

VOLVO CONSTRUCTION EQUIPMENT

QUALITY, ENVIRONMENTAL CARE & SAFETY

BRINGING OUR CORE VALUES TO LIFE



WHO IS

VOLVO CONSTRUCTION EQUIPMENT

Volvo Construction Equipment is one of the market leaders that develops, makes and markets equipment for construction and related industries. Its products are leaders in many world markets and include a comprehensive range of wheel loaders, hydraulic excavators, articulated haulers, motor graders, soil and asphalt compactors, pavers, milling machines and compact equipment.

As a total-solution provider, Volvo Construction Equipment offers a broad range of hard products, supported by solutions in areas such as servicing, financing, used equipment and rental.

Volvo Construction Equipment is part of the Volvo Group, one of the world's leading manufacturers of trucks, buses and construction equipment, drive systems for marine and industrial applications, aerospace components and services. The Group also provides complete solutions for financing and related services.



1 / Articulated haulers // 2 / Backhoe loaders // 3 / Crawler excavators // 4 / Pavers // 5 / Wheel loaders // 6 / Motor graders // 7 / Compact wheel loaders // 8 / Skidsteer loaders // 9 / Compact excavators // 10 / Wheeled excavators // 11 / Soil compactors // 12 / Asphalt compactors // B / Milling machines

BRINGING CORE VALUES TO LIFE

In work, as in life, there is a virtuous circle between what we do and the manner in which we do it. Having 'good' products that work well are of course essential – but being a responsible corporate citizen requires that we do more than that. Volvo Construction Equipment's whole approach – encompassing our products, factories, partners and services – is to create a symbiotic relationship between quality, safety and care for the environment.

This approach does not stop at the factory gates, of course, and is vigorously promoted to our customers, the wider industry and society in general. The words **Quality, Safety and Environmental Care** are central to the genetic make-up of Volvo Construction Equipment – demonstrated in thousands of practical ways by our employees and our products every day.

Our core values are by no means isolated – they are closely related and preconditions for one another. In our opinion, it would be impossible for us to produce construction machines with world leading quality and minimal impact on the environment if we didn't strive for world-class safety as well.

QUALITY

Quality is an expression of our goal to offer reliable products and services. In all aspects of our operations, from product development and production, to delivery and customer support, our focus is on our customers. With a customer focus based on everyone's commitment and participation, combined with a process culture, our aim is to be number one in customer satisfaction. This is based on a work climate where all employees are responsive and aware of what must be accomplished to be the best business partner.

ENVIRONMENTAL CARE

The aim is to achieve the least possible adverse impact on the environment for our products & operations. We are working to improve energy efficiency and to reduce emissions in all aspects of our business, with particular focus on the use of our products. Volvo Group is one of the industry leaders in Environmental Care. To make sure we continue this we strive for a holistic view, continuous improvement, technical development and efficient resource utilization.

SAFETY

Safety has been a central focus throughout the history of Volvo and we are perceived as the industry leader. Constantly improving safety is an integral part of our product development work. Safety is also central to the mindset of employees, and the knowledge gained from our safety-related studies, simulations and crash tests is applied in product development.

Our goal is to reduce the risk of accidents and mitigate the consequences of any incidents that may occur, as well as to improve safety and the work environment for the operators of our vehicles and equipment.

1832

Johan Theofron Munktell started his workshop in Eskilstuna and Volvo Construction Equipment was born, even though nobody at that time could envision its development.

1893

The first internal combustion engine was presented. This was the start of the company's success as one of the world's leading manufacturers of crude oil engines.

1952

The first diesel engines for construction equipment were introduced as 3- and 4-cylinder direct injection engines. They were a success from the start thanks to excellent torque characteristics, low fuel consumption, reliability and long service life.

1954

The world's first wheel loader to feature a parallel lift arm system and attachment bracket with quick coupler.

1966

The world's first articulated hauler. The invention revolutionized earth moving and has been continuously improved upon ever since.

1972

Pehr G Gyllenhammar formulated Volvo very first environmental declaration.

1973

The first wheel loader (LM1641) with direct injected turbo engine.

1974

Volvo introduces the world's first truly low-emission diesel engines in construction equipment.

1977

Introduction of the pressurized cab, integrated air conditioning and parallel arm system.

1978

Intercooler technology for higher performance, lower fuel consumption, and cleaner emissions was put in production. Volvo, and the world's, first truly low-emission engines for construction equipment were born.

1979

First articulated hauler with automatic transmission, automatic lock up, six-wheel drive, front suspension and lockable longitudinal differential; delivering great fuel efficiency.

1981

Automatic Power Shift. Computer-controlled gear shifting for smoother operation and lower fuel consumption.

1984

Fully hydraulic brakes and introduction of a new cab with front hinged door and swing out radiator

1988

Introduction of 'Comfort Drive Control', improving safety, comfort and control of the machine.

