SANDVIK

Upgrades and engineered solutions

Offering catalogue 2025

Sandvik upgrades and engineered solutions

Safer, Stronger, Smarter!

Ever thought of raising your equipment to higher standards? To increase their productivity or safety? Or to reduce cost of ownership or environmental impact?

For 150 years, Sandvik has been synonymous with high quality and has been the driving force behind many innovations, constantly developing new, more productive, more intelligent products and service.

But we also offer the opportunity of Sandvik product owners to take advantages of these new developments by allowing our customers to upgrade their existing machines.

All our Upgrades Solutions retrofit kits include only genuine Sandvik parts of the highest quality materials, so you can expect superior reliability and longer life than non-OEM alternatives.

Special Upgrade requirement? Thanks to our highly experienced engineering team, we can design specific custom Upgrade solutions and modify your machine to adapt it to your specific needs to allow you to accomplish your new tasks at a lower investment.

Sandvik Upgrades and Engineered Solutions delivers extra and better lifetime to your equipment.

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Access new technology, improve your productivity!

At Sandvik Mining and Rock Technology we continuously invest in R&D to take advantage of the latest, smartest technology in order to boost productivity.

We want to extend these technologies to our existing customers by offering upgrades to their existing equipment, enabling them to enhance gross profits and maintain their competitive edge.

Sandvik Upgrades & Engineered Solutions provides access to technology to significantly improve the productivity of your current machine. Our enhancements include retrofitting integrated weighing systems on trucks and loaders, adding instrumentation systems to drill rig booms and upgrading rock drills to more powerful models.

Improve safety, health and sustainability!

Safety is our top priority at Sandvik Mining and Rock Technology. This is reflected in our commitment to develop new technology for improving equipment safety and reducing the environmental impact of operation. We aim to go beyond continuous improvement, by applying special upgrades to our existing customers equipment in order to efficiently achieve the highest safety and environmental standards.

Sandvik Upgrades & Engineered Solutions gives you the technology to improve the safety and sustainability of your operations. Retrofitting to a modern, more sustainable engine to limit gas emissions and installing safety rails on truck platforms are just two of the possible upgrades available.

Invest in new improvements, reduce your lifecycle cost!

As your productivity partner, Sandvik Mining and Rock Technology will use our expertise and solutions to help you reduce the running costs of your equipment, thereby enhancing your operational efficiency and increasing your competitive edge.

Sandvik Upgrades & Engineered Solutions gives you access to improved technology, allowing savings on ownership costs as well as improved maintenance performance and consistent productivity. Offered upgrades include engine retrofitting to a modern, more sustainable model,and rock drill model conversion with a stabilizer system to prolong tool lifespan.

New requirements? Simply adapt your machine!

Keeping up with operational evolutions might require new tasks that your current equipment cannot handle. Sandvik Upgrades & Engineered Solutions will adapt your current fleet to your new needs for a minimal capital investment.

These adaptations range from introducing new features such as a mesh handler for bolters or an air-mist flushing system, to making sweeping changes to core machine functionality, adapting a rock breaker system to your loaders or even transforming your bolter to a face drill jumbo, for example.

Upgrades solutions for underground drills

Sandvik upgrades and engineered solutions offer a vast range of retrofit kits that allow to modify the original specifications of your underground mining drills to improve the performance, the drilling accuracy, the safety or to reduce the environmental impact and the operating cost. Our offering includes also solutions to adapt your machine to different application.

Productivity improvement

TMS+ boom instrumentation for development drills

Description

Inaccurate drilling set-up and hole length can cause misalignment of the whole tunnel, blasting difficulties, and can lead to over-break and under-break. Fixing tunnel alignment later is extremely expensive and it also increases the need for rock support and the risk of rock fall.

Sandvik TMS+ Boom Instrumentation systems allows the operator to control with great accuracy the drilling direction. It can also display information about hole depth, penetration rates and cumulative drilled length (”DDS” option).

Get optimal control over the drilling angle and positioning in order to avoid tunnel misalignment, as well as over-break and under-break.

Optimize ore recovery, advance per blast and the fragmentation process.

Advantages	Customer Values
Measures and displays the direction of the angle of drilling with high accuracy.	Reduces the risk of generating over-break and under-break that leads to extra costs, slower production, and an increased risk of falling rocks (safety issue)
Version available with hole-depth measurement, penetration-rate indication and cumulative drilled hole-length counters	Allows accurate control of the drilling process Allow rock tools life follow-up
Simple and basic system that’s easy to install and use	Minimal installation time and training required
Integrated troubleshooting function	Easily test the correct function of the system’s sensors to ensure minimal downtime in case of failure

Machine models	Part Numbers
Sandvik DD320	Contact local Sandvik representative
Sandvik DD321	
Sandvik DD410	
Sandvik DD420	
Sandvik DD411	
Sandvik DD421	
Sandvik DD530	

TCAD+ boom instrumentation for development drills

Description
Inaccurate drilling set-up and hole length can cause misalignment of the whole tunnel, blasting difficulties, and can lead to over-break and under-break. Fixing tunnel alignment later is extremely expensive and it also increases the need for rock support and the risk of rock fall.
Sandvik TCAD+ is an aiming tool for executing on a pre-designed drilling plan, featuring face drilling, long-hole drilling and bolting-hole plans on the screen.
Sandvik TCAD+ supports different navigation methods. In addition to traditional laser and drill-bit navigation, it introduces total station navigation to standard rigs, greatly improving their accuracy. The navigation user interface is easy to use, with on-screen creation and editing of the lasers.
With its built-in data collection, TCAD+ provides information on hole position and angle logging, as well as the drilling process. By improving the accuracy of drilling, the TCAD+ enables optimization of the whole tunneling project.
The Sandvik TCAD+ includes a troubleshooting function to help test the correct functioning of the system's sensors and the CAN system.

TCAD+ is delivered together with Sandvik iSURE®, the most sophisticated and advanced tunnel-process management software on the market. Results in accurate drilling and optimized excavation due to drilling and blasting design at the most critical position (i.e. at the end of the round). Optimizes the drilling process, as well as the complete drill and blast process. iSURE® is user-friendly and easy-to-use software.
Professional training available for operators and service with comprehensive training tools (Windows simulator).
Global Sandvik technical support team. Access to new product upgrades via lifetime services. Upcoming features can be installed on rig.

Advantages	Customer Values
Measures and displays the direction angle of drilling with high accuracy. Displays positioning of each hole according the pre-designed drilling plan. Automatic hole length control according to a drill plan.	Optimized drill and blast cycle. Less over- and under-breaks. Improves productivity and safety as no need to stand close to the face to paint the holes locations.
Easy-to-use navigational interface. Professional training available for operators. Comprehensive training tools (Windows simulator). Global technical support team.	Full Sandvik support on the implementation process and during life of the machine.
The data collection system collects locations and directions of the drilled holes and MWD (Measurement While Drilling) data.	Allow to monitor accurately: Productivity, Total Cost of Ownership, cost per drilled meters, etc Rock tools life Identify operator training needs
TCAD+ comes with iSURE®, the most advanced tunnel-process management software on the market.	High drilling accuracy and optimized excavation. Optimized drilling process. User-friendly and easy-to-use software.
Upcoming features can be installed on rig.	Access to new product upgrades via lifetime services.

Machine models	Part Numbers
Sandvik DD310	Contact local Sandvik representative
Sandvik DD311	
Sandvik DD320	
Sandvik DD321	
Sandvik DD410	
Sandvik DD420	
Sandvik DD411	
Sandvik DD421	
Sandvik DD530	
Sandvik DD531	

Rock drill(s) conversion for development drills

Description

Productive underground drilling is a crucial component in achieving your production targets and meeting your required advance rates. Even the most efficient drill rig can only deliver so many meters in a shift if it's not coupled with the latest rock drill technology.

Our Rock Drill(s) Upgrade Solutions for Underground Development Drills enable seamless progression to the latest Sandvik technology. Each Upgrade kit consists of new RD-series rock drill(s) (RD520 or RD525) and all other parts needed to convert your existing equipment to the most technically advanced drilling technology available.

Highest productivity is achieved by the increased percussion frequency rate and stabilizer system that insure optimal control of the contact between the rock and the bit.

Reduced operating costs are achieved by:

Increased reliability due to new design concept (only few pressurized seams between functional modules) that allows increased service interval of 750 percussion hrs.

Excellent serviceability through modular construction and visual wear indicators.

Stabilizer system that dampens recoil impulses from rock and lengthens the lifetime of rock tools.

The quicker drilling and faster production will start a ripple effect. Your productivity and reliability will increase and you'll cut costs.

Advantages	Customer values
Highest percussion frequency. Stabilizer system insures optimal Rock/bit contact.	Highest penetration rate that Improves productivity (+17% compare to HLX5, +28% compare to HLX5T)*.
High striking frequency with low energy per impact. Stabilizer system: efficient dampening of shock waves from the rock. New design and construction concept with only few pressurized seams and less parts (20%). Rock drill attached to carrier with only 6 bolts. Harmonized nut size. Visual wear indicator on key components.	Longer rock tools life (+17% bit life, +40% shank life)*. Higher reliability and maintenance interval (750 hrs). Improved serviceability; Easy condition evaluation in service.

Machine models	Rock drill model	Part Numbers
Sandvik DD210L	RD520	Contact local Sandvik representative
Sandvik DD211L	RD520	
Sandvik DD220L	RD520	
Sandvik DD310	RD520	
Sandvik DD311	RD520	
Sandvik DD312i	RD520	
Sandvik DD320	RD520	
Sandvik DD321	RD520	
Sandvik DD410	RD520	
Sandvik DD411	RD520	
Sandvik DD420	RD525	
Sandvik DD421	RD525	
Sandvik DD530	RD525	
Sandvik DD531	RD525	

Power extractor for underground drills

Description

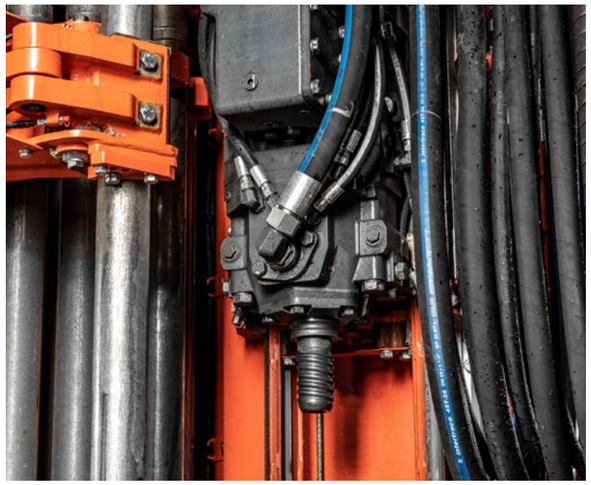
Fractured and heterogeneous ground, poor flushing quality, cross drilling, or worn out rock tools can lead to drilling rod jamming, And It is quite hard work to recover from the jamming and it robs your job and production of expensive and valuable time.

In production drilling, one of the major loss of production cause could be the difficulty to uncouple efficiently the rods.

In order to solve these issues and preserve the productivity, Sandvik has developed the Power Extractor system.

Power Extractor is a module for a hydraulic rock drill, operated by a switch on the operator's control panel. A hydraulic actuator mounted on the front end of the rock drill gear housing, by multiple (small) pistons, is able to pull the shank adapter towards the striking point, so that the piston can hit the shank during pull-back. Percussive stress waves can therefore be transmitted to the drill rods.

Power Extractor is very efficient when the drill string are jammed so tight that it can not be removed by only using feed, rotation and percussion. Use of Power Extractor for uncoupling rods makes easier and faster the opening of joints. It reduces the non-drilling time, increases drilling capacity and rock tool service life and reduces rock drill maintenance cost.



Advantages	Customer values
Power Extractor allows the rock drill piston to hit the shank during pull back (percussive stress waves transmitted to the drill rods).	Improve productivity by help to remove rod(s) from the hole in case of jamming. In Production drilling, ease rods uncoupling.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD210L	Contact local Sandvik representative	Sandvik DL310	Contact local Sandvik representative
Sandvik DD211L		Sandvik DL311	
Sandvik DD220L		Sandvik DL320	
Sandvik DD310		Sandvik DL321	
Sandvik DD311		Sandvik DL330	
Sandvik DD312i		Sandvik DL331	
Sandvik DD320		Sandvik DL410	
Sandvik DD321		Sandvik DL411	
Sandvik DD322i		Sandvik DL420	
Sandvik DD410		Sandvik DL421	
Sandvik DD411		Sandvik DL422i	
Sandvik DD420		Sandvik DL422iE	
Sandvik DD421		Sandvik DL430	
Sandvik DD422i		Sandvik DL431	
Sandvik DD422iE		SandvikDL432i	
Sandvik DL210		Sandvik DS421	
Sandvik DL230		Sandvik DS422i	

TMS DDS instrumentation for production drills

Description
During production drilling operations, inaccurate feed positioning and an incorrect drilling angle can have serious consequences on the operational costs of an underground mine. It can cause:

- Oversized blocks
- Ore loss
- Dilution

The TMS DDS instrumentation allows the operator to control with great accuracy the drilling hole direction on long hole drills.
It is used to position the drilling feed at the correct angle (tilt and rotation), and displays hole depth, penetration speed and drilling pressures (percussion, feed, rotation and flushing). This instrument is a great help for the operator to follow exactly the drill plan. Data collection is included for further review (drilling performance monitoring, comparison between planned and effective drilling, etc.).
A large, user-friendly, display clearly shows parameters to the operator. Instrumentation checks itself at every start to find possible faults in the system.

Advantages	Customer values
Measures and displays the direction of the angle of drilling with high accuracy.	Reduces the risk of generating over- and under-break that leads to extra costs, slower production, and an increased risk of falling rocks (safety issue).
Displays the hole depth and penetration rate.	Allows accurate control of the drilling process.
Simple and basic system that's easy to install and use.	Minimal installation time and training required.

Machine models	Part Numbers
Sandvik DL311	Contact local Sandvik representative
Sandvik DL321	
Sandvik DL411	
Sandvik DL421	
Sandvik DL431	

TIS instrumentation for production drills

Description
During production drilling operations, inaccurate feed positioning and an incorrect drilling angle can have serious consequences on the operational costs of an underground mine. It can cause:

- Oversized blocks
- Ore loss
- Dilution

TIS is basic CAN-bus based instrumentation for medium and NV long-hole top-hammer drills.
It is used to accurately position the drill feed at the correct angle (tilt and rotation). On the DL331, it displays hole depth, penetration speed and drilling pressures (percussion, feed, rotation and flushing). Data collection is included.
Instrumentation is equipped with side lasers mounted to the carrier. The lasers are used to position the carrier at the drill-fan location.
A large, user-friendly display clearly shows the operator the parameters. Instrumentation checks itself for every start to find possible faults in the system.
Collected data is stored in the display unit. Data is in ASCII format comma separated and data recovery is done via USB.

Advantages	Customer values
Measures and displays the direction of the angle of drilling with high accuracy.	Reduces the risk of generating over- and under-break that leads to extra costs, slower production, and an increased risk of falling rocks (safety issue).
Displays hole-depth measurement and penetration rate (optional only on DL331)	Allows accurate control of the drilling process
Simple and basic system that's easy to install and use.	Minimal installation time and training required, and minimal downtime in case of failure.
Data collection via USB and viewer software	Allows for accurate follow-up of the machine's production.

Machine models	Part Numbers
Sandvik DL210	Contact local Sandvik representative
Sandvik DL331	

Rod handler sequence control for production drills

Description
Rod handler sequence control features three separate manual movements, each covering a series of controlled movements (sequences) carried out by the drill automatically. These sequences are designed to ease the work of the operator and make rod handling more controllable and reliable; the sequences can be activated from the control panel and engaged with the joystick.
The sensors of the rod handler are connected to the individual CAN-bus modules of the control system, and the status of each sensor can be monitored in the control panel for fault finding.
The software that runs this control has been designed to include internal security checks in order to prevent activation in the event of risk of damage posed to the drill or rock tools.
The sequence control includes three separate functionalities:

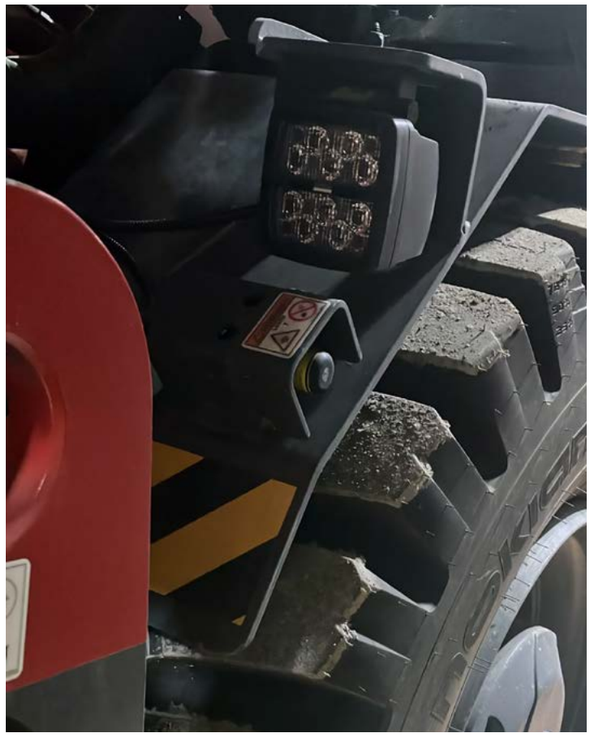
- Extension: Moves a new rod from the rod cassette port to the rod handler arms.
- Threading: Moves the selected tool to drill center and couples it to the drill string in the hole.
- Uncoupling: Moves a rod from the drill center to the rod handler port and into the cassette.

Advantages	Customer values
Ease the work of the operator and make rods handling more controllable and reliable.	Improve productivity Improve quality and consistency for operators of all experience levels, and reduces training duration for new operators.

Machine models	Part Numbers
Sandvik DL311	Contact local Sandvik representative
Sandvik DL321	
Sandvik DL411	
Sandvik DL421	

Positioning laser relocation for Sandvik DL421

Description
Sandvik longhole drills use lasers to position with accuracy the machine's carrier in the drift, using marks drawn on the walls by mining Engineers. The distance between the drilling line and the lasers has changed between the older DL421 and the new generation DL422i and DL432i drill rigs.
To enable both generations of longhole drill rigs to operate with the same wall marking, Sandvik has designed a kit to change the location of the lasers on the DL421. The lasers are now installed in the front mudguards of the machine, instead of on the boom tilt pins.



Advantages	Customer values
Enables DL421 or DL422i and DL32i to use same positioning marking to navigate.	Reduce the risk of error is the positioning of the longhole drills. Ease the planning work.

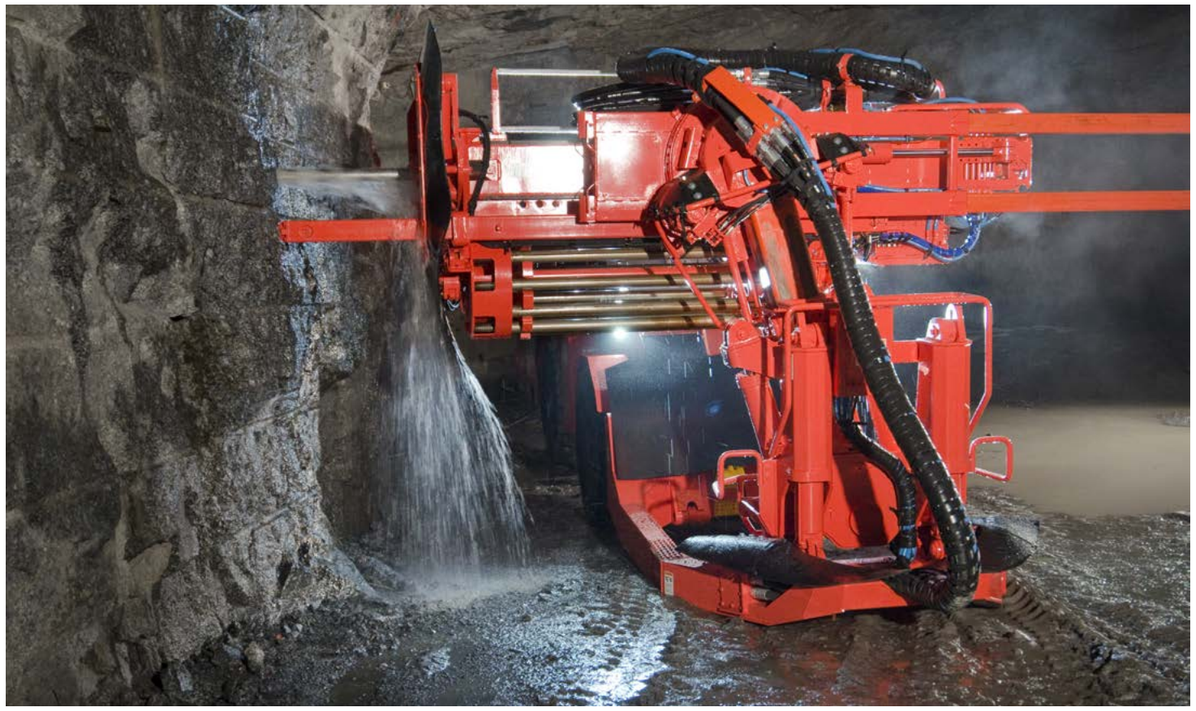
Machine models	Part Numbers
Sandvik DL421	BG01965727

One hole automation for production drills

Description
One-hole automation is designed for drilling a single long hole automatically in any direction to predefined depth, including coupling and uncoupling of rods.
It eases the work of the operator and increases productivity, by making the drilling process more controllable. It also allows the drilling operation to continue through shift change and breaks, therefore increasing the operational efficiency in long hole drilling.
The operator can use the following operating modes in one-hole automation:

- Drill – rods are automatically added, hole is drilled to given depth and rods are left in the hole.
- Drill and uncouple – in addition to the “Drill” mode features, uncouples the rods.
- Uncouple – the feature only uncouples the rods.

The following features are designed for improving hole quality: extra flushing sequences during the drilling cycle, break through tolerance and rushing detection.
Information on the progress of drilling is shown in the operator display. User friendly and comprehensive diagnostics system helps in fault finding and the status of CAN modules and sensors can be easily checked.
One Hole Automation Upgrade Solution includes TMS DDS instrumentation and Rod Handler Sequence Control, if these options are not yet installed on the machine.
The use of rock drill power extractor is recommended in combination with One-hole automation, for the ease of uncoupling rods and for improved productivity (Upgrade Solution available).



Advantages	Customer Values
Drilling of single automatically, in any direction, to predefined depth, including coupling and uncoupling of rods.	Eases the work of operator. Increase productivity. Reduce operator training duration. Allows to continue drilling of a single hole during breaks or shift changes.
Full automation of coupling and uncoupling of the rods.	Increase rock tools life.
Predefined hole depth (accuracy 0,1 m). Extra flushing sequences during drilling. Breakthrough tolerance and rushing detection.	Increase hole quality. Reduce hole deviation. Reduce risk of generating over- and under-break that leads to extra costs, slower production, and an increased risk of falling rocks (safety issue). Reduce risk to loose ore.
Integrated diagnostic system. Status of CAN modules and sensors can be easily checked.	Helps in fault finding. Reduce mobilization time in case of failure.

Machine models	Part Numbers
Sandvik DL311	Contact local Sandvik representative
Sandvik DL321	
Sandvik DL411	
Sandvik DL421	
Sandvik DL431	

Fan automation for production drills

Description

Fan Automation system for Production Drills is designed for drilling a complete fan automatically in any direction, depth and from the number of pivot points defined in the pre-programmed drilling plan uploaded in the system, depending on the configuration of the boom and drilling module.

During fan automation the boom is automatically moved hole-to-hole and the feed is automatically aligned according to the plan. The drilling module is stabilized utilizing stingers and automatic stinger pressurization.

Fan automation increases long hole drilling productivity by making the drilling process highly controllable. The drilling cycle can be repeated with speed and precision, improving hole accuracy.

Product safety is improved as operator presence is required only for a short period of time during the work cycle. Fan automation allows the units to be operated with less tear and wear, reducing operating cost.

The following features are designed to improve the hole quality: extra flushing sequences during the drilling cycle, break through tolerance and rushing detection.

Information on the progress of drilling is shown in the operator display. User-friendly and comprehensive diagnostics system helps the operator in fault finding and the status of CAN modules and sensors can be easily checked.

Fan Automation Upgrade Solution includes TMS DDS instrumentation and Rod Handler Sequence Control, if these options are not yet installed on the machine.

The use of rock drill power extractor is recommended in combination with Fan automation, for the ease of uncoupling rods and for improved productivity (Upgrade Solution available).

Advantages	Customer Values
Drilling a complete fan automatically, in any direction, depth and from the number of pivot points defined in the preprogrammed drilling plan uploaded in the system.	Eases the work of operator. One operator can supervise multiple units. Increase productivity. Reduce operator training duration. Allows to continuous drilling of a full fan during breaks or shift changes.
Data transfer can be utilized for uploading drill plans in the control system of the unit, and downloading the drilled data after the fan has been completed.	Accurate drilling according predesigned plan. Data collection and reporting system for drilling operation planning and follow-up. Allow full drilling process control
Full automation of coupling and uncoupling of the rods.	Increase rock tools life.
Boom automatically moved hole-to-hole and feed automatically aligned according the drilling plan. Predefined hole depth (accuracy 0,1 m). Extra flushing sequences during drilling. Breakthrough tolerance and rushing detection.	Increase hole quality. Reduce hole deviation. Reduce highly the risk of generating over- and under-break that leads to extra costs, slower production, and an increased risk of falling rocks (safety issue). Reduce risk to loose ore.
Operator presence required only for a short period of time (only during moves between fans and setting up the boom.)	Helps in fault finding. Reduce immobilization time in case of failure.

Machine models	Part Numbers
Sandvik DL311	Contact local Sandvik representative
Sandvik DL321	
Sandvik DL411	
Sandvik DL421	
Sandvik DL422i	
Sandvik DL422iE	
Sandvik DL432i	

Tele-remote drilling and data transfer for production drills

Description

Tele-Remote Drilling system allows to control the unit from a safe remote location (i.e; operation surface room), with a static user interface, identical at the remote location and on the drill.

Operating a production drill remotely offers number of benefits in underground mining, related to product safety and productivity. Exposure to potentially hazardous working conditions and time on-board the drill unit are minimized. Distance between the drill unit and remote location is not limited; the remote-control interface can be in a dedicated facility or in a vehicle. Layout and ergonomics of the remote location infrastructure can be designed to meet the mine requirements and the user interface between the locations is identical. The system is fitted with remote cameras for good visibility and audio stream for realistic and informative scene on drilling.

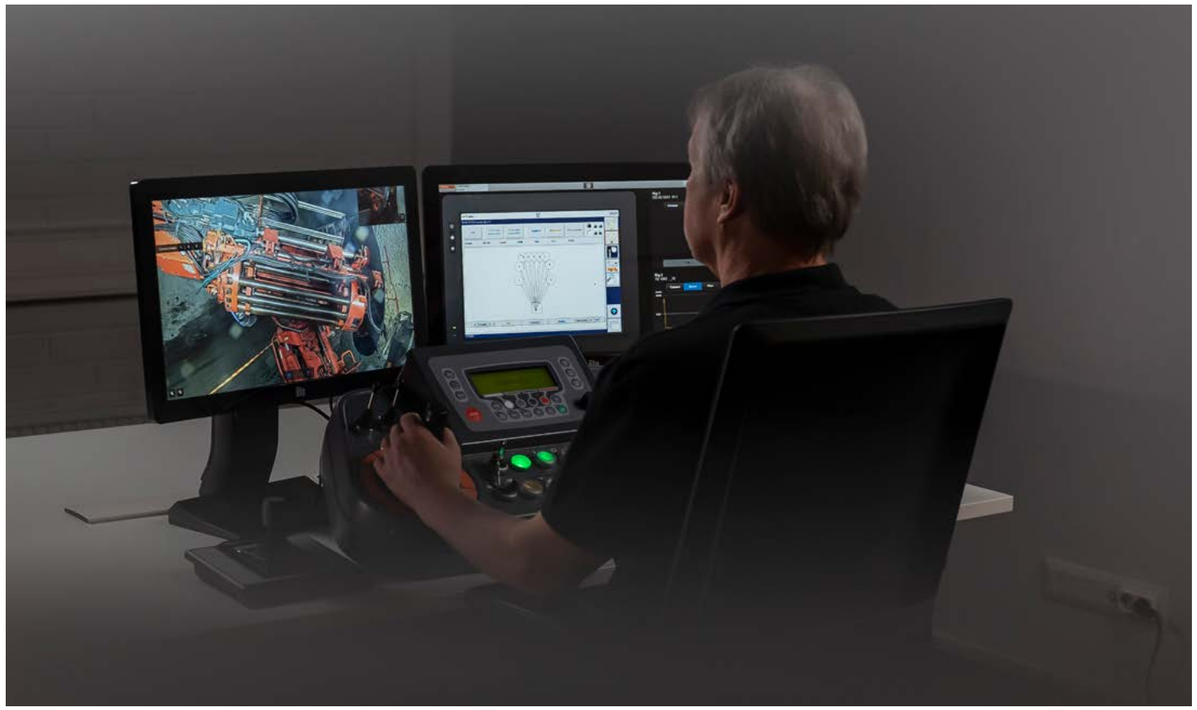
Tele-remote drilling allows multiple units to be controlled by one operator (through individual user interfaces).

Combined with drilling automation, working can continue through shift changes and breaks, or during the shift.

The drill and the remote-control location can be connected through WLAN network or LAN cable. Teleremote operation can be integrated in the existing mine network if it meets the requirements on connectivity.

The WLAN connection is also delivered with the cable connection feature. The communication components on-board the drill and at remote location are using TPC/IP protocol. The maximum Ethernet cable length between the drill and mine network access point is 70 meters. For longer sections optical fiber or equivalent solution is recommended, for maintaining sufficient signal strength. The mobile terminal (WLAN transmitter/receiver) is located on the drill and provides wireless connection to the WLAN network of the mine.

Mobile Tele-Remote option consists of a battery powered remote control station, easy to set-up and transport, instead of the static station.

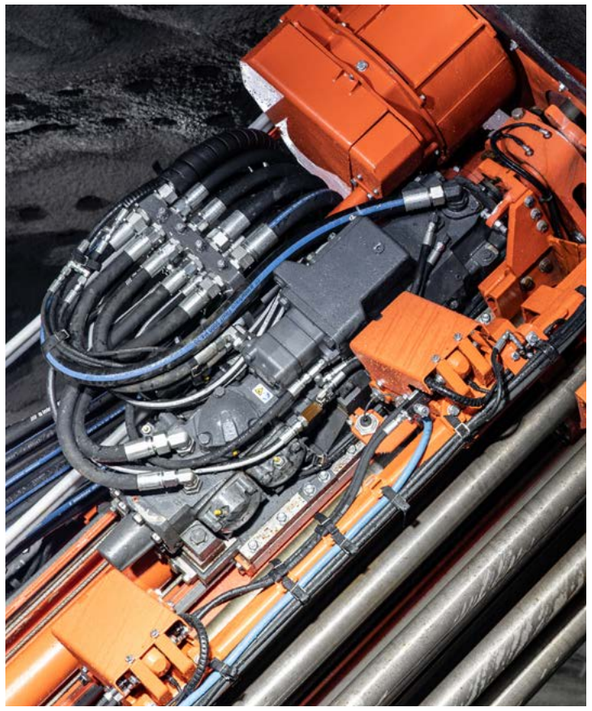


Advantages	Customer Values
Much less time spend in shift changes. One operator can supervise multiple units. Allows to operate through shift changes, breaks, blast smoke hours. Safe operation in hazardous areas. Remote cameras and audio stream live.	Increase productivity. Achieve higher output at lower cost. Better utilization of the workforce and competence. Improved operator performance. Ore reserves can be utilized economically in areas with compromised safety. Realistic and informative drilling scene.
Control of operation from safe and remote location. Time on-board the drill minimized Operation on dust, noise and vibration free environment Identical user interface at the remote location and on-board the drill.	Improve operator safety Addresses the problem of maintaining a suitably qualified work force at remote sites.
With Automation, drilling cycles are repeated with speed and accuracy.	Reduction in equipment tear and wear, improved mechanical availability

Machine models	Part Numbers
Sandvik DL311	Contact local Sandvik representative
Sandvik DL321	
Sandvik DL411	
Sandvik DL421	
Sandvik DL431	
Sandvik DL422i	
Sandvik DL422iE	
Sandvik DL432i	
Sandvik DU412i	
Sandvik DU422i-W	

Rock drill conversion for production drills

Description
Productive underground drilling is a crucial component in achieving the production targets. Even the most efficient drill rig can only deliver so many meters in a shift if it's not coupled with the latest rock drill technology.
Our Rock Drill Upgrade Solutions for Underground Production Drills enable seamless progression to the latest Sandvik technology. Each Upgrade kit consists of new Rock drills (model selected according machine model and application) and all other parts needed to convert your existing equipment to the most technically advanced drilling technology available.
The latest Sandvik rock drills bring a substantial improvement on drilling performances , reliability in operation and low operating cost through patented and simple product design.
HL820ST, RD921, RD927 and HL1560ST includes stabilizer system absorbs recoil energy traveling back through the rods after each impact, that can be harmful for the drill steels. With a consisted bit-rock contact and by optimizing the percussion energy, the stabilizer increases rock tools life and protects the rock drill of tear and wear.



Advantages	Customer values
Increase the overall drilling performances	Improve productivity
Stabilizer system (except HL710S) absorb recoil energy. Consistent bit-rock contact and optimizing percussion energy.	Increase rock tools life. Extends rock drill life.
Allows to adapt the rock drill to new rock condition or different drilling application.	Allow machine adaptation to new application.

Machine models	HL710S	HL820ST	RD921S	RD925M	RD927L	HL1560ST
Hole Size	**64-115**	**64-127**	**64-76**	**76-89**	**89-140**	**89-127**
Sandvik DL311	√	√				
Sandvik DL321	√	√				
Sandvik DL411		√			√	√
Sandvik DL421	√	√		√	√	√
Sandvik DL422i			√	√	√	√
Sandvik DL422iE			√	√	√	√
Sandvik DL431	√	√				
Sandvik DL432i			√	√	√	

Contact local Sandvik representative for advices on the optimal rock drill configuration according machine model and application.

Bit changer for production drills

Description
Manual replacement of the drill bit brings limitations on the full automation of production drills as the process cannot be fully autonomous. It also generate safety risk if not done according safe procedures.
Sandvik bit changer is designed for automatic changing of bits in long hole drilling. Once activated the bit changer carousel moves the selected bit to the port in the carousel. A selector arm is then moved into the bit. The arm is fitted with a rubber tank, which can be inflated and with which the bit can be held firmly. The bit is then moved from the carousel to the drill center in the retaining centralizer, where it can be coupled to a rod and the drilling can continue.
Worn bits are stored in the carousel; the automation stops the drilling when all bits are used. The use of bits can be optimized on the unit with the drilling automation; if bits are not fully used the amount of meters that still is available is known to the control system. The (automatic) bit change interval can be pre-set.
Bit Changer Upgrade Solution is available for Sandvik DL432i and for DL411 and DL421 delivered in the year 2014 or later.

Advantages	Customer values
Increased number of holes that can be drilled in fan automation mode. Drill bit change interval is programmed.	Improves productivity by allowing work through shift changes, breaks, blast smoke hours. Drill condition controlled, ensures optimal energy transfer and higher penetration rate.
Minimize the need for human intervention near the feed.	Improves safety
Drill bit change interval is programmed.	Rock tools cost can be easily tracked. Bit regrinding interval optimized allows rock tools cost optimization. Control of the drill bit condition reduce stress and wear on the drilling module.

Machine models	Part Numbers
Sandvik DL411*	Contact local Sandvik representative
Sandvik DL421*	
Sandvik DL422i	
Sandvik DL422iE	
Sandvik DL432i	

*Only machine delivered in 2014 or later.

Rear stinger extension for Sandvik DL331

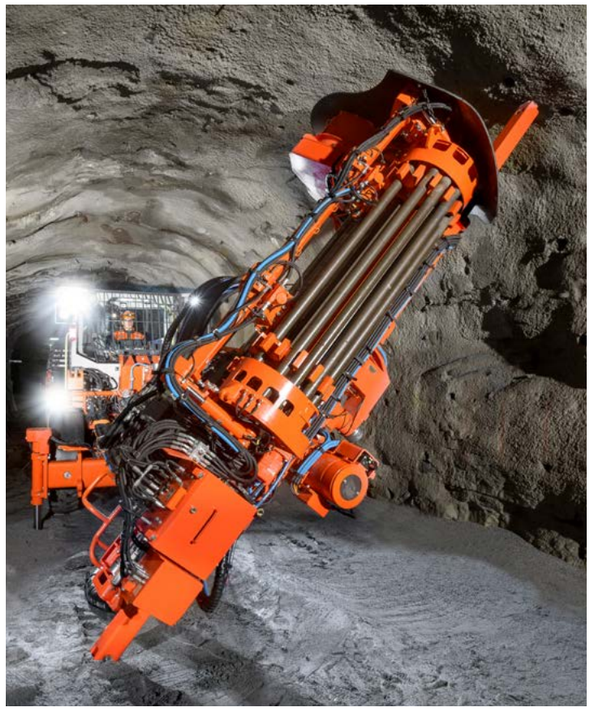
Description
Correct anchoring of the feed is an essential factor to in obtaining acceptable hole quality and limited deviation.
In order to ensure correct anchoring in up-hole drilling in larger cross sections, Sandvik has developed the Rear Stinger Extension for Sandvik DL331.
It increase the effective length of the feed with stingers by 1000mm. The extension is bolted on the rear stinger.

Advantages	Customer values
Extend the rear stinger length by 1000mm. Allows correct anchoring in large cross sections.	Insure correct anchoring in large sections that allow to obtain acceptable hole quality an limited deviation

Machine models	Part Numbers
Sandvik DL311	77022320

Stinger pressurization upgrade for Sandvik DL432i

Description
Stability of the drilling module during long hole drilling operation is a critical factor to insure hole accuracy and optimal drilling performances. This means the stingers efficiency is a very important topic. Improper anchoring of the drilling module can also generate important vibrations and unexpected movements that could damage or reduce the life of the module.
Sandvik has developed a new modification kit for stinger pressurization to improve the drilling module stability of the DL432i.
Continuous pressure holds the stinger better on the rock during drilling.



Advantages	Customer values
Improve the drilling module stability.	Improve drilling accuracy and performance
Avoid unexpected vibrations and movements	Reduce vibrations and risk of unexpected movements that could damage the drilling module.

Machine models	Part Numbers
Sandvik DL432i	BG01548840

SBH bolting head for bolters

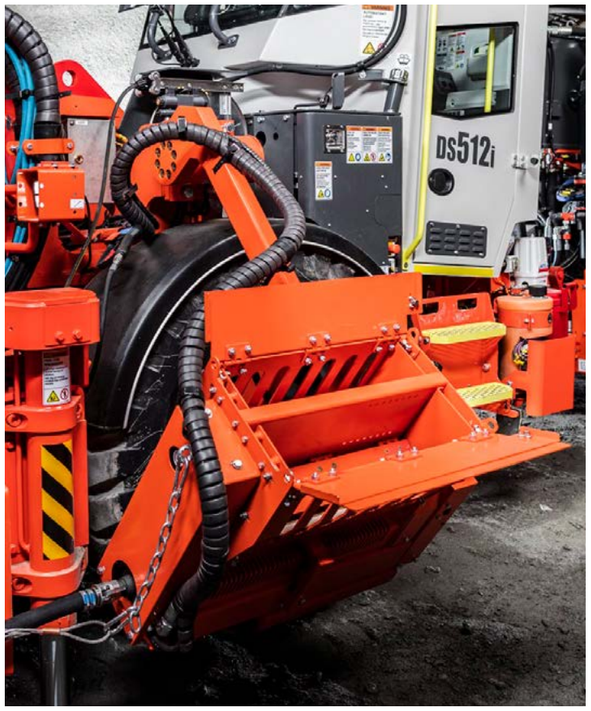
Description
Customers are looking for better performances and lower operating costs on their rock support operations with mid-size bolters.
Our new Sandvik SBH Bolting Head, thanks to the high frequency and powerful RD314 rock drill allow significant improvement on the bolt installation speed (+35% faster).
The operating costs are drastically reduced thanks to new design and new material used for several new key parts (i.e. Aluminum beam, stainless steel rails, plastic skids and bolt guides, etc...).
The maintenance is easier and faster due to improved design that give better access to perform maintenance tasks in a most efficient way.

Advantages	Customer values
New powerful rock drill. Improve drilling performance by up to 35% New shorter aluminum feed. Same design and working principle as previous bolting head generation (TUC).	Improve productivity. Fastest bolt installation. Easier to operate in small section. No need extra operator training.
New changeable stainless steel feed rails, clipped on the beam. New plastic skids. New plastic bolt guides. Feed cylinder with dampening system. High frequency rock drill. Longer rock tools life.	Longer life of feed wear parts. Easier and faster to replace. Lower maintenance cost and downtime. Better serviceability and reduced maintenance cost. New lighter aluminum feed beam. Longer life for boom parts.

Machine models	Part Numbers
Tamrock Robolt 05	Contact local Sandvik representative
Tamrock Robolt 5	
Sandvik DS310	
Sandvik DS311	

Automatic resin injection (A.R.I.) for bolters

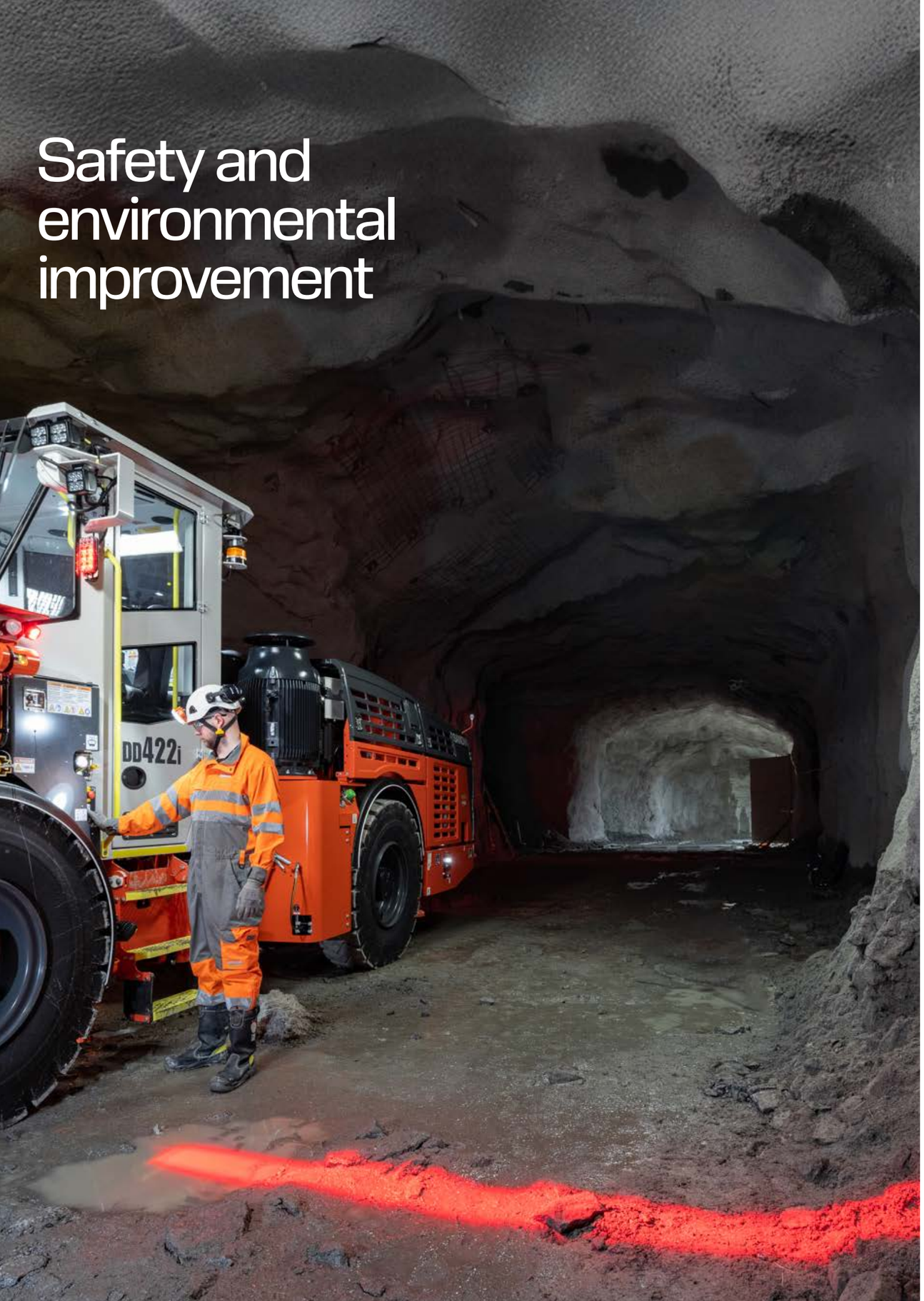
Description
Bolting cycle, when installing resin grouted bolts is a quite long process and every improvement on the installation time brings a lot of value. Also, the number of resin cartridges injected for each hole has to be very accurate as an error would cause lower resistance of the bolt, causing safety issue. Finally, the chemical vapors emitted by the resin cartridges are very odorous and can inconvenience the operator, especially on machine equipped with cabins.
Sandvik Automatic Resin Injection (ARI) is a system which count and inject automatically resin cartridges.
Equipped with 2 separated storages for fast set and low set cartridges, ARI realizes what ever cartridge sequence is needed by the operator. If only one type of cartridge is needed, the system's autonomy is therefore doubled. The number and sequence of cartridges can be either programmed for all or part of the shift, or realized manually for each bolt, insuring the correct quantity of resin is injected for each hole.
The system improve productivity as the operator can achieve other task while the cartridges are injected. This operation is then done by pressing 2 simple push buttons. ARI is installed outside the machine's cabin, so there no more issue due to resin smell for the operator.



Advantages	Customer values
ARI count and inject automatically resin cartridges.	Improve productivity by shortening the resin grouted bolt installation process. Improve safety by insuring the correct amount of resin is injected for each bolt.
The system is located outside the cabin.	Improve operator comfort by avoiding odorous resin vapors inside the cabin.

Machine models	Part Numbers
Sandvik DS410	Contact local Sandvik representative
Sandvik DS411	
Sandvik DS412i	
Sandvik DS412iE	
Sandvik DS510	
Sandvik DS511	
Sandvik DS512i	

Safety and environmental improvement



Tramming cameras system for underground drills

Description

In Underground mining, confined space and limited visibility due to dust or poor lighting increase the risk of collision with pedestrians, other machines or walls. Collision is one of the major risk on underground mining with several fatalities registered every year.

In order to increase the visibility of the operator and to limit risk of collision, Sandvik has developed cameras system for Underground drills.

Cameras system improves the safety by increasing the operator field of vision, allowing view on the blind areas. It also limits the risk of collision with walls that would cause damages on the equipment.

The systems includes on development drills and bolters two reverse cameras located on the top side of the canopy / cabin and at the back of the machine). A monitor is located on the cabin. On Production drills, there is an additional camera on the front. An optional recording device is also available.

Advantages	Customer values
Increase the field of vision of the operator, allow view on the blind side areas. Limit the risk of collision with a pedestrian. Limit the risk of collision with an other equipment.	Increase safety
Reduces risk of damage on the machine due to collision with walls or other machine.	Reduce operating cost

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD212i	Contact local Sandvik representative	Sandvik DL331	Contact local Sandvik representative
Sandvik DD311		Sandvik DL410	
Sandvik DD321		Sandvik DL411	
Sandvik DD322i		Sandvik DL420	
Sandvik DD410		Sandvik DL421	
Sandvik DD411		Sandvik DL430	
Sandvik DD420		Sandvik DL431	
Sandvik DD421		Sandvik DS311	
Sandvik DD421		Sandvik DS410	
Sandvik DD422i		Sandvik DS411	
Sandvik DD422iE		Sandvik DS420	
Sandvik DD530		Sandvik DS421	
Sandvik DD531		Sandvik DS510	
Sandvik DL311		Sandvik DS511	
Sandvik DL321		Sandvik DS520	

Cabin upgrade for underground drills

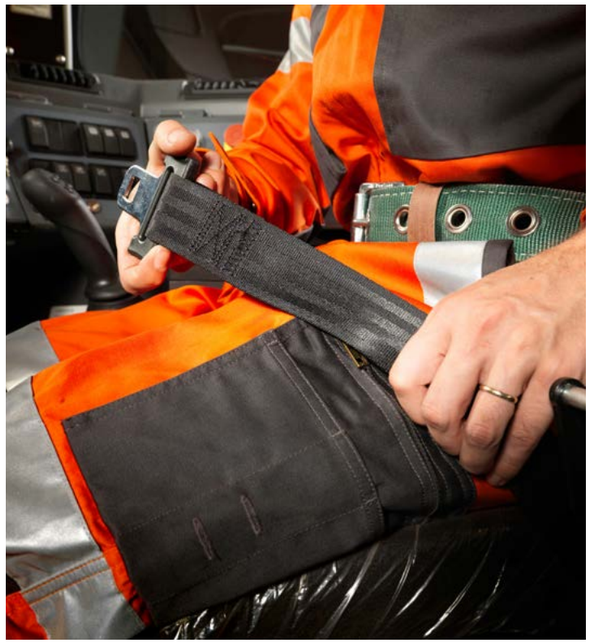
Description
Mining conditions varies and affects the operator's environment. Mining conditions can be dusty, dark, wet, noisy, icy and hot.
Sandvik has designed cabins for it's underground drills to improve operator's safety and comfort. The cabins are designed to be extremely durable. They meet and exceed the international standard:
ISO 3449 - Falling Object Protective Structure (FOPS).
ISO 3471 - Roll-Over Protective Structure (ROPS).
Sandvik Cabin offers low noise (LpA 80 dB according EN 791) and vibration levels (0.5 m/s² according EN 791) and allows emergency exit.
Cabin upgrade solution includes Air Conditioning system.
Heating system and Window Protective Grill are available as option. Acid Proof cabin (stainless steel) version is available on selected machine models (only FOPS).
Cabin have to be selected according the height of the mine site galleries. Low cabin version available on selected machine models.

Advantages	Customer values
Cabin meet and exceed international safety requirements FOPS & ROPS.	Improve operator's safety and comfort
Protect operator from excessive noise vibration and dust exposure.	
Protect operator from hot or cold environment.	

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD311	Contact local Sandvik representative	Sandvik DL420	Contact local Sandvik representative
Sandvik DD320		Sandvik DL421	
Sandvik DD321		Sandvik DL430	
Sandvik DD320		Sandvik DL431	
Sandvik DD410		Sandvik DS311	
Sandvik DD411		Sandvik DS410	
Sandvik DD420		Sandvik DS411	
Sandvik DD421		Sandvik DS420	
Sandvik DL321		Sandvik D421	
Sandvik DL331			

Doors and seat belt interlock for underground drills

Description
Cabin doors and seat belt are essential safety system to limit the risk of injury during machine tramming phases.
In order to insure these safety elements are operational; means cabin doors are closed and safety belt is locked, the Sandvik Doors and Safety Belt Interlock System can be added on your underground drills.
With the Sandvik Doors and Safety Belt Interlock System, the park brake release is prevented if both cabin doors are not closed and safety belt is not locked.
Furthermore, if during machine's tramming phase, the doors are opened or seat belt unlocked, a strong alarm will sound, forcing the operator to stop the machine and solving the issue.
The brakes are NOT automatically applying if, during machine's tramming phase, the doors are opened or seat belt unlocked, as sudden automatic braking causes an additional risk to a person who does not wear a seat belt.
The Doors and Safety Belt Interlock System retrofit kit is delivered with all needed parts including, switches, brackets, electric wiring, operator manual update, etc.



Advantages	Customer values
Insure cabin doors are closed and seat belt always fasten when the machine is tramming.	Improve safety

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD212i	Contact local Sandvik representative	Sandvik DD422iE	Contact local Sandvik representative
Sandvik DD310		Sandvik DL320	
Sandvik DD311		Sandvik DL321	
Sandvik DD312i		Sandvik DL330	
Sandvik DD320		Sandvik DL331	
Sandvik DD321		Sandvik DL421	
Sandvik DD410		Sandvik DL431	
Sandvik DD411		Sandvik DS310	
Sandvik DD420		Sandvik DS311	
Sandvik DD421		Sandvik DS312	
Sandvik DD422i		Sandvik DS421	
Sandvik DS421			

Cabin safety grill for underground drills

Description
When drilling in poor ground condition, rock may fall from the roof and hit the cabin windshield, generating risk of injuries for the operator and damages on the unit.
In order to improve safety of the operations, Sandvik has designed the Cabin Safety Grill that provides additional protection against frontal falls of rock.
The safety grill is mounted on the cabin to cover the front windshield and folds up manually, allowing cleaning or replacement of the windshield, or servicing the window wiper(s).

