

Title (en)
IMPINGEMENT COOLED TRANSITION DUCT

Publication
EP 0203431 B1 19901122 (EN)

Application
EP 86106295 A 19860507

Priority
US 73401885 A 19850514

Abstract (en)
[origin: EP0203431A1] A transition duct in an advanced heavy duty gas turbine engine is cooled by impingement jets formed by apertures in a sleeve spaced a distance from the surface to be cooled. The sleeve is configured so as to duct spent impingement air towards the combustor, where it can be subsequently used for mixing with, and combustion of, the fuel, or for cooling of the combustor. The distance between the impingement sleeve and the transition duct surface is varied to control the velocity of air crossflow from spent impingement air in order to minimize the pressure loss due to crossflow. The cross-sectional areas of the apertures are varied to project impingement jets over the various distances and crossflow velocities. Generally, larger aperture areas are used with larger distances. The distance between the impingement sleeve and the transition duct systematically increases towards the combustor as the quantity of spent impingement air increases to a maximum value at the intersection of the combustor and the transition duct. The combination of variations in distance, aperture size, and inter-aperture spacing is utilized to vary the impingement cooling intensity to compensate for the variable internal heat load and also to produce the desired temperature distribution over the surface of the transition duct according to design requirements. The aforementioned variations are optimized to minimize the air flow pressure drop ahead of the combustion tem which achieving the required cooling intensity according to design requirements.

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