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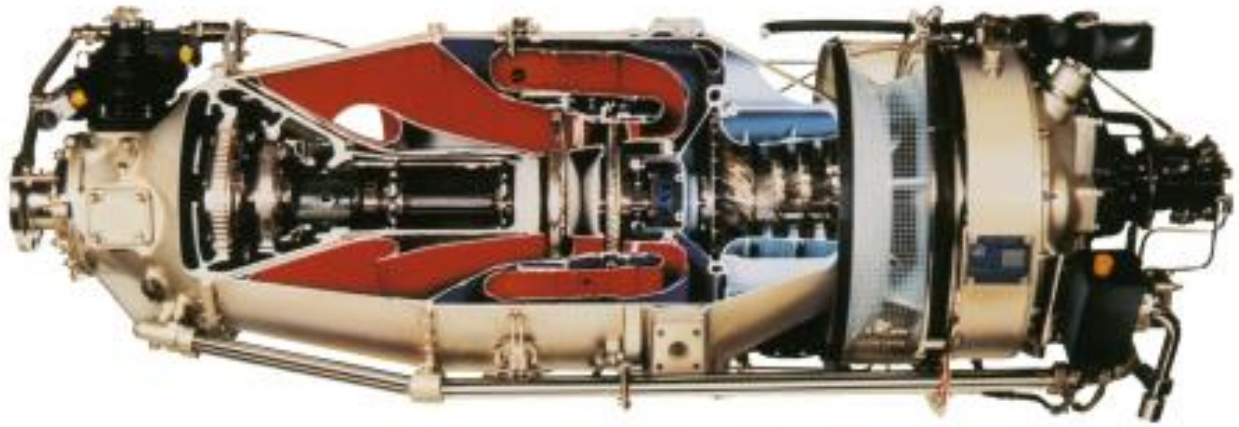
PT6A Séries -Training Manual

