The Cooling System

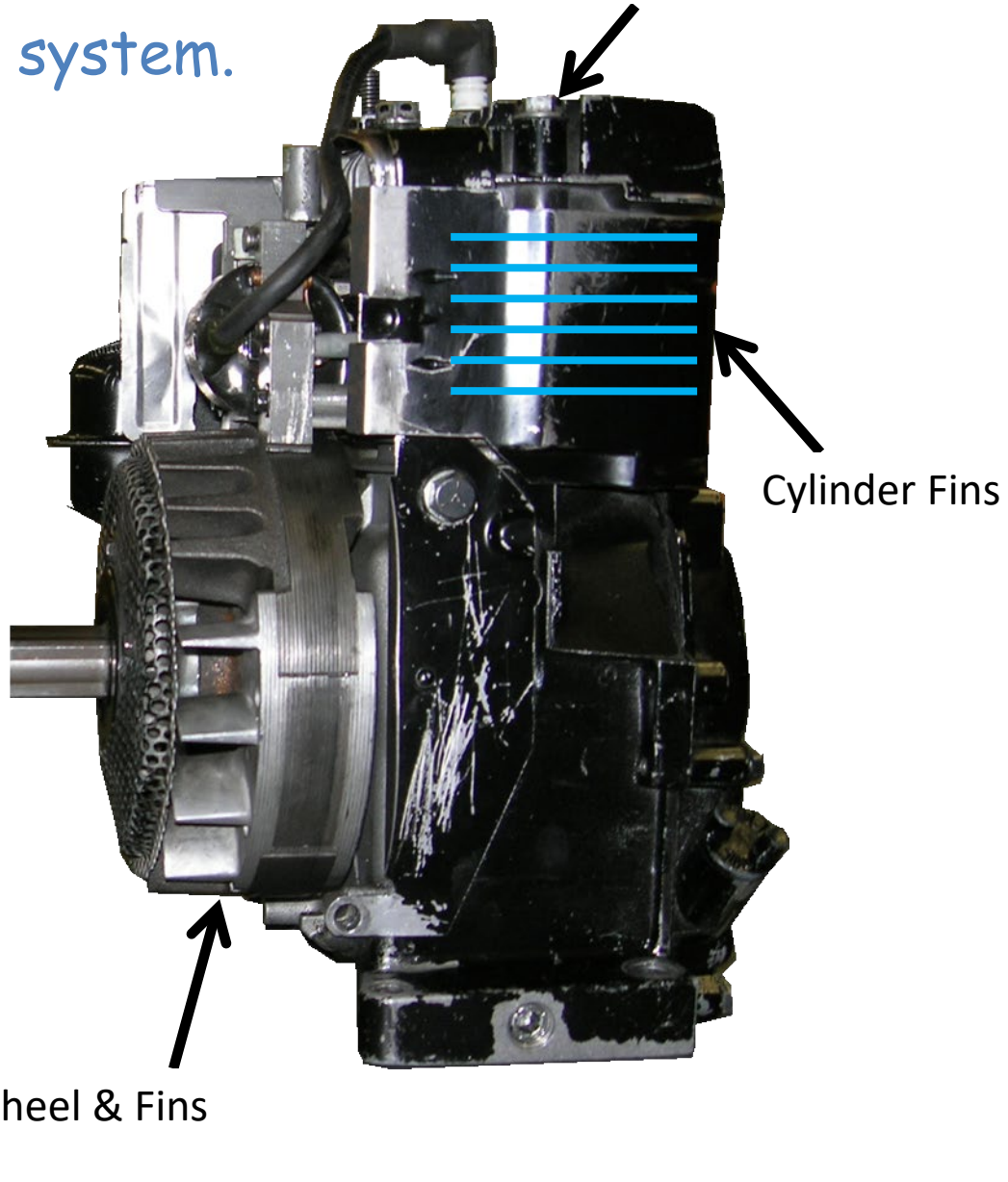
Why cooling systems are needed

When fuel is burnt in the engine so much heat is produced that if they weren't cooled the engine's parts would melt!