1989

Volvo employed its first environmental auditor.

1991

Torque Parallel (TP) Linkage. Providing wheel loaders with high levels of breakout force and strength throughout the lifting range, the TP linkage also keeps the load level and helps with machine stability.

The Volvo Care Cab; The best cab on the market then and now. Providing a safe and comfortable environment puts the operator in complete control.

The air-to-liquid intercoolers received a twin pump device to give the charge air optimal temperature for even better engine efficiency, higher performance and lower emission levels in anticipation of the Tier 1/Stage I emission limits that were enforced a few years later.

1994

The first ISO9001 certification (Quality) for Volvo Construction Equipment's site in Braås, Sweden.

1996

The first ISO14001 certification (Environment) for Volvo Construction Equipment's site in Changwon, Korea.

2001-2004

Successive introduction of new engine versions with higher efficiency in order to meet Tier 2/Stage II emission requirements while improving performance.

2004

Volvo Tooth system; the bucket's tooth system is exposed to extreme stresses when it encounters a combination of hard materials, shocks and high breakout forces. Volvo Construction Equipment reduced the effect it has on the tooth system, which ensures and optimum service life with maintained performance.

2005

Volvo Customer Support Agreements gives maximum reliability tailored to the customers' specific needs.

2006

The first OHSAS18001 certification (Health & Safety) for Volvo Construction Equipment's site in Shanghai, China.

Introduction of a new generation of engines with Volvo Advanced Combustion Technology, V-ACT. These engines are characterized by enhanced fuel injection and air handling control. One prominent feature is Volvo patented I-EGR design. Low emission levels have been reached without sacrificing engine performance. These engines comply with the Tier 3/Stage IIA emission requirements.

2007

World's first full suspension system on an articulated hauler. Constantly monitoring load and ground conditions, the system automatically adjusts the hauler's suspension to provide a smooth and safe ride. It allows a much higher speed with full load and thereby increases capacity.

2009

Eco Operator: Volvo Eco Operator training is an easy way to save money and protect the environment. It teaches operators correct machine operation and manoeuvring as well as how to plan their work in the smartest way. You save fuel, increase production and spend less money on maintenance.

2010

CareTrack, Volvo Construction Equipment telematics system that has been developed to work with the onboard electronic control system became standard fit on most machines. CareTrack increases security, productivity and availability through the use of operation reports, service reminders and error alerts. It gives superior control of the machine fleet and the whole operation.

OptiShift
New drive line solution to make acceleration and short cycle loading more efficient.

2011

Volvo Construction Equipment is ready to comply with tough new EU Stage IIIB and US (EPA) Tier 4 interim legislation for off-road vehicles with the introduction of a cascade of innovations in its new generation V-ACT engine systems.

New eco pedal
Helps the operators to drive the new G-Series wheel loaders in a more fuel efficient way.

SAFETY

OUR SAFETY VISION

Zero accidents with Volvo Group products.

The **Safety Vision** points out the direction for our work. The vision of zero accidents is a way of thinking, a mental image of an optimum future state. We are committed to always striving towards zero accidents with Volvo Group products. It is a fact that most accidents involve factors that are out of our control. Therefore, co-operation with other concerned stakeholders in society will be needed to reach our vision.

As long as there is a risk of accidents occurring, Volvo will strive for this vision through high quality and innovative products that reduce the frequency of accidents as well as their consequences. Safety is historically an integrated part of all Volvo products, processes and services.

From being among the first to offer a wheel loader with fully enclosed, heated and ventilated cab in 1954, to adding a whole host of safety innovations ever since, Volvo has built its reputation with its customers and wider society based on its commitment to safety.



SAFER WORKING ENVIRONMENT

The cost of cutting corners

Accidents are generally the result of a chain of events and badly performed activities. Little corners cut here and there can add up to a big accident. But just as there is a chain of events leading up to an accident, there is a chain of safety events that can help prevent it. To address the issue of improving safety in and around construction equipment, Volvo has established a Safety Council. This council has devised a three pronged approach that targets improvements in the areas of **Worksites, Machines** and **People**.



People

The human factor

A safety mindset starts with wearing the right protective equipment. Hard hats, steel toe capped boots and high visibility jackets are the basics; but safety glasses, gloves and ear protection are all good ideas to have close to hand.

Personal protective equipment helps make us more visible on sites and it also reinforces the message that safety is important. Ultimately, a large proportion of the responsibility to keep safe rests on those most affected – the site worker. This sounds like stating the obvious, but people don't always do what is best for them.

Our behaviour is driven not so much by rational considerations as by pressures which constrain and limit our ability to do our job. Like the equipment fitter who rushed an important task even though he knew he shouldn't because of the pressures he felt he was under. History is littered with similar examples where disaster has ensued.

