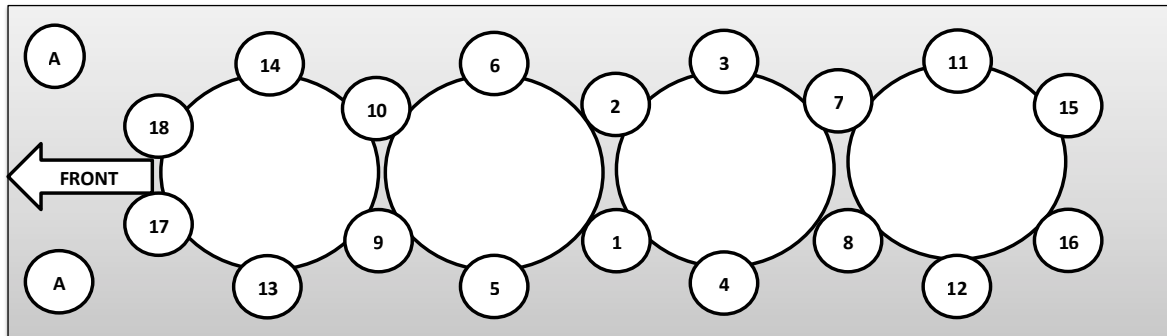
- 1. Ensure both mating surfaces are **CLEAN** and **FREE OF DIRT AND OIL**.
- 2. **DO NOT** clean block threads with a thread **TAP**. Best use an old head bolt with “cleaning” grooves cut the length of the thread to “chase” the block threads.
- 3. Ensure **NEW** head bolts are used where applicable
- 4. Ensure the correct torque settings and sequence are employed.
- 5. For engines that use a **MLS (Multi Layer Steel)** Head gasket, flush block of any remaining “anti freeze”. When fitment is completed only use water (preferably distilled water) for the first 600kms. This is to insure the head gasket has the best possible chance to seal correctly.
- 6. **FUEL INJECTORS** must always be checked and /or serviced to be sure of correct operation.
- 7. If this is a “Fully Assembled” head kit which includes new camshafts? Then the correct “Start-up Procedure” **MUST** be followed. Otherwise premature camshaft wear **WILL** occur and will **NOT** be covered by warranty.

Start-Up Procedure

- **Diesel Cam Shaft.** With rocker cover & glow plugs removed & fuel solenoid de-activated. Apply the “Z Paste” to the camshaft lobes. Using the starter motor, crank the engine until oil is present from ALL oil galleries & across the entire cam shaft and valve train area. This may take several minutes. It is now safe to complete the assembly and start the engine.
- **Petrol Cam Shaft.** With the rocker cover & spark plugs removed & the ignition dis-connected. Apply “Z Paste” to the camshaft lobes. Using the starter motor, crank the engine until oil is present at ALL oil galleries & across the entire cam shaft & valve train area. This may take several minutes. It is now safe to complete the assembly. Ensure the ignition timing is as close as possible to correct setting before firing the engine. Also ensure there is adequate cooling for the engine, air flow & ventilation. DO NOT let the engine idle, run engine at approx. 1800RPM for 15 - 20 minutes. ANY unusual noises shut down & inspect.
- **Failure to follow this exact procedure can & will lead to premature camshaft wear which will NOT be covered by KCH Warranty.**

Ford/Mazda WEC Torque Sequence

- HEAD BOLT P/N 30056017 QUANTITIES: 10 @ 114/50mm M12x1.5mm, 4 @ 150/54mm M10x1.25mm
- HEAD BOLT TIGHTENING SEQUENCE. 4 @ 101/52mm M10 x 1.25
- STEP ONE: 29Nm
- STEP TWO: +105 Degrees
- STEP THREE: +105 Degrees Bolts "A" x 2 19Nm
- STEP FOUR: +105 Degrees Apply Threebond TB012 to threads on bolts "A"
- Note: Rocker Box Bolts 10Nm
- IMPORTANT: ALL BOLT THREADS, BOLTHEADS AND WASHERS MUST BE LIGHTLY OILED.
- USING AN OLD HEADBOLT WITH GROOVE CUT DOWN THREAD, CLEAN THE BLOCK HEADBOLT THREADS.



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IMPORTANT NOTE

Installing MLS (Multi-Layer Steel) Head Gaskets

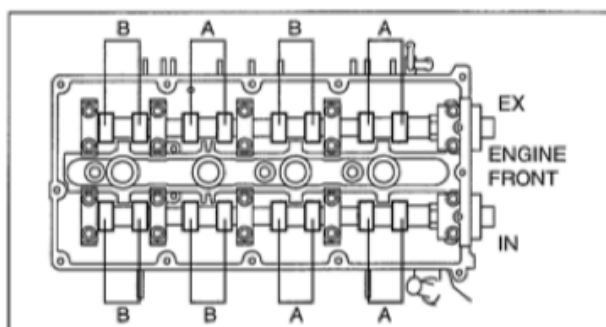
NEVER employ any abrasive cleaning methods to the engine block or cylinder head mating surfaces. Such as sandpapering, scouring discs etc.