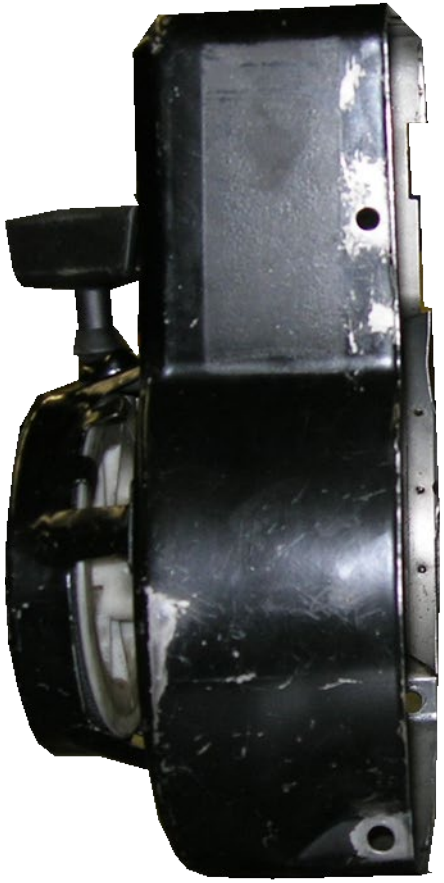
Types of engine cooling

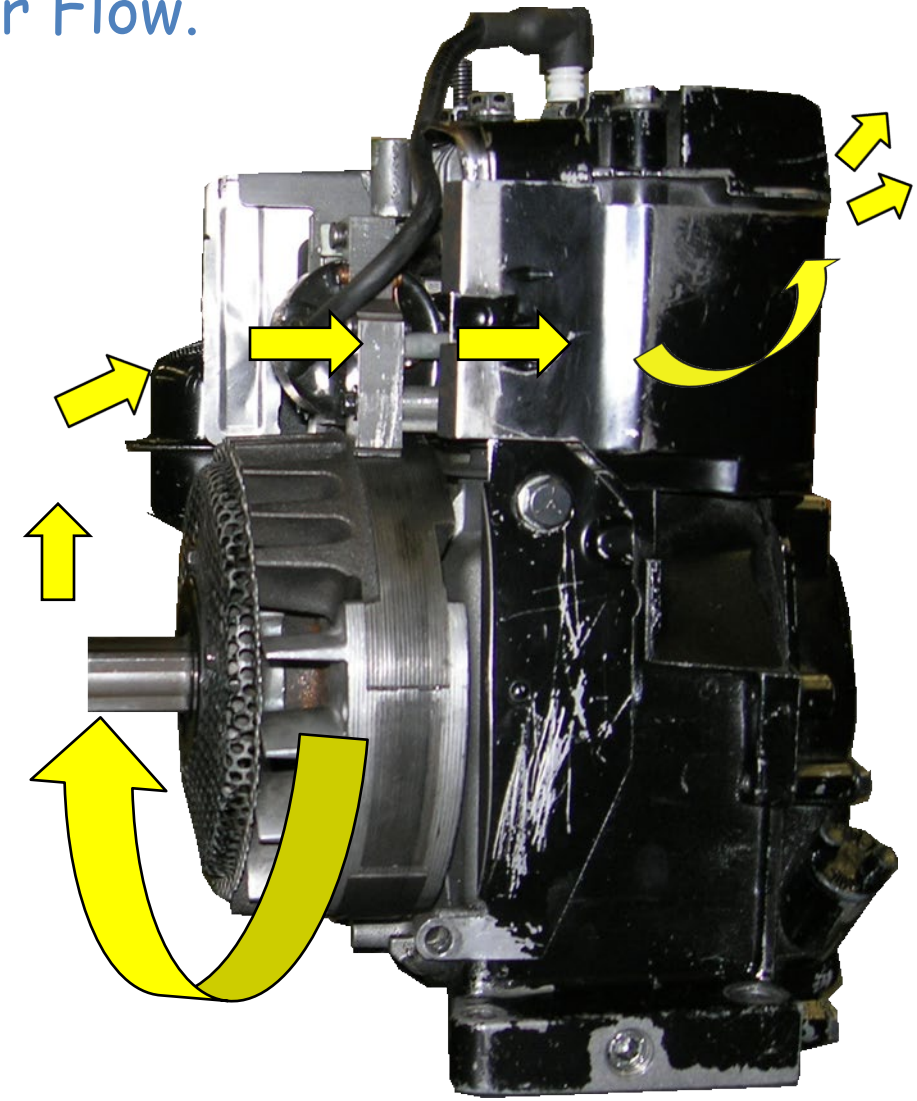
1. Air Cooling (simple & light weight)
2. Liquid Cooling (more efficient)

Parts of the B&S cooling system.



Direction of Cooling Air Flow.





What do cooling fins do?

Just like with radiant heating systems, by providing a larger surface area, the cooling fins increase the contact with the surrounding air helping to transfer heat to the air.

Maintenance

Air cooled systems are easy to maintain. ..

1. Keep cooling passages clear of debris (grass, leaves, etc.)
2. Maintain systems integrity; Keep all cooling tin components attached .