Safety training is a good thing. But the training should be an ongoing process rather than a single event. It should also be conducted in a number of ways. We learn best by experience and therefore sitting solely in classrooms listening to lectures is unlikely to be as effective as active safety training where operatives actually use the equipment.





Worksites

A hive of activity

Construction sites are peculiar places. Large numbers of nomadic workers descend upon a designated location at a prescribed time for an intense period of activity. They build what is needed and then decamp, off to set up operations at their next project. Proper site evaluation from a safety perspective may be rushed. Procedures often don't have enough time to become properly established and there are invariably deadlines to meet. This means that few people feel they have sufficient time to make safety an issue, or to map out the best way of identifying and minimizing risks. This has to change if the construction industry's safety record is to improve.

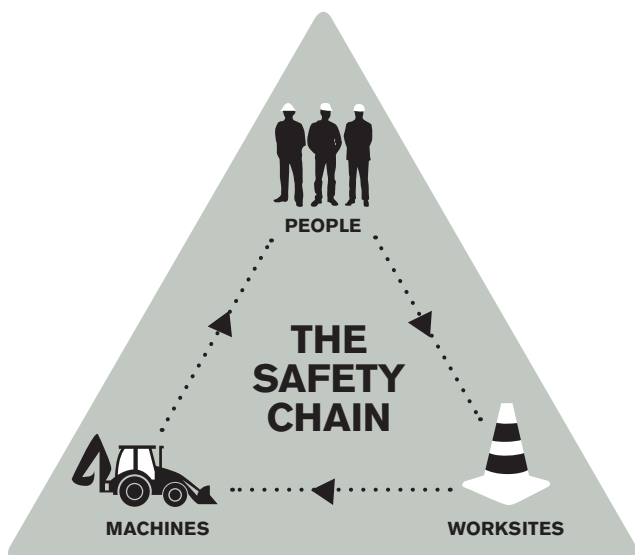
Machines

Reducing the risks

It almost goes without saying that staff on site – regardless of how long they will be there – should be highly visible, wear effective personal protective equipment and be made aware of the dangers present. But there is more to a safe site than that...

It is a good idea to avoid sharp or blind bends and to set sensible and clearly signposted speed limits. Also, prominent warning of any height restrictions should be set – preferably well in advance. Any potentially dangerous obstruction, such as overhead cables, needs to be protected as best as possible. Safety banks may be needed to prevent vehicles running over open edges, or to indicate a safe route; and they should be high and wide enough to stop a vehicle.

Reversing should be minimized and tightly controlled, either by signallers or by using reversing alarms, radar, mirrors or closed circuit television cameras sited on the rear of the vehicles. Pedestrian walkways should be protected by screens where they pass close to vehicle routes to protect people from anything that might fall from a vehicle. The quality of the roads should be suitable for the vehicles intending to use them; they should be firm, even, properly drained and steep slopes should be avoided.





DESIGNED TO PROTECT

As a large number of construction equipment accidents are attributable to slip and fall. Actually much of the potential for improvement lies in innovative design. Sturdy anti-slip steps and rails that guide operators into a wide aperture cab are a must, but operators also need to make sure that these steps aren't covered in mud, ice or oil. Adopting a three point stance to get into the cab, and coming down facing the steps when leaving it, are the safest methods of entry/exit.

It isn't just about safety, health is also important. Volvo has targeted the internal and external vibration and noise levels of its machines for continual reduction. Low emission, low noise engines are fitted, as are anti-vibration components that have to deal with a variety of operating conditions and shock inputs, from rough terrain to accidental impacts and unloading/loading heavy burdens.

Modern construction equipment now comes offered with a host of safety features such as roll over/falling object cab protection; full dual circuit brake systems;

overload indicators and hydraulic attachment brackets. Even less technical items such as inclined ladders that make it easier to get in and out of the machines are valuable. Some safety features are focused on particular machine types – for example, Volvo articulated haulers have ground sensitive steering and also restrict machine speed if the operator's door is open. These are complicated systems, but simple ones such as seat belt warning lights are just as useful in preventing mishaps. Operator fatigue, and the ensuing lack of concentration it leads to, is a major factor in many site accidents – so making operators as comfortable as possible offers real safety advantages.

Volvo Care Cab

Volvo Care Cab is appropriately named: it features controls that fall easily to hand, large glass areas for improved visibility, simple to read gauges and an air conditioned, pressurized cabin that prevents the entry of airborne particles. Care Cab is built with the ultimate aim to increase Safety through an improved operator working environment.

The Care Cab has been designed for safety, operator performance and control:

SAFETY – excellent front and rear visibility thanks to ergonomically-located large rear-view mirrors; easy-to-grip, sturdy grab handles; exits in two directions, easily opened from the inside.

COMFORT – market-leading cab climate and filter system; seat with ample adjustment features and seat belt; viscous cab mounts to help eliminate unwanted noise and vibrations.