72-40 COMBUSTION SECTION



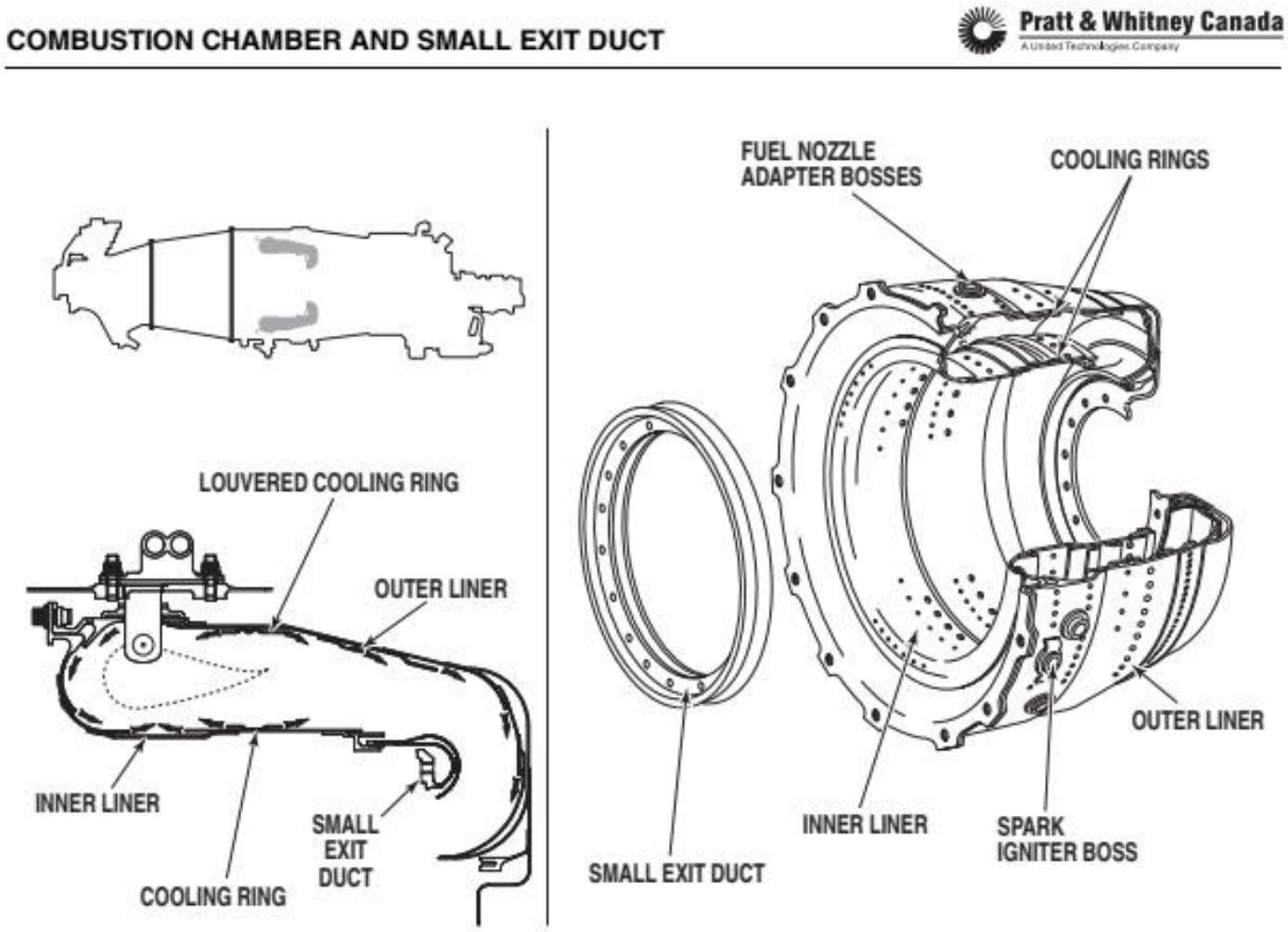
72-40-00

COMBUSTION SECTION - DESCRIPTION AND OPERATION

1. Description and Operation

The combustion section of the engine is contained in the front section of the gas generator case and consists of the combustion chamber liner and the small and large exit ducts. The liner is retained within the gas generator case by the two spark igniters and the 14 fuel manifold adapters. Compressor discharge air is directed from the diffuser section and discharges into the combustion section; air enters the liner through straight and plunged holes, mixes with fuel from the manifold and is ignited. The expanding gases flow to the rear and into the exit duct zone where the gas flow is turned 180 degrees inward to flow forward through the compressor turbine inlet guide vanes to the compressor turbine.

COMBUSTION SECTION - DESCRIPTION AND OPERATION



COMBUSTION SECTION - DESCRIPTION AND OPERATION

HOT SECTION AREA

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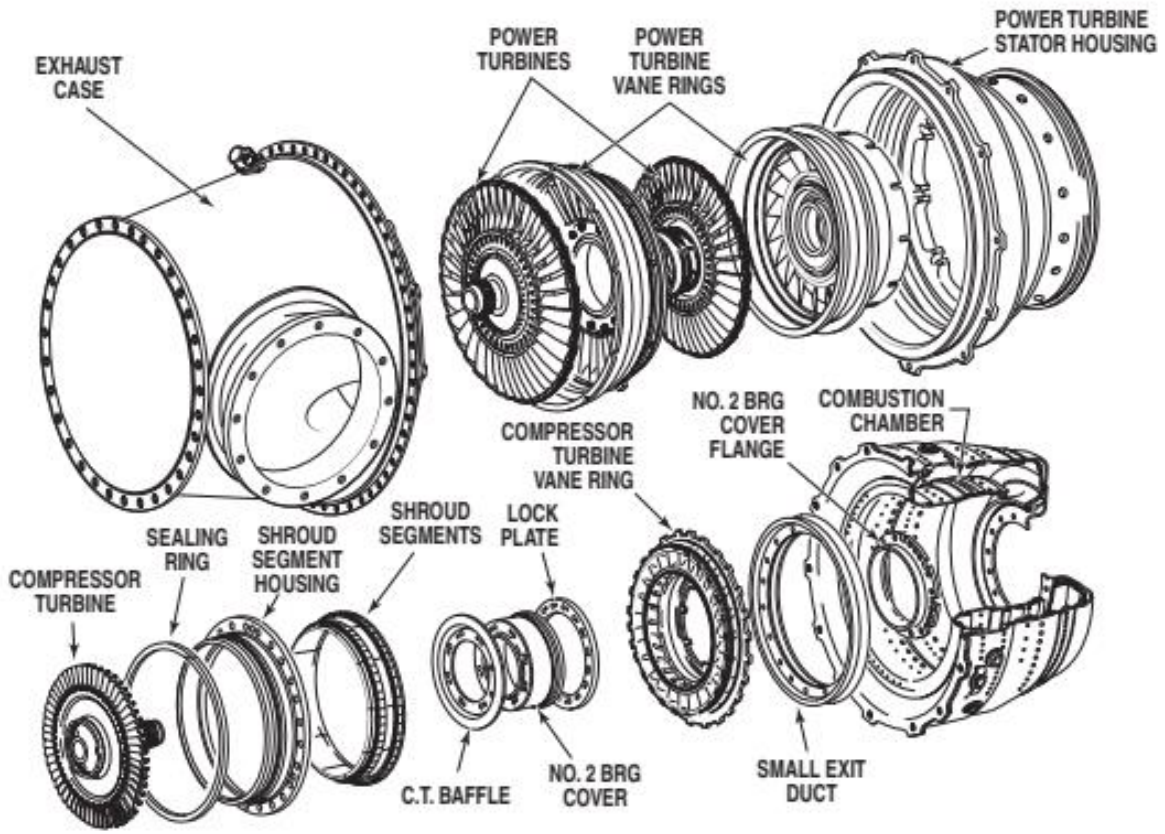