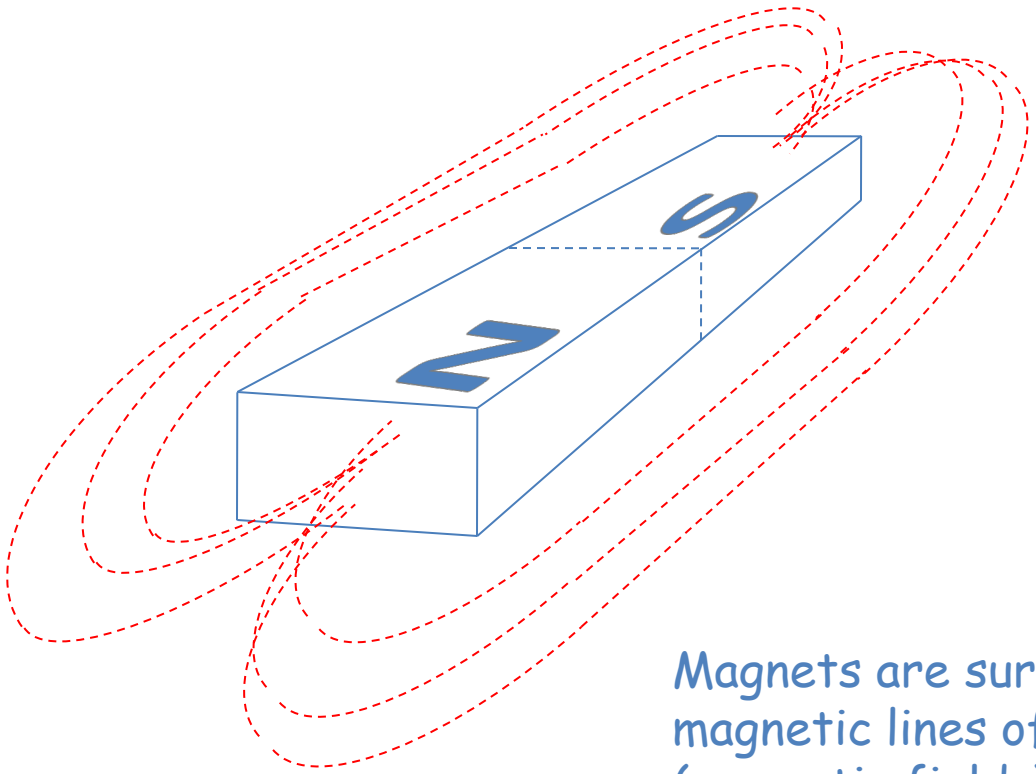
The Magneto Ignition

Purpose/Goal of the Ignition System

1. To generate a high enough voltage to push electrons across an air gap at the spark plug.

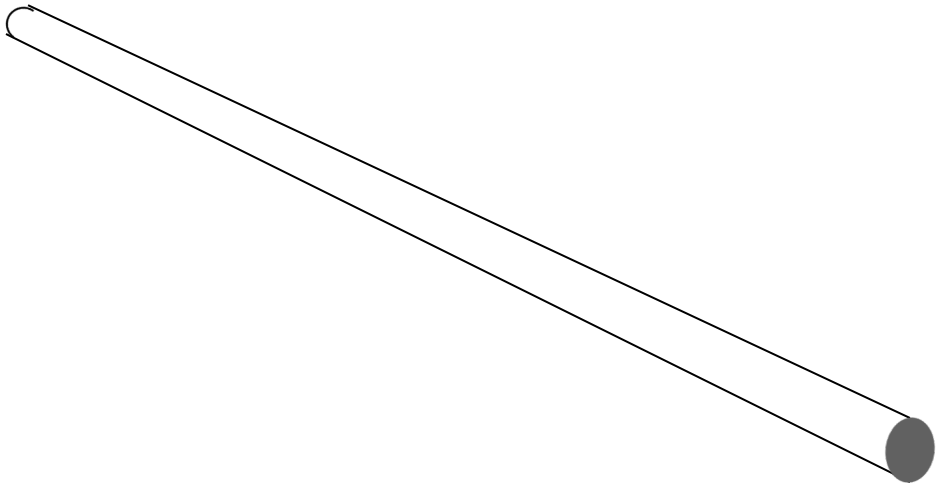
2. To have the spark occur at the correct moment in time.

Background Theory - Magnetic Field's Effect on Conductors



Magnets are surrounded by magnetic lines of force (magnetic fields) called Flux

Background Theory - Magnetic Field's Effect on Conductors

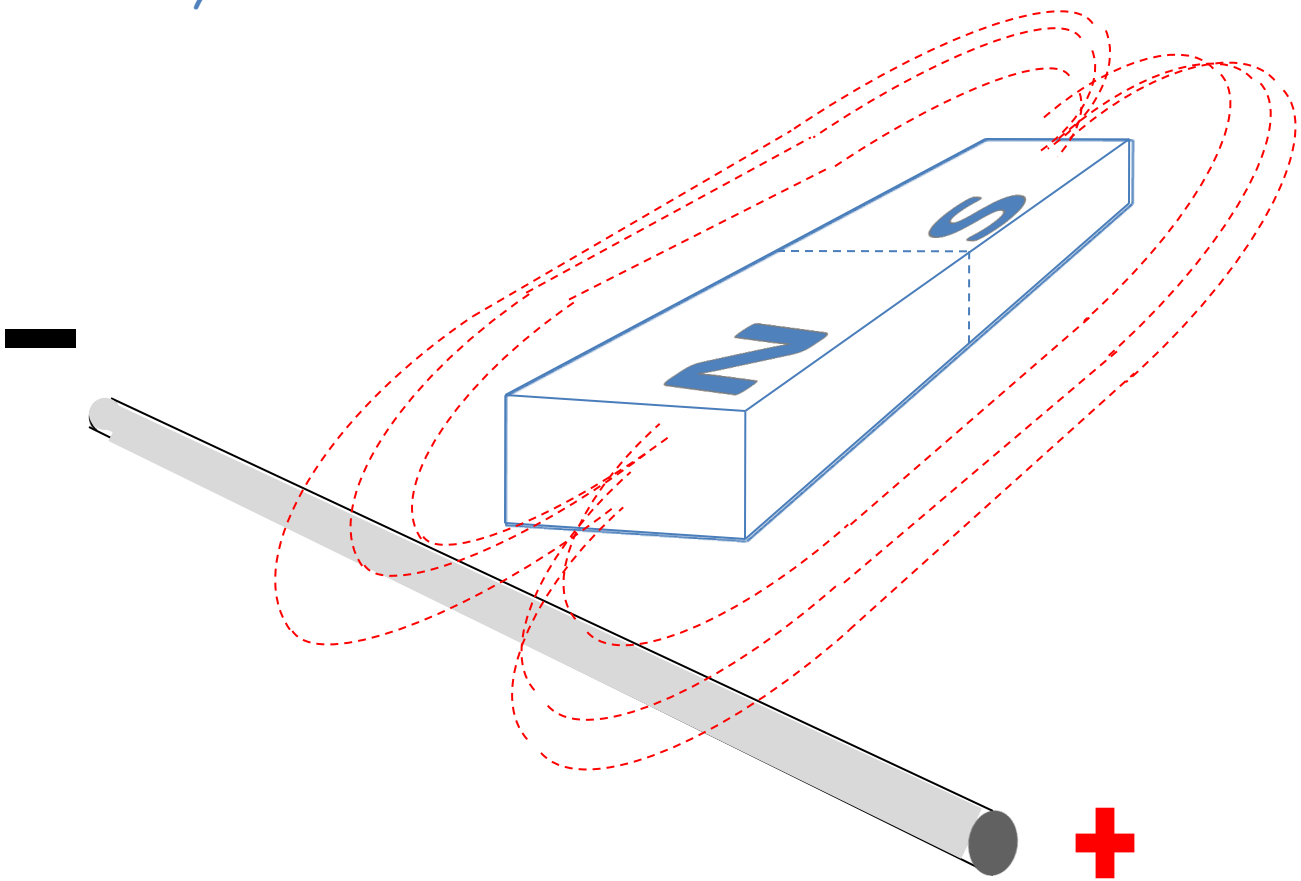


Conductors are affected by magnetic fields.