CONTROL – Multi-adjustable seat, pedals and joystick/steering wheel offer the perfect operating position. Enhanced suspension systems surpass cab vibration requirements, reducing operator fatigue and whole body vibration. Other features include easy to read instruments; comfort drive control; easy access controls and switches.





SAFETY & VOLVO AN INTEGRAL PART OF WHO WE ARE

Safety is no longer an optional extra when it comes to construction equipment design. Every component – and all of them in unison – comes under the safety microscope. Volvo is instrumental in lobbying governments and policymakers on how to make construction equipment not only safer, but also more environmentally responsible.

When it comes to designing new construction equipment, all manufacturers have to be safety conscious. New legislation and rules are regularly being introduced that manufacturers have to comply with if they are to sell their machines in the countries affected. But Volvo aim isn't just to meet the minimum requirements, instead it wants to raise the expectations of the whole industry and develop working environments that are as safe and as practicable for the operator, the service technician and anyone likely to be close by. Providing safe machines involves designing a package of features rather than



relying on being good in one area. Seat belts, effective lighting, eradicating blind spots, reducing vibration and noise, clear view of the work area and comfortable working conditions all help contribute to a safer basic package. Even more mundane things such as window wipers and swing out radiators for easier access to service points have a part to play. Where the operator's vision is unavoidably impaired, then alarms can be fitted, or proximity sensors, or even video cameras that feed 'blind spot' information to a monitor in the cab.





SAFETY AT THE HEART OF ALL VOLVO EQUIPMENT

Our commitment:

- A leading position in safety and aim to stay in that position.
- Continue to implement intelligent product safety features adapted to customer and society requirements.
- Invent and introduce safety solutions before they become legal demands.
- Provide safety information to market in order to improve awareness of safety.
- Take an active part in the training of operators, site managers and staff to make operations safer.



QUALITY

OUR QUALITY VISION

Customers and competitors view Volvo Construction Equipment as a company that delivers products and services that are clearly superior in the marketplace.

A HARD WON REPUTATION

Volvo Construction Equipment can chart its history back further than any other global manufacturer of construction equipment. We have been pioneers in making machines with outstanding durability for more than 175 years, and our long-standing commitment to quality has led to the success of our worldwide industrial and commercial activities today.

Our measure of quality is customer satisfaction and our goal is to provide products and services that meet, or exceed, customer expectations at all times. Everyone at Volvo Construction Equipment, including our dealers, has a clear focus on quality and together we aim to be number one in the market for customer satisfaction.



WHAT WE MEAN BY QUALITY

The high standard of every finished Volvo Construction Equipment product is a result of the quality that runs deep through the operation.

Quality is at the heart of everything we do – from **product conception** through to **development, manufacturing, sales and distribution**, and **customer support**. The mark of quality remains with our products from the moment the design concept is conceived to the end of a long and productive life.

We have a holistic approach to Total Quality Management which combines a number of unique methods, processes, systems and tools. We work within the Volvo Construction Equipment quality framework, which encompasses:

- **Quality Planning** to translate customer needs into desired product features.
- **Quality Assurance** to assure our work is executed correctly.
- **Quality Control** to ensure defined standards are maintained.
- **Quality Improvement** to achieve unprecedented levels of performance and to eliminate deficiencies and waste.



PRODUCT CONCEPTION

Born of total market understanding

Listening to the customer

Our target is to be number one in the market when it comes to customer satisfaction. To fulfil this ambition we recognise that we must listen to our customers at all times.

Customer tailored solutions and services

Customers use machines in differing ways and for a wide variety of tasks. Therefore to improve the quality of service and product offering we use a segmentation approach. This gives us an in-depth knowledge of each stage of each industrial application our machines operate in. By understanding the processes involved, we can help customers by developing better machinery and optimize each machine in our portfolio to provide a complete tailored package for the customer.



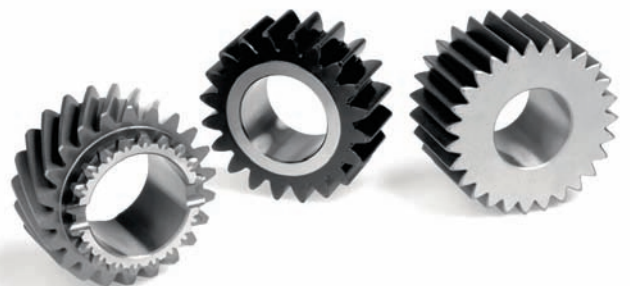
PRODUCT DEVELOPMENT

Quality by design

The detail of development

Our design engineers are dedicated to translating customer needs into prototypes that are tested and optimised in order to help customers improve efficiency, assure safety, and minimize environmental impact.

We use the latest simulation techniques to develop virtual reality machine models to examine new design ideas – all before a screw has been turned or a piece of metal cut.



