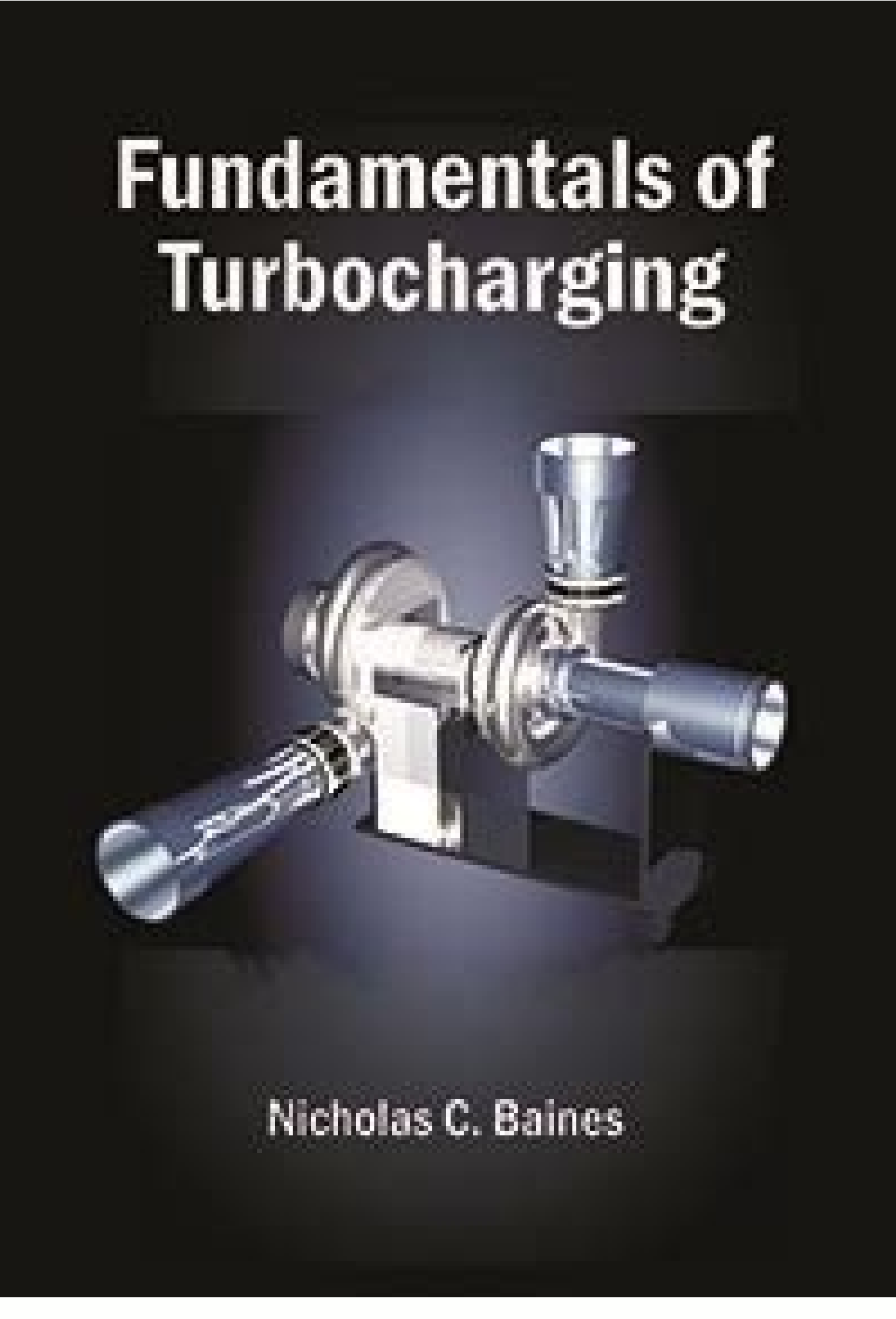
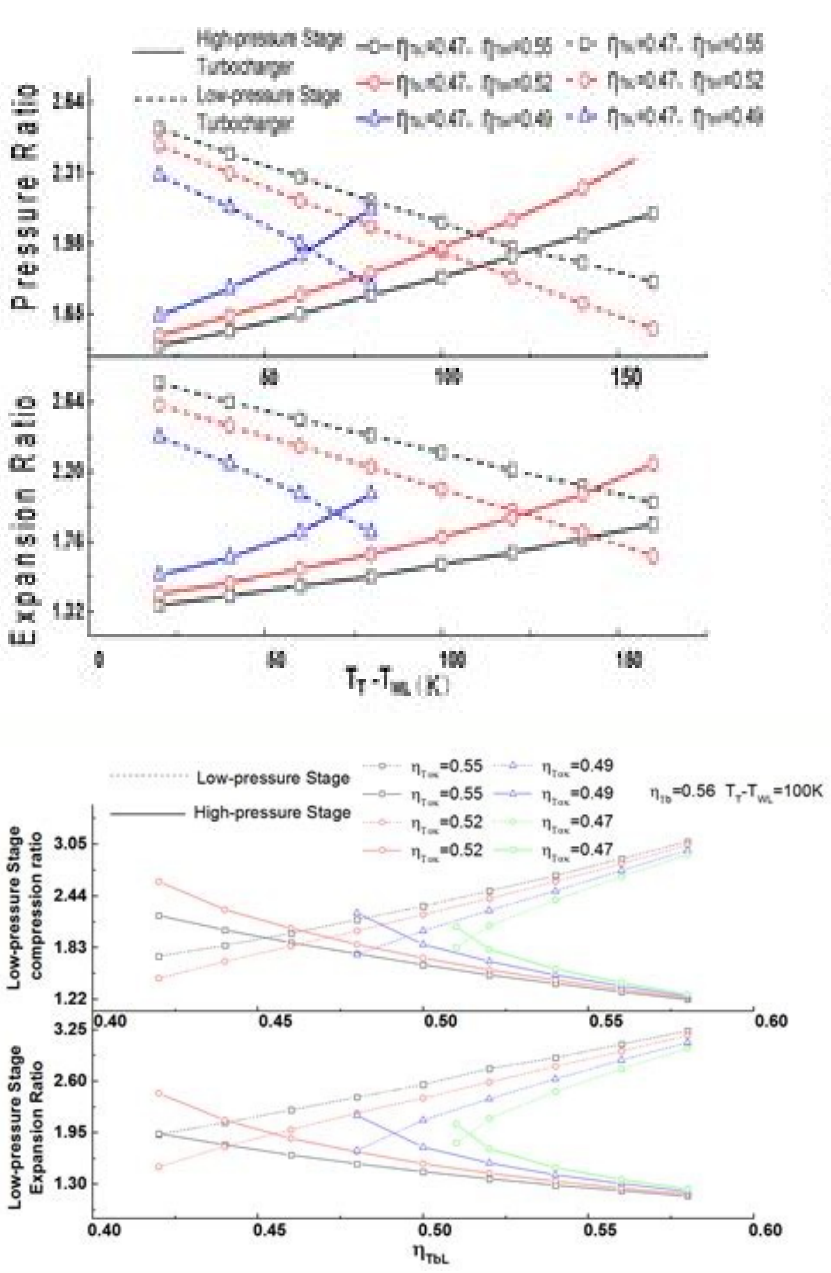
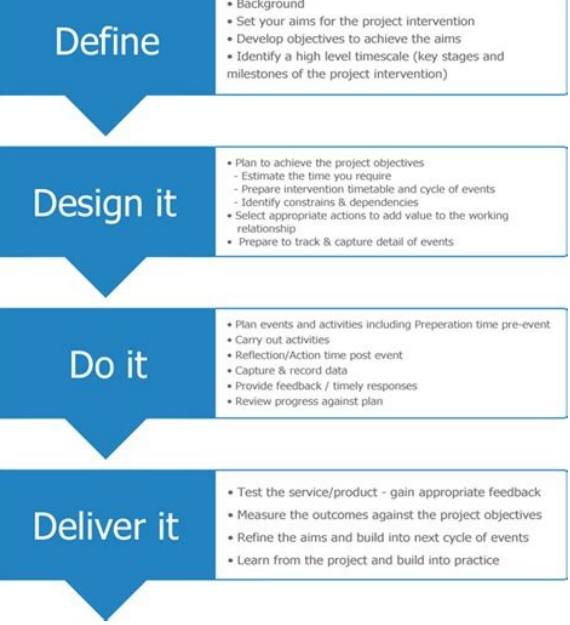


I'm not robot!



