

Detonation and Preignition:

	Detonation	Preignition
Definition	<i>Uncontrolled, explosive ignition of the fuel/air mixture within the cylinder combustion chamber</i>	<i>Occurs when the fuel/air mixture ignites prior to the engines' normal ignition event.</i>
Effects	<ul style="list-style-type: none"> ❑ Causes engine overheating, roughness, and loss of power. ❑ Excessive temperatures and pressure (could lead to piston, valve, or cylinder failure) 	<ul style="list-style-type: none"> ❑ Causes engine to lose power ❑ Produces high operating temperatures ❑ May cause severe engine damage ❑ Expanding gases exert excessive pressure on the piston while still on its compression stroke.
Characteristics	High cylinder head temperature	Produces high operating temperatures
Causes	<ul style="list-style-type: none"> ❑ Using lower fuel grade ❑ Operating with high manifold pressure and low RPM ❑ High power setting with excessively lean mixture ❑ Extended ground ops, or steep climbs 	Residual hot spots in the combustion chamber cause a part to heat sufficiently to ignite the fuel/air charge. This is created by: <ul style="list-style-type: none"> ❑ Small carbon deposits on a spark plug. ❑ Cracked spark plug insulator ❑ Damage in the cylinder
Corrective Actions	<ul style="list-style-type: none"> ❑ Use proper fuel grade ❑ Keep cowl flaps open on the ground if available ❑ Use enriched mixture on initial climb and use shallower climb angle ❑ Avoid extended high angle/high power steep climbs ❑ Monitor engine gauges periodically to confirm appropriate operations 	<ul style="list-style-type: none"> ❑ Use recommended fuel grade ❑ Operate engine within its proper temperature, pressure, and RPM
<ul style="list-style-type: none"> ❑ Detonation and preignition often occur simultaneously and one may cause the other. ❑ Summary: causes high engine temperature and loss of performance; use correct fuel grade and avoid high power low airspeed situations. Land as soon as practical or don't take off if problem does not correct itself. 		