
DIGGER DTR
DIGGER D-250
SWISS MADE | BUILT TO LAST
MECHANICAL
DEMINING
SOLUTION

“ Last week, [using the DIGGER D-3] we accomplished the same amount of work that would previously have taken six months ”

October 11th 2011 (IRIN publication)

18 months later

“ The integration of the mechanical component [DIGGER DTR] has considerably contributed to the reduction of the cost per square metre cleared, at a ratio of one to ten ! ”

Jean-François Lepetit
Chief of Mission for HI’s Senegal demining programme.

“ Taking into account all of the MECHEM types of ground preparation machines which I have worked with in Sudan, Afghanistan and Angola the DIGGER D-3 is by far the best and most suitable for follow up by MDD and Manual Teams. ”

Frederik B. Weyers
MECHEM Project Manager Senegal
Internal report

How honoured and delighted I feel to be able to present to you, in the following pages, the outcome of fifteen years of work and experience gained in more than thirteen countries.

Trained as an engineer, I initially worked in research and development for more than ten years before establishing DIGGER DTR. In this industrial world, I was constantly searching excellence in order to make products increasingly more efficient and cost-effective.

I am convinced that the humanitarian world also has the right to benefit from the best available products and especially at the lowest prices.

It is for this reason that I created this humanitarian non-profit company. To ensure a safer and more efficient working environment for the women and men who do risk their lives in order to assist their fellow human beings.

The whole DIGGER DTR team is proud to introduce you to the DIGGER D-250 which is certainly the most advanced demining machine in its category today.

Get ready to be dazzled!

Frédéric Guerne
Director and Founder

Contents

DIGGER DTR
PRESENTATION

PRESENTATION

Located in Switzerland in the “Watch Valley”, DIGGER is surrounded by the most prestigious watch-making manufacturers.
It is in this spirit of excellence, quality and reliability that our machines are produced.

SWISS PRODUCTION SITE

The FIELD as a laboratory

The DIGGER DTR team holds recognized demining skills (IMAS level 3 EOD) and has also acquired experience in managing complete demining projects.

Presence in

-

01 / France
02 / Switzerland (HQ)
03 / Croatia
04 / Bosnia-Herzegovina
05 / Kosovo
06 / Macedonia
07 / Senegal
08 / Mali
09 / Benin
10 / Chad
11 / Sudan
12 / South Sudan
13 / Mozambique

Just like the Swiss Army knife, the DIGGER D-250 is a multifunctional platform designed to meet almost all the deminers needs and requirements.

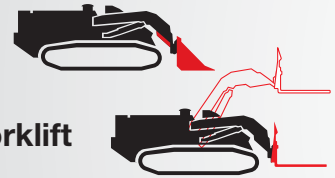
VERSATILITY for your needs

Demining, C-IED, ammunition stockpiles or hazardous products destruction, disaster response, intervention in risk areas, etc...

Demining tiller

Demining flail

Bucket



Forklift

RTK-GPS (2cm)

Track shoes

Backhoe with gripper + video support

Piloting via camera

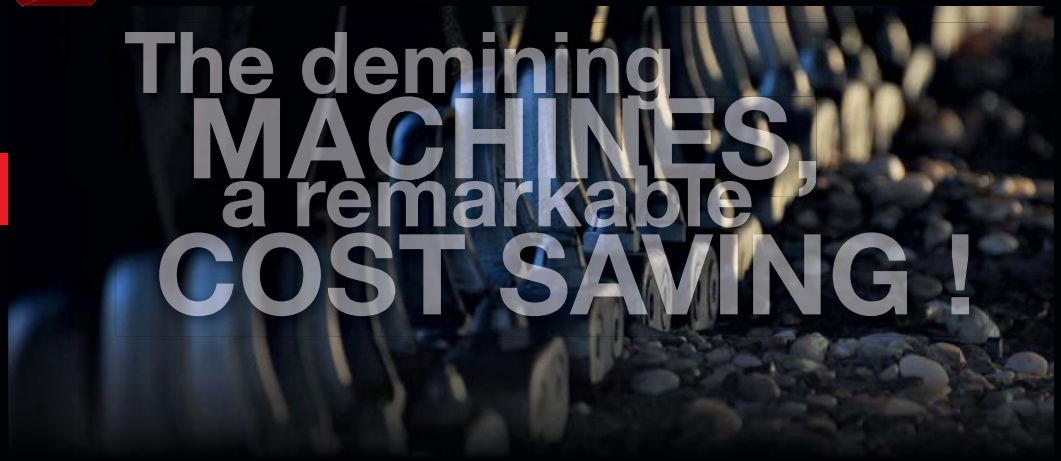
Winch

Tailor-made options

Skidding blade

COSTS AND YIELDS

COSTS AND YIELDS



The figures presented besides are based on the study of realistic situations subject to variations depending on the working location.

For an equivalent yield, mechanical demining is far more beneficial.

The models used for the charts on the following pages are showing the necessary staffing and equipment resources based on three different strategies.