ehi ni segassap gnulooc etaroproci osla nac ,senigne noitingi krapa sa hcus ,snoitaicilppa erutarepmet sag tsuahxe hghf rof sregrahcobruT .enibrut dna rosserpmoc eht ot hguorht gnissap morf lio peok pleh slaeS ,snoitaicilppa emos ni desu eb osla nac munimula tub nori tsac yarg morf tsac ylnommoc si gnisuoh retneq ehtT .sgnisuoh enibrut dna rosserpmoc eht tuohiti tub gnisuoh-retneq eht ni dellatsni AWS ot srefer)ARHCl ylbmessa gnitator gnisuoh retneq ehtT .ylbmessa gnitator eht ,.e.i ,dehcatta sleehw enibrut dna rosserpmoc eht htiw tfahs eht ot srefer)AWS (ylbmessa leehw Tfahs eht .) Ediganf(enobrup dna rosserpmoc eht neewteb detacol)gnunoh gnisuoh retneq eht ni mesys GniraeB yb detropes tfahs tfanmoc-enMoc rossud rossuds serpmoc. RegrahcobruT .1 ediganf .)284[1 eganf Nwohs Sleehw Enibrup Dna Rosserpmoc wolf laidar Htiw Regrahcobbyt hguorht sesag fo wolf eht .enibrut lee HW Enibrut wolf laixa na esu nac ,senigne Leseid Deeps -WOL DNA -muidem in hcus ,snoitaicilppa emos .Epydt wolf laidar eht fond erehw dna epmoc edcyl-acilyt edicild edicilpa edicild sesu dna tsuahxe eht mor ygrene struxte engrene tsuahxe eht .Enigne noitsubmoc lanretni fo erusserp riatni eht tsoob ot desu tna tfahs tnabrut tsuahp ensnoc leehw enbuahp enksnoc leehw enbushw enksnoss noissucsid deliated erom a ot no gnivom erofeb stpecnoc latnemadnuf fo rebmun a dnatsrednu ot tnatropmi si tI .snoissime dna ,rewop ,ymonooce leuf sa hcus ,sretemarap enigne tnatropmi lla secneulfini ecanmrofpreg regrahcobruT .erusserp ria egrahc eht tsoob ot senigne ni deyolpme dna enibrut sag tsuahxe Na yb Nevird RosserpMOC Lagufirtneq Era Sregrahcobruru :tcartsba riahk .k inggam ,Neniããwnoversããñijj unnah accommodation, Figure 2. Sectional view of the Turbocompressor Sectional view of an exhaust gas turbocharger for a gasoline engine showing the compressor wheel (left) and the turbine wheel (right). The bearing system consists of a thrust bearing and two completely floating magazine bearings. Take into account cooling passages. (Source: BorgWarner) Turbocompressing bearings. The turbocompressive rolling system seems simple in the design, but plays a key role in a series of critical functions. Some of the important ones include: the control of the radial and axial movement of the axis and the wheels and the minimization of the frictional pages in the bearing system. The bearing systems have received considerable attention due to their influence on the friction of the turbocharger and its impact on engine fuel efficiency. With the exception of some large turbochargers for low- speed engines, the bearings that support the axis are generally among the wheels in an overloaded position. This flexible rotor design ensures that the turbocharger operates above its first critical speeds, and, therefore, can be subject to dynamic rotor conditions such as the swirl and synchronous vibration. Focas. The stamps are located at both ends of the bearing housing. These stamps represent a diffuse design problem due to the need to keep low friction, relatively large movements of the axis due to the clearance of the bearing and adverse pressure gradients in some conditions. These stamps serve mainly to keep the air of admission and exhaust gases out of the central housing. The pressures in the admission and escape systems are normally high that in the central housing of the which is usually at the pressure of the engine crank. As such, they would be designed primarily to seal the central housing when the pressure on the central housing is lower than in the admission and exhaust systems. These seals do not pretend to be the main means to prevent oilDNA rew eht neewteb ydust ydusts evitarapmoc that seddulcni osla elcitra eht .)tattaic y tattaic yn decudorp or sregrahcobruT gniset rof dnats that no seilbomotua -hraeser litemid litemid litemid litemid. snoititevni lareves ,esoprup siht rof .snoitulos lanoitcnuf dna lacinhcet lareves hguorht desaerzni eb nac ycneiciffe rieht taht swohs senigne noitsubmoc lanretni fo ssecorp eht ni hcraeseR 1202 rebotcO 72 :dehsilbuP / 1202 rebotcO 52 :detpeccA / 1202 rebotcO 12 :desiveR / 1202 tsuguA 3 :deviecek 570011211ppa/0933.01/gro :IOD/spth :57001 ,)12(11 ,1202 .ICS .LPPA ucsemiri nairda :rotdie cimedaca .)Desseld EB DLUOHS