

S-I

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EGR:

Experimental Investigation of EGR Fluid Temperature Effect on Performance and Pollutants in S-I Engine

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Abstract

Vehicles are one of the major source of the environment pollution, particularly the air. The safety of the human being and all other creatures would be in serious danger if the amount of pollutants in air are not controlled. Exhaust gas recirculation is one of the common methods of reducing nitrogen oxides pollutants. In this experimental research work, in order to reduce the amount of NO pollutant further, and for reducing its negative effects on engine performance, cold EGR was investigated in a 1725^{cc} spark ignited automotive engine of Iran Khodro. The engine equipped with the EGR circuit went under comprehensive test of performance and pollutant evaluation. The results of the experiments showed that the power and torque losses for the experiments in which cold EGR was used were less than that of hot EGR. Moreover the amount of NO pollutant were reduced further for the cold EGR experiments. The optimum amount and temperature of EGR under test condition were 8% and 430K respectively.

Key words: Cold EGR, NO_x reduction , Combustion in S-I engines

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kg

UHC

UHC

kg CO
[]

/ kg CO

kg

NO_x / kg

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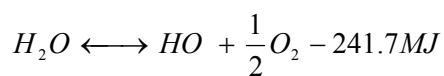
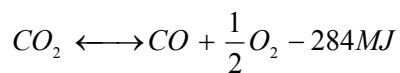
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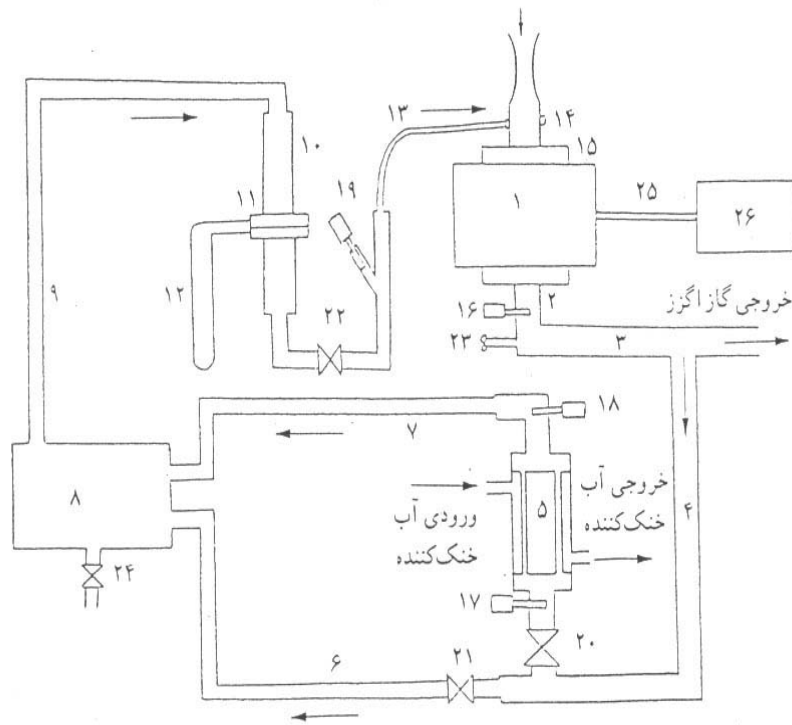
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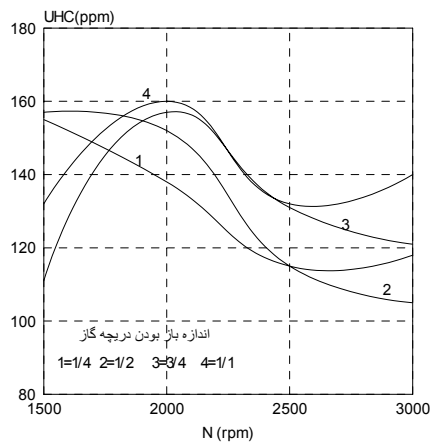
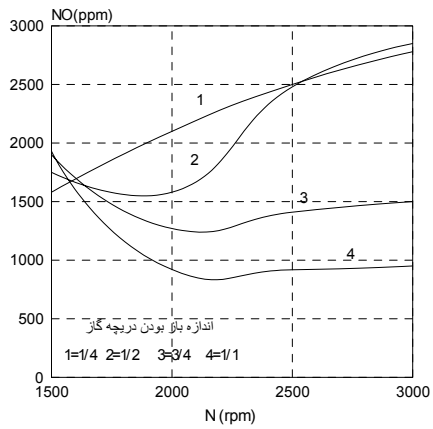
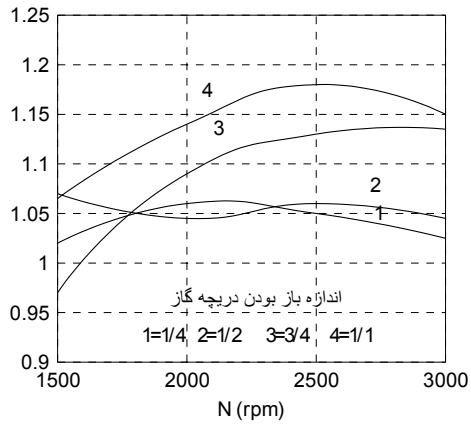
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EGR