Mechanical assets

7 1/2 Expatriate Staff

Administration & management

Field management

28 National Staff

Administration & management

Deminers

Medics

Team leaders

Machine operators

Drivers

Mechanics

Equipment

D-250

Van

Truck

Cars

Office equipment

Medical & technical equipment

Radio & phone

Security

EOD equipment

Operating expenses

Accomodation

Fuel

Per Diem

Traveling

Audit

Monitoring

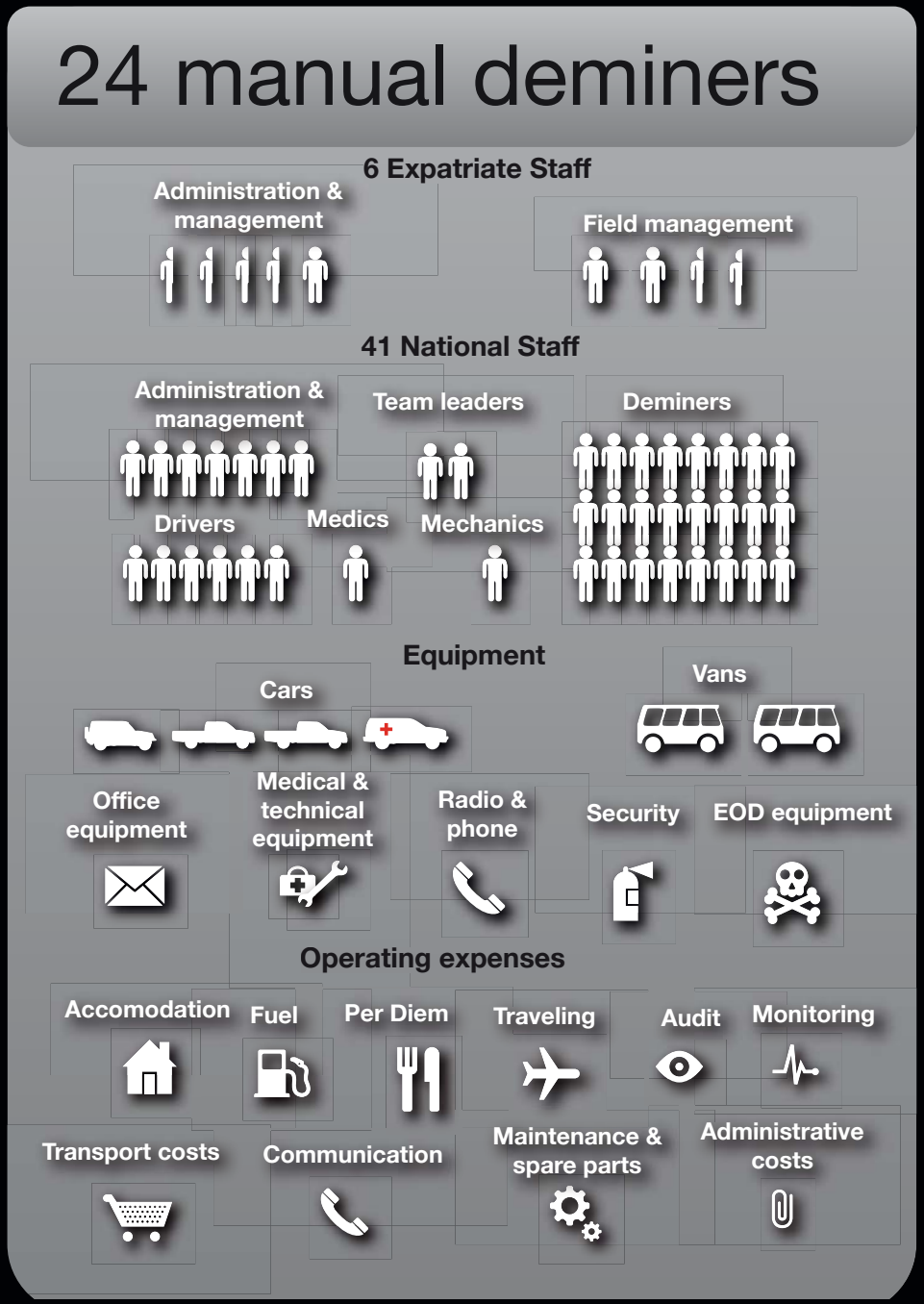
Transport costs

Communication

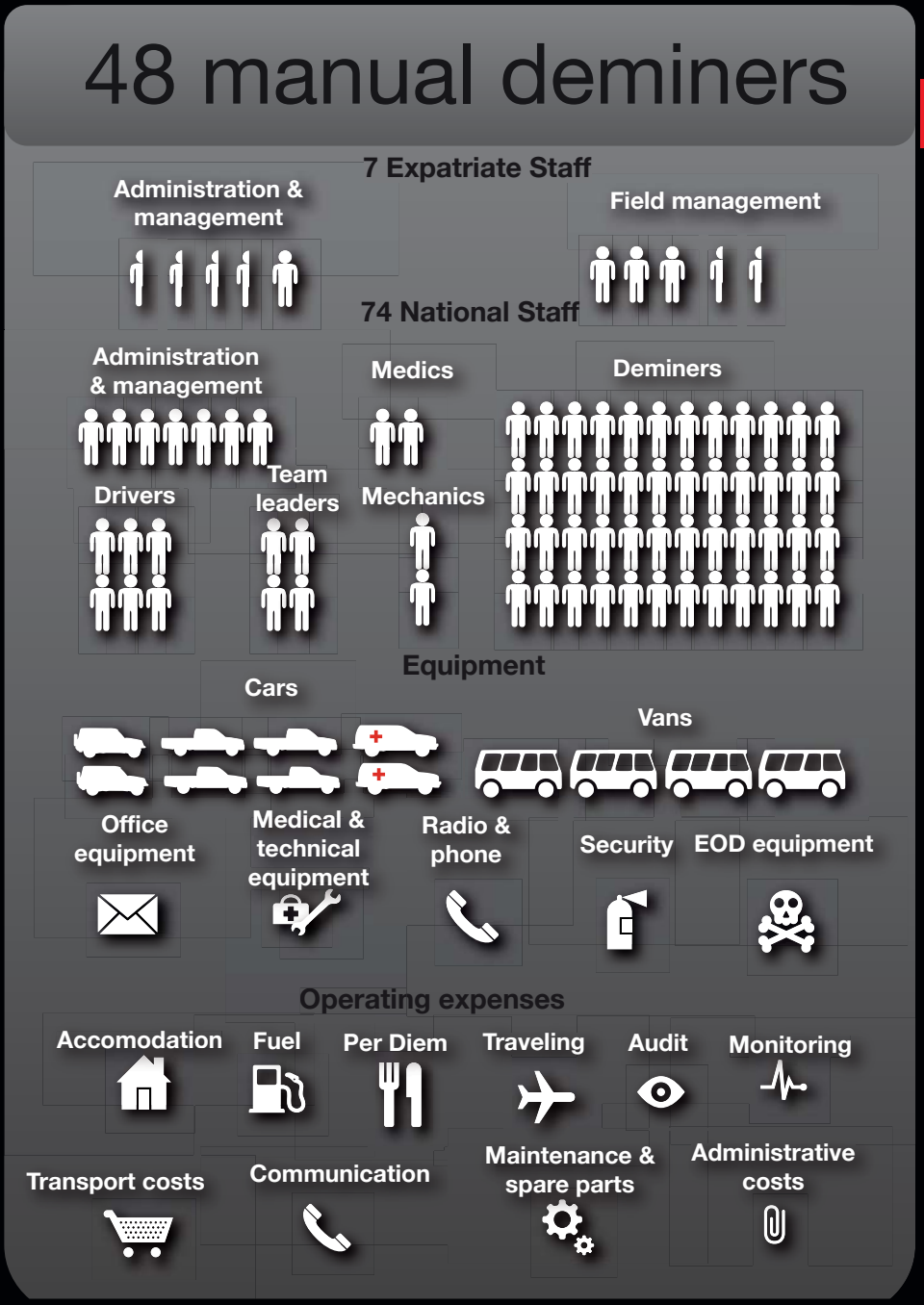
Maintenance & spare parts

Administrative costs

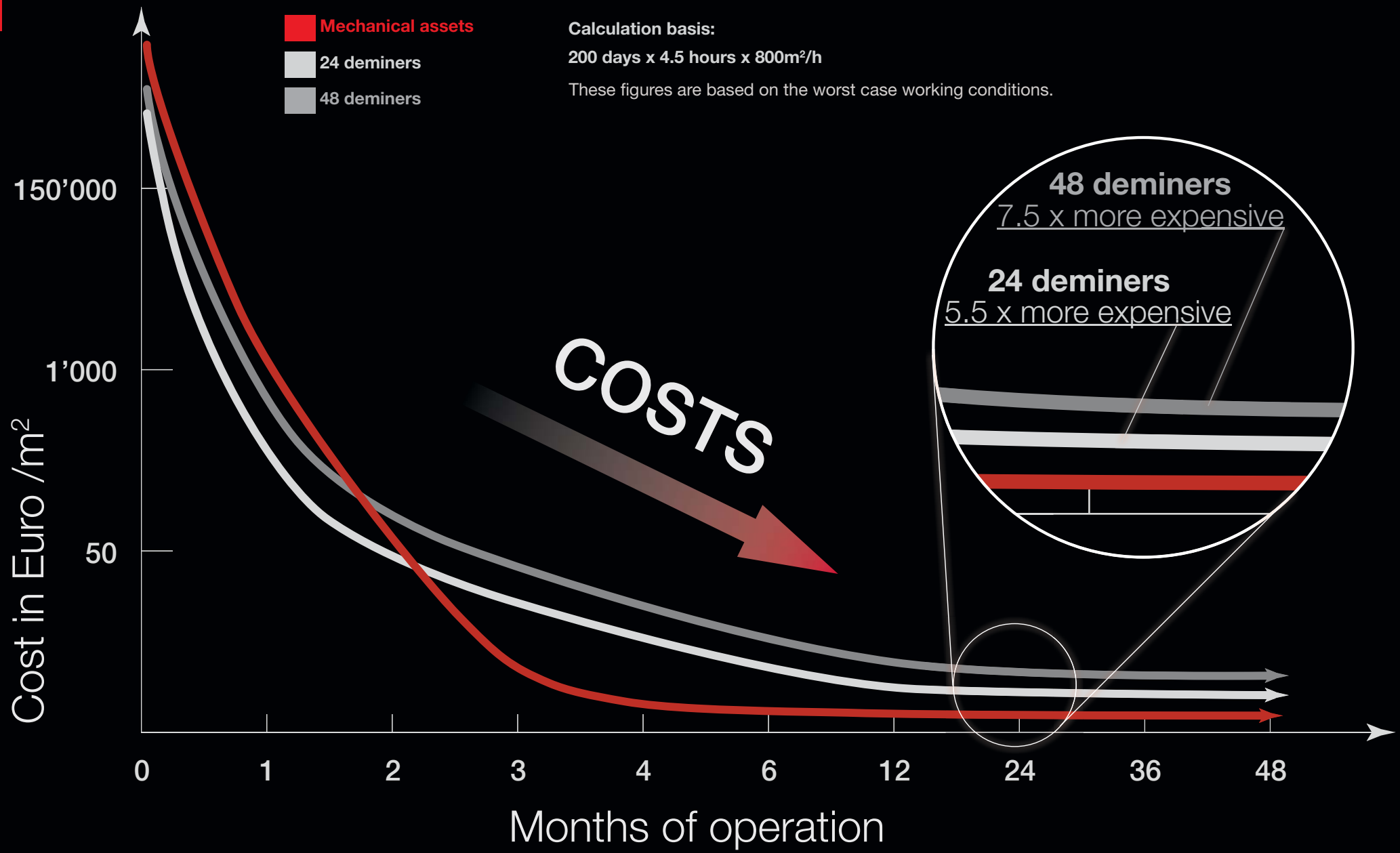
24 manual deminers



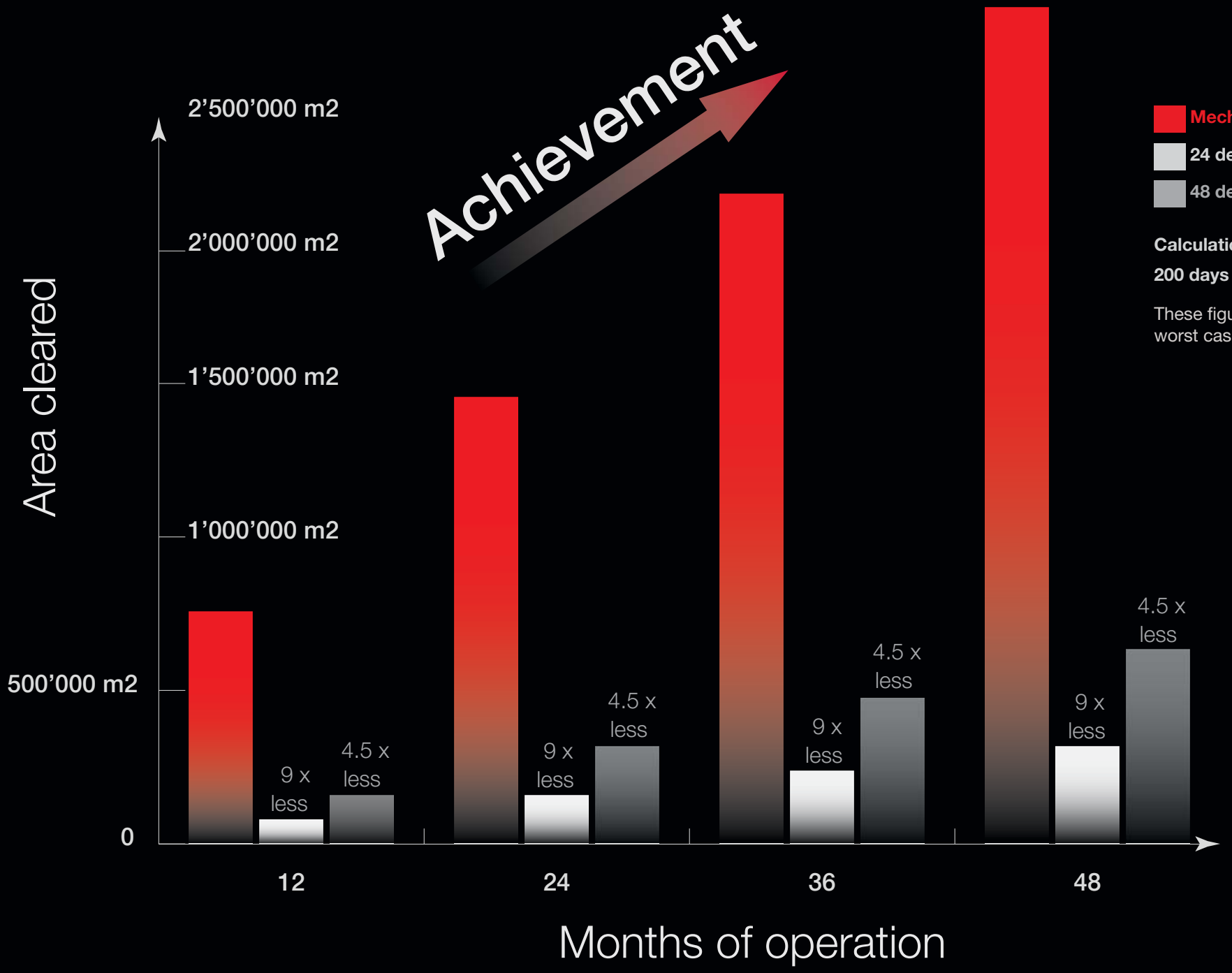
48 manual deminers



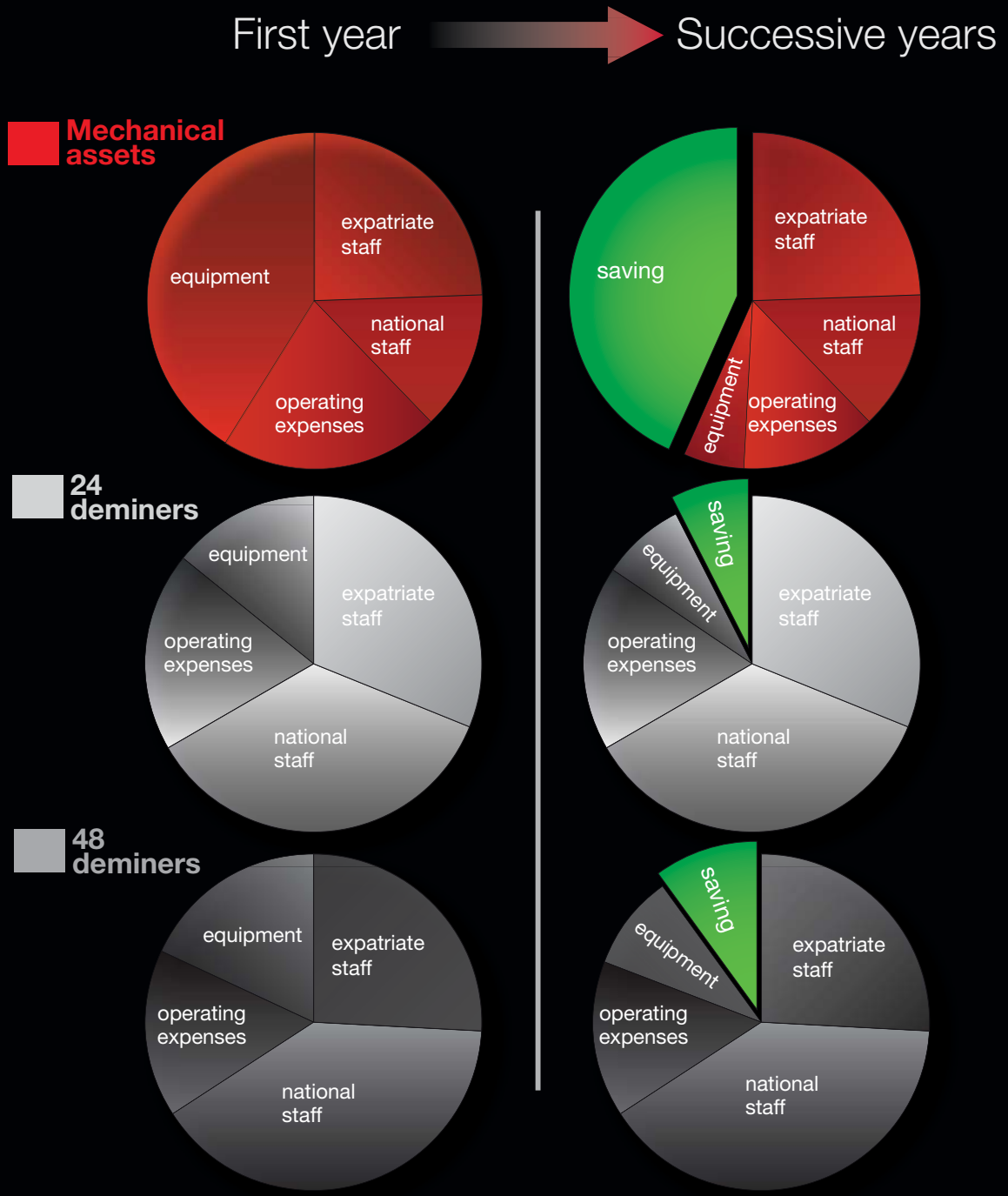
COSTS AND YIELDS



COSTS AND YIELDS



COSTS AND YIELDS

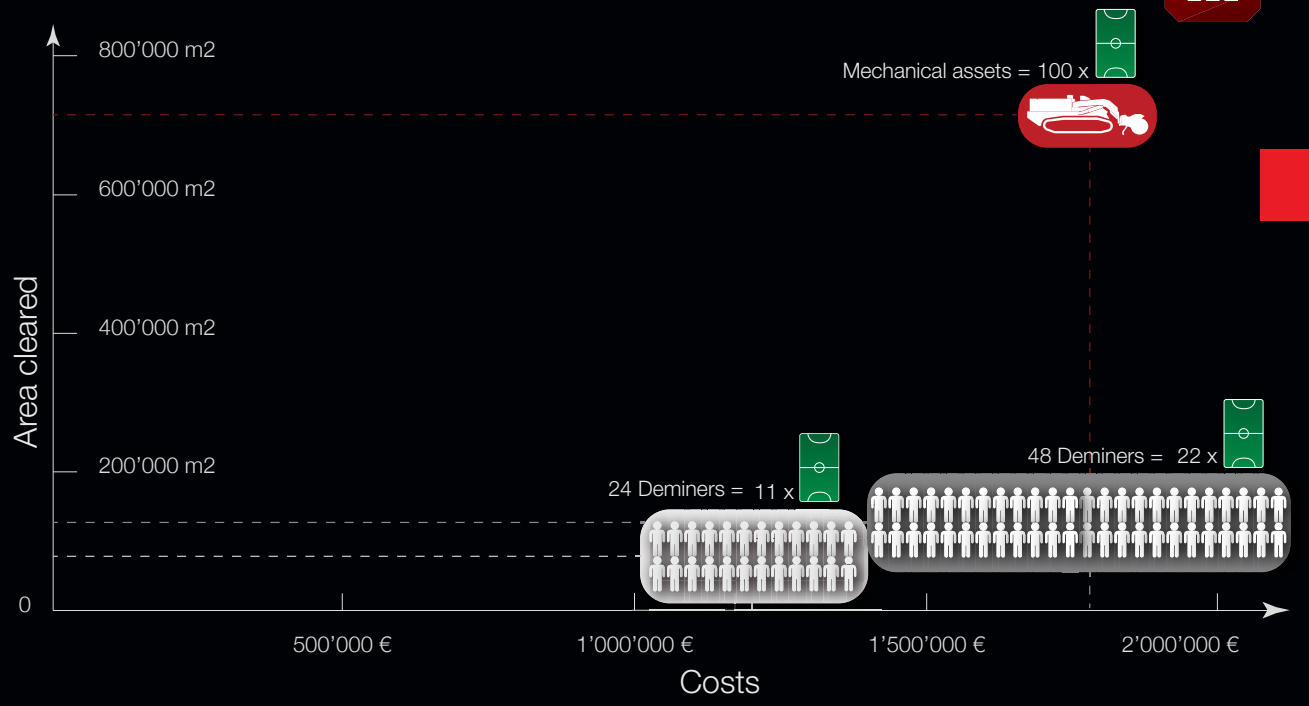


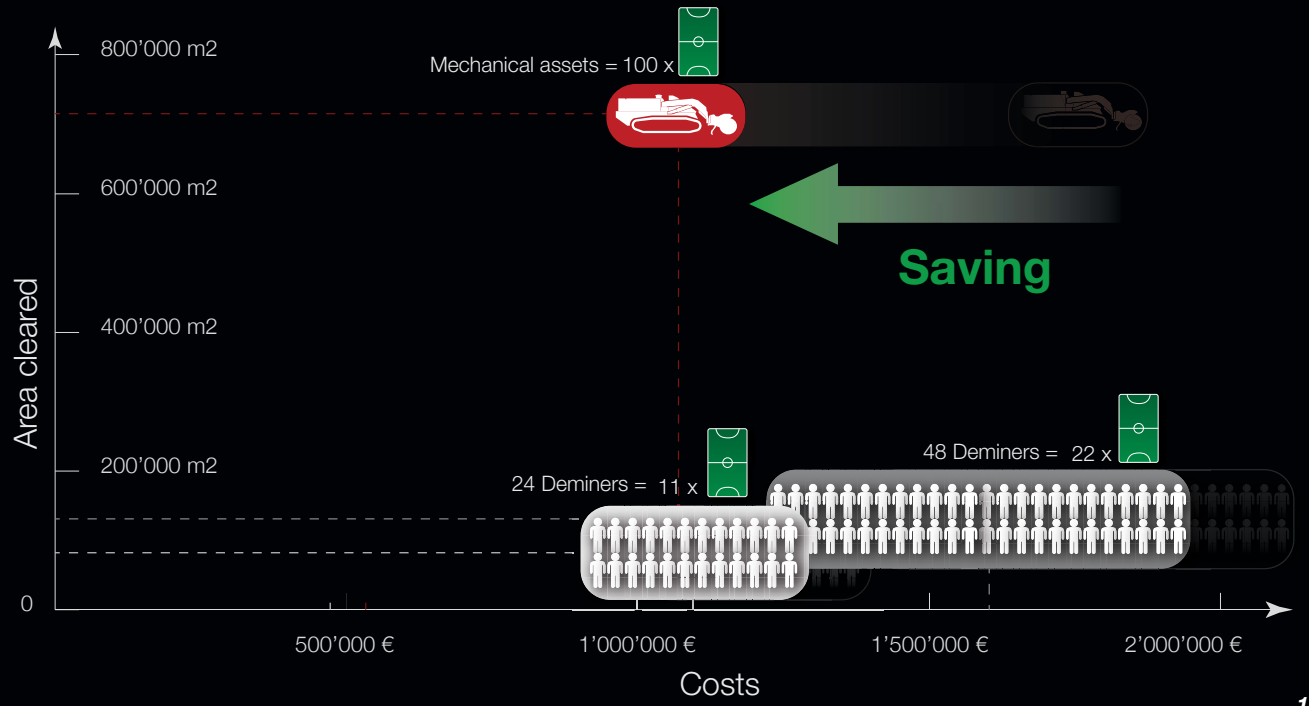
COSTS AND YIELDS

YEARS OF OPERATION

FIRST YEAR
(investment)

