Aircraft Engine Operations
Using RPM and Manifold Pressure Gauges

Fly Safe
Engine Components

- exhaust valve
- exhaust port
- glow plug
- intake valve
- intake port
- cooling fins
- piston
- connecting rod
- crankshaft
- crankcase

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RPM Gauge

• RPM – *engine* revolutions per minute

• The RPMs are registered on tachometer

• Higher TACH reading = Faster Engine RPMs
• Lower TACH reading = Slower Engine RPMs
Four Stroke Engine:
1) Intake
2) Compression
3) Power
4) Exhaust

Each full cycle = 1 revolution

On direct-drive engine, each full cycle turns the propeller one revolution

Propeller rate is measured in revolutions per minute (RPM)
1. Intake
2. compression
3. power
4. exhaust

• Engine 4 Stroke Action

• Drop in RPM or Manifold Pressure means Engine is producing less Power

• Increase in RPM or Manifold Pressure means Engine is producing less Power
RPM Gauges

AKA = Tachometers or Tachs

- Fixed-pitch propeller
  Aircraft – direct linking of Engine and Prop
- Controllable Pitch Propeller – Indirect linking of Engine and Prop through Prop Pitch Control & Prop Governor
Manifold Pressure Gauges
(Controllable-Pitch Propeller Aircraft)

- Manifold Pressure Gauge (Manifold Pressure)- Indicates Absolute Air Pressure at Carburetor Air Intake
- MPG relates proper RPM setting to the Absolute Air Pressure
Manifold Pressure Gauges

- Prior to Engine Start, MANIFOLD should read same as AMBIENT or STATION Pressure
- EXMAPLE: Pressure of Air at that airport is 30.00, then MANIFOLD should read 30 inches as well)
Manifold pressure increases as throttle is opened, therefore manifold pressure indicates engine power.
RPM Gauge and Function

• How much power the engine is producing.
• Can be used to determine airspeeds (which RPM setting gives you X knots of indicated airspeed).
• In a high performance aircraft (180 hsp and greater) tells how fast prop is spinning.
• RPM equals speed.
• For Correct Operation of RPM and Manifold Pressure, follow Pilot Operating Handbook - POH
• Using Both RPM and Manifold Pressure correctly reduces unnecessary wear and tear on the engine, the prop, and the airframe
• Follow the Pilot’s Operating Handbook - POH

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