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EGR

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NO (Part-load)

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()
UHC ()

UHC

(UHC

() () ()

EGR %

EGR

(Full-load)

rpm

EGR

() ()

EGR

EGR %

EGR

(EGR

%)

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%

%

EGR

%

%

EGR

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EGR

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rpm

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UHC

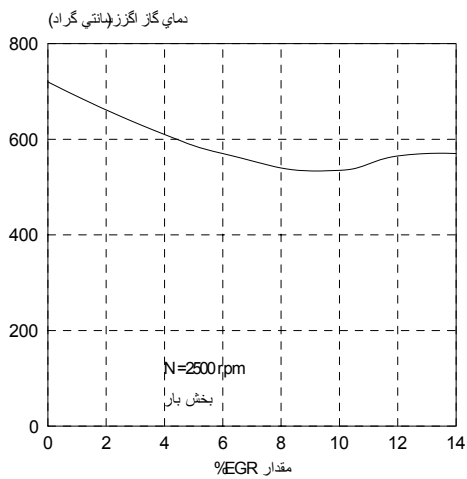
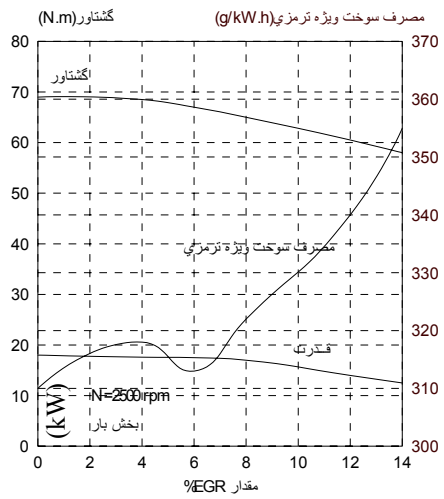
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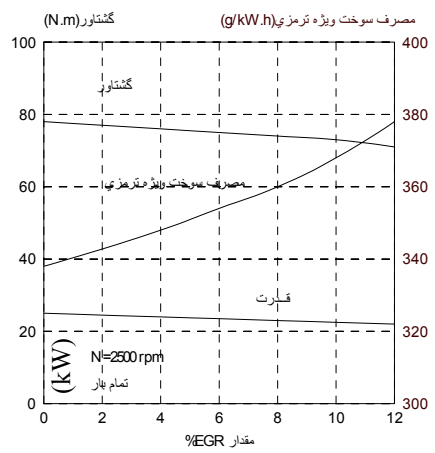
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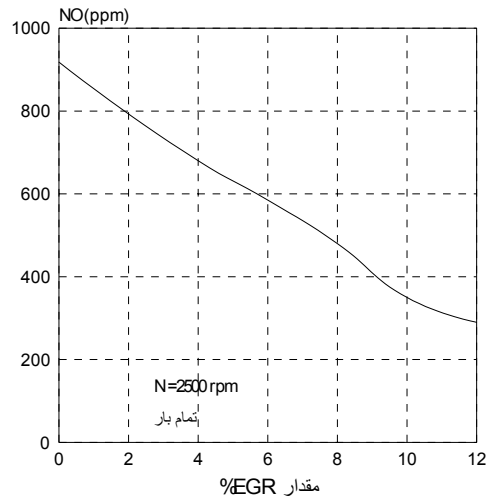
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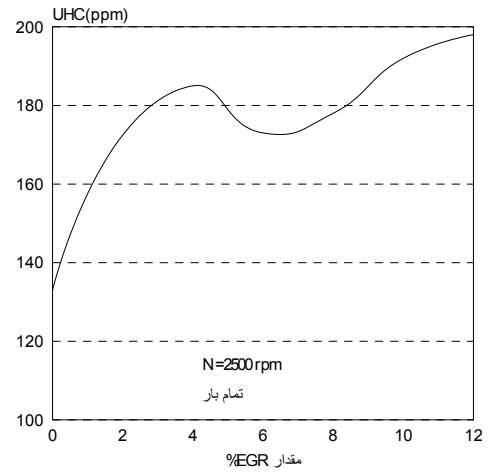
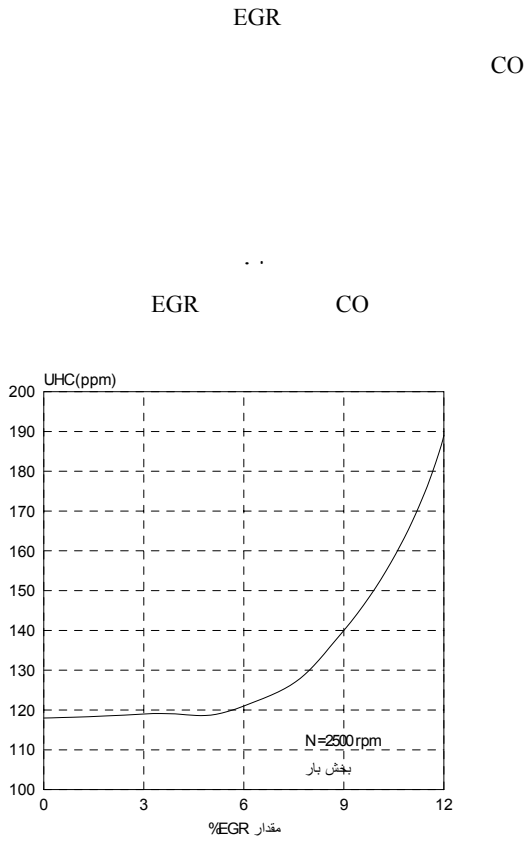