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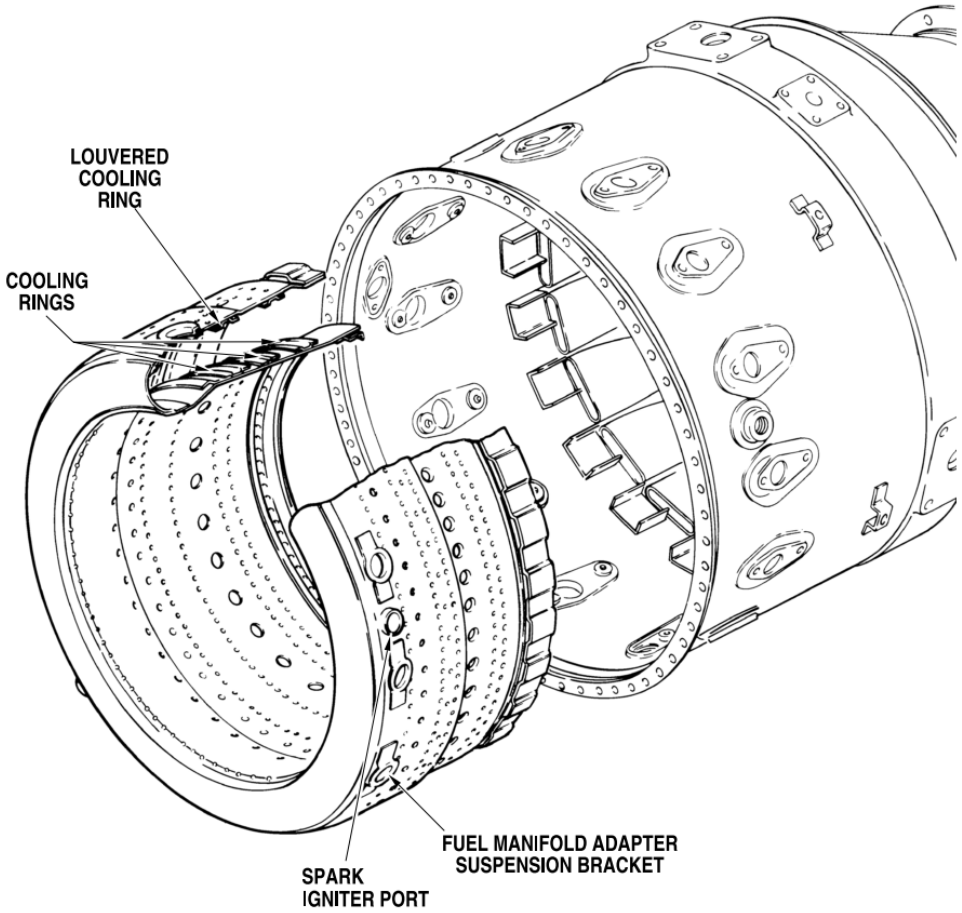
COMBUSTION CHAMBER LINER ASSEMBLY- DESCRIPTION AND OPERATION

