

Figure 2: One of the first Canadian production engines to be produced at the Malton plant of Orenda Engines.

# Manufacturing the J79 at Orenda

By D. H. PARKER\*

**P**OWER FOR THE CF-104 airplane is furnished by the General Electric designed J79-7 engine. The manufacture and testing of the Canadian version of this engine are now well underway at Orenda Engines Ltd., at Malton.

The first engine from Orenda production was delivered on Jan. 19 to Lockheed Aircraft Corp., which is supplying the 14 initial trainer airframes. This represents a period of 15½ months from receipt of the drawings by Orenda. Other engines are assembled and are on test for delivery to Canadair, as well as to Lockheed.

The J79 being manufactured by Orenda started out as a direct copy of the J79-7 model in order to keep costs and development to a minimum and to enable Canadian suppliers to take full advantage of U.S. production experience. To differentiate it from the American-produced engine, the Canadian item is designated the J79-OEL-7. Over the past year it has undergone some changes so that it is not now a direct copy of the original 7, but incorporates modifications included in the -11 and -11A versions.

**Involved Negotiations:** The Canadian J79 program is the result of negotiations between the Canadian and U.S. governments and Canadian General Electric Co. Ltd., General Electric Co. in the U.S., and Orenda Engines. As a result, Orenda is manufacturing

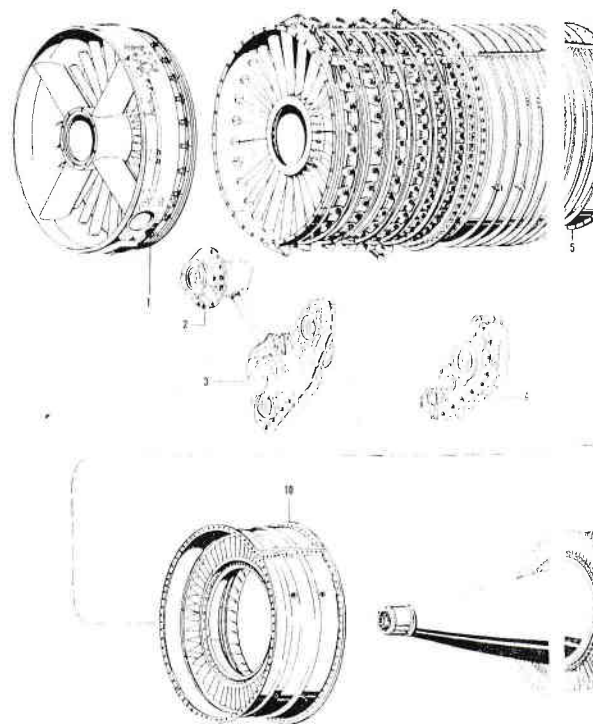
the J79 under an agreement with the Department of Defence Production, to technical data supplied by GE. This agreement between DDP and Orenda is the outcome of a license arrangement between DDP and CGE, and between CGE and the parent General Electric Co.

The negotiations necessitated to bring this program about were sufficiently completed in the latter part of 1959 to institute receipt of drawings at Orenda from GE's Evendale, Cincinnati plant. On Oct. 26, 1959, Orenda received complete J79 technical data including all engine and tool drawings, specifications, planning sheets, etc. All of this data was reviewed and released within Orenda so that engineering, procurement and manufacturing activities could commence simultaneously.

In the engineering area, it was necessary to review all of the engine drawings and specifications so that our engineers would be fully cognizant of the design and testing requirements of the complete engine and its accessories. The drawing review was straightforward because the Canadian manufacture of the J79 engine was to be a direct copy of the design currently under manufacture in the U.S. Specification reviews, however, required additional work. This entailed a compilation, from GE information, of special instructions applicable to either the engine testing facilities at Orenda or to the testing and qualification requirements of the various Canadian

vendors who would now be providing materials and accessories for this program.

For example, such items as fuel pumps, controls and nozzle area controls, which are just a few of the main accessories, are now being manufactured in Canada by Canadian companies under license from their original American designers. This meant that adequate testing requirements had to be set up to qualify each of these manufacturers to the satisfaction of Orenda and the RCAF. Review of material specifications peculiar to this



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manufacturing interests, the company is still very much in the aircraft building business. At the present time, Avro has two sub-contracts for CF-104 components, and is doing a limited amount of maintenance work on CF-100's.

## Forest Fire Expenses

B.C. Lands & Forests Minister Ray Williston said the Federal Government doesn't pay a fair share of forest fire fighting costs and should set up a national forest fire air force.

The minister told the provincial legislature, now in session, that Federal Forests Minister Hugh Flemming has indicated consideration is being given to the use of defence personnel and equipment to fight forest fires.

Mr. Williston said the giant Mars water bombers had proved satisfactory for small fires and on some isolated corners of large fires, but they are not a panacea for all fire-fighting problems. Water bombers should never be used without ground crews to follow up, the minister added, but have proved effective in keeping outbreaks in check until ground crews arrive.

For this purpose it would be desirable to maintain a small unit of flying tankers readily mobile for quick changes in base locations as the fire hazard through the province develops, the minister said.

