



FIRE IN RED

by PistenBully

Special



info

PistenBully 600 – Some like it hot

The future of slope preparation is within arm's reach. FIRE IN RED stands for state-of-the-art technology and red-hot design in the world market of snow groomers.

This vehicle underlines yet again Kässbohrer Geländefahrzeug AG's pre-eminent position in the world market – not just in terms of market share but above all in terms of technological and innovation leadership. The PistenBully 600 boasts numerous innovations and build-standard enhancements while remaining faithful to the tried and tested Kässbohrer vehicle concept. With its free platform as a load area, its driving comfort, superlative all-round visibility, attractive design and, not least, its low running costs, it will quickly conquer its rightful place in the world's winter sports regions.

"Form follows Function" – this principle of practical design was central to the development of the PistenBully 600. As a result, the many and varied requirements of everyday slope care and preparation flowed straight through into development. The focus was on the driver's needs. The result is a driver's cab which is remarkable not just in terms of its modern design but because its new dimensions convey an entirely new sense of space. It offers greater simplicity and a wealth of ergonomic enhancements and new equipment

features, in short: the PistenBully 600 opens up an entirely new dimension in driving comfort.

Not just the driver's cab but the entire vehicle has

reliability, serviceability and ease of repair. For example, new test rigs were developed specifically to test the reliability of all modules and components. Cold weather and stress tests ensured that

The new PistenBully 600 has finally arrived: you can experience it on the FIRE IN RED European road show. In Germany, Switzerland, France, Italy, Austria and Scandinavia, the very places where the PistenBully feels at home: on the slopes in mountainous regions.

What's missing?
You as the driver. That's all!



Data of Road Show

Switzerland:
Meiringen-Hasliberg

Germany: Zugspitze

Austria: Zauchensee, Stuben, Scheffau

Italy: Corvara

Sweden: Sälen

Norway: Kongsberg

Finland: Ruka

France:
Mégevè, La Plagne, Serre Chevalier

Andorra: Grand Valira

been redeveloped from first principles. The challenge was to accommodate the most widely differing criteria. The goal was not merely to build a snow groomer that would satisfy current market requirements but also to put down a technological marker. With new production technology, new product quality assurance techniques and even better vehicle safety, the PistenBully 600 exceeds all previous requirements in terms of performance,

the PistenBully 600 will function even under extreme operating conditions. In addition to durability and reliability, development focussed on the optimal size and design of components such as the engine and gearbox, high performance hydraulics and electronics. What has emerged is an uncompromising vehicle offering operators a cost-effective solution both to purchase and run thanks to its fuel economy and ease of maintenance.

Editorial

The next chapter in a successful tradition: the new PistenBully 600

Since production of the PistenBully began, Kässbohrer Geländefahrzeug AG has set standards for the entire industry. The highlights were the PistenBully 145, the PistenBully 170 D, the PistenBully 240 D and since 1996 the huge success story that is the PistenBully 300.

The PistenBully brand has become synonymous with innovation and quality worldwide. Nowadays, Kässbohrer vehicles enjoy an outstanding image worldwide. At the same time, however, this image is an obligation.

That is why our own ambitions in developing a new generation of snow groomers were very high.

The technical specification was comprehensive as never before. The focus however remained on performance, economy and reliability. Quite simply top quality for our customers.

Today we are able to introduce you to the culmination of this development. We have concentrated on what we do best. Building a PistenBully. Instantly recognisable: a PistenBully – powerful, strong, almost aggressive and yet elegant in its design. At second glance, it reveals what is new about it. From the driver's cab through the power train to the running gear, all the components have been completely revamped or developed from scratch. We have an admission to make; this marvel was not all our own work. We have partners to help us with tasks as large as this. We develop many

components in conjunction with our long standing system suppliers. Here too, we only trust companies who match up to our demanding quality standards and who are prepared to come up with special and tailored solutions for a vehicle operating in extreme weather conditions. Our advanced technological competence requires us to invest approximately 4 percent of our total turnover in development each year.