Background Theory - Magnetic Field's Effect on Conductors

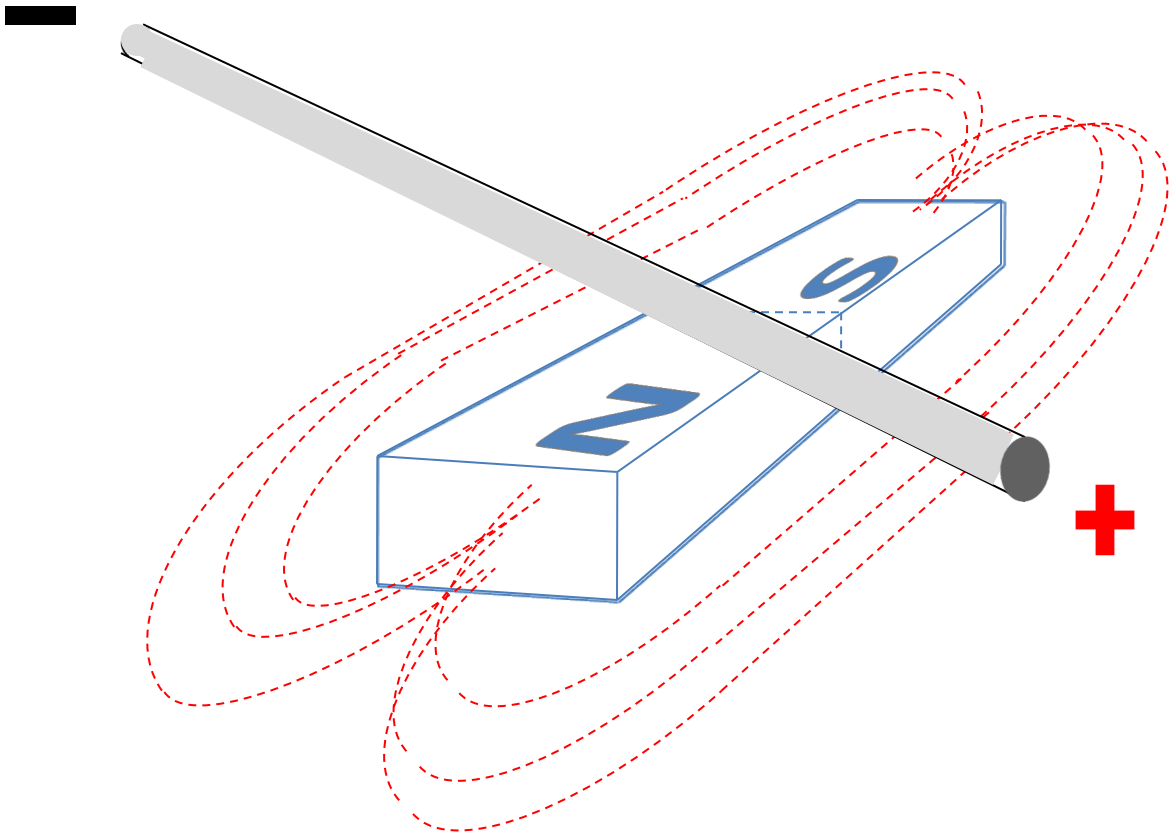
Michael Faraday

"When a moving magnetic field 'cuts' through a conductor electricity is induced in the conductor"