Use ONLY proper gasket scrapers and appropriate solvents. The surface finish of the mating surfaces is absolutely critical to the successful sealing of the MLS head gaskets.

Note: The Ford Ranger / Mazda BT50 models are also available in a 2.5 litre variant of this same engine. The cylinder head is the same but the head gasket is different (smaller bore diameter). The head gasket contained in this kit is only suitable for the 3.0 litre engine.

MECHANICAL [WL-C, WE-C]

6. Adjust the valve clearances A with the No.1 cylinder at TDC of compression, and those of B with the No.4 cylinder at TDC of compression.



Valve clearance [Engine cold]

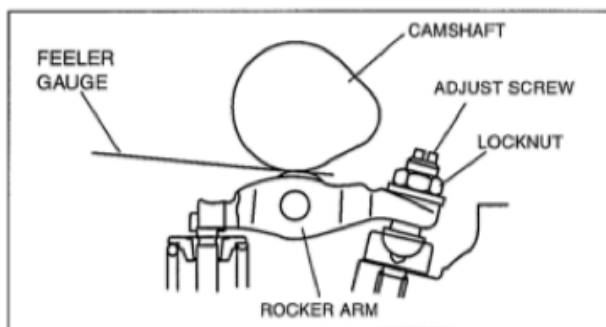
IN: 0.10—0.16 mm {0.0040—0.0062 in}

EX: 0.17—0.23 mm {0.0067—0.0090 in}

Tightening torque (lock nut)

20—24 N·m {2.1—2.4 kgf·m, 15—17 ft·lbf}

7. Turn the crankshaft one full turn and measure the remaining valve clearances. Adjust if necessary.
8. Install the cylinder head cover. (See 01-10B-9 CYLINDER HEAD GASKET REPLACEMENT [WL-C, WE-C].)
9. Install the fuel injector. (See 01-14B-15 FUEL INJECTOR REMOVAL/INSTALLATION [WL-C, WE-C].)
10. Install the water pump pulley, cooling fan and drive belt.
11. Adjust the drive belt deflection. (See 01-10B-4 DRIVE BELT ADJUSTMENT [WL-C, WE-C].)
12. Install the engine cover.



Note: As the rocker box needs to be removed to facilitate the fitment of the cylinder head, please ensure the above valve clearances are applied.

Also ensure the fitment of the “oil O ring” between the rocker box and the top of the cylinder head.

ROCKER ARM REMOVAL/INSTALLATION [WL-C, WE-C]

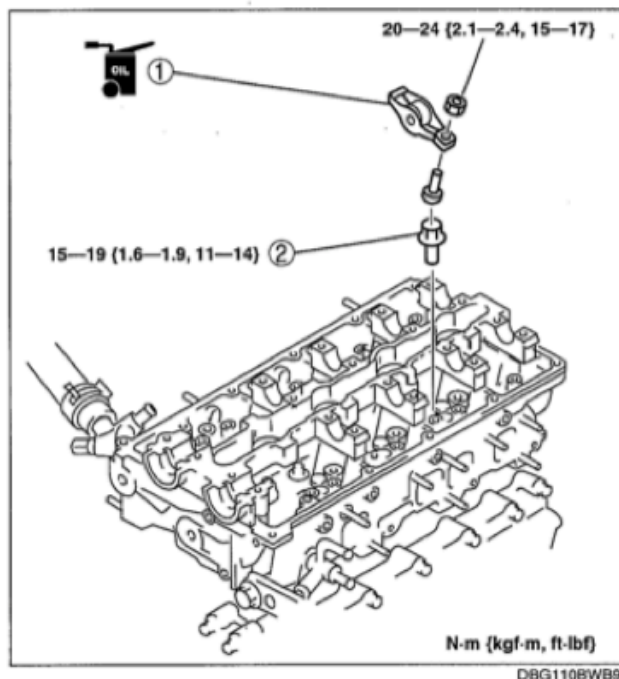
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Caution

- Removing the camshaft under load can break the camshaft. When removing the camshaft, be sure to prevent the camshaft from pressing down the rocker arm. (See 01-10B-5 VALVE CLEARANCE ADJUSTMENT [WL-C, WE-C].)

1. Remove the engine cover.
2. Disconnect the negative battery cable.
3. Remove the air intake pipe and breather chamber.
4. Remove the timing belt. (See 01-10B-7 TIMING BELT REMOVAL/INSTALLATION [WL-C, WE-C].)
5. Remove the camshaft. (See 01-10B-9 CYLINDER HEAD GASKET REPLACEMENT [WL-C, WE-C].)
6. Remove the order indicated in the table.
7. Install in the reverse order of removal.