As far as its name goes, we have refrained from conferring any misleading attributes. We are continuing our successful tradition with this new generation of vehicles: PistenBully 600. We are sure that you will find the new PistenBully 600 fascinating! Catch fire.

Yours

Gebhard Schwarz





FIRE IN RED Special

by PistenBully




The future of slope preparation

Dynamic and powerful with flowing lines, the new PistenBully 600 is revolutionizing slope preparation. It is the logical refinement of the PistenBully concept. The extensive technical know-how and reliable quality standards are underpinned by many years of Kässbohrer Geländefahrzeug AG development work. High quality materials and components from prestigious automotive industry subcontractors combine with Kässbohrer to create the best technology and superlative production standards.

Synergies from 3D design

This is the first time that a PistenBully has been designed entirely on the computer using 3D advanced surfacing design. The resulting data records can be used in subsequent process steps as the basis for production work and quality control.

Generous feeling of space

One outstanding outcome of the redevelopment of the PistenBully 600 is the driver's cab. The

cab's internal volume has increased 29 percent to 5.3 cubic meters. A four-point mounting ensures a stable position in any driving situation. This is achieved at the front by broad-based hydro bearings and at the rear by two special purpose, newly developed oil-filled shock absorbers.

As before, the striking new look design is the unmistakable hallmark of the "genuine" PistenBully. The driver's cab – the vehicle's heart and control centre – is manufactured using Kässbohrer's proven hybrid construction; steel combined with glass fibre reinforced plastic. The spectacular looking ROPS test (Roll-over-Protection) ensures that the driver's cab is able to withstand a 15 tonne load, thus guaranteeing all round protection for the driver in extreme situations. The new frame design as well, comprising sheet metal edge profiles, underwent extensive stress testing to check for stability and deformability.

The focus is on the driver

A workplace has been created in the new size



driver's cab which will look in vain for its equal in the piste maintenance sector. State-of-the-art technology in an unmistakable design is allied with optimal ergonomic working conditions. All the necessary movements are easily performed. All the cockpit controls – steering wheel, joystick and control panel – are designed to be self-explanatory. A glance at the multifunction display tells the driver about the status of the

PistenBully's most important operating functions. A 10.4 inch touch screen fitted as standard provides all the most important information and rapid onboard diagnosis. All functions can be accessed via the touch screen or the I-Command built into the middle arm rest. Heating vents integrated into the steering column and doors ensure an even temperature and clear windscreens on all sides. Apropos clear views: in the PistenBully 600 the

all-new laminated safety glass technology dispenses with the need for the previous double glazing on winch vehicles. The strength of the new windscreen was subjected to extensive pendulum impact tests.



Excellent all round visibility

But it is not just visibility looking from the inside out that is important; at night as well the driver must be aware at all times of what is going on in and around "his" PistenBully and whether the quality of his preparation work is up to the mark. The integration of all front headlamps in the roof allows glare-free working. The working headlight



itself employs Xenon technology. The vehicle also comes fitted with H3 rear headlamps, two all-round lights, indicators and tail lights. Two LED lights ensure that it is safe to board and dismount from the vehicle and an additional LED light provides adequate light inside the bridge superstructure when service work has to be done. Finally, two newly developed SideFinder lights fitted as standard ensure adequate illumination of the side and rear working areas of the clearing blade.

Quality assurance during development

Each and every component was tested for reliability and functionality as part of the extensive test



programme. Tests down to -40 degrees were run in the cold chamber to see if the engines would start in the most adverse weather conditions and whether the entire drive train would work perfectly at any temperature. In parallel with these endurance

tests, supplier quality as well comes in for close scrutiny. Suppliers do not merely undergo a rigorous selection process but the parts they supply are subject to an ongoing checking process as well. On three levels. Kässbohrer quality assurance people are involved right from the production of the models and tooling. Then there is a thorough quality inspection of the first pre-production

samples and finally the Laupheim specialists gain a thorough understanding of how the parts are manufactured in series conditions.