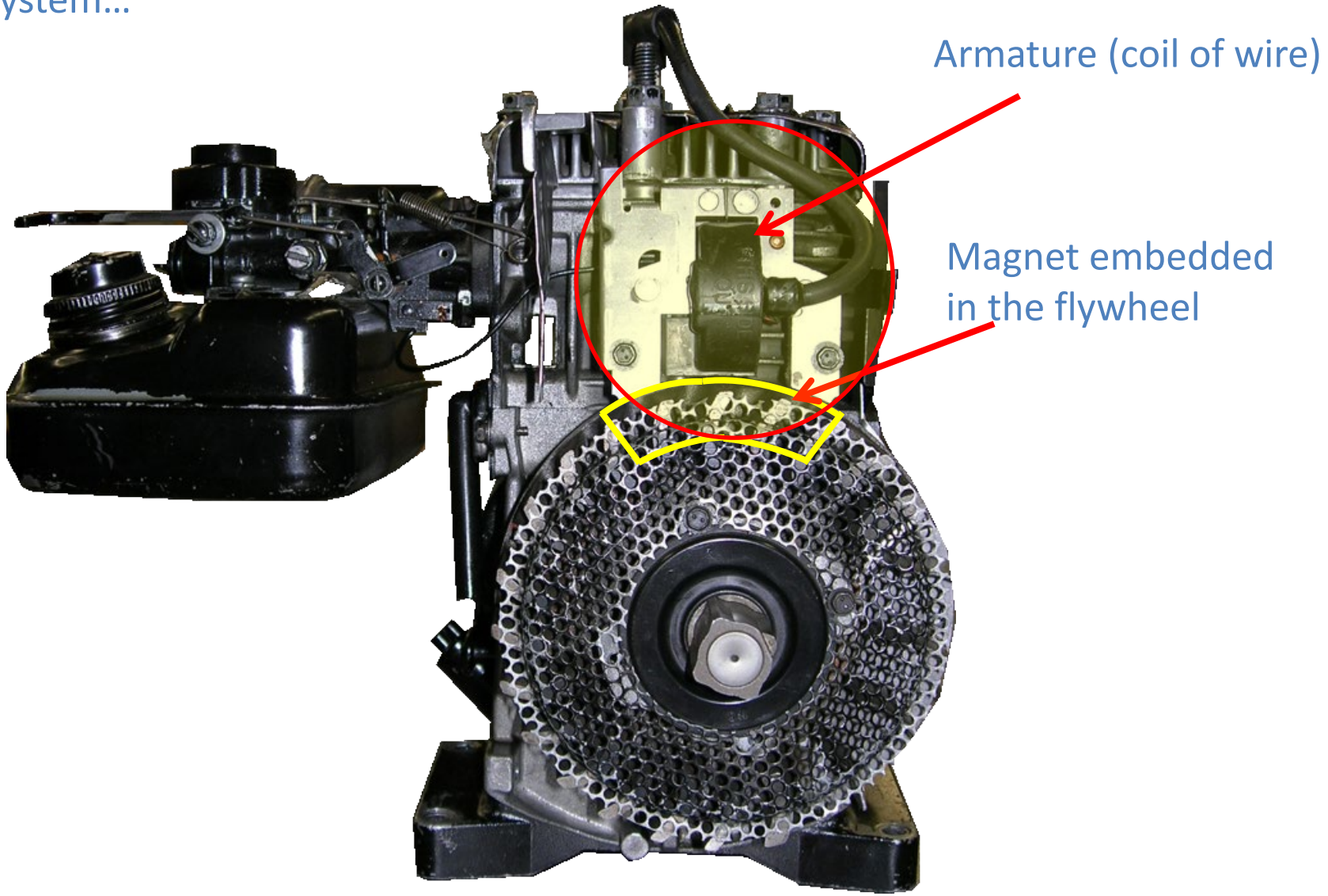


Background Theory - Magnetic Field's Effect on Conductors

The effect is the same no matter whether the conductor passes through the magnetic field or the magnetic field is passed through the conductor.



How this all relates to your engine's ignition system…

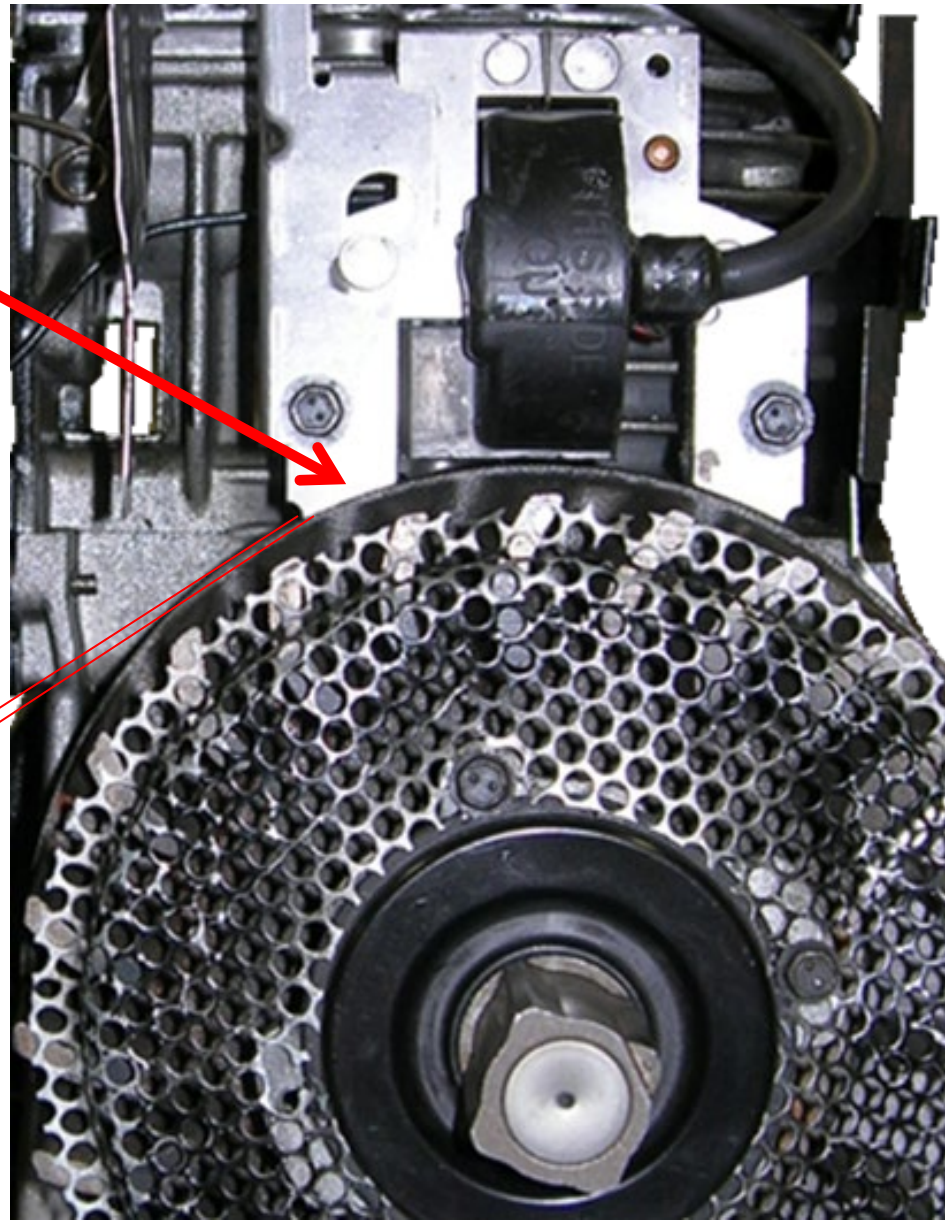


How this all relates to your engine's ignition system…

A small ‘air gap’ exists between the armature and the flywheel.