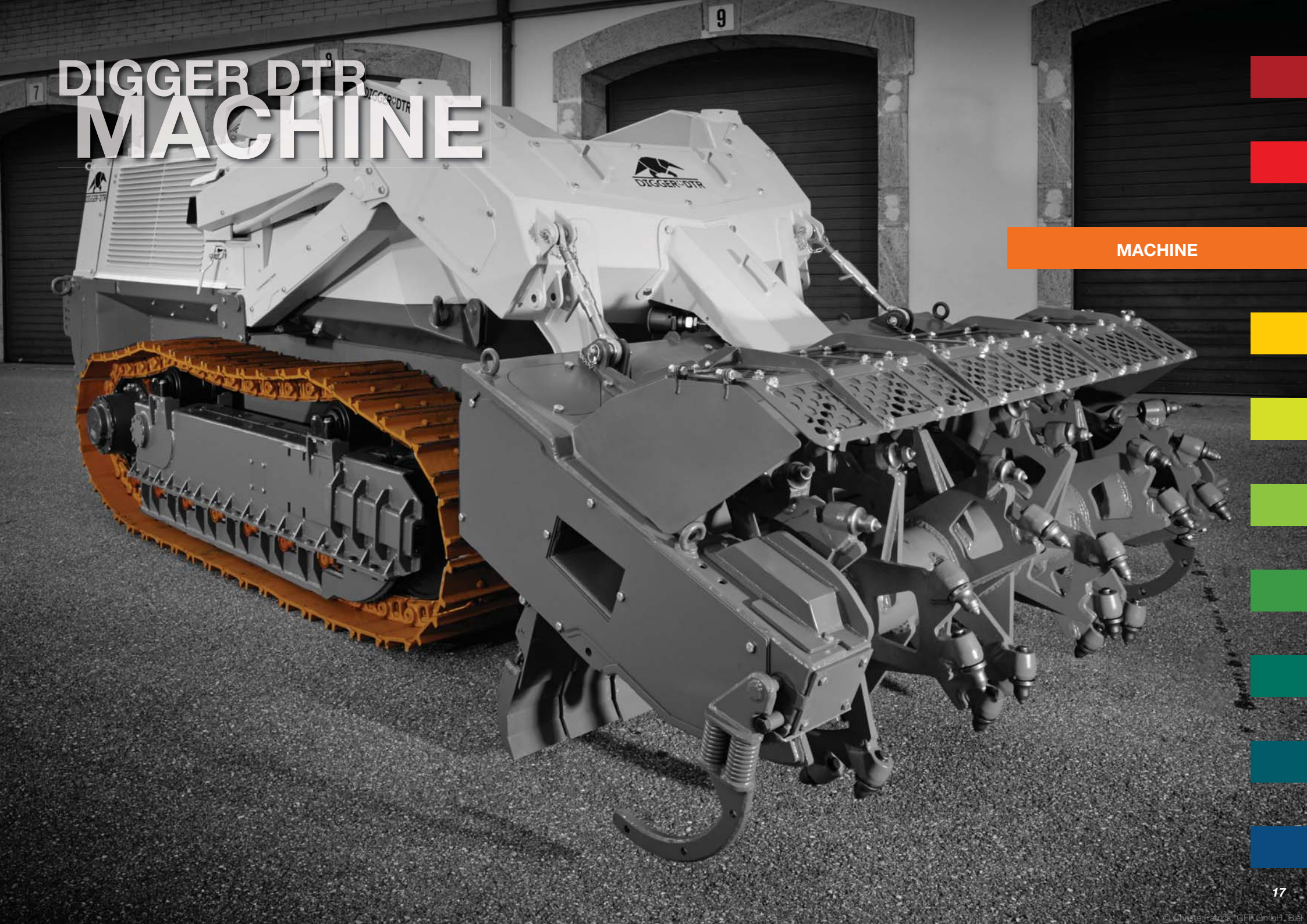
SUCCESSIVE YEARS





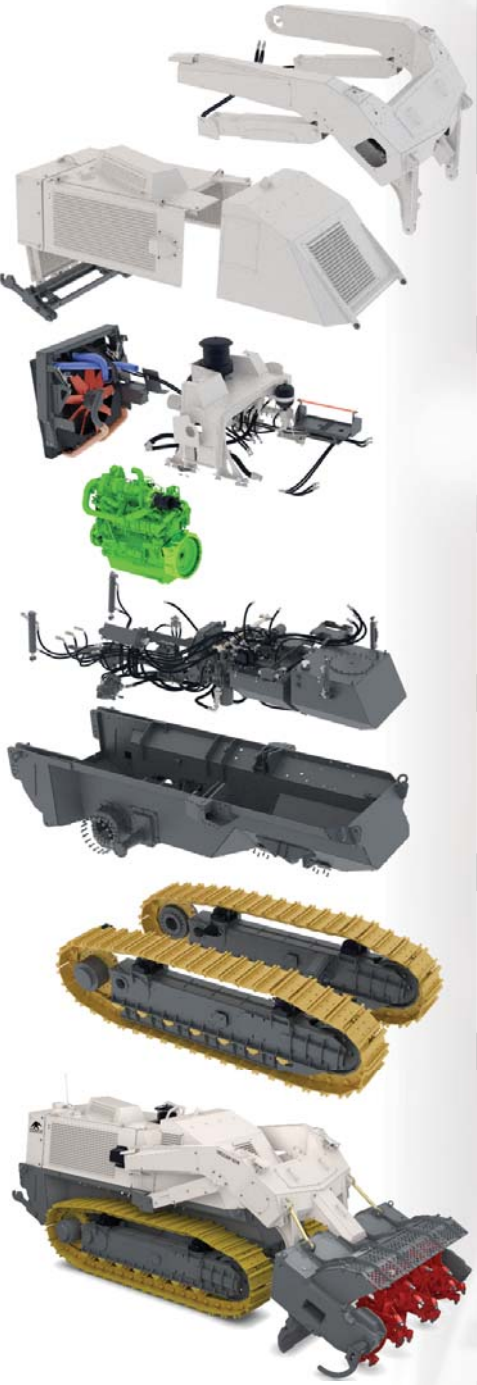

DIGGER DTR

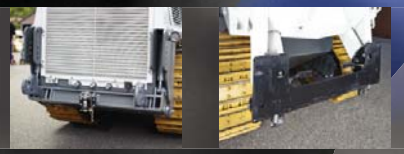
DIGGER DTR MACHINE



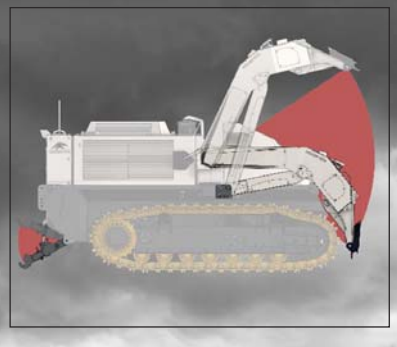
DIGGER D-250

250 HORSEPOWER under CONTROL in a robust FRAME



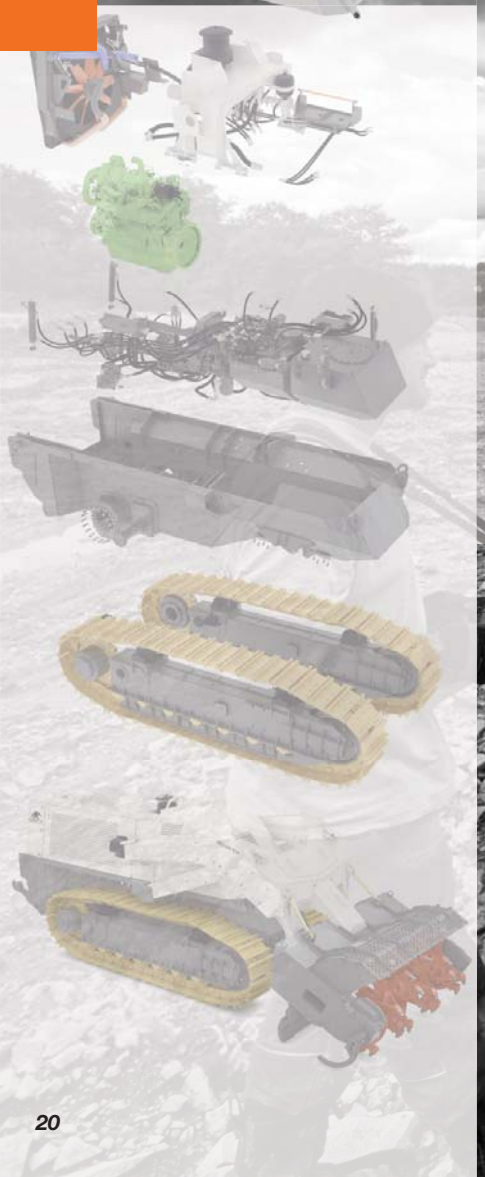


MACHINE - Coupling systems



Front: Caterpillar mechanical quick coupler. Potential use of all the compatible Caterpillar tools.

Front : arms lifting capacity : 2 tons at four meters height.



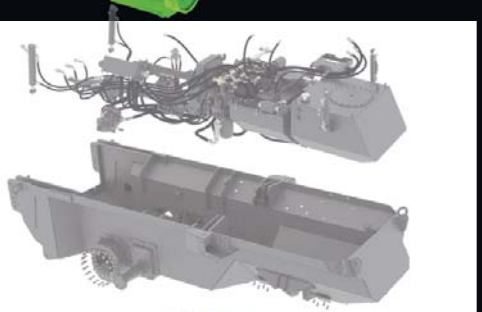
« Versatility, flexibility, wide moving range and tremendous force are the key attributes of the front and rear coupling systems of the machine. »

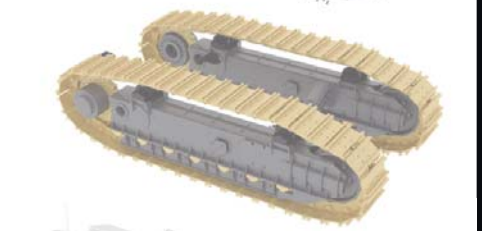
Front : hydraulic quick coupling (250 litres/minute at 400 bar) and electrical connection (CAN bus and power supply).

Rear : hydraulic quick coupling and electrical connection (CAN bus and power supply).

Rear : agricultural mechanical coupler

MACHINE - Engine





Options
Ecology

6 cylinders
6800 cm³
250 hp

Options
EURO II or EURO IIIb
with particles
filter

Triple
filtration of
fuel system

32 litres of
oil provide
a constant
lubrication
under the
most extreme
conditions

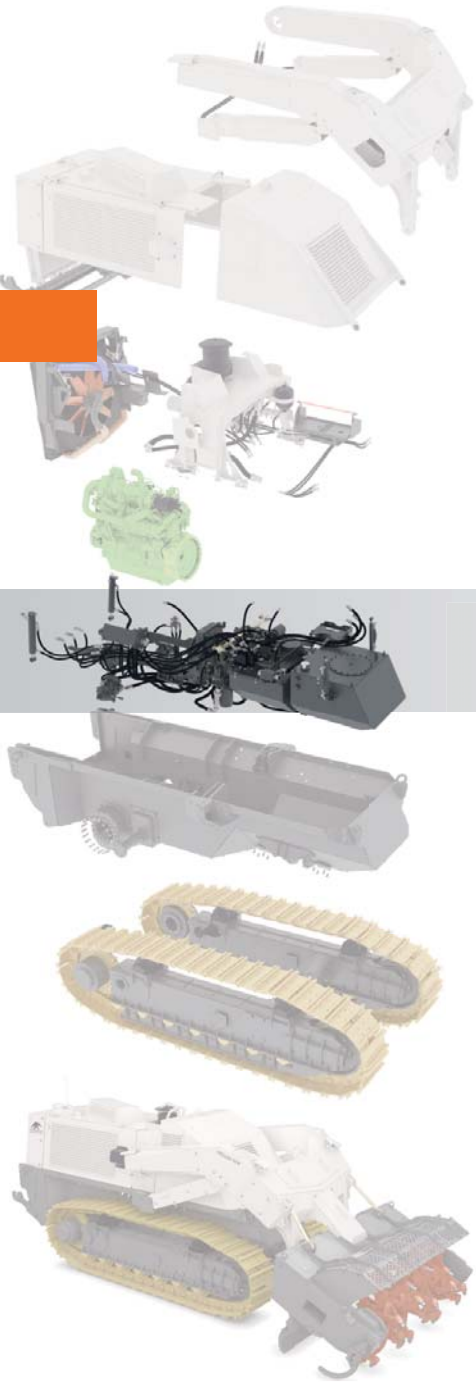
This engine, tested
and certified by John
Deere for this specific
application, is covered
by the John Deere
international warranty.

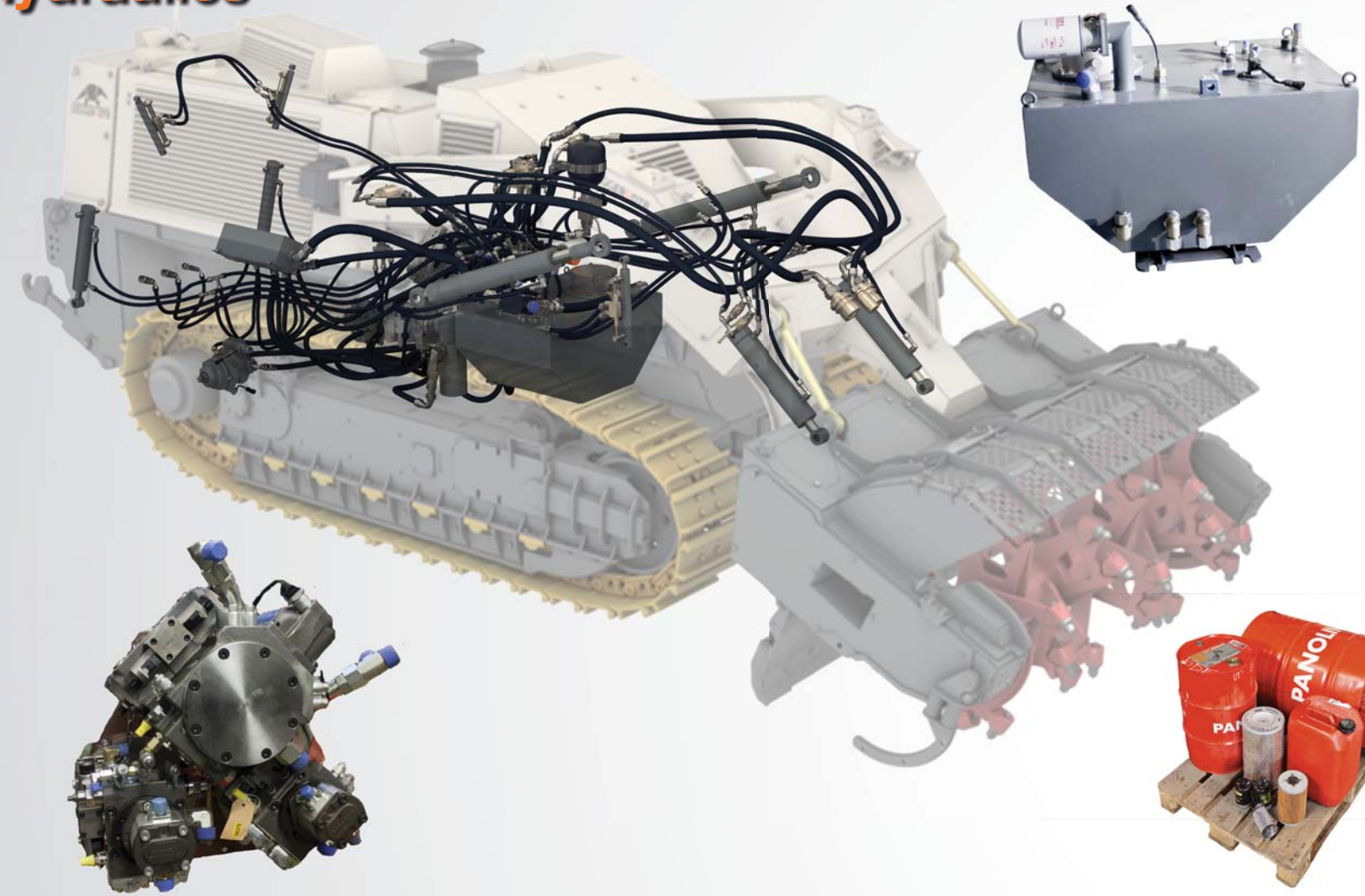
Triple air
intake
filtration
system to
ensure working
efficiency even
under extremely
dusty conditions

Cooling system
with reverse
air flow for
automatic
cleaning

Technical data table :
-
Model : 6068HFC94 (phase IIIb) / 6068HF475 (phase II)
Nb. of cylinders : 6
Displacement: : 6.8L
Combustion system: : High pressure Common Rail, direct injection
Air intake: : Turbocharged and air-to-air post cooled
Cooling system: Water
Max. power : 250hp @ 2200 rpm
Continuous max. torque : 1025Nm @ 1400 rpm
Max. fuel consumption : 43-47 L/h (Stage IIIb), 46L/h(Stage II)
Average fuel consumption : 30-35L/h

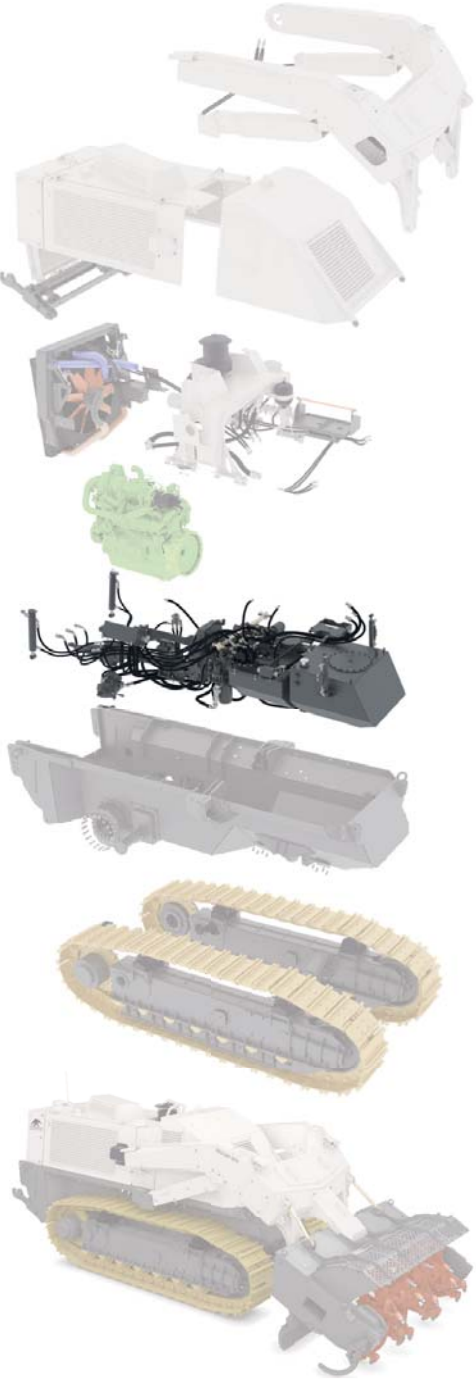
MACHINE - Hydraulics





Pumps and hydraulic motors are from the Bosch-Rexroth™ brand, a guarantee of reliability and performance.
This technology combines flexible and precise use.

MACHINE - Fuel tank



With a capacity of 225 litres, the fuel tank ensures a normal working day without the need to refuel, thus increasing productivity.

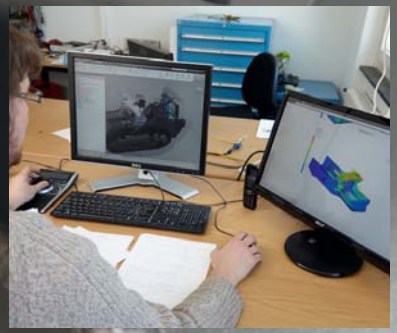
Options

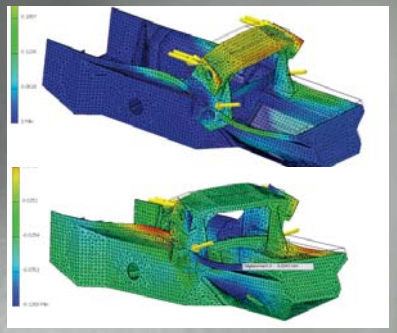
The tank is filled with special security foam. It's specifically designed to prevent any risk of explosion caused by a puncture from shrapnel.

The fuel level information is constantly transmitted to the operator. In the event of a critical level, an alarm is activated, thus avoiding any risk of fuel shortage in a minefield.

A quick connector, easily accessible, allows a simple drainage of the contaminated fuel.