Advantages	Customer values
Provide protection if rock hit the cabin windshield.	Improve Safety
Limit the risk of damage on the cabin front windshield	Reduce operating cost

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD212i	Contact local Sandvik representative	Sandvik DL330	Contact local Sandvik representative
Sandvik DD310		Sandvik DL331	
Sandvik DD311		Sandvik DL420	
Sandvik DD320		Sandvik DL421	
Sandvik DD321		Sandvik DL430	
Sandvik DD410		Sandvik DL431	
Sandvik DD411		Sandvik DS310	
Sandvik DD420		Sandvik DS311	
Sandvik DD421		Sandvik DS410	
Sandvik DD531		Sandvik DS411	
Sandvik DL310		Sandvik DS420	
Sandvik DL311		Sandvik DS421	
Sandvik DL320		Sandvik DB311	
Sandvik DL321		Sandvik DB311	

Canopy safety grill for Sandvik low profile drills

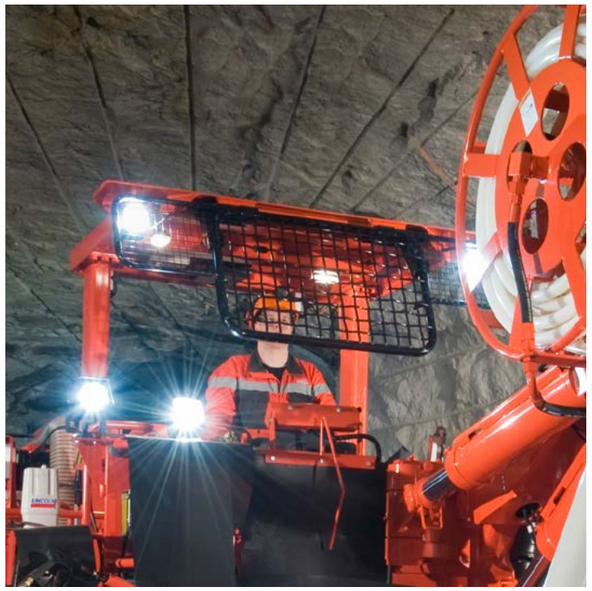
Description
When drilling in poor ground condition, rock may fall, roll on the boom structure down to the operator's compartment . Consequences could be fatal injuries for the operator and severe damages for the unit.
In order to strongly mitigate this risk, Sandvik has designed a specific Canopy Safety Grill for the Low Profile drills.
Canopy Safety Grill provides extra protection in poor ground environments. Designed to protect low profile drill operator compartments against frontal falls of ground, this self-movable grill improves operator safety.
The grill design allows to keep the canopy variable height function.
The energy deflected is exactly in line with the normalized value used for FOPS dimensioning of the operator canopy (11.6 kJ). The protection was calculated to absorb the impact of a rock weighing 500 kilograms falling from a height of four meters. In a typical low profile environment with a room height of 2.3 meters, that means the screen protection is designed to absorb the impact of a rock weighing two tons.

Advantages	Customer values
Protect the operator in case of frontal falls of ground.	Improve safety
Reduce the risk of damages on the unit	Reduce operating cost

Machine models	Part Numbers
Sandvik DD210L	BT00001916
Sandvik DD210L-V	BT00001916
Sandvik DD211L	BT00001916
Sandvik DD211L-V	BT00001916
Sandvik DL230	BT00001916
Sandvik DS210L	BT00001916
Sandvik DS210L-V	BT00001916
Sandvik DS210L-M	BT00001916
Sandvik DS211L-V	BT00004610
Sandvik DS211L-M	BT00004610
Sandvik DS221L	BT00004610

Canopy safety grill for underground drills

Description
When drilling in poor ground condition, rock may fall, roll on the boom structure down to the operator's compartment. Consequences could be fatal injuries for the operator and severe damages for the unit.
In order to strongly mitigate this risk, Sandvik has designed a specific canopy safety grill for underground drills.
The safety grill is mounted on the canopy to protect the front of the operator compartment from rock falls and projections. The grill design allows to keep the canopy variable height function.



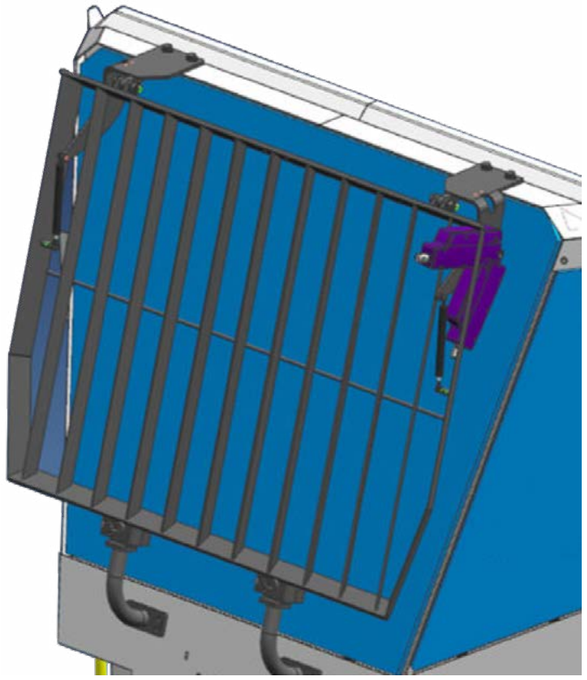
Advantages	Customer values
Protect the operator in case of frontal falls of ground.	Improve safety
Reduce the risk of damages on the unit.	Reduce operating cost

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD210		Sandvik DL2721	
Sandvik DD212*		Sandvik DL311	
Sandvik DD212i*		Sandvik DL321	
Sandvik DD2710		Sandvik DL331	
Sandvik DD2711		Sandvik DL411	
Sandvik DD311		Sandvik DL421	
Sandvik DD321	Contact local Sandvik representative	Sandvik DL431	Contact local Sandvik representative
Sandvik DD411		Sandvik DS311	
Sandvik DD421		Sandvik DS312	
Sandvik DL210		Sandvik DS411	
Sandvik DL230		Sandvik DS421	
Sandvik DL2710		Sandvik DS511	
Sandvik DL2711		Sandvik DB311	
Sandvik DL2720		Sandvik DB331	

*Only frontal or "all around" safety grill available.

Electrically activated safety grill for underground drills

Description
Poor visibility is a major factor on the risk of collision when operating underground drills. That's why keeping the cabin windows as clean as possible is very important.
Sandvik has improved the cabin's windscreen Safety Grill system in order to make it easier to clean.
Now the grill can be lifted with the help of an electrical actuator so that the window can be cleaned more easily from the ground level.



Advantages	Customer values
Electric system that helps to lift the windscreen's safety grill.	Allows to clean more easily the windscreen. Improve safety.

Machine models	Part Numbers
Sandvik DD422i	
Sandvik DD422iE	
Sandvik DL422i	
Sandvik DL422iE	
Sandvik DL432i	
Sandvik DU412i	Contact local Sandvik representative
Sandvik DU422i-W	
Sandvik DS412i	
Sandvik DS412iE	
Sandvik DS422i	
Sandvik DS512i	

Cabin heating system for underground drills

Description

Cold temperatures have hazardous effects on humans and their ability to work well. When the body is exposed to cold temperatures, the negative effects can includes dehydration, numbness, shivering, frostbite and hypothermia. This can lead to extended reactivity time, fatigue, uncontrolled movements or loss of lucidity that increase the risk of loss of control and accident.

In order to mitigate this risk, Sandvik has developed Heating Systems for their Underground Drills equipped with cabin.

The Heating Systems are able to generate sufficient heat in the cabin, even on the coldest ambient temperatures.

On D301 series, the heating system consist on a “mini boiler” fueled by diesel (from unit diesel tank). The system is operational on both drilling and tramming modes.

On larger units, the heating system use cooling fluid from the engine cooling system to generate heat while the engine is running (tramming phases). During drilling phases, the heat is generated by electric resistance located on the AC system. The temperature on the cabin is fully adjustable with a simple knob.

Advantages	Customer values
System that provides heat on the cabin during drilling and tramming phases.	Reduce risk of accident due to negative effect of cold ambient temperature. Improve operator’s comfort.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD212i	Contact local Sandvik representative	Sandvik DL421	Contact local Sandvik representative
Sandvik DD311		Sandvik DL430	
Sandvik DD312i		Sandvik DL431	
Sandvik DD321		Sandvik DS310	
Sandvik DD322i		Sandvik DS311	
Sandvik DD422i		Sandvik DS312	
Sandvik DD410		Sandvik DS410	
Sandvik DD411		Sandvik DS411	
Sandvik DD420		Sandvik DS412i	
Sandvik DD421		Sandvik DS412iE	
Sandvik DD530		Sandvik DS420	
Sandvik DD531		Sandvik DS421	
Sandvik DL320		Sandvik DS510	
Sandvik DL321		Sandvik DS511	
Sandvik DL330		Sandvik DS512i	
Sandvik DL331		Sandvik DB311	
Sandvik DL420		Sandvik DB331	

Assisted emergency steering for underground drills

Description

In case of failure of the diesel engine or the coupling between the engine and the tramming motor, it is very difficult to tow the unit as brakes are still applied, jacks might be on the ground and steering is very difficult (or even almost impossible) to operate with the orbitrol function.

In order to make safer and to ease the towing procedure, Sandvik offer the possibility to equip the machine with motorized emergency steering retrofit kit.

The system consist on a hydraulic pump (supplied in 24V by the machine’s batteries), activated with a button located on the operator’s dashboard. The operator must keep the button pressed so that the system stays activated (hold-to-run). When both emergency pump and parking brake release buttons are pushed, the electric motor of the pump unit is activated, and the pump starts to provide flow to activate the steering, lift-up the jacks and release the brake.

Advantages	Customer values
Eases and make the towing operation by making steering, brake release and jack lift easier.	Safer and easier towing procedure. Reduce machine immobilization time

Machine models	Part Numbers
Sandvik DD211L	Contact local Sandvik representative
Sandvik DD211L-V	

Access detector for underground drills

Description
The working area of the boom(s) of an underground drill is a dangerous areas. The risk of injury due to rock fall, collision with moving boom(s), or rotating drilling rod is major, and statistics show several fatalities registered every year due to these causes.
In order to reduce this risk, Sandvik has developed the access detector system for UG drills.
Access detector is a systems enhancing safer drilling operations by decreasing risks caused by human actions and errors. The system detects access from both sides of the drill rig thanks to a laser scanner located at the back of the machine.
When Sandvik Access Detector is actuated by a person entering the hazard zone, it warns the operator with a visual warning. The operator may continue the drilling operation normally but he/she must ensure that no-one is in the hazard zone.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD210	Contact local Sandvik representative	Sandvik DL421	Contact local Sandvik representative
Sandvik DD212		Sandvik DL422i	
Sandvik DD212i		Sandvik DL422iE	
Sandvik DD311		Sandvik DL431	
Sandvik DD312i		Sandvik DL432i	
Sandvik DD321		Sandvik DU412i	
Sandvik DD322i		Sandvik DS311	
Sandvik DD411		Sandvik DS312	
Sandvik DD421		Sandvik DS411	
Sandvik DD422i		Sandvik DS412i	
Sandvik DD422iE		Sandvik DS412iE	
Sandvik DD531		Sandvik DS421	
Sandvik DL210		Sandvik DS422i	
Sandvik DL230		Sandvik DS511	
Sandvik DL311		Sandvik DS512i	
Sandvik DL321		Sandvik DB311	
Sandvik DL331		Sandvik DB331	
Sandvik DL411			

Advantages	Customer values
Warn the operator when somebody entering the hazard zone of the machine.	Improve Safety

Access protector for underground drills

Description
The working area of the boom(s) of an underground drill is a dangerous areas. The risk of injury due to rock fall, collision with moving boom(s), or rotating drilling rod is major, and statistics show several fatalities registered every year due to these causes.
In order to mitigate this risk, Sandvik has developed the access protector system for UG drills.
If the Sandvik Access Protector system recognizes a person in the detection field, thanks to laser scanner fences located on both sides of the machine, boom and drilling movements will automatically be stopped. In other words, the Sandvik access protector prevents anyone from entering the working area of the booms while they are in operation. If boom operation is automatically stopped, the system must be reset by pressing the acknowledgment button, after ensuring that no-one is in the hazard zone.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD212	Contact local Sandvik representative	Sandvik DL422i	Contact local Sandvik representative
Sandvik DD212i		Sandvik DL422iE	
Sandvik DD311		Sandvik DL431	
Sandvik DD312i		Sandvik DL432i	
Sandvik DD321		Sandvik DU412i	
Sandvik DD322i		Sandvik DU422i-W	
Sandvik DD411		Sandvik DS311	
Sandvik DD421		Sandvik DS312	
Sandvik DD422i		Sandvik DS412i	
Sandvik DD422iE		Sandvik DS412i	
Sandvik DL311		Sandvik DS412iE	
Sandvik DL321		Sandvik DS422i	
Sandvik DL331		Sandvik DS512i	
Sandvik DL411		Sandvik DB331	
Sandvik DL421			

Advantages	Customer values
Stop automatically all boom and drilling movements as soon as somebody enter the dangerous working area of the boom(s).	Improve safety

PDS interface for underground drills

Description
Collision between vehicles or between machines and pedestrians is one of the major risk on underground mining. Collision with another vehicle or person could cause death or severe injury.
Proximity Detection System (PDS) is technologies or devices that actively detect close encounters between two or more objects and transmit this information to an interface system that takes automatic action to render the equipment to a safe state when potentially dangerous interaction occurs.
PDS are generally designed to inform the machine to slow down and/or eventually stop the equipment in case of collision risk with a person or an object carrying a tag.
The Sandvik proximity detection system interface allows to link third-party proximity detection system and the Sandvik equipment.

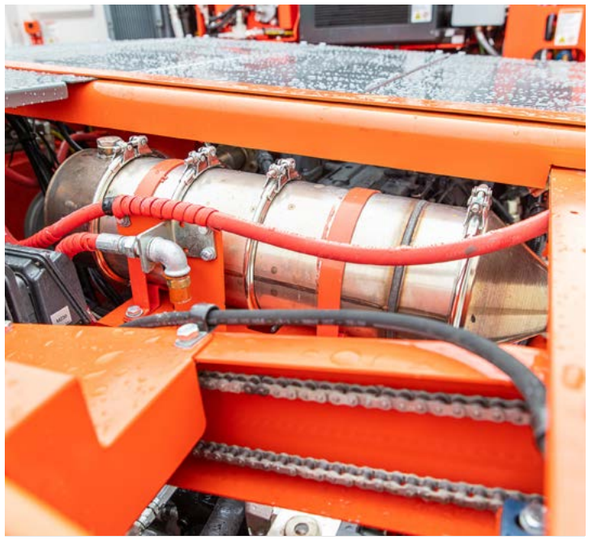
Machine models	Part Numbers	Machine models	Part Numbers
Tamrock Axera LP	BG01091286[1)]	Sandvik DL311	Contact local Sandvik representative
Sandvik DD210L	BG01091286[1)]	Sandvik DL321	
Sandvik DD211L	BG01805306[2)]	Sandvik DL331	
Sandvik DD211L-V	BG01805306[2)]	Sandvik DL411	BG01811423[3)]
Tamrock Hybrid Bolter	BG01091286[1)]	Sandvik DL411-C	BG01811427[3)]
Tamrock Robolt LP-M	BG01091286[1)]	Sandvik DL421	BG01811423[3)]
Sandvik DS210L-V	BG01091286[1)]	Sandvik DL421-C	BG01811427[3)]
Sandvik DS210L-M	BG01091286[1)]	Sandvik DL422i	Contact local Sandvik representative
Sandvik DS211L-V	BG01805306[2)]	Sandvik DL422iE	
Sandvik DS211L-M	BG01805306[2)]	Sandvik DL431	BG01811423[3)]
Sandvik DS221L	Contact local Sandvik representative	Sandvik DL431-C	BG01811427[3)]
Sandvik DD212i		Sandvik DL432i	Contact local Sandvik representative
Sandvik DD311		Sandvik DU412i	
Sandvik DD312i		Sandvik DS311	
Sandvik DD321	BG01811423[3)]	Sandvik DS312	
Sandvik DD321-C	BG01811427[3)]	Sandvik DS411	BG01811423[3)]
Sandvik DD322i	Contact local Sandvik representative	Sandvik DS411-C	BG01811427[3)]
Sandvik DD411	BG01811423[3)]	Sandvik DS412i	Contact local Sandvik representative
Sandvik DD411-C	BG01811427[3)]	Sandvik DS412iE	
Sandvik DD421	BG01811423[3)]	Sandvik DS421	BG01811423[3)]
Sandvik DD421-C	BG01811427[3)]	Sandvik DS421-C	BG01811427[3)]
Sandvik DD422i	Contact local Sandvik representative	Sandvik DS422i	Contact local Sandvik representative
Sandvik DD422iE		Sandvik DS512i	

Advantages	Customer values
Allow to link a third party PDS with the Sandvik equipment tramming and braking systems.	OEM solution that ensure the perfect interaction of the third party PDS with the Sandvik machine systems
On large drills, the system supports the use of three PDS “detection zones”	Allows to warn the operator of potential danger in gradual way and act accordingly before the machine stops automatically.

1) Basic level. Non ISO 21815-2 compliant.
2) Level 9. Non ISO 21815-2 compliant.
3) Only for machines equipped with MB engines

Diesel Particulate Filter (D.P.F.) for underground drills

Description
Diesel exhaust particles are dangerous for health. Prolonged exposure to high concentrations of diesel particulate matter increases a worker’s risk of cardiovascular, cardiopulmonary and respiratory disease, and lung cancer. This is especially true on the confined underground environment.
In order to prevent the small, health-endangering diesel exhaust particles and carcinogenic toxins from spreading into the environment, Sandvik offers Diesel Particulate Filter (DPF) retrofit kit for the D201L range.
The DPF uses sintered metal filter with external regeneration technology. It is protected by an on-board diagnostic system. The system will give an early alarm to the operator if something is wrong before any serious failure can occur. The Diesel Particulate Filter has to be cleaned regularly simply with a water HP cleaner.



Advantages	Customer values
Reduce by up to 90% the diesel exhaust particles emissions.	Increase safety.
On-board diagnostic system that monitor the condition of the DPF and alarm the operator in case of issue before serious and expensive failure occur.	Reduce operating cost.

Machine models	Part Numbers
Sandvik DD211L	Contact local Sandvik representative
Sandvik DD211L-V	
Sandvik DS211L-V	
Sandvik DS211L-M	

Eclipse™ fire suppression for underground drills

Description

From diesel fuels to hydraulic fluids, heavy equipment depends on flammable liquids to keep moving. The dangers associated with underground mine fires are multifaceted, often leading to devastating consequences. These fires can produce toxic gases, such as carbon monoxide and hydrogen sulphide, which can cause respiratory failure and even death. In addition, , the intense heat generated by these fires can lead to the collapse of mine structures, trapping miners and hindering rescue efforts.

Sandvik Eclipse™ is a crucial component of your safety management system to protect people, investments and equipment. Sandvik Eclipse™ fire suppression systems are designed and tested to meet the most stringent requirements of fire protection on mobile and transportable equipment, including underground drilling applications.

Compared to traditional dry powder systems, Eclipse™ is up to 30 percent more effective on super-heated surfaces. Our Sandvik system is equipped with liquid agents to attack all the elements a fire needs to ignite - heat, fuel and oxygen (fire triangle).

Automatic activation is a standard feature and the rapid cooling effect blocks the risk of re-ignition. The engine is also automatically shut-down.

The system is very efficient to service and maintain and can be installed on new or existing equipment - regardless of size or brand.

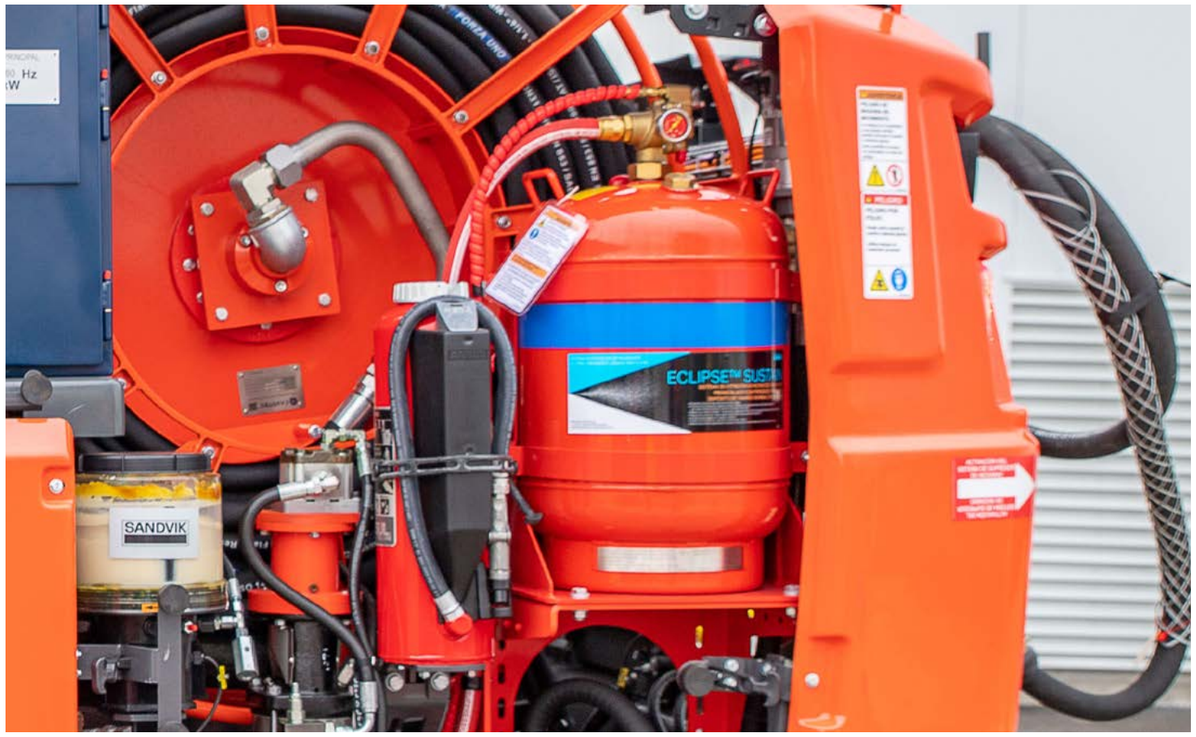
Sandvik Eclipse™ It is available in two versions to suit global application:

Sandvik Eclipse™ Sustain is suitable for climates 0°C to + 60°C. The tank contains foam concentrate and water solution. The mixture is fluorine free making it environmentally sustainable.

Sandvik Eclipse™ Extreme is suitable for climates - 40°C to + 60°C. The tank contains a pre-mixed liquid agent for the harshest of environments.

The reliable automatic activation concept and system hardware remains identical between Eclipse™ Sustain and Eclipse™ Extreme.

Eclipse™ is a smart way to reduce the risk of injuries, production loss, costly repairs and replacements. Design flexibility and a range of different tank sizes make it possible to install Eclipse™ on a wide range of mobile plants and equipment.



Advantages	Customer Values
Fully automated activation (loss-of-pressure activation) and engine shutdown standard on all systems. Foam fire extinguishing cutting off oxygen, vapor sealing and cooling down superheated surfaces (such as turbo charger and engine manifold).	Increase safety. System 30% more efficient compared to traditional dry powder systems.
Quick and efficient on site discharge testing and servicing. Quick recharge times for productivity	Easy testing and services procedures. Increase machine availability (productivity).

Machine models	Part Numbers
All equipment	Contact local Sandvik representative

Rod changer for Sandvik DL210

Description

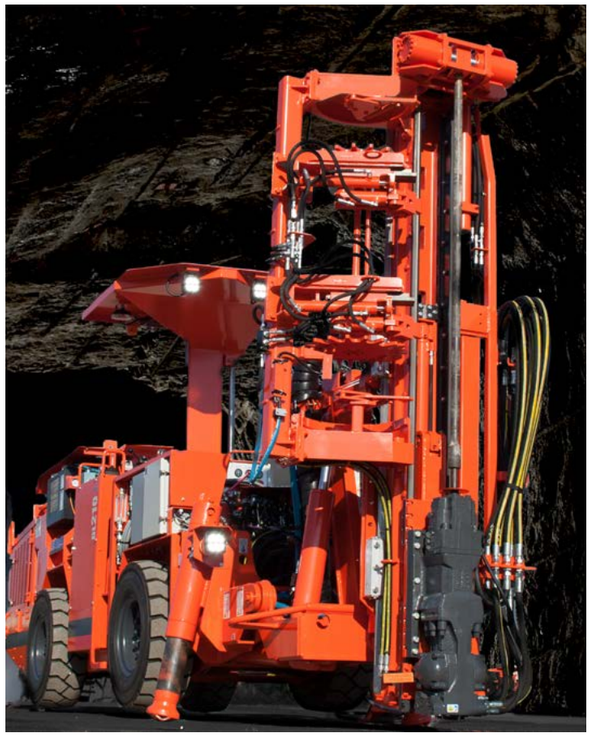
Adding manually rods on the feed is an hazardous task as the personnel in charge is exposed to risks of fatal injuries due to rock falls, rotative parts, unexpected boom movements, etc...

In order to improve the safety of the operation of the DL210 and mitigate the risk of accident during addition and removal of rods on the feed, Sandvik has developed a compact rod changer for this machine model.

The rod changer has arms geometry optimized for fast and accurate rod handling. It is manufactured of heavy duty steel and fitted with large diameter bushings for increased service life. The rod handler consists of a hydraulic motor powered carousel type magazine and rotation mechanism, index plates, front and rear end plates, and sliding arms with gripping jaws.

The rod changer is designed for R32, T38 or T45 MF rods. When changing between rod diameters the index plates and gripping jaw wear pieces must be changed (upgrade modification kit available).

The use of rock drill power extractor is recommended in combination with Rod handler, for the ease of uncoupling rods and for improved productivity (Upgrade Solution available).



Rods length		3”	4”	5”
Storing Capacity (Number of rods)	R32	12+1	12+1	12+1
	T38	11+1	11+1	11+1
	T45	10+1	10+1	10+1
Maximal hole Length (m)	R32	12,1	15,4	19,5
	T38	11,2	14,3	18,0
	T45	10,3	13,1	16,4

Advantages	Customer values
Avoid manual operation near the drilling module during drilling operations.	Improve safety

Machine models	Part Numbers
Sandvik DL210	Contact local Sandvik representative

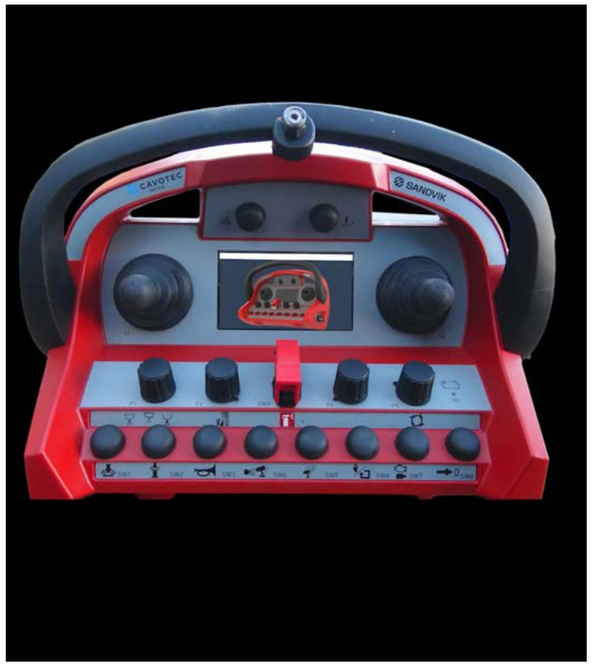
Radio remote control for Sandvik DL210

Description

The Sandvik DL210 longhole rigs are originally equipped with an remote control connected to the machine with a cable. Handling this big and heavy remote control is not always easy, just like handling the cable that can be easily damaged has it lie on the ground when the machine is operating.

To ease the operation and improve the comfort of the operator, thanks to the new the ergonomic of the controls, Sandvik offer to retrofit the active Sandvik DL210 with a new radio remote control.

The radio remote control is lighter and offer better ergonomics for the operator. It is also possible to position the TIS display on it if the machine is equipped with this instrumentation system.



Advantages	Customer values
The radio remote control is lighter and have better ergonomics No cable to manage.	Improve ergonomics Mitigate the risk of remote control cable damage.

Machine models	Part Numbers
Sandvik DL210	Contact local Sandvik representative

Screen handler for bolters

Description
Installation of mesh during support installation can be very hazardous if people have to go under the non supported area during the installation process.
To mitigate this risk, Sandvik has developed the SH Screen handler for DS2710 and DS300 series.
The SH Screen Handler is a hydraulic telescopic boom specially designed for the mechanization of screen installation, along the roof and/or side walls, handled by only one operator from the control station.
Not only safety and productivity are increased, but difficult places to reach are now accessible.
The system is mounted directly on the TUC or SBH bolting head goose neck. The use of the screen manipulator is simple, reliable and easy.
It can install rigid expanded metal mesh or welded wire mesh screen sheets.

Advantages	Customer values
Allows the mechanized installation of support mesh without having anybody on the unsupported area.	Improves safety by avoiding injuries due to rock fall during mesh installation.
Simple, reliable and easy to use system.	Require minimal maintenance and training.

Machine models	Part Numbers
Sandvik DS2710	Contact local Sandvik representative
Sandvik DS2711	
Sandvik DS310	
Sandvik DS311	

Screen handler boom for bolters

Description
Installation of mesh during support installation can be very hazardous if people have to go under the non supported area during the installation process.
To mitigate this risk, Sandvik has developed the SH Screen handler on separate boom for large bolters.
The Screen Handler is a hydraulic telescopic boom specially designed for the mechanization of screen / wire mesh installation, along the hanging wall / back and / or side walls.
It is controlled by the operator from the drilling control panel.
This shortens the rock reinforcement cycle and optimizes the meshing support efficiency, because the mesh is directly pinned up with rock supporting bolts.
In addition, the meshing job will be safely done from a comfortable safety cabin or canopy.

Advantages	Customer values
Allows the mechanized installation of support mesh without having anybody on the unsupported area. Optimize meshing support efficiency.	Improves safety by avoiding injuries due to rock fall during mesh installation.
Shortens bolting cycle.	Improve productivity.

Machine models	Part Numbers
Sandvik DS410	Contact local Sandvik representative
Sandvik DS411	
Sandvik DS412i	
Sandvik DS412iE	
Sandvik DS510	
Sandvik DS511	
Sandvik DS512i	

Roll mesh handler interface for bolters

Description

Installation of mesh in roll during rock support operations can be very hazardous if people have to go under the non supported area during the installation process. Also, this task is often difficult and long to perform.

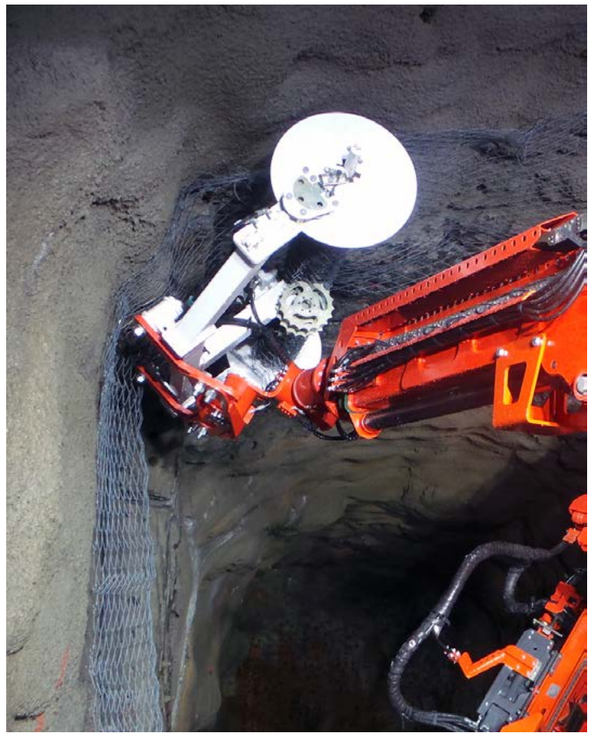
In Order to mitigate risks during mesh installation and also to ease and speed up the rock support process, Sandvik has developed an interface that allows our customer to install roll mesh handler on Sandvik large bolters

The Roll Mesh Handler is a mechanized unrolling device mounted on a dedicated boom (screen handler boom if the unit is already equipped with this option). It is a simple and robust system.

The mesh roll is automatically grasped and unwound along the tunnel profile in both directions (vertically and horizontally). During the process, the installation crew is never exposed to working under unsupported ground, and so, protected from rock fall hazard.

The Roll Mesh Handler ease and speed up the installation of mesh as manual work is kept to a minimum and greater quantities of mesh can be processed simultaneously.

Note: Sandvik only commercialize the interface. Roll mesh handler has to be bought separately directly from the distributor of it manufacturer. For more information, ask your local Sandvik representative.



Advantages	Customer values
Allows to install mesh in roll without exposing people under the unsupported ground.	Improve safety by protecting people from rock fall during mesh installation process..
Ease and speed up the mesh installation process.	Improve productivity.
Simple and robust system.	Low operating cost.

Machine models	Part Numbers
Sandvik DS411	Contact local Sandvik representative
Sandvik DS412i	
Sandvik DS412iE	
Sandvik DS512i	

Tubes manipulator for production drills

Description

Drilling rods and tubes could be quite difficult and dangerous to manipulate as they are weighing several tenth of kilos. Also, the shape of rods make it difficult to handle with a standard crane, without specific tools .

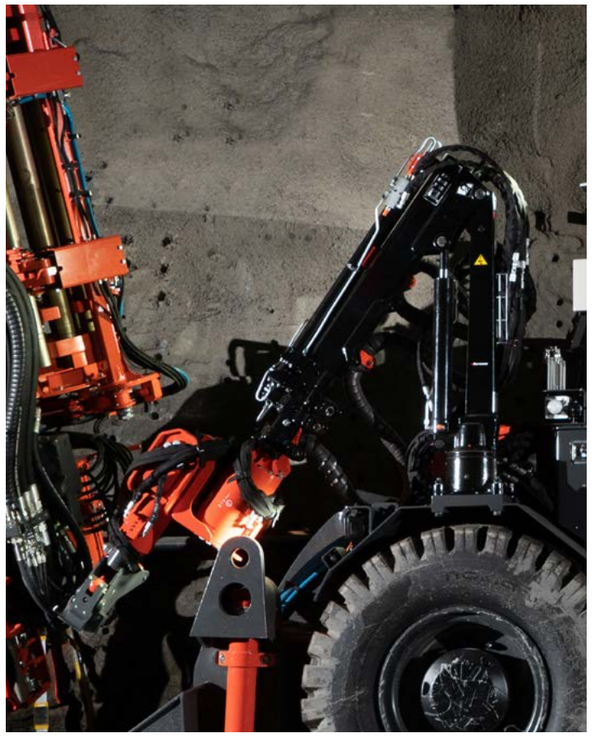
In order to make tube carousel loading operation safer and easier, Sandvik offer the possibility to equip the DL421 and the DL422i with a Tube Manipulator.

The Tube Manipulator is an additional hydraulic telescopic boom that can be used to grab drilling rods/ tubes on the floor and place it on the carousel of the drilling module. The system is controlled with a radio remote control.

It can lift up to 125 kg when retracted and 55 kg in fully extended position and can reach up to 3,8 m from it base.

Associate with the specific tool P/N: BG00405451 and a lifting chain, the Tube manipulator can also be used to handle the rock drill flushing head (i.e. for shank adapter change or service).

The Tube Handler system is only available on units equipped with cabin.



Advantages	Customer values
Allows to manipulate the drilling rods / Tubes safely. Allows to handle safely the rock drill flushing head.	Improve safety.

Machine models	Part Numbers
Sandvik DL421-C	Contact local Sandvik representative
Sandvik DL422i	
Sandvik DL422iE	

Lifecycle cost improvement

Boom suspension system for underground drills

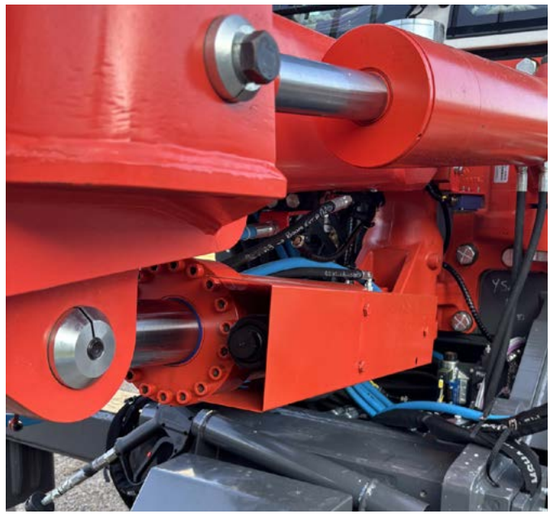
Description

Based on it long experience on mining equipment design and testing, Sandvik introduces a new Boom Suspension System, dedicated to UG drills.

The main purpose of this System is to extend the lifetime of boom and carrier parts by reducing the vibrations and peak forces carried to the boom when the machine is tramming on tunnels. It also improves significantly the operator comfort.

When the park brake is released and motion switch activated, the Boom Suspension System is in function. A special piston pressure accumulator, connected directly to the boom lift cylinder, absorbs most of the picks of pressures generated and preserve the rest of the structure from high stress and vibrations.

The Boom Suspension System can be disabled easily, if needed, with a simple electric switch, from the operator compartment. Due to the small size of the accumulator, the system fulfills all the local regulations (EU, CRN).



Advantages	Customer values
Life of the boom parts (extension tube, skids, pins, etc.) is extended by +60% due to reduced stress and vibrations carried by the boom. Reduce the stress on front carrier structure and on front axle. Avoid engine rpm fluctuations. Reduce stress on transmission. Decrease the amount of failures and repairs	Reduce the operating cost
Operator is less exposed to vibrations and machine's movements during tramming. Decrease the risk of boom structure failures that could generates accident while the machine is tramming.	Improve safety and ergonomics
Reduce the risk of downtime due to boom parts failures, front carrier cracks or axles failures.	Improve productivity

Machine models	Part Numbers
Sandvik DD210L	
Sandvik DD211L	Contact local Sandvik representative
Sandvik DL230L	
Sandvik DS210L-M	BG01253627
Sandvik DS211L-M	
Sandvik DD212	
Sandvik DD212i	
Sandvik DD31	Contact local Sandvik representative
Sandvik DD312i	
Sandvik DL330	
Sandvik DS310	
Sandvik DS311	BG01206978
Sandvik DS312	Contact local Sandvik representative

*Only with B26LC boom.

Health Monitoring for underground drills

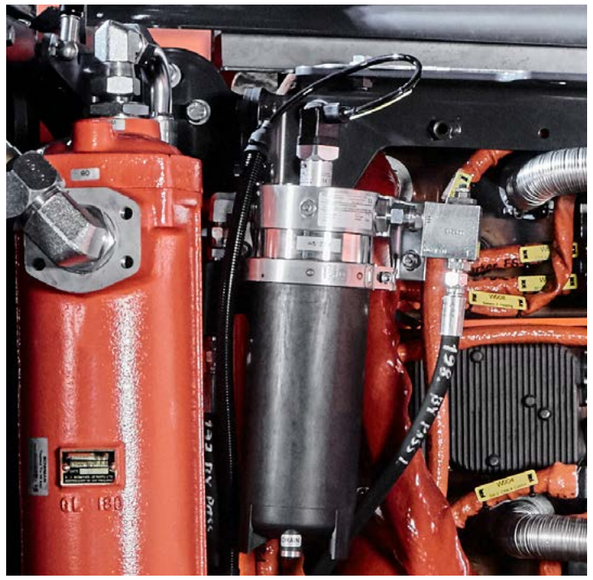
Description
Scheduled maintenance done at regular interval is NOT the most optimized maintenance strategy as there are risk to under or over-maintaining the machine.
The Sandvik Health Monitoring System allows to switch easily to an optimized conditional maintenance strategy by monitoring the real condition of your machine.
Thanks to a network of sensors the Sandvik Health Monitoring System measures and transfer information about the operating state and wear level of the main machine's systems.
The Sandvik Health Monitoring System makes your machine "intelligent" by collecting easily reliable data that will help you to follow closely the condition of the main systems of your drill rig and so, to make maintenance decision based on real facts!
The data measured by the Health Monitoring System are transferred to the My Sandvik Digital Services Knowledge Box™. These data are used to build My Sandvik Productivity reports that gives a direct overview of fleet condition, utilization and performance. It also gives access to alarm and signal reports to detect early safety violations or lower performance issues.
Digitalization is true as we speak and market is moving fast. With your machines being ready to send reliable and applicable data you can make your decisions based on facts that weren't visible before.

System Monitored	Feature	Advantages
Rock drill(s) (Only Machines equipped with rock drills with stabilizer system)	Measurement of the pressure on the return line of the rock drill(s) stabilizer system	Provides indications about wear state of the rock drill(s). Monitor the condition of the rock drill(s) and perform maintenance accordingly to prevent catastrophic failures.
Shank lubrication	Measurement of Temperature and water content of shank lubrication oil.	Monitor shank lub oil water content and T°. Control the shank lubrication oil quality. Prevent issues due to oil water contamination on shank lubrication oil like piston striking face cracks and failures, corrosion and premature wears of bushings and bearings.
Hydraulic system	Measurement of load on powerpack motor(s) with current transducer(s). Measurement of the temperature and water content on the hydraulic oil.	Estimate hydraulic system condition and detect loss of performance of the main components to anticipate failures. Monitor hydraulic oil temperature and water content to identify issues and failures before important consequences.
Drilling parameters	Measurement of Percussion, rotation and feed pressures.	Overall look at fleet's utilization and performance to improve efficiency for different shifts, as well as compare them on the My Sandvik Productivity reports.
Water flushing	Measurement of Water flushing pressure.	Identify issues with mine water supply or water pump condition.
Mine water supply	Measurement of Mine water supply pressure and temperature.	Identify issues on the mine water supply and help you to take the appropriate measures to solve the issues before important loss of productivity or machines failures.
Mine electric supply	Measurement of Mine electric voltage.	Alerts in case of wrong voltage input. Helps to take the appropriate measures to solve the issues before important loss of productivity or machines failures.
Operating environment	Measurement of machine environment T° and humidity.	The Health Monitoring System Upgrade Solution is available for the following UG Drills.

Machine models	Part Numbers
Sandvik DD311	Contact local Sandvik representative
Sandvik DD321	
Sandvik DD421	

Additional parallel filtration for underground drills

Description
Underground Mining operations have to run smoothly and economically with limited or no downtime to be successful. Unplanned equipment breakdown can often be the most timely and expensive setbacks for mining companies. And a majority of the failures concerns the hydraulic systems of the machines. The components that are parts of the hydraulic systems (Rock drills, pumps, cylinders, valves...) are generally very expensive and difficult to troubleshoot and replace.
Studies provided by suppliers of hydraulic components, show that up to 80% of the hydraulic systems failures are caused by excessive hydraulic oil contamination. The most efficient solution to reduce dramatically the risk of failures of hydraulic components is to control and limit the contamination level of the hydraulic oil. This means that hydraulic fluids maintenance should be a top priority during maintenance operations.
Sandvik always promotes the best maintenance practices and would like to help his customers to manage the hydraulic oil contamination level. So we have developed an additional parallel filtration system that clean continuously the oil.
This additional filter is mounted in parallel with the hydraulic circuit, which allow a very fine and efficient filtration (2µm absolute). The filter element has a high retention capacity (240g) that makes replacement interval wide and economical. Electric clogging indicator inform when replacement of the element is needed.



Advantages	Customer values
Very efficient filtration that reduce the risk of failure of the hydraulic components	Reduce operating cost
Limit the risk of downtime due to failure of hydraulic component	Preserve productivity

Machine models	Part Numbers
Sandvik DD312i	Contact local Sandvik representative
Sandvik DD322i	
Sandvik DD422i	BG00752286
Sandvik DD422iE	Contact local Sandvik representative
Sandvik DL422i	
Sandvik DL422iE	
Sandvik DL432i	
Sandvik DU412i	
Sandvik DU422i-W	
Sandvik DS412i	
Sandvik DS412iE	
Sandvik DS422i	
Sandvik DS511	
Sandvik DS512i	

KVL-10 to SLU-1 conversion kit for underground drills

Description
Proper Rock drill lubrication is of critical importance to avoid frequent reliability problems and maintain operating cost at an acceptable level. Low lubrication lead to premature wear of bushings, failure of ball bearings and excessive wear of all rotative and sliding parts. Excess of lubrication, or water contamination of the oil leads to frequent failure of the piston striking face and corrosion that weaken the parts.
So we understand that the setting of the lubrication flow is very important as the control of the water content on the oil.
Some of the Sandvik drills are still operating on the field with KVL10-1 shank lubrication system. The function of this system is very basic (which can be considered an advantage) but it has two important critical flaws:
It's impossible to control accurately the oil flow.
The water coming from the moisture on the air flow contaminate the oil in the tank (air flow and oil tank not separated).
In order to limit rock drill failures generated by improper oil flow or water contamination of the lubrication oil, Sandvik offers to replace the KVL10-1 shank lubrication system by SLU-1. SLU-1 shank lubrication system offers the possibility to adjust with great accuracy the oil flow. Also, the oil tank is separated from the air flow, which avoid water contamination of the oil in the tank.

Advantages	Customer values
SLU-1 allows accurate adjustment of the shank lubrication oil flow	Avoid issues generated by lack or excess of shank lubrication oil. Improve reliability.
SLU-1 works with separation of the oil stored in the tank and air flow.	Limit contamination of the oil by moisture in air.

Machine models	Part Numbers
Sandvik DD210	Contact local Sandvik representative
Sandvik DD210L	
Sandvik DD210L-V	
Sandvik DD211L	
Sandvik DD211L-V	
Sandvik DS211L-M	
Sandvik DS211L-V	

Water/air separator auto-bleeding for underground drills

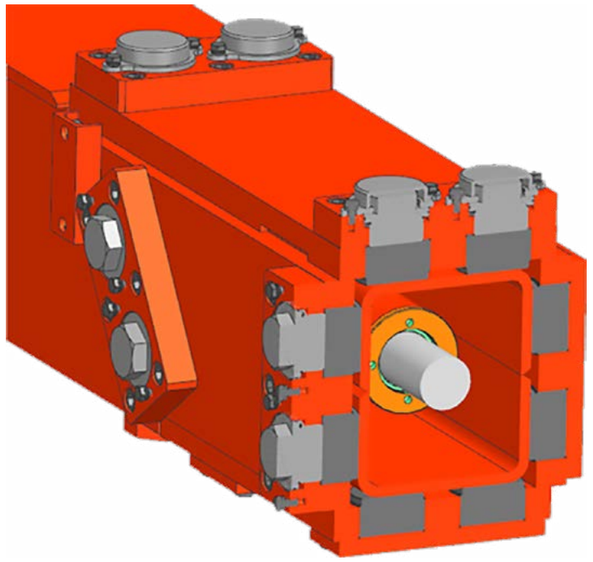
Description
Significant water contamination of the shank lubrication is a serious concern as it generate corrosion that weaken the rock drill parts and can lead to failure of the piston striking face.
In order to limit water contamination, our machines are equipped with Water/Air Separation System on the compressed air line. But this system has to be bled manually regularly in order to ensure the system efficiency. In very humid environment, like underground mine tunnels, the bleeding tap has to be sometimes turned on several times per shift, which can be quite restrictive.
To avoid this repetitive task and to ensure the Water/Air Separator is always protect the rock drill from excessive water contamination in the lubrication oil, Sandvik has developed an Auto Bleeding System upgrade. It automatically drain the water from Separator system. The interval and duration of the drains can be fully set-up to adapt to the machine working environment (air humidity level).

Advantages	Customer values
Ensure proper operation of the air/water separator by automatic bleeding of the water collected.	Limit the risk of rock drill failure due to excessive water contamination of the shank lubrication oil
Reduce daily maintenance tasks	Improve productivity

Machine models	Part Numbers
Sandvik DD210L	BG00653634
Sandvik DD210L-V	
Sandvik DL230L-5	
Sandvik DS210L-V	
Sandvik DS210L-M	
Sandvik DD311	BG00613215
Sandvik DS311	
Sandvik DL331	

B26 boom adjustment pads for underground drills

Description
Correct adjustment of the clearance of the boom extension is important as it affect the drilling precision and an incorrect adjustment can create damages on the outer tube and premature wear of the inner tube, leading to expensive repairs.
But the adjustments of the clearance of the boom extension on the B26 booms can be difficult to perform as it requires to follow a complex process, to do accurate gap measurements and add or remove shims.
In order to simplify the adjustment process, Sandvik has designed a new system that help to adjust the clearance of the boom extension more easily. The new adjustment system consist on a wear pad under a simple threaded adjusting pad, kept in the correct position by the cover. The system is simple and do not require specific tools or extra parts to be adjusted.
The new boom adjustment pads are retrofitable in all B26 booms.



Advantages	Customer values
Make adjustment of the boom extension clearance easier and faster to perform.	Reduce the risk of damages on the boom extension tubes. Good adjustment preserves drilling accuracy. Reduces machine immobilization during service.

Machine models	Part Numbers
Sandvik DD210L	Contact local Sandvik representative
Sandvik DD210L-V	
Sandvik DD211L	
Sandvik DD211L-V	
Sandvik DL330*	
Sandvik DS210L-M	
Sandvik DS211L-M	
Sandvik DD310	
Sandvik DS310	
Sandvik DS311	

*Only with B26LC boom.

Automatic greasing system for underground drills

Description

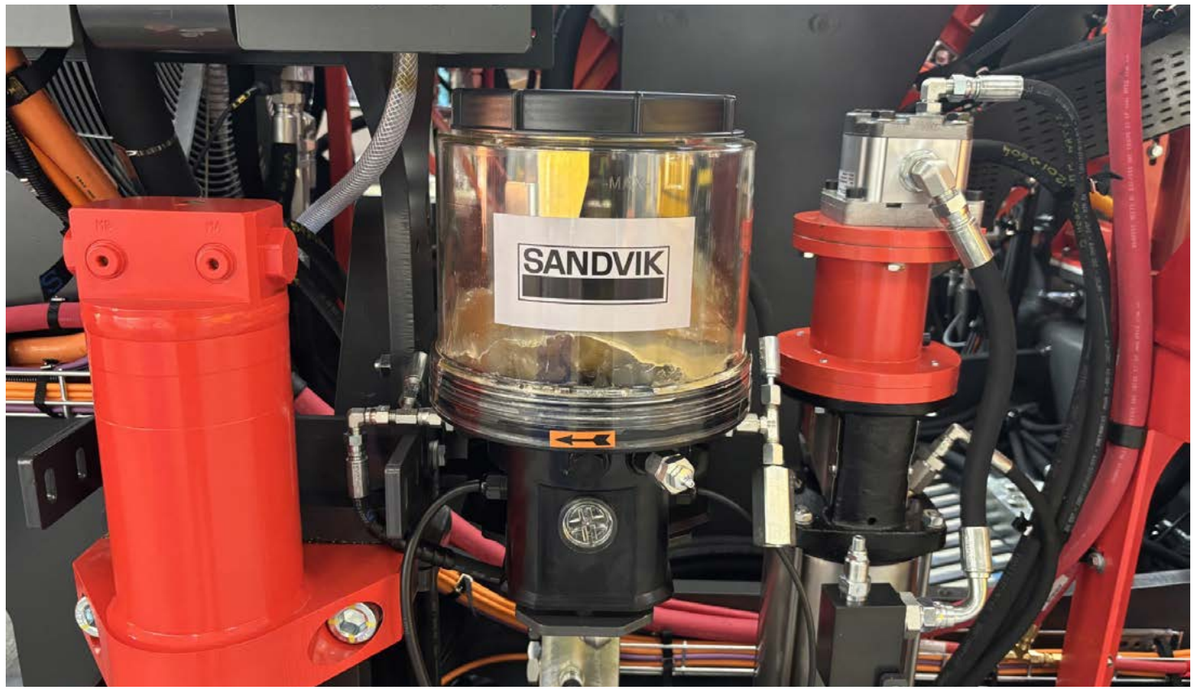
Regular lubrication of implemented greasing points is essential for reliable and trouble-free operations of the drilling mechanical components. Important saving on the life of different pins and skids can be achieved with optimum lubrication. Proper condition of the boom articulation insures also drilling precision.

Yet for many operators, manual lubrication is becoming too much of a challenge as it is time consuming and require to locate every single grease point on a machine where there are numerous.

