

AERO – CONTACT News Letter February, 2004

1. The AI-25TLSh engine

Aero-contact's staff went in February to the Facilities of Ivchenko / Progress in Saporozhye / Ukraine, the home of the L-39 engines. We got some update information about the latest modifications on the L-39 Standard Engine AI-25TL.

As the first foreign company and civil operator we were selected by Ivchenko Progress to get a training course about the new AI-25TLSh engine. Up till now the engine is only available to the Ukrainian Air Force. At the same time we were selected by Ivchenko / Progress to work as their representatives for TBO extension on the AI-25TL and to perform warranty work after overhaul and modification from AI-25TL to the TLSh version.

Description:

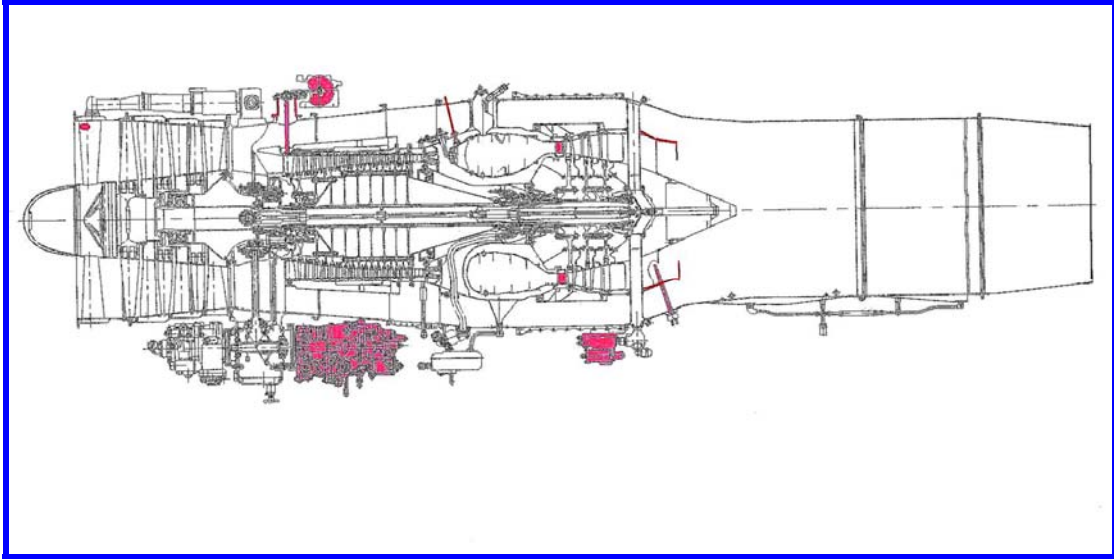


The AI-25TLSh ("Sh"turmovik - attack) can be produced (modified) from any AI-25TL engine during an overhaul of the engine. The core engine is basically the same but has been highly modified. To answer your question now: A field modification is impossible! Major parts have been modified and added to engine. The engine compressor, fuel control, HPT turbine stage, inner jet nozzle and electrical system have been extremely modified. The engine power settings and operational limitations have also been changed.

We have now: Combat Power
 Take Off Power
 Nominal
 0,85 Nominal

with new RPM's in percent!

Here are some details:



(Click on the picture to enlarge it)

Red marked items have been modified or added to the engine.

1. Pitot probe on the LPC.
2. The hydraulic actuator for changing the IDB blades of the HPC has been replaced by an air-controlled and air driven actuator, which works now continually.
3. Due to the bigger diameter of this actuator an additional bushing has been mounted to the compressor case to hold the actuator and the drive shaft for the IDB has been extended.
4. The Fuel controller has been internally modified.
5. An altitude corrector is installed to improve the acceleration time and the fuel management.
6. An additional pipe has been welded into the combustion chamber to take P2 pressure of the compressor for controlling of the air actuator.
7. The compressor ratio is increased and with that the T-3 Temperature in the combustion chamber.
8. The HPT turbine got new stator and rotor blades with improved cooling system.
9. The inner nozzle of the mixing chamber after the LPT turbine is now narrowing.
10. The thermocouple system has been modified from a 4 to a 12 pcs. set.

11. The engine temperature limiter has been upgraded with an onboard recording system for the several power levels (read out by computer).

Note: The old and original installed RT-12-9 unit can also be used on the TLSh engine but then without this option.

