

# ARCHIVED REPORT

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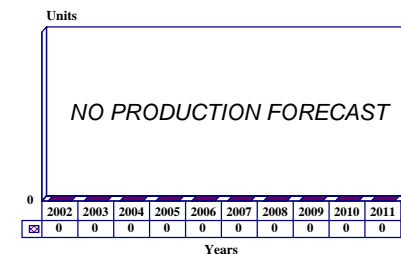
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## Ilyushin Il-86 - Archived 3/2003

### Outlook

- New production has been completed
- The CFM56 re-engining effort has been delayed indefinitely

10 Year Unit Production Forecast  
2002 - 2011



### Orientation

**Description.** Four-engine, medium-range, widebody commercial passenger transport aircraft.

**Sponsor.** Russian Department of Air Transport. The aircraft was previously sponsored by the Soviet government.

**Contractors.** Ilyushin Aviation Complex, Moscow, Russia.

**Status.** Production was completed in 1994.

**Total Produced.** Approximately 103 Il-86 transports were produced (not including one aircraft used for static testing).

**Application.** Short/medium-range, high-density, scheduled passenger transportation.

**Price Range.** Approximately \$42-\$43 million in 1995 US dollars.

### Technical Data

**Design Features.** Cantilever low-swept-wing monoplane with swept vertical and horizontal stabilizers. The wing is equipped with double-slotted trailing-edge flaps inboard of ailerons, multiple spoilers and airbrakes on the upper wing surface, and full-span leading-edge slats. The tail unit employs all-moving horizontal stabilizers, each with two sectioned elevators.

The tail fin has a two-section rudder. Quadracycle landing gear has one four-wheeled centerline unit and two wing-mounted four-wheeled main units plus a single twin-wheeled nose gear. PZL Mielec of Poland supplied vertical and horizontal stabilizers, engine pylons, flaps, and wing slats.

	<u>Metric</u>	<u>US</u>
<b>Dimensions</b>		
Overall length	59.54 m	195.34 ft
Overall height	15.81 m	51.87 ft
Wingspan	48.06 m	157.68 ft

### Weight

	<u>Metric</u>	<u>US</u>
Maximum take-off weight <sup>(a)</sup>	208,000 kg	458,560 lb
Payload, maximum	42,000 kg	92,600 lb
Fuel, maximum	88,350 kg	194,775 lb
<b>Capacities</b>		
Fuel capacity	114,000 liters	30,116 gal
<b>Performance</b>		
Normal cruise speed <sup>(b)</sup>	900-950 km/h	486-512 kt
Max range (estimated)	2,500 km	1,350 nm
<b>Propulsion</b>		
Il-86	(4)	Kuznetsov NK-86 twin-spool, low-bypass-ratio turbofan engines rated 127.5 kN (28,660 lbst) each.

**Seating**

Two-class seating for 234, including 28 first class and 206 in economy/tourist class.  
Single, high-density seating for up to 350 passengers.

<sup>(a)</sup>Depending on runway type and size.

<sup>(b)</sup>Design performance; at 9,000-11,000 meters (30,000-36,000 feet).

## Variants/Upgrades

Il-86 (Re-engined). The Il-86 suffers from a deficiency in its range performance. Ilyushin designed the aircraft to fly 2,480-nautical mile segments with maximum fuel. However, the Il-86 appears to have been only able to reach just over 1,300 nautical miles, at least in operation with former East German carrier Interflug. To address this problem, Ilyushin evaluated installation of the Perm PS-90A, which is the powerplant for the Il-96-300 and the Tupolev Tu-204. However, this plan was subsequently abandoned. In late 1992, Ilyushin signed

an agreement with CFM International, valued at some \$800 million, covering the re-engining of 20 Il-86 airliners with CFM56 engines. CFM International is a joint venture formed by General Electric and Snecma. Delivery of the engines was due to begin in 1994, but financing concerns delayed this effort.

International Aero Engines (IAE) has been working with Ilyushin to offer the V2500 turbofan for re-engining Il-86 aircraft.

## Program Review

**Background.** The Il-86 was the first widebody airliner produced in the Soviet Union. The initial prototype was built in 1976. It flew for the first time in December of that year. Aeroflot took its initial delivery of an Il-86 in 1979. Over the life of the program, approximately 103 Il-86s were produced.

The planned manufacture of two Il-86s in 1995 never occurred, and Il-86 production was instead terminated. More than 60 Il-86s remain in active service.

Performance Limitation. The Il-86 is a large, comfortable aircraft but is extremely limited by engine performance. Originally designed for high-density long-haul routes, the four-engine widebody is apparently capable of a maximum range of only 1,350 nautical miles. In an effort to improve the performance and economics of the aircraft, Ilyushin and CFM International signed a deal in 1992 to re-engine 20

Il-86s with the CFM56 engine. The engine model to be used for the program is the 150-kN (34,000-lbst) CFM56-5C2. Not only would the new engines significantly increase the range of the aircraft, they would also dramatically cut fuel consumption and reduce noise on the ground.

Snecma business development manager Jean-Bernard Roulet said in 1994 that approximately 40-50 Il-86s were then in operation that had less than 5,000 flight hours on the airframe. These are the main target aircraft for the re-engining effort. Ilyushin has estimated the cost of the modification at \$19 million.

IAE and Ilyushin have been studying re-engining the Il-86 with V2500 engines.

## Funding

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The Soviet government provided funding for Il-86 development. Actual figures are not available.

## Timetable

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<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1974	Production of first prototype began
Dec	1976	First flight of initial prototype
Oct	1977	First production aircraft entered flight testing
Sep	1979	Initial delivery to Aeroflot
Dec	1980	Scheduled service began on Aeroflot
	1985	Fiftieth Il-86 delivered
Dec	1992	Ilyushin/CFMI agreement signed on re-engining program
	1994	Il-86 production completed

## Worldwide Distribution

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<b>Aeroflot Russian International Airlines</b>	18
<b>AJT Air International</b>	1
<b>Armenian Airlines</b>	1
<b>Atlant Soyuz Airlines</b>	2
<b>Belavia</b>	1
<b>East Line Airlines</b>	1
<b>Kras Air</b>	2
<b>Sibir Airlines</b>	6
<b>St. Petersburg Avia</b>	9
<b>TransEuropean Airlines</b>	2
<b>Ural Airlines</b>	3
<b>VASO Airlines</b>	2
<b>Vnukovo Airlines</b>	17

## Forecast Rationale

The Il-86/CFM56 re-engining program is still delayed indefinitely. An inability to arrange financing has plagued the program.

Aeroflot Russian International Airlines has shown interest in re-engining Il-86s with CFM56 powerplants. Some other Russian carriers have also shown interest. The airlines may not be able to afford to purchase the re-engined aircraft, however. A leasing company might

have to be established in order to lease the aircraft back to the carriers.

IAE has been working with Ilyushin to offer the V2500 turbofan for re-engining Il-86 aircraft. Ilyushin has intended to provide Il-86 operators with a choice of powerplants for re-engining their aircraft. The 133 kN (30,000 lbf) V2500-I5 would be the engine used for the program.

## Ten-Year Outlook

### ESTIMATED CALENDAR YEAR PRODUCTION

Aircraft	(Engine)	High Confidence Level				Good Confidence Level				Speculative			Total 02-11
		thru 01	02	03	04	05	06	07	08	09	10	11	
ILYUSHIN													
IL-86(a)	NK-86	103	0	0	0	0	0	0	0	0	0	0	0
Total Production		103	0	0	0	0	0	0	0	0	0	0	0

(a)Not including one aircraft used for static testing.