Powerful drivetrain

The ability to cope with every driving situation, even in extreme terrain, makes great demands on the engine. The power unit in the new PistenBully 600 is the thoroughly tried and tested OM 460 LA Mercedes-Benz 6-cylinder inline engine with turbo charger and charge-air intercooling. It has adequate power reserves and

meets the Euro 3 emission standards as well as US TIER III/stage 3A regulations for non road engines. Its 295 kW (400 hp) and the enormous 1,900 Nm of torque at 1,300 revs per minute ensure abundant pulling power and are accompanied by quiet operation allied with low noise emissions. The OM 460 LA delivers superior dozing and levelling performance, thus satisfying an essential financial criterion. The power of the 6-cylinder engine is transferred to the tracks through a new, lighter planetary gearbox. The forged planet carrier, two-stage planetary gearbox and smooth gear teeth ensure adequate reserves of power. The drivetrain is completed by the steel collar of the Magnum drive wheel, providing greater stability and safety.

The PistenBully's super brain

The PSX controller is the new PistenBully 600's super brain and the control centre for the vehicle's power and energy management. In addition to tilling depth, the PSX also controls the working of the lifting and lowering ram using the equipment carrier's new gradient sensors as well as the smooth raising and lowering of the MultiFlex tiller. New high performance valves with built-in CAN technology ensure a quick response from the



relevant functions. A large tiller pump drives the MultiFlex tiller with tiller shaft speeds up to 1,800 revs/minutes.

Because of the weight optimised and shorter equipment carrier, there is a less of a load on the main frame as the MultiFlex tiller is closer to the frame. Taken together, this ensures optimal slope quality.

The culmination of all these ideas, design and building of the product is a vehicle in which all the components are precisely intermeshed and which ideally meets the needs of customers and users alike.



And this is what our customers have to say about their testing of the PistenBully 600



Andermatt Gotthard Sportbahnen AG



Fredri Nager, Workshop foreman

The cab is very well designed, very quiet and functional. Thanks to the large windows and good lighting, I can see very well by day and night.

The Mercedes engine means that we can be sure of continued trouble-free operation, helped by the fact that the number of service parts can be kept low because of the compatibility with the 300 Polar.

The new diagnostic capability means that I will definitely be even faster in tracing any faults that may occur, although our machine has been working very reliably and we haven't yet experienced any malfunctions.

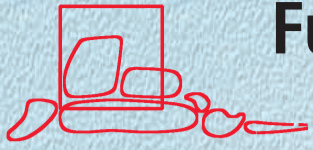


Carlo Danioth, slope and rescue manager

Economy is very important to me; reliability, fuel consumption and levelling performance requirements are met in full.

The vehicle is very easy to operate and very agile. In our terrain, high in the Alps, climbing ability and dozing work are a must.

Kässbohrer is a reliable partner company who's always there to back me up.



Functional design



The Antares designers, based near Stuttgart, have been working for Kässbohrer for the past eleven years. The beginning of their involvement back then was the PistenBully 300. The Swabian vehicle designers were also involved in the configuration and design of the PistenBully 600. Reason enough to ask a couple of questions:

How does one tackle a project like this?

With the utmost motivation and determination because creating a PistenBully is a great opportunity for any designer. The focus of our work, of course, was the technical specification containing the combined requirements of customers, operators and drivers alike. That is why the intelligent combination of design and function with an eye to ergonomic considerations was at the forefront of each task. Ultimately, it was the



shared knowledge of manufacturers and designers that led to the creation of entirely new objects. Such as a joystick which has never existed before in this form.

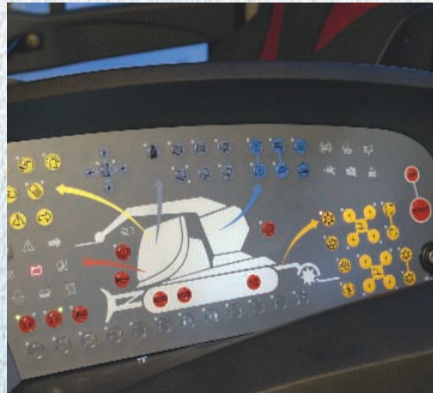
Why did you develop this joystick from scratch? Aren't they parts which one normally simply buys in?