Every feature of a machine and every Volvo Construction Equipment component is designed to maximize operational economy; every detail tested to withstand extreme worksite conditions; and every step is taken to provide the operator with a safe and comfortable workplace.

Based on this rigorous design approach, constantly keeping customers' needs in focus, we at Volvo Construction Equipment have been able to develop and produce premium construction machines that have become synonymous with our brand.

MANUFACTURING

The Volvo Way

We use best practice at every step of the process to create value for our customers through increased quality, delivery precision and cost efficiency.

To be sure that every component of a Volvo machine is of the highest quality we have an efficient and effective Quality Assurance System. This 'QA' scheme secures all our deliveries, including 'soft' products such as aftermarket products and services.

Our manufacturing operations are all based on the five principles of the **'The Volvo Production System'**: teamwork; process stability; built-in quality; Just-in-time; and continuous improvement.

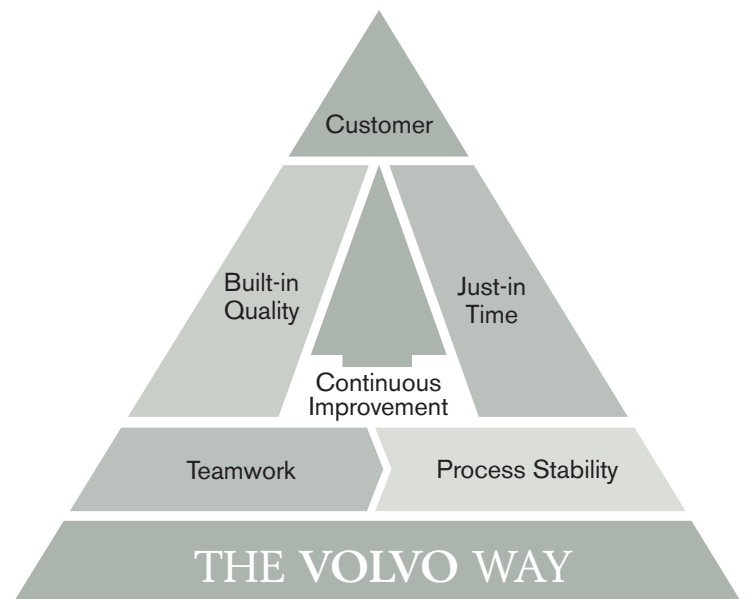


SALES AND DISTRIBUTION

Selling quality across the globe

Our focus on quality means that our worldwide network of dealers, in more than 150 countries, can go to market with a considerable amount of confidence. Our customers get a first-rate service as our network shares our values – the majority of our dealers have represented us for decades and some have been growing with us since the 1930s.

Our experienced Volvo Construction Equipment dealers provide customers with professional advice and support to help them choose the best equipment and services, including parts supply, used equipment, rental services and finance packages.



CUSTOMER SUPPORT PRODUCTS AND SERVICES YOU CAN RELY ON

Customer support

Quality service does not stop when we have delivered the machine to the customer. We aim for complete customer satisfaction throughout the lifecycle of the product by allowing the operator to get on with the job while we worry about maintaining the machine. Volvo Construction Equipment has a network of 10,000 service technicians in 2,000 service points – this means we can carry out regular maintenance work efficiently and respond to emergencies rapidly. With consistent care and attention, our Customer Support organization will ensure maximum uptime for our customers' machines, as well as offering a wide range of parts and services tailored to customer needs.



Parts

Construction equipment is required to work under the toughest of conditions and even the best quality machines need parts. We understand that any downtime for a machine equates to lost revenue for our customer so the availability of parts and our ability to provide a first-rate service is vital.



GENUINE VOLVO PARTS - IT'S A MATTER OF TRUST

The safe choice

When you buy Genuine Volvo Parts you're buying peace of mind. You get parts that are designed and developed specifically for your Volvo machine, parts with maximum durability and performance. Some non-Volvo parts may initially seem cheaper – but they can work out more expensive in the long run. They have not been produced to Volvo specifications for material quality and manufacturing tolerances – this could mean a reduced service life for the part and reduced performance from your machine. Every Genuine Volvo Parts works in harmony with the whole machine and that gives you a longer operating life, with improved lifetime economy. Choosing Genuine Volvo Parts for your Volvo machine is the safest option.

With Genuine Volvo Parts you get:

- High quality and good total economy.
- Comprehensive warranties.
- Parts developed specifically for your machine.
- Optimum machine performance.
- High machine availability.
- The latest technology.
- Volvo standards of safety.
- Improved residual machine value.
- Fast and dependable deliveries.
- Parts are available for at least 10 years after discontinued production of the machine model.