By finding a simpler, smarter way to lubricate your machinery, you could maintain reliability without the costs and effort of manual lubrication. Although the initial costs of installing an automatic lubrication system are higher, the investment pays off quicker than you might think. Firstly, labor costs are significantly reduced. But you also make considerable savings by reducing downtime and extending component life.

There is also no need to stop the machine for re-lubrication – you simply need to keep the lubrication system filled and maintained. The automatic greasing system lubricates continuously while the machine is working. This increases efficiency as there is no need to stop machinery for lubrication. Lubricating while the mechanisms are rotating also improves the distribution of lubricant. A small amount of grease remains flowing, keeping out contamination even when the machine is operating in an environment as harsh as the underground mining one.

The lubrication interval can be adjusted from the central greasing unit. System diagnostics monitor that greasing cycle is done successfully.



Advantages	Customer Values
Improve life of booms and central articulation pins and skids by insuring constant and optimal greasing. Reduce maintenance time.	Reduce operating cost.
Ensure good condition of boom pins and skids.	Improve drilling precision/ productivity

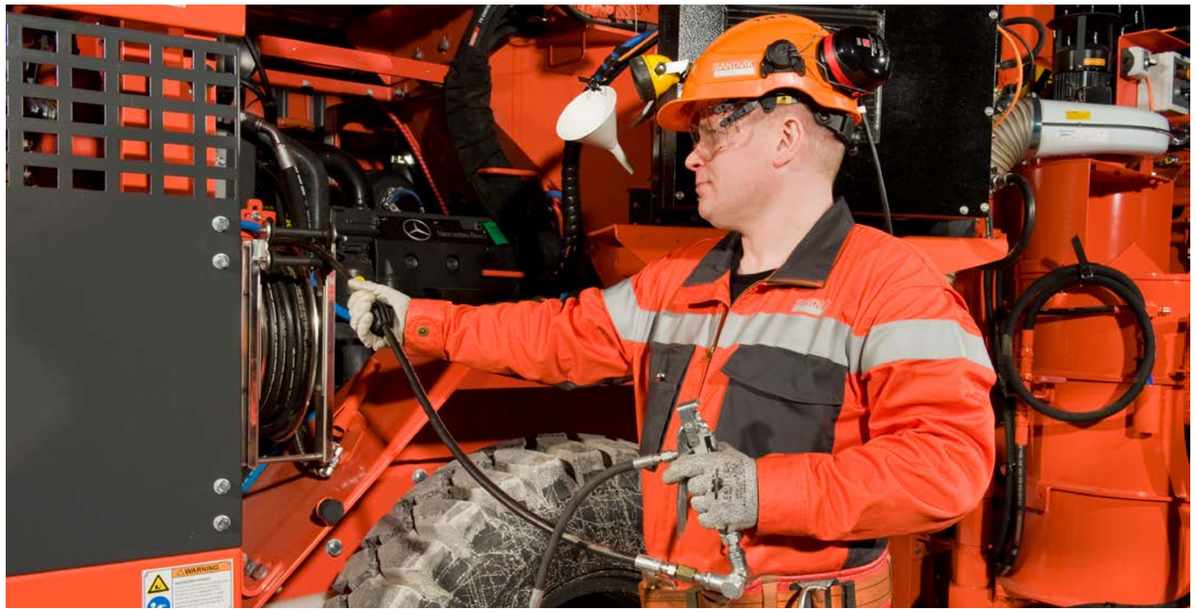
Machine models	Part Numbers	Machine models	Part Numbers	Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD311	Contact local Sandvik representative	Sandvik DD531	Contact local Sandvik representative	Sandvik DL430	Contact local Sandvik representative	Sandvik DS412iE	Contact local Sandvik representative
Sandvik DD312i		Sandvik DL310		Sandvik DL431		Sandvik DS420	
Sandvik DD320		Sandvik DL311		Sandvik DL432i		Sandvik DS421	
Sandvik DD321		Sandvik DL320		Sandvik DU412i		Sandvik DS422i	
Sandvik DD410		Sandvik DL321		Sandvik DU422i-W		Sandvik DS510	
Sandvik DD411		Sandvik DL331		Sandvik DS310		Sandvik DS511	
Sandvik DD420		Sandvik DL410		Sandvik DS311*		Sandvik DS512i	
Sandvik DD421		Sandvik DL411		Sandvik DS312*		Sandvik DS520	
Sandvik DD422i		Sandvik DL421		Sandvik DS410		Sandvik DB311	
Sandvik DD422iE		Sandvik DL422i		Sandvik DS411		Sandvik DB331	
Sandvik DD530		Sandvik DL422iE		Sandvik DS412i			

*Only carrier greasing.

Grease reel with pump and nozzle for underground drills

Description
Regular lubrication of implemented greasing points is essential for reliable and trouble-free operations of the drilling mechanical components. Important saving on the life of different pins and skids can be achieved with optimum lubrication. Proper condition of the boom articulation insures also drilling precision.
Greasing reel with pump and nozzle enables the operator to manually lubricate the needed locations.
The system is fully integrated on the machine and autonomous. The lubrication hose is long enough to reach all grease point on the drilling unit (15 m).
Operator manually controls the amount of grease to be injected with the trigger of the nozzle. The pump works with compressed air provided by the machine's compressor.

The grease tank capacity is 14 or 22 liters according machine model.



Advantages	Customer Values
Improve life of booms, cylinders, articulation pins and skids by making greasing maintenance operation easy and convenient on every machine's location.	Reduce operating cost.

Machine models	Part Numbers	Machine models	Part Numbers	Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD212i	Contact local Sandvik representative	Sandvik DD530	Contact local Sandvik representative	Sandvik DL411	Contact local Sandvik representative	Sandvik DS410	Contact local Sandvik representative
Sandvik DD2710		Sandvik DD531		Sandvik DL420		Sandvik DS411	
Sandvik DD2711		Sandvik DL2710		Sandvik DL421		Sandvik DS412i	
Sandvik DD310		Sandvik DL2711		Sandvik DL422i		Sandvik DS412iE	
Sandvik DD320		Sandvik DL2720		Sandvik DL422iE		Sandvik DS420	
Sandvik DD320S		Sandvik DL2721		Sandvik DL430		Sandvik DS421	
Sandvik DD321		Sandvik DL310		Sandvik DL431		Sandvik DS422i	
Sandvik DD410		Sandvik DL311		Sandvik DL432i		Sandvik DS510	
Sandvik DD411		Sandvik DL320		Sandvik DU412i		Sandvik DS511	
Sandvik DD420		Sandvik DL321		Sandvik DU422i-W		Sandvik DS512i	
Sandvik DD421		Sandvik DL330		Sandvik DS2710		Sandvik DS520	
Sandvik DD422i		Sandvik DL331		Sandvik DS2711			
Sandvik DD422iE		Sandvik DL410		Sandvik DS310			

Carrier centralized greasing system for underground drills

Description
Regular lubrication of implemented greasing points is essential for reliable and trouble-free operations of the mechanical components. Important saving on the life of articulation and cylinders pins of the carrier can be achieved with optimum lubrication.
With Carrier Centralized Greasing System the lubrication points are grouped together for easy access. Central articulation, front stabilizers, rear axle bolster, etc. Greasing points are grouped by areas. The number of lubrication points varies between drilling unit types.
Greasing is done manually with hand greasing pump or by using the options described on the previous and next pages. (Grease reel with pump and nozzle or grease gun and cartridge).

Advantages	Customer values
Improve life carrier's pins by making greasing maintenance operation more faster, easier and efficient.	Reduce operating cost.
Reduce daily maintenance time.	Increase machine availability (productivity).

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD211L		Sandvik DD422iE	
Sandvik DD211L-V		Sandvik DL311	
Sandvik DD220L		Sandvik DL321	
Sandvik DL230L-5		Sandvik DL331	
Sandvik DS211L-V		Sandvik DL410	
Sandvik DS211L-M	Contact local Sandvik representative	Sandvik DL420	Contact local Sandvik representative
Sandvik DS221L		Sandvik DL430	
Sandvik DD310		Sandvik DS311	
Sandvik DD311		Sandvik DS312	
Sandvik DD312i		Sandvik DB311	
Sandvik DD320S		Sandvik DB331	
Sandvik DD422i			

Grease cartridge gun and reel for underground drills

Description
Regular lubrication of implemented greasing points is essential for reliable and trouble-free operations of the drilling mechanical components. Important saving on the life of different pins and skids can be achieved with optimum lubrication. Proper condition of the boom articulation insures also drilling precision.
The Cartridge Grease Gun and Reel system includes a variable speed trigger that allows excellent grease flow control.
The gun is automatic, with an accessible check valve assembly for a superior flow performance.
The Cartridge Grease gun is powered by compressed air from the on-board air compressor (except on DD312i and DD322i which use a battery operated grease gun).

Advantages	Customer values
Improve life of booms, cylinders, articulation pins and skids by making greasing maintenance operation easy and convenient on every machine's location.	Reduce operating cost

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD210L		**Sandvik DD212**	
Sandvik DD210L-V		**Sandvik DD212i**	
Sandvik DD211L		Sandvik DD311	
Sandvik DD211L-V		Sandvik DD312i	
Sandvik DD220L		**Sandvik DD322i***	
Sandvik DL230L	Contact local Sandvik representative	Sandvik DL210	Contact local Sandvik representative
Sandvik DS210L-V		Sandvik DL230	
Sandvik DS210L-M		Sandvik DL331	
Sandvik DS211L-V		Sandvik DS311	
Sandvik DS211L-M		**Sandvik DS312**	
Sandvik DS221L		Sandvik DB311	
Sandvik DD210		Sandvik DB331	

*Battery operated grease gun (no reel).

High pressure cleaner for underground drills

Description
Mining equipment are operating is a very dusty, muddy and wet environment. That's why it's important to keep the equipment as clean as possible with regular washing with high pressure water to remove, mud, dirty grease, and rock cuttings, that could on the long run damage the unit, generate premature wearing or inhibit some functions and movements. And it's even more important for bolting rigs where cement or resin splash have to be removed before drying as when dry, it could block mechanisms and stop the unit.
In order to ease the maintenance operations, and especially the unit washing operations, Sandvik offers to equip underground drills with on-board water High Pressure Cleaner.
This heavy duty High Pressure Cleaner, can generate pressure up to 180 bars. Water is pressurized with a separate hydraulically driven high pressure water pump, powered by the diesel engine of the rig and the system can be used anywhere, as long as the machine is connected to the mine water network.
The High Pressure Cleaner upgrade solution includes a practical spring loaded hose reel.

Advantages	Customer Values
On-board water HP cleaner. Allows to clean the machine efficiently everywhere it is possible to connect the machine to the mine water network.	Reduce operating cost by allowing to clean easily and efficiently the machine. Improve machine availably and productivity by reducing downtimes.

Machine models	Part Numbers	Machine models	Part Numbers	Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD210L	Contact local Sandvik representative	Sandvik DD320	Contact local Sandvik representative	Sandvik DL311	Contact local Sandvik representative	Sandvik DS310	Contact local Sandvik representative
Sandvik DD210L-V		Sandvik DD320S		Sandvik DL320		Sandvik DS311	
Sandvik DD211L		Sandvik DD321		Sandvik DL321		Sandvik DS312	
Sandvik DD211L-V		Sandvik DD322i		Sandvik DL330		Sandvik DS410	
Sandvik DL230L-5		Sandvik DD410		Sandvik DL331		Sandvik DS411	
Sandvik DS210L-V		Sandvik DD411		Sandvik DL410		Sandvik DS412i	
Sandvik DS210L-M		Sandvik DD420		Sandvik DL411		Sandvik DS412E	
Sandvik DS211L-V		Sandvik DD421		Sandvik DL420		Sandvik DS420	
Sandvik DS211L-M		Sandvik DD422i		Sandvik DL421		Sandvik DS421	
Sandvik DS221L		Sandvik DD422iE		**Sandvik DL422i**		Sandvik DS422i	
Sandvik DD210		Sandvik DD530		**Sandvik DL422iE**		Sandvik DS510	
Sandvik DD212		Sandvik DD531		Sandvik DL430		Sandvik DS520	
Sandvik DD212i		Sandvik DL210		Sandvik DL431		Sandvik DS511	
Sandvik DD2711		Sandvik DL230		**Sandvik DL432i**		Sandvik DS512i	
Sandvik DD310		Sandvik DL2711		**Sandvik DU412i**			
Sandvik DD311		Sandvik DL2721		**Sandvik DU422i-W**			
Sandvik DD312i		Sandvik DL310		Sandvik DS2711			

Water hose reel for underground drills

Description
Frequent repair or replacement of the water supply hose could be very costly and frequent damages of the hose can really impact the production as drilling is impossible without correct water supply.
Also, unreeling and reeling hose ”by hand” is a long and heavy task for the operator if the mine water connection is located several tenth of meters from the work place.
In order to ease the management of the water supply hose and to protect it during tramming phases, Sandvik has developed a Water Hose Reel.
The reel can be controlled from the operator station or from the back of the machine. There is an automatic function that unreel the hose in the same time the machine tram to the face (same as the electric supply cable).

The Water Hose Reel upgrade solution can be delivered with water hose (size and length differ according machine models.)

Advantages	Customer Values
Water Hose Reel ease the management of the water supply hose and protect it during tramming phases.	Reduce risk of damages on the water hose that are costly and disturbs production. Makes operator tasks easier and more comfortable.

Machine models	Part Numbers	Machine models	Part Numbers	Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD311	Contact local Sandvik representative	Sandvik DD422i	Contact local Sandvik representative	Sandvik DL420	Contact local Sandvik representative	Sandvik DS410	Contact local Sandvik representative
Sandvik DD312i		Sandvik DD422iE		Sandvik DL421		Sandvik DS411	
Sandvik DD320S		Sandvik DD530		Sandvik DL422i		Sandvik DS412i	
Sandvik DD321		Sandvik DD531		Sandvik DL422iE		Sandvik DS412iE	
Sandvik DD322i		Sandvik DL311		Sandvik DL430		Sandvik DS420	
Sandvik DD410		Sandvik DL321		Sandvik DL431		Sandvik DS421	
Sandvik DD411		Sandvik DL331		Sandvik DL432i		Sandvik DS422i	
Sandvik DD420		Sandvik DL410		SandvikDS311		Sandvik DS511	
Sandvik DD421		Sandvik DL411		Sandvik DS312		Sandvik DS512i	

Improved rod handling system for production drills

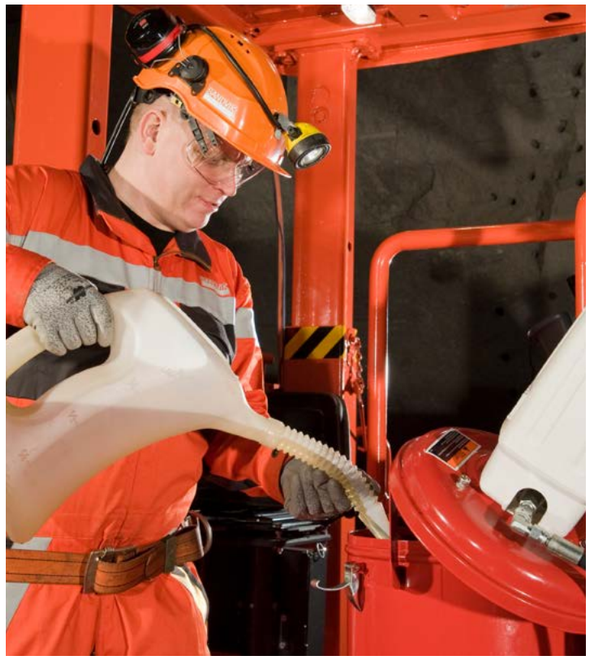
Description
Sandvik offers an improvement of the DL331 / DL210 rod handling system. New rod handling system improve greatly the reliability of the rod handling by ensuring a better rod alignment into the drill feed, thanks to the new auto bleeding cylinders.
Perfect alignment of the rods improve the coupling/uncoupling process and reduce the wear of the rods threads and shank.

Advantages	Customer values
Ensures better rod alignment into the drill feed	Reduces wear of the rods threads and shank.

Machine models	Part Numbers
Sandvik DL210	Contact local Sandvik representative
Sandvik DL331	

Bolting head oiler for underground drills

Description
Bolting head have to be in relative good and clean condition to operate correctly. Dirt and more precisely cement or resin residues can prevent the correct operation of the turret and generate expensive repair.
In order to avoid cement and resin residues to stick on the bolting head elements and makes cleaning operations long and tedious tasks, Sandvik has developed the Bolting Head Oiler.
Bolting Head Oiler allows to creates a film of oil that protect the bolting head from cement and resin overflow and splashing. It also prevents itself from rusting.
Before bolting, the operator, with a high pressure pistol, sprays a film of oil on the whole bolting head. Immediately after finishing the bolting operations, it is highly recommended to wash the bolting head to remove the cement lying on the oil film.
This pneumatic system is working either on the mine air network supply or on the on-board air compressor supply.
It is a highly recommended option when operating bulk cement bolting unit or cement or resin injection.



Advantages	Customer values
Water Hose Reel eases the management of the water supply hose and protect it during tramming phases.	Reduces risk of damages on the water hose that are costly and disturbs production. Makes operator tasks easier and more comfortable.

Machine models	Part Numbers
Sandvik DS311	Contact local Sandvik representative
Sandvik DS312	
Sandvik DS410	
Sandvik DS411	
Sandvik DS412i	
Sandvik DS412iE	
Sandvik DS420	
Sandvik DS421	
Sandvik DS422i	
Sandvik DS510	
Sandvik DS511	
Sandvik DS512i	

Application modification

Telescopic feed conversion for development drills

Description

When it is needed to perform new tasks with your development drill rig, like for instance drilling cross-cuttings on narrow drifts or drilling bolt holes, using a solid long feed can be problematic. That's why Sandvik has developed the TFX500 feeds.

Sandvik TFX500 telescopic feeds are designed for Sandvik face drilling jumbos with RDX5 and RD500 series rock drills. A versatile feed for face drilling, bolt hole drilling and cross-cuttings in a limited space where both long and short rods have to be used.

When Sandvik TFX500 feed is at the minimum length, short holes (i.e. bolt holes) can be drilled and while at maximum length, longer holes (i.e. face holes) can be drilled. The extension of feed can be adjusted step-by-step between the minimum and maximum length.

The beams are made of special aluminum profile with sliding surfaces faced with stainless steel strips. The drill rod centralizers are equipped with hardened steel wear pieces and designed for optimum visibility and durability.

TRR1 (hydraulic rod retainer) for extension drilling is available as an option.

The TFX500 conversion kit is delivered with all needed parts including, telescopic function controls (hydraulic or electro-hydraulic according machine model) and hoses harness.

Advantages	Customer values
Allow to do several tasks with the same machine in an efficient way.	Improve versatility
No waste of time and human resources on bringing several machines on the same location to perform different tasks.	Improve productivity
Transform development drill rig into versatile machine that can drill face and also bolt holes at a low investment cost.	Reduce operations costs.

Machine models	Part Numbers
Sandvik DD210L[1)]	Contact local Sandvik representative
Sandvik DD211L[1)]	
Sandvik DD2711[1)]	
Sandvik DD310[1)]	
Sandvik DD311[1)]	
Sandvik DD312i[1)]	
Sandvik DD320[1)]	
Sandvik DD320S[1)]	
Sandvik DD321[1)]	
Sandvik DD322i[1)]	
Sandvik DD410[2)]	
Sandvik DD411[2)]	
Sandvik DD420[2)]	
Sandvik DD421[2)]	
Sandvik DD422i[2)]	
Sandvik DD422iE[2)]	
Sandvik DD530[2)]	
Sandvik DD531[2)]	

1) Feed lengths available: TFX6/12 or TFX8/14
2) Feed lengths available: TFX6/12, TFX8/14 or TFX10/16 (with SB60 or SB90 booms only)

TRR1 rod retainer for development drills

Description

Occasionally, it might be necessary to drill holes longer than the standard rod length used, i.e. probe drilling, holes for grouting or, etc. For this purpose, Sandvik has developed the TRR1 rods retainer system that allows to add one or several rods on the feed, to drill longer holes.

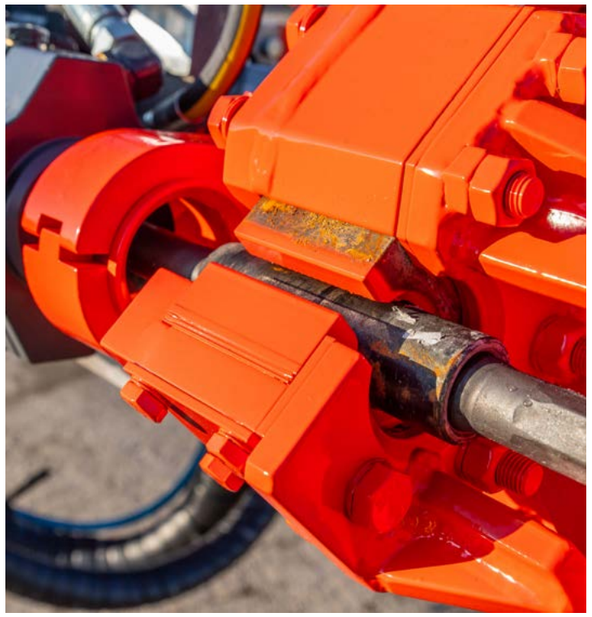
Sandvik Rod Retainer TRR1 can be fitted on Sandvik development drills feeds (TF, TFi and TFX) with HLX5, RDX5 and RD500 series rock drills.

Additional rods have to be loaded manually in the gripper. A safety wire is installed near the TRR1 to allow immediate emergency stop in case of issue. During coupling and uncoupling phase TRR1 is holding extension rods. TRR1 can be used either 32 mm (1 ¼ in) or 38 mm (1 ½ in) rods.

The design of TRR1 rod retainer aims at simplicity of structure and ease of maintenance. TRR1 is a robust welded steel structure with only one movable jaw piece. The jaw pieces are made of hardened steel and designed for optimum visibility and durability.

When TRR1 is installed on TF feed, hole depth is shortened by 35 mm. By cutting 35 mm off from the buffer hole depth can be restored. On telescopic TFX feed there is no effect on hole length.

The TRR1 conversion kit is delivered with all needed parts including, new controls (hydraulic or electro-hydraulic according machine model) and hoses harness.



Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DD210L	Contact local Sandvik representative	Sandvik DD320S	Contact local Sandvik representative
Sandvik DD211L		Sandvik DD321	
Sandvik DD210		Sandvik DD322i	
Sandvik DD212		Sandvik DD410	
Sandvik DD212i		Sandvik DD411	
Sandvik DD2710		Sandvik DD420	
Sandvik DD2711		Sandvik DD421	
Sandvik DD310		Sandvik DD422i	
Sandvik DD311		Sandvik DD422iE	
Sandvik DD312i		Sandvik DD530	
Sandvik DD320		Sandvik DD531	

Advantages	Customer values
Allow to drill occasional longer hole by adding additional rod(s) on the feed.	Improve machine versatility
Safety wire allows emergency stop while adding rod on the feed.	Improve safety

TRS two rod system for development drills

Description

Occasionally, it might be necessary to drill holes longer than the standard rod length used, i.e. drilling investigation holes, holes for grouting etc.

For this purpose, Sandvik has developed the TRS two rods system that allow to had safely a second rod on the feed. The TRS can be retrofitted to TF feeds on development drills.

The TRS consists of two grippers with cylinders to hold one rod at a time in jaws, a rod retainer to hold the rod during coupling / uncoupling, an opening traveling centralizer to allow adding / removing rods from the center line, and a limit plate to help positioning the rods in the grippers.

The drilling starts with one rod in the feed, and another in the grippers. When the first rod is drilled, the second rod is placed in the feed by the grippers. Additional rods can be loaded manually in the gripper. A safety wire is installed near the TRS to allow immediate emergency stop in case of issue.

The TRS Upgrade Solution Retrofit kit is delivered fully adapted to customer's rods specifications, with all needed parts including controls and hoses harness.

Machine models	Part Numbers
Sandvik DD321	Contact local Sandvik representative
Sandvik DD410	
Sandvik DD420	
Sandvik DD411	
Sandvik DD421	
Sandvik DD422i	
Sandvik DD422iE	
Sandvik DD530	
Sandvik DD531	

Advantages	Customer values
Allow to drill occasional longer hole by adding a second rod on the feed without having to bring people on the front danger area of the machine.	Improve machine versatility and safety

Dual drilling controls for Sandvik DD422i and DD422iE

Description
Sandvik DD422i And DD422iE face drills have introduced major improvements compare to the previous generation of drills. Particularly concerning the operator safety and usability with the new cabin design that brings drastically reduced noise levels, improved drilling visibility and the possibility to drill seated. Drilling performance and costs of drilling consumables are also greatly improved thanks to the torque optimized drilling control (approximately 10% improvement in productivity and nearly 20% improvement on drill consumable costs measured during field test, compare to previous generation hydraulic controlled jumbo).
In order to make these benefits available for ground support application, Sandvik has released a new Dual Controls package. This package is retrofitable on active DD422i and DD422iE.

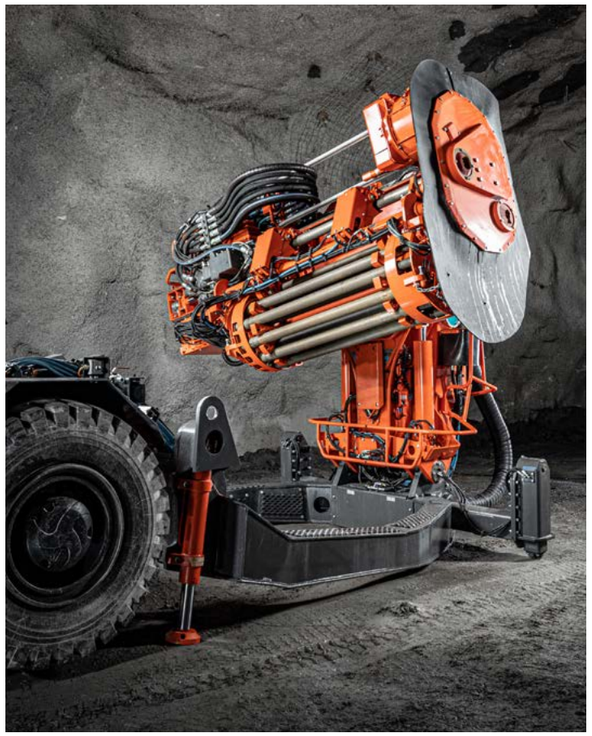
Dual Drilling Controls improve fleet optimization, versatility and performance for the Sandvik DD422i and Sandvik DD422iE face drills. The Dual Controls package was designed to address a wide range of needs identified by mining contractors currently using development drills for a variety of tasks including boring, bolting and meshing DD422i and DD422iE Dual Controls (DC) allows customer to use a single platform for all drilling applications.
Depending original machine configuration, the retrofit kit could require complete new cabin with Dual Drilling Controls, TFX feeds, hydraulic parallelism booms with hosing, electric system modification and software update.
Retrofit of Dual Drilling controls imply the removal of boom instrumentation and drilling automation.

Advantages	Customer value
Allows the DD422i platform to be used for a variety of non-automated tasks like boring, bolting and meshing.	Increase versatility of the unit. This provides modular options for the boom and drilling assemblies, whilst the carrier and cabin remain standardized.
Allows to use of a single platform (DD422i) for all drilling application.	Commonality in spare parts, service points and service principles with 400i series. Compatibility with Sandvik digital systems, e.g. My Sandvik and OptiMine
Improved cabin, compare to previous hydraulic controlled jumbos.	Improve safety and usability by reduced noise level and improved comfort, ergonomic and visibility.
Torque optimized drilling controls system.	Increase productivity by providing best possible drilling performance. Improve rock tools life.

Machine models	Part Numbers
Sandvik DD422i	Contact local Sandvik representative
Sandvik DD422iE	

Long boom support for Sandvik DL421 and DL422i

Description
Sandvik DL421, DL422i and DL422iE long-hole drills can be equipped with a longer (horseshoe) boom support for up to ±45° drilling module tilt in drilling fans or single long-holes.
The maximum tilt angle backwards can be achieved by keeping the support in horizontal position; it is equipped with hydraulic jacks so it can sufficiently be stabilized for acceptable drilling stability. When the boom support is kept on the ground the boom tilt angle in the extreme back position is 30° from vertical.
In addition to feed extension, units with longer boom support are equipped with a telescopic feed cradle that allows the greater boom tilt angles.
The wider boom tilt range increases the versatility your production drill in down-hole drilling or if holes need to be drilled parallel to the contact of the ore body. This feature is also suited for drop raise and drainage hole drilling.
Units equipped with this feature have the same boom coverage and drilling module rotation, compared to standard units.

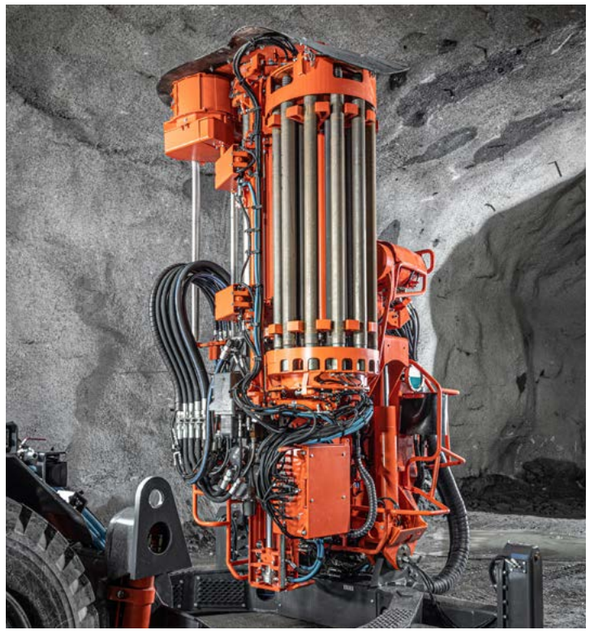


Advantages	Customer values
Long Boom Support Upgrade Solution allows the drilling module to tilt up to ±45° in fan drilling or single long holes. When the boom support is kept on the ground, the boom tilt angle in the extreme back position is 30° from vertical.	Increase versatility of the machine in: Down-hole drilling Parallel holes drilling in contact with the ore body Drop raise and drainage hole drilling.

Machine models	Part Numbers
Sandvik DL421	Contact local Sandvik representative
Sandvik DL422i	
Sandvik DL422iE	

Rods length conversion kit for production drills

Description
Change on the mine drifts shape, or need for different hole length can lead to necessity to change the rods length on production Drills.
Sandvik offers to customers to adapt the drilling module of their Production Drills to different rods length with specific Conversion kits.
The Rods Length Conversion kits are optimized to include all (and only) needed parts to change the rods length in the minimal possible machine immobilization time and at the lowest cost possible.



Advantages	Customer values
Rods Conversion Kit includes all needed part to adapt the drilling module to different rods length.	Allows to adapt easily and cost effectively the drilling module to different rods size.

Machine models	3’	4’	5’	6’
Sandvik D210	√	√	√	
Sandvik DL2710		√	√	√
Sandvik DL2720		√	√	√
Sandvik DL2711		√	√	√
Sandvik DL311		√	√	√
Sandvik DL321		√	√	√
Sandvik DL331	√	√	√	√
Sandvik DL411		√	√	√
Sandvik DL421		√	√	√
Sandvik DL422i		√	√	√
Sandvik DL422iE		√	√	√
Sandvik DL431		√	√	√
Sandvik DL432i		√	√	√

Bolts type/length conversion kit for underground drills

Description

Change on the mining methods, on rock geology, on machine application or on safety regulation, may involve to install a different type or length of bolt.

Sandvik offers to customers the solution to modify the bolting head and other required systems (cartridges injection, cement mixer, etc...) on their bolters to allow the mechanized installation of most of the bolt type and length of the market.

Sandvik offers to customers the solution to modify the bolting head and other required systems (cartridges injection, cement mixer, etc...) on their bolters to allow the mechanized installation of most of the bolt type and length of the market.

The Bolts type/length conversion kits are optimized to include all (and only) needed parts to adapt the bolter to the new bolt specification, in the minimal possible machine immobilization time and at the lowest cost possible.

Advantages	Customer value
Bolts type/length conversion kit includes all needed part to adapt the bolting head, and the rest of the bolter if needed, to different type or length of bolt.	Allows to adapt easily and cost effectively your bolter to different bolt size.

	Bolts types*							Bolts lengths												
Machine models	**GCC**	**BC**	**GCR**	**M**	**K**	**S**	**W**	**1100**	**1200**	**1300**	**1400**	**1500**	**1800**	**2200**	**2400**	**2700**	**3000**	**4000**	**5000**	**6000**
Sandvik DS210L-M	√		√	√			√	√	√	√	√	√	√							
Sandvik DS211L-M	√		√	√			√	√	√	√	√	√	√							
Sandvik DS2710	√		√	√		√	√					√	√	√	√		√			
Sandvik DS310	√		√	√		√	√					√	√	√	√		√			
Sandvik DS311	√		√	√		√	√					√	√	√	√		√			
Sandvik DS312	√		√	√		√	√					√	√	√	√		√			
Sandvik DS410		√	√	√	√	√	√					√	√	√	√	√	√			
Sandvik DS411		√	√	√	√	√	√					√	√	√	√	√	√			
Sandvik DS412i		√	√	√	√	√	√					√	√	√	√	√	√			
Sandvik DS412iE		√	√	√	√	√	√					√	√	√	√	√	√			
Sandvik DS510		√	√	√	√	√	√					√	√	√	√	√	√	√	√	√
Sandvik DS511		√	√	√	√	√	√					√	√	√	√	√	√	√	√	√
Sandvik DS512i		√	√	√	√	√	√					√	√	√	√	√	√	√	√	√

GCC: Grout Cement Cartridge
GCR: Grout Cartridge resin
K: Kiruna
W: Water inflated
BC: Bulk Cement
M: Mechanical shell anchor
S: Splitset

Air mist flushing for underground drills

Description

Flushing is needed on a drill rig for removing the cutting generated by the drill bits. A proper removal of cuttings is one key parameter for maximized drilling performance, rock drill reliability and optimized rock tool life.

The standard media used for flushing holes on Underground drills is water. But sometime, rock condition do not allow the use of water flushing (hole collapse after being drilled, avoiding to charge it with explosive). Also, In some locations, water can also be a rare and expansive resource that cannot be wasted.

To solve this issue, Sandvik has developed Air Mist Flushing system for Underground Drills.

The Air Mist Flushing use mainly compressed air for flushing but with the injection of a small quantity of water to avoid generation of dust that could be harmful for the mine personal and generate high cost of ventilation.

The pressurized water is conveyed through a special jet that sprays it into the air from inside a special Y connection. This connection is located as close as possible from the rock drill / rotary drill flushing head in order for the sprayed water not to settled down in the line.

Depending on unit model supply of air can be done internally (with replacing the original compressor by a bigger one or addition of a second compressor, or addition of air receiver(s)).

Also in few models, a water tank and OA cooler can be installed to have on-board (internal) water supply.

Advantages	Customer value
Drilling with mainly compressed air and only a small quantity of water.	Allows to drill almost all rocks specifications (the hole do not collapse after drilling. Improve safety by avoiding dust generation (compare to dry air drilling).
Drilling with minimum quantity of water.	Allows to drill where water is a rare and/or expensive resource.

Machine models*	Ext. A/ Ext. W.	Int.A/ Ext.W.	Ext. A./ Int. W.	Int. A./ Int. W.	Machine models*	Ext. A/ Ext. W.	Int.A/ Ext.W.	Ext. A./ Int. W.	Int. A./ Int. W.
Sandvik DD210L	√	√			Sandvik DL2720	√	√		
Sandvik DD210L-V	√	√			Sandvik DL2721	√	√		
Sandvik DD211L	√	√			Sandvik DL310	√			
Sandvik DD211L-V	√	√			Sandvik DL311	√	√	√	√
Sandvik DD220L	√				Sandvik DL320	√			
Sandvik DS210L-V	√				Sandvik DL321	√	√	√	√
Sandvik DS210L-M	√				SandvikDL330	√			
Sandvik DS211L-V	√	√			Sandvik DL331	√	√	√	√
Sandvik DS211L-M	√	√			Sandvik DL410	√			
Sandvik DD210	√				Sandvik DL411	√	√		
Sandvik DD212	√	√	√	√	Sandvik DL420	√			
Sandvik DD212i	√	√	√	√	Sandvik DL421	√	√		
Sandvik DD2710	√	√			Sandvik DL422i	√			
Sandvik DD2711	√	√			Sandvik DL422iE	√			
Sandvik DD310	√	√	√	√	Sandvik DL430	√			
Sandvik DD311	√	√	√	√	Sandvik DL431	√	√		
Sandvik DD312i	√	√	√	√	Sandvik DL432i	√			
Sandvik DD320	√				Sandvik DS2710	√	√		
Sandvik DD320S	√				Sandvik DS2711	√	√		
Sandvik DD321	√				Sandvik DS310	√	√	√	√
Sandvik DD322i	√				Sandvik DS311	√	√	√	√
Sandvik DD410	√				Sandvik DS312	√	√	√	√
Sandvik DD411	√				Sandvik DS410	√			
Sandvik DD420	√				Sandvik DS411	√	√		
Sandvik DD421	√				Sandvik DS420	√			
Sandvik DD422i	√				Sandvik DS421	√	√		
Sandvik DD422iE	√				Sandvik DS510	√			
Sandvik DL210	√				Sandvik DS511	√			
Sandvik DL2710	√	√			Sandvik DS512i	√			
Sandvik DL2711	√	√			Sandvik DS520	√			

*Possibilities of implementing different configurations of the Air Mist Flushing can vary according machine specifications and options.
Please contact your local Sandvik Representative for more information.

Ext. A : External air supply
Ext. W: External water supply
Int. A: Internal air supply (on-board air compressor)
Int. W: Internal water supply (on-board water tank)

Dry drilling for underground drills

Description

Flushing is needed on a drill rig for removing the cutting generated by the drill bits. A proper removal of cuttings is one key parameter for maximized drilling performance, rock drill reliability and optimized rock tool life.

The standard media used for flushing holes on Underground drills is water. But sometime, rock condition do not allow the use of any water for flushing (hole collapse if being drilled with water, avoiding to charge it with explosive). Also, In some locations, water cannot be available (desertic places) or used (environmental regulations).

To solve this issue, and allows to drill with only compressed air, Sandvik has developed Dry Drilling system for Underground Drills.

The Dry Drilling system includes a dust collector, installed on the back of the unit, that suck and collect the cuttings, avoid generation of dust on the gallery, that could be harmful for the mine personnel. The dust collector includes filters with cleaning by reversed air automatic system.

Depending unit model and specification, compressed air system could need to be improved to insure sufficient air flushing flow.

Advantages	Customer values
Drilling with only dry air flushing .without generating dust that could be harmful for mine personnel.	Allows to drill rock that do not accept any water in the flushing without generating dust.
Drilling without water.	Allows to drill where there is no water supply.

Machine models	Part Numbers
Sandvik DD210L	
Sandvik DD210L-V	
Sandvik DD211L	
Sandvik DD211L-V	
Sandvik DL230L-5	
Sandvik DS210L-V	
Sandvik DD2710	Contact local Sandvik representative
Sandvik DD310	
Sandvik DD311	
Sandvik DD321	
Sandvik DD421	
Sandvik DL2720	
Sandvik DS311	
Sandvik DS411	

Upgrades solutions for tunneling drills

Sandvik upgrades and engineered solutions offers a vast range of retrofit kits that allows to modify the original specifications of your tunneling drills to improve the performance, the drilling accuracy, the safety or to reduce the environmental impact and the operating cost. Our offering includes also solutions to adapt your machine to different application.

TMS+ boom instrumentation for tunneling drills

Description
Inaccurate drilling set-up and hole length can cause misalignment of the whole tunnel, blasting difficulties, and can lead to over-break and under-break. Fixing tunnel alignment later is extremely expensive and it also increases the need for rock support and the risk of rock fall.
Sandvik TMS+ Boom Instrumentation systems allows the operator to control with great accuracy the drilling direction. It can also display information about hole depth, penetration rates and cumulative drilled length (”DDS” option).
Get optimal control over the drilling angle and positioning in order to avoid tunnel misalignment, as well as over-break and under-break.
Optimize ore recovery, advance per blast and the fragmentation process.

Advantages	Customer values
Measures and displays the direction of the angle of drilling with high accuracy.	Reduces the risk of generating over-break and under-break that leads to extra costs, slower production, and an increased risk of falling rocks (safety issue)
Version available with hole-depth measurement, penetration-rate indication and cumulative drilled hole-length counters	Allows accurate control of the drilling process Allow rock tools life follow-up
Simple and basic system that's easy to install and use	Minimal installation time and training required
Integrated troubleshooting function	Easily test the correct function of the system's sensors to ensure minimal downtime in case of failure

Machine models*	Part Numbers
Sandvik DT611	Contact local Sandvik representative
Sandvik DT621	
Sandvik DT721	
Sandvik DT821	
Sandvik DT821-C	
Sandvik DT1231	

*TMS+ not available for machines equipped with NV boom(s).

TCAD+ boom instrumentation for tunneling drills

Description

Inaccurate drilling set-up and hole length can cause misalignment of the whole tunnel, blasting difficulties, and can lead to over-break and under-break. Fixing tunnel alignment later is extremely expensive and it also increases the need for rock support and the risk of rock fall.

Sandvik TCAD+ is an aiming tool for executing on a pre-designed drilling plan, featuring face drilling, long-hole drilling and bolting-hole plans on the screen.

Sandvik TCAD+ supports different navigation methods. In addition to traditional laser and drill-bit navigation, it introduces total station navigation to standard rigs, greatly improving their accuracy. The navigation user interface is easy to use, with on-screen creation and editing of the lasers.

With its built-in data collection, TCAD+ provides information on hole position and angle logging, as well as the drilling process. By improving the accuracy of drilling, the TCAD+ enables optimization of the whole tunneling project.

The Sandvik TCAD+ includes a troubleshooting function to help test the correct functioning of the system's sensors and the CAN system.

TCAD+ is delivered together with Sandvik iSURE®, the most sophisticated and advanced tunnel-process management software on the market. Results in accurate drilling and optimized excavation due to drilling and blasting design at the most critical position (i.e. at the end of the round). Optimizes the drilling process, as well as the complete drill and blast process. iSURE® is user-friendly and easy-to-use software.

Professional training available for operators and service with comprehensive training tools (Windows simulator).

Global Sandvik technical support team. Access to new product upgrades via lifetime services. Upcoming features can be installed on rig.

Advantages	Customer Values
Measures and displays the direction angle of drilling with high accuracy. Displays positioning of each hole according the pre-designed drilling plan. Automatic hole length control according to a drill plan.	Optimized drill and blast cycle. Less over- and under-breaks. Improves productivity and safety as no need to stand close to the face to paint the holes locations.
Easy-to-use navigational interface. Professional training available for operators. Comprehensive training tools (Windows simulator). Global technical support team.	Full Sandvik support on the implementation process and during life of the machine.
The data collection system collects locations and directions of the drilled holes and MWD (Measurement While Drilling) data.	Allow to monitor accurately: Productivity, Total Cost of Ownership, cost per drilled meters, etc Rock tools life Identify operator training needs
TCAD+ comes with iSURE®, the most advanced tunnel-process management software on the market.	High drilling accuracy and optimized excavation. Optimized drilling process. User-friendly and easy-to-use software.
Upcoming features can be installed on rig.	Access to new product upgrades via lifetime services.

Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative
Sandvik DT621	
Sandvik DT721	
Sandvik DT821	
Sandvik DT821-C	
Sandvik DT1031-SC	
Sandvik DT1131	
Sandvik DT1131-SC	
Sandvik DT1231	

Rock drills conversion for tunneling drills

Description

Productive underground drilling is a crucial component in achieving your production targets and meeting your required advance rates. Even the most efficient drill rig can only deliver so many meters in a shift if it's not coupled with the latest rock drill technology.

Our Rock Drill(s) Upgrade Solutions for tunneling drills enable seamless progression to the latest Sandvik technology. Each Upgrade kit consists of new RD-series rock drill(s) (RD520, RD525 or RD535) and all other parts needed to convert your existing equipment to the most technically advanced drilling technology available.

Highest productivity is achieved by the increased percussion frequency rate and stabilizer system that insure optimal control of the contact between the rock and the bit.

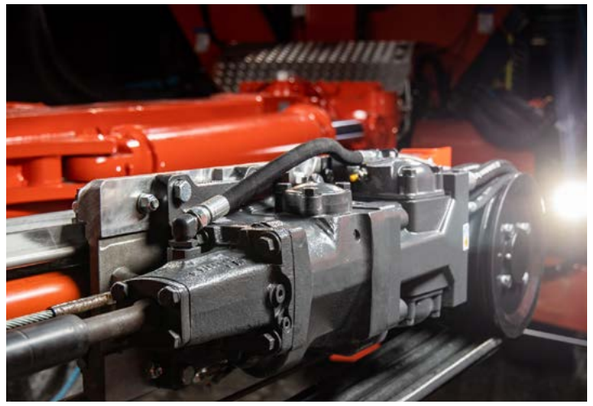
Reduced operating costs are achieved by:

Increased reliability due to new design concept (only few pressurized seams between functional modules) that allows increased service interval of 750 percussion hrs.

Excellent serviceability through modular construction and visual wear indicators.

Stabilizer system that dampens recoil impulses from rock and lengthens the lifetime of rock tools.

The quicker drilling and faster production will start a ripple effect. Your productivity and reliability will increase and you'll cut costs.



Machine models	Rock drill model	Part Numbers
Sandvik DT611	RD520	Contact local Sandvik representative
Sandvik DT621	RD520	
Sandvik DT721	RD520/RD525	
Sandvik DT821	RD520/RD525	
Sandvik DT912D	RD520/RD525	
Sandvik DT912iD	RD520/RD525	
Sandvik DT921i	RD520/RD525	
Sandvik DT922i	RD520/RD525	
Sandvik DT923i	RD520/RD525	
Sandvik DT1031-SC	RD520/RD525	
Sandvik DT1121	RD520/RD525	
Sandvik DT1131	RD520	
Sandvik DT1131-SC	RD520/RD525	
Sandvik DT1131i	RD525/RD535	
Sandvik DT1132i	RD525/RD535	
Sandvik DT1231	RD525/RD535	
Sandvik DT1231i	RD525/RD535	
Sandvik DT1232i	RD525/RD535	
Sandvik DT1331i	RD520/RD525	

Advantages	Customer values
Highest percussion frequency. Stabilizer system insures optimal Rock/bit contact.	Highest penetration rate that Improves productivity (+17% compare to HLX5, +28% compare to HLX5T)*.
High striking frequency with low energy per impact. Stabilizer system: efficient dampening of shock waves from the rock. New design and construction concept with only few pressurized seams and less parts (20%). Rock drill attached to carrier with only 6 bolts. Harmonized nut size. Visual wear indicator on key components.	Longer rock tools life (+17% bit life, +40% shank life)*. Higher reliability and maintenance interval (750 hrs). Improved serviceability; Easy condition evaluation in service.

Power extractor for tunneling drills

Description

Fractured and heterogeneous ground, poor flushing quality, cross drilling, or worn out rock tools can lead to drilling rod jamming, And It is quite hard work to recover from the jamming and it robs your job and production of expensive and valuable time.

In production drilling, one of the major loss of production cause could be the difficulty to uncouple efficiently the rods.

In order to solve these issues and preserve the productivity, Sandvik has developed the Power Extractor system.

Power Extractor is a module for a hydraulic rock drill, operated by a switch on the operator's control panel. A hydraulic actuator mounted on the front end of the rock drill gear housing, by multiple (small) pistons, is able to pull the shank adapter towards the striking point, so that the piston can hit the shank during pull-back. Percussive stress waves can therefore be transmitted to the drill rods.

Power Extractor is very efficient when the drill string are jammed so tight that it can not be removed by only using feed, rotation and percussion. Use of Power Extractor for uncoupling rods makes easier and faster the opening of joints. It reduces the non-drilling time, increases drilling capacity and rock tool service life and reduces rock drill maintenance cost.

Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative
Sandvik DT821	
Sandvik DT921i	
Sandvik DT922i	
Sandvik DT923i	
Sandvik DT1031-SC	
Sandvik DT1121I	
Sandvik DT1131	
Sandvik DT1131-SC	
Sandvik DT1131i	
Sandvik DT1132i	
Sandvik DT1231	
Sandvik DT1231i	
Sandvik DT1232i	
Sandvik DT1331i	

Advantages	Customer values
Power Extractor allows the rock drill piston to hit the shank during pull back (percussive stress waves transmitted to the drill rods).	Improve productivity by help to remove rod(s) from the hole in case of jamming.

Safety and environmental improvement

Cameras system for tunneling drills

Description

In tunneling, confined space and limited visibility due to dust or poor lighting increase the risk of collision with pedestrians, other machines or walls. Collision is one of the major risk on underground mining with several fatalities registered every year.

In order to increase the visibility of the operator and to limit risk of collision, Sandvik has developed cameras system for Underground drills.

Cameras system improves the safety by increasing the operator field of vision, allowing view on the blind areas. It also limits the risk of collision with walls that would cause damages on the equipment.

The systems includes on development drills and bolters two reverse cameras located on the top side of the canopy / cabin and at the back of the machine). A monitor is located on the cabin. On Production drills, there is an additional camera on the front. An optional recording device is also available.

Advantages	Customer values
Increase the field of vision of the operator, allow view on the blind side areas. Limit the risk of collision with a pedestrian. Limit the risk of collision with an other equipment.	Increase safety
Reduces risk of damage on the machine due to collision with walls or other machine.	Reduce operating cost

Machine models	Part Numbers
Sandvik DT611[2)]	
Sandvik DT621[2)]	
Sandvik DT721[2)]	
Sandvik DT821[1)]	
Sandvik DT821-C[2)]	
Sandvik DT912D[2)]	
Sandvik DT912iD[2)]	
Sandvik DT921i[2)]	
Sandvik DT922i[3)]	
Sandvik DT923i[2, 3, 4)]	
Sandvik DT1031-SC[2)]	Contact local Sandvik representative
Sandvik DT1121I[2)]	
Sandvik DT1131[1)]	
Sandvik DT1131i[2)]	
Sandvik DT1131-JP[2)]	
Sandvik DT1131-SC[2)]	
Sandvik DT1132i[2)]	
Sandvik DT1231[2)]	
Sandvik DT1231i[2)]	
Sandvik DT1232i[2)]	
Sandvik DT1331i[2)]	

1) Rear camera only
2) Rear and side cameras
3) Rear, side and front
4) Rear, side and two in the front cameras

Eclipse™ fire suppression for tunneling drills

Description

From diesel fuels to hydraulic fluids, heavy equipment depends on flammable liquids to keep moving. The dangers associated with underground worksites fires are multifaceted, often leading to devastating consequences. These fires can produce toxic gases, such as carbon monoxide and hydrogen sulphide, which can cause respiratory failure and even death. In addition, the intense heat generated by these fires can lead to the collapse of tunnels structures, trapping workers and hindering rescue efforts.

Sandvik Eclipse™ is a crucial component of your safety management system to protect people, investments and equipment. Sandvik Eclipse™ fire suppression systems are designed and tested to meet the most stringent requirements of fire protection on mobile and transportable equipment, including underground drilling applications.

Compared to traditional dry powder systems, Eclipse™ is up to 30 percent more effective on super-heated surfaces. Our Sandvik system is equipped with liquid agents to attack all the elements a fire needs to ignite - heat, fuel and oxygen (fire triangle).

Automatic activation is a standard feature and the rapid cooling effect blocks the risk of re-ignition. The engine is also automatically shut-down.

The system is very efficient to service and maintain and can be installed on new or existing equipment - regardless of size or brand.