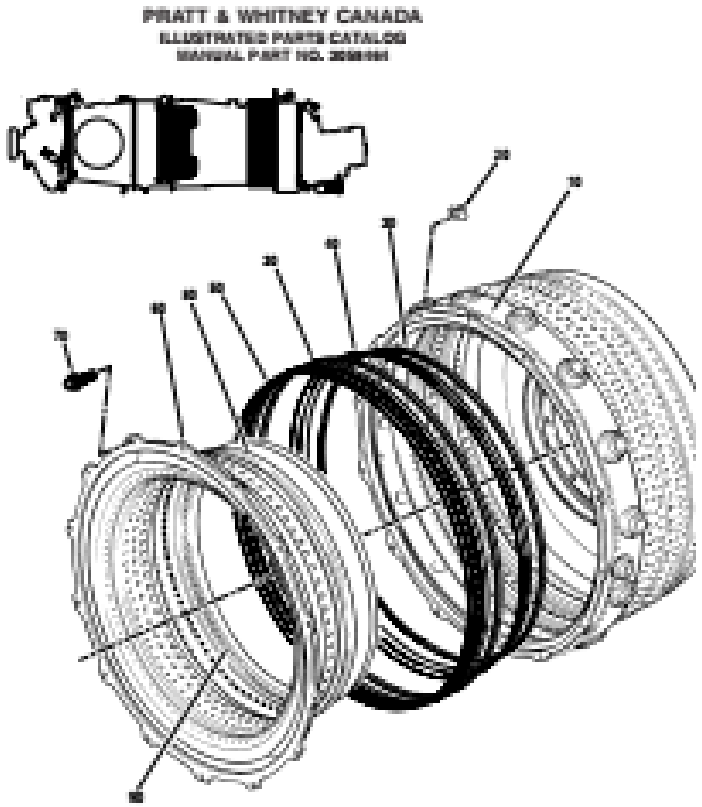
1. Description and Operation (Ref. Fig. 1)

The combustion chamber liner is an annular, heat-resistant steel liner, open at the rear end and domed at the front end. A series of straight, plunged and shielded holes in the inner and outer walls of the liner allow compressor discharge air to enter the liner combustion zone. Two igniter sleeves and 14 fuel nozzle ports, which incorporate nozzle support brackets, are located in the liner outer wall adjacent to the domed end. The shape, size and locations of the holes and shields, as well as the locations of the igniter sleeves, provide the best fuel/air ratios for starting and sustained combustion and form efficient primary and secondary zones within the liner combustion zone. Primary air, introduced near the fuel nozzle ports, serves to support combustion. The secondary air provides a layer of cooling air adjacent to the liner inner walls; this effectively keeps the flame away from the walls and, by mixing, ensures that the gases leaving the liner are cooled to a temperature which the compressor turbine can tolerate; it also provides additional air for the combustion process.

The domed end of the liner is supported inside the front section of the gas generator case (Ref. 72-30-04) by the 14 fuel manifold adapter sheaths (Ref. 73-10-05) while the rear end of the liner is supported by the large and small exit ducts.