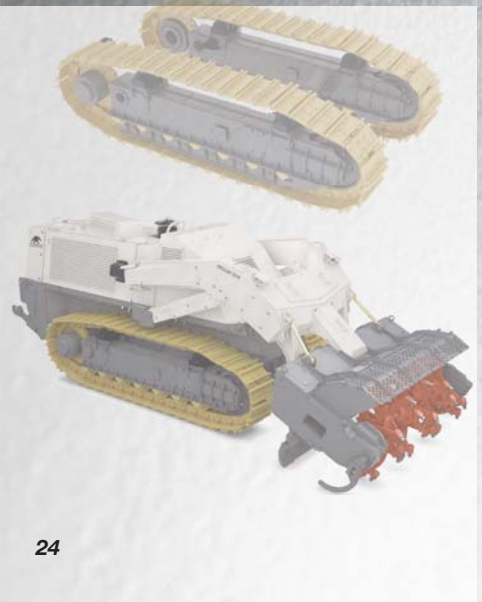
MACHINE - Frame





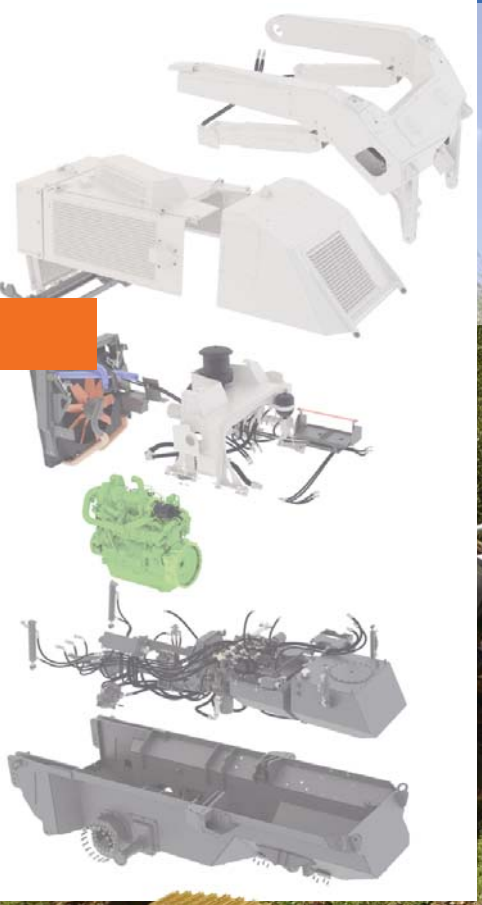
The monobloc frame of the DIGGER D-250 is the secret of its incredible solidity.

Each part is subjected to numerous optimizing cycles by using cutting-edge computer-based tools.

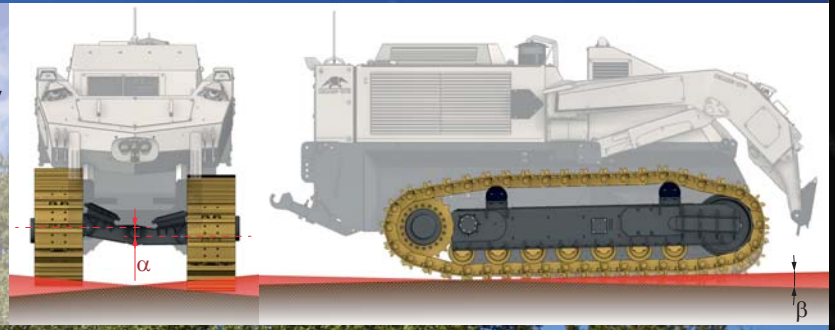


The best steels have been selected to produce each part. They guarantee robustness and flexibility.

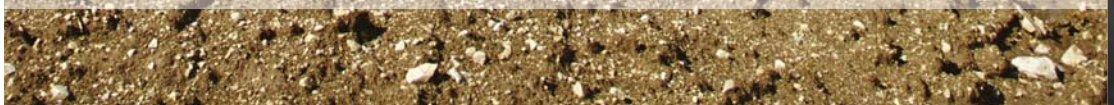
MACHINE - Undercarriage



The oscillating tracks considerably increase the stability of the machine and allow a better working regularity while using earth-moving tools.



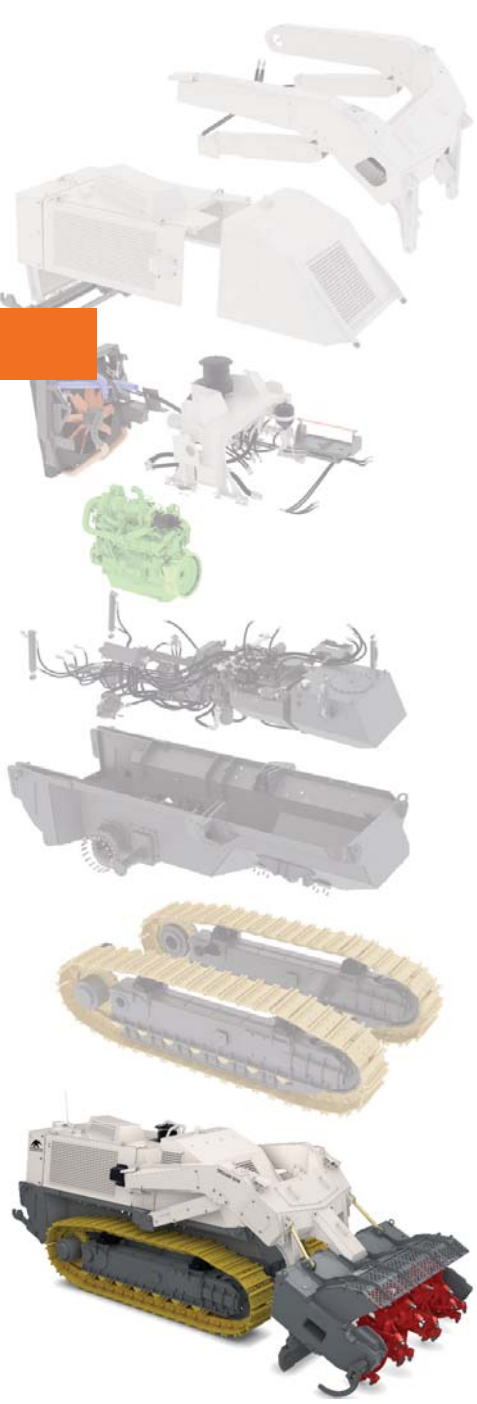
With tracks providing a traction of 14 tons , with its oscillating system ensuring optimum adherence and with its minimum specific ground pressure, you can go almost everywhere …



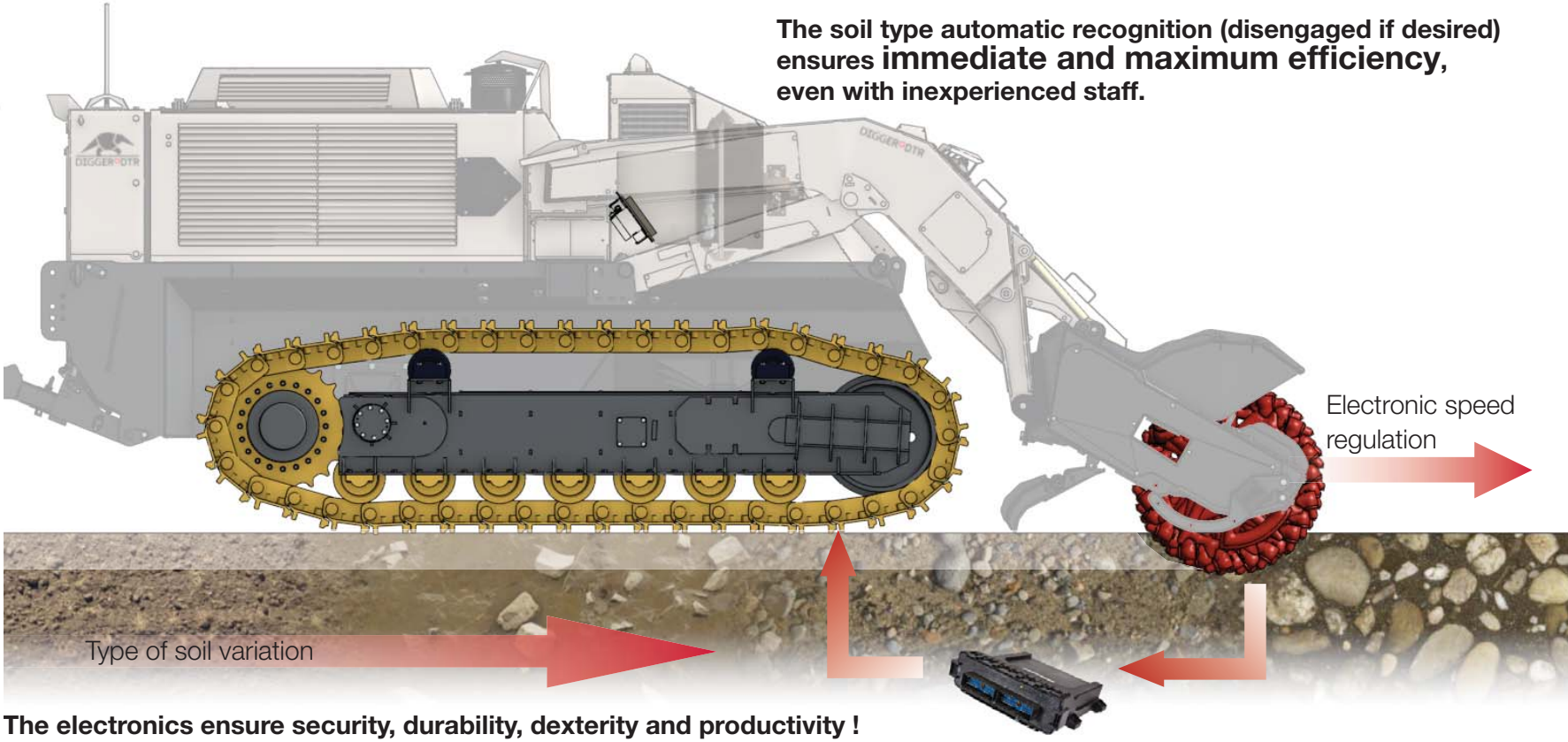
VERSATILITY
for your needs

The strength of its tracks and the robustness of the D-250 transform it into a true bulldozer.

MACHINE - Electronics



The soil type automatic recognition (disengaged if desired) ensures immediate and maximum efficiency, even with inexperienced staff.



The electronics ensure security, durability, dexterity and productivity !

Security

The essential parameters such as temperature, oil level, fuel level, leak detection, state of the filters and others are constantly monitored. Any defect is immediately signalled to the pilot via the remote control and automatic security measures are taken by the machine to avoid any mechanical damage.

Durability

Whenever an inexperienced operator inadvertently attempts inappropriate manoeuvres, auto-protections are activated to avoid any damage.

Dexterity

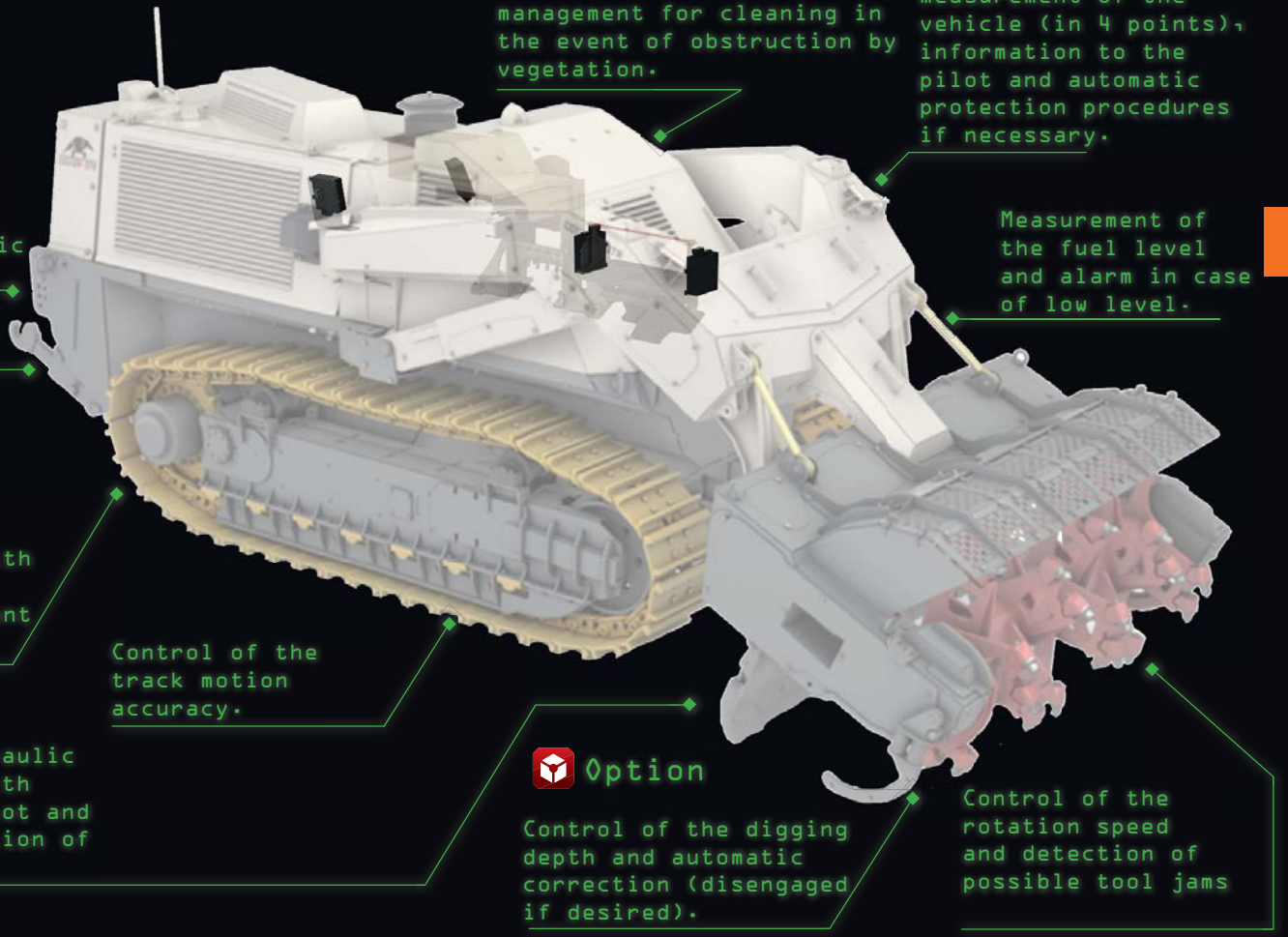
The main movements of the machine are assisted to make them as precise as possible. The pilot tends to forget that at his fingertips, with his joystick, he is driving a 250 hp monster.

Productivity

A speed control system (disengaged if desired) incorporated into the machine responds according to the torque imposed on the demining tool, depending on the nature of the soil. This produces immediate maximum operating efficiency even with an inexperienced operator.

MACHINE - Electronics

The « brain » of the D-250 is made of small identical interchangeable and very easily replaceable boxes, distributed in several parts of the machine.



Option
Automatic air-flow reversal management for cleaning in the event of obstruction by vegetation.

Internal temperature measurement of the vehicle (in 4 points), information to the pilot and automatic protection procedures if necessary.

Measurement of the hydraulic fluid temperature, alarm to the pilot and automatic protection.

Measurement of the fuel level and alarm in case of low level.

Diagnostic of the Diesel engine.

Constant control of the hydraulic filters condition with information in the event of a replacement need.

Control of the track motion accuracy.

Detection of hydraulic fluid leakages with alarm for the pilot and automatic protection of the pumps.

Option
Control of the digging depth and automatic correction (disengaged if desired).

Control of the rotation speed and detection of possible tool jams

A complete electronic system developed and produced by DIGGER DTR

The engine status can be easily checked thanks to the diagnostic tool.

Additionally, each box is equipped with its own display. Any failure is detected and identified instantly.

The modular concept with identical and interchangeable boxes ensures a complete secured utilization.

A damaged box can be replaced without technical knowledge.

MACHINE - Remote control

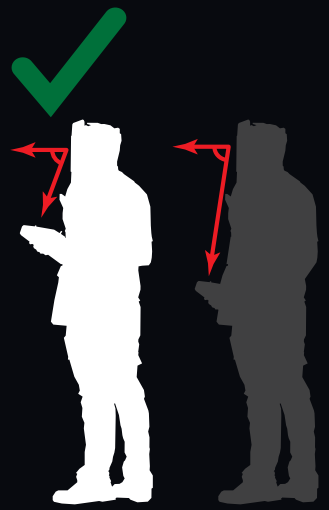
a surgical PRECISION

From its inception, the « ease of use » parameter has been integrated into the remote control. Taking fully in hands requires a few minutes.

250 hp at fingertips

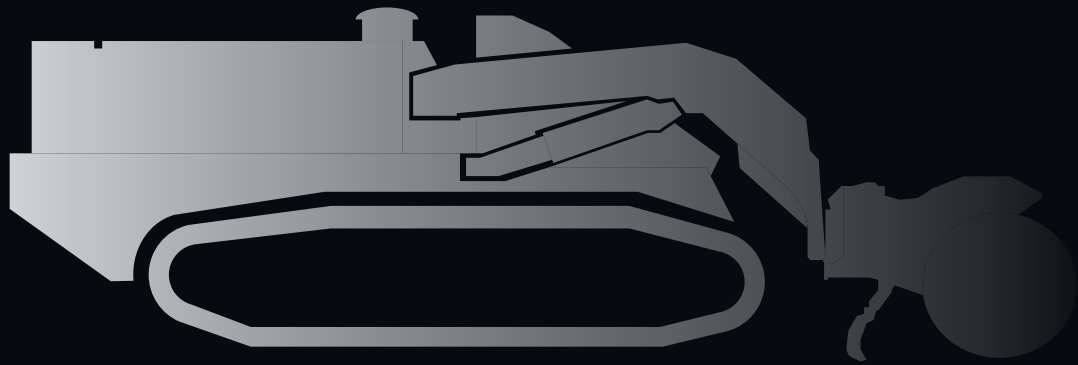
A harness made of very robust soft material ensures optimal comfort. Especially adapted to the wearing of a flak jacket, it has been designed for an extended use without muscular tiredness.