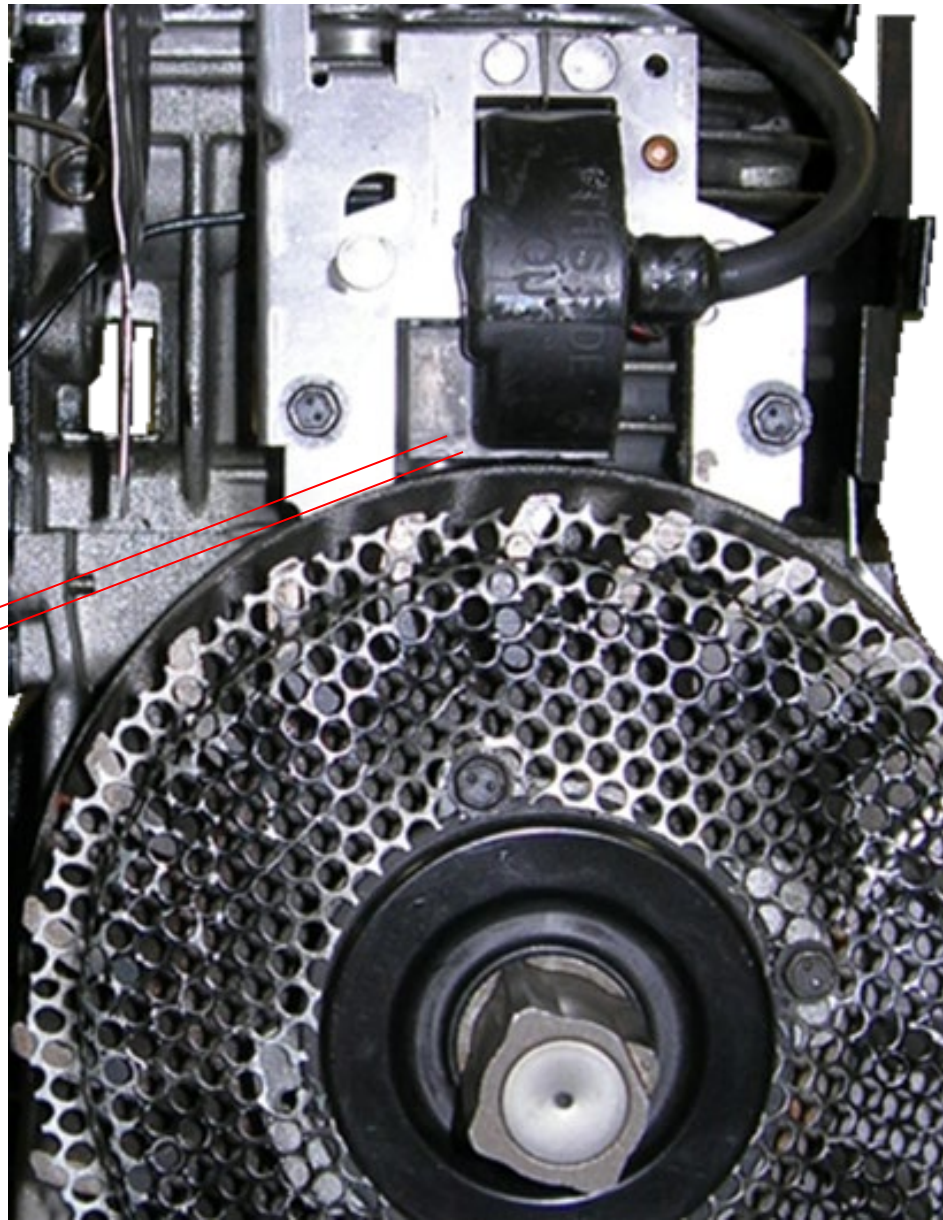
This gap is adjustable and must be set to a very exacting tolerance.

The gap cannot be too big or too small.



Air Gap Too Big…

The magnetic field will have less effect on the armature and the voltage generated will be low.