CUSTOMER SUPPORT AGREEMENTS

Agreements - Tailored to our Customers' needs

Volvo Customer Support Agreements are a natural choice for everyone who owns a Volvo machine. The reason is simple: we have developed and designed your machine so we know exactly what it takes to look after it. Our customer support agreements are all flexible with regards to content and can be tailored to your specific needs and budget. They cover everything from inspections of your machine by the experts – Volvo service trained technicians – to Volvo assuming full responsibility for maintenance and repairs at a fixed cost – giving you peace of mind over the availability of your Volvo machine. This means you can avoid unplanned downtime and unexpected costs, protecting your profitability.

VOLVO OIL ANALYSIS

Analyse for better planning

Simply put, the Volvo Oil Analysis is a thorough **'health check'** of the machine's vital systems. It includes analysis of oils in the engine, transmission, hydraulic system, axles and brakes as well as coolant and fuel on request. Regular use of oil analysis gives a comprehensive diagnosis of the machine's ongoing condition. Thanks to the early warnings provided by the oil analysis component changes can be planned in good time before failures occur, therefore avoiding expensive damage and machine downtime. Using the oil analysis program can also shorten repair times as it can sometimes pinpoint the cause of the malfunction. This means much faster troubleshooting and diagnosis.



CARETRACK INVALUABLE HELP

**Don't just take our word for it -
the real results our customers
are achieving with CareTrack
everyday speak for themselves.**

Take the example of one of our customers in Europe. When this customer was first introduced to CareTrack by their Volvo dealer, their average fuel consumption was 40 liters (11 gallons)/hr. With the information CareTrack provides, they were able to introduce an incentive scheme, offering a reward to the most efficient operator. Today, average fuel consumption for the customer is 20 liters (5.3 gallons)/hr – a massive saving across their fleet.

**This is just one example of Volvo
customers who are achieving real and
measurable results using CareTrack.**

CareTrack is Volvo Construction Equipment's state-of-the-art telematics system, standard fit on the machines. It is designed to work with the electronic control system in your Volvo machine, providing information which can help optimise productivity and increase machine utilization.

CareTrack data can clearly demonstrate opportunities to improve machine operating efficiency. Machine operators have a great effect on fuel efficiency – CareTrack supplies you with critical information on fuel consumption. It can also tell you if operator technique needs correction in order to lower machine stress and extend component life.

Running a business operation is complicated. Correct information is absolutely critical to making the right decisions, and fast information also puts you in the lead. With CareTrack you get the knowledge and information you need to make the right decisions and increase profitability. You simply log in to your password-protected website, where you get an overview and detailed information about your machines.



TAKE MACHINE MONITORING TO THE NEXT LEVEL

At any given moment, wherever you are, you can access a wealth of valuable information about the state of your machines. Connecting via the internet, you can see when they are being used, at what speeds they have been driven, the time remaining until the next service, and much more. Or, you can simply check to see exactly where they are – right now.

Every 24 hours, CareTrack makes available the previous day's machine operating information in a manner that's easy to understand. It's like getting a complete daily technical update on each machine from the operator – only more complete and more accurate. Or if preferred, CareTrack will email the same information, collated once a day, once a week or once a month – as you determine. For a fleet or operations manager, the time savings are enormous.



WITH ITS FLEXIBILITY, **CARETRACK** GIVES YOU A LOT OF ADVANTAGES INCLUDING:



- **Increased control safety:** you can assign the machine to a geographic area where it should operate.
- **Control of service:** for example, you get service reminders and service history.
- **Higher productivity:** you get reports on how each machine is used, for example, engine load as well as use of brakes and differential locks.
- **Greater availability:** information about the machine's position enables you to coordinate service and refueling.
- **Better when renting:** you always know where the machines are and how they are used.
- CareTrack is thoroughly **tested on several continents** and is described by many users as invaluable.



ENVIRONMENTAL CARE

OUR ENVIRONMENT VISION

The Volvo Group is to be ranked as a leader in terms of Environmental Care among the world's top producers of transport related products, equipment and systems.

ACCEPTING THE CLIMATE CHALLENGE

The Earth's climate is in a delicate state of balance. Failure to react, and soon, could cause the scales to tip dangerously in the wrong direction, to a point of no return. Battling climate change is one of the greatest challenges we have ever faced.

It is also the primary environmental issue for those of us who work in the transport sector. Construction equipment companies are responsible for helping to build the infrastructure of the planet. As we undeniably add to greenhouse emissions and climate change, manufacturers have a duty to also be part of the solution.



VOLVO GROUP CODE OF CONDUCT, ENVIRONMENTAL PRINCIPLES

Resource Efficiency

Volvo Group products and processes are designed in such a way that energy and raw materials are used efficiently, and waste and residual products are minimised over the products' life cycles.

Precautionary Principle

The Volvo Group supports the precautionary principle by avoiding materials and methods that pose environmental and health risks when suitable alternatives are available.

Environmental Performance

The Volvo Group routinely audits, follows up and reports on its environmental performance, with particular emphasis on evaluating the potential risks of present and future products and operations.