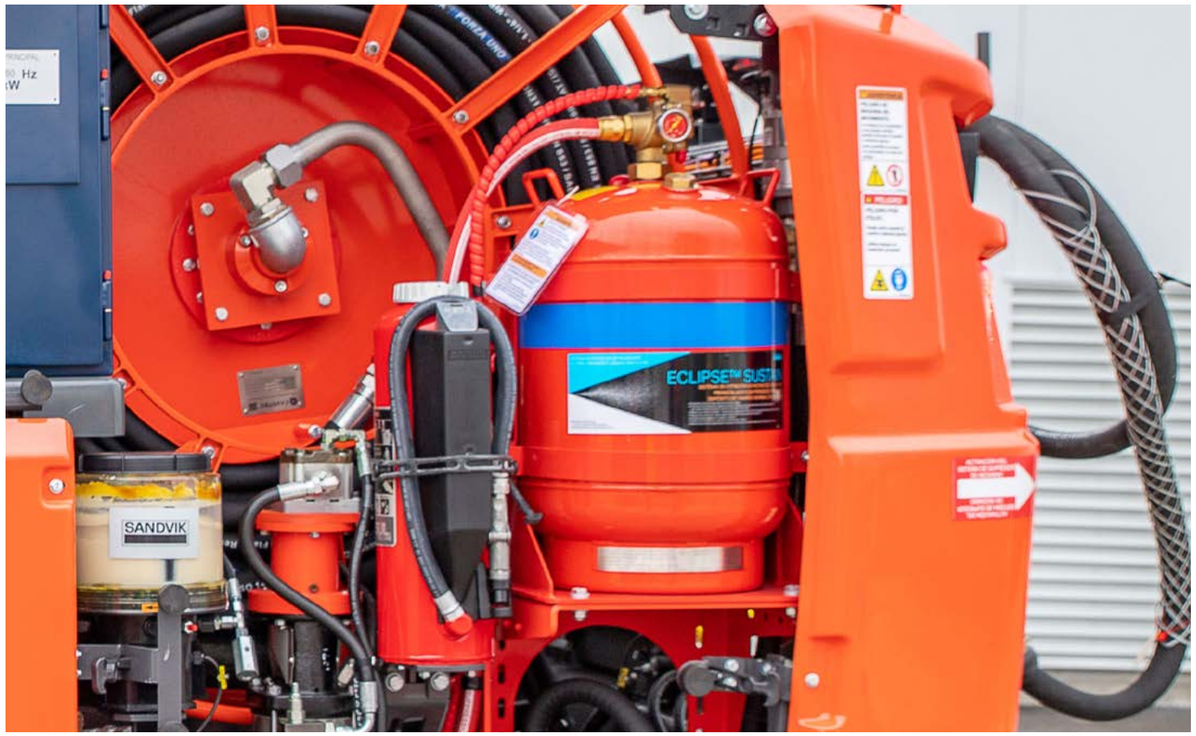
Sandvik Eclipse™ It is available in two versions to suit global application:

Sandvik Eclipse™ Sustain is suitable for climates 0°C to + 60°C. The tank contains foam concentrate and water solution. The mixture is fluorine free making it environmentally sustainable.

Sandvik Eclipse™ Extreme is suitable for climates - 40°C to + 60°C. The tank contains a pre-mixed liquid agent for the harshest of environments.

The reliable automatic activation concept and system hardware remains identical between Eclipse™ Sustain and Eclipse™ Extreme.

Eclipse™ is a smart way to reduce the risk of injuries, production loss, costly repairs and replacements. Design flexibility and a range of different tank sizes make it possible to install Eclipse™ on a wide range of mobile plants and equipment.

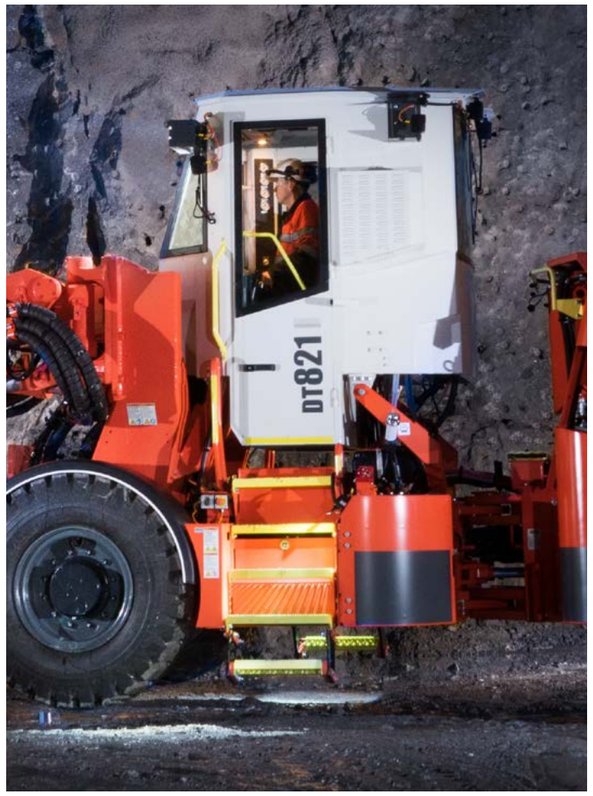


Advantages	Customer Values
Fully automated activation (loss-of-pressure activation) and engine shutdown standard on all systems. Foam fire extinguishing cutting off oxygen, vapor sealing and cooling down superheated surfaces (such as turbo charger and engine manifold).	Increase safety. System 30% more efficient compared to traditional dry powder systems.
Quick and efficient on site discharge testing and servicing. Quick recharge times for productivity	Easy testing and services procedures. Increase machine availability (productivity).

Machine models	Part Numbers
All equipment	Contact local Sandvik representative

Cabin upgrade for tunneling drills

Description
Working conditions on construction sites varies and affect the operator's environment. The conditions can be dusty, dark, wet, noisy, icy and hot.
Sandvik has designed cabins for it's tunneling drills to improve operator's safety and comfort. The cabins are designed to be extremely durable. They meet and exceed the international standard:
ISO 3449 - Falling object Protective Structure (FOPS).
ISO 3471 - Roll-Over Protective Structure (ROPS).
Sandvik Cabin offers low noise (LpA 80 dB according EN 791) and vibration level (0.5 m/s^2 according EN 791) and allows emergency exit.
Cabin upgrade solution includes Air Conditioning system. Heating system and Window Protective Grill are available as option. Acid Proof cabin (stainless steel) version is available on selected machine models (only FOPS).



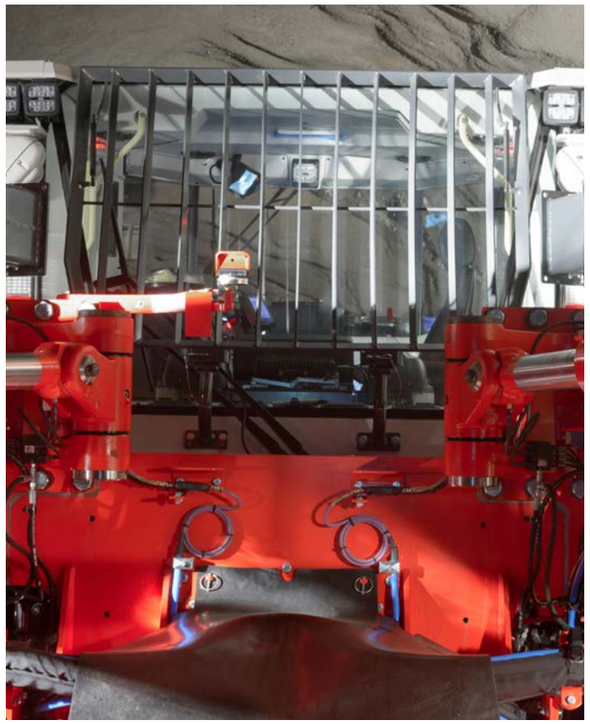
Advantages	Customer values
Protect operator from rock fall or projection. Protect operator in case of machine tipping-over Protect operator from excessive noise vibration and dust exposure. Protect operator from hot or cold environment.	Improve operator's safety and comfort

Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative
Sandvik DT621	
Sandvik DT721	
Sandvik DT821*	
Sandvik DT912D	
Sandvik DT1131-JP	
Sandvik DT1231	

*Low cabin and/or acid proof version available.

Cabin safety grill for tunneling drills

Description
When drilling in poor ground condition, rock may fall from the roof and hit the cabin windshield, generating risk of injuries for the operator and damages on the unit.
In order to improve safety of the operations, Sandvik has designed the Cabin Safety Grill that provides additional protection against frontal falls of rock.
The safety grill is mounted on the cabin to cover the front windshield and folds up manually, allowing cleaning or replacement of the windshield, or servicing the window wiper(s).

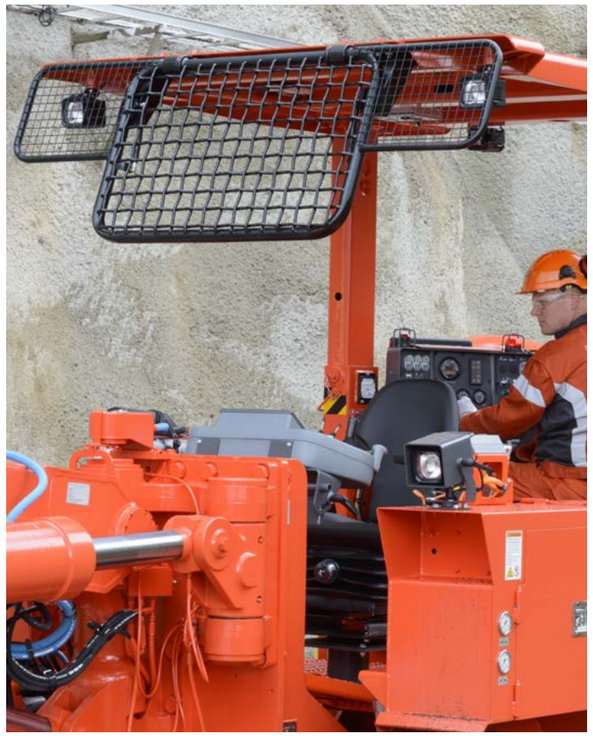


Advantages	Customer values
Provide protection if rock hit the cabin windshield.	Improve Safety
Limit the risk of damage on the cabin front windshield	Reduce operating cost

Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative
Sandvik DT621	
Sandvik DT721	
Sandvik DT821-C	
Sandvik DT912D	
Sandvik DT912iD	
Sandvik DT922i	
Sandvik DT923i	

Canopy safety grill for tunneling drills

Description
When drilling in poor ground condition, rock may fall, roll on the boom structure down to the operator's compartment . Consequences could be fatal injuries for the operator and severe damages for the unit.
In order to strongly mitigate this risk, Sandvik has designed a specific Canopy Safety Grill for Tunneling Drills.
The safety grill is mounted on the canopy to protect the front of the operator compartment from rock falls and projections. The grill design allows to keep the canopy variable height function.

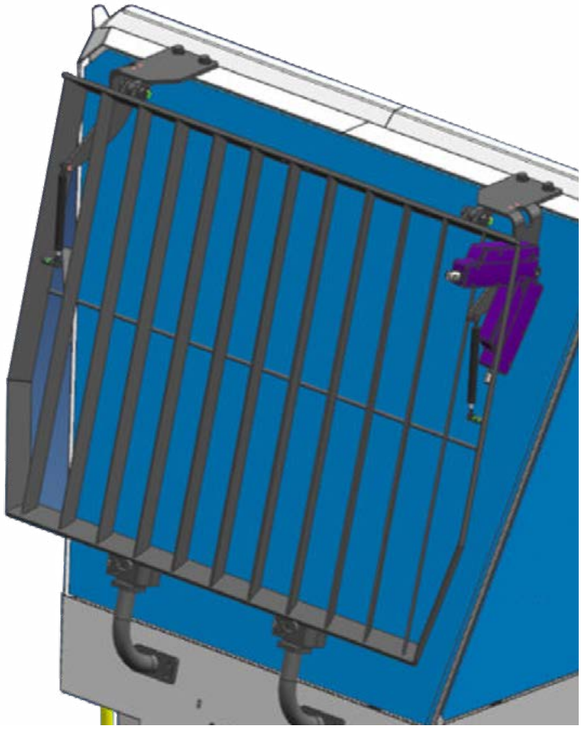


Advantages	Customer values
Protect the operator in case of frontal falls of ground.	Improve safety
Reduce the risk of damages on the unit.	Reduce operating cost

Machine models	Part Numbers
Sandvik DT621	Contact local Sandvik representative
Sandvik DT721	
Sandvik DT821	

Electrically activated safety grill for tunneling drills

Description
Poor visibility is a major factor on the risk of collision when operating Tunneling drills. That's why keeping the cabin windows as clean as possible is very important.
Sandvik has improved the cabin's windscreen Safety Grill system in order to make it easier to clean.
Now the grill can be lifted with the help of an electrical actuator so that the window can be cleaned more easily from the ground level.



Advantages	Customer values
Electric system that helps to lift the windscreen's safety grill.	Allows to clean more easily the windscreen. Improve safety.

Machine models	Part Numbers
Sandvik DT912D	Contact local Sandvik representative
Sandvik DT922i	

Cabin heating system for tunneling drills

Description
Cold temperatures have hazardous effects on humans and their ability to work well. When the body is exposed to cold temperatures, the negative effects can includes dehydration, numbness, shivering, frostbite and hypothermia. This can lead to extended reactivity time, fatigue, uncontrolled movements or loss of lucidity that increase the risk of loss of control and accident.
In order to mitigate this risk, Sandvik has developed Heating Systems for their tunneling drills equipped with cabin. The Heating Systems are able to generate sufficient heat in the cabin, even on the coldest ambient temperatures.
The heating system use cooling fluid from the engine cooling system to generate heat while the engine is running (tramming phases). During drilling phases, the heat is generated by electric resistance located on the AC system.
The temperature on the cabin is fully adjustable with a simple knob.

Advantages	Customer values
System that provides heat on the cabin during drilling and tramming phases.	Reduce risk of accident due to negative effect of cols ambient temperature. Improve operator's comfort.

Machine models	Part Numbers
Sandvik DT621	Contact local Sandvik representative
Sandvik DT721	

Access detector for tunneling drills

Description
The working area of the boom(s) of an underground drill is a dangerous areas. The risk of injury due to rock fall, collision with moving boom(s), or rotating drilling rod is major, and statistics show several fatalities registered every year due
In order to reduce this risk, Sandvik has developed the Access Detector system for Tunneling drills.
Access Detector is a systems enhancing safer drilling operations by decreasing risks caused by human actions and errors. The system detects access from both sides of the drill rig thanks to a laser scanner located at the back of the machine.
When Sandvik Access Detector is actuated by a person entering the hazard zone, it warns the operator with a visual warning. The operator may continue the drilling operation normally but he/she must ensure that no-one is in the hazard zone.

Advantages	Customer values
Warn the operator when somebody entering the hazard zone of the machine.	Improve safety

Machine models	Part Numbers
Sandvik DT621	Contact local Sandvik representative
Sandvik DT721	
Sandvik DT821	
Sandvik DT821-C	
Sandvik DT912D	
Sandvik DT912iD	
Sandvik DT922i	
Sandvik DT923i	
Sandvik DT1132i	
Sandvik DT1232i	

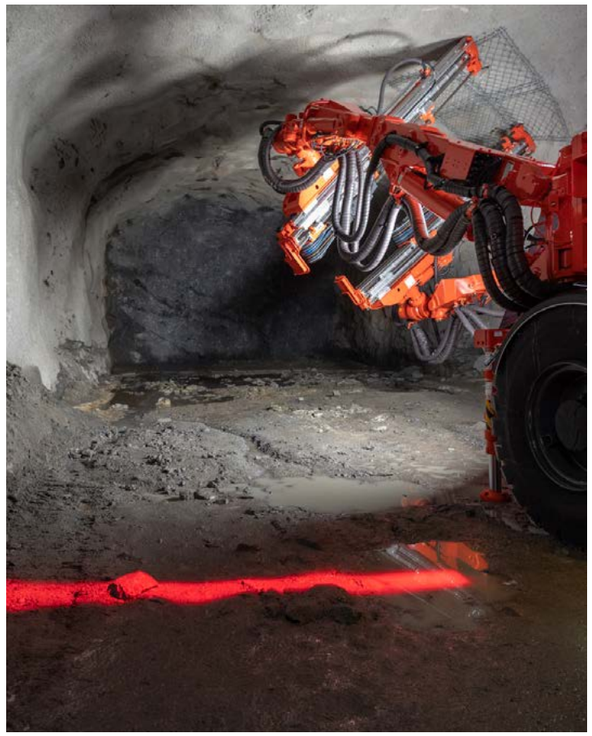
Access protector for tunneling drills

Description

The working area of the boom(s) of a Tunneling drill is a dangerous areas. The risk of injury due to rock fall, collision with moving boom(s), or rotating drilling rod is major, and statistics show several fatalities registered every year due

In order to mitigate this risk, Sandvik has developed the Access Protector system for Tunneling drills. If the Sandvik Access Protector system recognizes a person in the detection field, thanks to laser scanner fences located on both sides of the machine, boom and drilling movements will automatically be stopped.

In other words, the Sandvik Access Protector prevents anyone from entering the working area of the booms while they are in operation. If boom operation is automatically stopped, the system must be reset by pressing the acknowledgment button, after ensuring that no-one is in the hazard zone.



Advantages	Customer values
Stop automatically all boom and drilling movements as soon as somebody enter the dangerous working area of the boom(s).	Improve safety

Machine models	Part Numbers
Sandvik DT912D	Contact local Sandvik representative
Sandvik DT912iD	
Sandvik DT922i	
Sandvik DT923i	
Sandvik DT1132i	
Sandvik DT1231i	
Sandvik DT1232i	
Sandvik DT1331i	

Lifecycle cost improvement

Additional by-pass filter for tunneling drills

Description

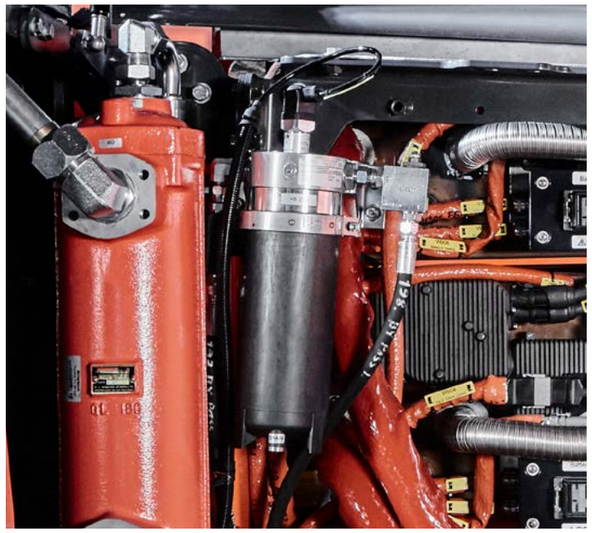
Tunneling operations have to run smoothly and economically with limited or no downtime to be successful. Unplanned equipment breakdown can often be the most timely and expensive setbacks for tunneling companies. And a majority of the failures concerns the hydraulic systems of the machines. The components that are parts of the hydraulic systems (Rock drills, pumps, cylinders, valves...) are generally very expensive and difficult to troubleshoot and replace.

Studies provided by suppliers of hydraulic components, show that up to 80% of the hydraulic systems failures are caused by excessive hydraulic oil contamination.

The most efficient solution to reduce dramatically the risk of failures of hydraulic components is to control and limit the contamination level of the hydraulic oil. This means that hydraulic fluids maintenance should be a top priority during maintenance operations.

Sandvik always promotes the best maintenance practices and would like to help his customers to manage the hydraulic oil contamination level. So we have developed a "by-pass" filtration system that clean continuously the oil.

This additional filter is mounted in parallel with the hydraulic circuit, which allow a very fine and efficient filtration (2µm absolute). The filter element has a high retention capacity (240g) that makes replacement interval wide and economical. Electric clogging indicator inform when replacement of the element is needed.



Advantages	Customer values
Very efficient filtration that reduce the risk of failure of the hydraulic components.	Reduce Operating Cost
Limit the risk of downtime due to failure of hydraulic component.	Preserve productivity

Machine models	Part Numbers
Sandvik DT912D	
Sandvik DT912iD	
Sandvik DT921i	
Sandvik DT922i	
Sandvik DT923i	
Sandvik DT1031-SC	
Sandvik DT1121	Contact local Sandvik representative
Sandvik DT1131	
Sandvik DT1131i	
Sandvik DT1132i	
Sandvik DT1231i	
Sandvik DT1232i	
Sandvik DT1331i	

Automatic greasing system for tunneling drills

Description
Regular lubrication of implemented greasing points is essential for reliable and trouble-free operations of the drilling mechanical components. Important saving on the life of different pins and skids can be achieved with optimum lubrication. Proper condition of the boom articulation insures also drilling precision.
With automatic greasing system the correct amount of grease is delivered automatically to the majority of lubrication points, excluding feed(s).
The lubrication interval can be adjusted from the central greasing unit. System diagnostics monitor that greasing cycle is done successfully.
The system is also available for utility boom(s).

Advantages	Customer values
Improve life of booms and central articulation pins and skids by insuring constant and optimal greasing Reduce maintenance time.	Reduce operating cost
Ensure good condition of boom pins and skids	Improve drilling precision/productivity

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative	Sandvik DT1121i	Contact local Sandvik representative
Sandvik DT621		Sandvik DT1131	
Sandvik DT721		Sandvik DT1131-SC	
Sandvik DT821*		Sandvik DT1131-JP*	
Sandvik DT821-C*		Sandvik DT1131i	
Sandvik DT912D		Sandvik DT1132i*	
Sandvik DT912iD		Sandvik DT1231	
Sandvik DT921i		Sandvik DT1231i	
Sandvik DT922i		Sandvik DT1232i*	
Sandvik DT923i*		Sandvik DT1331i	
Sandvik DT1031-SC			

* Automatic greasing system for utility boom also available.

Grease reel with pump and nozzle for tunneling drills

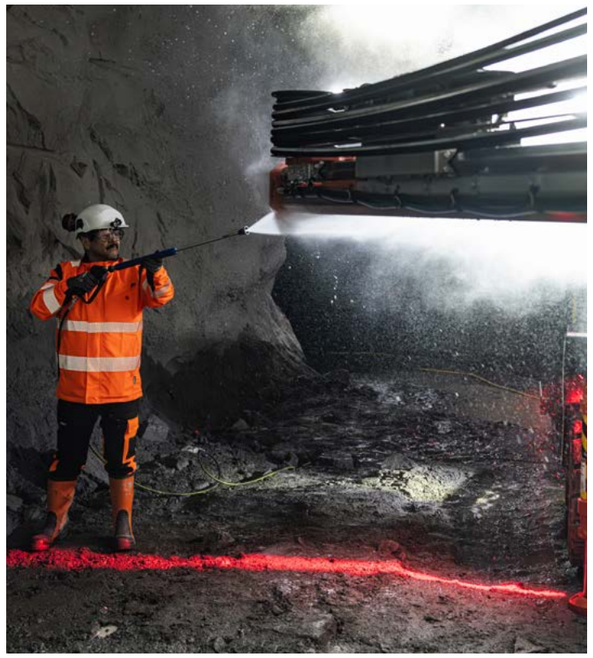
Description
Regular lubrication of implemented greasing points is essential for reliable and trouble-free operations of the drilling mechanical components. Important saving on the life of different pins and skids can be achieved with optimum lubrication. Proper condition of the boom articulation insures also drilling precision.
Greasing reel with pump and nozzle enables the operator to manually lubricate the needed locations.
The system is fully integrated on the machine and autonomous. The lubrication hose is long enough to reach all grease point on the drilling unit (15 m).
Operator manually controls the amount of grease to be injected with the trigger of the nozzle. The pump works with compressed air provided by the machine's compressor.
The grease tank capacity is 14 or 22 liters according machine model.

Advantages	Customer values
Improve life of booms, cylinders, articulation pins and skids by making greasing maintenance operation easy and convenient on every machine's location.	Reduce operating cost

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative	Sandvik DT1031-SC	Contact local Sandvik representative
Sandvik DT621		Sandvik DT1121i	
Sandvik DT721		Sandvik DT1131	
Sandvik DT821		Sandvik DT1131-SC	
Sandvik DT821-C		Sandvik DT1131-JP	
Sandvik DT912D		Sandvik DT1131i	
Sandvik DT912iD		Sandvik DT1132i	
Sandvik DT921i		Sandvik DT1231	
Sandvik DT922i		Sandvik DT1232i	
Sandvik DT923i			

High pressure cleaner for tunneling drills

Description
Mining equipment are operating is a very dusty, muddy and wet environment. That's why it's important to keep the equipment as clean as possible with regular washing with high pressure water to remove, mud, dirty grease, and rock cuttings, that could on the long run damage the unit, generate premature wearing or inhibit some functions and movements.
In order to ease the maintenance operations, and especially the unit washing operations, Sandvik offers to equip tunneling drills with on-board water High Pressure Cleaner.
This heavy duty High Pressure Cleaner, can generate pressure up to 180 bars. Water is pressurized with a separate hydraulically driven high pressure water pump, powered by the diesel engine of the rig and the system can be used anywhere, as long as the machines connected to the mine water network.
The High Pressure Cleaner upgrade solution includes a practical spring loaded hose reel.



Advantages	Customer values
On-board water HP cleaner. Allows to clean the machine efficiently everywhere it is possible to connect the machine to the mine water network.	Reduce operating cost by allowing to clean easily and efficiently the machine.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative	Sandvik DT1031-SC	Contact local Sandvik representative
Sandvik DT621		Sandvik DT1121i	
Sandvik DT721		Sandvik DT1131-SC	
Sandvik DT821		Sandvik DT1131-JP	
Sandvik DT821-C		Sandvik DT1131i	
Sandvik DT912D		Sandvik DT1132i	
Sandvik DT912iD		Sandvik DT1231	
Sandvik DT921i		Sandvik DT1231i	
Sandvik DT922i		Sandvik DT1232i	
Sandvik DT923i		Sandvik DT1331i	

Water hose reel for tunneling drills

Description
Frequent repair or replacement of the water supply hose could be very costly and frequent damages of the hose can really impact the production as drilling is impossible without correct water supply. Also, unreeling and reeling hose "by hand" is a long and heavy task for the operator if the mine water connection is located several tenth of meters from the work place.
In order to ease the management of the water supply hose and to protect it during tramming phases, Sandvik has developed a Water Hose Reel.
The reel can be controlled from the operator station or from the back of the machine. There is an automatic function that unreel the hose in the same time the machine tram to the face (same as the electric supply cable).
The Water Hose Reel upgrade solution can be delivered with water hose (size and length differ according machine models.)

Advantages	Customer values
Water Hose Reel ease the management of the water supply hose and protect it during tramming phases.	Reduce risk of damages on the water hose that are costly and disturbs production. Makes operator tasks easier and more comfortable.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative	Sandvik DT1130i	Contact local Sandvik representative
Sandvik DT621		Sandvik DT1131	
Sandvik DT721		Sandvik DT1131-SC	
Sandvik DT821		Sandvik DT1131i	
Sandvik DT821-C		Sandvik DT1132i	
Sandvik DT921i		Sandvik DT1231	
Sandvik DT922i		Sandvik DT1231i	
Sandvik DT923i		Sandvik DT1232i	
Sandvik DT1121i		Sandvik DT1331i	

Application modification

Telescopic feed conversion for tunneling drills

Description

When it is needed to perform new tasks with your development drill rig, like for instance drilling cross-cuttings on narrow drifts or drilling bolt holes, using a solid long feed can be problematic. That's why Sandvik has developed the TFX500 feeds.

Sandvik TFX500 telescopic feeds are designed for Sandvik face drilling jumbos with RDX5 and RD500 series rock drills. A versatile feed for face drilling, bolt hole drilling and cross-cuttings in a limited space where both long and short rods have to be used.

When Sandvik TFX500 feed is at the minimum length, short holes (i.e. bolt holes) can be drilled and while at maximum length, longer holes (i.e. face holes) can be drilled. The extension of feed can be adjusted step-by-step between the minimum and maximum length.

The beams are made of special aluminum profile with sliding surfaces faced with stainless steel strips. The drill rod centralizers are equipped with hardened steel wear pieces and designed for optimum visibility and durability.

TRR1 (hydraulic rod retainer) for extension drilling is available as an option.

The TFX500 conversion kit is delivered with all needed parts including, telescopic function controls (hydraulic or electro-hydraulic according machine model) and hoses harness.

Advantages	Customer values
Allow to do several tasks with the same machine in an efficient way.	Improve versatility
No waste of time and human resources on bringing several machines on the same location to perform different tasks.	Improve productivity
Transform development drill rig into versatile machine that can drill face and also bolt holes at a low investment cost.	Reduce operations costs.

Machine models	Part Numbers
Sandvik DT611[1]	Contact local Sandvik representative
Sandvik DT621[1]	
Sandvik DT721[2]	
Sandvik DT820[1]	
Sandvik DT821[3]	
Sandvik DT821-C[3]	
Sandvik DT912D[3]	
Sandvik DT912iD[3]	
Sandvik DT922i[2]	
Sandvik DT923i[3]	
Sandvik DT1031-SC[2]	
Sandvik DT1131i[2]	
Sandvik DT1131-JP[2]	
Sandvik DT1132i[3]	
Sandvik DT1231i[2]	
Sandvik DT1232I[3]	

1) Feed lengths available: TFX6/12 or TFX8/14
2) Feed lengths available: TFX6/12, TFX8/14 or TFX10/16
3) Feed lengths available: TFX6/12, TFX8/14, TFX10/16 or TFX12/18

TRR1 rod retainer for tunneling drills

Description
Occasionally, it might be necessary to drill holes longer than the standard rod length used, i.e. drilling investigation holes, holes for grouting etc.
For this purpose, Sandvik has developed the TRR1 rods retainer system that allows to add several rods on the feed, to drill longer holes.
Sandvik Rod Retainer TRR1 can be fitted on Sandvik Tunneling drills feeds (TF, TFi and TFX) with HLX5, RDX5 and RD500 series rock drills.
Additional rods have to be loaded manually in the gripper.
A safety wire is installed near the TRR1 to allow immediate emergency stop in case of issue.
During coupling and uncoupling phase TRR1 is holding extension rods. TRR1 can be used either 32 mm (1 ¼ in) or 38 mm (1 ½ in) rods.
The design of TRR1 rod retainer aims at simplicity of structure and ease of maintenance. TRR1 is a robust welded steel structure with only one movable jaw piece. The jaw pieces are made of hardened steel and designed for optimum visibility and durability.
When TRR1 is installed on TF feed, hole depth is shortened by 35 mm. By cutting 35 mm off from the buffer hole depth can be restored. On telescopic TFX feed there is no effect on hole length.
The TRR1 conversion kit is delivered with all needed parts including, new controls (hydraulic or electro hydraulic according machine model) and hoses harness.

Machine models	Part Numbers
Sandvik DT611	Contact local Sandvik representative
Sandvik DT621	
Sandvik DT721	
Sandvik DT820	
Sandvik DT821	
Sandvik DT821-C	
Sandvik DT912D*	
Sandvik DT912iD	
Sandvik DT922i*	
Sandvik DT923i	
Sandvik DT1031-SC	
Sandvik DT1131i	
Sandvik DT1131-JP	
Sandvik DT1232i*	

Advantages	Customer values
Allow to drill occasional longer hole by adding a second rod on the feed	Improve machine's versatility
Safety wire allow emergency stop while adding rod on the feed.	Improve Safety

* Only with TFX feed

SCR rod retainer for tunneling drills

Description
Occasionally, it might be necessary to drill holes longer than the standard rod length used, i.e. drilling investigation holes, holes for grouting etc.
For this purpose, Sandvik has developed the SCR rods retainer system that allows to add several rods on the feed, to drill longer holes.
Sandvik Rod Retainer SCR can be fitted on Sandvik Tunneling drills feeds (TF, TFi) with HLX5, RDX5 and RD500 series rock drills. SCR is not available with TFX feed.
Additional rods have to be loaded manually in the gripper.
A safety wire is installed near the SCR to allow immediate emergency stop in case of issue.
The design of the SCR rod retainer aims at simplicity of structure and ease of maintenance. SCR is a robust welded steel structure with two movable jaw pieces. The jaw pieces are made of hardened steel and designed for optimum visibility and durability.
The key benefit of SCR in addition to effective holding of the rods is the ability to keep the rod centralized in the middle of the feed front centralizer while clamping. The grip is tighter and better suited for the rod coupling than a non-centralizing retainer (i.e. TRR1).
The SCR conversion kit is delivered with all needed parts including new controls (hydraulic or electro-hydraulic according machine model) and hoses harness.

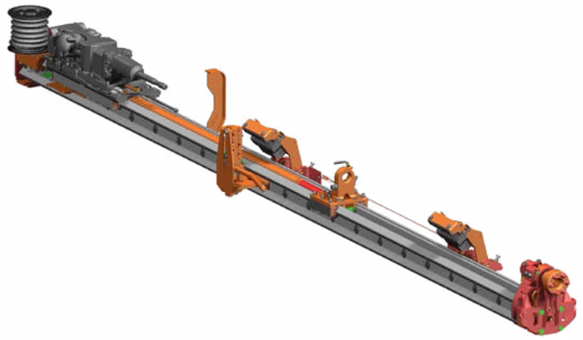
Machine models	Part Numbers
Sandvik DT611*	Contact local Sandvik representative
Sandvik DT821	
Sandvik DT821-C	
Sandvik DT912D*	
Sandvik DT912iD	
Sandvik DT921i	
Sandvik DT922i*	
Sandvik DT923i	
Sandvik DT1031-SC*	
Sandvik DT1121i	
Sandvik DT1131-JP	
Sandvik DT1131i*	
Sandvik DT1132i	
Sandvik DT1231*	
Sandvik DT1231i	
Sandvik DT1232i	
Sandvik DT1331i	

Advantages	Customer values
Allow to drill occasional longer hole by adding a second rod on the feed.	Improve machine's versatility
Safety wire allow emergency stop while adding rod on the feed.	Improve Safety

*Only with TF and TFi feeds

TRS two rods system for tunneling drills

Description
Occasionally, it might be necessary to drill holes longer than the standard rod length used, i.e. drilling investigation holes, holes for grouting etc. For this purpose, Sandvik has developed the TRS two rods system that allow to had safely a second rod on the feed.
The TRS can be retrofitted to TF and TFi feeds on tunneling drills.
The TRS consists of two grippers with cylinders to hold one rod at a time in jaws, a rod retainer to hold the rod during coupling / uncoupling (TRR1 or SCR) , an opening traveling centralizer to allow adding / removing rods from the center line, and a limit plate to help positioning the rods in the grippers.
The drilling starts with one rod in the feed, and another in the rippers. When the first rod is drilled, the second rod is placed in the feed by the grippers.
Additional rods can be loaded manually in the gripper. A safety wire is installed near the TRS to allow immediate emergency stop in case of issue.
The TRS Upgrade Solution Retrofit kit is delivered fully adapted to customer's rods specifications, with all needed parts including controls and hoses harness.



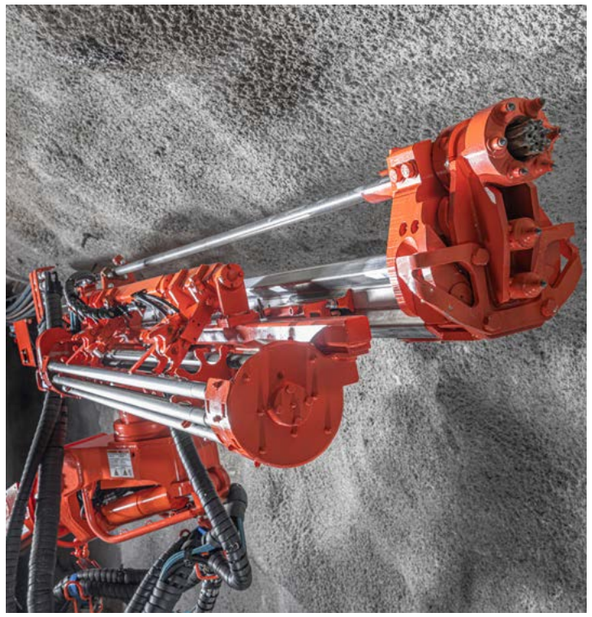
Advantages	Customer values
Allow to drill occasional longer hole by adding a second rod on the feed without having to bring people on the front danger area of the machine.	Improve versatility and safety

Machine models	Part Numbers
Sandvik DT611	
Sandvik DT621*	
Sandvik DT721*	
Sandvik DT820*	
Sandvik DT821	
Sandvik DT821-C	
Sandvik DT912D	
Sandvik DT921i	
Sandvik DT922i	Contact local Sandvik representative
Sandvik DT1031-SC	
Sandvik DT1121i	
Sandvik DT1131i	
Sandvik DT1131-JP	
Sandvik DT1132i	
Sandvik DT1231	
Sandvik DT1231i	
Sandvik DT1331i	

*TRR1 Rod retainer instead of SCR.

SRH rod handling system for tunneling drills

Description
Sandvik SRH is a fully automatic rod handling system for longhole drilling in tunneling with Sandvik GT38 MF extension rods. The optimal hole size is 64 mm.
Typical applications are drilling of injection and probe hole fans heading from tunnel face forward.
SRH provides safe, ergonomic and automated way of extension rod handling.
Design criteria of revolutionary Sandvik SRH solution has been hole straightness, productivity, low weight, compact design, ease of use and durable and protected structure for demanding tunnel conditions. Sandvik SRH is designed for the latest models of i-series tunneling jumbos.
Depending on application Sandvik SRH can use 8 ft or 10 ft extension rods. For effective uncoupling of rods SRH is delivered with Power Extractor which is mounted on a rock drill.
The magazine is designed for eight extension rods in addition to the starter rod on the feed. Controls of SRH and Power Extractor are integrated to the control system of the drill rig.



Advantages	Customer values
Allow to drill long hole by adding up to 9 rods rod on the feed.	Improve machine versatility
Fully mechanized system that allows extension drilling without having to bring people on the front danger area of the machine.	Improve safety

Machine models	Part Numbers
Sandvik DT923i	
Sandvik DT1132i	
Sandvik DT1232i	

Utility boom upgrade for tunneling drills

Description
Marking the face, scaling the roof or installing bolts are hazardous tasks if not done with the proper equipment.
Sandvik Utility booms are designed to lift people in order to achieve needed tasks in the most safe way.
The Utility booms have a telescopic extension, parallel automatics of the basket and dual controls (from the basket and from the unit's operator station) for the boom swing, lift and extension features.
Type A basket is without and type B basket with a swing feature. The basket swing speed is adjustable.
Sandvik SUB5i booms are manufactured and tested according to European Standard EN280.
Safety canopy, hydraulically lifted (FOPS, ISO 3449, 11600J) is available as optional feature as is a rod rack (2 pieces, for max. 4 pieces of 10 or 12 ft rods per rack) and working lights assembly.

Machine models	Utility boom	Part Numbers
Sandvik DT611	SUB2A	Contact local Sandvik representative
Sandvik DT821	SUB3A	
Sandvik DT821-C	SUB3A	
Sandvik DT921i	SUB4iA/B	
Sandvik DT922i	SUB4A/B	
Sandvik DT923i	SUB4iA/B	
Sandvik DT1031-SC	SUB5iA/B	
Sandvik DT1121i	SUB5iA/B	
Sandvik DT1131	SUB5iA/B	
Sandvik DT1131-JP	SUB5iA/B	
Sandvik DT1131i	SUB5iA/B	
Sandvik DT1132i	SUB5iA/B	
Sandvik DT1231	SUB5iA	
Sandvik DT1231i	SUB5iA/B	
Sandvik DT1232i	SUB5iA/B	
Sandvik DT1331i	SUB5iA/B	

Advantages	Customer values
Utility boom that is able to lift people in safety to perform task in height.	Improve safety during hazardous tasks.

Rx expansion bolt kit for tunneling drills

Description
RX expansion bolt kit is an option on Sandvik utility booms.
The kit allows to inflate manually, from the basket of the utility boom, expansion bolts with H.P. water. A pressure gauge, located on the inflation gun, allows the operator to insure the bolt is inflated to the correct pressure.
The kit includes also an high pressure water pump (max. 320 bars) and all mechanical, electric and hydraulic assemblies needed.

Machine models	Part Numbers
Sandvik DT821	Contact local Sandvik representative
Sandvik DT821-C	
Sandvik DT921i	
Sandvik DT922i	
Sandvik DT923i	
Sandvik DT1031-SC	
Sandvik DT1121i	
Sandvik DT1131	
Sandvik DT1131i	
Sandvik DT1132i	
Sandvik DT1231	
Sandvik DT1231i	
Sandvik DT1232i	
Sandvik DT1331i	

Advantages	Customer values
Allows to inflate manually, from the basket of the Utility Boom, expansion bolts.	Install expansion bolts on a safe way.

Upgrades solutions for loaders

Sandvik upgrades and engineered solutions offers a vast range of retrofit kits that allow to modify the original specifications of your underground mining loaders to improve the performance, the productivity, the safety or to reduce the environmental impact and the operating cost. Our offering includes also solutions to adapt your machine to different application.

Productivity improvement

Integrated weighing system for loaders

Description
Improper loading of the loader's bucket leads to loss of productivity, and could generates safety consequences and expensive technical issues.
Sandvik Integrated Weighing System (IWS) for Loader allows to monitor the load on the bucket of your loader with great accuracy (up to 97%) thus ensuring the maximal productivity.
In addition, it will help to avoid safety and technical issues that could be generated by frequent over-loading of the bucket.
The data measured by the IWS are transferred to the My Sandvik Digital Services Knowledge Box™. These data are used to build My Sandvik Productivity reports that gives a direct overview of fleet utilization and performance. It also gives access to alarm and signal reports to detect early safety violations or lower performance issues.

Advantages	Customer values
Provide reliable estimation of the bucket payload (within 3% maximal error*) when lifting the boom (weighing "on the go").	Ensures optimum bucket filling thus maximal productivity. No interruption of the loading process due to weighing. Avoids safety or technical issues caused by bucket overloading.
IWS is fully integrated into the machine control system using the original display to provide bucket load information to the operator. Assist the operator with a sound signal when the weighing result is ready.	User friendly interface. IWS is simple and easy to use No additional screen needed. Improves quality and consistency for operators of all experience levels, and reduces training duration for new operators. Identifies needs for operator training.
IWS information are collected and can be transferred wirelessly or via USB to the My Sandvik Digital Services Knowledge box™.	IWS data are used to build the My Sandvik Productivity reports. Reliable data easily collected and compiled. Optimal production follow-up. Possibility to compare real productivity results with targets for each individual loader and to get a direct overview of fleet's utilization. Access to alarm and signal reports. Early detection of lower performance, safety violations, etc...

Machine models	Part Numbers
Sandvik LH208L	Contact local Sandvik representative
Sandvik LH410	BG01681322
Sandvik LH410	BG01683216
Sandvik LH514	BG01683251
Sandvik LH514iE	
Sandvik LH514E	
Sandvik LH515i	
Sandvik LH517	BG01683254
Sandvik LH517L	BG01683254
Sandvik LH517i	BG01683427
Sandvik LH518iB	Contact local Sandvik representative
Sandvik LH621	BG01683261
Sandvik LH621i	BG01687532
Sandvik LH625iE	Contact local Sandvik representative

The retrofit kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

Boom suspension and floating system for loaders

Description

While the loader is tramming with bucket loaded, the suspended weight generates important fore-and-aft pitching motions that lead to bucket spillage, if the loader trams too fast, which has important consequences in terms of productivity and operating cost (increase needs for road maintenance, risk of tyres damages...).

These movements also generates high stress on the loaders components and reduce their lifetime.

In order to reduce the fore-and-aft pitching motions while the loader is tramming, Sandvik has developed the Boom Suspension System for Loaders (also called “Ride Control”).

The boom suspension improves the loader’s driving and operator’s comfort by suspending the boom on pressure accumulators during tramming. It also reduces the stress on the machine frame components, extending their lifetime.

Daily tasks get more effective by stable driving and more comfort increasing safety, reliability and productivity.

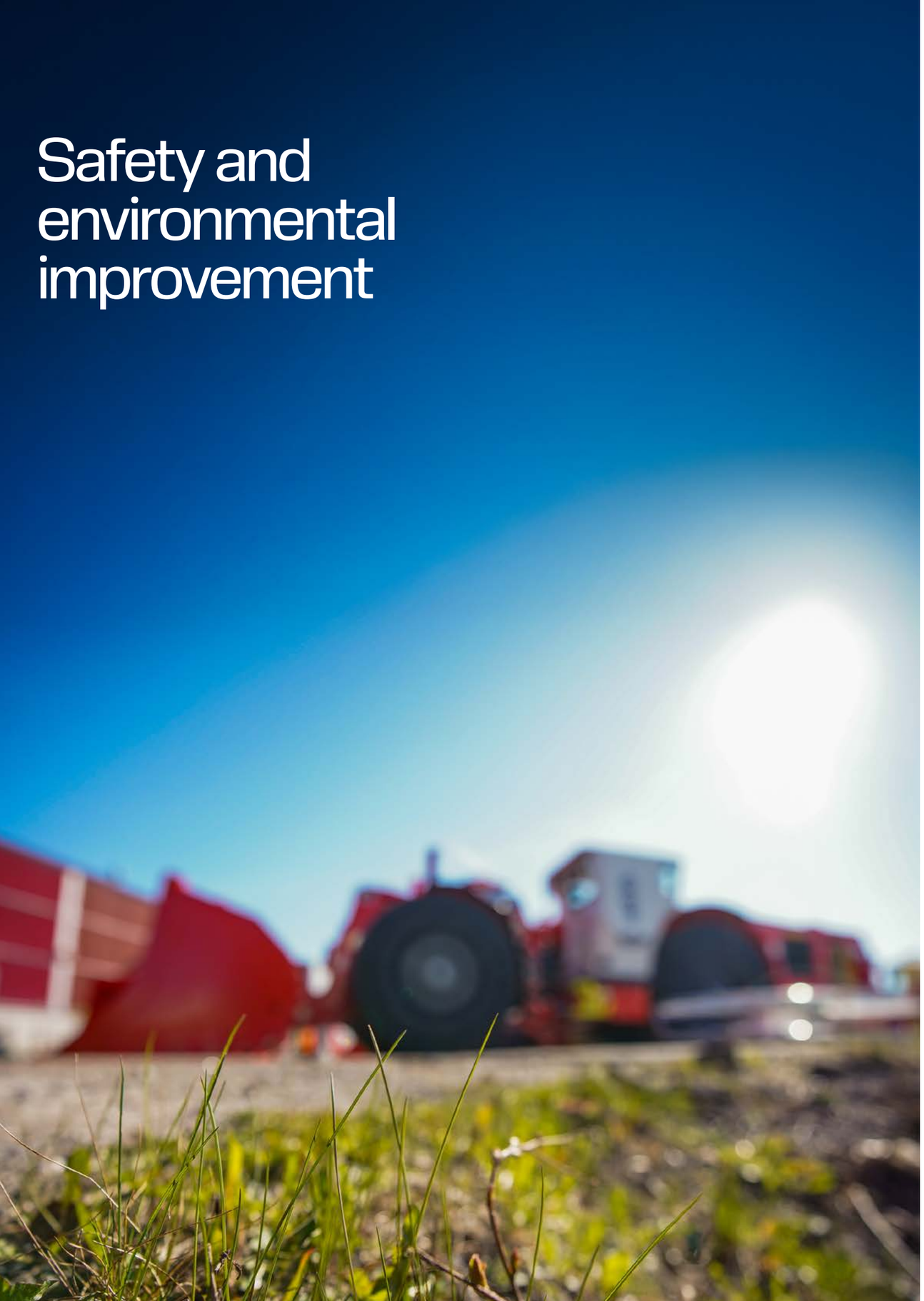
Boom suspension system comes together with the Bucket Floating System that allows the bucket to follow the ground smoothly. It enable to clear easily fallen rock on the roads.

Advantages	Customer values
Reduces bucket spillage with boom suspension. Higher tramming speed.	Increase Productivity.
Reduced stress on the loader extends components life. Reduced road maintenance due to less spillage. Reduced tires wear and risk of tire damage.	Reduce operating cost.
Improved road condition and operator comfort. Stable and smooth operation, even with higher speed. Reduced fore-and-aft pitching motion and collision with rocks.	Improve safety and operator’s comfort.

Machine models	Part Numbers
Sandvik LH202	Contact local Sandvik representative
Sandvik LH307	56203746
Sandvik LH307	BG01128201*
Sandvik LH410	56043918
Sandvik LH410	BG01128435*
Sandvik LH514	BG00353725
Sandvik LH514	BG01127002*
Sandvik LH514E	Contact local Sandvik representative
Sandvik LH514iE	
Sandvik LH515i	
Sandvik LH517	
Sandvik LH517i	
Sandvik LH518iB	
Sandvik LH621	
Sandvik LH621i	

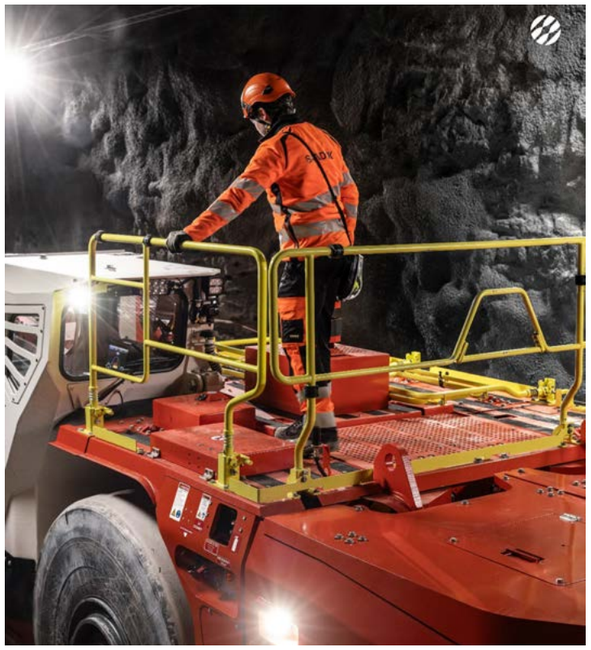
*CRN Certified (only units operating in Canada)

Safety and environmental improvement



Safety rails for loaders

Description
Working at height is one of the highest risk that mine workers are facing. And statistics show that slip and fall are a major cause of accident in the mining industry with several fatalities registered every year.
On loaders, some maintenance and repair operations have to be done from the top deck.
To help our customers to control fall hazards during maintenance and repair operations, Sandvik has developed the Safety Rails system that offers an efficient protection against the risk of fall.
The Safety Rails system is specifically designed for underground mining harsh environment. The Safety Rails system is operated by an electro-hydraulic system, providing immediate protection to the worker while climbing on the machine.



Advantages	Customer values
Safety Rails mitigate the risk that service people fall from the top of the machine.	Improve the safety of the maintenance and repair operations
Foldable system that stays permanently on the machine, it is always available, even if the machine is not located on the workshop.	Able to protect the people in any circumstances.
Simple and reliable system.	Easy to use, require minimal training to be used. Minimal maintenance and withstands tough mining conditions.
Easy and quick to set-up.	Immediate safety to the person climbing on top of the machine.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik LH307	BG01264247	Sandvik LH515i	Contact local Sandvik representative
Sandvik LH410	BG00374042	Sandvik LH517	56212199
Sandvik LH410	BG00361081	Sandvik LH517	56212225
Sandvik LH514	56203845	Sandvik LH517	BG00242012*
Sandvik LH514	56203853	Sandvik LH517i	BG00929241
Sandvik LH514	56210891	Sandvik LH517i	BG00971876
Sandvik LH514	BG00524798	Sandvik LH518iB	Contact local Sandvik representative
Sandvik LH514	BG00610353		
Sandvik LH514	BG00757703	Sandvik LH621	BG00311581
Sandvik LH514E	Contact local Sandvik representative	Sandvik LH621	BG00736986
Sandvik LH514iE		Sandvik LH621i	BG00976329

* Conversion Manual to Electro-hydraulic kit.
The retrofit kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

Cameras system for loaders

Description

In Underground mining, confined space and limited visibility due to dust or poor lighting increase the risk of collision with pedestrians, other machines or walls.

Collision is one of the major risk on underground mining with several fatalities registered every year.

In order to increase the visibility of the operator and to limit risk of collision, Sandvik has developed cameras system for Loader.

Cameras system improves the safety by increasing the operator field of vision, allowing view on the blind areas. It also limits the risk of collision with walls that would cause damages on the equipment.

The system includes two cameras located on front and rear on the machine, on the opposite side of the cabin. (Two monitors (one for each camera) are located on the cabin (only 1 monitor on LH208L) . An optional recording device is also available on some models.

Advantages	Customer values
Increase the field of vision of the operator, allow view on the blind side areas. Limit the risk of collision with a pedestrian. Limit the risk of collision with an other machine. Optional recording device allows accident cause analysis	Increase safety
Reduces risk of damage on the machine due to collision with walls or other machine.	Reduce operating cost

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik LH208L	BG00817394	Sandvik LH514E	Contact local Sandvik representative
Sandvik LH209L	BG00844928	Sandvik LH514iE	
Sandvik LH307 (OC)	BG00955379	Sandvik LH514L	BG00300053
Sandvik LH307 (CC)	BG00775155	Sandvik LH515i	Contact local Sandvik representative
Sandvik LH410 (OC)	BG01708065	Sandvik LH517	56037484
Sandvik LH410 (CC)	BG01707925	Sandvik LH517L	BG00300053
Sandvik LH410 (CC)[1)]	BG01707917	Sandvik LH517i	BG00868381
Sandvik LH514 (OC)	BG00842909	Sandvik LH518iB	Contact local Sandvik representative
Sandvik LH514 (CC)	BG00841015	Sandvik LH621	56037838
Sandvik LH514 (CC)[1)]	BG01174450	Sandvik LH621i	BG00915720
Sandvik LH514 (OC)[2)]	56210214	Sandvik LH625iE	Contact local Sandvik representative
Sandvik LH514(CC)[2)]	56212181		

(1): These retrofit kits include recording device
(2): For loaders equipped with secondary breaking system (Rammer).
“OC” = Open Cabin
“CC” = Closed cabin.