EGR

() UHC ()
 EGR rpm
 UHC EGR
 CO
 CO EGR
 []



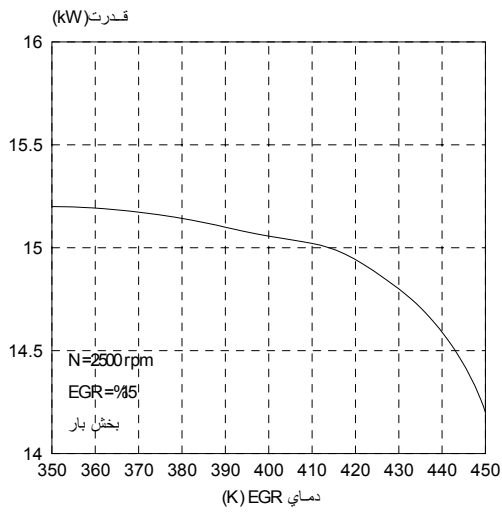
EGR NO -



EGR
 NO EGR
 () NO ()
 EGR
 () NO ()
 EGR

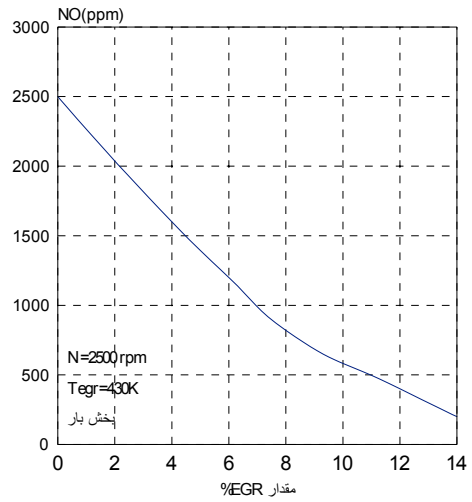
()
 NO EGR

EGR
 ()
 EGR
 K K EGR
 % /

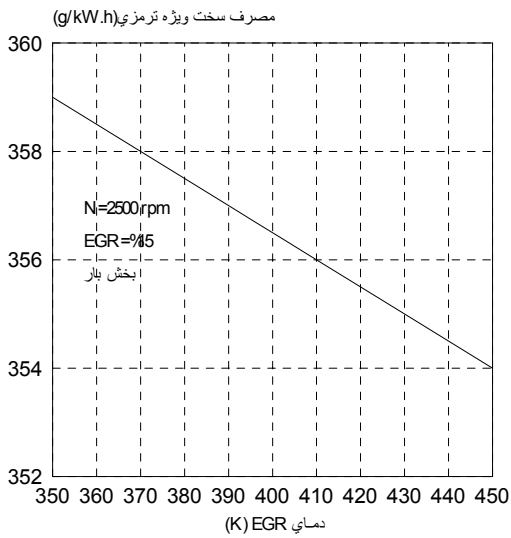


EGR -

NO EGR %
 NO %
 []
 ppm NO
 K



EGR NO -



EGR

EGR

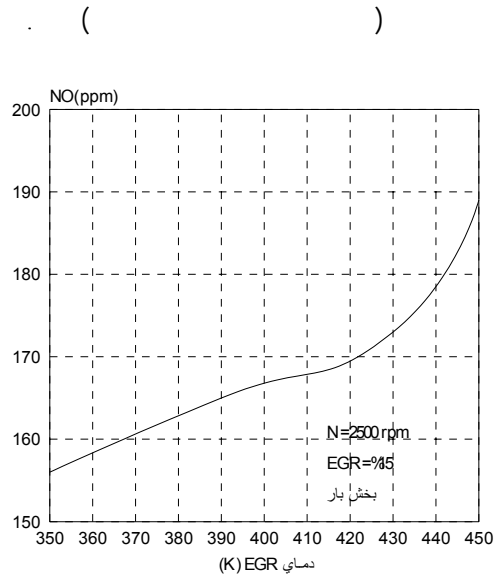
UHC

K

EGR
 EGR NO
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 (PM) EGR
 NO_x
 UHC
 EGR
 () EGR
 EGR
 K EGR %
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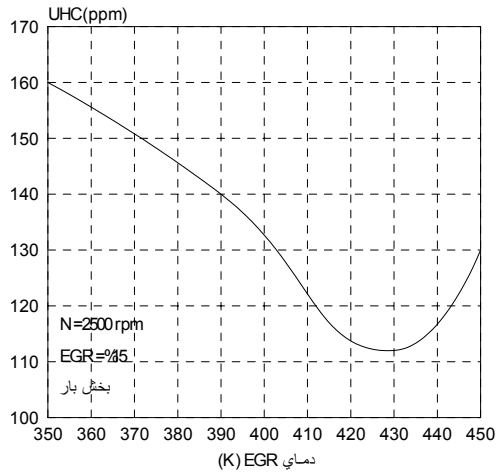
