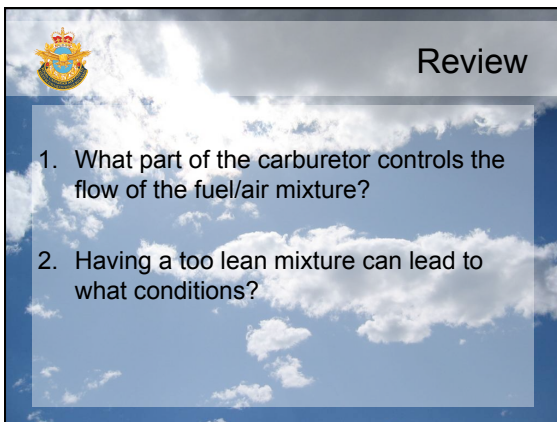


The slide features a blue background with a white cloud. In the top left corner is the Royal Air Force crest. The title "Aero Engines" is in the top right. A propeller aircraft is shown in flight in the center. At the bottom, a white box contains the text "9.04 Ignition & Propeller" and "References: FTGU pages 69-71, 72-75".

Aero Engines

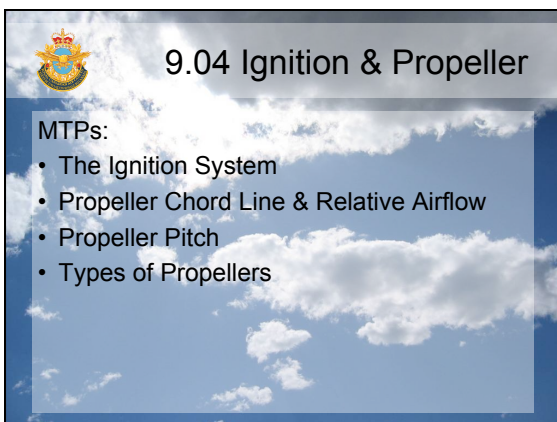
9.04 Ignition & Propeller
References:
FTGU pages 69-71, 72-75



The slide features a blue background with a white cloud. In the top left corner is the Royal Air Force crest. The title "Review" is in the top right. Two numbered questions are listed in a white box.

Review

1. What part of the carburetor controls the flow of the fuel/air mixture?
2. Having a too lean mixture can lead to what conditions?



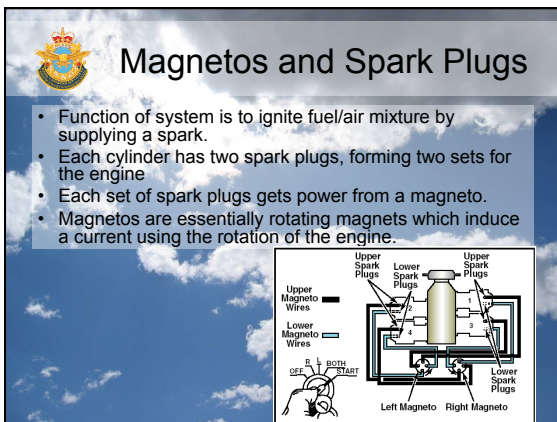
The slide features a blue background with a white cloud. In the top left corner is the Royal Air Force crest. The title "9.04 Ignition & Propeller" is in the top right. A white box contains the text "MTPs:" followed by a bulleted list.

9.04 Ignition & Propeller

MTPs:

- The Ignition System
- Propeller Chord Line & Relative Airflow
- Propeller Pitch
- Types of Propellers







Chord Line & Relative Airflow

- Propeller acts very similar to wing in order to move air backwards pushing the a/c forwards.
- The angle at which the propeller (or chord line) meets the relative airflow is known as the Angle of Attack (AoA).
- Higher AoA means more air pushed backwards (more thrust).

The diagram shows a propeller blade with a dashed line representing the chord line. An arrow labeled 'Blade motion' points downwards from the root of the blade. An arrow labeled 'Relative airflow' points upwards and to the right, meeting the chord line at an angle labeled 'Angle of attack'. Two other arrows show 'Airflow due to blade motion' pointing upwards and 'Airflow due to incoming air' pointing to the right.

Propeller Pitch


- The distance (in feet) a blade moves forward for every rotation.
- Fine Pitch: used when more power is required.
- Coarse Pitch: used during cruise or when extra power not needed

The diagram shows two propeller blades. The left one is labeled 'fine (low) pitch - take-off' and has a smaller angle between the chord line and the pitch control line. The right one is labeled 'coarse (high) pitch - cruise flight' and has a larger angle. A 'pitch control' line is shown at the bottom of both blades.


Fixed Pitch

- **Fixed Pitch:** used in simple aircraft such as Cessnas or Float Planes.
 - Simple, inexpensive design
 - Useful on trainer aircraft
 - Limited to one pitch
- Coarse pitch for good cruise performance.
- Fine pitch for good take-off and climb performance.

A photograph showing the propeller and engine cowling of a small aircraft, likely a Cessna, with a white and green paint scheme.

 **Variable Pitch**


- **Variable Pitch:** used in larger or aerobatic propeller driven aircraft.
 - Useful for higher performance during entire flight
 - Complex, expensive design
 - Requires additional training



 **Variable Pitch**

- **3 Different categories of variable pitch props:**
 - **Adjustable Pitch Prop:**
 - Adjustable only on ground
 - **Controllable Pitch Prop:**
 - Pilot selects pitch during flight from cockpit
 - **Constant Speed Prop:**
 - Propeller automatically pitches to remain at same RPM



 **Confirmation**

1. The spark plugs receive power directly from which part of the ignition system?
2. A coarse pitch setting of a propeller is usually used for what flight conditions?
3. Name the 3 categories of variable pitch propellers.