COMBUSTION CHAMBER LINER ASSEMBLY- DESCRIPTION AND OPERATION



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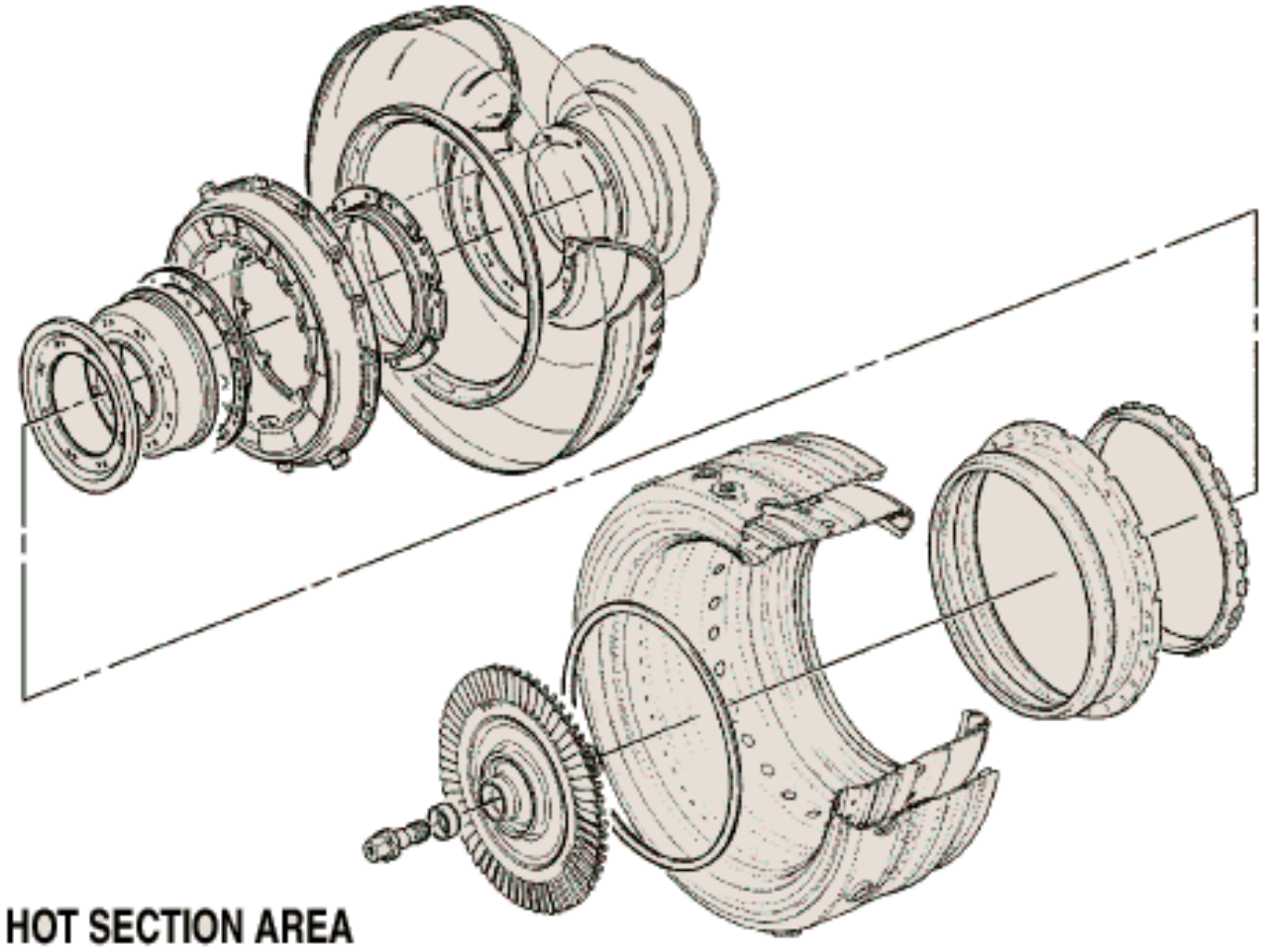