Diesel particulate filter (DPF) for loaders

Description

Diesel exhaust particles are dangerous for health. Prolonged exposure to high concentrations of diesel particulate matter increases a worker’s risk of cardiovascular, cardiopulmonary and respiratory disease, and lung cancer. This is especially true on the confined underground environment.

In order to prevent the small, health-endangering diesel exhaust particles and carcinogenic toxins from spreading into the environment, Sandvik has equip the LH208L with Diesel Particulate Filter (DPF).

The DPF uses sintered metal filter with external regeneration technology.

It is protected by an on-board diagnostic system. The system will give an early alarm to the operator if something is wrong before any serious failure can occur. The Diesel Particulate Filter has to be cleaned regularly simply with a water HP cleaner.

Advantages	Customer values
Reduce by up to 90% the diesel exhaust particles emissions.	Improve safety and reduce environmental impact.
On-board diagnostic system that monitor the condition of the DPF and alarm the operator in case of issue before serious and expensive failure occur.	Reduce operating cost

Machine models	Part Numbers
Sandvik LH208L	BG01559948
Sandvik LH209L[1)]	Contact local Sandvik representative
Sandvik LH307[2)]	

1) Only on EU Stage IIIA engine
2) Only on B-gen with Tier3 engine.

Cabin upgrade for loaders

Description
Mining conditions varies and affects the operator's environment. Mining conditions can be dusty, dark, wet noisy, icy or hot.
Sandvik has designed cabins for it's loaders to improve the operator's safety and comfort. The cabins are designed to be extremely durable. They meet and exceed the international standard:

- ISO 3449 - Falling Object Protective Structure (FOPS).
- ISO 3471 - Roll-Over Protective Structure (ROPS).

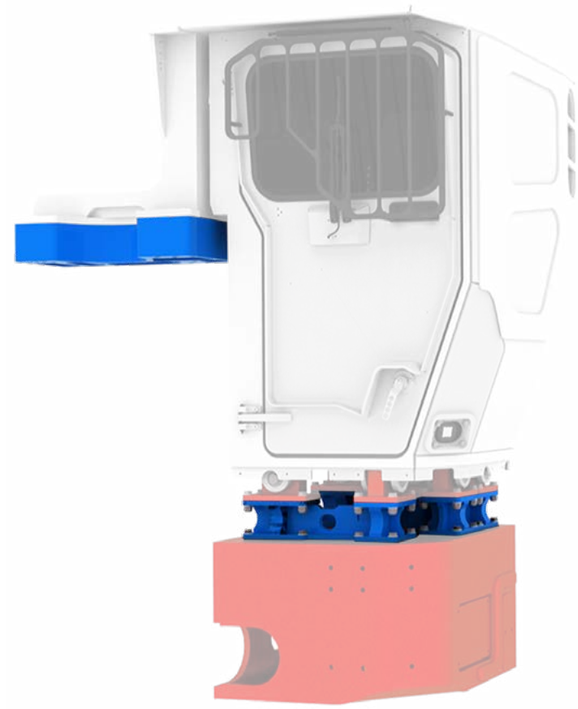
Sandvik Cabin offers low noise and vibration levels and allows emergency exit. Over-pressure in the cabin reduces exposure to air borne particles Cabin upgrade solution includes Air Conditioning system and additional cabin heater element on AC is available on option.

Advantages	Customer values
Cabin meet and exceed international safety requirements FOPS & ROPS. Protect operator from excessive noise, vibration and dust exposure. Protect operator from hot or cold environment	Improve operator's safety and comfort.

Machine models	Part Numbers
Sandvik LH209L	Contact local Sandvik representative
Sandvik LH307	
Sandvik LH410	
Sandvik LH514	
Sandvik LH514E	
Sandvik LH514iE	

Cabin lift upgrade for loaders

Description
In Underground mining, confined space and dust or poor lighting increase the risk of collision with pedestrians, other machines or walls. Collision is one of the major risk on underground mining with several fatalities registered every year.
In order to increase the visibility of the operator and to limit risk of collision, Sandvik has developed Cabin Lift Upgrade Solution for Loader.
The Cabin Lift Upgrade Solution consist on spacers under the cabin and the ROPS bar and lifts the cabin up by 150 mm. Consequently it in increase the height of the equipment by 150 mm (hight of the drifts must be sufficient).



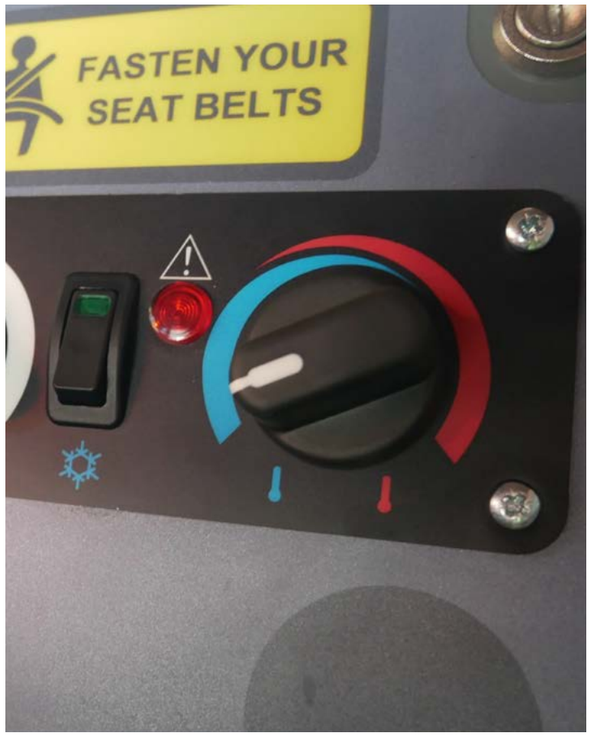
Advantages	Customer values
Increase the field of vision of the operator. Limit the risk of collision with a pedestrian. Limit the risk of collision with an other machine.	Increase safety
Reduces risk of damage on the machine due to collision with walls or other machine.	Reduce operating cost

Machine models	Part Numbers
Sandvik LH514	56032513
Sandvik LH514E	56032513
Sandvik LH514iE	Contact local Sandvik representative
Sandvik LH517	56039786
Sandvik LH517i	Contact local Sandvik representative
Sandvik LH621[1)]	56044162
Sandvik LH621[2)]	56212903
Sandvik LH621i	Contact local Sandvik representative

1) CC517 Cabin
2) CC621 Cabin

Additional cabin heater for loaders

Description
Cold temperatures have hazardous effects on humans and their ability to work well. When the body is exposed to cold temperatures, the negative effects can includes dehydration, numbness, shivering, frostbite and hypothermia. This can lead to extended reactivity time, fatigue, uncontrolled movements or loss of lucidity that increase the risk of loss of control and accident.
In order to mitigate this risk, Sandvik has developed Additional Cabin Heater for Loaders equipped with cabin. The Heating Systems are able to generate sufficient heat in the cabin, even on the coldest ambient temperatures.
The heating system use cooling fluid from the engine cooling system to generate heat while the engine is running (tramming phases). In the Sandvik LH514E, there is a separate heater, not integrated in the air conditioning system, mounted in the cabin
The temperature on the cabin is fully adjustable with a simple knob.



Advantages	Customer values
System that provides heat on the cabin.	Reduce risk of accident due to negative effects cold ambient temperatures. Improve operator's comfort

Machine models	Part Numbers
Sandvik LH307	Contact local Sandvik representative
Sandvik LH410	BG01666067
Sandvik LH514	Contact local Sandvik representative
Sandvik LH514E	
Sandvik LH514iE	
Sandvik LH517i	
Sandvik LH621i	

Cabin safety grill for loaders

Description
When operating in poor ground condition rock may fall from the roof and hit the cabin windshield, generating risk of injury for the operator and damages on the unit.
In order to improve safety of the operations, Sandvik has designed the Cabin Safety Grill that provides additional protection against frontal falls of rock.
The Safety Grill is mounted on the cabin to cover the front window and rotate manually, allowing cleaning or replacement of the window, or servicing the window wiper.

Advantages	Customer values
Provides protection if rock hit the windshield.	Improve safety.
Limit the risk of damage on the cabin windshield.	Reduce operating cost.

Machine models	Part Numbers
Sandvik LH307	BG00418484
Sandvik LH410	BG00418484
Sandvik LH514[1)]	56046962
Sandvik LH515i	Contact local Sandvik representative
Sandvik LH517[2)]	BG01131035
Sandvik LH517i	BG00892250

1) Only low profile cabin.
2) Raised Cabin only.

High backrest seat for loaders

Description
Operators spend a lot of time every day sitting in their loader. This stationary work places a lot of physical and mental stress on the operator. Sitting in an uncomfortable seat can cause additional fatigue and lead to loss of concentration. The risk of accidents increases in consequence. And staying in a stationary position for a long time leads to long-term damage, especially to the lower back, which can lead to chronic pain and permanent disability.
In order to improve the comfort and safety of the operator, Sandvik offers an High Backrest Seat Upgrade Solution.
High Backrest Seat improves the operator ergonomics by providing a better head support when operating the equipment. It includes four-points seat belt that ties the operator tightly to the seat improving safety during operation.

Advantages	Customer values
High Backrest Seat improves operator ergonomics by providing better head support.	Improve operator's comfort and safety.

Machine models	Part Numbers
Sandvik LH515i	Contact local Sandvik representative
Sandvik LH517i	
Sandvik LH518iB	
Sandvik LH621i	

Seat belt & door latch monitoring for loaders

Description
Cabin door and seat belt are essential safety system to limit the risk of injury during machine tramming phases.
In order to insure these safety elements are operational, means cabin door is closed and safety belt is locked, the Sandvik Doors and Safety Belt Monitoring System can be added on your loaders.
The seat belt and door latch indication system is designed to warn the machine operator if machine is used without seat belt or when the cabin door is not properly closed. Warnings are given by a buzzer and with warning lights in the instrument panel.
The brakes are NOT automatically applying if, during machine's tramming phase, the door are opened or seat belt unlocked, as sudden automatic braking causes an additional risk to a person who does not wear a seat belt.
The Doors and Safety Belt Interlock System retrofit kits delivered with all needed parts including, switches, brackets, electric wiring, operator manual update, etc.

Advantages	Customer values
Insure cabin doors are closed and seat belt always fasten when the machine is tramming.	Improve safety

Machine models	Part Numbers
Sandvik LH514	Contact local Sandvik representative
Sandvik LH515i*	
Sandvik LH517	

*Only seat belt

Improved door lock for loaders

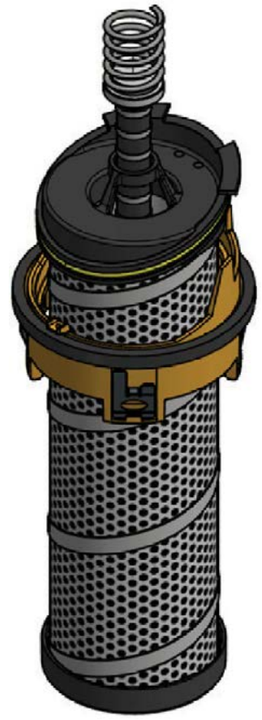
Description
Sandvik has upgraded the door lock in LH517i and LH621i loaders.
When closing the door, the door lock opening handles inside and outside the cabin don't follow the locking mechanism movement anymore. This will help to close the door firmly and ensure the safety of the operator.

Advantages	Customer values
Door lock opening handles do not follow anymore the locking mechanism movement.	Helps to close firmly the door and ensure the safety of the operator.

Machine models	Part Numbers
Sandvik LH517	BG01465700
Sandvik LH621	

Return filter upgrade for loaders

Description
On it latest i-series loaders, Sandvik has introduced a new type of hydraulic return filter.
This new filter brings several advantages:
The filter is shorter and much lighter (-40% when wet) and it is offering firmer grip for lifting the element with a hook or with the fingers as there is more space on the top of the filter. Also, the bottom of the filter is flat making it stand alone when removed. This makes safer and easier the filter replacement. When less effort is needed, more concentration are possible for safe filter change-out. This is particularly true for this filter that has to be replaced form the top of the unit (risk of slip and fall from height).
During the filter element installation, the magnet is guided with the help of a central rod. Magnet stays away from internal metal wire mesh and avoiding any touches with the filter media. So there is no more risks to damage the inside of the filter media or metal wire mesh during the installation process. Media surfaces stay clean and not defected. The possibility of having an element installed that won´t perform according to expectations leading to higher contamination of oil and premature wear of whole system components is then strongly mitigated.



Advantages	Customer values
The new filter is shorter and lighter (-40% when wet). There is more space on the top to insert a lifting hook or the fingers. Smooth and "cut free" surface of the filter element increasing handling safety. New filter element is a stand alone unit thanks to its plain bottom design (no falling down risk).	Replacement of the filter element is safer as the weight to lift is reduced (filter located in the tank, so the lifting position at the beginning is really low) and no need to lift as high because the filter is shorter. Less effort needed, more concentration for safe filter change-out. Reduce risk of messy oily operation. Less risks of injuries due to lifting on slippery surface.
Filter element can be installed carefully to the bottom plate without any magnet distractions. After the element installation, the magnet is guided by a central rod. Magnet stays away from internal metal wire mesh and avoiding any touches with the media. No special tools required to replace the filter element. No jigs or inserts.	Avoid risks to operate with damaged filter element, leading to higher contamination of oil and premature wear of whole hydraulic system components. Safety and performance of the equipment guaranteed.
Same filter installed on latest Sandvik LH517i and LH621i.	Standardization of the fleet spare parts. Limit references on stock.

Machine models	Part Numbers
Sandvik LH517	BG01492400
Sandvik LH517L	
Sandvik LH621	

Eclipse™ fire suppression for loaders

Description
From diesel fuels to hydraulic fluids, heavy equipment depends on flammable liquids to keep moving. The dangers associated with underground mine fires are multifaceted, often leading to devastating consequences. These fires can produce toxic gases, such as carbon monoxide and hydrogen sulphide, which can cause respiratory failure and even death. In addition, , the intense heat generated by these fires can lead to the collapse of mine structures, trapping miners and hindering rescue efforts.
Sandvik Eclipse™ is a crucial component of your safety management system to protect people, investments and equipment. Sandvik Eclipse™ fire suppression systems are designed and tested to meet the most stringent requirements of fire protection on mobile and transportable equipment, including underground Loaders applications.
Compared to traditional dry powder systems, Eclipse™ is up to 30 percent more effective on super-heated surfaces. Our Sandvik system is equipped with liquid agents to attack all the elements a fire needs to ignite - heat, fuel and oxygen (fire triangle).
Automatic activation is a standard feature and the rapid cooling effect blocks the risk of re-ignition. The engine is also automatically shut-down.

The system is very efficient to service and maintain and can be installed on new or existing equipment - regardless of size or brand.
Sandvik Eclipse™ It is available in two versions to suit global application:
Sandvik Eclipse™ Sustain is suitable for climates 0°C to + 60°C. The tank contains foam concentrate and water solution. The mixture is fluorine free making it environmentally sustainable.
Sandvik Eclipse™ Extreme is suitable for climates - 40°C to + 60°C. The tank contains a pre-mixed liquid agent for the harshest of environments.
The reliable automatic activation concept and system hardware remains identical between Eclipse™ Sustain and Eclipse™ Extreme.
Eclipse™ is a smart way to reduce the risk of injuries, production loss, costly repairs and replacements. Design flexibility and a range of different tank sizes make it possible to install Eclipse™ on a wide range of mobile plants and equipment.

Advantages	Customer Values
Fully automated activation (loss-of-pressure activation) and engine shutdown standard on all systems. Foam fire extinguishing cutting off oxygen, vapor sealing and cooling down superheated surfaces (such as turbo charger and engine manifold).	Increase safety. System 30% more efficient compared to traditional dry powder systems.
Quick and efficient on site discharge testing and servicing. Quick recharge times for productivity	Easy testing and services procedures. Increase machine availability (productivity).

Machine models	Part Numbers
All equipment	Contact local Sandvik representative

Radio remote control system for loaders

Description
In the case of specific mining methods are used, such as sub-level stopping or block caving, ore needs, in some situation, to be loaded from unsupported areas. It can create hazardous situation as there is a risk the roof collapse on the loader, and smash or trap the operator.
To mitigate those hazards, and to make the loader available for loading in an unsupported area, Sandvik has developed Radio Remote Control (RRC) system to operate the unit from line-of-sight distance.
Line of sight system: the operator must see the loader under his/her control at all times. During RRC operation, the gears are limited to the first gear. Optional camera system can be added to improve the visibility of the operations.
The RRC system requires a safe operating place for the operator that controls the unit (mine responsibility). The transmitter is compact and light to carry (about 2.0kg with battery) but still durable. It is equipped with a tilt switch for operator safety.
Frequencies: 2.4 GHz as standard, other frequencies available on request, depending on local country specific regulations.
The Radio Remote Control System is frequently associated with Recovery System to be able to remove safely the loader in case of roof collapse.

Advantages	Customer values
Remote control system that allows the operator to control the loader with a remote controller instead of operating the unit from the cabin/ canopy.	Improve safety, especially when part of the loader cycle takes place under unsupported roof.
Enable an access to the ore from hard-to-reach ore.	Improve productivity

Machine models	Part Numbers
Sandvik LH202	
Sandvik LH203	
Sandvik LH307	
Sandvik LH400T	
Sandvik LH409E	
Sandvik LH410	
Sandvik LH514	
Sandvik LH514E	Contact local Sandvik representative
Sandvik LH514iE	
Sandvik LH515i	
Sandvik LH517	
Sandvik LH517i	
Sandvik LH518iB	
Sandvik LH621	
Sandvik LH621i	

RRC video system for loaders

Description
When operating loader with line of sight radio remote control system, visibility can be poor due to dust, smoke or poor lightening.
The improve the visibility of the operations during the Radio Remote Controlled operations, Sandvik has developed a specific Video System. This system improve the safety of the operation and also the productivity (operator can ensure the bucket is correctly fill).
The RRC Video System includes two cameras mounted on the machine to have front and rear views. A display is mounted on the remote control. The system is wireless (radio transmission).

Advantages	Customer values
Improve the visibility when operating the loader with the line of sight radio remote control system.	Improve safety and productivity

Machine models	Part Numbers
Sandvik LH307	
Sandvik LH410	
Sandvik LH514	
Sandvik LH517	Contact local Sandvik representative
Sandvik LH517i	
Sandvik LH621	
Sandvik LH621i	

Recovery system (radio signal) for loaders

Description
In some breakdown cases like engine failure or transmission breakdown, or even roof collapse (if machine operated under unsupported roof with RRC), the loader can be stuck and block the production site, generating important productivity loss.
Removing the unit from the location without all functional components, or without easy and safe access to the operator compartment, can be hazardous.
In order to mitigate this risk and makes easier to remove the loader from the location, Sandvik has developed a Recovery System that allows, remotely, to shut down the engine and release the brakes of the loader with a radio Signal.
The system includes a radio remote control to operate the system (and a receiver installed on the unit), an electric operated hydraulic pump to pressurize the brake circuit and release the brakes, and a tow hook that is installed at the back of the unit and allows to pull out the loader with an other loader.

Advantages	Customer values
Allows to remotely release the brakes in case of need to retrieve a buried unit or to remove it quickly from the section in case of breakdown.	Improve the safety by making the unit recovery process safer.

Machine models	Part Numbers
Sandvik LH202	Contact local Sandvik representative
Sandvik LH203	

Recovery system (pulled hook) for loaders

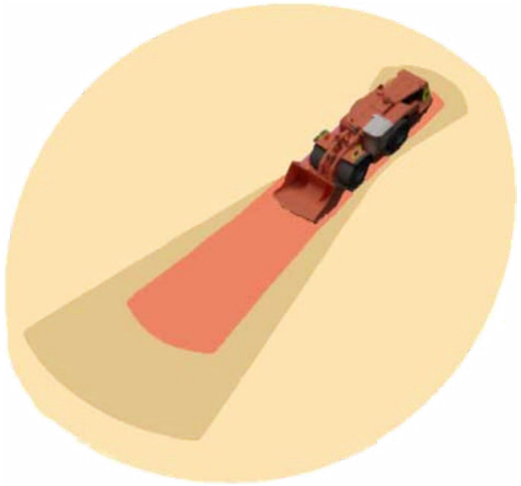
Description
In some breakdown cases like engine failure or transmission breakdown, or even roof collapse (if machine operated under unsupported roof with RRC), the loader can be stuck and block the production site, generating important productivity loss.
Removing the unit from the location without all functional components, or without easy and safe access to the operator compartment, can be hazardous.
In order to mitigate this risk and makes easier to remove the loader from the location, Sandvik has developed a Recovery System that allows to release the brakes when pulling on the towing hook.
On the LH514 and LH517, the system is electro-hydraulic. When the recovery hook is pulled, a pressure accumulator provides pressure to release the brakes. More pressure, if needed, is produced by an electric pump.
On LH517i and LH621i, the system is fully hydraulic. The retrieval hook is connected to a cylinder which extends when the hook is pulled. Oil from the cylinder flows to the brake pistons releasing the brakes.

Advantages	Customer values
Allows to remotely release the brakes in case of need to retrieve a buried unit or to remove it quickly from the section in case of breakdown.	Improve the safety by making the unit recovery process safer.

Machine models	Part Numbers
Sandvik LH307	Contact local Sandvik representative
Sandvik LH410	
Sandvik LH514	
Sandvik LH515i	
Sandvik LH517	
Sandvik LH517i	
Sandvik LH621i	

PDS interface for loaders

Description
Collision between vehicles or between machines and pedestrians is one of the major risk on underground mining. Collision with another vehicle or person could cause death or severe injury.
Proximity Detection System (PDS) is technologies or devices that actively detect close encounters between two or more objects and transmit this information to an interface system that takes automatic action to render the equipment to a safe state when potentially dangerous interaction occurs.
PDS are generally designed to inform the machine to slow down and/or eventually stop the equipment in case of collision risk with a person or an object carrying a tag.
The Sandvik Proximity Detection System Interface allows to link third-party Proximity Detection System and the Sandvik equipment.
All PDS Interface for Loaders listed here are Level 9 and ISO 21815-2 compliant.



Advantages	Customer values
PDS interface system allow to link a third party PDS with the Sandvik equipment tramming and braking systems. OEM solution that ensure the perfect interaction of the third party PDS with the Sandvik machine systems. The interface system supports the use of three PDS “detection zones”. Allow to warn the operator of potential danger in gradual way and act accordingly before the machine stops automatically.	Improve safety

Machine models	Part Numbers
Sandvik LH208L	
Sandvik LH209L	
Sandvik LH307	
Sandvik LH410	
Sandvik LH514	
Sandvik LH515i	Contact local Sandvik representative
Sandvik LH517	
Sandvik LH517i	
Sandvik LH518iB	
Sandvik LH621	
Sandvik LH621i	

The possibility of retrofitting the PDS interface depends on the specifications of each machine specifications and options. Contact your local Sandvik representative for more information.

Jump start connector for loaders

Description
Discharged battery might lead to the need to use jump cables to start the engine of the loader with the use of an external battery pack or other unit.
This process can be dangerous is case of polarity mistake on the jump cables connection as the battery short circuit can lead to explosion of the battery, fire start and serious damages on the electric system of the machine.
In order to mitigate this risk, Sandvik offers the installation of the Jump Start Connector Upgrade Solution.
The Jump Start Connector avoid the risk to invert polarity of the jump cable. It avoid also generation of sparks, that could happen if cables where connected temporarily on the battery terminals with clamps (risk of fire).
Only female connector is supplied on the kit. Cable with male connector can be ordered separately from Sandvik:
- P/N 504744: Jump cable length 3m (10ft):
- P/N: 56034295: Jump cable length 4,5m (15ft)

Advantages	Customer values
Jump Start Connector avoid risk of inversion of polarities during jump start operations.	Avoid risk of fire or battery explosion during jump start operations. Avoid risk of damage on electric and electronic equipment of the unit during jump start operations.

Machine models	Part Numbers
Sandvik LH209L	56030116
Sandvik LH307	BG00687584
Sandvik LH410 (Tier 4F and Stage V engine)	BG00974034
Sandvik LH410 (other engines)	56050359
Sandvik LH514	56033894
Sandvik LH515i	
Sandvik LH517 (Tier4F engine)	56020980
Sandvik LH517 (other engines)	56033894
Sandvik LH517i	BG00870020
Sandvik LH621	56020980
Sandvik LH621i	BG00887863

Emergency steering for loaders

Description
In case of failure of the steering system of the engine there is a high risk for the operator to lost the control of the loader and have an accident that could have dramatic concequences.
In order to mitigate this risk, Sandvik has designed the Emergency steering system for loaders. This system enables limited steering in case of failure of the steering pump or if the engine stalls in an unusual way.
The emergency steering system activates automatically, but can also be activated manually by pushing and holding a button on the dashboard. It is interlocked if the emergency stop is activated or cabin door is open.

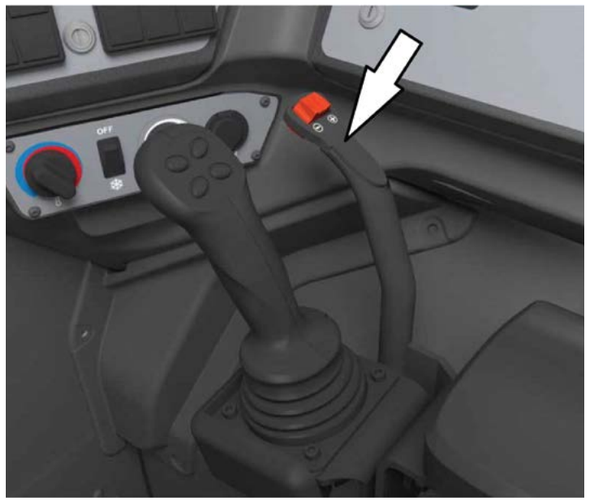
Advantages	Customer values
Emergency steering system enable limited steering in case of failure of steering pump or engine stalling.	Improves operator safety and reduces risk of entrapment in the operator's compartment in case the engine stalls and equipment is fully articulated

Machine models	Part Numbers
Sandvik LH209L	
Sandvik LH202	
Sandvik LH203*	
Sandvik LH307	
Sandvik LH410	Contact local Sandvik representative
Sandvik LH514	
Sandvik LH514E	
Sandvik LH514iE	
Sandvik LH515i	
Sandvik LH517	BG00967558
Sandvik LH517i	BG02101480
Sandvik LH518iB	
Sandvik LH621i	Contact local Sandvik representative
Sandvik LH625iE	

*N/A for Australia

Operator speed assist for loaders

Description
Full control of equipment speed is essential when using a loader in underground mines because over-speed can cause an accident with dramatic consequences.
In order to help the operator to maintain a safe and constant pace, Sandvik has developed the operator speed assist system for loaders. This system improves safety by limiting the maximum driving speed, making operation easier and improving the focus on the driving.
Also, it reduce brakes wear by using the engine brake as a primary speed control device and engine wear by keeping the engine RPM on the optimum level.
The system is activated automatically by Sandvik Intelligent Control System. The speed of the machine is primarily limited by limiting the maximum possible gear. The operator can adjust speed limit with preset values by using a rotary switch. If the speed increases despite having controls in place, service brakes are automatically applied.
The speed limit parameters can be adjusted separately for level and downhill driving as the built in inclinometer automatically detects vehicle inclination. Set maximum downhill speed is indicated on the control system display.
Operator speed assist is only available on loaders equipped with Stage V engine option (engine brake required for the system).



Advantages	Customer values
Limits the maximum driving speeds Allows easier operation Improves focus on driving	Improves safety
Reduces service brakes wear Reduces engine wear	Reduces operating cost

Machine models*	Part Numbers
Sandvik LH515i	BG01777680
Sandvik LH517i	BG01919842
Sandvik LH621i[1)]	BG01919842
Sandvik LH621i[2)]	BG01920492

*Operator speed assist is only available for machines equipped with Stage V engines.
1) Standard cabin
2) Cabin with swivel seat

Lifecycle cost improvement

Engine conversion solution for Sandvik LH410

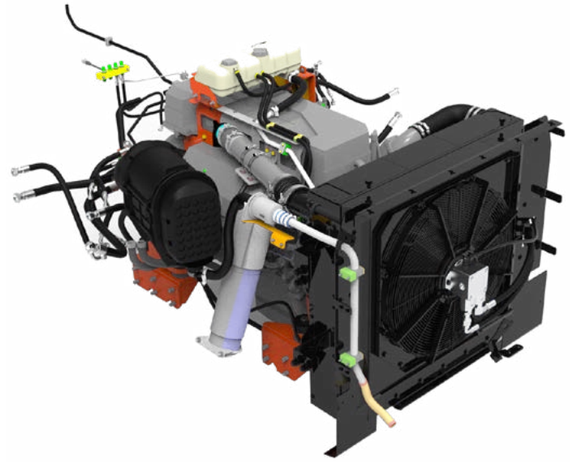
Description

The Volvo Penta TAD941VE engine (9L), that used to be the standard engine on Sandvik LH410 Loader, has been phased-out by the manufacturer and it is not anymore available as spare part.

Therefore, Sandvik has developed and extensively tested a new Volvo Penta TAD1140VE engine (11L) that is now the standard engine on Sandvik LH410 loader.

The Volvo Penta TAD1140VE is a 6 cylinder off-road turbo diesel engine with 235kW and 2100 rpm. Due to increased power, the complete power pack systems had to be re-viewed for engine manufacture certification (warranty coverage), optimal performances, safety , lifetime and reliability.

Sandvik offers to our customers to upgrade their LH410 active fleet with this powerful, reliable and economical engine.



Specifications	
Engine	
Engine model	Volvo TAD1140VE
Emissions	Tier 2, Euro Stage II
Operating altitude	-1500m to +3000m
Operating temperature	-20°C to +50°C
Upgrade Engine OEM certification	Engine manufacturer certified modification with warranty coverage
Cooler	
Type	Heavy duty
Radiator	Corrosion resistant anodized aluminum
Air intake	
Air filtration	Two stages filtration, dry type
Maintenance	Free tools maintenance
Exhaust	
Exhaust system	Catalytic purifier and muffler
Heat shield	Long life composite material

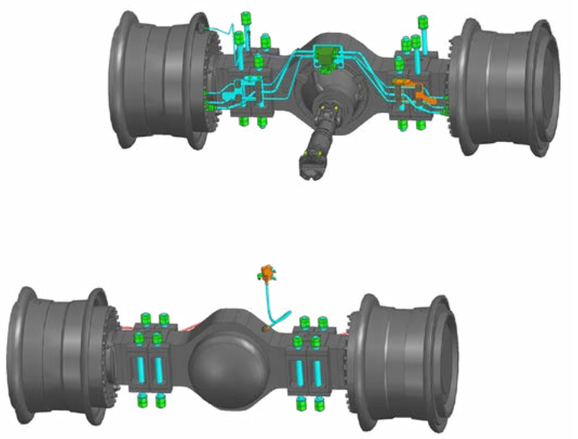
Advantages	Customer values
New Volvo Penta TAD1140VE engine.	Increased power. Reduced operating cost. Certified modification, Warranty coverage.
New heavy duty aluminum cooler.	Improved cooling performance. Increased resistance to corrosion. Easier to clean. Lower cost to replace in case of damages.
New air intake system.	Improved engine protection. Improved handling and maintenance.
Modification of exhaust system.	New heat shield material. Extended life. Improve safety.
OEM upgrade solution.	All needed parts included (hoses, accessories and all needed parts). Insure smooth installation. Complete fitting instructions. Insure smooth installation. Spare parts documentation provided.

Machine models	Part Numbers
Sandvik LH410*	BG00958660

*With original Volvo Penta TAD941VE engine (9L)

Axles conversion kit for loaders

Description
Sandvik offers to customers to retrofit Kessler Axles on their active loaders, originally equipped with Dana axles.
Kessler axles equip the latest Sandvik loaders and are characterized by a superior reliability based on product knowledge proven through many years of field experience as well as by an elaborated lightweight design.
The axles conversion kit includes all items needed to do the conversion in the most efficient way.

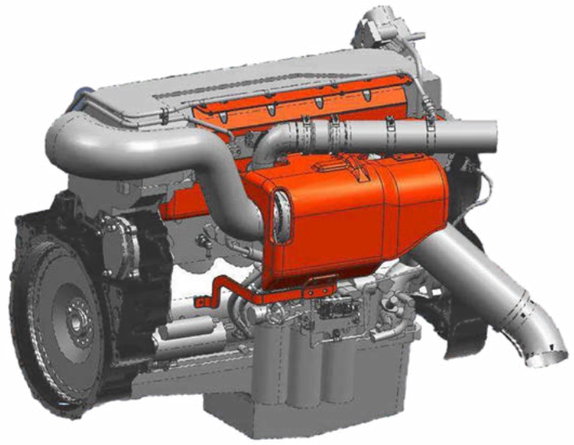


Advantages	Customer values
Axle conversion kit allows to retrofit Kessler axles instead of original Dana axles.	Improved reliability. Spare parts commonality between older and latest units.

Machine models	Part Numbers
Sandvik LH307	BG00213127
Sandvik LH410	BG00212456
Sandvik LH514	BG00212158
Sandvik LH517	BG00906838
Sandvik LH621	BG00214095

Turbocharger heat shield for loaders

Description
Sandvik has released a new turbocharger heat shield for loaders equipped with Volvo engines. The new turbocharger heat shield is made of composite material, designed to extend the service life. Deteriorated heat shield increase risk of fire.
Our Turbocharger Heat Shield Upgrades Solution include the new shield and all other needed to make the modification.

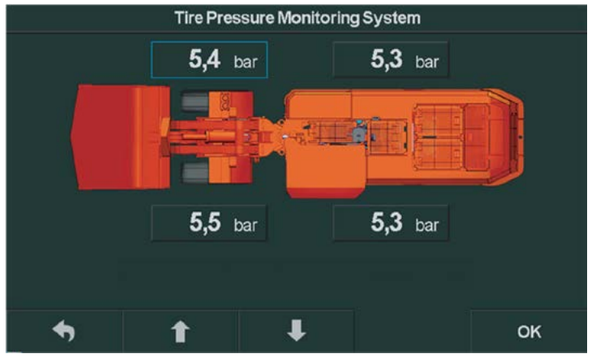


Advantages	Customer values
Composite material of the new turbocharger heat shield provides longer lifespan.	Reduce maintenance cost. Reduce risk of fire (safety improvement).

Machine models	Engine model	Part Numbers
Sandvik LH307	Volvo TAD572VE	BG01258370
Sandvik LH410	Volvo TAD941VE	BG00818876
Sandvik LH410	Volvo TAD1140VE	BG00941154
Sandvik LH410	Volvo TAD882VE	BG01640685
Sandvik LH514	Volvo TAD1171VE	BG00818885

Tyres pressure monitoring system for loaders

Description
Sandvik has developed the Tyres Pressure Monitoring System (T.P.M.S.) for loaders. The system is fully integrated in the Intelligent Control System of the machine.
Thanks to the four self-powered radio pressure sensors mounted on tyre's valves stem, the pressure information of every individual tyre is collected, send by radio signal to the receiver, through the antenna located in the central articulation of the machine, and displayed on the original control system screen (no additional display).
The operator is informed in real time with warning and alarm in case of air leakage or incorrect tyre pressure.
Control of the correct inflation pressure avoid premature damages on tyres and prevents unexpected failure of the tyre which increases safety. Productivity and operating cost are improved by reduction of service time and tyre costs.



Advantages	Customer values
System components are easy to maintain and replace. Correct tyre pressure reduces risk of premature tyre wear and damages. Reduce service time.	Reduce service and tyre cost.
Warning or alarms pop-up on the display in case of pressure error detected. Operator can execute proactive actions instead of reactive. Increase machine availability.	Increase productivity and reliability.
Operator gets real-time information about tyre pressure. Correct tyre pressure increases operating comfort and reduces operator fatigue. Incorrect pressure could generate tyre burst and causes loss of machine control.	Increase Safety.

Machine models	Part Numbers
Sandvik LH307	Contact local Sandvik representative
Sandvik LH410	
Sandvik LH514	
Sandvik LH515i	
Sandvik LH517	
Sandvik LH517i	
Sandvik LH518iB	
Sandvik LH621	
Sandvik LH621i	

Traction control system for loaders

Description
Sandvik Traction Control System is intended to reduce wheel slipping when penetrating to the muck pile and filling the bucket. It is specifically useful when loading with radio remote control, when the operator's feel to the equipment is not ideal.
By reducing slipping, the Traction Control System improve the tires lifetime and reduces the need for tire change.
The system measures each wheel speed separately.
When the speed of any wheel differentiates enough from the others, engine RPM is limited until the speed difference decreases back to the allowed range.
Functional only during bucket filling, with first gear forward selected, and bucket not in transport position The system can be switched on/off directly from the control system display.

Advantages	Customer values
Increase the lifetime of the tires by reducing wheel slipping while the bucket penetrate the muck pile.	Reduce service and tyre cost.
Limit the risk of loss of productivity due to tire failure or premature wear.	Increase productivity and reliability.
Reduce the risk of tyre failure that could cause accident due to loss of control.	Increase Safety.

Machine models	Part Numbers
Sandvik LH208L	Contact local Sandvik representative
Sandvik LH307	
Sandvik LH410	
Sandvik LH515i	
Sandvik LH517	BG01423956
Sandvik LH621	BG01225255

Tilt cylinder upgrade for loaders

Description
Sandvik has released an improved tilt cylinder for LH621i loaders. The improved tilt cylinder included a new sensor and sensor wiring.
This change increases maintainability in wiring issues and helps to achieve a longer service life for the tilt cylinder.

Advantages	Customer values
Improved tilt cylinder design. New sensor and sensor wiring.	Improve the life of the lift cylinder. Increase maintainability of the sensor wiring.

Machine models	Part Numbers
Sandvik LH621i	BG01518795

Fuel fast filling system for loaders

Description
The Fuel Fast Filling system is designed for fast and safe refueling and lubrication service on Sandvik loaders.
Fuel Fast Filling System allows rapid fueling with no spillage and with automatic shut-off when the tank is full. As the receiver is mounted near the bottom of the tank, there is no foaming that could result into partial fuel loads.
The system is based on using a sealed tank on the vehicle. A receiver is mounted on the tank, near the bottom (to eliminate foaming) and a vent on the top of the tank. Filling is done using a Wiggins ZZ9A1 nozzle – as fuel enters the tank, it forces the air inside to exit through the vent. When fuel level nears the top of the tank, the “hollow floating balls” force the valve in the vent seal the tank, and pressure inside the tank starts building up until at 8 to 10 psi the fueling nozzle automatically shuts off.

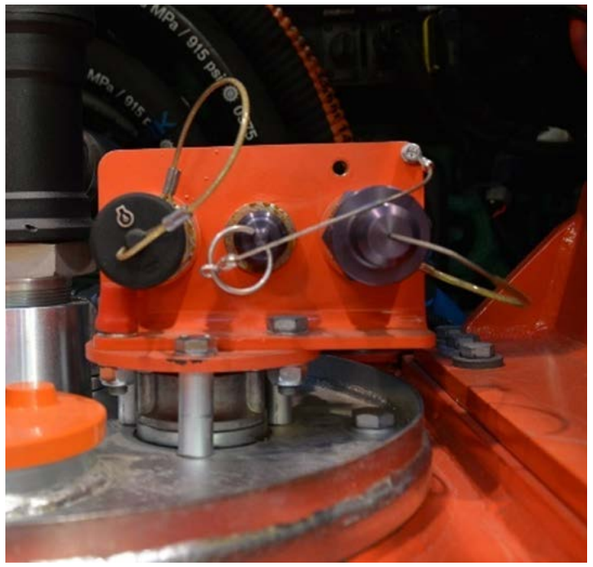
Advantages	Customer values
Fuel Fast Filling system allows to speed up refilling oils and fuel. System cuts off fuel supply when the tank is full by sensing pressure or monitoring fuel level.	Faster than manual filling. Ground level filling increases safety. Reduces spillage due to automatic shut-off when the tank is full. Reduces entry of dirt into the fuel and oil tanks.

Machine models	Part Numbers
Sandvik LH209L	Contact local Sandvik representative
Sandvik LH202	Contact local Sandvik representative
Sandvik LH203	BG01125518
Sandvik LH307	29612763
Sandvik LH400T	Contact local Sandvik representative
Sandvik LH410	56026162
Sandvik LH514	BG01128905[1)]
Sandvik LH515i	Contact local Sandvik representative
Sandvik LH517	56025327[2)]
Sandvik LH517	BG00528181[3)]
Sandvik LH517i	BG01275317[1)]
Sandvik LH621	29607166
Sandvik LH621i	BG01275324[1)]

1) Includes lockable cap for standard filling
2) “Small tank” version
3) “Large tank” version

Quick oils filling system for loaders

Description
Oil contamination is one of the major risk of failure of expensive component and mistake in the oil type can lead to catastrophic failures.
In order to reduce the risk of contamination of new oil during the filling process and also to avoid risk of mixing oil types, Sandvik has developed Quick Oil Filling system for Loaders.
The systems consist on quick coupling for hydraulic oil, transmission oil, engine oils, coolant (i.e. in practice all except AdBlue/DEF), allowing to fill directly the receivers without having to use any other container that could be dirty. Each coupling have different size in order to avoid any fluid type error.
The mine oil filling system must be equipped with the corresponding quick coupling from Wiggins.



Advantages	Customer values
Limit the risk of contamination when filling the equipment with oil or coolant fluid. Avoid the risk of mixing the different oils types.	Improve reliability. Avoid risk of failure due to use of improper oil.

Machine models	Part Numbers
Sandvik LH209L	
Sandvik LH307	
Sandvik LH400T	
Sandvik LH410	
Sandvik LH514	
Sandvik LH514E	
Sandvik LH514iE	Contact local Sandvik representative
Sandvik LH515i	
Sandvik LH517	
Sandvik LH517i	
Sandvik LH518iB	
Sandvik LH621	
Sandvik LH621i	

Electric filling pump for loaders

Description
Oil contamination is one of the major risk of failure of expensive component of the hydraulic system, generate frequent downtimes and In order to reduce the risk of contamination of new oil during the filling process, Sandvik has developed the Electric Filling Pump for hydraulic tank(s).
This on-board oil pump enables hydraulic oil to be filled, from ground level, straight from barrels, without having to use any other container that could be dirty and bring contamination in the oil. The oil in pumped through a filter ensuring the oil is clean and reduces possibility of contamination of oil during filling.
On units equipped with two separate hydraulic tanks, there is a selector to choose which tank to fill.

Advantages	Customer values
Oil can be pumped directly from the barrel, through a filter.	Reduce risk of contamination of the new oil. Reduce service time
Oil tanks can be filled from ground level	Improve safety

Machine models	Part Numbers
Sandvik LH209L	Contact local Sandvik representative
Sandvik LH202	BR00078154
Sandvik LH307	56049654
Sandvik LH409E	Contact local Sandvik representative
Sandvik LH410	56048638

Improved live oil sampling for loaders

Description

Contaminants such as dirt, sand, water and metallic particles cause premature component wear and failures, leading to unscheduled downtime and loss of production.

Monitoring the condition of equipment fluids helps to understand component health and enables making informed maintenance decisions to extend the equipment lifetime and reduce total lifecycle cost.

Results can provide an early warning of emerging issues and enable corrective and preventative actions:

- Minimize risks of unexpected failure and downtime.
- Control maintenance and operating costs.
- Optimize maintenance scheduling to minimize impact on production.
- Increase reliability and safety.

The live oil sampling kit offers the customer a safer, quicker and controlled way of taking oil samples from the machine.

This improved version allows faster samples collections due to improved piping. It can be installed in a machine to replace the old version or in a machine where the Live Oil Sampling is not factory installed.

Advantages	Customer values
Helps to collect easily, properly and with constancy oil sampling for contamination measurement purpose	Control of the oil contamination level has a huge impact on hydraulic systems reliability and maintenance cost.
Improved version allows faster samples collections	Reduce maintenance time

Machine models	Part Numbers
Sandvik LH517i	BG01603529
Sandvik LH621i	BG01601986

Application modification

Ejector bucket adaptation kit for loaders

Description

In some low profile drifts, it might be difficult or even impossible to lift properly the bucket of the loader for dumping due to too low roof hight.

Moreover, there might be a risk of contacting overhead obstacles like power lines or ventilation pipes while dumping the bucket.

In case of dumping on slope, uneven or unstable ground, there is also a risk of tipping over when dumping.

To solve these issue, Sandvik has developed an Ejector Bucket to equip the loaders.

The Sandvik Ejector bucket is made of high-quality steel & hard materials – made to last. It is equipped with a push plate that dump the load while the bucket stays horizontal.

The push blade movement insures there are no material remaining in the bucket after dumping.

The elector bucket allows to spread easily the material out over a distance, making easier back filling works.

The Ejector Bucket adaptation kit includes all needed parts to do the adaptation of an Ejector bucket on a loader originally equipped with conventional bucket, including hydraulic and electric components, hose and electric wiring harness, etc.

Advantages	Customer values
Allow dumping on low profile drift Allow to spread easily the material out over a distance.	Improve machine versatility
Mitigate the risk of tipping over when dumping on slope and uneven or unstable ground. Mitigate the risk to collide with overhead obstacles like power lines, or ventilation pipes.	Improve safety
Push blade movement insures the complete emptying of the bucket.	Improve productivity

Machine models	Bucket size	Part Numbers
Sandvik LH208L	2,6m²	Contact local Sandvik representative
Sandvik LH209L	4,0m²	
Sandvik LH202	1,0m²	
Sandvik LH203	1,5m²	
Sandvik LH307	3,0m²	
Sandvik LH307	3,7m²	
Sandvik LH410	4,6m²	
Sandvik LH514	5,4m²	
Sandvik LH514iE	5,4m²	
Sandvik LH515i	6,3m²	
Sandvik LH517i	7,0m²	

Hydraulic hammer interface for loaders

Description

Most underground mines face the challenge of moving oversized rock blocks. Whether that oversize is created from inaccurate drilling, blasting, or just not enough homogeneous grinding in the case of a block cave, large rocks can be very costly and extremely dangerous to deal with.

Oversized rock boulders affect mining operations and increase the cost of operations in many ways like:

- Inefficient loading operations
- Higher cycle time for hauling equipment due to higher waiting time and loading time
- Risk of damages and/or extra wear of loading and hauling equipment.
- Jamming and wear and tear of the crusher.
- Blocking of galleries or draw point.

Even in some mines, the oversize is dispatched to the waste dump, resulting on direct loss of ore.

In order to mitigate this problem, Sandvik has designed an interface system that allows to install an hydraulic hammer (Rammer®) on selected Loaders.

Hydraulic hammer installed on loader allows to efficiently fragment oversized rock blocks.

The Sandvik Hydraulic Hammer interface retrofit kit includes all needed parts to do the adaptation of a Rammer® hydraulic hammer on a loader originally equipped with conventional bucket, including new controls, hydraulic and electric components, hose and electric wiring harness, etc.

Advantages	Customer values
Allows to transform standard loader into secondary breaking unit a low investment cost.	Increase machine versatility
Allows to fragment oversized boulders efficiently, on site, prior to handling. Reduce blocking of galleries or draw point due to oversized rock blocks.	Increase productivity
Mitigate risk of damages on loaders and truck due to handling of oversized rock blocks. Mitigate risk of jamming and wear and tear of the crusher	Reduce operating cost

Machine models	Rammer® hammer*	Rammer® carriage*	Part Numbers
Sandvik LH307	BR1533E	EC60	Contact local Sandvik representative
Sandvik LH410	BR2577E	EC80	
Sandvik LH514	BR4099E	EC80	
Sandvik LH517	BR4099E	EC80	

*Rammer® hydraulic hammer and carriage are not included on the Sandvik Hydraulic Hammer Interface retrofit kit. These components have to be sourced from local Rammer® dealer.

Quick detach system interface for loaders

Description

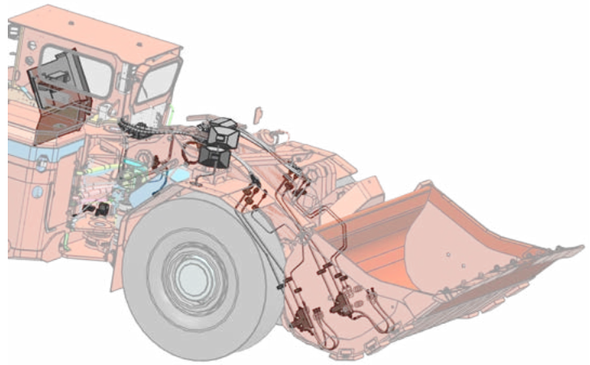
Underground mining requires to perform a lot of different tasks and it is very difficult and expensive to own a specific machine dedicated to each of them.

That's why versatility is one of the major feature for a loader.

In order to increase loader versatility and allow to adapt easily the machine to the task to be done, Sandvik has developed an interface kit for Quick Detach System (QDS) for Loader.

QDS allow quickly to switch to different size or type of bucket or even to install a different tool like forks, jib boom or tire handler for instance.

The QDS Interface kit includes all needed parts to do the adaptation of WBM® wheel loaders attachments tools on a loader originally equipped with conventional bucket, including hydraulic and electric components, hose and electric wiring harness, etc.



Advantages	Customer values
Allow to change quickly and safely the bucket or to replace it with an other tool to perform different task.	Improve machine versatility

Machine models	Part Numbers
Sandvik LH203	Contact local Sandvik representative
Sandvik LH307	
Sandvik LH410	

QDS Interface retrofit kit do not include WBM® attachment tools.

Upgrades solutions for trucks

Sandvik upgrades and engineered solutions offers a vast range of retrofit kits that allow to modify the original specifications of your underground mining trucks to improve the performance, the productivity, the safety or to reduce the environmental impact and the operating cost. Our offering includes also solutions to adapt your machine to different application.

Productivity improvement

Integrated weighing system for trucks

Description

Improper loading of the truck box leads to loss of productivity, and could generates safety consequences and expensive technical issues.

Sandvik Integrated Weighing System (IWS) for trucks allows to monitor the payload of your truck with great accuracy (up to 97%) and so ensuring the maximal productivity. In addition, it helps to avoid technical issues that could be generated by frequent over-loading of the box. It also protects against the safety risks that over-loading could generate.

The system also informs the loader operator in real time about the truck payload with the help of “traffic lights” located on each size of the truck.

The data measured by the IWS can be transferred wirelessly or via USB to the My Sandvik Digital Services Knowledge Box™ for further analysis. Together with the alarm and signal reports from IWS, you will have access to productivity reports that you can compare with your productivity targets.

Advantages	Customer values
Insures optimal filling of the box (no short loading or over-loading of the box). Insures the box is empty and thus minimize carry-back. Improves quality and consistency for operators at all experience levels. Insures homogeneous load resulting on homogeneous speed of the trucks on the ramp. Allows accurate production follow-up of each individual truck.	Increase productivity
Reduce the risk of loss of control due to overloading of the box. Reduce risk of brake failure or premature wear due to overloading of the box. Reduce the risk of tires overheating, blow-out or premature wear due overloading of the box. Limit the gas emissions that could increase significantly if the truck is overloaded. Reduce the chances rocks would fall from the box on roads and could damages the others equipment and roads.	Increase safety
Avoid excessive fuel consumption. Avoid excess of ventilation due to extra exhaust gas emissions.. Saving cost on brake system. Limit axle and carrier fatigue. Saving on tires cost. Avoid damages on roads due to rock falling from the box. Reduce new operators training duration.	Reduce operating cost

Machine models	Part Numbers*
Sandvik TH430	BG00805790
Sandvik TH430L	Contact local Sandvik representative
Sandvik TH540	BG00791985
Sandvik TH540	BG00997212
Sandvik TH545i	BG00997212
Sandvik TH550	BG00791985
Sandvik TH550B	Contact local Sandvik representative
Sandvik TH551	BG01457159
Sandvik TH551i	Contact local Sandvik representative
Sandvik TH663	BG01457159
Sandvik TH663i	Contact local Sandvik representative

*The retrofit kit content varies according machine specifications and options. Always contact your local Sandvik representative for more information and part number confirmation.

External IWS displays for trucks

Description
Sandvik has developed External Displays as an optional feature for Integrated Weighing System. The 11.3 inch display screens enable the loader's operator to see directly the weight on the truck dump box.
The instant load information for the loader operator ensure more efficient passes and maximal productivity. The fill factor is optimized and the risk of overloading is minimized.
Compare to the standard "traffic lights" load indication system, the digital readout of the optional External Displays gives the loader operator better indication of how much load is in the box (The "traffic lights" system* has greater ranges of payload values).
Available for normal operating environments and for arctic or harsh conditions*.

Advantages	Customer values
Instant digital readout of the load on the truck box	Increase productivity by ensuring optimized fill factor.
Reduce the risk of overloading	Improve safety and reduce risk of failure due to overloading.

