

G350™/G450™ (ATA 36): Amber Left Manifold Synoptic Line with APU Air Applied

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During cold weather, Technical Operations receives calls from operators regarding an amber Left Manifold Line on the ECS/PRESS synoptic page. This occurs in cold climates following APU start and subsequent application of APU air. The right manifold line almost immediately goes to green, but the left manifold line may remain amber until left engine start. The following is an explanation of why this occurs and is considered a normal indication.

The precooler outlet sensor is designed to provide the flight crew bleed air manifold temperature in the cockpit when the engines are operating. The precooler outlet sensor is located in the pylon after the air exits the precooler coming into the manifold. In cold weather during APU operations with APU air applied, it is not unusual to see the line on the ECS/PRESS synoptic page for the left manifold to the ACM scroll and to the precooler to be amber in color. Per the Honeywell specification, this line will change to amber when the duct temperature is below 100°F.

The reason the right precooler outlet temp does not fall to 100°F or below during APU operations is due to the proximity of the right precooler outlet sensor to the APU duct entering the right manifold. The APU air flow typically is ducted directly into the right manifold and then through the right and left packs inlet valves. The left pack inlet valve is located left of the isolation valve in the manifold and is farthest from the APU air source.

It is known that air flow equates to increased heat. The air is quite hot at the intersection of the APU to the right manifold duct when packs are operating, but note the air is not flowing through the precoolers. Since the air is static in the duct due to the engine manifold pressure regulating and shutoff valves (PRSOVs) being closed on both sides, the air flow also equates to a temperature rise. Where there is no air flow, the air cools off in the LH pylon during APU operations.

Since the precooler outlet temp on the left is farther from the dynamic airflow, the sensor in the left pylon ducting is cooler and will rarely reach 100°F during cold weather APU operations, and thus the synoptic page will display amber as designed until additional air flow is routed through the duct (LH engine bleed air). The right pylon ducting is closer to the APU duct, so it reaches 100°F or greater, which allows the synoptic line color to change to green.

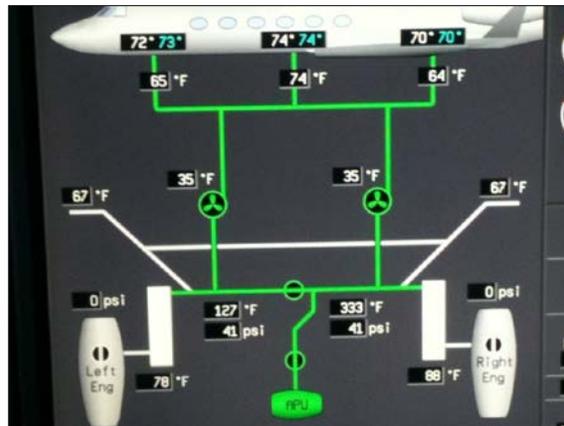
This does not happen on the GV, G500/G550, and G650/G650ER aircraft because the precooler outlet temperature sensors are located in the tail compartment bleed air manifold on either side of the isolation

valve, not in the pylon like the G350/G450 aircraft. Therefore, the GV, G500/G550, and G650/G650ER left pre-cooler temperature sensor is closer to the APU air source.

The following below reflect normal indications: first, when in cold weather with APU bleed air selected and second, with normal engine bleed air selected.



APU bleed air selected during cold weather operations



Normal engine bleed air selected during cold weather operations