An ergonomic position of the display for a “head high” reading: this allows the operator to continue working without eye or muscle discomfort.



MACHINE - Remote control

a RANGE of up to 10 km



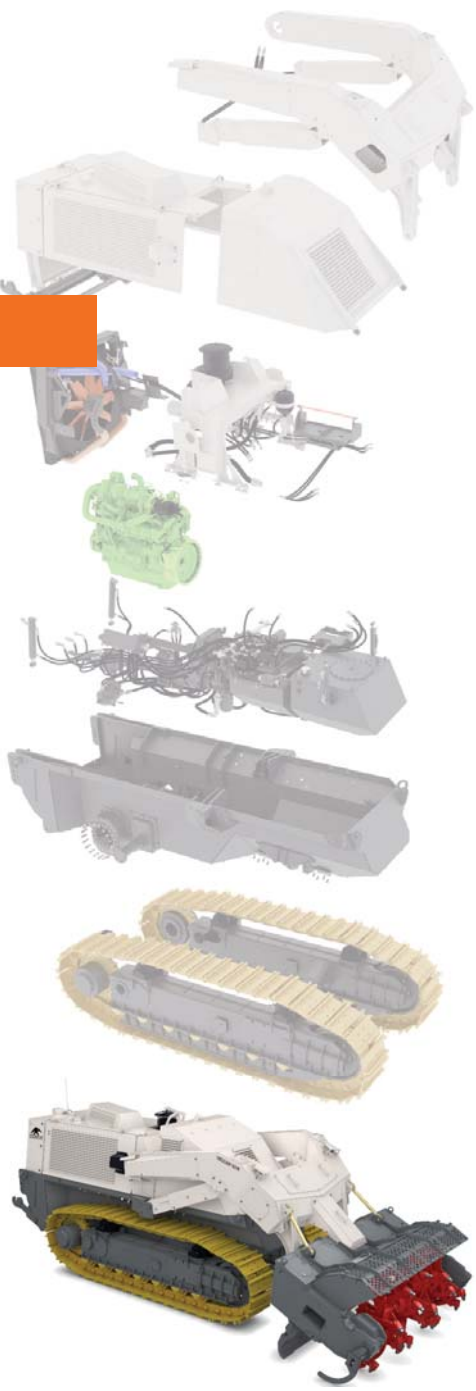
The remote-to-machine communication is two-way for permanent monitoring of the machine's status, even from a distance, to anticipate any potential problem.

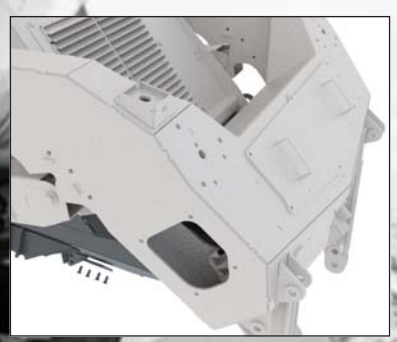
The basic range of the remote control is 500 metres, but it can be extended to more than 10 km with the camera and GPS option.

If needed, a control cable can be used for operating in areas under serious disruption (radars, radio, …).

© Christe Patrick, GFF GmbH, Biel

MACHINE - Maintenance





Access for hydraulic and fuel tanks drainage

a **QUICK** and **SIMPLE** acces for easy **MAINTENANCE**

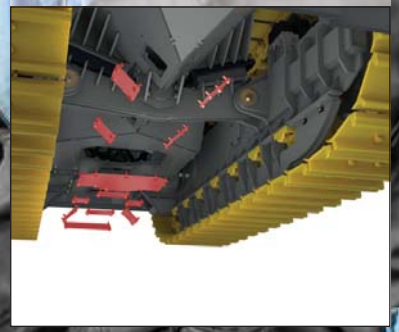
Even the best machine must be maintained to last long.

The DIGGER D-250 is designed for an easy access to the maintenance points.

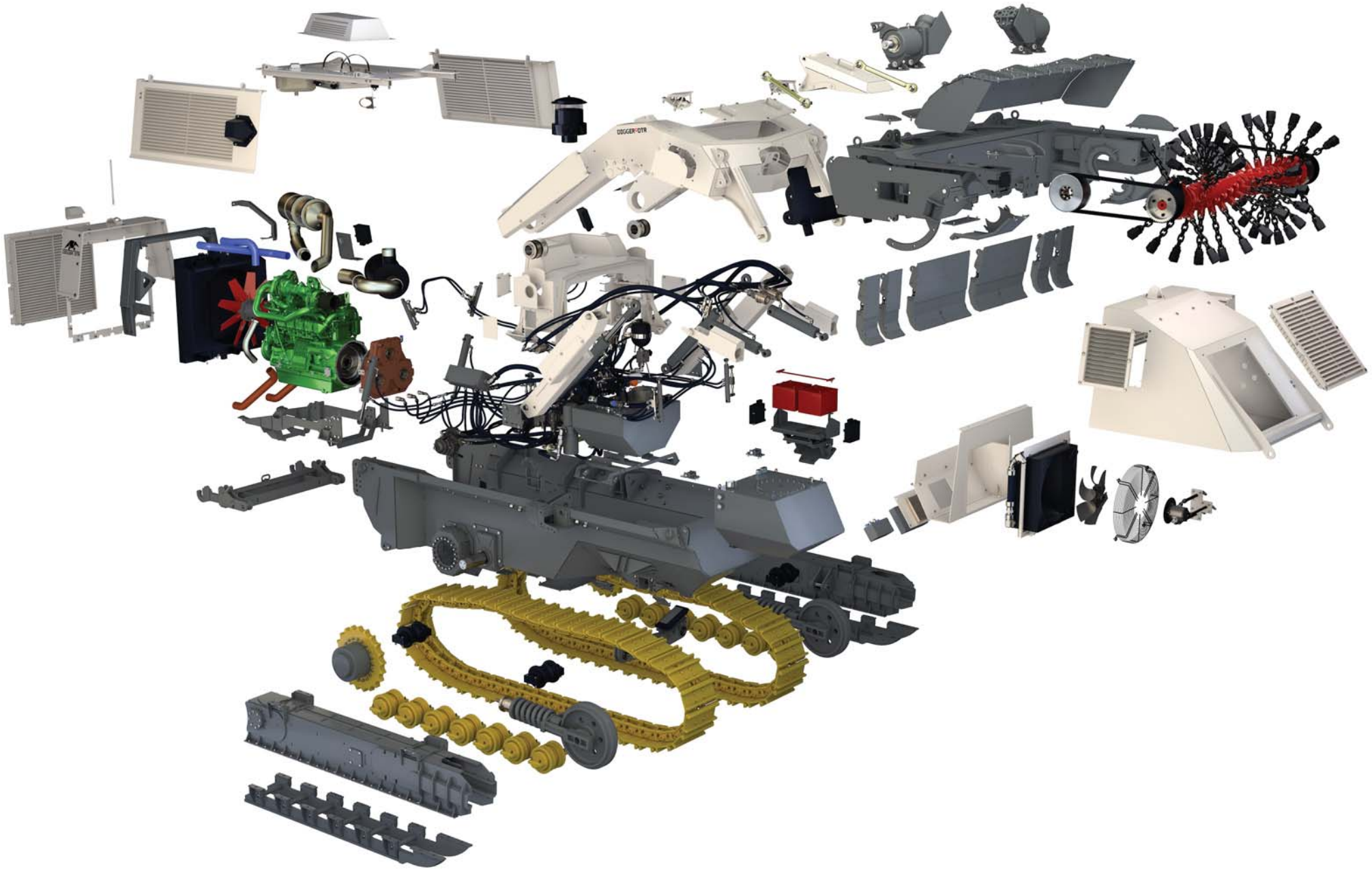
Automatic (or manual) access for Diesel engine servicing (Diesel filters, gauge, oil, intake filters, ...)

Access to key locations for the front tool maintenance.

Many trapdoors for access and cleaning



MACHINE - Exploded view



DIGGER DTR TOOLS & OPTIONS

options

Just like the traditional Swiss Army knife, the DIGGER D-250 is a multifunctional and high-quality toolbox.

It can be equipped with four types of tools to offer a wide range of uses, almost without limit:

- « DIGGER DTR » tools and options
- « CATERPILLAR » compatible tools
- « AGRICULTURAL » tools (cat. I to IV)
- « ON-DEMAND tools », imagined by the customer according to his specific requirements and then developed and constructed by DIGGER DTR.

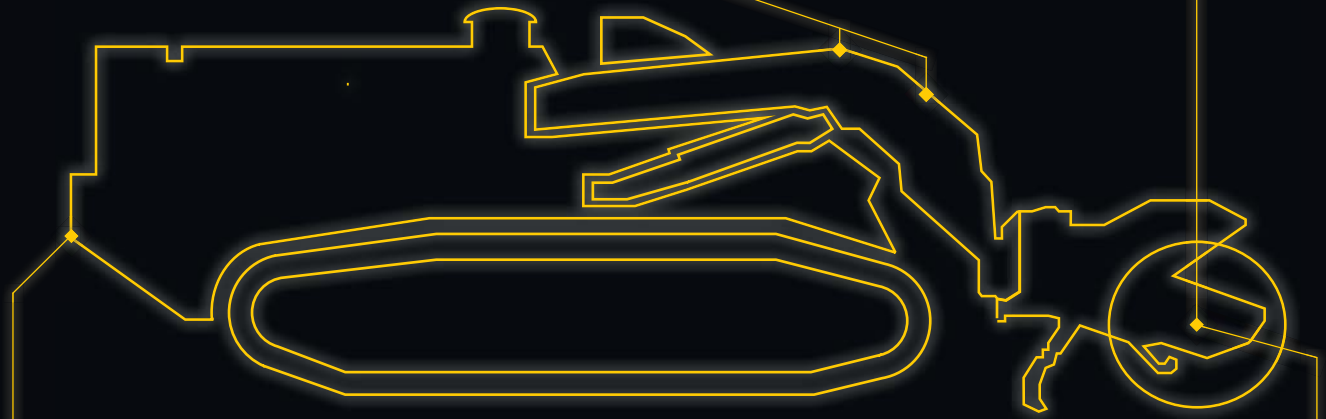
TOOLS & OPTIONS

DIGGER DTR options p.46-48

On-board cameras, very high-precision RTK-GPS, … DIGGER DTR has developed a full range of options to extend the use of the DIGGER D-250.

DIGGER DTR tools p. 39-41

DIGGER DTR has produced a series of demining tools compatible with the quick front and rear couplers.

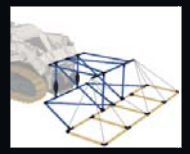


AGRICULTURAL tools p.44-45

The rear quick coupler is of AGRICULTURAL type cat. I to IV. The rear tools range is also compatible with the DIGGER DTR tools.

ON-DEMAND tools p.49

The DIGGER DTR Research & Development Department covers the mechanics, electronics and computing fields. We study and create solutions to meet all the requirements of our customers.



CATERPILLAR tool p.42-43

The front quick coupler of the Caterpillar trademark opens possibilities for using all the compatible tools of the famous maker.


DIGGER DTR
DEMINAGE
DIGGER DTR

DIGGER DTR TOOLS - Tool frame

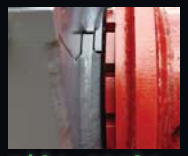
DIGGER DTR has developed a demining tool frame which can be fixed in front of the DIGGER D-250. Attached to its Caterpillar coupler, it provides an unmatched flexibility of use.
Only one tool frame is required for using a tiller or a demining flail.

Quick
Compatibility with the Caterpillar coupler ensures a quick change of tool.

Security

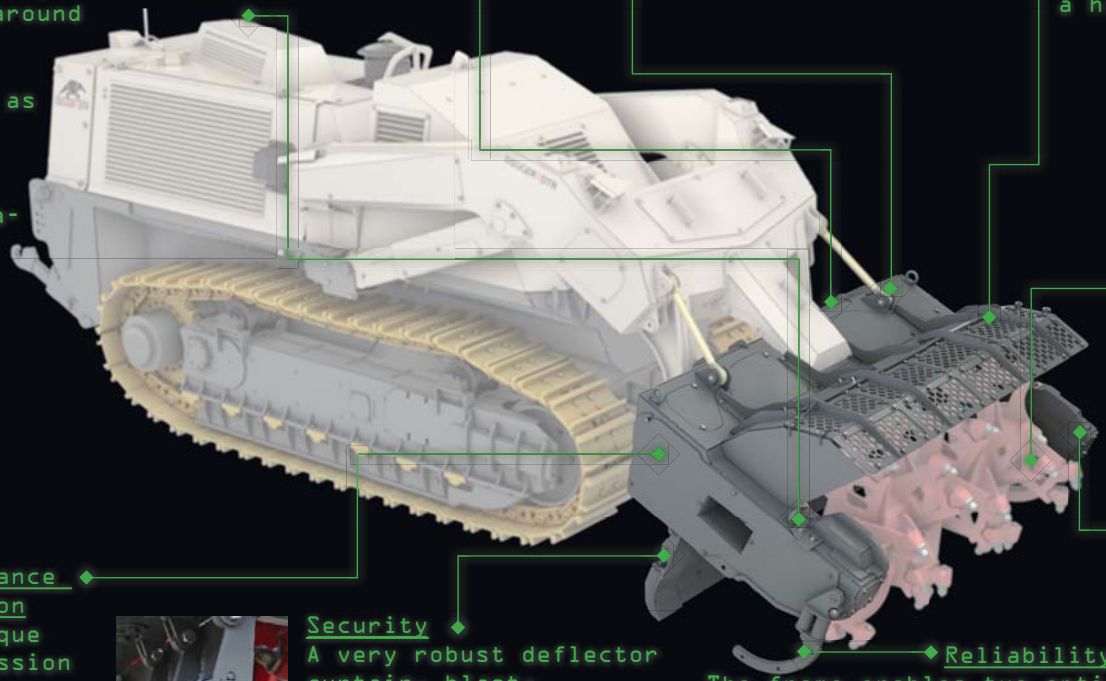
The deflector shield plays a significant role in the quality of work. It reduces greatly the projections. However, it is exposed to the huge explosion blasts due to its position.

Our defector shield is built in two parts. One (the primary shield) is away from the blast. The other one (the secondary shield), with a simple and cheap concept, is placed in a higher-risk area.



Longevity
On each side of the tool, a labyrinth system traps the dust without the need of fragile seals. A second system of knives crushes the barbed wires wound around the axis.
The disks of the cleaning system act as side stops when the explosion of anti-tank mines occurs, avoiding the deformation of the frame.

Reliability
No visible pipe nor fragile part.



Productivity
If necessary, a little trained mechanic can change the rotor in less than 30 minutes, without hoist.

Maintenance reduction
The torque transmission via two hydraulic motors is done by two carbon belts, resistant and very durable. Without maintenance, adjusting the tension is as simple as a child's play.

Security
A very robust deflector curtain, blast-resistant, contains the projections generated by the demining tool.

Reliability
The frame enables two options of digging depth adjustment.
Robust and simple skids or sensors, for an automatic and constant control (piloting further simplified).

Sensors

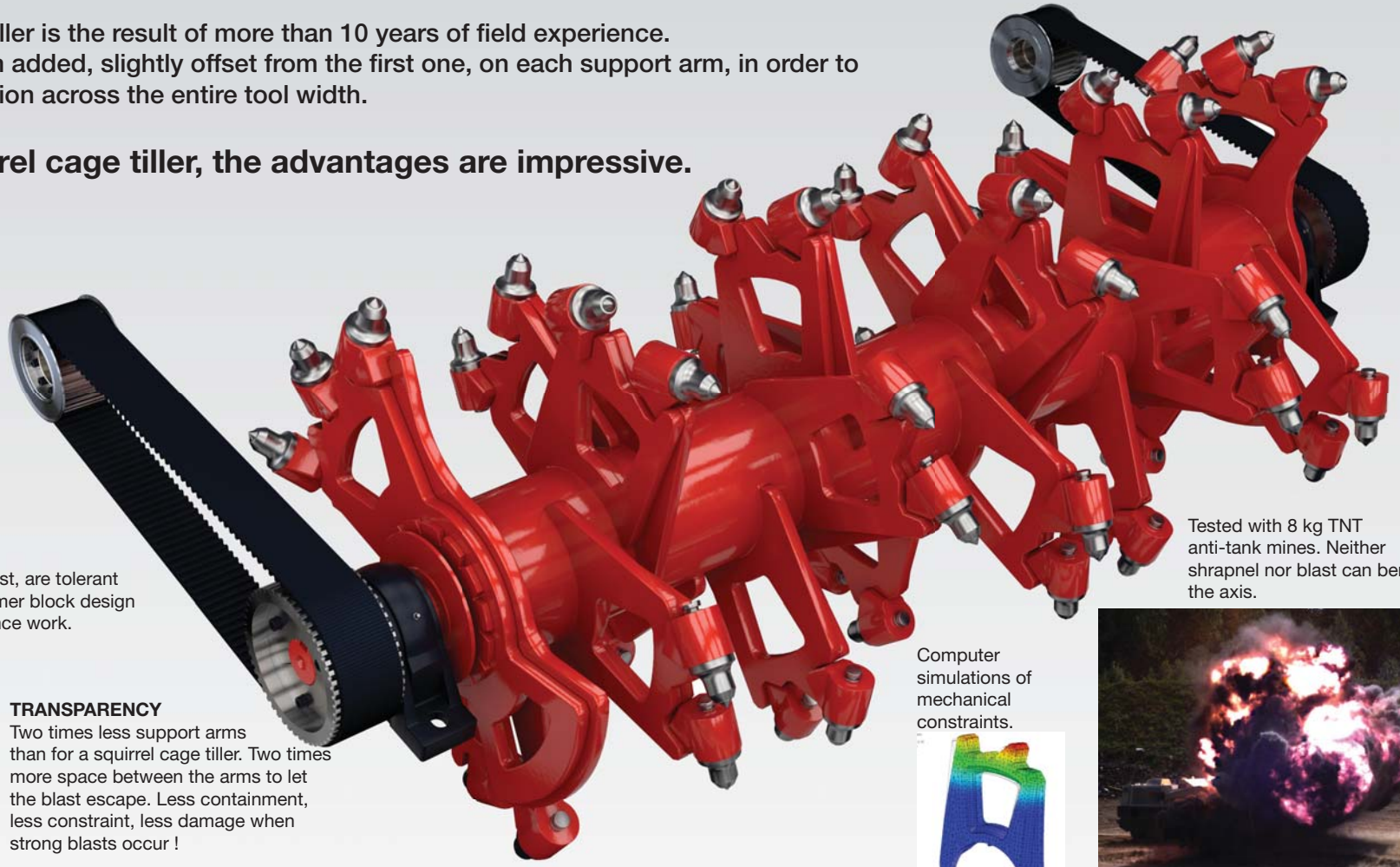
Skids

Standardisation
A single frame for a demining tiller or a flail

DIGGER DTR TOOLS - Demining tiller

Our « Twin-Pikes » demining tiller is the result of more than 10 years of field experience.
A second digging bit has been added, slightly offset from the first one, on each support arm, in order to maintain an optimum distribution across the entire tool width.