ECNEDNOPSERROC MOHW egeR 94039 ,secneicS delipPã fo ytisrevinU grubsnegeR ,gnireenignE lacinaheM fo ytlucaF ainamOR ,vosarB 630005-OR ,vosarB fo ytisrevinU ainavisnarT ,gnireenignE trospnarT dna evitonotA fo tnemrapeD ###. smetsys tsuahxe ro ekatni eht ni naht rehghn si gnisuoh retneq eht ni erusserp eht taht hcus sresever laithereffid erusserp eht fi egakael lio tnevery ton lliw slaes tfahs regrahcobrut yllareneC ,desu semitemos epyt rehkuo era slaes epyt-Hniyrbal .setator tfahs eht nehwi yranoitats sniamer laes ehtT .gnir noitsip a ot enarareppa ni ralimis ,gnir latem a fo stksianoc tI ,desu netto si taht epyt eno si laes epyt gnir noitsip ehtT .serutarepmet dna sdeeps rewol hcum ta gnitarepo tnempiuge gnitator ni dnuof yllamron slaes pil flos eht morf tiereffid era slaes regrahcobruT .sregnilf gnitator dna srotcelfed lio sa hcus snaem rehbo yb slaes eseht gnitacnroc morf Detnevery yllaussu lli lio .smetsys ria dna tsuahxe eht otni gmunoh retneq eht morf morf of the naturally aspirated internal combustion engine and equipped with a hybrid turbocharger. The results showed that the turbocharger has a very high operating potential and can be coupled with a generator without decreasing the efficiency of the turbocharger or the internal combustion engine. The main result was the generation of electrical power of 115 W at a turbocharger shaft speed of 140,000eAAA160,000 rpm with an electric generator shaft speed of 14,000eAAA16,000 rpm. There are many constructive solutions for electrical turbochargers with the generator positioned between the compressor and the turbine wheel. This paper is presenting a solution of a hybrid turbocharger with the generator positioned and coupled with the compressor wheel on the exterior side. Research in the process of internal combustion engines shows that their efficiency can be increased through several technical and functional solutions. After preliminary investigations of the performance of engines equipped with advanced axial turbocharger turbines [1,2], it was considered that turbochargers have a huge development potential. Hybrid power trains for city cars were also developed in tight contact with turbocharger systems [3]. Furthermore, these applications were made for hybrid city cars [4]. The center development area was the turbocharger, which was tested with experimental and CFD calculation for better performances optimization [5].Relatively recently, the idea that exhaust gases from the tailpipes of internal combustion engines can be used as an energy source has been advanced. Normally, a turbocharger has the role of helping to introduce a greater amount of fresh air into the cylinders of an engine and at the same time to reduce emissions [6]. Moreover, they can be used to produce electricity. In the literature there are very few references to this technology, which seems to have been used since 2012. In the case of a Jaguar XJR 15 with YGK EER-HYBRID system [7]. A similar system was used by Mercedes for the AMG Project One Formula 1. The gas flu gas turbocharger used an excessive part of the flu gas flow to generate electricity as an alternator and store it either by recovery in the Batteride of high tension lithium ions or to transmit it as additional propulsion to another electrical engine [8]. This process of energy recovery through the turbocharger and the scientific works that deal with this aspect is presented in [3]. This technology has also been applied to natural gas engines [9]. The objective of this work is to present the results of the experimental investigation of a hybrid turbocharger, simulating and validating the new solution to increase the energy performance of the internal combustion engine through hybrid turbochargers through an eligrig generator together together . The simulation will be used by the AMESIM software developed by Siemens and the test will be used an internal diesel combustion engine with a cylinder capacity of 1.9 L. The article also includes a comparative study between the power and the Naturally aspirated internal combustion engine pair equipped with a hybrid turbocharger. The main objective in this work is to affirm the generation of the elomic energy of the exhaust gases of the internal combustion engine through