Machine models	Part Numbers
Sandvik TH545i	Contact local Sandvik representative
Sandvik TH551i**	
Sandvik TH663i**	

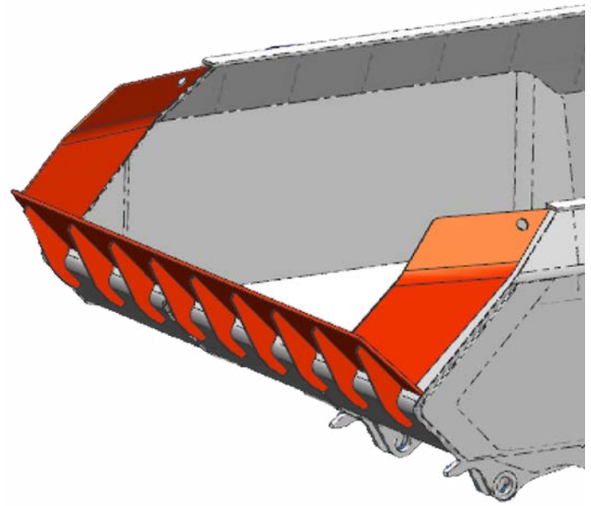
*Normal conditions: -20˚ - +50˚C without heating
Arctic conditions: -40˚ - +50˚C with heating
**Must already have IWS; VCM software TH 02.02.57 or newer required

Ducktail box extension for Sandvik TH551i and TH663i

Description
Loading the truck box at full capacity, at every round, is the most easier way to achieve productivity targets. But when the handling material is light, the volume of the box might be insufficient to reach the maximal payload of the truck.
In order to improve the volume of the TH551i and TH663i trucks boxes (30, 38 or 40m3), Sandvik has designed the Ducktail Box Extension retrofit kit.
By adding this box extension, the volume of the box is increased and it allow to carry more material at every round. Also, it reduces the chances rocks would fall from the box on roads and could damages the others equipment and roads.

- 30m3 box: +2m3
- 38 and 40m3 boxes: +2,5m3

Warning: The Ducktail Box Extension do not increase the maximal payload capacity of the truck.



Advantages	Customer values
Allows to increase the volume of the box.	Improve productivity by increasing the volume of material carried by the truck.
Reduce risk to drop rocks on the hauling roads.	Reduce operating cost by reducing the risk of damages on other on other equipments and on the roads. Reduce the need for road cleaning.

Machine models	Box size	Part Numbers
Sandvik TH551i	30m3	BG01510650
Sandvik Th663i	38m3	BG01525767
Sandvik Th663i	40m3	BG01449999

Safety and environmental improvement

Safety rails for trucks

Description

Working at height is one of the highest risk that mine workers are facing. And statistics show that slip and fall are a major cause of accident in the mining industry with several fatalities registered every year.

On trucks, some maintenance and repair operations have to be done from the top deck.

To help our customers to control fall hazards during maintenance and repair operations, Sandvik has developed the Safety Rails system that offers an efficient protection against the risk of fall.

The Safety Rails system is specifically designed for underground mining harsh environment. The rails are hinged to the frame at the top of the unit and have to be raised up before starting service and maintenance work, then put down and locked before the machine is returned to operation.

Advantages	Customer values
Safety Rails mitigate the risk that service people fall from the top of the machine.	Improve the safety of the maintenance and repair operations by suppressing one of the main risk faced by the service peoples.
Foldable system that stay permanently on the machine.	Unlike a removable system, it is always available, even if the machine is not located on the workshop. Able to protect the people in any circumstances.
Simple and reliable system.	Easy to use, require minimal training to be used. Requires minimal maintenance and withstands tough mining conditions.
Easy and quick to set-up.	Providing a steady hand grip and sure footing for balance or support during climbing up and going down the machine immediate safety to the person climbing on top of the machine.

Machine models	Part Numbers*	Machine models	Part Numbers*
Sandvik TH430	BG00262820	Sandvik TH550B	Contact local Sandvik representative
Sandvik TH540	BG00390756	Sandvik TH551	56208774
Sandvik TH540	BG00891903	Sandvik TH551	BG00838621[1)]
Sandvik TH540	BG00408911	Sandvik TH551i	56208774
Sandvik TH545i	BG00970982	Sandvik TH551i	BG00838621[1)]
Sandvik TH545i	BG01008920	Sandvik TH663	BG00768651
Sandvik TH550	BG00390756	Sandvik TH663	BG00838621[1)]
Sandvik TH550	BG00408911	Sandvik TH663i	BG00768651
Sandvik TH545i	BG01007860	Sandvik TH663i	BG00838621[1)]

1) Extra removable rail on box side (protect when box is lifted or removed).
*The retrofit kit content varies according machine specifications and options. Always contact your local Sandvik representative for more information and part number confirmation.

Cameras system for trucks

Description
In Underground mining, confined space and limited visibility due to dust or poor lighting increase the risk of collision with pedestrians, other machines or walls.
Collision is one of the major risk on underground mining with several fatalities registered every year.
In order to increase the visibility of the operator and to limit risk of collision, Sandvik has developed cameras system for Trucks.
Cameras system improves the safety by increasing the operator field of vision, allowing view on the blind areas. It also limits the risk of collision with walls that would cause damages on the equipment.
The systems includes a monitors, located on the cabin and one reverse camera , one reverse and one side camera, or four cameras located on front and rear on the machine, on the opposite side of the cabin (kit content depend machine model). On the TH550B the system is composed of a network of seven cameras.
An optional recording device is also available on some models.

Advantages	Customer values
Increase the field of vision of the operator, allow view on the blind side areas. Limit the risk of collision with a pedestrian. Limit the risk of collision with an other machine. Optional recording device allows accident cause analysis.	Improve safety
Reduces risk of damage on the machine due to collision with walls or other machine.	Reduce operating cost

Machine models	Specifications	Part Numbers
Sandvik TH315	One reverse camera	BG00324388
Sandvik TH320	One reverse camera	BG00958659
Sandvik TH320	Additional module including front camera and recorder	BG00878375
Sandvik TH430	Four cameras + recorder	BG01270981
Sandvik TH430L	Front and reverse camera	Contact local Sandvik representative
Sandvik TH540	Four cameras + recorder	BG01224943
Sandvik TH545i	Four cameras + recorder	BG01224943
Sandvik TH550	Four cameras + recorder	BG01224943
Sandvik TH550B	Seven cameras system	Contact local Sandvik representative
Sandvik TH551	One side + one rear camera	BG00758274
Sandvik TH663	One side + one rear camera	BG00758274

Integrated jacking system for trucks

Description
Replacing tires on large and heavy UG truck can be challenging and dangerous as it requires specific tools that are often difficult to use on underground mining environment.
To make tires replacements safer, quicker and easier, Sandvik has developed the Integrated Jacking System.
The system consist on four hydraulic cylinders mounted to the front and rear frames. These hydraulic cylinders are intended to jack-up the truck for replacement of the tire.
Each cylinder is controlled separately with a remote control which is connected to the outside of the cabin with a cable.
The Sandvik Integrated Jacking System is able to jack-up the truck in any place (with level and firm ground) and circumstance, even in confined spaces or if the truck is fully loaded.
Service stands are a separate option that is strongly recommended to use in combination with Integrated jacking System.

Advantages	Customer values
Four hydraulic jacking cylinders mounted to the front and rear frames.	Improves the safety of the maintenance and repair operations, especially when it comes to tire replacement.
Remote controlled system	Allows to operate the Integrated jacking System from a safe distance.
Simple operator interface	Easy to use, require minimal training to be used. Requires minimal maintenance and withstands tough mining conditions.
Strong system, allows to jack-up fully loaded truck	Makes tires replacement easier an d faster in a confined mining environment. Increase productivity by reducing downtime.

Machine models	Part Numbers
Sandvik TH551	Contact local Sandvik representative
Sandvik TH551i	
Sandvik TH663	
Sandvik TH663i	

PDS interface for trucks

Description
Collision between vehicles or between machines and pedestrians is one of the major risk on underground mining. Collision with another vehicle or person could cause death or severe injury.
Proximity Detection System (PDS) is technologies or devices that actively detect close encounters between two or more objects and transmit this information to an interface system that takes automatic action to render the equipment to a safe state when potentially dangerous interaction occurs.
PDS are generally designed to inform the machine to slow down and/or eventually stop the equipment in case of collision risk with a person or an object carrying a tag.
The Sandvik Proximity Detection System Interface allows to link third-party Proximity Detection System and the Sandvik equipment.
All PDS Interface for trucks listed here are Level 9 and ISO 21815-2 compliant except when mentioned.

Advantages	Customer values
PDS interface system allow to link a third party PDS with the Sandvik equipment tramming and braking systems. OEM solution that ensure the perfect interaction of the third party PDS with the Sandvik machine systems. The interface system supports the use of three PDS “detection zones”. Allow to warn the operator of potential danger in gradual way and act accordingly before the machine stops automatically.	Improve Safety

Machine models	Part Numbers
Sandvik TH320*	Contact local Sandvik representative
Sandvik TH330	
Sandvik TH430	
Sandvik TH430L	
Sandvik TH540	
Sandvik TH545i	
Sandvik TH550	
Sandvik TH550B	
Sandvik TH551	
Sandvik TH551i	
Sandvik TH661	
Sandvik TH661i	

*Not ISO 21815-2 compliant

Electrical brake retarder for Sandvik TH430

Description
Service brakes overheating is a major risk as it can lead to complete loss of the brake function and dramatic accidents. In order to mitigate this risk, Sandvik has developed an Electrical Brake Retarder for the Sandvik TH430.
The Electric Brake Retarder supports the truck service brakes system by acting as a supplementary brake system. It dissipate the braking energy by generating eddy currents. The eddy currents produce a gradual rise in rotor temperature and the heat is then released into the atmosphere through ventilation systems. With this “induction braking systems”, it is thus possible to effectively slow down the transmission rotating shaft without friction and therefore without wear.
This technology guarantees unequaled instantaneous availability and full braking power provided by the retarder, regardless of the vehicle’s speed and it remains effective even after the engine stops, or when the gearbox is in neutral. Risks associated with service braking system overheating are therefore avoided and the system remains fully operational in case of emergency.
Trucks equipped with an Electrical Brake Retarder can multiply the lifespan of their service braking system up to ten times: maintenance costs are therefore greatly reduced and operational availability is increased. The ease of use, flexibility and progressive character of Electrical Brake Retarder guarantees exceptional comfort for the Truck operator. Activated and easy to control with a switch located on the dashboard: once the function is turned on, it works automatically.
Electric Brake Retarder can be used with an empty or fully loaded box. Recommended for ramp haulage applications (i.e. backfilling).

Advantages	Customer values
A switch mounted on the operator’s dashboard allows to activate the system and to select four different levels of retarder activation. Lack of friction on the working principle make Electric Brake Retarder totally silent in all condition of use of use and guarantees the absence of particle emissions or any other pollutant release into the environment. Progressive and instant response to operator solicitations.	Improve operator’s comfort and safety. Do not affect the ambient air quality.
Reduce drastically solicitation and wear on the service brake system. Do not require specific maintenance.	Improve operating cost by extending the lifespan of the service brake system’s parts. Increase operational availability.

Advantages	Customer values
Provide extra braking power without generating heat on the service brake system, regardless truck speed. Effective after the engine stops or when gear box is in neutral. Can be used with empty or fully loaded box.	Mitigate risk of service brake overheating and total loss of braking power. Brake system fully operational in all conditions and in case of emergency.

Machine models	Part Numbers
Sandvik TH430	Contact local Sandvik representative

Cabin upgrade for trucks

Description
Mining conditions varies and affects the operator's environment. Mining conditions can be dusty, dark, wet noisy, icy or hot.
Sandvik has designed cabins for it's trucks to improve the operator's safety and comfort. The cabins are designed to be extremely durable. They meet and exceed the international standard:

- ISO 3449 - Falling Object Protective Structure (FOPS).
- ISO 3471 - Roll-Over Protective Structure (ROPS).

Sandvik Cabin offers low noise and vibration levels and allows emergency exit. Over-pressure in the cabin reduces exposure to air borne particles.
Cabin upgrade solution includes Air Conditioning system and additional cabin heater element on AC is available on option.

Advantages	Customer values
Cabin meet and exceed international safety requirements FOPS & ROPS. Protect operator from excessive noise, vibration and dust exposure. Protect operator from hot or cold environment	Improve operator's safety and comfort.

Machine models	Part Numbers
Sandvik TH320	Contact local Sandvik representative
Sandvik TH330	

Cold climate package for trucks

Description
Cold temperatures have hazardous effects on humans and their ability to work well. When the body is exposed to cold temperatures, the negative effects can includes dehydration, numbness, shivering, frostbite and hypothermia. This can lead to extended reactivity time, fatigue, uncontrolled movements or loss of lucidity that increase the risk of loss of control and accident.
Also, frost and condensation on cabin window and mirrors can affect the correct visibility that could lead to accident.
In order to mitigate this risk, Sandvik has developed Cold Climate Package for Trucks. The Package includes Additional Cabin Heater, mirror heater, cabin window and mirror defroster.
The Cold Climate Package improve the operator comfort in cold conditions. It keeps the cabin warm and windows and mirrors clear of ice and condensation water.
If the truck is regularly stored outside in below -10°C or if the temperature may occasionally drop below -20°C, an arctic package is required (see Lifecycle Cost Improvement section of this catalogue).

Advantages	Customer values
System that provides heat on the cabin. System that avoid frost and condensation on cabin windows and mirror.	Reduce risk of accident due to negative effects cold ambient temperatures. • Improve operator's comfort

Machine models	Part Numbers
Sandvik TH430	Contact local Sandvik representative
Sandvik TH550B	
Sandvik TH545i	

Emergency steering for trucks

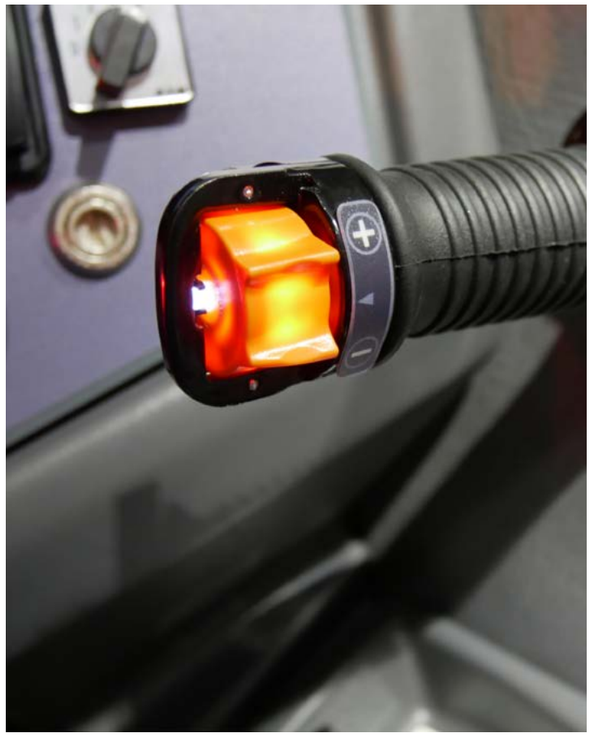
Description
In case of failure of the steering system, or the engine, there is a high risk for the operator to lost the control of the truck and have an accident that could have dramatic consequences.
In order to mitigate this risk, Sandvik has designed the emergency steering system for trucks. This system enables limited steering in case of failure of the steering pump or if the engine stalls in an unusual way.
The emergency steering system activates automatically, but can also be activated manually by pushing and holding a button on the dashboard. It is interlocked if the emergency stop is activated or cabin door is open.

Advantages	Customer values
Emergency steering system enable limited steering in case of failure of steering pump or engine stalling.	Improves operator safety and reduces risk of entrapment in the operator's compartment in case the engine stalls and equipment is fully articulated

Machine models	Part Numbers
Sandvik TH320	Contact local Sandvik representative
Sandvik TH330	
Sandvik TH430	
Sandvik TH545i	
Sandvik TH550B	
Sandvik TH551i	
Sandvik TH663i	

Operator speed assist for trucks

Description
Full control of equipment speed is essential when using a turk in underground mines because over-speed can cause an accident with dramatic consequences.
In order to help the operator to maintain a safe and constant pace, Sandvik has developed the operator speed assist system for trucks. This system improves safety by limiting the maximum driving speed, making operation easier and improving the focus on the driving.
Also, it reduce brakes wear by using the engine brake as a primary speed control device and engine wear by keeping the engine RPM on the optimum level.
The system is activated automatically by Sandvik Intelligent Control System. The speed of the machine is primarily limited by limiting the maximum possible gear. The operator can adjust speed limit with preset values by using a rotary switch. If the speed increases despite having controls in place, service brakes are automatically applied.
The speed limit parameters can be adjusted separately for level and downhill driving as the built in inclinometer automatically detects vehicle inclination. Set maximum downhill speed is indicated on the control system display.
Operator speed assist is only available on loaders equipped with Stage V engine option (engine brake required for the system).



Advantages	Customer values
Limits the maximum driving speeds Allows easier operation Improves focus on driving	Improves safety
Reduces service brakes wear Reduces engine wear	Reduces operating cost

Machine models	Part Numbers
Sandvik TH551i	Contact local Sandvik representative
Sandvik TH663i	

Eclipse™ fire suppression for trucks

Description

From diesel fuels to hydraulic fluids, heavy equipment depends on flammable liquids to keep moving. The dangers associated with underground mine fires are multifaceted, often leading to devastating consequences. These fires can produce toxic gases, such as carbon monoxide and hydrogen sulphide, which can cause respiratory failure and even death. In addition, , the intense heat generated by these fires can lead to the collapse of mine structures, trapping miners and hindering rescue efforts.

Sandvik Eclipse™ is a crucial component of your safety management system to protect people, investments and equipment. Sandvik Eclipse™ fire suppression systems are designed and tested to meet the most stringent requirements of fire protection on mobile and transportable equipment, including underground drilling applications.

Compared to traditional dry powder systems, Eclipse™ is up to 30 percent more effective on super-heated surfaces. Our Sandvik system is equipped with liquid agents to attack all the elements a fire needs to ignite - heat, fuel and oxygen (fire triangle).

Automatic activation is a standard feature and the rapid cooling effect blocks the risk of re-ignition. The engine is also automatically shut-down.

The system is very efficient to service and maintain and can be installed on new or existing equipment - regardless of size or brand.

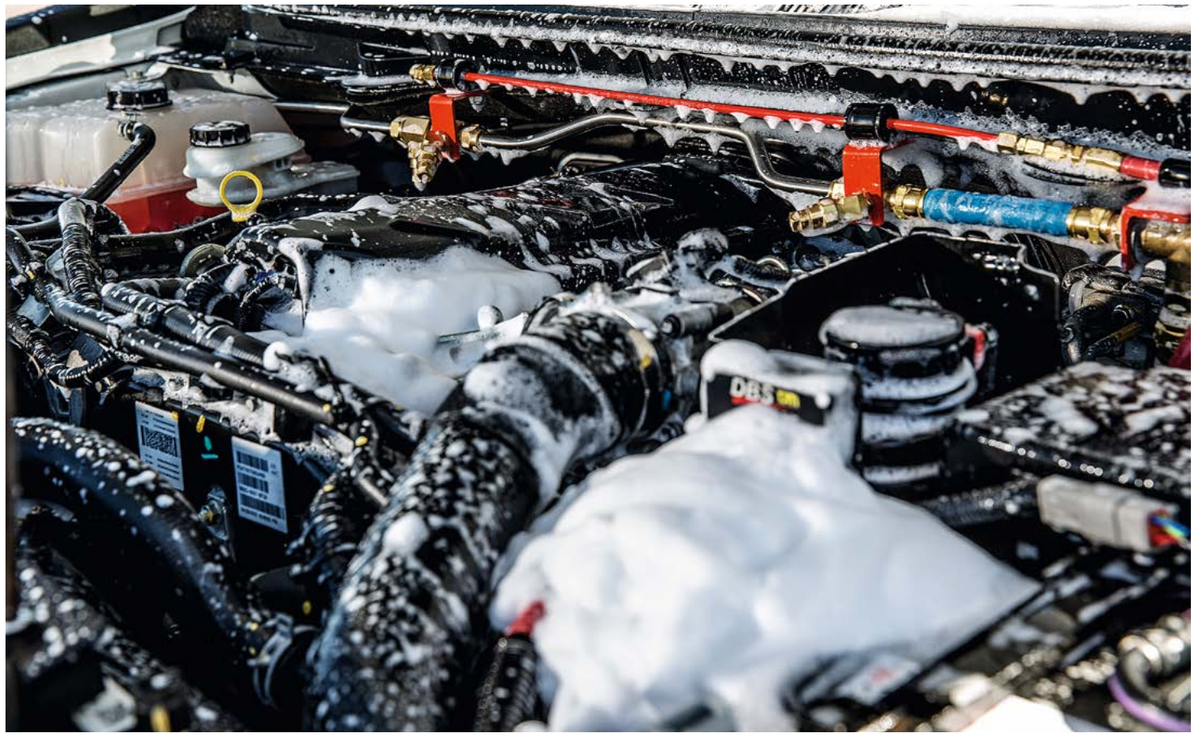
Sandvik Eclipse™ It is available in two versions to suit global application:

Sandvik Eclipse™ Sustain is suitable for climates 0°C to + 60°C. The tank contains foam concentrate and water solution. The mixture is fluorine free making it environmentally sustainable.

Sandvik Eclipse™ Extreme is suitable for climates - 40°C to + 60°C. The tank contains a pre-mixed liquid agent for the harshest of environments.

The reliable automatic activation concept and system hardware remains identical between Eclipse™ Sustain and Eclipse™ Extreme.

Eclipse™ is a smart way to reduce the risk of injuries, production loss, costly repairs and replacements. Design flexibility and a range of different tank sizes make it possible to install Eclipse™ on a wide range of mobile plants and equipment.



Advantages	Customer Values
Fully automated activation (loss-of-pressure activation) and engine shutdown standard on all systems. Foam fire extinguishing cutting off oxygen, vapor sealing and cooling down superheated surfaces (such as turbo charger and engine manifold).	Increase safety. System 30% more efficient compared to traditional dry powder systems.
Quick and efficient on site discharge testing and servicing. Quick recharge times for productivity	Easy testing and services procedures. Increase machine availability (productivity).

Machine models	Part Numbers
All equipment	Contact local Sandvik representative

Lifecycle cost improvement

Tyres pressure monitoring system for trucks

Description
Sandvik has developed the Tyres Pressure Monitoring System (T.P.M.S.) for trucks. The system is fully integrated in the Intelligent Control System of the machine.
Thanks to the four self-powered radio pressure sensors mounted on tyre's valves stem, the pressure information of every individual tyre is collected, send by radio signal to the receiver, through the antenna located in the central articulation of the machine, and displayed on the original control system screen (no additional display).
The operator is informed in real time with warning and alarm in case of air leakage or incorrect tire pressure.
Control of the correct inflation pressure avoid premature damages on tyres and prevents unexpected failure of the tyre which increases safety. Productivity and operating cost are improved by reduction of service time and tyre costs.

Advantages	Customer values
System components are easy to maintain and replace. Correct tyre pressure reduces risk of premature tyre wear and damages. Reduce service time.	Reduce Service and tyres cost.
Operator gets real-time information about tyre pressure. Correct tyre pressure increases operating comfort and reduces operator fatigue. Incorrect pressure could generate tyre burst and causes loss of machine control.	Improve Safety.
Warning or alarms pop-up on the display in case of pressure error detected. Operator can execute proactive actions instead of reactive. Increase machine availability.	Increase productivity and reliability.

Machine models	Part Numbers*
Sandvik TH430	56046416
Sandvik TH430L	Contact local Sandvik representative
Sandvik TH540	56046416
Sandvik TH550	56046416
Sandvik TH550B	Contact local Sandvik representative
Sandvik TH545i	56046416
Sandvik TH551	BG00752622
Sandvik TH551i	BG00752622
Sandvik TH663	BG00752622
Sandvik TH663i	BG00752622

*The retrofit kit content varies according machine specifications and options. Always contact your local Sandvik representative for more information and part number confirmation.

Transmission upgrade for Sandvik TH551i and TH663i

Description

To increase productivity, improve reliability and reduce truck operating costs, Sandvik has introduced a new transmission for its flag ship trucks Sandvik TH551i and Sandvik TH663i. The new size-class transmission is a result of extensive product development work done by Sandvik and the transmission supplier to meet the customer needs for 51 and 63 tonnes trucks.

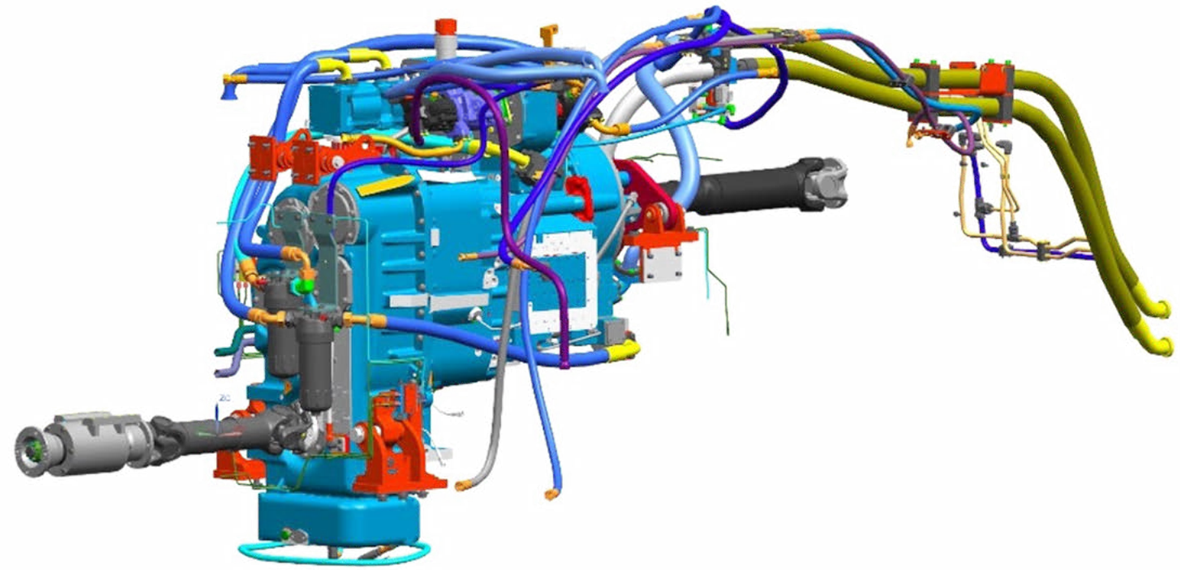
In the new transmission, improved reliability and reduced costs are achieved with robust and simple design, made specifically for heavy off-road application. Compared to the previous model, the transmission lifetime is expected to be longer, and less gearbox change-outs are required during the truck lifetime, reducing total costs.

From the intelligence point of view, self-diagnostics in the transmission control system has been improved and fully integrated into the Sandvik Intelligent Control System, enabling easy and fast trouble shooting without external diagnostics tools or laptops.

The driveline design has been also improved as a the original two-piece rear driveline shaft is replaced with a one-piece driveline shaft. This more robust driveline shaft extends the driveline lifetime, eases maintenance and eliminates the need for the rear driveline support bearing.

The Upgrade solution can include also a new durable and maintenance friendly aluminum cooler with outstanding corrosion resistance and long component lifetimes (option)

Front and rear axles replacement is mandatory in downhill loaded applications..



Advantages	Customer Values
Robust and more simple design with less components (integrated PTO for hydraulic pumps and drop box). Lower operating costs with longer transmission lifetime due to robust design specifically made for heavy off-road application. Increased lock-up clutch lifetime with reduced lock-up activations. Heavy duty aluminum coolers. Improved cooling performance. Increased resistance to corrosion. Easier to clean. Lower cost to replace in case of damages. Improved self diagnostics integrated on truck's control system. Easy and fast trouble shooting.	Increase reliability and reduce operating cost.
Engine brake and fully proportional, more powerful hydraulic retarder which operate simultaneously. Makes easier downhill control and higher speeds enabling shorter cycle times. Maximum speed and efficiency in varying ramps and with different loads. Achieved with eight gears and optimized axle ratio, compared to original transmission with six gears). Lock-up to lock-up gear shifting. Quick and smooth gear shifting that allows to keep speed better in uphill gear shifting.	Increase productivity
Easy operation and extremely smooth gear shifting improve operator comfort.	Increase operator comfort.

Kit content
Transmission complete assembly incl. pumps, hosing, brackets, etc.
Rear drive shaft
Complete air intake assembly
Hydraulic assembly
Electric assembly
Brackets and screws set
Option: Complete new cooling system, incl. coolers, hoses, mask, etc..
Option (in case of downhill application): Front and rear axles assemblies

Machine models	Part Numbers
Sandvik TH551*	Contact local Sandvik representative
Sandvik TH663*	
Sandvik TH551i	
Sandvik TH663i	

* Only trucks equipped with Volvo engine (Upgrades Solutions conversion kit available).

Fuel fast filling system for trucks

Description
The Fuel Fast Filling system is designed for fast and safe refueling and lubrication service on Sandvik trucks.
Fuel Fast Filling System allows rapid fueling with no spillage and with automatic shut-off when the tank is full. As the receiver is mounted near the bottom of the tank, there is no foaming that could result into partial fuel loads.
The system is based on using a sealed tank on the vehicle. A receiver is mounted on the tank, near the bottom (to eliminate foaming) and a vent on the top of the tank. Filling is done using a Wiggins ZZ9A1 nozzle – as fuel enters the tank, it forces the air inside to exit through the vent. When fuel level nears the top of the tank, the “hollow floating balls” force the valve in the vent seal the tank, and pressure inside the tank starts building up until at 8 to 10 psi the fueling nozzle automatically shuts off.

Advantages	Customer values
Fuel Fast Filling system allows to speed up refilling oils and fuel. System cuts off fuel supply when the tank is full by sensing pressure or monitoring fuel level.	Faster than manual filling. Ground level filling increases safety. Reduces spillage due to automatic shut-off when the tank is full. Reduces entry of dirt into the fuel and oil tanks.

Machine models	Part Numbers
Sandvik TH320	56204337
Sandvik TH330	Contact local Sandvik representative
Sandvik TH430	
Sandvik TH540	BG00607824
Sandvik TH545i	BG00607824
Sandvik TH550	BG00607824
Sandvik TH551	BG00699704
Sandvik TH663	BG00699704
Sandvik TH551i	BG00699704
Sandvik TH663i	BG00699704

Quick oils filling system for trucks

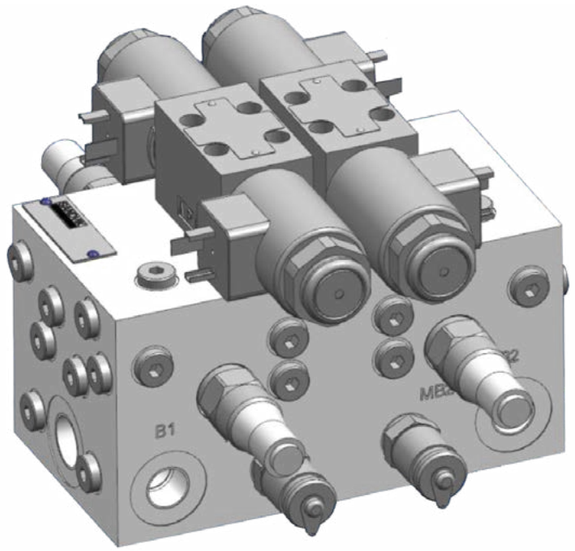
Description
Oil contamination is one of the major risk of failure of expensive component and mistake in the oil type can lead to catastrophic failures.
In order to reduce the risk of contamination of new oil during the filling process and also to avoid risk of mixing oil types, Sandvik has developed Quick Oil Filling system for Trucks.
The systems consist on quick coupling for hydraulic oil, transmission oil, engine oils, coolant (i.e. in practice all fluids except AdBlue/DEF), allowing to fill directly the receivers without having to use any other container that could be dirty. Each coupling have different size in order to avoid any fluid type error.
The mine oil filling system must be equipped with the corresponding quick coupling from Wiggins.

Advantages	Customer values
Limit the risk of contamination when filling the equipment with oil or coolant fluid. Avoid the risk of mixing the different oils types.	Improve reliability. Avoid risk of failure due to use of improper oil.

Machine models	Part Numbers
Sandvik TH320	Contact local Sandvik representative
Sandvik TH330	
Sandvik TH430	
Sandvik TH540	
Sandvik TH545i	
Sandvik TH550B	
Sandvik TH551	
Sandvik TH663	
Sandvik TH551i	
Sandvik TH663i	

Integrated jacking valve upgrade for trucks

Description
Sandvik has released a new jacking system control valve for the dump trucks Sandvik TH551, TH551i, TH663, and TH663i that are equipped with the jacking system option.
The new Integrated Jacking System control valve provides better operational reliability.
Sandvik offers to its customers operating Sandvik TH551, TH551i, TH663, and TH663i trucks, equipped with the jacking system option, a possibility to replace the current jacking system valve with a new valve. The current and improved valves are directly interchangeable.
In the truck there are two jacking system valves: one in the front frame and one in the rear frame.
The new jacking system valve replaces the current jacking system valve BG00223149.

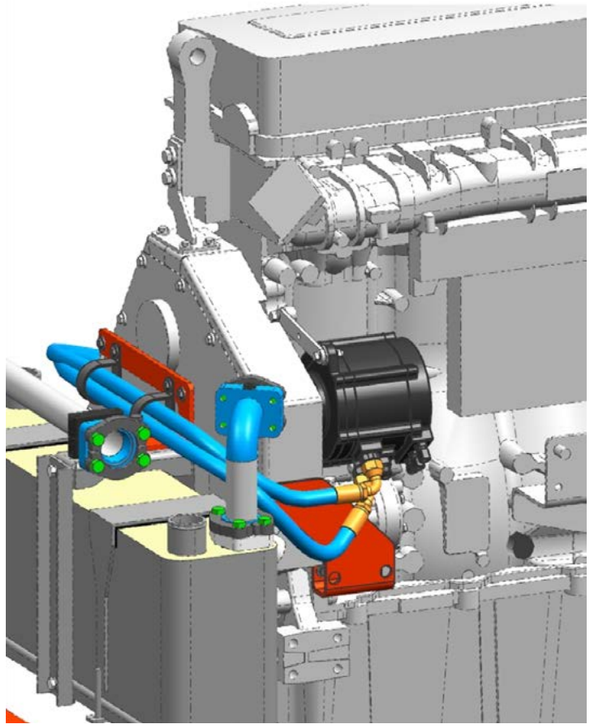


Advantages	Customer values
The new Integrated Jacking System control valve are more reliable.	Increase machine reliability and availability.

Machine models	Part Numbers
Sandvik TH551	BG01478586
Sandvik TH551i	
Sandvik TH663	
Sandvik TH663i	

Water cooled alternator for trucks

Description
Dusty or salty environments have a negative impact on the life time of the air cooled alternator, as the cooling fins gets quickly clogged and loose their efficiency, leading to alternator over-heating.
In order to improve the reliability of the alternator in dusty and salty environment, Sandvik offers to his customers the possibility to replace the standard air cooled alternator by a Water Cooler Alternator.
Water cooled alternator increases the alternator lifetime compared to the standard (air cooled) alternator. It reduces costs and increases equipment uptime as the alternator change interval is longer compared to the standard alternator.



Advantages	Customer values
Water cooled alternator increases the alternator lifetime compared to the standard (air cooled) alternator; Especially in dusty and salty environment.	Reduces costs and increases equipment uptime as the alternator change interval is longer compared to the standard alternator.

Machine models	Part Numbers
Sandvik TH320	Contact local Sandvik representative
Sandvik TH330	
Sandvik TH430	
Sandvik TH540	
Sandvik TH545i	
Sandvik TH550	
Sandvik TH551i	
Sandvik TH663i	

Harsh condition package for trucks

Description
Mining operation in acidic or salty water environment affect the equipment lifetime and reliability, and cause corrosion.
In order to reduce the issues due to this aggressive environment, Sandvik offers the possibility to the customers to equip their trucks with Harsh Condition Package.
The Harsh Condition package for Trucks includes a Water Cooled Alternator (instead of the standard air cooled one), and box lift, steering and suspension cylinders with nickel-chromium plated rods.
Water cooled alternator increases the alternator lifetime compared to the standard (air cooled) alternator, especially in acidic environment.
The chromium layer of the cylinders rods is characterized by a controlled micro-crack distribution with high crack density, which in combination with specially adapted finishing procedures, provides for superior corrosion resistance.

Advantages	Customer values
Water cooled alternator increases the alternator lifetime compared to the standard (air cooled) alternator; Especially in harsh condition Chromium plated cylinders rods with superior corrosion resistance.	Reduces costs and increases equipment uptime.

Machine models	Part Numbers
Sandvik TH430	Contact local Sandvik representative
Sandvik TH540	
Sandvik TH545i	
Sandvik TH550	
Sandvik TH551	
Sandvik TH551i	
Sandvik TH663	
Sandvik TH663i	

Arctic package for trucks

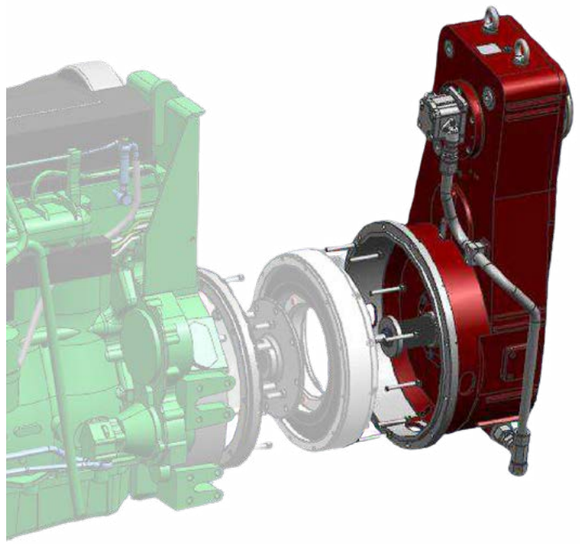
Description
In low temperatures, the oil gets cold and thicker, and makes it very difficult to start the engine which reduce productivity. Start cold also increase the component wearing, reduce the lifetime of components and generate frequent downtime.
Arctic package offers an efficient preheating system for the engine, transmission, gear box, battery, as well as hydraulic and brake oils.
Sandvik TH430 and TH545i arctic package includes all the components of the Cold Climate Package (See details on the Safety and Environmental Improvement section of this catalogue) plus the following additional components: engine block heater, gearbox heating pads, hydraulic oil heater and charge air pre-heater.
On TH551i and TH663, cabin heater, window defroster and side mirrors defroster are standard features, so the arctic package option includes only engine block heater, gearbox heating pads, hydraulic oil heater, charge air pre-heater brake oil heater, drop box heating pads and up box heating pads. The heater is available as 120 V and as 230 V.
Preheating components allows faster start and more efficient operations, and decreases downtime. Less component wear and tear, less breakdowns.
Recommended when the equipment is regularly stored outside in below -10°C or when the temperature may occasionally drop below -20°C .

Advantages	Customer values
Efficient preheating system for the engine, transmission, gear box, battery, as well as hydraulic and brake oils. Ease engine start when cold.	Less component wear and tear, less breakdowns Allows faster start and more efficient operations, and decreases downtime

Machine models	Part Numbers
Sandvik TH330	Contact local Sandvik representative
Sandvik TH430	
Sandvik TH545i	
Sandvik TH551i	
Sandvik TH663i	

Improved up-box for trucks

Description
Sandvik has released a new Up-box for Sandvik TH551, TH551i, TH663 and TH663i dump trucks.
In the new improved up-box the weight of gears has been optimized in order to reduce inertia values. Gear teeth width has changed from 60mm to 43mm.
This improvement, associated with the Improved Flexible Coupling (see next page), will help to reduce the torsional vibration in the rest of the power train, which improves the lifetime of the power train components.
This modification is only possible on Volvo powered trucks.

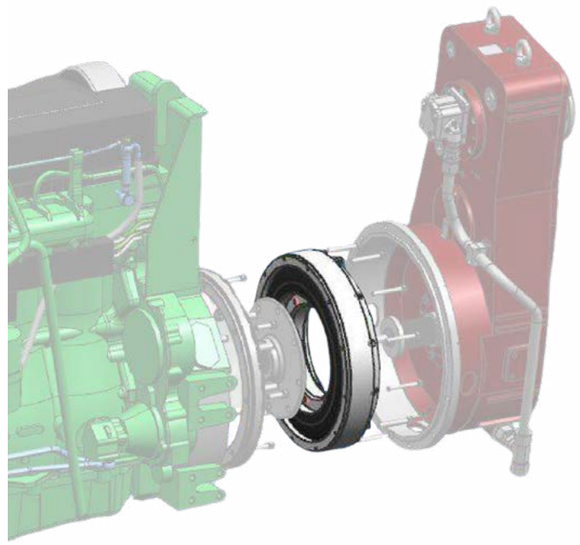


Advantages	Customer values
New design of gears with optimized weight and increased teeth width.	Improves lifetime of the power train components.

Machine models	Part Numbers
Sandvik TH551	Contact local Sandvik representative
Sandvik TH551i	
Sandvik TH663	
Sandvik TH663i	

Improved flexible coupling for trucks

Description
Sandvik has released a new Flexible Coupling for Sandvik TH551, TH551i, TH663 and TH663i dump trucks.
New improved flexible coupling has smaller inertia value and better damping ration compared to old flexible coupling.
This improvement, associated with the Improved Up-Box (see previous page), will help to reduce the torsional vibration in the rest of the power train, which improves the lifetime of the power train components.
This modification is only possible on Volvo powered trucks.

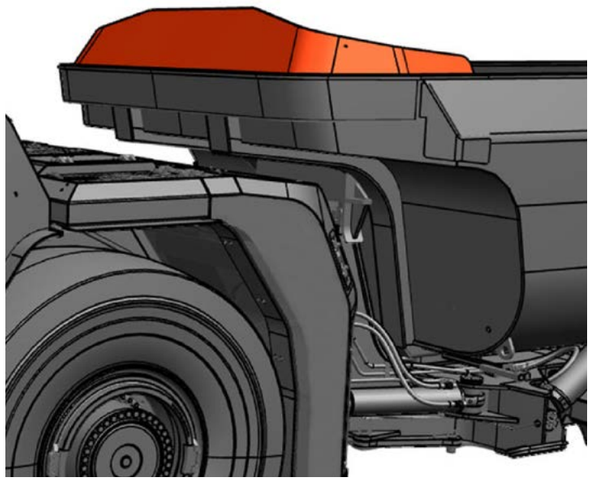


Advantages	Customer values
The Improved Flexible Coupling has smaller inertia and better damping ratio	Improves lifetime of the power train components.

Machine models	Part Numbers
Sandvik TH551	Contact local Sandvik representative
Sandvik TH551i	
Sandvik TH663	
Sandvik TH663i	

Spill guard for trucks

Description
When loading the dump box of the truck, material could fall and damage the machine's covers.
In order to mitigate this risk, Sandvik introduces a new spill guard assembly for TH551, TH551i, TH663 and TH663i dump trucks. The spill guard is designed to better protect the machine covers from falling rocks when loading the box. The spill guard does not require more space when tipping the box. It has to be welder on the box.



Box size	Box Part Numbers	Spill guard Part Number
24m³	BG00982667	BG01704328
26m³	BG00976266	BG01704328
28m³	BG00934613	BG01704328
29m³	BG01764584	BG01704563
30m³	BG00934871	BG01704328
32m³	BG00986317	BG01703480
33m³	BG01475275	BG01704563
34m³	BG00984449	BG01703480
35m³	BG01194896	BG01704563
36m³	BG00864545	BG01703480
38m³	BG00799410	BG01703480
40m³	BG00888773	BG01704563

Advantages	Customer values
Limit the risk material to damage truck's covers	Reduce operating cost

Live oil sampling for trucks

Description
Contaminants such as dirt, sand, water and metallic particles can cause premature component wear and failures, leading to unscheduled downtime and loss of production.
Monitoring the condition of equipment fluids helps to understand component health and enables making informed maintenance decisions to extend the equipment lifetime and reduce total lifecycle cost.
Results can provide an early warning of emerging issues and enable corrective and preventative action:

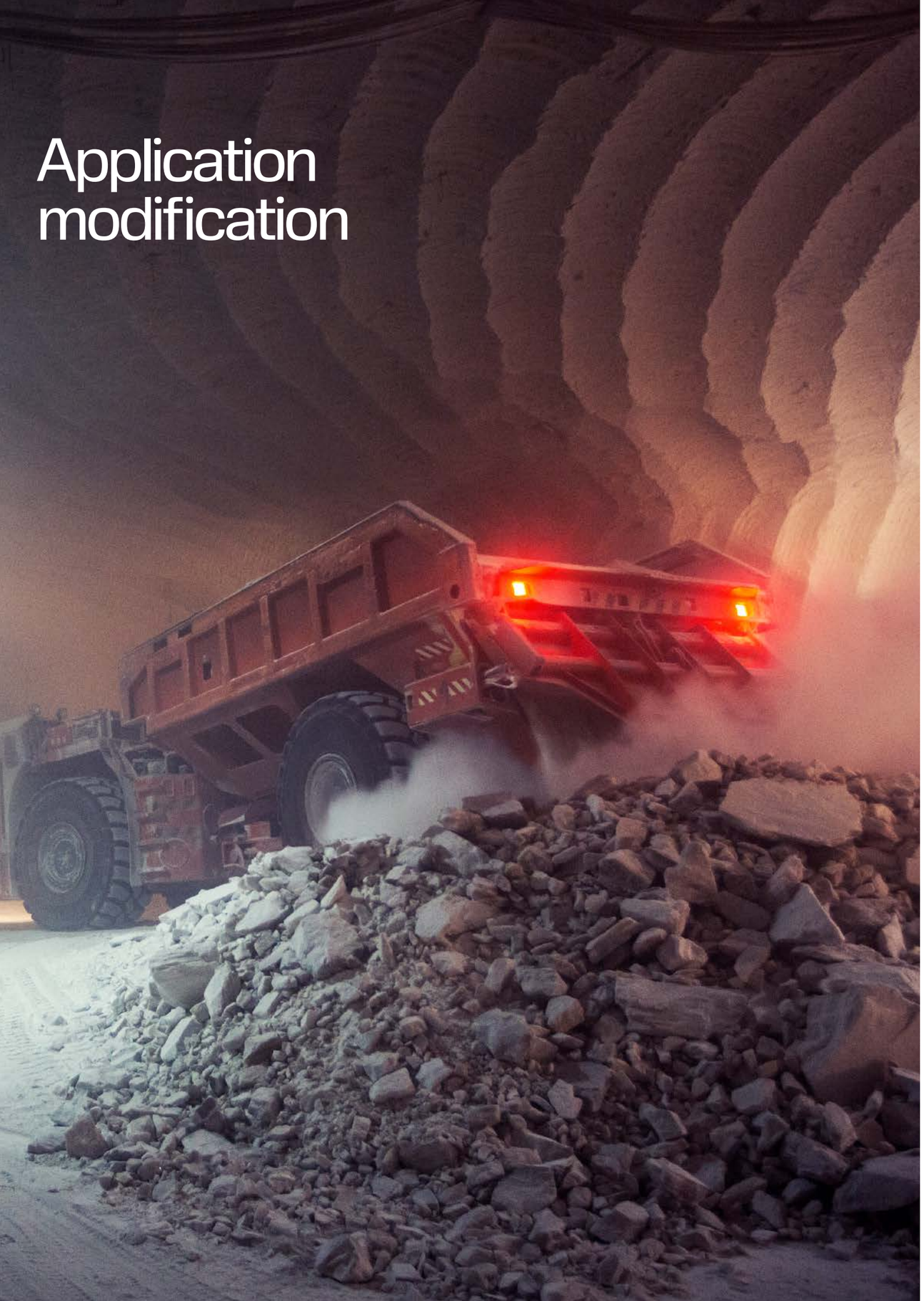
- Minimize risks of unexpected failure and downtime
- Control maintenance and operating costs
- Optimize maintenance scheduling to minimize impact on production
- Increase reliability and safety

The live oil sampling kit offers a safer, quicker and controlled way of taking equipment oil samples.

Advantages	Customer values
Helps to collect easily, properly and with constancy oil sampling for contamination measurement purpose	Control of the oil contamination level has a huge impact on hydraulic systems reliability and maintenance cost.
Improved version allows faster samples collections	Reduce maintenance time

Machine models	Part Numbers
Sandvik TH551i	Contact local Sandvik representative
Sandvik TH663i	

Application modification



Ejector box adaptation kit for trucks

Description

In some low profile drifts, it might be difficult or even impossible to lift properly the box of the truck for dumping due to too low roof hight. Moreover, there might be a risk of contacting overhead obstacles like power lines or ventilation pipes while dumping the box.

In case of dumping on slope, uneven or unstable ground, there is also a risk of tipping over when dumping.

To solve these issue, Sandvik has developed an Ejector Box System to equip the trucks.

The Sandvik Ejector box consist of a durable hight strength steel frame equipped with a tail gate and a push blade that dump the load while the box stays horizontal. The tail gate and the push blade are operated by cylinders.

The push blade movement insures there are no material remaining in the box after dumping (no carry-back).

The elector box allows also to spread easily the material out over a distance without slowing down.

The Ejector Box adaptation kit includes all needed parts to do the adaptation of an Ejector box on a truck originally equipped with conventional box, including hydraulic and electric components, hose and electric wiring harness, etc.

Advantages	Customer values
Allow dumping on low profile drifts. Allow to spread easily the material out over a distance..	Improve machine versatility.
Mitigate the risk of tipping over when dumping on slope and uneven or unstable ground. • Mitigate the risk to collide with overhead obstacles like power lines, or ventilation pipes.	Improve safety.
Push blade movement insures the complete emptying of the box, preventing any carry-back. Allow spreading material out over distance without slowing down.	Improve productivity.

Machine models	Box size	IWS compatibility	Automation compatibility
Sandvik TH320	9,6m³	No	No
Sandvik TH430	14m³	No	No
Sandvik TH540	20m³	No	No
Sandvik TH545i	20m³	No	Yes
Sandvik TH551	25m³	Yes	Yes
Sandvik TH551i	25m³	Yes	Yes
Sandvik TH663	28m³	Yes	Yes
Sandvik TH663i	28m³	Yes	Yes

The adaptation kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

Upgrades solutions for boom surface drills

Sandvik upgrades and engineered solutions offers a vast range of retrofit kits that allow to modify the original specifications of your boom surface drill to improve the performance, the productivity, the safety or to reduce the environmental impact and the operating cost. Our offering includes also solutions to adapt your machine to different application.

Productivity improvement

TIM 1400 instrumentation system for boom surface drills

Description
TIM 1400 is a simple, robust and reliable instrumentation system for boom surface drills. There are several versions of the system available:

- TIM 1402 - The display shows feed angles in reference of boom and feed swings. It's possible to set hole inclination as a reference for next holes. This feature works only when the rig is not moved between holes. The display unit is equipped with LED display showing accuracy of the feed alignment towards reference inclination.
- TIM 1403 - Displays the current drilled hole depth, penetration rate and counter of total drilled meter as additional feature.
- TIM 1404 - The most evolved version. In addition to the feed angles and hole depth information, the system adjusts feed inclination to the reference inclination automatically. Automatic feed alignment works only within boom coverage area without moving carrier between holes.

Advantages	Customer values
Fast aligning for vertical holes Better blasting quality and even floor	Improve productivity and drilling quality.
Simple and clear user interface. Robust design	Easy to use and maintain. Require minimum training.