Compared with a squirrel cage tiller, the advantages are impressive.



MAINTENANCE
Double-row roller bearings, extremely robust, are tolerant of possible frame deformation. Their plummer block design makes them easier to mount for maintenance work.

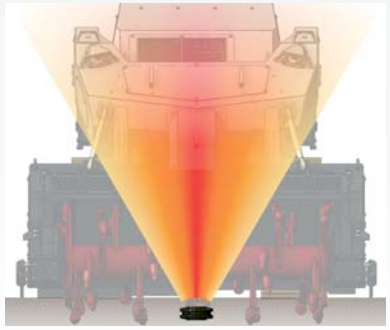
EFFICIENCY
At both ends, the tiller is equipped with hardened toothing disks.
Blades mounted on the frame are a perfect and tested tool for shredding fibrous vegetation and barbed wires.

TRANSPARENCY
Two times less support arms than for a squirrel cage tiller. Two times more space between the arms to let the blast escape. Less containment, less constraint, less damage when strong blasts occur !

Computer simulations of mechanical constraints.

Tested with 8 kg TNT anti-tank mines. Neither shrapnel nor blast can bend the axis.

ROBUSTNESS
Two times less support arms than for a squirrel cage tiller. At equal weight, twice thick arms, so much more robust !



MAINTENANCE
Two times less support arms than for a squirrel cage tiller. An easy access during possible repairs.

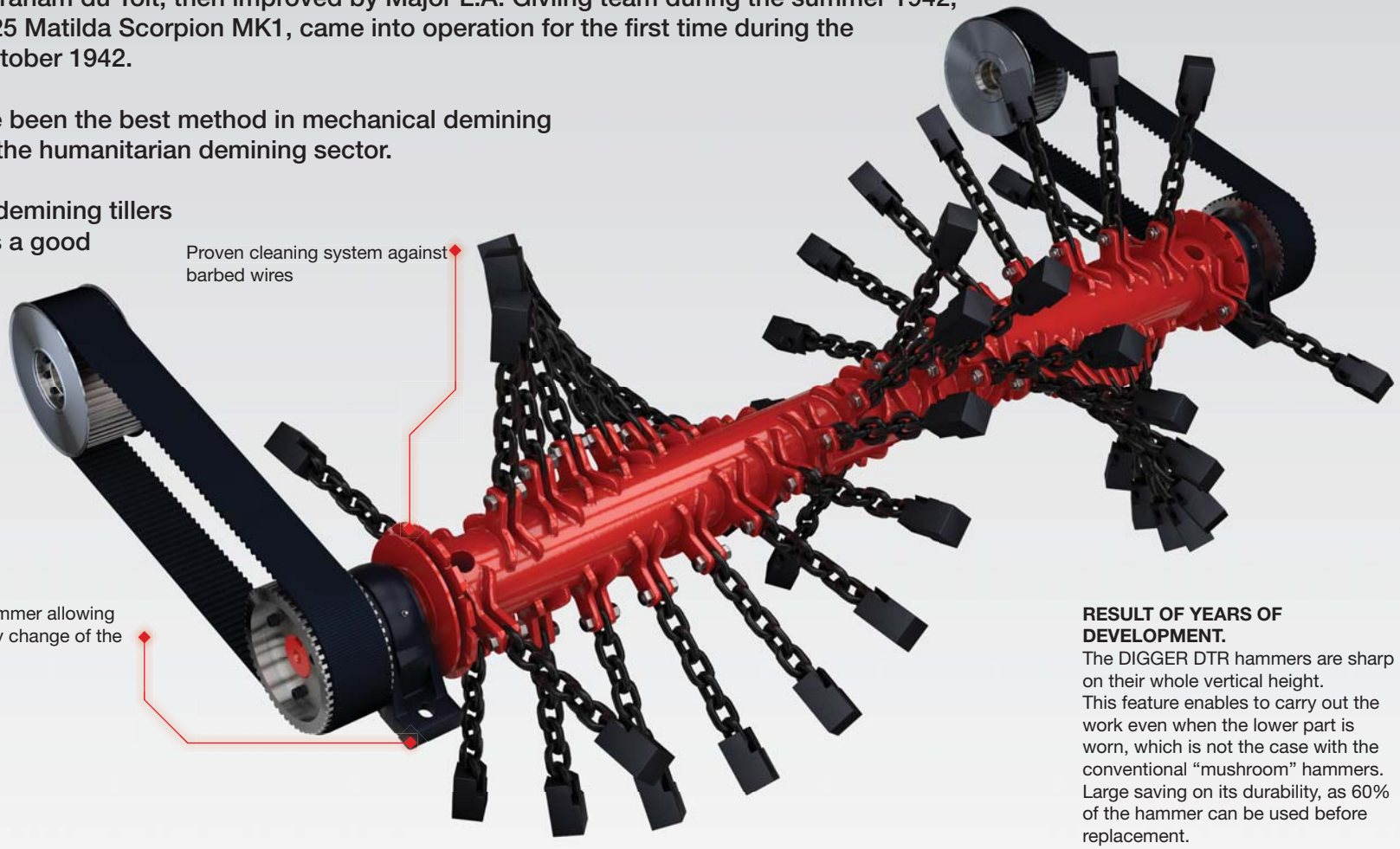
ROBUSTNESS
The tiller central axis is made of a high grade steel alloy whose walls have been doubled to stop the crack propagation.
It will not give away, even in case of induced punctures caused by high velocity fragments.

DIGGER DTR TOOLS - Demining flail

Mainly designed by Captain Abraham du Toit, then improved by Major L.A. Givling team during the summer 1942, the demining flail mounted on 25 Matilda Scorpion MK1, came into operation for the first time during the second El Alamein battle, in October 1942.

This tool has during a long time been the best method in mechanical demining and continues to be valued by the humanitarian demining sector.

Although outperformed by the demining tillers on most aspects, the flail offers a good resistance to explosion of anti-tank mines.



RESULT OF YEARS OF DEVELOPMENT.
The DIGGER DTR hammers are sharp on their whole vertical height.
This feature enables to carry out the work even when the lower part is worn, which is not the case with the conventional “mushroom” hammers.
Large saving on its durability, as 60% of the hammer can be used before replacement.

A flail improperly used can be hazardous as, at a too slow rotation speed, the chains are not tensioned and it will not dig at the desired depth. An imposed and high rotation speed of the flail of the DIGGER D-250 ensures a perfect digging depth, without any compromise.

The DIGGER DTR hammers consist of elements of very high grade and heat treated steel to improve hardness and reduce wear.

CATERPILLAR TOOLS

Caterpillar is the DIGGER D-250 standard compatibility for additional tools.
You can make your choice from the full range of products of the renowned manufacturer!


Bucket


Rear and front backhoe


Pushing blade

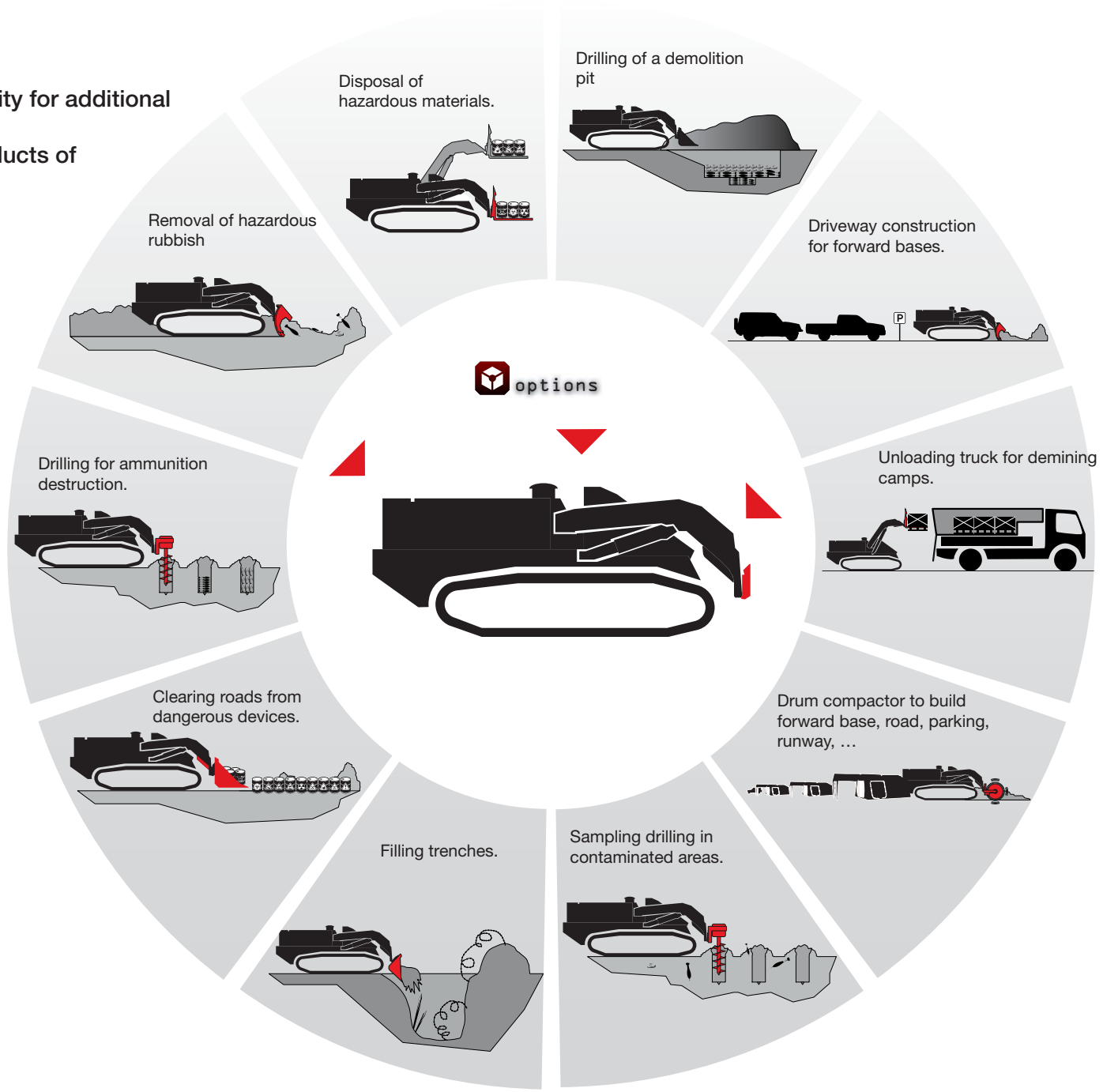

Trencher


Pallet forks


Vibratory drum compactor

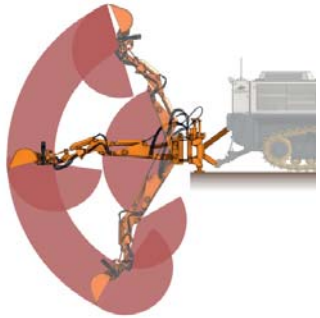

Jackhammer


Auger



CATERPILLAR TOOLS - Backhoe

Dig up and extract heavy and potentially dangerous devices.



Options :

- Simple backhoe with heavy duty bucket.
- + Option Gripper with rotary coupler.
- + Option Integrated cameras system.

Backhoe :

- Remote controlled through the DIGGER D-250 standard remote control.
- Digging depth maximum : 3 meters
- Digging depth 2438 mm (8 ft) flat bottom : 2.5 meters.
- Loading height : 2.2 meters.
- Reach from swing pivot at ground level : 3.9 meters.
- Total side shift travel : 0.8 meters.
- Stick breakout force : 1500 kg.
- Bucket breakout force : 3200 kg.
- Total weight : 1023 kg.
- Proportional hydraulic system

Option Gripper :

- Excavator to gripper shifting by simple flap of the one or the other, without manual intervention.
- Rotary coupler to guide the gripper.

Option Integrated cameras system

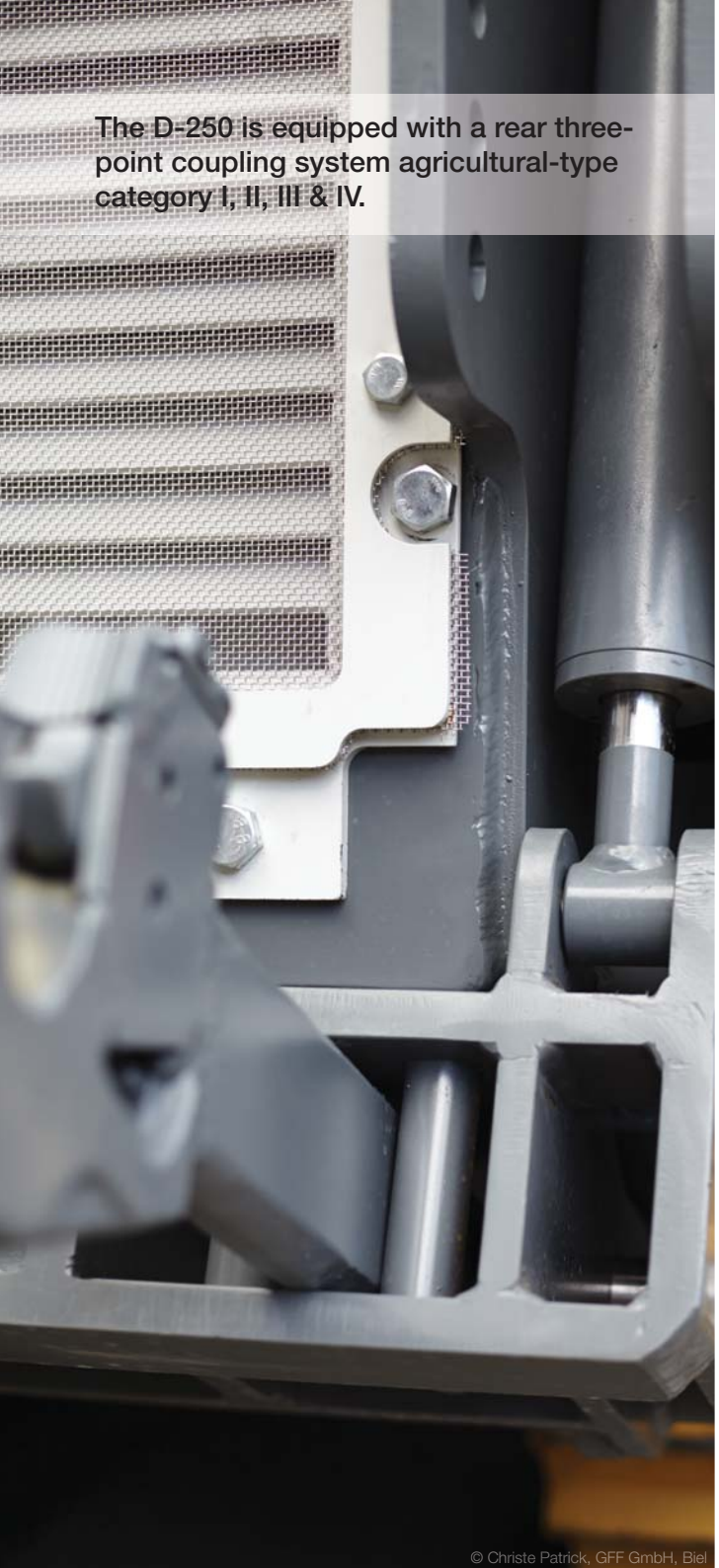
- A multiple cameras system for an ultimate visibility.
- Totally remote use (extending range of the remote control to several kilometres).
- Display on standalone field computer.
- Compatible with DIGGER DTR RTK-GPS (p. 48).

AGRICULTURAL TOOLS – Rear blade with forestry winch

Need a hydraulic winch, a bulldozer to clear rubbish ?

