AD-A049 393 FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO F/G 1/3
FUEL PRESSURE INCREASE LIMITER,(U)
JUL 77 Y M AKHMETOV, V I BOLSHAGIN
UNCLASSIFIED FTD-ID(RS)T-1249-77 NL

1 OF 1
AD
A049393

END
DATE
FILMED
3-78
DDC

FTD-ID(RS)T-1249-77

FOREIGN TECHNOLOGY DIVISION

(1)

FUEL PRESSURE INCREASE LIMITER

by

Yu. M. Akhmetov, V. I. Bol'shagin,
et al.

U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere. When written as ë in Russian, transliterate as yë or ë. The use of diacritical marks is preferred, but such marks may be omitted when expediency dictates.

GREEK ALPHABET

Alpha	A	α		Nu	N	ν	
Beta	B	β		Xi	Ξ	ξ	
Gamma	Γ	γ		Omicron	O	ο	
Delta	Δ	δ		Pi	Π	π	
Epsilon	E	ε		Rho	P	ρ	
Zeta	Z	ζ		Sigma	Σ	σ	ς
Eta	H	η		Tau	T	τ	
Theta	Θ	θ		Upsilon	T	υ	
Iota	I	ι		Phi	Φ	φ	ϕ
Kappa	K	κ		Chi	X	χ	
Lambda	Λ	λ		Psi	Ψ	ψ	
Mu	M	μ		Omega	Ω	ω	

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English
sin	sin
cos	cos
tg	tan
ctg	cot
sec	sec
cosec	csc
sh	sinh
ch	cosh
th	tanh
cth	coth
sch	sech
csch	csch
arc sin	$\sin^{-1}$
arc cos	$\cos^{-1}$
arc tg	$\tan^{-1}$
arc ctg	$\cot^{-1}$
arc sec	$\sec^{-1}$
arc cosec	$\csc^{-1}$
arc sh	$\sinh^{-1}$
arc ch	$\cosh^{-1}$
arc th	$\tanh^{-1}$
arc cth	$\coth^{-1}$
arc sch	sech^{-1}
arc csch	csch^{-1}
rot	curl
lg	log

GRAPHICS DISCLAIMER

All figures, graphics, tables, equations, etc. merged into this translation were extracted from the best quality copy available.

EDITED TRANSLATION

FTD-ID(RS)T-1249-77 26 July 1977

MICROFICHE NR: FTD-77-C-000927

CSP73052395

FUEL PRESSURE INCREASE LIMITER

By: Yu. M. Akhmetov, V. I. Bol'shagin, et al.

English pages: 4

Source: USSR Patent No. 339672, 24 May 1972, PP. 1-2

Country of origin: USSR
Translated by: Robert D. Hill
Requester: ASD/ETID
Approved for public release; distribution unlimited

FUEL PRESSURE INCREASE LIMITER

Yu.M. Akhmetov, V.I. Bol'shagin, A.A. Ryzhov,
V.S. D'yakonov, M.A. Medvedeva, and D.M. Segal'

The invention belongs to the field of the automatic control of turbojet engines, in particular, to fuel pressure increase limiters.

Known are fuel pressure increase limiters, predominantly for a turbojet engine, which contain a spring-opposed servopistion with a rod, the cavities of which are connected by channels with a constant pressure valve, and a control slide valve.

The purpose of the invention is to provide the optimal rate of pressure increase.

To do this, made in the rod are additional channels connected to both cavities of the servodrive by means of holes which are provided in its body.

Figure 1 gives a diagram of the proposed device, and Fig. 2 shows the dependence of the fuel pressure on time.

The pressure increase limiter (OND) consists of a slide valve 1 located in the housing 2 and loaded by springs 3 and 4, rod 5 and servopiston 6, which have outlet holes 7-10. An internal channel 11 with an inlet hole 12 is made in rod 5. An adjusting screw 13 is provided for the setting of the initial position of the rod 5 with the servopiston 6.

Fuel is fed from the constant pressure valve along the channel 16 to the throttle packets 14 and 15. There are also fuel channels 17-19 in the OND, and channel 18 is the drain.

The limiter operates in the following manner.

With the acceleration of the engine, due to the sharp opening of the fuel valve, there occurs a fuel pressure surge in front of the injectors, which moves the valve 1 in the direction of the rod of the OND. Here the dosing edges of the valve change the pressure ratio in the fuel metering channels for removal of the surge with respect to the fuel flow rate and close the outlet of fuel from under the piston into the drain cavity.The fuel pressure begins to increase under the servopistion 6, and the fuel passes through the throttle packets 14 and 15 from the constant pressure channel.

Fuel is fed from the throttle packet 14 under the piston along the side channel and from the throttle packet 15, through the inlet hole 12 in the rod 5 along the channel 11 through the outlet hole 9 into the ring channel of the piston and from it through the outlet hole 10, under the servopiston. The rate of movement of the piston, and this means the rate of retightening of the spring, the rate of movement of the valve and rate of change in the ratios of pressures in the control channels, is constant and determined by the characteristic of the throttling packets 14 and 15 and the ratio of areas of the holes 12 and 9.