Machine models	Part Numbers
Sandvik Commando DC120*	Contact local Sandvik representative
Sandvik Commando DC121	
Sandvik Commando DC122R	

*Only TIM 1402 and 1403

TIM 5000 and 6000 instrumentation systems for boom surface drills

Description
TIM 5000 and 6000 are instrumentation systems for Boom surface drills. There are several versions of the system available:

- TIM 5200 - It is a feed angle measuring system for drilling vertical holes. It consists of a feed inclination sensor and a display unit which is located in the cabin. Feed angle difference from vertical position is shown with LED display. When feed is moved towards vertical, LED lights turn off gradually. Vertical position is shown with green LED light in the middle. Difference to vertical plane is also shown numerically on the screen. The upper screen shows the side inclination and the lower shows the longitudinal inclination. The total inclination is shown as well. The measuring range is ± 60° and accuracy of the instrument is ± 0,3°.
- TIM 5300 - In addition to the feed angle measuring system, TIM5300 displays the drilled hole depth and the penetration rate. The required hole depth can be preset on the TIM display. The system alarms/stops the drilling when the set depth is achieved. The automatic start and stop for the hole are built-in, thus there is no need to feed in the values again. System has drilling memory which contains three sets of counters: one total counters and two reset counters. Total counter holds the cumulative data over the lifetime of the instrument. The reset counters hold the cumulative data since last reset. The depth and alignment values are shown on the screen according to the stage of operation.
- Tim 5600 - The feed angle measuring system is working for horizontal holes but also working for horizontal ones. It includes also the holes depth measuring function.
- TIM 6300 - It is used for drilling vertical and inclined holes with a hole depth measuring. The hole depth can be given as a bench height or directly as a hole depth. The system displays the drilled hole depth and the penetration rate and it alarms the operator/stops the drilling when the set depth is achieved. Inbuilt drilling memory contains counters as well. The counters hold the cumulative data since the last reset of counters and following counters are included: amount of drilled holes, drilled meters, drilling time, percussion hours and average penetration rate. Inclination direction can be given by using directly blast direction or reference direction with the aiming unit.
- TIM 6500 - Some applications require a smooth floor or a certain inclination even when the job site surface is uneven. With a laser level based TIM 6500 the operator can meet these requirements easily. The sensor is protected to IP65 class and reading area is full 360 degrees. The detection distance is 150 meters with 1 mW laser beacon. The laser beacon* has to transmit rotating visible red and the wavelength 630-680 nm. TIM 6500 has a laser receiver on the side of the rock drill. The operator presets the required hole depth on TIM display based on a laser level. The system indicates when the rock drill first time passes the laser level and starts counting the preset hole depth. The operator gets a signal and the drilling stops when the desired hole depth is reached. Other features of TIM6500 are like in TIM6300 without GPS compass.

	Vertical holes	Inclined holes	Horizontal holes	Depth Measuring	Aiming device	Laser level	GPS Compass option
TIM 5200	√						
TIM 5300	√			√			
TIM 5600	√		√	√			
TIM 6300	√	√		√	√		√
TIM 6500	√	√		√	√	√	√

*TIM6500 does not included laser beacon.

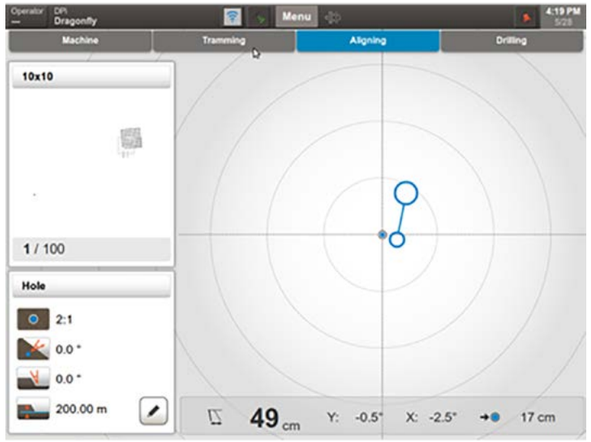
Advantages	Customer Values
Fast aligning for vertical holes. Better blasting quality and even floor.	Improve productivity and drilling quality.
Simple user interface	Easy to use and maintain. Require minimum training.
Possibility to collect production information through My Sandvik Productivity[2)]	Reports that gives direct overview of fleet utilization and performance.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Dino DC400R[1)]	Contact local Sandvik representative	Sandvik Ranger DX600[1)]	Contact local Sandvik representative
Sandvik Dino DC410R[1)]		Sandvik Ranger DX600R[1)]	
Sandvik Leopard DI450		Sandvik Ranger DX700[1)]	
Sandvik Leopard DI550		Sandvik Ranger DX800[1)]	
Sandvik Leopard DI560		Sandvik Ranger DX800R[1)]	
Sandvik Ranger DQ500[2)]			

1) TIM 5600 not available
2) Only TIM 5600 available.

TIMi for vertical holes and hole depth measuring for boom surface drills

Description
Operator uses displays target to align feed to vertical position. Hole depth measurement displays the drilled hole depth and penetration rate. Drilling stops when set depth is achieved.
System has drilling memory which contains three sets of counters: one total counters and two reset counters. Total counter hold the cumulative data over the lifetime of the instrument. The reset counters hold the cumulative data since last reset.

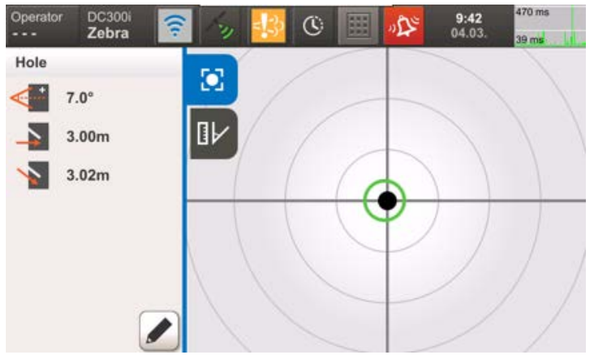


Advantages	Customer values
Fast aligning for vertical holes	Improve productivity and drilling quality
Auto stop for drilling when the set depth is achieved	Better blasting quality and even floor
Possibility to collect production information through My Sandvik Productivity	Reports that gives direct overview of fleet utilization and performance.

Machine models	Part Numbers
Sandvik Commando DC130Ri	Contact local Sandvik representative
Sandvik Commando DC300Ri	
Sandvik Dino DC420Ri	

TIMi horizontal holes measurement for boom surface drills

Description
TIMi horizontal holes measurement is a feed angle measuring system for drilling vertical and horizontal holes with hole depth measuring.
Hole depth measurement displays the drilled hole depth and penetration rate. The required hole depth can be preset on the TIM display. The system alarms when the set depth is achieved.
System has drilling memory which contains three sets of counters: one total counters and two reset counters. Total counter holds the cumulative data over the lifetime of the instrument. The reset counters hold the cumulative data since last reset.. The system memory consists of amount of drilled holes, drilled meters, drilling time, percussion hours and average penetration rate.



Advantages	Customer values
Fast aligning for vertical and horizontal holes	Improve productivity and drilling quality
Auto stop for drilling when the set depth is achieved	Better blasting quality and even floor
Possibility to collect production information through My Sandvik Productivity	Reports that gives direct overview of fleet utilization and performance.

Machine models	Part Numbers
Sandvik Commando DC130Ri	Contact local Sandvik representative
Sandvik Commando DC300Ri	
Sandvik Dino DC420Ri	

TIMi for inclined holes and hole depth measurement for boom surface drills

Description
Blasting direction is indicated with the aiming unit. Aiming can be done to free selected reference point. This is a patented feature by Sandvik.
Hole depth measurement displays the drilled hole depth and penetration rate. Drilling stops when set depth is achieved. System has drilling memory which contains three sets of counters: one total counters and two reset counters. Total counter holds the cumulative data over the lifetime of the instrument. The reset counters hold the cumulative data since last reset
Optionally TIMi for inclined holes can be equipped also with GPS which is reducing drilling errors and especially directional errors of inclined holes even more. System equipped with GPS saves time and guarantees parallel direction of the holes having direct affect to fragmentation result. The drilling direction will be given once in either compass direction only or by traditional aiming device. The direction is stored and used in every hole until new direction is given. GPS aiming reduces the need to find any reference target. It works in rain, fog or other poor visibility conditions. Random and human errors are eliminated and the accuracy is approximately 0.5°.

Advantages	Customer values
Fast aligning for vertical and inclined holes	Improve productivity and drilling quality
Auto stop for drilling when the set depth is achieved	Better blasting quality and even floor
Drilling counters Possibility to collect production information through My Sandvik Productivity	Reports that gives direct overview of fleet utilization and performance.

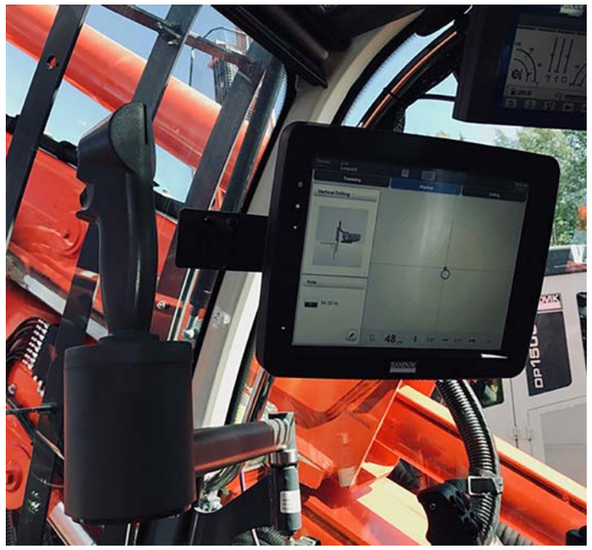
Machine models	Part Numbers
Sandvik Commando DC130Ri	Contact local Sandvik representative
Sandvik Commando DC300Ri	
Sandvik Dino DC420Ri	
Sandvik Leopard DI650i	
Sandvik Leopard DI650i RC	
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX800i	
Sandvik Ranger DX910i	
Sandvik Pantera DP1100i	
Sandvik Pantera DP1110i	
Sandvik Pantera DP1500i	
Sandvik Pantera DP1510i	
Sandvik Pantera DP1600i	
Sandvik Pantera DP1610i	

TIM for inclined holes and TIM3D readiness for boom surface drills

Description
TIM for inclined holes and TIM3D readiness is used for drilling vertical and inclined holes with a hole depth measuring. The system makes possible to retrofit full TIM3D system easy by adding just antennas and GPS receiver. The system has upgraded user interface with touchscreen function. Through the display its possible also to troubleshoot the system and initialize sensors.
The hole depth can be given as a bench height or directly as a hole depth. The system displays the drilled hole depth and the penetration rate and it alarms the operator/stops the drilling when the set depth is achieved. Inbuilt drilling memory contains counters as well. The counters hold three types of data:

- Cumulative data since the last reset of counters by user
- Cumulative data since the last reset of counters by service personnel
- Cumulative data through machine life time

Following counters are included: amount of drilled holes, drilled meters, drilling time, percussion hours and average penetration rate. The system also includes aiming unit and hydraulic cylinders with sensors. Inclination direction can be given by using directly blast direction or reference direction with the aiming unit.



Advantages	Customer values
Fast aligning for vertical and inclined holes. Auto stop for drilling when the set depth is achieved.	Improve productivity. Improve quality and consistency for operators of all experience levels, and reduces training duration for new operators.
Drilling counters. Possibility to collect production information through My Sandvik Productivity	Allows to review the performance of each individual unit and compare with similar units to detect easily inefficiency. Help to react quickly and make decision based on real facts. Allows to set-up and measure easily and accurately productivity KPI's. Follow up cost/drilled meters (parts, rock tools life, etc...).
Touchscreen user-interface. System troubleshooting and sensors initialization through the display.	Easy and simple to use and maintain.
Easy upgradeable to full TIM3D drill navigation	Evolutive system.

Machine models	Part Numbers
Sandvik Leopard DI450	Contact local Sandvik representative
Sandvik Leopard DI550	
Sandvik Leopard DI560	
Sandvik Leopard DI650i	
Sandvik Leopard DI650i RC	
Sandvik Ranger DX600	
Sandvik Ranger DX700	
Sandvik Ranger DX800	
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	

TIM3D drill navigation system for boom surface drills

Description
Sandvik TIM3D drill navigation system ensures the hole quality and hole position accuracy in all drilling tasks. It bases on the most accurate multi-satellite system, RTK GNSS (Real time kinematics global navigation system). The system accuracy is better than 10 cm.
TIM3D reads a drilling plan made in IREDES format (International Rock Excavation Data Exchange Standard). The drilling plan file is transferred to TIM3D with USB stick or it can be created through the display.
When the actual drilled geometry is saved to TIM3D, it can be transferred back to the office in IREDES format for further actions.
In i-Series drill rigs the system is integrated to standard screen. In “classic or hybrid” series drill rig the additional screen is mounted to the cabin.
The system consists of three essential operations (rig navigation, feed alignment and drilling) to assist the driller to improve the whole drilling process and cut of the production costs in every job site.
TIM3D is available with the optional Automatic feed alignment system. When the drill has been trammed to the proximity of the hole to be drilled, the function can be activated with single click of the hole to run button. This activates automatics and take the feed in correct position and alignment.

Machine models	Part Numbers
Sandvik Leopard DI450	Contact local Sandvik representative
Sandvik Leopard DI550	
Sandvik Leopard DI560	
Sandvik Leopard DI650i	
Sandvik Leopard DI650iRC	
Sandvik Ranger DX600	
Sandvik Ranger DX600R	
Sandvik Ranger DX700	
Sandvik Ranger DX800	
Sandvik Ranger DX800R	
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	
Sandvik Pantera DP1100i	
Sandvik Pantera DP1110i	
Sandvik Pantera DP1500i	
Sandvik Pantera DP1510i	
Sandvik Pantera DP1600i	
Sandvik Pantera DP1610i	

Advantages	Customer values
Full system support from a single source. System calibration and self diagnostics are done through user-interface Less-add on devices	Simplicity, availability.
SanRemo integration, inc. fleet and process data	Connectivity
Platform for future updates and advanced features	Scalability

Rock Pulse™ sensor system for boom surface drills

Description
RockPulse™ utilizes ground breaking sensor technology and gives you visibility inside the rock while you drill. The system analyses the efficiency and quality of your drilling, suggesting adjustments to your feed pressure, giving immediate feedback on your drilling settings.
RockPulse is the real time heartbeat of your drilling. The system enables you to quickly adapt to changing rock conditions, increasing your productivity and efficiency.
RockPulse system upgrade is currently available for Ranger DX800i and DX900i, with RD920-series rock drills. RockPulse system consists of the RockPulse sensor, RockPulse shank and the user interface.
The system guides every operator to perform their best productivity with three new indicators in the main drilling views:

- Drill Bit Response measures the bit-rock contact and helps you to achieve higher penetration rate in changing rock conditions.
- Tools Load measures harmful energy reflected back from the rock. By adjusting drilling settings, the tool life can be significantly increased.
- Feed Level measures the optimal feed level in changing rock conditions. Optimal performance can be achieved by adjusting the feed level, while improving hole quality and tool life.

Advantages	Customer values
System that analyzes drilling efficiency and quality. Suggest feed pressure adjustment.	Help the operator to increase drilling efficiency. Improve productivity Improve rock tools life. Reduce operating cost.

Machine models	Part Numbers
Sandvik Ranger DX800i	Contact local Sandvik representative
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	

Water injection system for boom surface drills

Description
When collaring a hole and drilling broken rock, the hole walls tend to collapse causing drill steels to jam or a need to re-drill the hole. This can be avoided by using a water injection system, which effectively stabilizes the hole walls. The water injection system consists of a water tank, control valves, water pump and control system.
Controlled amount of water or a water / foaming agent mixture is pumped into the rock drill's flushing air. The mixture pumped into the flushing air suppresses the dust and vaults the hole with a cement-like layer which prevents the hole from collapsing.
The actual amount of mixture used depends on the type of the rock and the size of drilled hole. Water tanks are big enough for one day operation. Capacities are as follows:

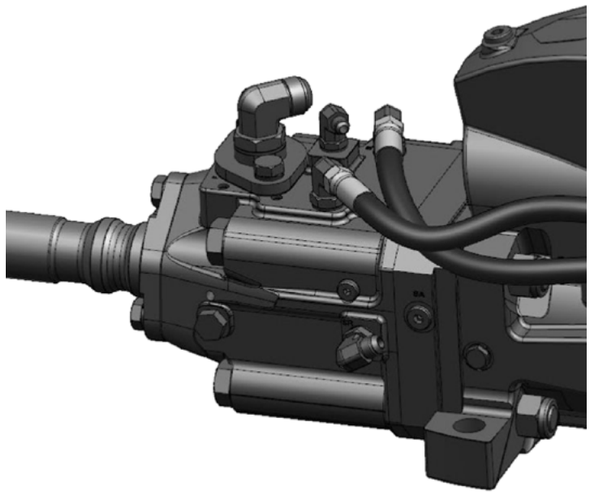
- Ranger DX & Tiger DG: 250 liters
- Ranger DXi: 250 liters (125 liters each)
- Pantera DPi 250 liters
- Leopard DI: 350 liters

Advantages	Customer values
Prevents hole from collapsing during collaring	Increase productivity
Reduced amount of flying dust	Improve safety

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Tiger DG710	Contact local Sandvik representative	Sandvik Ranger DX800R	Contact local Sandvik representative
Sandvik Tiger DG810		Sandvik Ranger DX800i	
Sandvik Leopard DI450		Sandvik Ranger DX810i	
Sandvik Leopard DI550		Sandvik Ranger DX900i	
Sandvik Leopard DI560		Sandvik Ranger DX910i	
Sandvik Leopard DI560i		Sandvik Pantera DP1100i	
Sandvik Ranger DQ500		Sandvik Pantera DP1110i	
Sandvik Ranger DX600		Sandvik Pantera DP1500i	
Sandvik Ranger DX600R		Sandvik Pantera DP1510i	
Sandvik Ranger DX700		Sandvik Pantera DP1600i	
Sandvik Ranger DX800		Sandvik Pantera DP1610i	

Power extractor for boom surface drills

Description
Fractured and heterogeneous ground, poor flushing quality, cross drilling, or worn out rock tools can lead to drilling rod jamming, And It is quite hard work to recover from the jamming and it robs your job and production of expensive and valuable time.
In production drilling, one of the major loss of production cause could be the difficulty to uncouple efficiently the rods.
In order to solve these issues and preserve the productivity, Sandvik has developed the Power Extractor system.
Power Extractor is a module for a hydraulic rock drill, operated by a switch on the operator's control panel.
An hydraulic actuator mounted on the front end of the rock drill gear housing, by multiple (small) pistons, is able to pull the shank adapter towards the striking point, so that the piston can hit the shank during pull-back.
Percussive stress waves can therefore be transmitted to the drill rods.
Power Extractor is very efficient when the drill string are jammed so tight that it can not be removed by only using feed, rotation and percussion.
Use of Power Extractor for uncoupling rods makes easier and faster the opening of joints. It reduces the non-drilling time, increases drilling capacity and rock tool service life and reduces rock drill maintenance cost.



Advantages	Customer values
Power Extractor allows the rock drill piston to hit the shank during pull back (percussive stress waves transmitted to the drill rods.	Improve productivity by help to remove rod(s) from the hole in case of jamming. In Production drilling, ease rods uncoupling.

Machine models	Part Numbers
Sandvik Ranger DX600	Contact local Sandvik representative
Sandvik Ranger DX600R	
Sandvik Ranger DX700	
Sandvik Ranger DX800	
Sandvik Ranger DX800R	
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	
Sandvik Pantera DP1100i	
Sandvik Pantera DP1110i	
Sandvik Pantera DP1500i	
Sandvik Pantera DP1510i	
Sandvik Pantera DP1600i	
Sandvik Pantera DP1610i	

Hydraulic rear ground support for boom surface drills

Description
Hydraulic rear ground support provides better stability for the feed when drilling on uneven ground. It also helps to utilize rigs weight against higher drilling forces when drilling with high percussion pressures.
Ground support is located on the lower frame and it is frog leg type. The control is located in the cabin and in the optional remote-control panel.

Advantages	Customer values
Provides better stability on uneven ground. Helps to utilize rigs weight with high percussion pressures	Improve drilling accuracy. Improve drilling performance.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Tiger DG710		Sandvik Ranger DX800i	
Sandvik Tiger DG810		Sandvik Ranger DX810i	
Sandvik Leopard DI450		Sandvik Ranger DX900i	
Sandvik Leopard DI550		Sandvik Ranger DX910i	
Sandvik Leopard DI560		Sandvik Pantera DP1100i	Contact local Sandvik representative
Sandvik Ranger DQ500		Sandvik Pantera DP1110i	
Sandvik Ranger DX600		Sandvik Pantera DP1500i	
Sandvik Ranger DX600R		Sandvik Pantera DP1510i	
Sandvik Ranger DX700		Sandvik Pantera DP1600i	
Sandvik Ranger DX800		Sandvik Pantera DP1610i	
Sandvik Ranger DX800R			

Safety and environmental improvement

Noise guard for Ranger DX series

Description

Many contractors and quarries face increasingly restrictive noise limits, particularly in urban areas. Effective solutions are necessary to cut out harmful noise to improve work safety and to maintain neighborly relations with local communities. The new solutions introduced by Sandvik are not only beneficial to the surrounding areas, they also reduce operators' and work site personnel's exposure to harmful noise levels, thereby offering a more comfortable working environment.

Noise Guard - DX reduces noise emissions from Ranger™ DX series drill rigs The Noise Guard - DX is a fully enclosed structure that reduces Lwa sound power level outside of the drill approx 10dB, down to 117,3 dB.

The LpA, sound pressure level at operator seat drops down to 71,6dB (normally around 80dB).

Requirements to limit noise from drilling machinery stem from several international and national sources, such as EU directives, various safety standards, occupational health and safety legislation and environmental regulations. The measurements above represent the A-weighted sound pressure (LpAd) levels according to the EN 16228-1 safety standard, which applies the methods standardized in SFS EN ISO 3744:2010 for determining the sound power level of a noise source.

Advantages	Customer values
Reduce noise emissions while drilling.	Help to respect local noise regulations. Improve work safety.

Machine models	Part Numbers
Sandvik Ranger DX600	Contact local Sandvik representative
Sandvik Ranger DX600R	
Sandvik Ranger DX700	
Sandvik Ranger DX800	
Sandvik Ranger DX800R	

Noise guard for Ranger DXi series

Description
Many contractors and quarries face increasingly restrictive noise limits, particularly in urban areas. Effective solutions are necessary to cut out harmful noise to improve work safety and to maintain neighborly relations with local communities. The new solutions introduced by Sandvik are not only beneficial to the surrounding areas, they also reduce operators' and work-site personnel's exposure to harmful noise levels, thereby offering a more comfortable working environment.

Noise guard-DXi is a fully enclosed structure that provides up to –12.9 dB noise reduction in A-weighted sound pressure within a 16-meter radius of the rig. In this measuring distance, the noise reduction compared to unmitigated sound pressure is up to 95 percent. The Noise guard-DXi option comes with a camera system that provides visually aided drilling when the structure doors are closed. Additionally, it has an innovative single bolt dismantling design for fast and easy maintenance on the feed system.

Requirements to limit noise from drilling machinery stem from several international and national sources, such as EU directives, various safety standards, occupational health and safety legislation and environmental regulations. The measurements above represent the A-weighted sound pressure (LpAd) levels according to the EN 16228-1 safety standard, which applies the methods standardized in SFS EN ISO 3744:2010 for determining the sound power level of a noise source.

Advantages	Customer values
Reduce noise emissions while drilling.	Help to respect local noise regulations. Improve work safety.

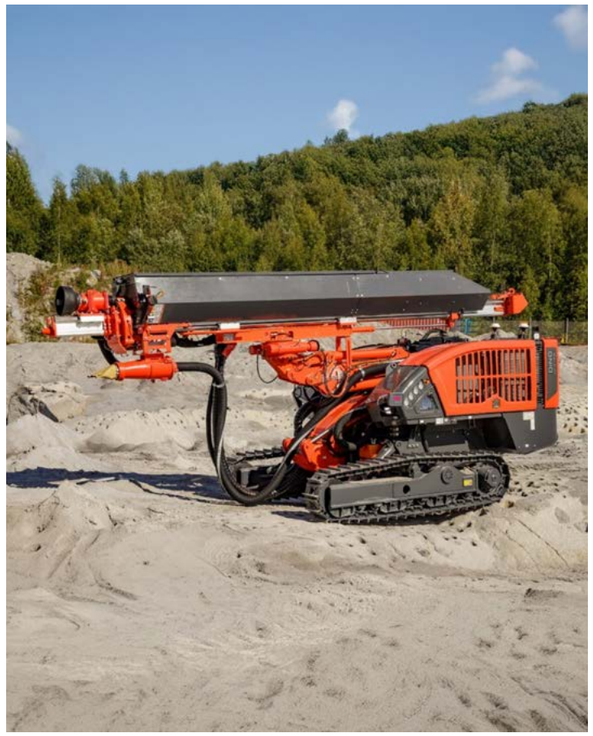
Machine models	Part Numbers
Sandvik Ranger DX800i	Contact local Sandvik representative
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	

NoiseShield for Dino DC series

Description
Many contractors and quarries face increasingly restrictive noise limits, particularly in urban areas. Effective solutions are necessary to cut out harmful noise to improve work safety and to maintain neighborly relations with local communities. The new solutions introduced by Sandvik are not only beneficial to the surrounding areas, they also reduce operators' and worksite personnel's exposure to harmful noise levels, thereby offering a more comfortable working environment.

NoiseShield-DC, is a simple, compact solution for the smaller, cabin-less Dino™ DC410Ri and DC420Ri(*) drill rigs (14 kW rock drill, recommended hole diameter 51–76 mm / 2"–3") that excel in urban worksites. While not fully enclosed, NoiseShield-DC offers up to a –7.5 dB reduction in A-weighted sound pressure by directing the drilling noise upwards through an open top, away from the operator and surrounding areas. This reduction translates to an 82 percent mitigation in noise pressure within a 16-meter radius of the drill rig.

Requirements to limit noise from drilling machinery stem from several international and national sources, such as EU directives, various safety standards, occupational health and safety legislation and environmental regulations. The measurements above represent the A-weighted sound pressure (LpAd) levels according to the EN 16228-1 safety standard, which applies the methods standardized in SFS EN ISO 3744:2010 for determining the sound power level of a noise source.



Advantages	Customer values
Reduce noise emissions while drilling.	Help to respect local noise regulations. Improve work safety.

Machine models	Part Numbers
Sandvik Dino DC410Ri	Contact local Sandvik representative
Sandvik Dino DC420Ri	

Safety cage for boom surface drills

Description
Unsafe working habits may cause the drill rig operator to stand near the feed while the machine is drilling. This expose him to serious risk of accident that can be dramatic.
The safety cage is a safety device attached to the feed beam consisting of a steel wire mesh. Its purpose is to prevent the operator from getting caught by the rotating drill steels.
On DX and DXi series, the Safety Cage is available on Long version (replace standard component).

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Commando DC130Ri	Contact local Sandvik representative	Sandvik Ranger DX700	Contact local Sandvik representative
Sandvik Commando DC300Ri		Sandvik Ranger DX800	
Sandvik Dino DC400R		Sandvik Ranger DX800R	
Sandvik Dino DC410R		Sandvik Ranger DX800i	
Sandvik Dino DC420R		Sandvik Ranger DX810i	
Sandvik Leopard DI450		Sandvik Ranger DX900i	
Sandvik Leopard DI550		Sandvik Ranger DX910i	
Sandvik Leopard DI560		Sandvik Pantera DP1100i	
Sandvik Ranger DX600		Sandvik Pantera DP1500i	
Sandvik Ranger DX600R		Sandvik Pantera DP1600i	

Advantages	Customer values
Cage installed on the feed that prevent the operator to be hurt by the drilling rod.	Increase the safety.

Reversing camera system for boom surface drills

Description
Reversing Camera System improves tramming safety of a rill rig.
On DPi, the system consist on a back camera and a right side camera, connected on the machine's original user interface touch screen.
On TG, DI and DX, The system consist of 6.9" TFT LCD color flat screen monitor and 3 cameras for monitoring the overall rear view and the ground behind the tracks. It is possible to show the view of all three cameras on screen at the same time or select the view of camera one by one.
On DXi, the system consist on 4 cameras that are on the machine's original user interface touch screen. There are a back camera, two lower side cameras and a front camera. Operator can look 2 Camera views at the same time.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Tiger DG710	Contact local Sandvik representative	Sandvik Ranger DX800i	Contact local Sandvik representative
Sandvik Tiger DG810		Sandvik Ranger DX810i	
Sandvik Leopard DI450		Sandvik Ranger DX900i	
Sandvik Leopard DI550		Sandvik Ranger DX910i	
Sandvik Leopard DI560		Sandvik Pantera DP1100i	
Sandvik Leopard DI650i		Sandvik Pantera DP1110i	
Sandvik Leopard DI650iRC		Sandvik Pantera DP1500i	
Sandvik Ranger DQ500		Sandvik Pantera DP1510i	
Sandvik Ranger DX600		Sandvik Pantera DP1600i	
Sandvik Ranger DX700		Sandvik Pantera DP1610i	
Sandvik Ranger DX800			

Advantages	Customer values
Improve visibility to back and side of machine.	Improve safety.
Reduce risk of damages on the machine.	Reduce operating cost.

Dustmizer for boom surface drills

Description
Dustmizer is an effective addition to standard dust collection system taking care of also the smallest particles which can't be seen but are most harmful.
Dustmizer's dust binding liquid is added to the rock drill flushing air during drilling. The fluid led into the flushing air suppresses the drilling dust and forms a sand like and grainy, dust free substance. Water receiver is big enough for one shift operation. There are two nozzles in the Dust Collector spraying dust binding liquid to the outlet when there is a need to bind the dust dropped to the ground.
Engine heater option is required, if machine equipped with Dustmizer operates below freezing point.
On Commando DC300Ri, Dino and Ranger DXi series, the Dustmizer upgrade includes always the flap feeder system.
On Ranger DX, Leopard DI650i and Pantera DPi, flap feeder system is not part of Dustmizer upgrade but can be added as an option (see page 229).
On Leopard DI650i, Dustmizer upgrade require Water Injection System (see page 218).

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Commando DC300Ri	Contact local Sandvik representative	Sandvik Ranger DX800	Contact local Sandvik representative
Sandvik Dino DC400R		Sandvik Ranger DX800R	
Sandvik Dino DC410R		Sandvik Ranger DX800i	
Sandvik Dino DC420Ri		Sandvik Ranger DX810i	
Sandvik Tiger DG710		Sandvik Ranger DX900i	
Sandvik Tiger DG810		Sandvik Ranger DX910i	
Sandvik Leopard DI650i		Sandvik Pantera DP1100i	
Sandvik Leopard DI650iRC		Sandvik Pantera DP1110i	
Sandvik Ranger DQ500		Sandvik Pantera DP1500i	
Sandvik Ranger DX600		Sandvik Pantera DP1510i	
Sandvik Ranger DX600R		Sandvik Pantera DP1600i	
Sandvik Ranger DX700		Sandvik Pantera DP1610i	

Advantages	Customer values
Reduce the amount of dust particles in the air.	Improve safety by reducing the risk for the operator and other staff to breathe dust particles.
Reduce the need to clean the coolers to avoid clogging. Reduce the need to clean cabin.	Improve reliability and operating cost.

Flap feeder for dust collector for boom surface drills

Description
The flap feeder system replaces the shutter valve at the rear of the drill rig. Hydraulic motor turns the feeder which lets the dust out of the collector and prevents filter cleaning air pulse to blow to the dust pile below the collector.
Reducing the amount of dust flying around the environment helps to preserve staff health and to keep clean the coolers.
On Commando DC300Ri, Dino and Ranger DXi series the Dustmizer upgrade (see page 223) includes always the flap feeder system.

Machine models	Part Numbers
Sandvik Commando DC300Ri	Contact local Sandvik representative
Sandvik Dino DC400R	
Sandvik Dino DC410R	
Sandvik Dino DC420i	
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	
Sandvik Pantera DP1100i	
Sandvik Pantera DP1110i	
Sandvik Pantera DP1500i	
Sandvik Pantera DP1510i	
Sandvik Pantera DP1600i	
Sandvik Pantera DP1610i	

Advantages	Customer values
Prevent filter cleaning air pulse to blow to the dust pile below the collector.	Improve safety by reducing the amount of dust particles in the environment.
Reduce the need to clean the coolers to avoid clogging. Reduce the need to clean cabin.	Improve reliability and operating cost.

Pipe winch for boom surface drills

Description
The drill pipes are heavy as they can weigh up to several hundred kilos. Handling the pipes without specific equipment can be hazardous. Even more, if this task has to be performed outside workshops.
The pipe winch is intended for loading and unloading drill pipes to and from the cassette in the easiest and safer way.
The pipe winch is operated with a radio remote control, which is an additional option

Advantages	Customer values
Allows to handle safely and easily the drill pipes.	Improve safety.
Easy and fast tube change.	Reduce machine downtime.

Machine models	Part Numbers
Sandvik Leopard DI450	Contact local Sandvik representative
Sandvik Leopard DI550	
Sandvik Leopard DI560	
Sandvik Leopard DI650i	
Sandvik Leopard DI650iRC	

Hydraulic winch for boom surface drills

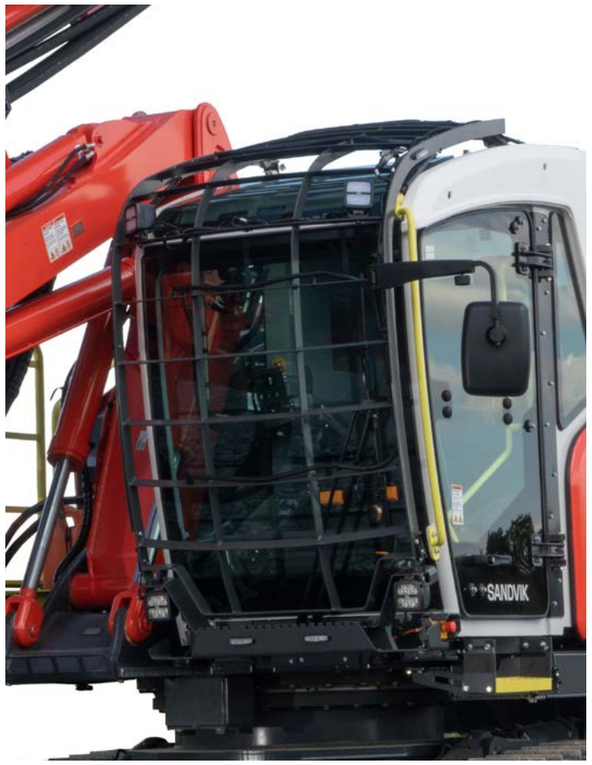
Description
Hydraulic winch is needed to secure drill rig when operating rig in steep slopes. This upgrade is required according to Drill Rig Safety rules when inclination of the rig exceeds more than 20°. When the winch is in use, the maximum allowed inclination angle is 30°.
Winch is operated from radio remote on all models, except on DC120 and DC121R units where operation happens via levers.
On DI range, the hydraulic winch require the radio remote control option.

Advantages	Customer values
Secure the drill while drilling on steep slopes.	Improve safety
Allows to operate in places which are normally unreachable.	Increase the operational scope of the machine.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Commando DC120	Contact local Sandvik representative	Sandvik Ranger DX700	Contact local Sandvik representative
Sandvik Commando DC121R		Sandvik Ranger DX800	
Sandvik Commando DC122R		Sandvik Ranger DX800R	
Sandvik Commando DC130Ri		Sandvik Ranger DX800i	
Sandvik Commando DC300Ri	BG01349568	Sandvik Ranger DX810i	
Sandvik Dino DC400R	Contact local Sandvik representative	Sandvik Ranger DX900i	
Sandvik Dino DC410R		Sandvik Ranger DX910i	
Sandvik Dino DC420Ri		Sandvik Pantera DP1100i	
Sandvik Ranger DQ500		Sandvik Pantera DP1500i	
Sandvik Ranger DX600		Sandvik Pantera DP1600i	

Explosion proof window for boom surface drills

Description
Explosive proof cabin window is an additional window on top of standard front window. This window is designed to resist to flying rocks and shock waves generated by blastings.
This provides better protection to the operator and also avoids damaging the machine and having to move it over long distances to get far away from the production area during each blast.
First layer is changeable wearing layer. Under that is 12mm Polycarbonate armor glass.



Advantages	Customer values
Provides better protection to the operator.	Increase safety.
Avoids damages on the window..	Reduce maintenance cost.
Allows to leave the machine closer to the production area during blasting.	Reduces tramming time and increases productivity.

Machine models	Part Numbers
Sandvik Leopard DI650i	Contact local Sandvik representative
Sandvik Leopard DI650iRC	
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	

Rock shield for lights and lower part of the window for boom surface drills

Description
The shield for lower front lights and lower part of front window protect front window for flying rocks and extends the life time of window.
This extra protection is fitted on the original window protective grid and lifts with it to allow the cleaning of the window and replacement of the wiper blades.

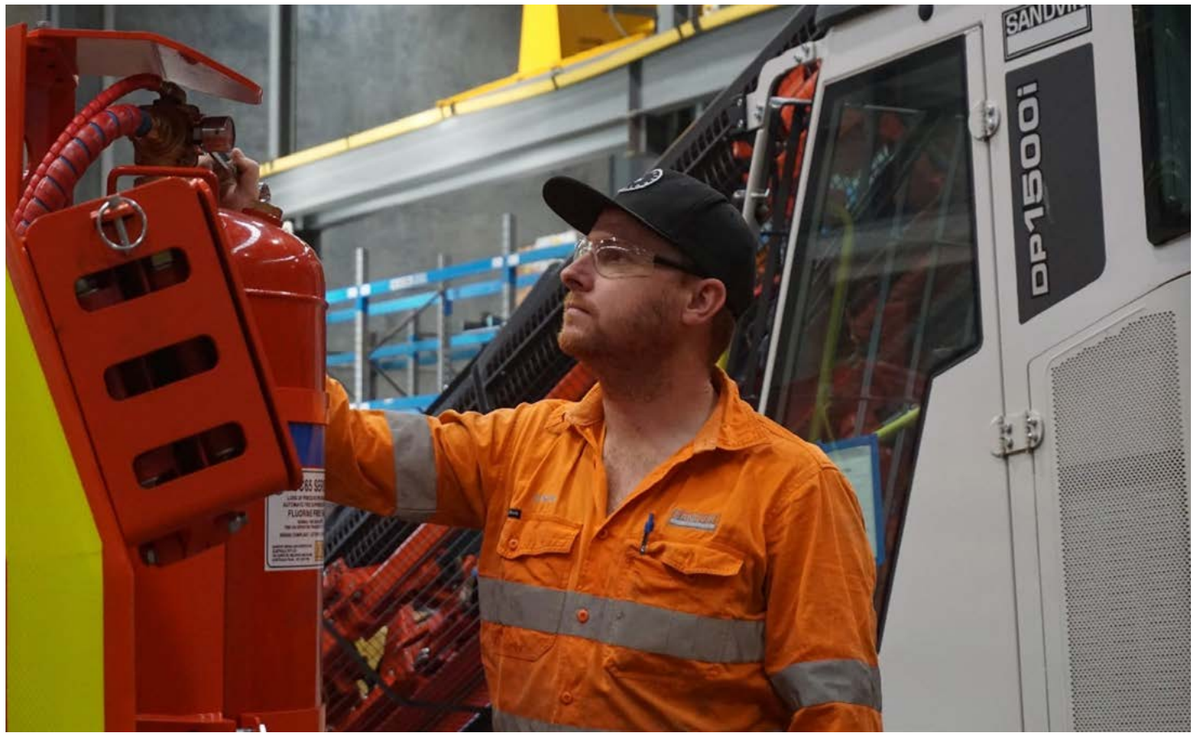
Advantages	Customer values
Provides better protection to the operator	Increase safety.
Avoids damages on the window..	Reduce maintenance cost.

Machine models	Part Numbers
Sandvik Leopard DI450	Contact local Sandvik representative
Sandvik Leopard DI550	
Sandvik Leopard DI560	

Eclipse™ fire suppression for boom surface drills

Description
From diesel fuels to hydraulic fluids, heavy equipment depends on flammable liquids to keep moving. The dangers associated with underground mine fires are multifaceted, often leading to devastating consequences. These fires can produce toxic gases, such as carbon monoxide and hydrogen sulphide, which can cause respiratory failure and even death. In addition, , the intense heat generated by these fires can lead to the collapse of mine structures, trapping miners and hindering rescue efforts.
Sandvik Eclipse™ is a crucial component of your safety management system to protect people, investments and equipment. Sandvik Eclipse™ fire suppression systems are designed and tested to meet the most stringent requirements of fire protection on mobile and transportable equipment, including underground drilling applications.
Compared to traditional dry powder systems, Eclipse™ is up to 30 percent more effective on super-heated surfaces. Our Sandvik system is equipped with liquid agents to attack all the elements a fire needs to ignite - heat, fuel and oxygen (fire triangle).
Automatic activation is a standard feature and the rapid cooling effect blocks the risk of re-ignition. The engine is also automatically shut-down.

The system is very efficient to service and maintain and can be installed on new or existing equipment - regardless of size or brand.
Sandvik Eclipse™ It is available in two versions to suit global application:
Sandvik Eclipse™ Sustain is suitable for climates 0°C to + 60°C. The tank contains foam concentrate and water solution. The mixture is fluorine free making it environmentally sustainable.
Sandvik Eclipse™ Extreme is suitable for climates - 40°C to + 60°C. The tank contains a pre-mixed liquid agent for the harshest of environments.
The reliable automatic activation concept and system hardware remains identical between Eclipse™ Sustain and Eclipse™ Extreme.
Eclipse™ is a smart way to reduce the risk of injuries, production loss, costly repairs and replacements. Design flexibility and a range of different tank sizes make it possible to install Eclipse™ on a wide range of mobile plants and equipment.



Advantages	Customer Values
Fully automated activation (loss-of-pressure activation) and engine shutdown standard on all systems. Foam fire extinguishing cutting off oxygen, vapor sealing and cooling down superheated surfaces (such as turbo charger and engine manifold).	Increase safety. System 30% more efficient compared to traditional dry powder systems.
Quick and efficient on site discharge testing and servicing. Quick recharge times for productivity	Easy testing and services procedures. Increase machine availability (productivity).

Machine models	Part Numbers
All equipment	Contact local Sandvik representative

Jump start connector for boom surface drills

Description

Discharged battery might lead to the need to use jump cables to start the engine of the loader with the use of an external battery pack or other unit.

This process can be dangerous is case of polarity mistake on the jump cables connection as the battery short circuit can lead to explosion of the battery, fire start and serious damages on the electric system of the machine.

In order to mitigate this risk, Sandvik offers the installation of the Jump Start Connector Upgrade Solution.

The Jump Start Connector avoid the risk to invert polarity of the jump cable. It avoid also generation of sparks, that could happen if cables where connected temporarily on the battery terminals with clamps (risk of fire).

Only female connector is supplied on the kit. Cable with male connector can be ordered separately from Sandvik:

- P/N 504744: Jump cable length 3m (10ft):
- P/N: 56034295: Jump cable length 4,5m (15ft)

Advantages	Customer values
Jump Start Connector avoid risk of inversion of polarities during jump start operations	Avoid risk of fire or battery explosion during jump start operations. Avoid risk of damage on electric and electronic equipment of the unit during jump start operations.

Machine models	Part Numbers
Sandvik Commando DC300Ri	Contact local Sandvik representative
Sandvik Leopard DI450	
Sandvik Leopard DI550	
Sandvik Leopard DI560	
Sandvik Leopard DI650i	
Sandvik Leopard DI650iRC	

Lifecycle cost improvement

Shut down of suction for water holes for boom surface drills

Description

Shut down of suction for water holes functionality is used to cut off the dust collector suction when drilling through wet layer.

When drilling through wet layer, dust collector sucks water into filter elements very easily. Water and dust forms cement-like layer to the filters which is difficult to clean and which prevents correct operation of filters. This can be avoided by switching off the suction immediately when water is noticed with the suction shutdown system. The suction is switched off by closing the suction flap valve of the dust collector. The flap valve is operated by a cylinder and the control lever is located at the control panel or at radio remote.

Advantages	Customer values
Allow to shut down suction system when drilling through wet layer.	Avoid dust filters to be clogged by water/dust mix. Increase life of the dust filter and reduce maintenance time and cost.

Machine models	Part Numbers
Sandvik Commando DC120	
Sandvik Commando DC121R	
Sandvik Commando DC122R	
Sandvik Commando DC130Ri	
Sandvik Commando DC300Ri	
Sandvik Dino DC400R	
Sandvik Dino DC410R	
Sandvik Tiger DG710	Contact local Sandvik representative
Sandvik Tiger DG810	
Sandvik Ranger DQ500	
Sandvik Ranger DX600	
Sandvik Ranger DX600R	
Sandvik Ranger DX700	
Sandvik Ranger DX800	
Sandvik Ranger DX800R	

Thread greasing system for boom surface drills

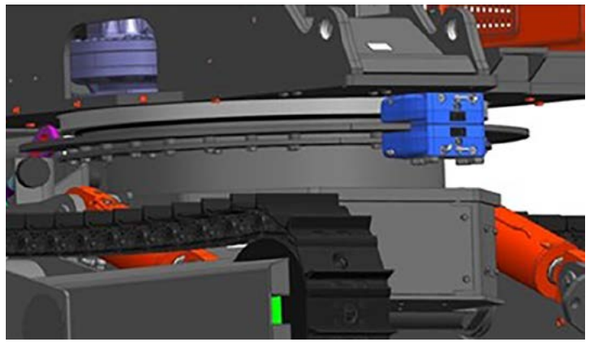
Description
Greasing drill steel threads systematically helps opening the threads, increase drill rod life and minimizes rattling time.
Thread Greasing system consists on rod greasing unit, injector and control electrics. The greaser is activated with a pedal switch located in the cabin. The special Sandvik grease, developed for this purpose, provides protection against corrosion and metal to metal contact, It is sprayed through nozzle to threads when adding next rod to the drill string.
On Ranger DX, Ranger DXR and Pantera DPi series rigs, optional 5 gallon bucket is used for filling up rod greasing system. Filling operation is done with pressurized air and when the bucket is empty it's easy to replace with a new one.
On Tiger DC range, the thread greasing system is based on the SLU system.
Note: Thread Greasing System is part of the full cycle drilling automatics system. It automatically distributes lubricant when rod is added.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Commando DC300Ri	Contact local Sandvik representative	Sandvik Ranger DX700	Contact local Sandvik representative
Sandvik Dino DC400R		Sandvik Ranger DX800	
Sandvik Dino DC410R		Sandvik Ranger DX800R	
Sandvik Dino DC420Ri		Sandvik Ranger DX800i	
Sandvik Tiger DG710		Sandvik Ranger DX810i	
Sandvik Tiger DG810		Sandvik Ranger DX900i	
Sandvik Leopard DI450		Sandvik Ranger DX910i	
Sandvik Leopard DI550		Sandvik Pantera DP1100i	
Sandvik Leopard DI560		Sandvik Pantera DP1110i	
Sandvik Leopard DI650i		Sandvik Pantera DP1500i	
Sandvik Leopard DI650iRC		Sandvik Pantera DP1510i	
Sandvik Ranger DQ500		Sandvik Pantera DP1600i	
Sandvik Ranger DX600		Sandvik Pantera DP1610i	
Sandvik Ranger DX600R			

Advantages	Customer values
Allows to spay grease on the rod threads	Grease protect rod threads from corrosion and metal to metal contact. Extended rods life. Reduced operating cost.

Extra brake for turntable upper structure for boom surface drills

Description
Extra brake for turnable upper structure upgrade takes away clearance between upper and lower structure. The system also increases service life for turning structure.
Extra brake for turnable upper structure is included on the Horizontal drilling Upgrade (See page 245).



Advantages	Customer values
Increases service life for turning structure	Reduce maintenance cost

Machine models	Part Numbers
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	

Electric fuel filling pump for boom surface drills

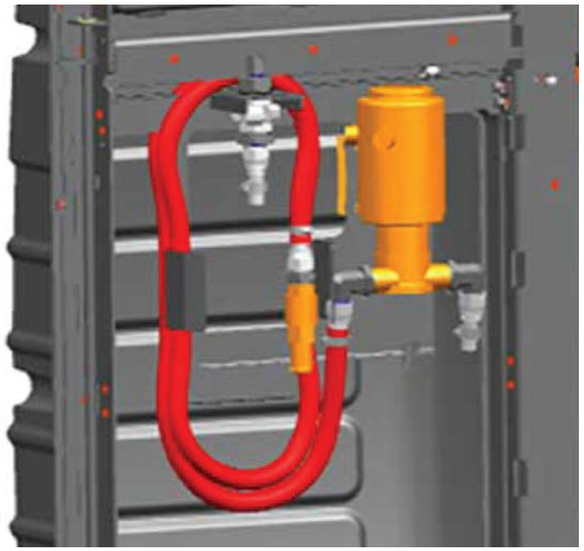
Description
Electric fuel filling pump is used to help operator refuel the drilling rig.
The system prevents possibility to fuel contamination as with pump, fuel can refilled directly from bigger tank instead of pouring it from canister. It includes a 500 microns strainer that retain the big particles that could generates damages on the fuel system.
Electric fuel filling pump makes refueling even easier and faster than with manual fuel filling pump as there is no need for manual labor.

Machine models	Part Numbers	Machine models	Part Numbers
Sandvik Commando DC120	Contact local Sandvik representative	Sandvik Ranger DX600R	Contact local Sandvik representative
Sandvik Commando DC121R		Sandvik Ranger DX700	
Sandvik Commando DC122R		Sandvik Ranger DX800	
Sandvik Commando DC130Ri		Sandvik Ranger DX800R	
Sandvik Commando DC300Ri		Sandvik Ranger DX800i	
Sandvik Dino DC400R		Sandvik Ranger DX810i	
Sandvik Dino DC410R		Sandvik Ranger DX900i	
Sandvik Dino DC420Ri		Sandvik Ranger DX910i	
Sandvik Leopard DI450		Sandvik Pantera DP1100i	
Sandvik Leopard DI550		Sandvik Pantera DP1110i	
Sandvik Leopard DI560		Sandvik Pantera DP1500i	
Sandvik Leopard DI650i		Sandvik Pantera DP1510i	
Sandvik Leopard DI650iRC		Sandvik Pantera DP1600i	
Sandvik Ranger DQ500		Sandvik Pantera DP1610i	
Sandvik Ranger DX600			

Advantages	Customer values
Fuel can be pumped directly from main tank. No need to use extra canister System includes a strainer.	Reduce the risk of using contaminated fuel. Improve reliability of the fuel system.
Fast fuel filling process.	Improve machine availability.

Electric hydraulic oil filling pump for boom surface drills

Description
Oil contamination is one of the major risk of failure of expensive component of the hydraulic system, generate frequent downtimes and In order to reduce the risk of contamination of new oil during the filling process, Sandvik has developed the Electric Filling Pump for hydraulic tank.
This on-board oil pump enables hydraulic oil to be filled, from ground level, straight from barrels, without having to use any other container that could be dirty and bring contamination in the oil. The oil in pumped through a filter ensuring the oil is clean and reduces possibility of contamination of oil during filling.
Electric oil filling pump makes also oil change easier and faster compared to manual oil filling pump as there is no need for manual labor.



Machine models	Part Numbers
Sandvik Leopard DI450	Contact local Sandvik representative
Sandvik Leopard DI550	
Sandvik Leopard DI560	
Sandvik Leopard DI650i	
Sandvik Leopard DI650iRC	
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	
Sandvik Pantera DP1100i	
Sandvik Pantera DP1110i	
Sandvik Pantera DP1500i	
Sandvik Pantera DP1510i	
Sandvik Pantera DP1600i	
Sandvik Pantera DP1610i	

Advantages	Customer values
Oil can be pumped directly from the barrel, through a filter.	Reduce risk of contamination of the new oil. Reduce service time
Oil tanks can be filled from ground level.	Improve safety

Application modification

Horizontal drilling upgrade for boom surface drills

Description
Horizontal drilling Upgrade is needed to support the feed when drilling toe holes.
Horizontal drilling upgrade consists of ground support for the feed, a hose reel and a bracket to turn the primary separator to vertical position when the feed is turned horizontal. This upgrade is needed to keep the hoses off the ground.
The Horizontal Drilling upgrade for DXi range includes also Extra Brake For Turnable Upper Structure (see Page page 241). The extra brake takes away clearance between upper and lower structure.

Advantages	Customer values
Horizontal drilling upgrade allows to drill horizontal holes	Allow to keep the hoses off the ground when drilling toe holes. Reduce wear and risk of failure of the feed hoses.

Machine models	Part Numbers
Sandvik Tiger DG710	Contact local Sandvik representative
Sandvik Tiger DG810	
Sandvik Leopard DI450	
Sandvik Leopard DI550	
Sandvik Leopard DI560	
Sandvik Ranger DX600	
Sandvik Ranger DX600R	
Sandvik Ranger DX700	
Sandvik Ranger DX800	
Sandvik Ranger DX800R	
Sandvik Ranger DX800i	
Sandvik Ranger DX810i	
Sandvik Ranger DX900i	
Sandvik Ranger DX910i	
Sandvik Pantera DP1100i	
Sandvik Pantera DP1110i	
Sandvik Pantera DP1500i	
Sandvik Pantera DP1510i	
Sandvik Pantera DP1600i	
Sandvik Pantera DP1610i	

Kit for alternative steel for boom surface drills

Description
Kit for alternative steels includes necessary components to modify drill rigs feed for another drill steel size.
When drill rigs feed is modified for different size of drill steels there is a need to change some of the jaws and wear pieces for new drill steels size. This kit includes all necessary components and parts (Except shank).