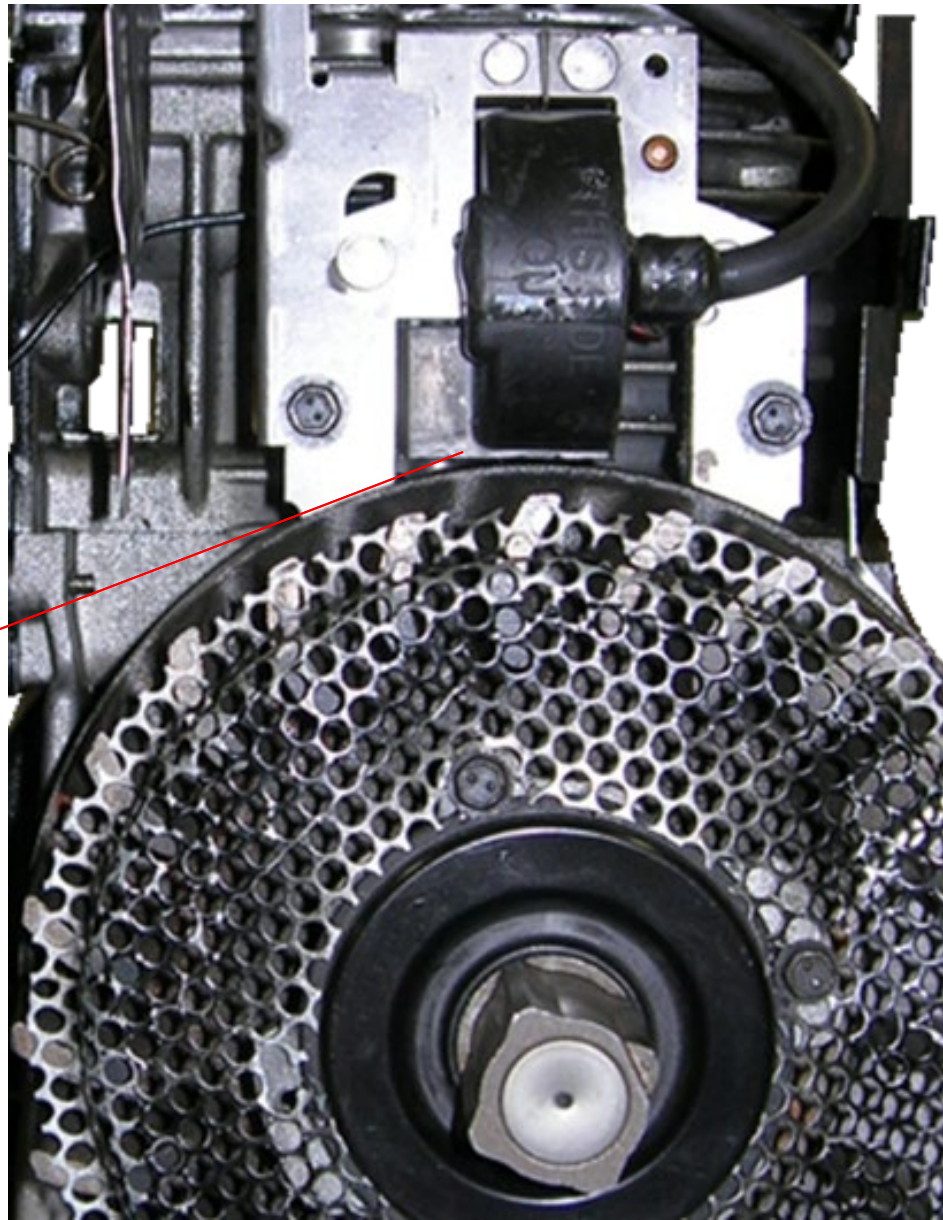
Result:

Electrical push (voltage) will not be strong enough to force electrons across the spark plug gap.

= no spark or intermittent spark

Air Gap Too Small…

Even though the gap may seem ok when the engine is cold, the flywheel will expand as the engine warms up resulting in mechanical contact.



Result:

Flywheel & Armature contact.

= engine stops or parts damaged

Amazingly, your engine's magneto ignition system produces around 16,000 volts!

Voltage is electrical push or pressure. The high voltage is necessary to be able to force electrons to jump across the spark plug's air gap.