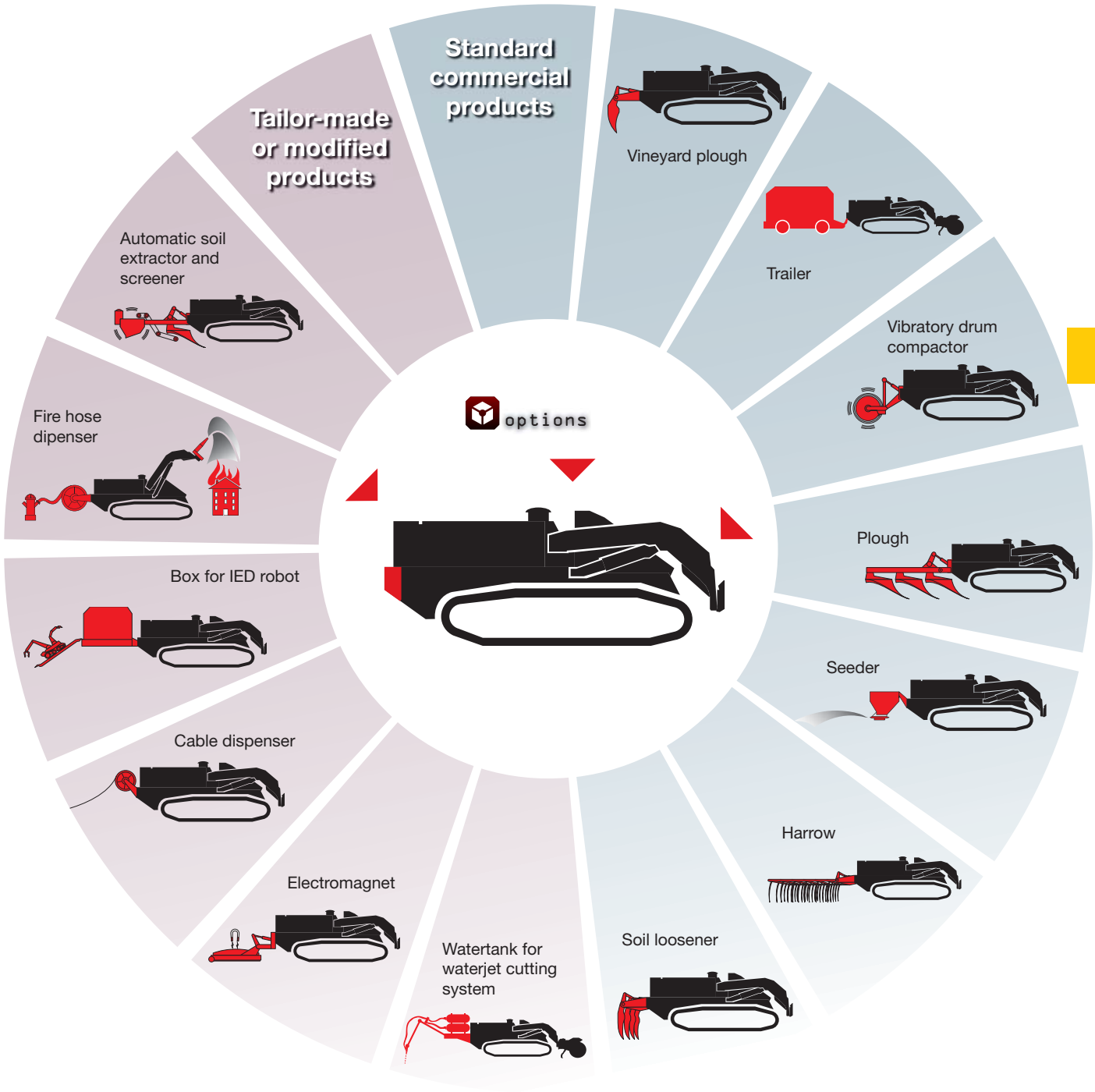
Equipped with its robust 1.6 m wide rear blade and with the 14 tons pulling capacity of the tracks, the D-250 turns into a real bulldozer.

A hydraulic winch with the rear blade.
- 5.5 tons pulling force
- 16.5 tons pulling force by using a pulleys and block system
- 100 metres of cable
- Automatic brake



The D-250 is equipped with a rear three-point coupling system agricultural-type category I, II, III & IV.

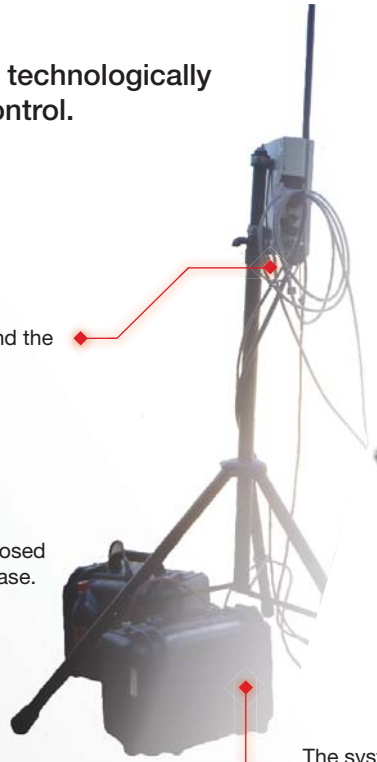
AGRICULTURAL TOOLS - Compatibility



DIGGER DTR OPTIONS – Cameras system

Three cameras: two in the front to monitor the work, one at the rear for manoeuvers.

The state-of-the-art cameras provide a technologically advanced image quality and lighting control.



If desired, relay stations allow to extend the operating range to more than 10 km.

In the field, a robust computer is enclosed in a highly resistant and waterproof case.

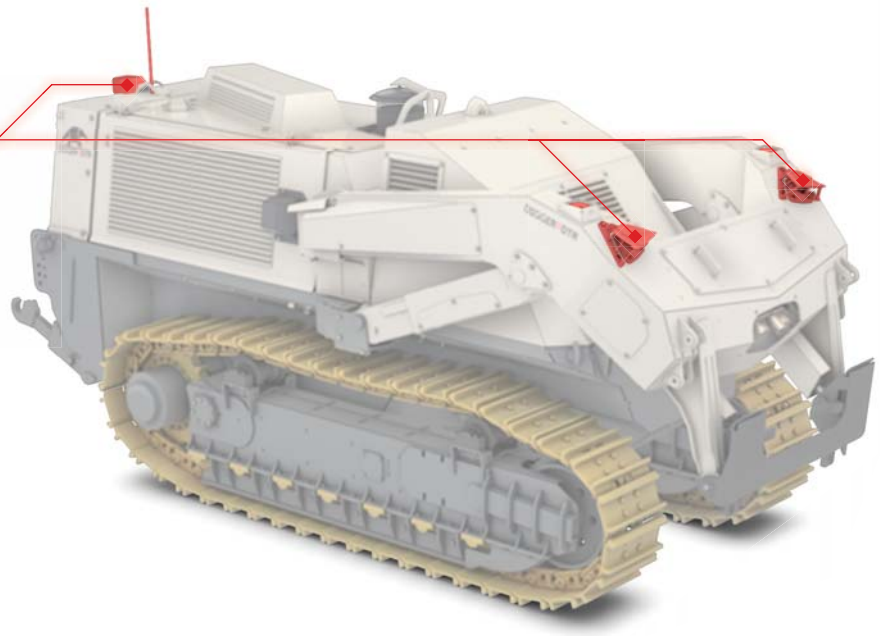
The system is perfectly autonomous. It is powered by a flexible functional and versatile power pack concept ensuring continuity of supply in all circumstances.

The DIGGER D-250 remote control connects easily to the user station merging that way the whole system.

Under cover or inside a building, the cameras images are displayed on several monitors for maximum visibility.

DIGGER DTR OPTIONS – Cameras system

The perfect cameras integration into the arms and the hood of the D-250 allows operating even in dense vegetation.



The DIGGER DTR cameras system is perfectly integrated into the machine. It merges both remote controlled datas and information supplied by the remote machine. At a glance, the pilot gets a full overview of his work.

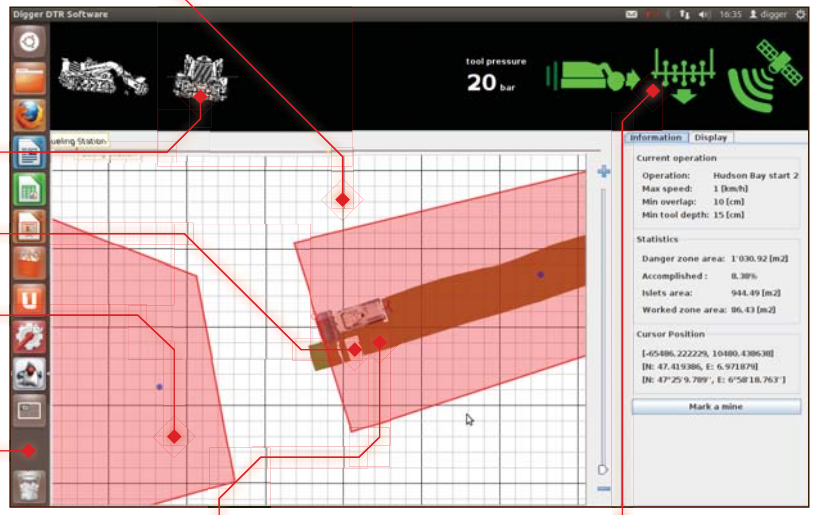
DIGGER DTR OPTIONS – GPS with centimetric accuracy (RTK)

The Real Time Kinematic (RTK) technology used for the DIGGER DTR GPS delivers an impressive 2 cm accuracy, the highest one available on the civilian market.

The DIGGER DTR GPS system allows :

- Piloting the machine with accuracy and without interruption, despite the dust generated by the demining tool.
- Piloting at a sufficient distance for the operators to work safely without wearing their personal protective equipment (reduce fatigue).
- Increasing labour efficiency by reducing overlapping by a factor of 3-4, while ensuring safely full coverage .
- Providing the supervisor with an automatic quality control by recording, every second, working data (coordinates, depth, advance speed, rotation speed of the tool, ...).
- Contributing to produce activity reports (daily, weekly, ...) in the assigned format by integrating automatically the required data (cartography, fuel consumption, downtimes, numbers,location and type of explosion, statistical records of the area covered and untreated, hourly output, costs tracking, ...).
- IMSMA compatibility (computerized tool for mine action information management developed by the GICHD)*

A piloting assistance tool allows the machine to remain on heading very precisely, even in total lack of visibility due to dust.



All the necessary information for piloting, such as the machine's slope value, the Diesel engine speed or the rotational speed of the demining tool.

An uncovered area is immediately marked.

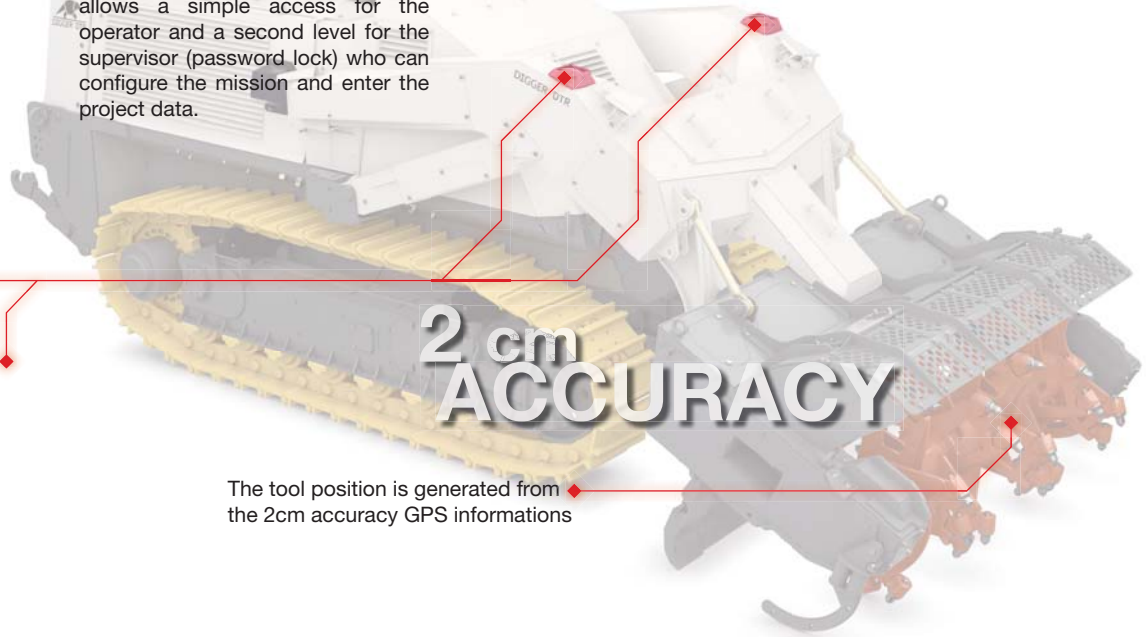
The areas to treat by the pilot are totally predefined by the supervisor.

If the system is operating together with the cameras, both images are spontaneously merged with the GPS data to provide a single use interface.

Only work matching with quality criteria is validated.

Every second, the work quality criteria are checked: advance speed of the machine, rotation speed of the tool, digging depth and GPS precision.

Very easy-to-use, the software allows a simple access for the operator and a second level for the supervisor (password lock) who can configure the mission and enter the project data.



The GPS antennas (2) are fully integrated into the machine avoiding the risk to be snagged by vegetation.

The tool position is generated from the 2cm accuracy GPS informations

* Information managment software for mine action, created by the GICHD.

ON-DEMAND TOOLS

It is possible that, despite the full range of options and tools proposed, you may not find the instrument suited to your needs.

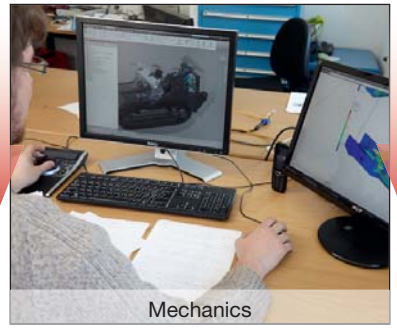
Our Research & Development Team is at your disposal to design tailor-made tools. Our workshops will then handle their production.

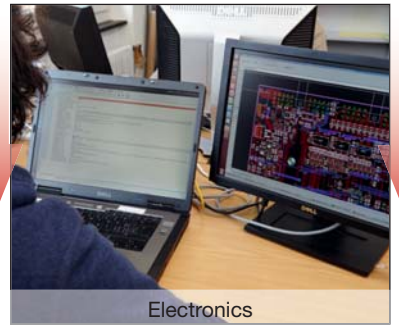

Research & Development Centre


Research & Development Centre

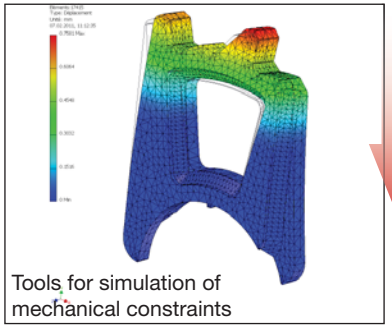

Tailor made products development


Hydraulics

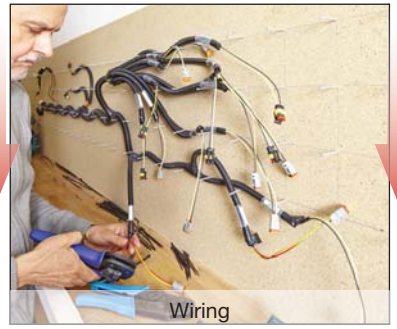

Mechanics


Electronics

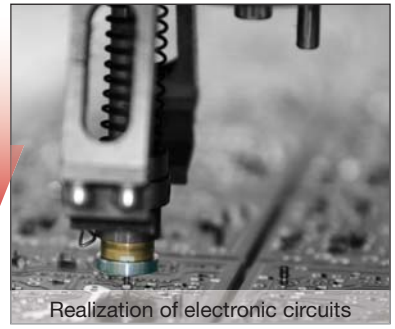

Software


Tools for simulation of mechanical constraints


Production of high-pressure hydraulic hose lines


Wiring


Mechanic welding

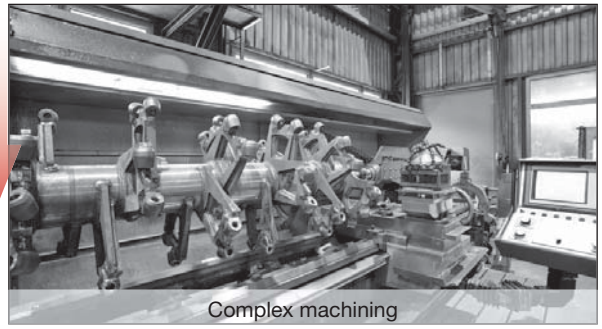

Realization of electronic circuits

We have FULL COMMAND of all these FIELDS

Our team of experienced engineers trained in the best Swiss schools is at your service.


Bending


Laser cutting


Complex machining

DIGGER DTR OTHER PRODUCTS

OTHER PRODUCTS - Kits

To simplify the tasks of logisticians, operations managers and buyers, DIGGER DTR proposes kits including ready-to-use components. Shaped by our field experience and the regular support provided to our customers, our kits are efficient, complete and especially adapted to the field conditions. Of course, each component can be obtained separately.