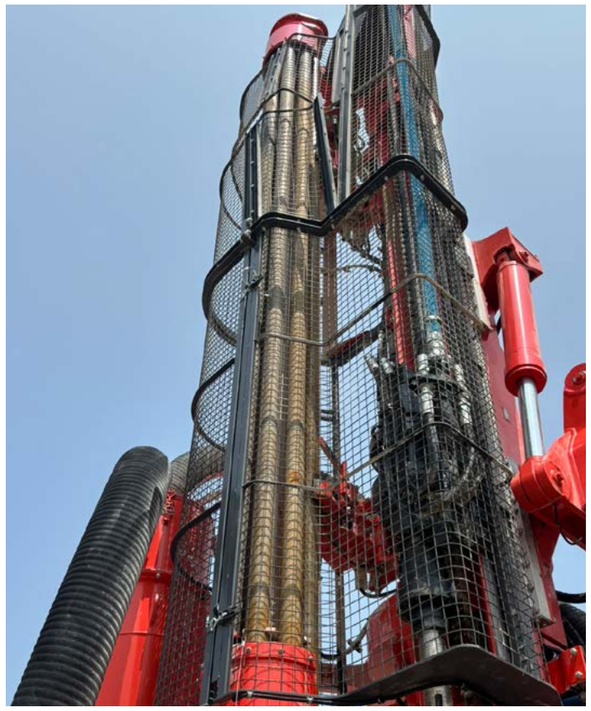
Machine models			Part Numbers
Sandvik Commando DC120		Sandvik Ranger DX700	
Sandvik Commando DC121R		Sandvik Ranger DX800	
Sandvik Commando DC122R		Sandvik Ranger DX800R	
Sandvik Commando DC130Ri		Sandvik Ranger DX800i	
Sandvik Commando DC300Ri		Sandvik Ranger DX810i	
Sandvik Dino DC400R		Sandvik Ranger DX900i	
Sandvik Dino DC410R	Contact local Sandvik representative	Sandvik Ranger DX910i	Contact local Sandvik representative
Sandvik Dino DC420Ri		Sandvik Pantera DP1100i	
Sandvik Tiger DG710		Sandvik Pantera DP1110i	
Sandvik Tiger DG810		Sandvik Pantera DP1500i	
Sandvik Ranger DQ500		Sandvik Pantera DP1510i	
Sandvik Ranger DX600		Sandvik Pantera DP1600i	
Sandvik Ranger DX600R		Sandvik Pantera DP1610i	

Advantages	Customer values
Optimize bit size and drill steel combination.	Straighter holes and improved flushing

Kit for alternative pipe for boom surface drills

Description
Kit for alternative pipes includes necessary parts to modify drill rigs feed for another drill pipe size than originally factory fitted.
When drill rig feed is modified for different size of drill pipe some jaws and wear pieces need to be replaced.
This kit includes necessary components, parts and rotary head saver sub adapter.
Following alternative pipe kits are available:

- 76mm (Leopard DI450/550/560)
- 89mm (Leopard DI450/550/560)
- 102mm (Leopard DI550/560/650i)
- 114mm (Leopard DI550/560/650i)
- 127mm (Leopard DI650i)
- 140mm (Leopard DI650i) - only with MRH6 HD rotary head



Machine models	Part Numbers
Sandvik Leopard DI450	Contact local Sandvik representative
Sandvik Leopard DI550	
Sandvik Leopard DI560	
Sandvik Leopard DI650i	
Sandvik Leopard DI650iRC	

Advantages	Customer values
Optimize bit size and drill steel combination.	Straighter holes and improved flushing

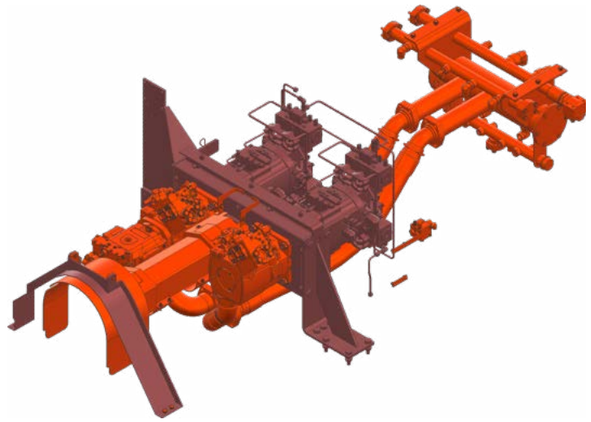
Upgrades solutions for rotary drills

Sandvik upgrades and engineered solutions offers a vast range of retrofit kits that allow to modify the original specifications of your rotary drill to improve the performance, the productivity, the safety or to reduce the environmental impact and the operating cost. Our offering includes also solutions to adapt your machine to different application.

Productivity improvement

Auxiliary hydraulic pumps retrofit kit for rotary drills

Description
Our current auxiliary pumps for the DR412i are discontinued by the supplier. As current pumps reach the end of their life, Sandvik offers the option to convert these pumps with a new pump upgrade kit.
The new design excludes the old auxiliary tank, for easier maintenance. The kit includes a new set of pipes, drain manifold, flanges, valves and all other parts needed for the conversion.

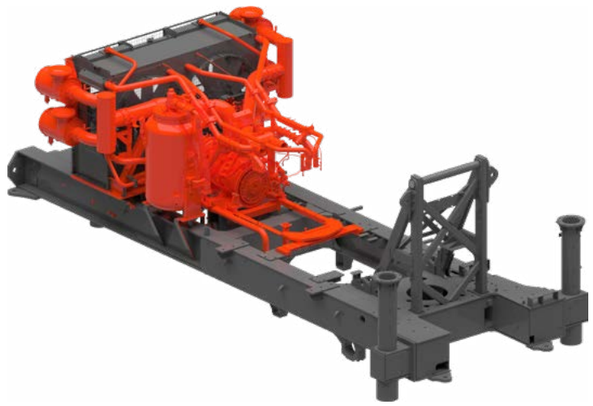


Advantages	Customer values
Retrofit solution to replace obsolete pumps assembly	Bring solution to repair the machine in case of failure of the pumps. Easier maintenance, as auxiliary tank has been suppressed.
OEM solution	All needed parts included (hoses, accessories, etc). Insure smooth installation. Complete fitting instructions. Spare parts documentation provided.

Machine models	Part Numbers
Sandvik DR412i	Contact local Sandvik representative

Compressor conversion for rotary drills

Description
Hole flushing is necessary to remove cuttings from the drilled hole. To get the best performance from your equipment, hole flushing must be optimized. Pressure and flow rate delivered by the compressor must be adapted to several factors such as the drilling method (rotary or DTH), the drilled hole size (diameter and length), the type of rock or even the working altitude.
If one or more of these factors change, Sandvik offers customers the compressor conversion solution.
Contact your local Sandvik dealer to determine the best option for your application. The kits includes all parts needed to do the modification.



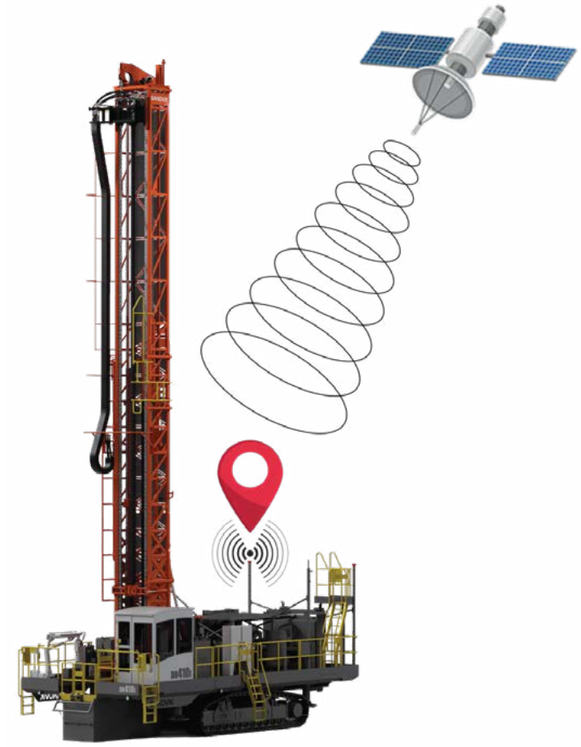
Advantages	Customer values
Kit that allow to adapt the compressor specification to new drilling parameters.	Optimize drilling performance according drilling parameters
OEM solution	All needed parts included (hoses, accessories, etc). Insure smooth installation. Complete fitting instructions. Spare parts documentation provided.

	CFM												
Machine models	**1000**	**1050**	**1160**	**1225**	**1300**	**1323**	**1350**	**1450**	**1500**	**1600**	**2000**	**2600**	**3850**
Sandvik DR410i								√		√			
Sandvik DR411i											√		
Sandvik DR412i								√	√		√	√	
Sandvik DR413i												√	
Sandvik DR416i													√
Sandvik D25KX	√	√	√										
Sandvik D45KX		√											
Sandvik D75KX								√			√		
Sandvik D45KS	√		√										
Sandvik D50KS		√				√				√			
Sandvik D55SP							√			√	√		
Sandvik D245S	√	√	√	√									

The conversion kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

GPS navigation system for rotary drills

Description
To obtain good fragmentation and flat ground after the blast, it is very important to precisely follow the drilling plan.
To help with this task, Sandvik has designed a GPS system that allows precise and quick localization of where each hole should be drilled. This Improves the blast quality/fragmentation, reduce drilling time and increase productivity and throughput.



Advantages	Customer values
Enables precise positioning of drill holes according to the blast design, reducing deviation and ensuring consistent fragmentation. Minimized Over-drilling or Under-drilling. Less manual input means fewer delays and faster transition between holes or drilling areas.	Improve drilling quality. Cost savings on explosives and better rock fragmentation. Faster set-up time. Improve productivity.

Machine models	Part Numbers
Sandvik RD410i	Contact local Sandvik representative
Sandvik DR412i	
Sandvik DR413i	
Sandvik DR416i	
Sandvik D25KX	
Sandvik D45KX	
Sandvik D75KX	

Safety and environmental improvement

Crane radio remote control for rotary drills

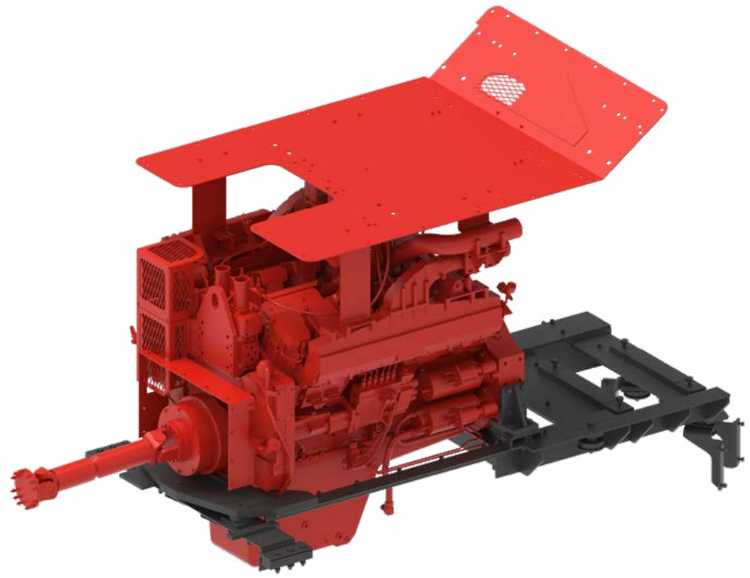
Description
Sandvik offers to his customers the possibility to upgrades the control system of the deck crane by replacing the wired remote control by a radio remote control system.
Using radio remote control will allow the operator to control the crane from the cabin of the rig, or another safe location.

Advantages	Customer values
Allows the operator to control the deck crane from the cabin of the rig or another safe location.	Improve safety

Machine models	Part Numbers
Sandvik DR410i	Contact local Sandvik representative
Sandvik DR412i	

Engine conversion for rotary drills

Description
Sandvik offers to customers the solution to replace / up-grade he engines on their drills.
Engine replacement can be needed in case of change on the environmental norms, local regulations, but also in case of change on the application that would require more power (i.e. installation of a bigger compressor). Installation of the latest technology of engine can also help to reduce the operating cost of the machine.



Advantages	Customer Values
Enables to adapt the engine to new environmental regulations	Reduce environmental footprint.
Allows to increase the engine power in case of new application that requires more power.	Adapt machine to new application

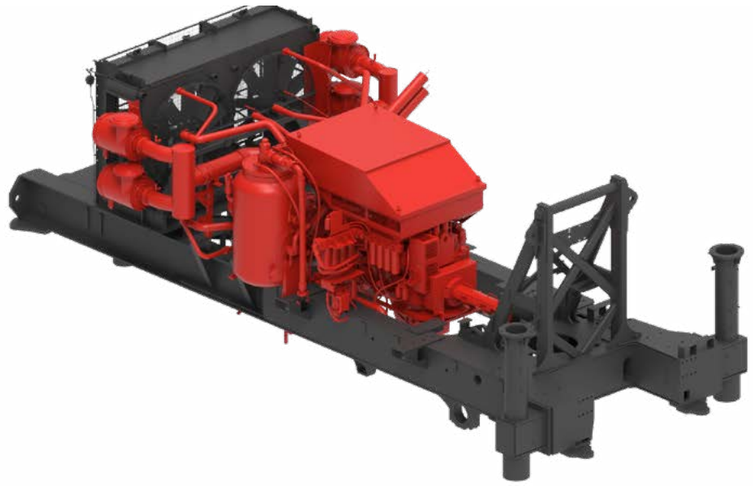
Machine models	Engine							
	QSX15 T2	QSX19 T3	QSK23 T2	QST30 T2	QST30 T3	QST30 T4	QST50 T3	QST50 T4
Sandvik DR410i		√						
Sandvik DR411i								
Sandvik DR412i								
Sandvik DR413i					√	√		
Sandvik DR416i							√	√
Sandvik D25KX								
Sandvik D45KX								
Sandvik D75KX								
Sandvik D45KS		√						
Sandvik D50KS		√						
Sandvik D55SP		√						
Sandvik D245S	√		√					

Machine models	Engine								
	C15 T3	C15 T4	C18 T3	C18 T4	C27 T2	C27 T3	C27 T4	C32 T2	C32 T4
Sandvik DR410i			√	√					
Sandvik DR411i							√		
Sandvik DR412i					√		√	√	√
Sandvik DR413i								√	√
Sandvik DR416i									
Sandvik D25KX	√	√	√						
Sandvik D45KX	√								
Sandvik D75KX						√	√		
Sandvik D45KS			√						
Sandvik D50KS	√		√						
Sandvik D55SP					√				
Sandvik D245S	√		√						

The conversion kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

Power group conversion for rotary drills

Description
Sandvik offers to customers the solution to replace / upgrade the complete power group on their drills.
If there is a change in environmental standards or application, it may be necessary to replace the entire power unit. Sandvik offers its customers a unique retrofit solution that allows them to carry out this modification in the most optimal way possible in terms of cost and delay.



Advantages	Customer Values
Enables to adapt the power group to new environmental regulations	Reduce environmental footprint.
Allows to increase the engine power in case of new application that requires more power.	Adapt machine to new application

	Engine	QSK19 T3	QSK19 T3	QST30 T2	QST30 T2	QST30 T2	QST30 T2	QST30 T4	QST50 T3
	Compressor	1450 CFM	1600 CFM	1450 CFM	1500 CFM	2000 CFM	2600 CFM	2600 CFM	3850 CFM
Machine models	Flushing pressure	350psi	100psi	350psi	500psi	100psi	80psi	80psi	85psi
Sandvik DR410i		√	√						
Sandvik DR411i									
Sandvik DR412i				√	√	√	√	√	
Sandvik DR413i				√	√	√	√	√	
Sandvik DR416i									√

QST50 T4	C18 T3	C18 T4	C18 T4	C27 T2	C27 T4	C27 T4	C27 T4	C32 T2	C32 T4
3850 CFM	1600 CFM	1600 CFM	1450 CFM	2000 CFM	1450 CFM	2000 CFM	2000 CFM	2600 CFM	2600 CFM
85psi	100psi	100psi	350psi	100psi	350psi	100psi	125psi	80psi	80psi
	√	√	√						
							√		
				√	√	√		√	√
								√	√
√									

	Engine	C15 T3	C15 T3	C15 T4	C15 T4	C18 T3	C18 T3
	Compressor	1050 CFM	1050 CFM	1000 CFM	1050 CFM	1160 CFM	1160 CFM
	Cooler	L&M	AKG	L&M	L&M	L&M	AKG
Machine models	Flushing pressure	100psi	100psi	350psi	100psi	350psi	350psi
Sandvik D25KX		√	√	√	√	√	√
Sandvik D45KX		√	√				
Sandvik D75KX							

C27 T3	C27 T3	C27 T3	C27 T3	C27 T4	C27 T4
1450 CFM	1450 CFM	2000 CFM	2000 CFM	1450 CFM	2000 CFM
L&M	AKG	L&M	AKG	L&M	AKG
350psi	350psi	100psi	100psi	350psi	100psi
√	√	√	√	√	√

The conversion kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

Power group conversion for rotary drills

Machine models	Engine	C15 T3	C15 T3	C15 T3	C15 T3	C15 T3	C15 T3	C15 T3	C15 T3
	Compressor	1000 CFM	1000 CFM	1050 CFM	1050 CFM	1225 CFM	1225 CFM	1323 CFM	1323 CFM
	Cooler	L&M	AKG	L&M	AKG	L&M	AKG	L&M	AKG
	Flushing pressure	350 psi	350 psi	100 psi	100 psi	100 psi	100 psi	100 psi	100 psi
Sandvik D45KS									
Sandvik D50KS				√	√			√	√
Sandvik D55SP									
Sandvik D245S		√	√	√	√	√	√		

C18 T3	C18 T3	C18 T3	C18 T3	C18 T3	C27 T3	C27 T3	C27 T3	C27 T3	C27 T3	C27 T3
1000 CFM	1000 CFM	1160 CFM	1160 CFM	1600 CFM	1350 CFM	1350 CFM	1600 CFM	1600 CFM	2000 CFM	2000 CFM
L&M	AKG	L&M	AKG	AKG	L&M	AKG	L&M	AKG	L&M	AKG
350 psi	350 psi	350 psi	350 psi	100 psi	350 psi	350 psi	100 psi	100 psi	100 psi	100 psi
√	√	√	√							
				√						
					√	√	√	√	√	√
		√	√							

Machine models	Engine	QSX15 T2	QSX15 T2	QSX15 T2	QSX15 T2	QSK19 T2
	Compressor	1000 CFM	1000 CFM	1160 CFM	1160 CFM	1600 CFM
	Cooler	L&M	AKG	L&M	AKG	L&M
	Flushing pressure	350 psi	350 psi	350 psi	350 psi	100 psi
Sandvik D45KS						
Sandvik D50KS						
Sandvik D55SP						√
Sandvik D245S		√	√	√	√	

QSK19 T2	QSK19 T3	QSK19 T3	QSK19 T3	QSK19 T3	QSK23 T2	QSK23 T2
1600 CFM	1160 CFM	1323 CFM	1600 CFM	1600 CFM	2000 CFM	2000 CFM
AKG	AKG	AKG	L&M	AKG	L&M	AKG
100 psi	350 psi	100 psi	100 psi	100 psi	100 psi	100 psi
	√					
		√	√	√		
√					√	√

The conversion kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

Eclipse™ fire suppression for rotary drills

Description
From diesel fuels to hydraulic fluids, heavy equipment depends on flammable liquids to keep moving. The dangers associated with mine fires are multifaceted, often leading to devastating consequences. These fires can produce toxic gases, such as carbon monoxide and hydrogen sulphide, which can cause respiratory failure and even death. In addition. Sandvik Eclipse™ is a crucial component of your safety management system to protect people, investments and equipment. Sandvik Eclipse™ fire suppression systems are designed and tested to meet the most stringent requirements of fire protection on mobile and transportable equipment, including surface drilling applications.

Compared to traditional dry powder systems, Eclipse™ is up to 30 percent more effective on super-heated surfaces. Our Sandvik system is equipped with liquid agents to attack all the elements a fire needs to ignite - heat, fuel and oxygen (fire triangle).

Automatic activation is a standard feature and the rapid cooling effect blocks the risk of re-ignition. The engine is also automatically shut-down.

The system is very efficient to service and maintain and can be installed on new or existing equipment - regardless of size or brand.

Sandvik Eclipse™ It is available in two versions to suit global application:

Sandvik Eclipse™ Sustain is suitable for climates 0°C to + 60°C. The tank contains foam concentrate and water solution. The mixture is fluorine free making it environmentally sustainable.

Sandvik Eclipse™ Extreme is suitable for climates - 40°C to + 60°C. The tank contains a pre-mixed liquid agent for the harshest of environments.

The reliable automatic activation concept and system hardware remains identical between Eclipse™ Sustain and Eclipse™ Extreme.

Eclipse™ is a smart way to reduce the risk of injuries, production loss, costly repairs and replacements. Design flexibility and a range of different tank sizes make it possible to install Eclipse™ on a wide range of mobile plants and equipment.

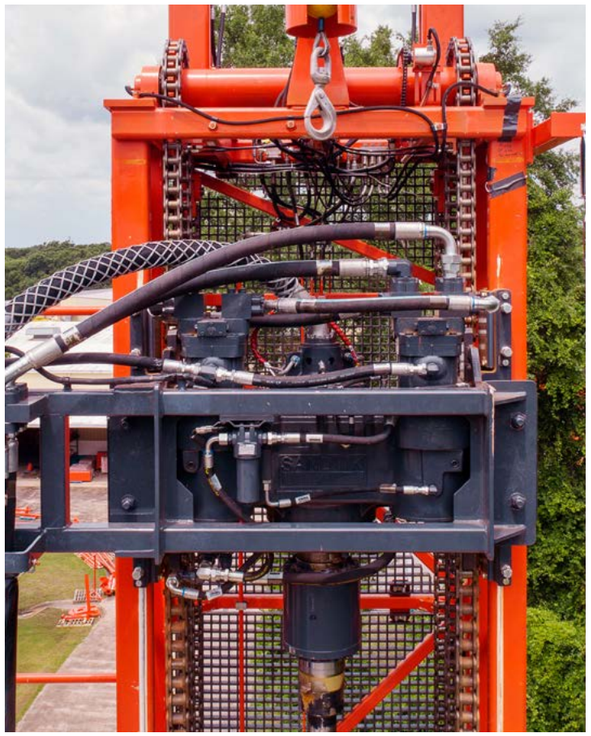
Advantages	Customer Values
Fully automated activation (loss-of-pressure activation) and engine shutdown standard on all systems. Foam fire extinguishing cutting off oxygen, vapor sealing and cooling down superheated surfaces (such as turbo charger and engine manifold).	Increase safety. System 30% more efficient compared to traditional dry powder systems.
Quick and efficient on site discharge testing and servicing. Quick recharge times for productivity	Easy testing and services procedures. Increase machine availability (productivity).

Machine models	Part Numbers
All equipment	Contact local Sandvik representative

Lifecycle cost improvement

Rotary head upgrade for rotary drills

Description
Sandvik offers its customers the solution to upgrade their original rotary head, with a planetary gearbox, to a new rotary head designed with a 2-stage gear reduction system (without planetary).
The planetary gearbox requires careful maintenance because the oil level it contains is very critical for reliability.
The new design with a 2-stage reduction requires less maintenance and is therefore expected to improve reliability. Kits include all parts needed to make the modification.



Offering	What is included
Rotary head Kit	Gear Box & Shipping Crate
Rotary Head with Motors	Gear Box, Motors & Shipping Crate
Modification Kit	Head hose support Hoses Chain links

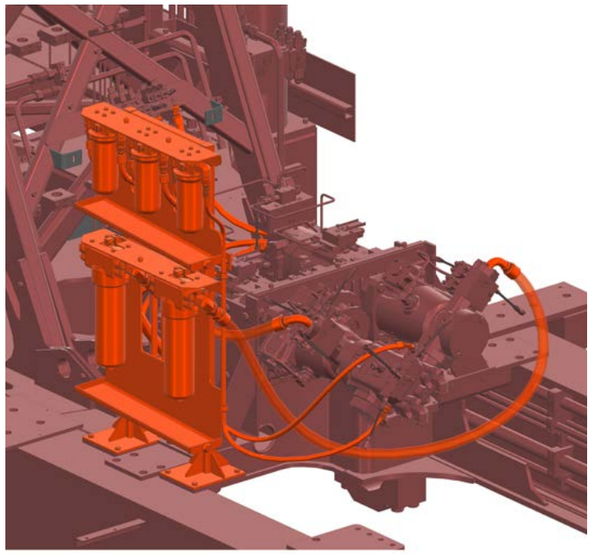
Advantages	Customer Values
New rotary head design requires less maintenance.	Improved reliability. Reduces operating cost. Improve machine availability

Machine models	Part Numbers
Sandvik DR410i	Contact local Sandvik representative
Sandvik DR412i MP	
Sandvik DR413i	
Sandvik DR460	
Sandvik D75KX	

The retrofit kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

Centralized filters stand for rotary drills

Description
Sandvik has designed a new centralized filters stand for pressure filters and offering it as an upgrade kit to customers.
The aim of this new design is to facilitate maintenance with better access to the filter elements and an oil pan for draining.

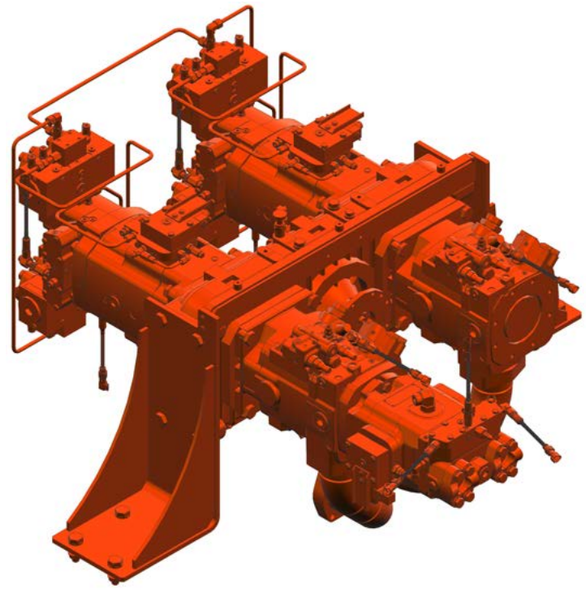


Advantages	Customer values
Ease of handling the huge filters.	Easier maintenance of HP filters
Ease of servicing with provision of Oil pan for drain.	
Improves ergonomics for the maintenance workers.	

Machine models	Part Numbers
Sandvik DR412i	Contact local Sandvik representative

Pump unit module for rotary drills

Description
Sandvik has recently improved the Pump Unit module. The new set no longer includes an additional filtration system. We offer our customers the possibility to retrofit the new Pump Unit module on active drilling rigs in the event of a major intervention or reconstruction.
This modernization will also provide better commonality of spare parts with the most recent machines.

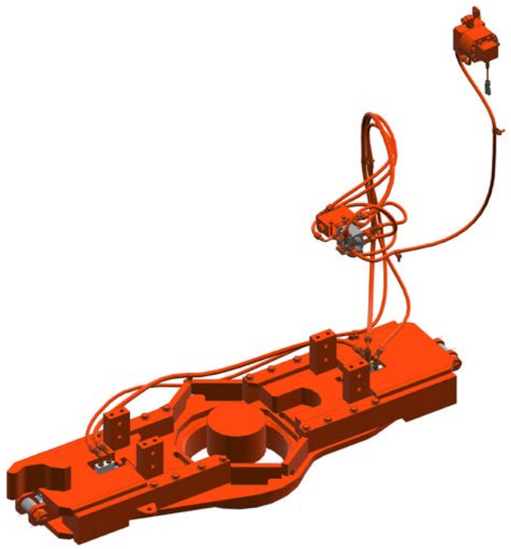


Advantages	Customer values
Increased lifetime	Reduce operation cost and downtime
Additional filtration removed	
Spare part commonality with newer units	Reduce inventory cost

Machine models	Part Numbers
Sandvik DR410i	Contact local Sandvik representative
Sandvik DR412i	

Deck wrench for rotary drills

Description
Sandvik has improved the design of the deck wrench with a new single fork design. In comparison to the old die type, jaw type or double fork design, this new design provides greater durability. The maintenance interval increases from 15hrs to 300hrs.



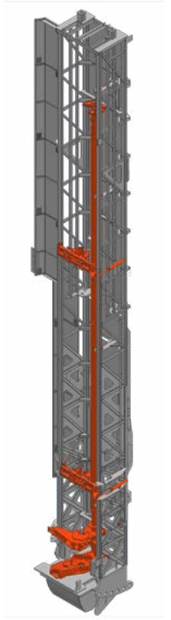
Advantages	Customer values
New design brings better durability	Reduce operating cost

Machine models	Part Numbers
Sandvik DR410i	
Sandvik DR412i	
Sandvik DR413i	Contact local Sandvik representative
Sandvik D25KX	
Sandvik D75KX	

Application modification

Pipe conversion kit for rotary drills

Description
Change on the mine drill plan can lead to necessity to change the rods diameters on rotary Drills.
Sandvik offers to customers to adapt the drilling module of their Rotary Drills to different rods diameter with specific Conversion kits.
The kits for alternative pipes are optimized to include necessary parts to modify drill rigs loader for another drill pipe size than originally factory fitted. When drill rig loader is modified for different size of drill pipe some jaws and wear pieces need to be replaced. This kit includes necessary components & parts.



Advantages	Customer Values
Optimize bit size and drill steel combination.	Straighter holes and improved flushing

Machine models	4”	4,5”	5”	5,5”	6”	6,5”	7”	7,625”	8”	8,625”	9,25”	9,625”	10,75”	12,75”	13”375
Sandvik DR410i		√	√	√	√	√	√	√							
Sandvik DR411i										√					
Sandvik DR412i MP							√	√		√	√	√			
Sandvik DR412i SP							√	√		√	√	√	√		
Sandvik DR413i							√	√		√	√	√	√		
Sandvik DR416i										√	√		√	√	√
Sandvik D25KX	√	√	√	√	√										
Sandvik D45KX				√											
Sandvik D45KS		√	√	√	√	√	√								
Sandvik D50KS		√	√	√	√	√	√								
Sandvik D55SP					√	√	√	√							
Sandvik D75KX							√	√	√	√	√				
Sandvik 245SP		√	√	√											

The retrofit kit content varies according machine specifications and options. Contact your local Sandvik representative for more information.

Index per machine models

Underground drills

Development drills

Machine models	Application area	Upgrade solution	Page
Sandvik DD210	Safety and environmental improvement	Canopy safety grill	44
		Access detector	48
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	KVL-10 to SLU-1 conversion kit	65
		Grease cartridge gun and reel	73
		High pressure cleaner	74
	Application modification	TRR1 rod retainer	82
		Air mist flushing	90
Sandvik DD212	Safety and environmental improvement	Canopy safety grill	44
		Access detector	48
		Access protector	49
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Boom suspension system	61
		Grease cartridge gun and reel	73
		High pressure cleaner	74
	Application modification	TRR1 rod retainer	82
		Air mist flushing	90
Sandvik DD212i	Safety and environmental improvement	Tramming cameras system	39
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
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	Lifecycle cost improvement	Boom suspension system	61
		Grease reel with pump and nozzle	70
		Grease cartridge gun and reel	73
		High pressure cleaner	74
Sandvik DD212i	Application modification	TRR1 rod retainer	82
		Air mist flushing	90
Sandvik DD2710	Safety and environmental improvement	Canopy safety grill	44
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
	Application modification	TRR1 rod retainer	82
		Air mist flushing	90
		Dry drilling	92
Sandvik DD2711	Safety and environmental improvement	Canopy safety grill	44
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		Air mist flushing	90
Sandvik DD310	Productivity improvement	TCAD+ boom instrumentation	18
		Rock drill(s) conversion	20
		Power extractor	21
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		Cabin safety grill	42
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	B26 boom adjustment pads	67
		Grease reel with pump and nozzle	70
		Carrier centralized greasing system	72
		High pressure cleaner	74
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		Air mist flushing	90
		Dry drilling	92
Sandvik DD311	Productivity improvement	TCAD+ boom instrumentation	18
		Rock drill(s) conversion	20
		Power extractor	21
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50

Machine models	Application area	Upgrade solution	Page
Sandvik DD311	Safety and environmental improvement	Eclipse™ fire suppression	52
	Lifecycle cost improvement	Boom suspension system	61
		Health Monitoring	62
		Water/air separator auto-bleeding	66
		Automatic greasing system	68
		Carrier centralized greasing system	72
		Grease cartridge gun and reel	73
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		Air mist flushing	90
		Dry drilling	92
Sandvik DD312i	Productivity improvement	Rock drill(s) conversion	20
		Power extractor	21
	Safety and environmental improvement	Doors and seat belt interlock	41
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Boom suspension system	61
		Additional parallel filtration	64
		Automatic greasing system	68
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		Grease cartridge gun and reel	73
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		Air mist flushing	90
Sandvik DD320	Productivity improvement	TMS+ boom instrumentation	17
		TCAD+ boom instrumentation	18
		Rock drill(s) conversion	20
		Power extractor	21
	Safety and environmental improvement	Cabin upgrade	40
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74

Machine models	Application area	Upgrade solution	Page
Sandvik DD320	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		Air mist flushing	90
Sandvik DD320S	Safety and environmental improvement	Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
		Carrier centralized greasing system	72
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		Air mist flushing	90
Sandvik DD321	Productivity improvement	TMS+ boom instrumentation	17
		TCAD+ boom instrumentation	18
		Rock drill(s) conversion	20
		Power extractor	21
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Health Monitoring	62
		Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		TRS two rod system	83
		Air mist flushing	90
		Dry drilling	92
Sandvik DD322i	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Tramming cameras system	39
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52

Machine models	Application area	Upgrade solution	Page
Sandvik DD421	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		TRS two rod system	83
		Air mist flushing	90
		Dry drilling	92
Sandvik DD422i	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Tramming cameras system	39
		Doors and seat belt interlock	41
		Electrically activated safety grill	45
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Additional parallel filtration	64
		Automatic greasing system	68
		Grease reel with pump and nozzle	70
		Carrier centralized greasing system	72
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		TRS two rod system	83
		Dual drilling controls	84
		Air mist flushing	90
Sandvik DD422iE	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Tramming cameras system	39
		Doors and seat belt interlock	41
		Electrically activated safety grill	45
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Additional parallel filtration	64
		Automatic greasing system	68
		Grease reel with pump and nozzle	70
		Carrier centralized greasing system	72
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		TRS two rod system	83
		Dual drilling controls	84

Machine models	Application area	Upgrade solution	Page
Sandvik DD422iE	Application modification	Air mist flushing	90
Sandvik DD530	Productivity improvement	TMS+ boom instrumentation	17
		TCAD+ boom instrumentation	18
		Rock drill(s) conversion	20
	Safety and environmental improvement	Tramming cameras system	39
		Cabin heating system	46
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		TRS two rod system	83
		Air mist flushing	90
Sandvik DD531	Productivity improvement	TCAD+ boom instrumentation	18
		Rock drill(s) conversion	20
	Safety and environmental improvement	Tramming cameras system	39
		Cabin safety grill	42
		Cabin heating system	46
		Access detector	48
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Telescopic feed conversion	81
		TRR1 rod retainer	82
		TRS two rod system	83
		Air mist flushing	90

Underground drills

Production drills

Machine models	Application area	Upgrade solution	Page
Sandvik DL210	Productivity improvement	Power extractor	21
		TIS instrumentation	23
	Safety and environmental improvement	Canopy safety grill	44
		Access detector	48
		Eclipse™ fire suppression	52
		Rod changer	54
		Radio remote control	55
	Lifecycle cost improvement	Grease cartridge gun and reel	73
		High pressure cleaner	74
		Improved rod handling system	78
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL230	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Canopy safety grill	44
		Access detector	48
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease cartridge gun and reel	73
		High pressure cleaner	74
	Application modification	Rods length conversion kit	87
Sandvik DL2710	Safety and environmental improvement	Canopy safety grill	44
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL2711	Safety and environmental improvement	Canopy safety grill	44
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL2720	Safety and environmental improvement	Canopy safety grill	44
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
		Dry drilling	92
Sandvik DL2711	Safety and environmental improvement	Canopy safety grill	44
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL2721	Safety and environmental improvement	Canopy safety grill	44
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL310	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Doors and seat belt interlock	41
		Cabin safety grill	42
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Air mist flushing	90
Sandvik DL311	Productivity improvement	Power extractor	21
		TMS DDS instrumentation	22
		Rod handler sequence control	24
		One hole automation	26
		Fan automation	28
		Tele-remote drilling and data transfer	30
		Rock drill conversion	32
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Canopy safety grill	44
		Access detector	48
		Access protector	49
		PDS interface	50

Machine models	Application area	Upgrade solution	Page
Sandvik DL311	Safety and environmental improvement	Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		Carrier centralized greasing system	72
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL320	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Doors and seat belt interlock	41
		Cabin safety grill	42
		Cabin heating system	46
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Air mist flushing	90
Sandvik DL321	Productivity improvement	Power extractor	21
		TMS DDS instrumentation	22
		Rod handler sequence control	24
		One hole automation	26
		Fan automation	28
		Tele-remote drilling and data transfer	30
		Rock drill conversion	32
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		Carrier centralized greasing system	72
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL330	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Doors and seat belt interlock	41
		Cabin safety grill	42
		Cabin heating system	46
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Boom suspension system	61
		B26 boom adjustment pads	67
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Air mist flushing	90
Sandvik DL331	Productivity improvement	Power extractor	21
		TIS instrumentation	23
		Stinger pressurization upgrade	35
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Water/air separator auto-bleeding	66
		Automatic greasing system	68
		Grease reel with pump and nozzle	70
		Carrier centralized greasing system	72
		Grease cartridge gun and reel	73
		High pressure cleaner	74
		Water hose reel	76
		Improved rod handling system	78
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL410	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Tramming cameras system	39
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		Carrier centralized greasing system	72
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Air mist flushing	90
Sandvik DL411	Productivity improvement	Power extractor	21

Machine models	Application area	Upgrade solution	Page
Sandvik DL411	Productivity improvement	TMS DDS instrumentation	22
		Rod handler sequence control	24
		One hole automation	26
		Fan automation	28
		Tele-remote drilling and data transfer	30
		Rock drill conversion	32
		Bit changer	33
	Safety and environmental improvement	Tramming cameras system	39
		Canopy safety grill	44
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL420	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Cabin safety grill	42
		Cabin heating system	46
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Air mist flushing	90
Sandvik DL421	Productivity improvement	Power extractor	21
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		Rod handler sequence control	24
		Positioning laser relocation	25
		One hole automation	26
		Fan automation	28
		Tele-remote drilling and data transfer	30
		Rock drill conversion	32
		Bit changer	33
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Doors and seat belt interlock	41
Sandvik DL421	Safety and environmental improvement	Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
		Tubes manipulator	59
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Long boom support	86
		Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL422i	Productivity improvement	Power extractor	21
		Fan automation	28
		Tele-remote drilling and data transfer	30
		Rock drill conversion	32
		Bit changer	33
	Safety and environmental improvement	Electrically activated safety grill	45
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
		Tubes manipulator	59
	Lifecycle cost improvement	Additional parallel filtration	64
		Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
	Application modification	Long boom support	86
		Rods length conversion kit	87
		Air mist flushing	90
Sandvik DL422iE	Productivity improvement	Power extractor	21
		Fan automation	28
		Tele-remote drilling and data transfer	30
		Rock drill conversion	32
		Bit changer	33
	Safety and environmental improvement	Electrically activated safety grill	45
		Cabin heating system	46

Underground drills

Bolters

Machine models	Application area	Upgrade solution	Page
Sandvik DS2710	Safety and environmental improvement	Canopy safety grill	44
		Eclipse™ fire suppression	52
		Screen handler	56
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
	Application modification	Bolts type/length conversion kit	88
		Air mist flushing	90
Sandvik DS2711	Safety and environmental improvement	Canopy safety grill	44
		PDS interface	50
		Eclipse™ fire suppression	52
		Screen handler	56
	Lifecycle cost improvement	Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Air mist flushing	90
Sandvik DS310	Productivity improvement	SBH bolting head	36
	Safety and environmental improvement	Doors and seat belt interlock	41
		Cabin safety grill	42
		Cabin heating system	46
		Eclipse™ fire suppression	52
		Screen handler	56
	Lifecycle cost improvement	Boom suspension system	61
		B26 boom adjustment pads	67
		Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
	Application modification	Bolts type/length conversion kit	88
		Air mist flushing	90
Sandvik DS311	Productivity improvement	SBH bolting head	36
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
		Screen handler	56
	Lifecycle cost improvement	Boom suspension system	61
		Water/air separator auto-bleeding	66
		B26 boom adjustment pads	67
		Automatic greasing system	68
		Carrier centralized greasing system	72
		Grease cartridge gun and reel	73
		High pressure cleaner	74
		Water hose reel	76
		Bolting head oiler	79
	Application modification	Bolts type/length conversion kit	88
		Air mist flushing	90
		Dry drilling	92
Sandvik DS312	Safety and environmental improvement	Doors and seat belt interlock	41
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Boom suspension system	61
		Automatic greasing system	68
		Carrier centralized greasing system	72
		Grease cartridge gun and reel	73
		High pressure cleaner	74
		Water hose reel	76
		Bolting head oiler	79
	Application modification	Bolts type/length conversion kit	88
		Air mist flushing	90
Sandvik DS410	Productivity improvement	Automatic resin injection (A.R.I.)	37
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Cabin safety grill	42
		Cabin heating system	46

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		Screen handler boom	57
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
		Bolting head oiler	79
	Application modification	Bolts type/length conversion kit	88
		Air mist flushing	90
Sandvik DS411	Productivity improvement	Automatic resin injection (A.R.I.)	37
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		PDS interface	50
		Eclipse™ fire suppression	52
		Screen handler boom	57
		Roll mesh handler interface	58
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
		Bolting head oiler	79
	Application modification	Bolts type/length conversion kit	88
		Air mist flushing	90
		Dry drilling	92
Sandvik DS412i	Productivity improvement	Automatic resin injection (A.R.I.)	37
	Safety and environmental improvement	Electrically activated safety grill	45
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
		Screen handler boom	57
	Lifecycle cost improvement	Additional parallel filtration	64
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		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
		Bolting head oiler	79

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Sandvik DS412iE	Productivity improvement	Automatic resin injection (A.R.I.)	37
	Safety and environmental improvement	Electrically activated safety grill	45
		Cabin heating system	46
		Access detector	48
		Access protector	49
		PDS interface	50
		Eclipse™ fire suppression	52
		Screen handler boom	57
	Lifecycle cost improvement	Additional parallel filtration	64
		Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
		Bolting head oiler	79
	Application modification	Bolts type/length conversion kit	88
Sandvik DS420	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Cabin safety grill	42
		Cabin heating system	46
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
		Bolting head oiler	79
	Application modification	Air mist flushing	90
Sandvik DS421	Productivity improvement	Power extractor	21
	Safety and environmental improvement	Tramming cameras system	39
		Cabin upgrade	40
		Doors and seat belt interlock	41
		Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		PDS interface	50
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Grease reel with pump and nozzle	70
		High pressure cleaner	74
		Water hose reel	76
		Bolting head oiler	79

Underground drills

Low profile drills

Underground drills

Secondary breaking units

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Sandvik DB311	Safety and environmental improvement	Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Carrier centralized greasing system	72
		Grease cartridge gun and reel	73
Sandvik DB331	Safety and environmental improvement	Cabin safety grill	42
		Canopy safety grill	44
		Cabin heating system	46
		Access detector	48
		Eclipse™ fire suppression	52
	Lifecycle cost improvement	Automatic greasing system	68
		Carrier centralized greasing system	72
		Grease cartridge gun and reel	73

Tunneling drills

Loaders

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		Electric filling pump	165
		Improved live oil sampling	166
Sandvik LH625iE	Productivity improvement	Integrated weighing system	131
	Safety and environmental improvement	Cameras system	136
		Eclipse™ fire suppression	146
		Emergency steering	154

Trucks

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		Eclipse™ fire suppression	188
Sandvik TH320	Safety and environmental improvement	Cameras system	180
		PDS interface	182
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		Emergency steering	186
		Eclipse™ fire suppression	188
	Lifecycle cost improvement	Fuel fast filling system	194
		Quick oils filling system	195
	Application modification	Ejector box adaptation kit	205
Sandvik TH330	Safety and environmental improvement	PDS interface	182
		Cabin upgrade	184
		Emergency steering	186
		Eclipse™ fire suppression	188
	Lifecycle cost improvement	Fuel fast filling system	194
		Quick oils filling system	195
		Water cooled alternator	197
		Arctic package	199
Sandvik TH430	Productivity improvement	Integrated weighing system	175
	Safety and environmental improvement	Safety rails	179
		Cameras system	180
		PDS interface	182
		Electrical brake retarder	183
		Cold climate package	185
		Emergency steering	186
		Eclipse™ fire suppression	188
	Lifecycle cost improvement	Tyres pressure monitoring system	191
		Fuel fast filling system	194
		Quick oils filling system	195
		Water cooled alternator	197
Sandvik TH430	Lifecycle cost improvement	Harsh condition package	198
		Arctic package	199
	Application modification	Ejector box adaptation kit	205
Sandvik TH430L	Productivity improvement	Integrated weighing system	175
	Safety and environmental improvement	Cameras system	180
		PDS interface	182
		Eclipse™ fire suppression	188
	Lifecycle cost improvement	Tyres pressure monitoring system	191
Sandvik TH540	Productivity improvement	Integrated weighing system	175
	Safety and environmental improvement	Safety rails	179
		Cameras system	180
		PDS interface	182
		Eclipse™ fire suppression	188
	Lifecycle cost improvement	Tyres pressure monitoring system	191
		Fuel fast filling system	194
		Quick oils filling system	195
		Harsh condition package	198
	Application modification	Ejector box adaptation kit	205
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		External IWS displays	176
	Safety and environmental improvement	Safety rails	179
		Cameras system	180
		Cold climate package	185
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	Lifecycle cost improvement	Tyres pressure monitoring system	191
		Fuel fast filling system	194
		Quick oils filling system	195
		Water cooled alternator	197
		Harsh condition package	198
		Arctic package	199
	Application modification	Ejector box adaptation kit	205
Sandvik TH550	Productivity improvement	Integrated weighing system	175
	Safety and environmental improvement	Safety rails	179
		Cameras system	180
		PDS interface	182
		Cold climate package	185
		Eclipse™ fire suppression	188
	Lifecycle cost improvement	Tyres pressure monitoring system	191
		Fuel fast filling system	194
		Quick oils filling system	195
		Harsh condition package	198

Boom surface drills

Machine models	Application area	Upgrade solution	Page
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	Safety and environmental improvement	Hydraulic winch	231
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Electric fuel filling pump	242
	Application modification	Kit for alternative steel	246
Sandvik Commando DC121R	Productivity improvement	TIM 1400 instrumentation system	209
	Safety and environmental improvement	Hydraulic winch	231
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Electric fuel filling pump	242
	Application modification	Kit for alternative steel	246
Sandvik Commando DC122R	Productivity improvement	TIM 1400 instrumentation system	209
	Safety and environmental improvement	Hydraulic winch	231
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Electric fuel filling pump	242
	Application modification	Kit for alternative steel	246
Sandvik Commando DC130Ri	Productivity improvement	TIMi for vertical holes and hole depth measuring	212
		TIMi horizontal holes measurement	213
		TIMi for inclined holes and hole depth measurement	214
	Safety and environmental improvement	Safety cage	226
		Hydraulic winch	231
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Electric fuel filling pump	242
	Application modification	Kit for alternative steel	246
Sandvik Commando DC300Ri	Productivity improvement	TIMi for vertical holes and hole depth measuring	212
		TIMi horizontal holes measurement	213
		TIMi for inclined holes and hole depth measurement	214
Sandvik Commando DC300Ri	Safety and environmental improvement	Safety cage	226
		Dustmizer	228
		Hydraulic winch	231
		Eclipse™ fire suppression	234
		Jump start connector	236
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Thread greasing system	240
		Electric fuel filling pump	242
	Application modification	Kit for alternative steel	246
Sandvik Tiger DG710	Productivity improvement	Water injection system	218
		Hydraulic rear ground support	220
	Safety and environmental improvement	Reversing camera system	227
		Dustmizer	228
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Thread greasing system	240
	Application modification	Horizontal drilling upgrade	245
		Kit for alternative steel	246
Sandvik Tiger DG810	Productivity improvement	Water injection system	218
		Hydraulic rear ground support	220
	Safety and environmental improvement	Reversing camera system	227
		Dustmizer	228
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Thread greasing system	240
	Application modification	Horizontal drilling upgrade	245
		Kit for alternative steel	246
Sandvik Dino DC400R	Productivity improvement	TIM 1400 instrumentation system	209
	Safety and environmental improvement	Safety cage	226
		Dustmizer	228
		Flap feeder for dust collector	229
		Hydraulic winch	231
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Thread greasing system	240
		Electric fuel filling pump	242
	Application modification	Kit for alternative steel	246
Sandvik Dino DC410R	Productivity improvement	TIM 1400 instrumentation system	209
	Safety and environmental improvement	NoiseShield	225
		Safety cage	226
		Dustmizer	228
		Flap feeder for dust collector	229

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		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Shut down of suction for water holes	239
		Thread greasing system	240
		Electric fuel filling pump	242
	Application modification	Kit for alternative steel	246
Sandvik Dino DC420Ri	Productivity improvement	TIMi for vertical holes and hole depth measuring	212
		TIMi horizontal holes measurement	213
		TIMi for inclined holes and hole depth measurement	214
	Safety and environmental improvement	NoiseShield	225
		Safety cage	226
		Dustmizer	228
		Flap feeder for dust collector	229
		Hydraulic winch	231
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Thread greasing system	240
		Electric fuel filling pump	242
	Application modification	Kit for alternative steel	246
Sandvik Leopard DI450	Productivity improvement	TIM for inclined holes and TIM3D readiness	215
		TIM3D drill navigation system	216
		Water injection system	218
		Hydraulic rear ground support	220
	Safety and environmental improvement	Safety cage	226
		Reversing camera system	227
		Pipe winch	230
		Rock shield for lights and lower part of the window	233
		Eclipse™ fire suppression	234
		Jump start connector	236
	Lifecycle cost improvement	Thread greasing system	240
		Electric fuel filling pump	242
		Electric hydraulic oil filling pump	243
	Application modification	Horizontal drilling upgrade	245
		Kit for alternative pipe	247
Sandvik Leopard DI550	Productivity improvement	TIM for inclined holes and TIM3D readiness	215
		TIM3D drill navigation system	216
		Water injection system	218
		Hydraulic rear ground support	220
	Safety and environmental improvement	Safety cage	226
		Reversing camera system	227
		Pipe winch	230
		Rock shield for lights and lower part of the window	233
		Eclipse™ fire suppression	234

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	Lifecycle cost improvement	Thread greasing system	240
		Electric fuel filling pump	242
		Electric hydraulic oil filling pump	243
	Application modification	Horizontal drilling upgrade	245
		Kit for alternative pipe	247
Sandvik Leopard DI560	Productivity improvement	TIM for inclined holes and TIM3D readiness	215
		TIM3D drill navigation system	216
		Water injection system	218
		Hydraulic rear ground support	220
	Safety and environmental improvement	Safety cage	226
		Reversing camera system	227
		Pipe winch	230
		Rock shield for lights and lower part of the window	233
		Eclipse™ fire suppression	234
		Jump start connector	236
	Lifecycle cost improvement	Thread greasing system	240
		Electric fuel filling pump	242
		Electric hydraulic oil filling pump	243
	Application modification	Horizontal drilling upgrade	245
		Kit for alternative pipe	247
Sandvik Leopard DI650i	Productivity improvement	TIMi for inclined holes and hole depth measurement	214
		TIM for inclined holes and TIM3D readiness	215
		TIM3D drill navigation system	216
		Water injection system	218
	Safety and environmental improvement	Reversing camera system	227
		Dustmizer	228
		Pipe winch	230
		Explosion proof window	232
		Eclipse™ fire suppression	234
		Jump start connector	236
	Lifecycle cost improvement	Thread greasing system	240
		Electric fuel filling pump	242
		Electric hydraulic oil filling pump	243
	Application modification	Kit for alternative pipe	247
Sandvik Leopard DI650iRC	Productivity improvement	TIMi for inclined holes and hole depth measurement	214
		TIM3D drill navigation system	216
	Safety and environmental improvement	Reversing camera system	227
		Dustmizer	228
		Pipe winch	230
		Explosion proof window	232
		Eclipse™ fire suppression	234

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		Power extractor	219
		Hydraulic rear ground support	220
	Safety and environmental improvement	Reversing camera system	227
		Dustmizer	228
		Flap feeder for dust collector	229
		Eclipse™ fire suppression	234
	Lifecycle cost improvement	Thread greasing system	240
		Electric fuel filling pump	242
		Electric hydraulic oil filling pump	243
	Application modification	Horizontal drilling upgrade	245
		Kit for alternative steel	246

Rotary drills

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