A HOLISTIC APPROACH TO CLIMATE ISSUES

Volvo Construction Equipment recognises its obligation to meet the climate challenge and has adopted a multi-faceted approach to tackling environmental issues. It simply isn't possible to operate efficiently and profitably, while implementing sound environmental policies, if you handle one problem at a time. With this in mind, Volvo Construction Equipment follows a range of environmental programs that feed into everything it does as a company. We have chosen to take a holistic view of environmental issues, promoting continual improvements in how we operate and striving for ongoing technical innovations.

FUELS OF THE FUTURE

There is no one single source of energy that can replace oil. Instead, we are now seeing the development of a spectrum of fuel alternatives and drive systems that are each suitable for different purposes.

Research and development

Volvo participates in research into new fuels and has chosen to focus on those alternatives that meet the toughest standards concerning both high energy efficiency and low environmental impact. This extends all the way from raw material extraction to consumption – a perspective known as the ‘well-to-wheel’ approach. At Volvo, we are primarily interested in biodiesel, synthetic diesel and DME – Dimethylether. In time, one new fuel source may emerge as the replacement fuel of choice for the construction equipment industry.

RECYCLABILITY FITTED AS STANDARD

Volvo Construction Equipment designs all of its machines with end-of-life in mind. During production, we consider the whole lifecycle of our machines. Volvo Construction Equipment machines are specifically designed so that they are easy to dismantle for recycling at end-of-life. The results of the emphasis placed on recyclability during product development means that Volvo is leading the way for the construction equipment industry.





VOLVO REMAN

Breathing new life into working machines

Replacing a broken component with a factory remanufactured component often doesn't cost any more than a repair. With remanufactured components in stock, downtime is cut to a minimum. Volvo Construction Equipment's remanufacturing requires the same know-how and equipment as factory production. We don't just restore the components to 'like-new' condition when the component was originally made. We update them to include the latest technical improvements that have been introduced in production. That's why the value of a remanufactured component can only be compared to the price of a new genuine component, never with the costs of a repair or reconditioning.

Factory remanufactured components can be recycled and used several times. When ordering a component you can leave your defective component at Volvo for remanufacturing.

ECO OPERATOR

Volvo Eco Operator training

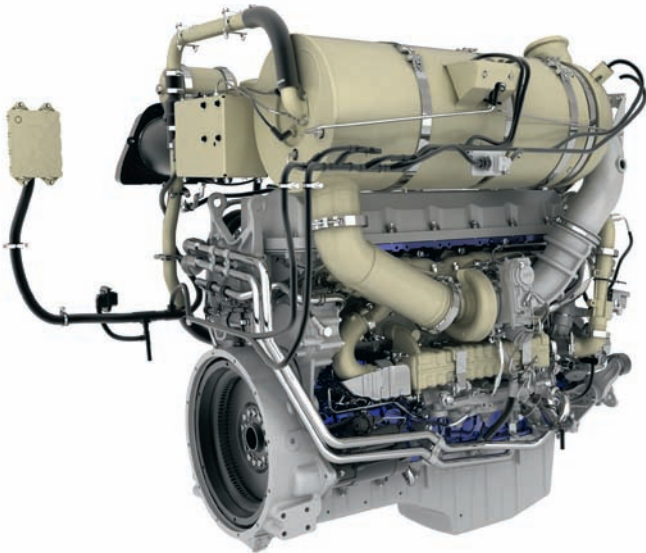
Proper planning and operation by trained operators can make a huge difference – especially in your profits. Eco Operator is a program from Volvo Construction Equipment that teaches fuel efficient methods of working. No matter how fuel efficient a piece of equipment is, the operator has a significant effect on fuel consumption and productivity.

Eco Operator gives operators the practical and theoretical knowledge they need to become safer, more efficient and extra environmentally conscious while operating equipment. The program teaches correct machine operation and manoeuvring as well as how to plan work in the smartest, most efficient way. By following these techniques operators can help save money on fuel, increase overall production and reduce maintenance expenses.

EMISSIONS

BIO HYDRAULIC OIL

Volvo Biodegradable Hydraulic Oil is used as an alternative to normal hydraulic oil for machines that operate in sensitive environments, for example, a gravel pit in a water conservation area. The oil is a biodegradable hydraulic fluid designed for minimal environmental impact.



A key factor in the battle against climate change is the reduction of greenhouse gases. CO² emissions from construction equipment machinery contribute to the greenhouse effect so everything possible must be done to reduce the impact they have.

Volvo, as one of the world's leading manufacturers of diesel engines for heavy commercial vehicles, recognises it has a responsibility to do all it can to reduce diesel engine emissions.

Regulated emissions

Volvo has always placed a great emphasis on caring for the environment. We support the various engine regulations, test methods and emission standards that are issued by the USA, EU, Japan and the rest of the world, and we look to exceed standards wherever possible. We also think it is important to go further, and if we are to see a meaningful, long-term reduction in engine emissions, then globally harmonised regulations on engines and fuels are needed in the future.