With movement of the servopiston 6 there is opened the drain from the channel of rod 5 in the second ring channel of the piston and through hole 8, into the cavity with low pressure. Here the rate of movement of the pistion is decreased, and a second branch of the rate of pressure increase is obtained. With further movement the servopiston recloses the hole 9, and the fuel feed under the pistion 6 and the rate of the piston are decreased. Obtained is a third branch of speed, the rate of speed with the

least rate, which is determined only by the characteristic of the throttling packet 14. Subsequently, according to the movement of the servopiston 6, there is opened the fuel feed under the piston through the hole 9 of rod 5 with an opening of its edge piston and through the hole 7 with its opening by the ring channel of the piston. Here the rate of the piston is increased, and the fourth and fifth branches of the rate of increase in pressure are respectively obtained (Fig. 2).

Object of the Invention

A fuel pressure increase limiter, predominantly for a turbojet engine, which contains a spring-opposed piston with a rod, the cavities of which are connected by channels with the channel of constant pressure, and a control valve, which is distinguished by the fact that for the purpose of ensuring the optimal rate of pressure increase, made in the rod are additional channels connected to both cavities of the servopiston by means of the holes made in its body.

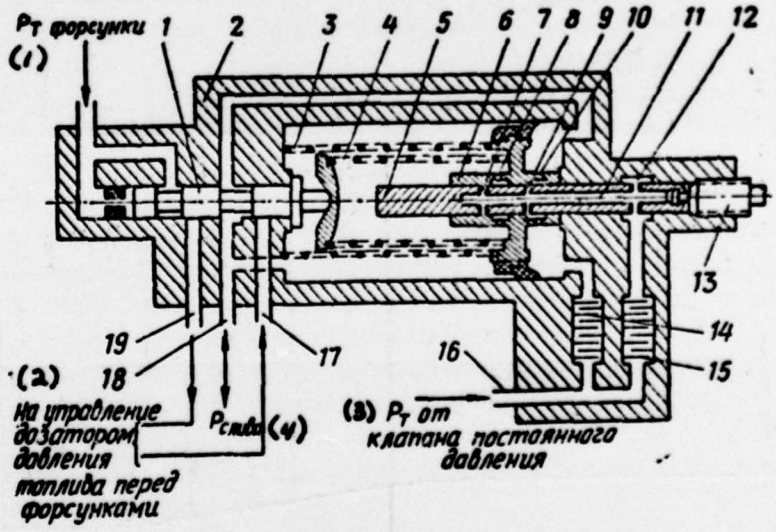

Fig. 1 KEY: 1) of injector; 2) for control of the feed-control device of fuel pressure in front of the injectors; 3) from valve of constant pressure, (4) drain.

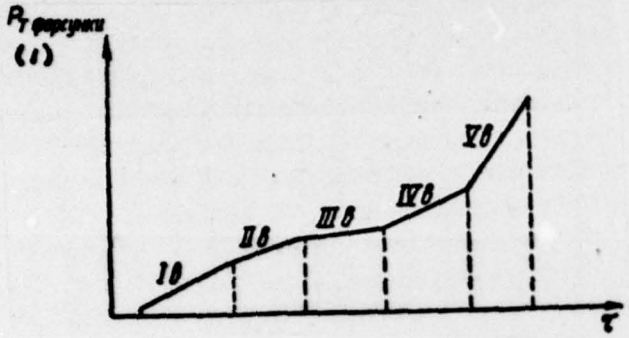

Fig. 2. KEY: 1) of injector.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER FTD-ID(RS)T-1249-77	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) FUEL PRESSURE INCREASE LIMITER		5. TYPE OF REPORT & PERIOD COVERED Translation
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Yu. M. Akhmętov, V. I. Bol'shągin, et al.		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Foreign Technology Division Air Force Systems Command U. S. Air Force		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE 24 May 1972
		13. NUMBER OF PAGES 4
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

13;21

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

DISTRIBUTION LIST

DISTRIBUTION DIRECT TO RECIPIENT

ORGANIZATION		MICROFICHE
A205	DMATC	1
A210	DMAAC	2
B344	DIA/RDS-3C	8
C043	USAMIIA	1
C509	BALLISTIC RES LABS	1
C510	AIR MOBILITY R&D LAB/FIO	1
C513	PICATINNY ARSENAL	1
C535	AVIATION SYS COMD	1
C557	USAIIC	1
C591	FSTC	5
C619	MIA REDSTONE	1
D008	NISC	1
H300	USAICE (USAREUR)	1
P005	ERDA	1
P055	CIA/CRS/ADD/SD	1
	NAVORDSTA (50L)	1
~~NAVWPNSCEN (Code 121)~~		~~1~~
	NASA/KSI	1
	AFIT/LD	1

ORGANIZATION		MICROFICHE
E053	AF/INAKA	1
E017	AF/ RDXTR-W	1
E404	AEDC	1
E408	AFWL	1
E410	ADTC	1
E413	ESD	2
	FTD	
	CCN	1
	ETID	3
	NIA/PHS	1
	NICD	5