## VOR/DME For Europe

ICAO has prepared a plan for the provision of VOR/DME in the European-Mediterranean area. The plan, which will now be submitted to the Air Navigation Commission and the Council of ICAO for approval, involves over 550 facilities at approximately 380 locations.

The task of assigning frequencies to these facilities was a difficult one in view of the number of installations to be accommodated within the same frequency bands.

This ground work was done by the ICAO Limited Regional Air Navigation Meeting held earlier this year in Paris. The meeting was attended by representatives of 26 nations and four international organizations.

## RCMP Called In

Responsibility for policing and security of five major Canadian air terminals has been turned over by the DoT to the RCMP. The terminals are: Toronto, Montreal, Ottawa, Edmonton and Halifax.

Transport Minister Leon Balcer pointed out that the question of airport security has been under study for some time. It was decided that the matter could best be handled by a specialized agency and, since the RCMP is already responsible for

security in the case of other Federal property, it was asked to handle the policing at the airports in question.

The decision to have the RCMP take charge of the policing at Toronto, Ottawa and Montreal airports will affect a total of 32 men, at present employed by the DoT as airport constables or security guards. The RCMP will employ a number of men from the Corps of Commissionaires under the new scheme. It is expected that about 49 members of the RCMP and 57 Commissionaires will be in service, all told, at the five airports.

## Dorval Sees 880

Northeast Airlines' Convair 880 jetliners have made their appearance at Montreal Dorval in recent weeks. The big 880's are being used on Northeast's Montreal and Miami via Boston route, and will soon be seen on an expanded service linking Mont-

real with Philadelphia, New York, Tampa, and Fort Lauderdale as well as Boston and Miami.

## Protest Lodged

The Victoria Chamber of Commerce and organized labor in the area have protested to Defence Production Minister Raymond O'Hurley the sending of B.C.-based military planes to Edmonton for a paint job.

Twelve Neptune patrol bombers from Comox RCAF base were sent outside the province for a routine paint job despite the fact that Fairey Aviation Co. of Canada Ltd., located at Patricia Bay, near Victoria, has full facilities and labor to tackle the job, the chamber said.

## ORENDA J79

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engine is mainly of sheet metal fabrications.

This necessitated a considerable expansion of our welding facilities. All of the materials had been welded previously at Orenda with the exception of Chromolloy. The increase in the welding facilities not only included the acquisition and qualification of the necessary equipment, but also the hiring and training of operators. Orenda has set up a welding training school which has been very successful. In this school, operators are required to become proficient in the welding of all types of materials and joint configurations.

**Canadian Suppliers:** In order to meet Canadian content requirements, the maximum amount of raw materials has been procured from Canadian sources. This posed a significant problem, namely, that of qualifying, in the short time available, not only the initial material from these sources, but the larger production quantities following immediately after the prototype samples. This has been overcome by the build-up of laboratory staff and the continued checking of test data to maintain minimum testing consistent with quality.

In the testing area, facilities were available for engine testing but modifications were required to adapt them to the J79. We used test cells which had been modified for the Iroquois operation and changed these to fit the J79 requirements. This involved installation of the particular instrumentation required and some minor modi-

## Coming Events

March 12-16—ASME Aviation Conference, Statler Hilton, Los Angeles, Calif.

March 19-25—1961 Joint Meeting, American Soc. of Photogrammetry and American Congress of Survey & Mapping, Shoreham Hotel, Washington, D.C.

April 4-7 — SAE National Aeronautic Meeting, Commodore Hotel, New York, N.Y.

April 5-7—Inst. of Environmental Sciences Annual Technical Meeting & Equipment Exposition, Park Sheraton Hotel, Washington, D.C.

April 10-11—AITA Semi-Annual Meeting, Empress Hotel, Victoria, B.C.

April 13-14—IAS/U.S. Army Aviation Meeting, Sheraton Park Hotel, Washington, D.C.

April 17—IATA 14th Technical Conference begins, Queen Elizabeth Hotel, Montreal.

April 24-27 — Annual Conference, Aerospace Medical Assoc., Palmer House Hotel, Chicago.

May 3-13—B.C. International Trade Fair, Exhibition Park, Vancouver.

May 8-12—National Industrial Production Show of Canada, Industry and Coliseum Bldgs., CNE Park, Toronto.

May 16-17—First Annual Meeting, Canadian Nuclear Assoc., Lord Simcoe Hotel, Toronto.

May 20-22—B.C. Aviation Council, Spring Executive-Director Meeting, hosted by Nelson Pilots Assoc., Nelson, B.C.

June 13-15—37th Meeting, Aviation Distributors & Manufacturers Assoc., Dennis Hotel, Atlantic City, N.J.

June 13-15—IAS/ARS Joint Summer Meeting, Ambassador Hotel, Los Angeles.

June 18—Annual Fly-in Breakfast Flight, Ontario County Flying Club, Oshawa, Ont.

June 28-July 1—Annual Meeting, Institute of Navigation, Williamsburg Inn, Williamsburg, Virginia.

May 25-26 — CAA Annual General Meeting, Royal York Hotel, Toronto.