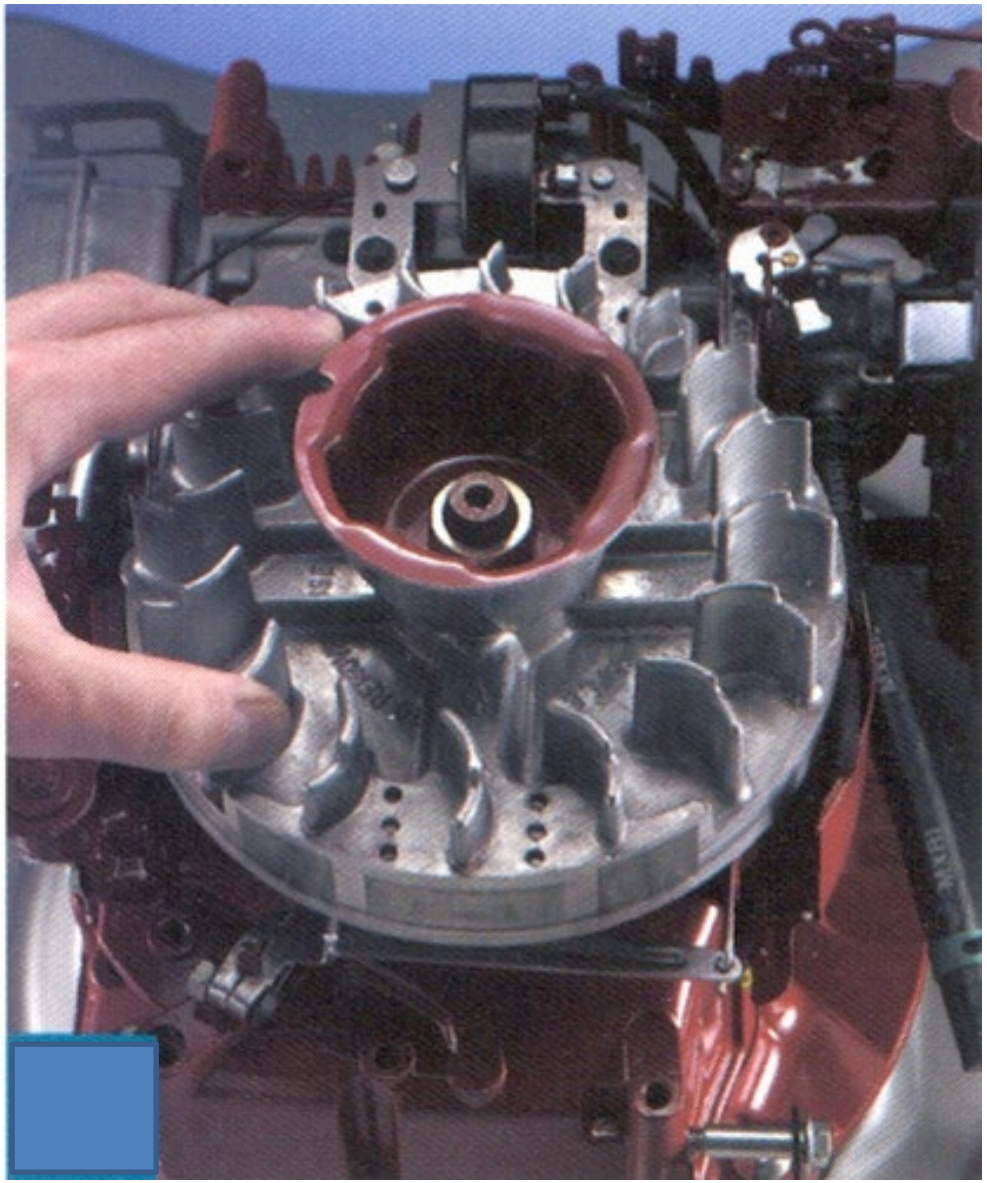
4 Simple steps for adjusting air gap

Step 1

loosen armature screws

Step 2

Rotate flywheel to position magnets away from armature

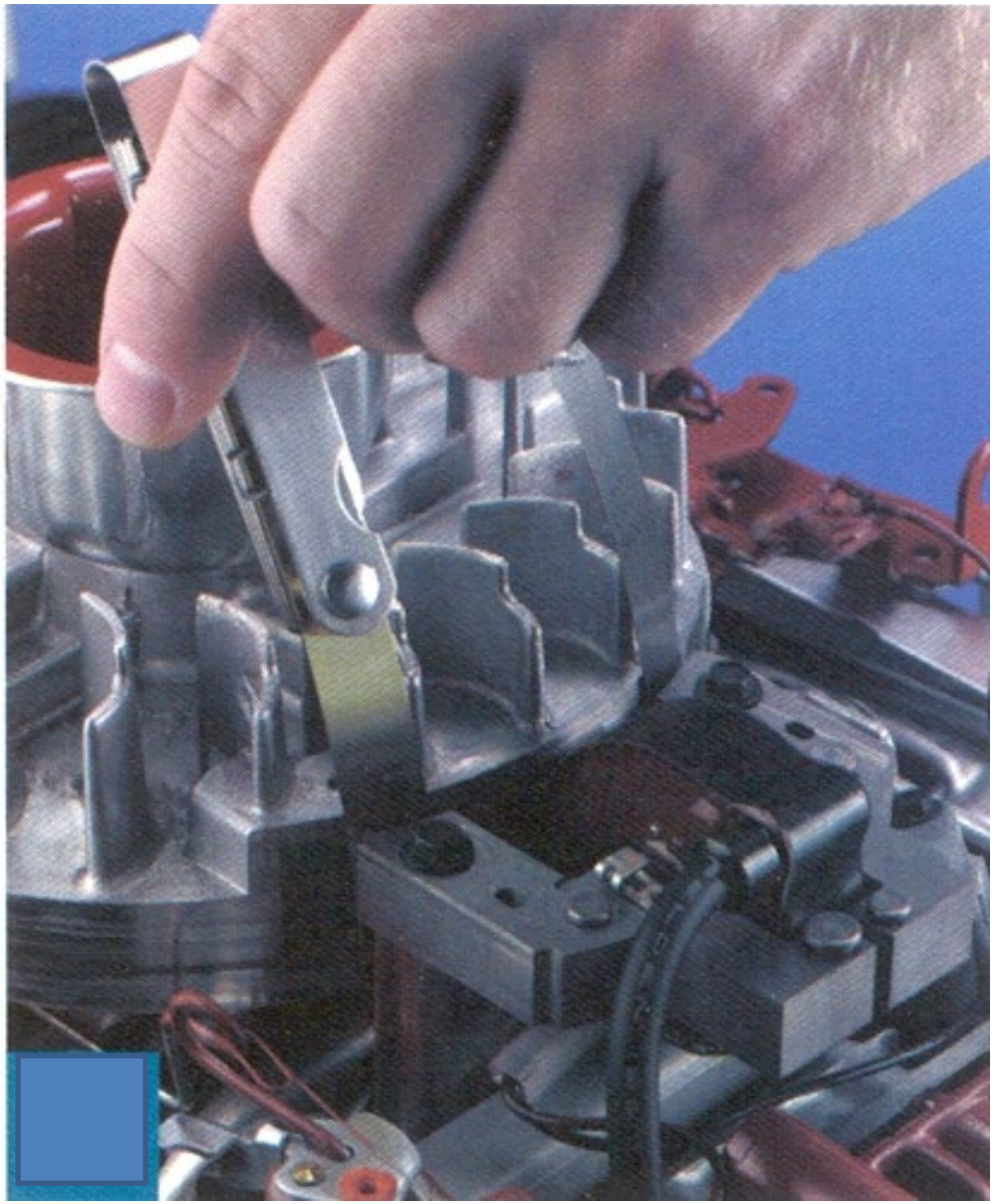


Step 3

place shim between armature and flywheel

then…

press armature against shim and flywheel



Step 4

lightly tighten screws to secure armature

then…

rotate flywheel to remove shim