Over the past two decades, a series of increasingly tough EU and US standards has seen regulated emissions from heavy duty diesel-powered vehicles, such as Nitrogen Oxides (NO_x), Hydrocarbons (HC), Carbon Monoxide (CO) and Particulate Matter (PM), fall dramatically, as manufacturers have designed ever cleaner engines.

The Volvo D13 Engine with V-ACT (Volvo Advanced Combustion Technology). This new generation of Volvo diesel engines, featuring V-ACT, is tailored for use in demanding off-road applications and designed to meet the specific needs of each Volvo machine.



GREEN THINKING

A sustainable future

Ensuring a successful and effective environmental care program means applying green thinking to everything we do. The Volvo Group executive committee has set very ambitious goals with respect to energy. These include reducing energy consumption per manufactured unit by 15% over a three-year period. We also have an objective to strive towards CO²-neutral facilities in our operations. The changes implemented at the Ghent factory in Belgium not only made it the first ever carbon-dioxide neutral factory for Volvo, but for the transport industry as a whole. Based on the experiences from the Ghent facility, similar initiatives are now being taken in other plants within Volvo Construction Equipment. Some other sites may also become carbon-dioxide neutral, and wherever it is possible to achieve a CO² free plant in the short-term, Volvo Construction Equipment will strive to reduce the carbon footprint as much as possible.

Volvo Construction Equipment also has an objective to improve material efficiency and reduce waste, including an efficient water management system. To ensure that resource efficiency is continuously improved within the industrial system, measures are taken within all plants to minimize waste material and to eliminate hazardous waste.



Building for a cleaner tomorrow

Working in harmony with the environment rather than against it takes careful thought and a concerted effort. Green thinking must underpin all of our decisions if we are to win the war on climate change. The Volvo Group takes environmental care very seriously – we undertake environmental impact analyses on all new products and processes as well as periodic environmental reviews to check we are still on the right track.

We continuously work to replace substances that are harmful to the environment. Volvo Group has developed an approach for systematic evaluation of the substances used within all products and processes. Substances which are judged to be harmful to the environment are replaced with better alternatives.

This is not a battle that can be won in one day, or one year – it is a continual struggle, but one that we are determined to overcome. At Volvo Construction Equipment we build leading products today for a better future tomorrow.

THE FUTURE

QUALITY, ENVIRONMENTAL CARE AND SAFETY FOR TOMORROW'S GENERATION

The Centaur

The 'Centaur' extreme concept rewrites the rules for articulated haulers. The ingenious two-piece haul body creates a new tipping action that greatly improves stability. The rear section of the body slides into the front section, compressing the load material down and out in a controlled manner.



The Gryphin

The 'Gryphin' extreme wheel loader concept has no heavy drivelines and free-moving wheels so it can climb to dump its load. It has a zero-emission electric hybrid engine, silent electrical wheel motors and intelligent cab glass that automatically heats up in cold weather and darkens in bright light. Much of the Gryphin's technology is already under development.



We have supplied quality machines to satisfied customers all over the world for the past 175 years. And we are determined to continue to be leaders in the field of premium construction equipment. Our designers are already imagining the dream machine with futuristic technology – the Centaur hauler, the Gryphin loader, the Sfinx excavator and the Fenix paver.



The Sfinx

The radical 'Sfinx' excavator design project caused quite a stir when it was unveiled – but some of its thinking is already finding its way into modern Volvo Construction Equipment.

The reduced weight of the machine's components makes the Sfinx more efficient, saves on steel and reduces the amount of fuel consumed during operation.



The Fenix

The extreme concept asphalt paver-compactor from Volvo Construction Equipment.

Like the immortal mythical fiery bird that is its namesake, the Fenix paver excels when the going gets hot. Not only is it fast, flexible and intelligent. It is clean and easy to use. While clearly a Volvo, it is almost unrecognizable as a paver: Fenix radically redraws the traditional profile. In fact it is much more than just a paver – it is a fully integrated highway paving/finishing system.

VOLVO CONSTRUCTION EQUIPMENT



Volvo Construction Equipment is different. Our machines are designed, built and supported in a different way. The difference comes from an engineering heritage of over 175 years.

A heritage of thinking first about people who actually use the machines. About how to help them be safer, more comfortable, more productive. About the environment we all share.

The result of that thinking is a growing range of machines and a global support network dedicated to helping people do more. People around the world are proud to use Volvo and we are proud of what makes Volvo different.

All products are not available in all markets. Under our policy of continuous improvement, Volvo reserves the right to change specifications and design without prior notice. The illustrations do not necessarily show the standard version of the machine. This brochure is produced by Volvo Construction Equipment Corporate Communications, Brussels, Belgium.

VOLVO

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