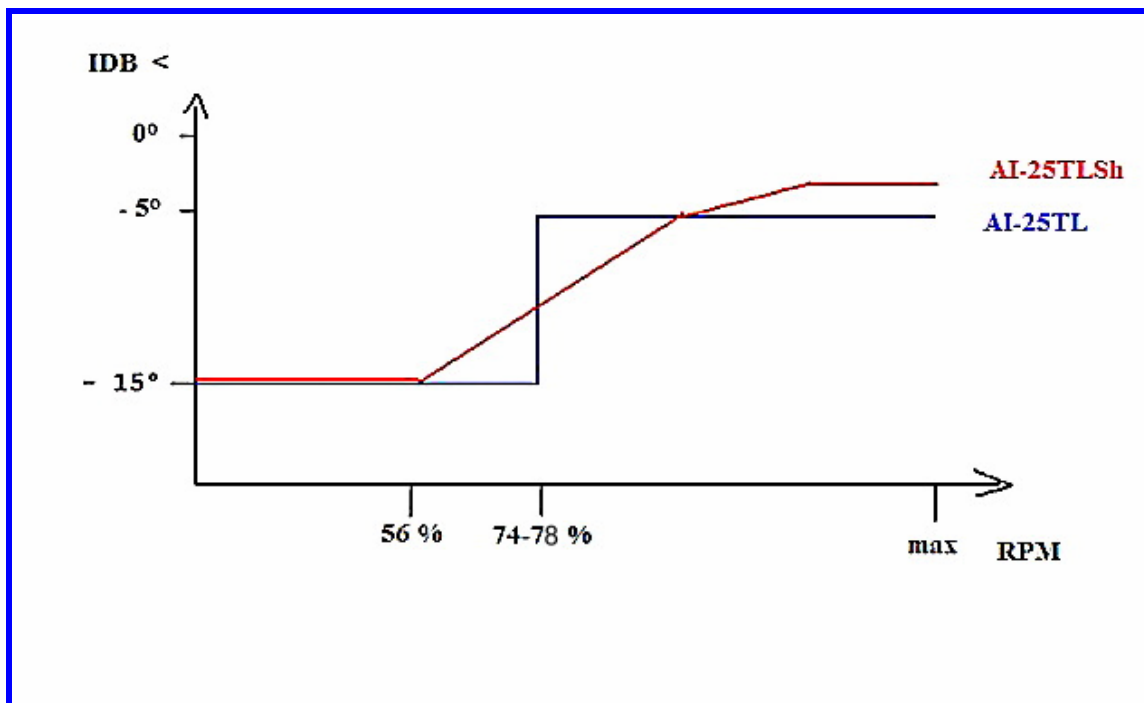
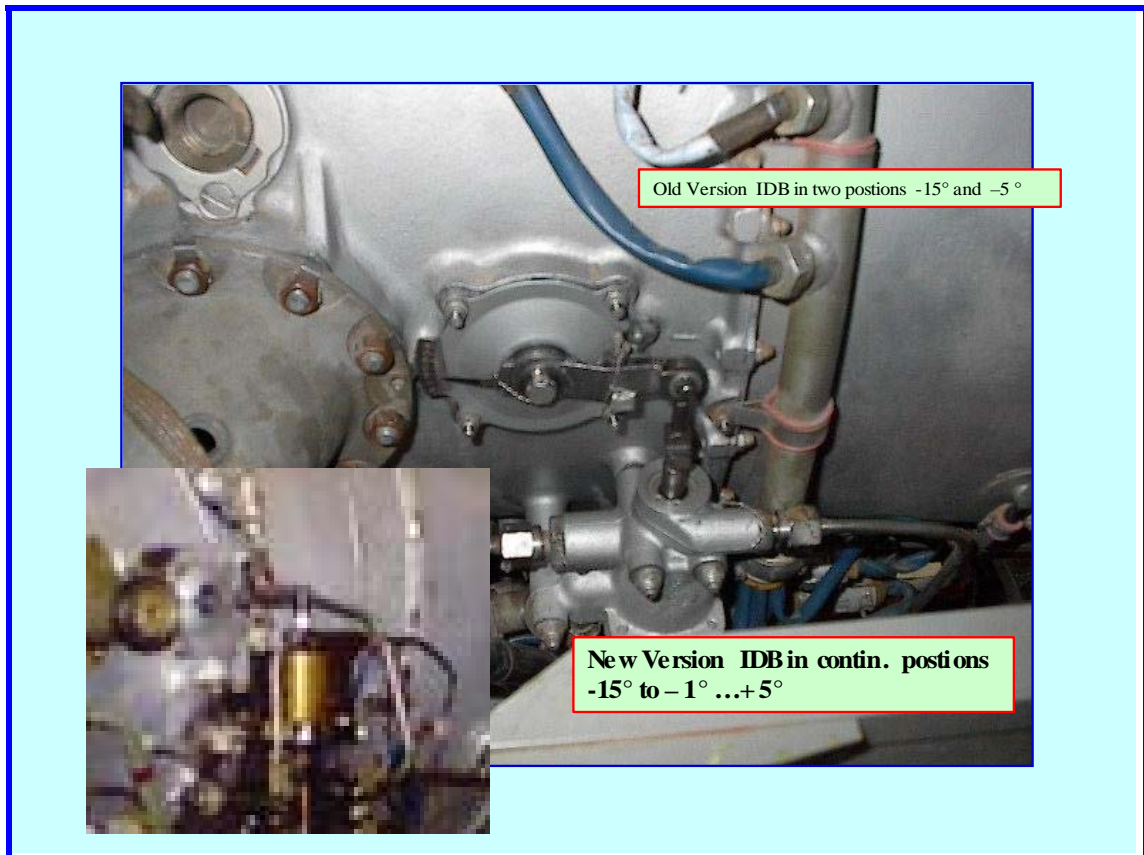
The results of those modifications are shown in the comparison below:

Engine parameters	AI-25TL	AI-25TLSH
H=0; M=0; MCA		
Thrust at max rating/kgf	1720	1850
QTY fuel consumption for max thrust/kg(kgf/hr)	0,588	0,607
Throttle response not more than/sec	12	6
Air consumption/kgf	46,75	47,95
UBA	1,98	1,96
Total extent of air compression	9,5	10,14
JPT/°K	1230	1285
H=0; M_{II}=0,6; t_H=30⁰C		
Thrust at max rating/kgf	1100	1250
H=6000; M_{II}=0,5; MCA		
Thrust at max rating/kgf	750	750
Throttle response not more than/sec	12	12
Dry solid matter/kg	350	350
Air inlet section dia.	600	600
Automatic control system	hydromechanical	Hydropneumatic & mechanical

The thrust on “Combat” power on ground has now increased by 7,5 % and in Flight at 0,6 M by about 13,6 %.

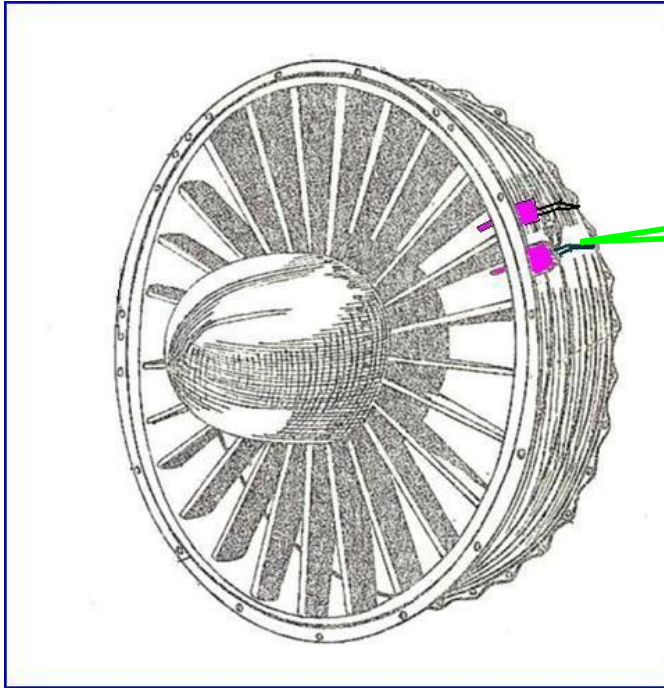
The engine compressor acceleration time is reduced from 9-12 sec to 5-6 sec on the ground.

The Compressor Modification



The modification of the IDB system results in a more stable compressor work and lower acceleration times are possible now!

The Engine Inlet Modification



The engine inlet stage got a 2nd pitot probe for additional installed altitude corrector.

Currently the English manual for this engine is in development! More pictures coming soon!



In the class room at Ivchenko –Progress



Click to enlarge our course certificate!

2. Engine Overhaul and Engine Overhaul with Modification

We are now in the position to offer you via our company the overhaul and upgrade for your engines for a reasonable price.

Ask for quotation! Please add to your RFQ the engine data of your engine, like S/N, TT, TSO, last run up parameters etc. Please note that only engines with original log books are accepted for overhaul.

Fly safe!

Bernd