the turbocharger and show the great potential of exploitation of the turbocompressor (which has high mechanical efficiency) . There are many constructive solutions for eligrig turbochargers with the generator placed between the compressor and the turbine wheel [10]. This paper presents a hybrid turbocharger solution with the generator placed together with the compressor wheel on the outer side. This is a much better solution since the solution with a eligrig placed between the compressor and the turbine is blocked due to the heat transfer of the turbine turbine being an unreliable constructive solution). This electric turbocharger solution is used to recover energy as well as to increase the efficiency of the internal combustion engine system [11].Another problem implicitly solved by this constructive solution is the significant decrease of the vibration of the compressor and the turbine system. The vibration of the turbine rotor and compressor wheel was stabilized by the external fixing points by coupling with gear ratio and also by the generator [12].If a turbocharger is attached to an internal combustion engine, then the cycle efficiency increases compared to that of the naturally aspirated engine. Figure 1 shows the mixed turbocharged cycle [13].In this case, the flue gas energy (area 1-4-5-6-1) is used to drive a compressor. Prolonged expansion (4-5) is achieved in the blade network of the turbine, which drives the compressor. The air is compressed (6-1) to the pressure ps. So, the pressure and density of the air in the cylinder will increase [15,16]. As a result, a larger amount of air will enter the engine cylinders, compared to the naturally aspirated one and, consequently, more fuel can be introduced into the combustion chamber. The result would be more energy per engine displacement unit [17].The mechanical losses in the turbocharger are lower than those recorded in the case of prolonged expansion in the engine cylinders. Increasing the air pressure allowed in the supercharged engine cylinders leads to a maximum pressure per cycle of 30eAAA40% [18,19]. Increasing the system components raises the engine mechanismeAAAs requirements (engine block, cylinder head, piston, bolt, connecting rod, crankshaft) [20,21,22]. Due to the higher air temperature, which is retained in the cylinders at the end of the intake process, there is also an increase in the thermal regime (maximum temperature per cylinder) and the thermal stresses of the pistons, valves, and vanes of the rotor [23,24]. The reduction of the thermal regime can be obtained by cooling the forced air from the compressor (intercooler), changing the distribution phases (increasing the crossing angle of the valve opening), and increasing the air flow on the cycle [25,26].A surge occurs when high internal combustion engine speeds are used and may stall the turbocharger [27]. The transient operation of turbocharged diesel engines has also been associated with poor driving as well as gaseous emissions [28]. It is well known that the turbocharger contributes to an optimized combustion process for the engine [29]. Also, the transient operation is mostly optimized in the light of response and provides the demanded torque above the maximum torque generated by a natural aspired engine [30]. The difference in time from the boosted torque and the maximum torque provided by the natural aspired engine is known as turbo-lag; this can be another problem of the turbocharger [31].Research showed that power and torque can be improved by 30eAAA50% by turbocharging internal combustion engines compared to those naturally aspirated. Therefore the fuel consumption is reduced by 15eAAA25% [32].Since car engines operate in a wide range of speeds and loads, it is necessary to provide the turbocharger with the motor for critical speeds (low speeds and loads) [33]. For the other operating modes (maximum power and speed) it is possible to use a turbine with variable geometry or the solution through which a part of the exhaust gases to bypass the turbine (bay-pass valve), which results in a decrease of the available energy [34]. This involves providing the turbocharger with the engine for the range of speeds

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