1	Rocker arm (See 01-10B-16 Rocker Arm Installation Note.)
2	Pivot (See 01-10B-16 Pivot Installation Note.)



Pivot Installation Note

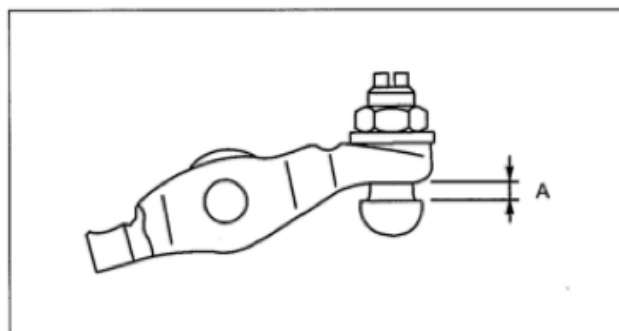
1. Apply adhesive to the thread of the pivot.

Rocker Arm Installation Note

1. If a new rocker arm is used, set dimension A as follows.

Dimension A

0.0—4.0 mm {0.0—0.115 in}



Note: When fitting the “Rocker Ball Bolts” (part (2) in above schematic) please use a mild “Loctite” type product, as they are known to work loose in operation.

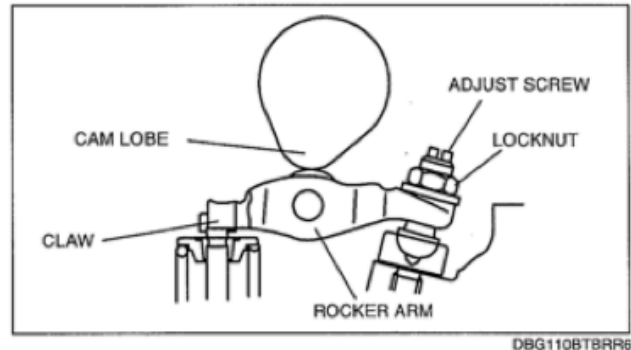
VALVE CLEARANCE ADJUSTMENT [WL-C, WE-C]

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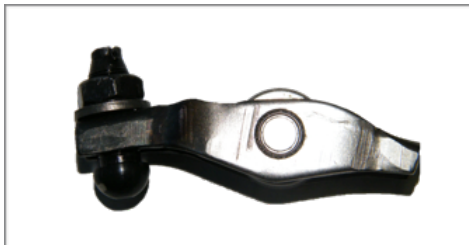
Caution

- Loosening the locknut and the adjust screw while the cam lobe is not pressing down the rocker arm will damage the claw of the rocker arm. When loosening the locknut and the adjust screw, rotate the crankshaft clockwise and be sure that the cam lobe presses down the rocker arm firmly as shown in the figure.

1. Remove the engine cover.
2. Remove the following parts to turn the crankshaft.
 1. Drive belt. (See 01-10B-4 DRIVE BELT ADJUSTMENT [WL-C, WE-C].)
 2. Cooling fan. (See 01-12B-8 COOLING FAN REMOVAL/INSTALLATION [WL-C, WE-C].)
 3. Water pump pulley.
3. Remove the fuel injector. (See 01-14B-15 FUEL INJECTOR REMOVAL/INSTALLATION [WL-C, WE-C].)
4. Remove the cylinder head cover.
5. Turn the crankshaft and align the timing mark so that the piston of the No. 1 or No. 4 cylinders is at TDC of compression.



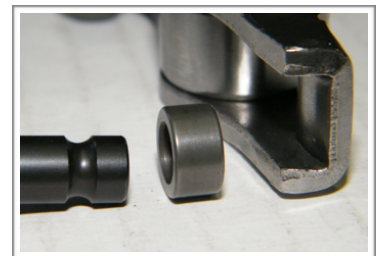
Assembly Note: This cylinder head package requires some assembly by the installer. Because the “cam-shaft box” is required to be removed to install the head bolts. The *roller rockers* and *valve stem caps* have not been set-up or installed. Please follow the recommended fitting instructions supplied below.



Roller Rocker



Valve Stem cap



Sequence of each part



Importance of Testing Diesel Fuel Injectors

“Improper Fuel Delivery” is a leading cause of Diesel Cylinder Head failure.

Faulty fuel injectors can & do cause serious engine damage! Never assume they are “ok”, always have them tested, serviced or replaced. They are critical to a healthy diesel engine.

Do you have ANY questions?

Please feel free to contact Kiwi Cylinder Heads if you have any questions or comments regarding any of our quality componants.

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Other Products Available from Kiwi Cylinder Heads

- ☒ Head Gaskets
- ☒ Head Sets (VRS)
- ☒ Head Bolt Sets
- ☒ Rocker Cover Sets
- ☒ Manifold Sets
- ☒ Bottom Sets
- ☒ Timing Belt Kits
- ☒ Timing Chain Sets

- ☒ Water Pumps
- ☒ Thermostats
- ☒ EGR Coolers
- ☒ Engine Valves
- ☒ Cam Shafts
- ☒ Valve Shims
- ☒ Valve Train Components
- ☒ Hydraulic Lifters