

Instructions for Installation

The “Z” High Compression Head

READ ALL INSTRUCTIONS BEFORE INSTALLING!

- Remove old head and clean off block of any old gasket material.
- Clean out block thread holes with an undersize drill
- It is recommended that a new copper gasket be used iwth a good gasket sealer.
- Place four bolts in head and tighten and rotate crank by hand to make sure pistons do not hit head. (Sometimes top of blocks have been surfaced, which causes the piston to come up higher.)
- Install high head bolts with washers (supplied) and torque to 45-50 ft/lbs
- Retorque after 50 - 100 miles. LET ENGINE COOL DOWN FIRST
- Use anti-seize when installing spark plugs and water outlet bolts.
- We recommend the use of Champion Ford plug #N16YC or 14mm Bosch Platinum #4220
- Do not remove head while it is hot.
- If painting use Engine Enamel (Resists heat to 500 degrees.)
- Above must be followed to justify warranty.

Purpose: To produce complete combustion of all the gases entering combustion chamber. In an engine with an ordinary head the fuel charge separates after it enters the combustion chamber, which permits the outer layer of this charge to cling to the walls to cool and become stagnant, or slow to ignite, while the outer part is burned. These dead, stagnant gases fail to burn during the explosion period - they burn afterwards or during the exhaust stroke (known as after-burning); therefore this heat and energy is wasted. After burning causes high power losses, excessive engine temperatures, which in turn cause detonation, more commonly called "pinging" or "knocking."

Detonation: The now accepted theory of detonation is that the knock is due to a secondary explosion caused by an extraordinarily high pressure or compression due to too long a flame run from the point of ignition to the combustion chamber wall. Detonation is not a spark knock. About one one-thousandth of a second after the mixture has been ignited, the detonation takes place. Then the pressure in the combustion chamber jumps from a low pressure to a very high pressure. It is this sudden secondary explosion which makes the ping. Elimination of this ping was the initial purpose of the "Z" head, which creates turbulence.

Turbulence is produced by the piston forcing the gas up into the combustion chamber and causing a rapid swirling of the main body of the charge, thus distributing the flame rapidly throughout the mixture.

The "Z" Head: The fuel charge (owing to the shape and design) enters the combustion chamber during the compression stroke as a swirling, intensively turbulent, wholly combustible uniform mass. This turbulence, or the swirling motion of the fuel charge, is of the utmost importance. Because of it, the outer layers of the fuel charge are dug off the combustion chamber walls and hurled into the energy-producing explosive mass, and thus the great bulk of the gas is reached more quickly by the spark and 8 to 12 percent of otherwise wasted fuel is made to burn in time to contribute power to the piston rather than to heat the exhaust.

The dark stagnant layer in a lazy moving mixture approximately 1/16" thick, constituting in a combustion chamber between 8 and 12 percent of the total volume of useful fuel. This layer burns too slowly to contribute its power to the piston before the exhaust valve is open.

The practical elimination of this dark, stagnant layer, due to turbulence in a "Z" head by driving gas layer out into the body of the flame. Thus, the 8 to 12 percent of otherwise wasted fuel is made to burn in time to contribute power to the piston rather than to heat the exhaust.

When operating an engine equipped with a "Z" head, the spark should not be advanced too far. The fuel mixture in a "Z" head burns much faster than in the conventional head, and because of this increased combustion speed, the explosion does not need to occur so soon.

The advantages are more power with much less fuel, more speed, quicker acceleration, easier and quicker starting, fast getaway, and elimination of engine pinging and detonation (even with less expensive grades of gasoline) are results of the use of this head.