K EGR

EGR
EGR
cc
%
K
bsfc (gr/kW.h)
EGR
MBT
N(rpm)
NO_x
T_{egr}(K)
UHC
λ



EGR NO -

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:
/ (mm)
/ (mm)
(cm)
/
rpm



EGR

Go Power

DA-316

EGR

S-I

TE-90

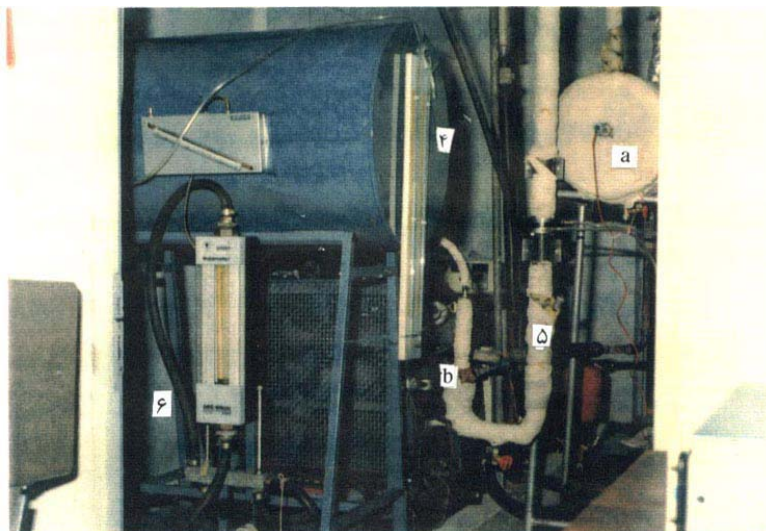
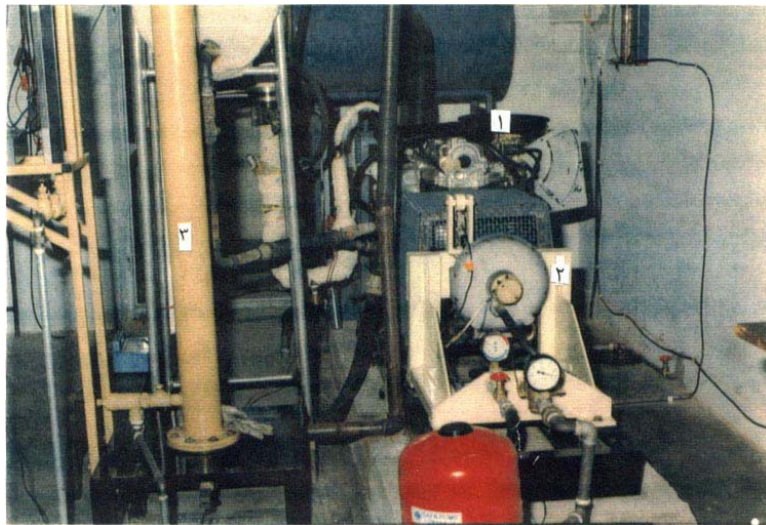
EGR

EGR -

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EGR

VM-4000	Signal	-	-
	NO NO		
	.CLD		EGR -
P8333	Cussons	-	-
.FID NDIR	UHC CO		-



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