

20.1 Purpose and Design

- The air inlet (or intake) is designed to provide a steady, turbulent-free supply of air to the face of the compressor.
- ☐ Subsonic Intakes: These are typically divergent ducts. As the aircraft's speed increases, the ram air is slowed down and its pressure increases before it reaches the compressor, improving efficiency. This is known as ram pressure recovery.
- ☐ Supersonic Intakes: Since an engine compressor cannot handle supersonic airflow, supersonic intakes are designed to slow the air down to subsonic speeds before it enters the engine. They use a convergent-divergent shape and often employ movable ramps or spikes to control the position of shockwaves for efficient deceleration of the air.
- ☐ Icing: Intakes are prone to icing in certain atmospheric conditions. Engine anti-ice systems, which use hot bleed air from the compressor, must be used to prevent ice from forming and being ingested by the engine.
- ☐ Foreign Object Damage (FOD): The intake is the entry point for any debris (stones, birds, etc.) that can severely damage the compressor blades.

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