

# INSTRUCTION MANUAL

## HEAD STUD KIT FOR 3.2L & 3.6L PENTASTAR ENGINES

PART NUMBER CP894

In certain vehicles, there are high cylinder pressures that can damage head gaskets. Factory OEM head bolts are torque to yield, meaning you torque the bolt to a specific torque with a final 90 degree rotation that will place the bolt at its' maximum stretch point.

Our observation through years of inspecting and repairing vehicles is that when you add parts that increase horsepower (turbocharger, injectors, chips etc.), you risk creating higher cylinder pressures lower than your RPM range, consequently leading to a blown head gasket.

In contrast to head bolts, head studs are engineered to resist stretching. XOTIC PERFORMANCE head studs are created using premium steel alloys (XOTIC 7200) that are superior in tensile strength in comparison to a bolt. We take real pride in manufacturing fasteners that will last you a lifetime.

To ensure optimal head stud installation, accurate preload must be achieved. Preload is the tensile force generated when a fastener is tightened, creating a compressive force in the bolted joint—known as clamp force.

Head gasket failures occur when the clamping forces securing the gasket, head, and engine block are

insufficient to withstand high cylinder pressures. By choosing head studs over head bolts, these failures can be avoided.

To ensure accurate preload, it is necessary to clean and lubricate every component in the joint. While torqueing each head stud, the same torque must be applied on every head stud – or else you risk unequal distribution of preload and possibly joint failure.






### A COMMON MISTAKE TO AVOID

When torqueing a fastener, do not stop short of the recommended torque value before reaching the desired torque (i.e., continue torqueing in one motion until the specified torque is achieved). If by accident, you stop short of the recommended torque, loosen the fastener and retorquer.

### VERIFY FIRST

Before installing any components, verify that this part number is compatible with the vehicle applications listed above. Inspect all package components, and clean as necessary to ensure accurate installation. Any obvious defects or shipping damages

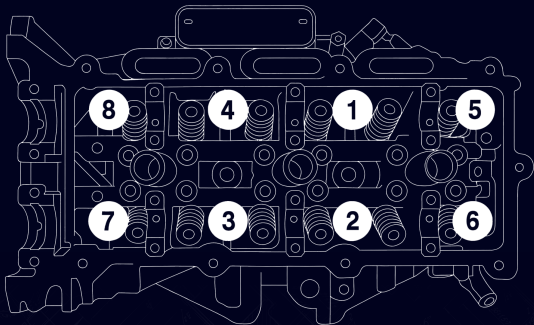
#### KIT INCLUDES

-  **16 X** HEAD STUDS
-  **16 X** NUTS
-  **16 X** HARDENED PARALLEL WASHERS
-  **1X** FASTENER ASSEMBLY LUBRICANT
-  **1X** ALLEN WRENCH
-  **1X** SOCKET

# GET TO ACTION!

1. Clean the threads in the block prior to installing the studs to ensure proper fitment and accurate torque readings. You may purchase a thread chaser separately by searching **CS306** in our catalog.
2. Thread the head studs into the block by hand until snug. Do not apply torque.
3. Use a straightedge ruler to measure the distance from the mating surface (deck or main cap) to the top of each installed stud. Ensure all studs of the same length group sit level with each other (within 1 mm / 0.040"). Uneven height may indicate debris or incorrect thread engagement. Properly installed studs will bottom out smoothly and show uniform height across all positions. If a stud appears higher or lower than the others, remove it, re-clean the hole, and reinstall by hand. Do not use tools to force studs deeper. Incorrect stud seating can cause off-angle stress, uneven preload, or stud fracture during engine operation.
4. Install the head gasket and cylinder head, ensuring proper alignment.
5. Clean the washer seating areas on the cylinder head using a fast-evaporating solvent like non-chlorinated brake cleaner to remove oil, grease, and contaminants. Ensuring a clean surface is essential for achieving proper fastener preload.
6. Using the fastener assembly lubricant included in the package, lubricate the threads of the head studs and the bottom surface of the nuts.
7. Thread the nuts onto the studs and hand-tighten until they make contact with the washers.
8. Following the torque recommendations below, tighten the nuts in the specified sequence:

**Torque studs to 30 ft-lbs, then to 60 ft-lbs, and finally to 100 ft-lbs.**



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## NEED HELP?

For technical support, please email:  
**tech@xotic-performance.com**



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## WORKING ON AN EXCITING NEW PROJECT?

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