As there weren't any joysticks available from the usual trade channels which would have met our requirements, we developed a new joystick of our own. The functionality and method of operation of the new PistenBully generation required it. What is innovative about it is that the driver no longer needs to hold the joystick but simply lay his hand on it from above. That allows us to accommodate more functions. We have succeeded in delivering in one joystick

what it previously took two to achieve. We also completely redesigned the steering wheel and control panel controlling all the PistenBully's functions.

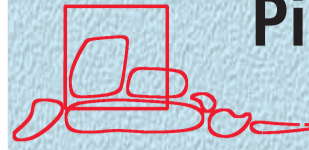
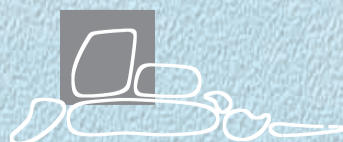
The new control panel is an excellent example of ergonomic design. Why did you select this solution and not just opt for switches, as was previously the norm?

A PistenBully is used on every continent and by people speaking different languages. The idea was for operation of the vehicle to be self explanatory. That required a pictorial language based on unambiguous pictograms which would be understood internationally. The next step was then to combine all the vehicle functions in a common user interface. That gave rise to the clearly organised structure with colour coded



functional groups. The driver is immediately able to get the hang of things thanks to the pictorial representation and logic of the pictograms. He does not need to remember what switch controls which function but simply presses on the pictogram corresponding to the part of the vehicle, for example the tiller, and it is lowered.

What optimal ergonomics means is also when the driver – not least for safety reasons – finds it easy to operate the most important functions in his vicinity and the necessary buttons and switches are within reach.



PistenBully Bestseller in changing times

In 1969 the Karl Kässbohrer Fahrzeugwerke GmbH, Ulm, began series production of the PistenBully PB 120 B. With a 120 hp engine, square driver's cabin and protruding front, the first PistenBully resembled a small tracked lorry. A powerful appearance on the ski slopes that caused a stir. Technically as well, the PistenBully represented a quantum leap in slope maintenance. That was apparent in the first comparative tests in 1971 when the PistenBully PB 145 D with hydrostatic drive and a 145 hp diesel engine received the award for the most technically advanced vehicle. The models that appeared over the next few years stuck with the basic construction concept of the first PistenBully. It was with these products that Kässbohrer made its big international breakthrough at the 11th Winter Olympic Games at Sapporo in 1972.

The driver's cabin as well was completely revamped during this period and with its sloping, forward leaning received lines, acquired the look which is the PistenBully hallmark to this day.



1985 – 1987: PistenBully PB 240 D with extremely high dozing power



1969: The PistenBully PB 145 enters series production



2000/01: Rollout of the PistenBully 300 ParkBully



1976: The improved technology PistenBully PB 170 D

The next big step forward came in 1976 with the PistenBully PB 170 D: the new steering system with semicircular steering wheel was introduced. No more protruding "snout", a large panoramic windscreen and rounded edges – the PistenBully acquired its own distinctive face. The models also became more powerful, for example the PistenBully PB 270 DS from 1979, which with its 270 hp engine possessed what was by the standards of the day an enormous dozing power of 7,200 kilograms.

1984 saw the emergence of the PistenBully PB 200 DW, the first vehicle with overhead winch. This was followed four years later by the PistenBully PB 320 D, a real heavy labourer with a dozing power of up to 10 tonnes.

Finally, in 1996, with the PistenBully 300, there began the history of what so far is the most successful snow groomer of all times. More than 2,500 vehicles of this model have been built to date. As such, they have lastingly consolidated Kässbohrer's position as the world's most successful manufacturer of snow groomers.

The new PistenBully 600 ideally equipped to write a new chapter in the success story of Alpine slope preparation.



Credits

Publisher:
Kässbohrer Geländefahrzeug AG
 Kässbohrerstraße 11
 D-88471 Laupheim
 Phone: +49 (0) 7392/900-0
 Fax: +49 (0) 7392/900-556
 e-Mail: info@pistenbully.com

Print run: 3,000 copies
 Editorial office: Sabine Denzler