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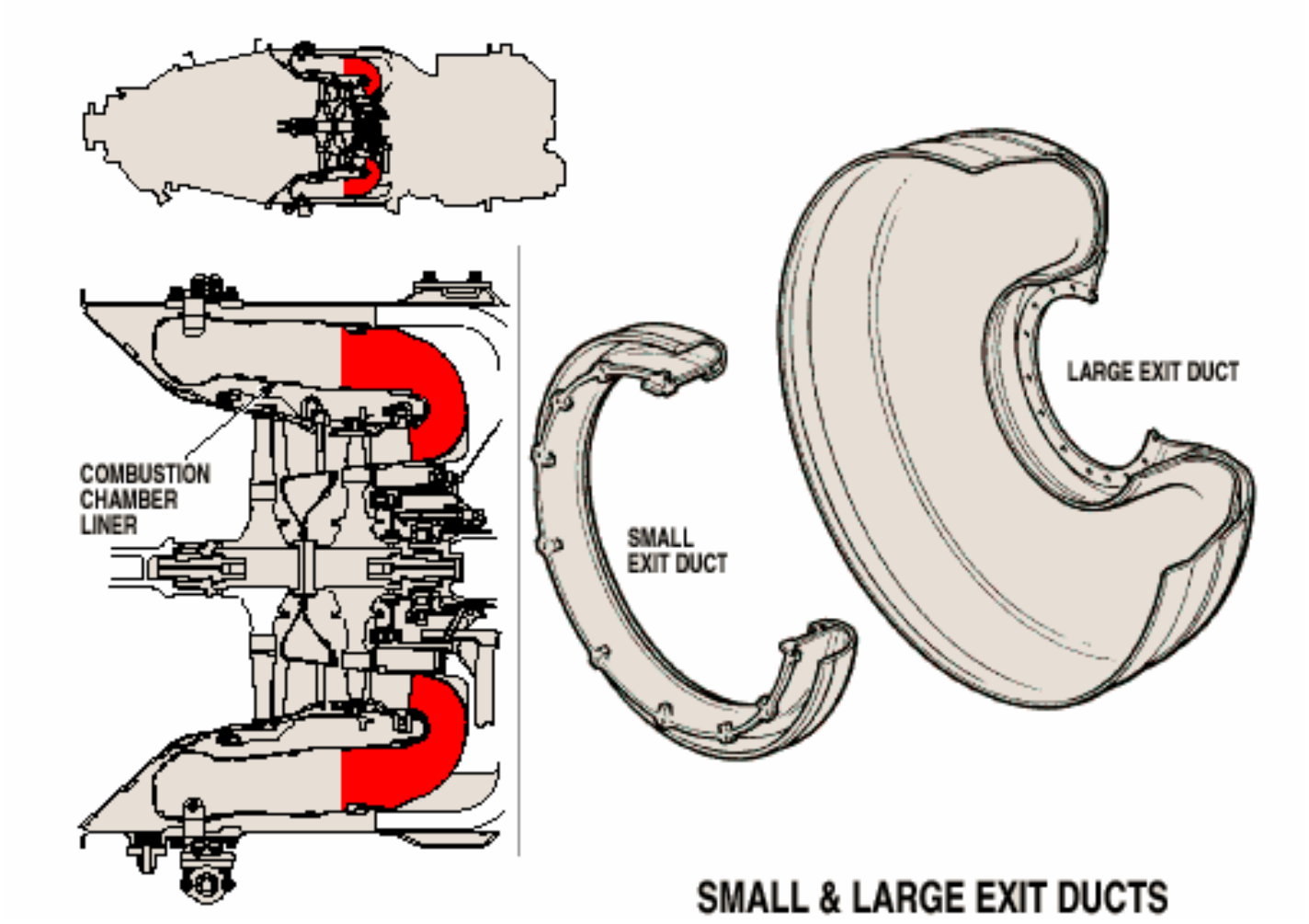
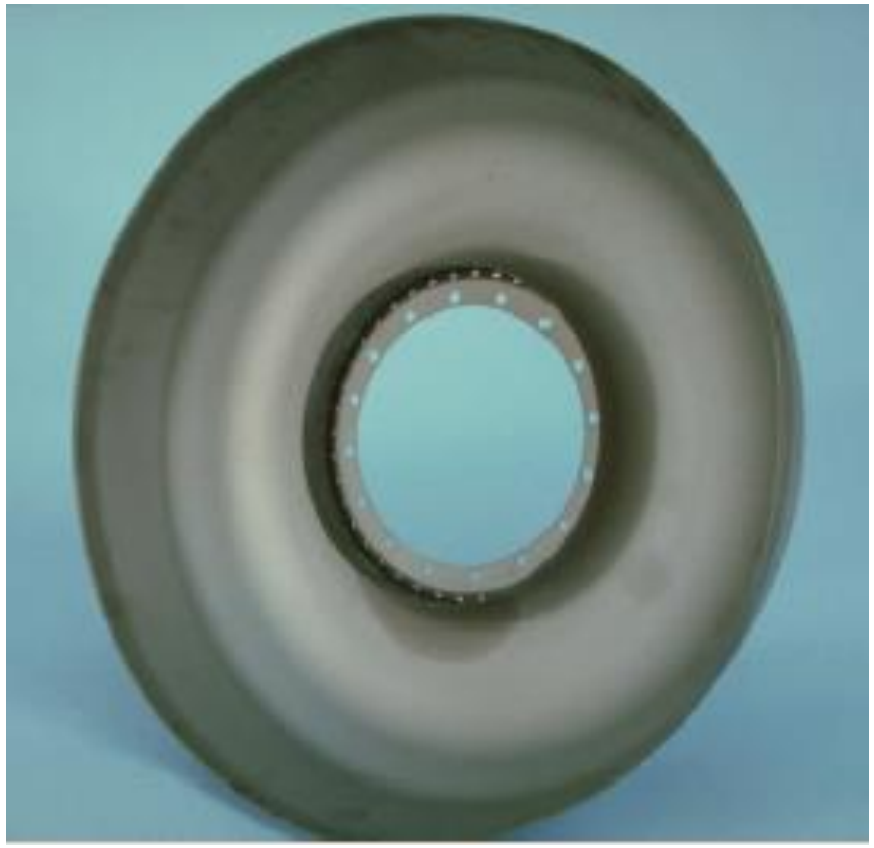


SMALL & LARGE EXIT DUCTS

COMBUSTION CHAMBER LINER ASSEMBLY- DESCRIPTION AND OPERATION



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