MACHINE CONSUMABLES

This kit contains various oils for the proper functioning of the machine: hydraulics, engine, gear, greases, fuel filters, hydraulic oil filters, air filters, engine oil filters, seals.
Depending on the countries, we offer a low-temperature (<35°C) and a high-temperature (>35°C) version.

Spare demining tiller complete kit

Contains one demining tiller, transmission belts, pulleys and bearings.

Spare demining flail complete kit

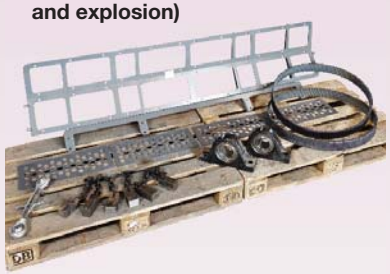
Contains one demining flail, transmission belts, pulleys and bearings.

SPARE PARTS

Demining tiller maintenance kit (wear and explosion)

Enables repairs and replacement of various elements. Contains: support arms, support pikes, secondary deflector shield, transmission belts, bearings, adjusting screws.

Demining flail maintenance kit (wear and explosion)



Contains: secondary deflector shield, transmission belts, bearings, adjusting screws.

Machine spare parts kit

Stock of spare parts for fast basic repairs in areas difficult to provision with supplies. Contains: fastenings, seals, belts, pulleys, water pump and diesel engine alternator, hydraulic pumps seals, clamp bearings, plugs, hydraulic hoses, shoes tool frame, antenna, antenna shielding, steel plates, hydraulic coils, electronic box.

Spare remote control

Including transport case, battery chargers and various recharging cables.

TOOLS

Specific tools kit

Special or specific tools for maintenance of the machine. Highly recommended.

Generic tools kit

Complements the specific tools kit and provides the user with the machine maintenance complete tools set.

Contains: generator, welding station, grinder, drill, vacuum, compressor, consumables, stands, protections, keys,…

WEARING PARTS

Digging pikes kit

For demining tiller. « Soft soil » or « hard soil » version. Contains: pikes with tungsten points and circlips.

Flail hammers kit

For demining flail. Contains: hammers with chains, screws and fixing nuts.

OTHER PRODUCTS - Kits & others

Extraction kit

A selection of tools for manual extraction if the machine becomes stuck. Contains: hand-winch, straps, return pulleys, shovels, crowbar, protections.

PERIODIC MAINTENANCE KIT

First 100 & 200 hours maintenance kit

250 hours / 6 months maintenance kit

500 hours / 12 months maintenance kit

1000 hours / 18 months maintenance kit

Ballistic protection shield

Protection of the operator against the fragments projected outward without hindering his work.

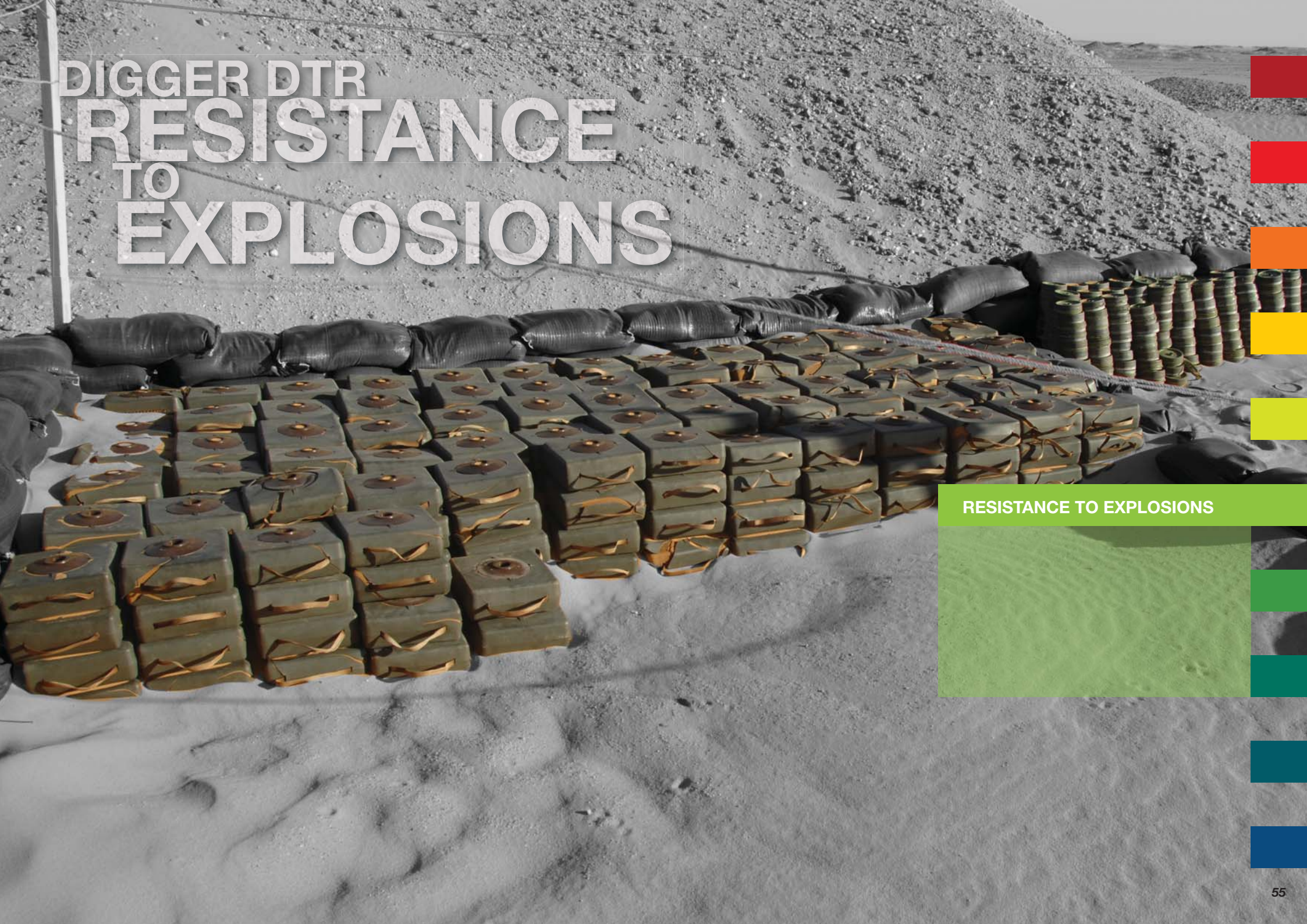
Thanks to its low weight and automatic legs system, and operator can easily transport and install it, even in difficult terrain.

Highly recommended for the personnel safety. Ballistic protection level: NIJ level III-A

Second-hand multi-lift truck

DIGGER DTR can arrange finding a second-hand truck (on the Swiss market) to transport your machine.
The Multi-lift concept with a platform is the most appropriate regarding logistics, costs and flexible use. It allows easy loading and unloading of your machine or the maritime container in which the machine is, even on difficult terrains.
DIGGER DTR provides a complete technical service adapted to the needs on the field.
For example:
- Technical servicing.
- Adaptation of tires to the soil type.
- Addition of padlocks for all the moving parts.
- Adjustment of ground clearance.
- Adjustment of underrun guard.

DIGGER DTR RESISTANCE TO EXPLOSIONS



RESISTANCE TO EXPLOSIONS

Optimised to withstand anti-personnel mines, the DIGGER D-250 successfully passed anti-tank mines tests.

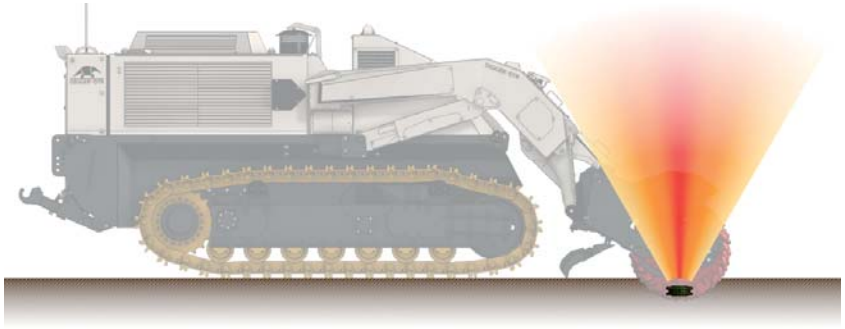
8 kg of TNT anti-tank mine (equivalent NATO, STANAG 4569 Level 3 Mine Blast Threat), SWEDEC Testing 2014, Sweden

1

2

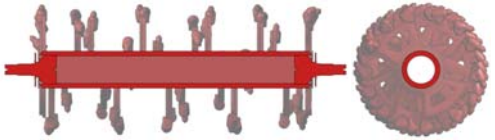
3

RESISTANCE TO EXPLOSIONS

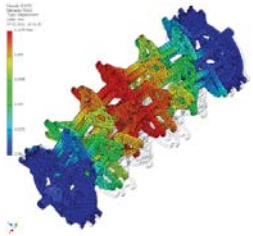


In the case of detonation, explosion occurs at the front of the machine, under the demining tiller. The computer graphics illustrates schematically the pressure cone generated by the explosion. As the tool is the only part exposed, the vehicle remains safe.

By its design, the « Twin-Pikes » demining tiller has a very open structure and therefore the effect of containment is considerably reduced. The gases resulting from the explosion are discharged generating minimum constraints to the tiller and the machine.



The structure of the Twin-Pikes tiller axis, double-walled and made of highly resistant steel, allows to withstand such explosions while incurring very little damage. Even perforated by fragments, the tiller remains rigid and the risks of bending are significantly reduced.



PROTECTION for the SURVIVAL of the vehicle

1

2

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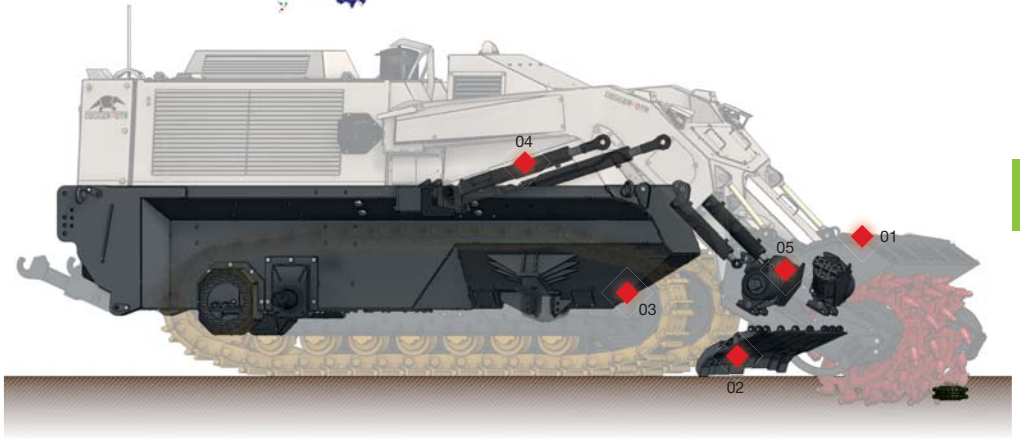


01 The **TOOL FRAME**, by its very resistant structure, provides shielding between the explosion and the vehicle.

02 The **REAR DEFLECTOR CURTAIN** , designed to follow the soil behind the demining tool, acts as a shield for any shrapnel blown in direction of the machine.

03 The **« V » SHAPE FRAME**, with a boat hull form at the front, drives out high-speed gases sidewise.

04 **HYDRAULIC PRESSURE RELIEFS** absorb the vertical shock generated into the arms.

05 A **DOUBLE WALL HIGH-RESISTANCE STEEL** protects the drive motors of the tool placed at the rear at a distance from the high pressure cone.

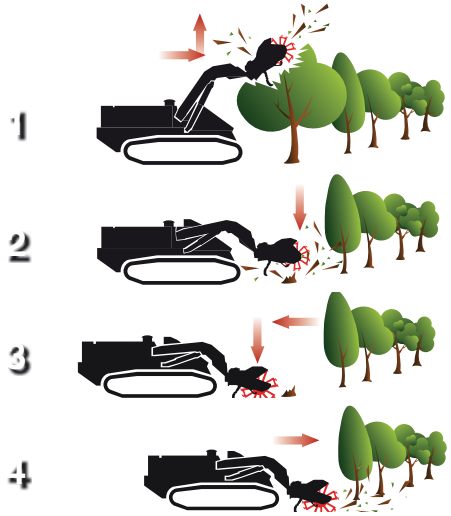
DIGGER DTR
PERFORMANCES

PERFORMANCES – Vegetation and dust

The demining tiller is also very efficient for vegetation grinding. Even large tree trunks can't resist to it.

It could be a very delicate exercise for a machine to operate in areas of dense vegetation. Fragile parts will certainly be torn away. The DIGGER D-250 has been designed to prevent any vulnerable part, such as hydraulic hose, to be within reach and visible from the outside.

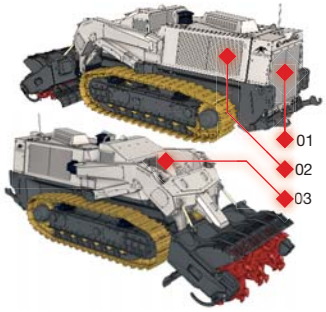
Its arm lifting capacity up to 4 metres height allows to work on the vegetation from the top, to cut trunks into chips within seconds and to finally attack the tree stump inside the soil down to a depth of 25 cm.



Dust is part of the natural environment in arid zones, it's unavoidable. Heavy dust can lead to mechanical constraints and piloting difficulty. The DIGGER D-250 has been specifically designed to remain efficient in such operating conditions.

The Diesel engine air intake is protected by a triple filtration system :

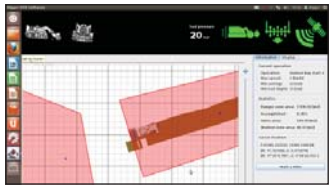
1) Maintenance-free centrifuge filter for heavy particles
2) Primary cartridge filter for medium particles
3) Secondary cartridge filter for fine particles



◆1 and ◆2 The blown air systems at the front and at the rear (option) are invertible to ensure a constant self-cleaning.

◆3 The front cooling system is oriented in such a way that the dust generated by the digging tool is discharged. In conditions of low and medium levels of dust, this allows to keep the machine visible by the pilot operating from a distance.

In case of high dust density, the GPS-RTK option (p.48) offers a complete control of the machine and allows the user to continue working without any loss of performance.

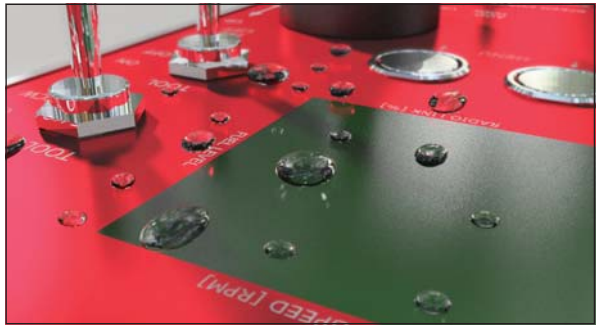


PERFORMANCES - Humidity and ambient temperatures

The wet areas are also a potential threat for the machines. DIGGER DTR took up the challenge.

The tracks of the DIGGER D-250 have been designed to delay as long as possible the risk of becoming stalled.

A perfectly balanced machine and the oscillating track system distribute optimally the ground pressure. The DIGGER D-250 is a true all-terrain vehicle.



The military-type external connection is built for extreme environments.

The inside of the machine, already well rain protected by the hoods, is also kept intact against moisture ingress. All electrical and electronic components are splash water-resistant.

The DIGGER D-250 has been designed to work in the hottest zones of the globe. It is also resistant to low temperatures.

Equipped with two separated and oversized cooling systems (rear Diesel engine, front hydraulic system), the DIGGER D-250 carries away the heat it generates.

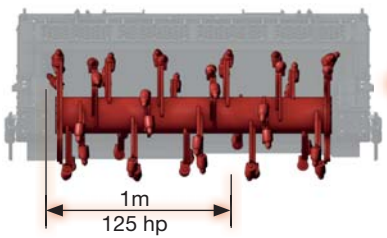
The ambient temperature, the temperature of the Diesel engine and the one of the hydraulic system are permanently monitored by the electronic system. It will take the appropriate measures to adjust.
If limits are exceeded, the pilot is immediately informed on the remote control and automatic protection measures are implemented.

For an efficient demining, a machine should use the maximum of its available power.

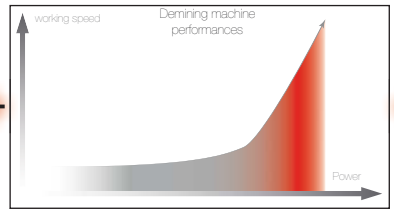
Up to a 50°C ambient temperature, the DIGGER D-250 can run at full power without needing to take a cooling break.

PERFORMANCES - Working efficency

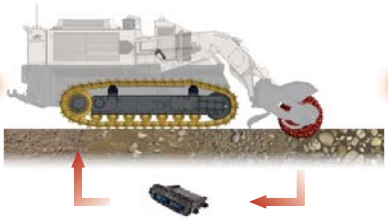
Efficiency is the key of an operation's success.



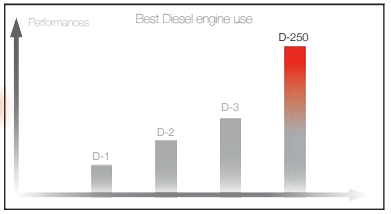
125 hp per tool metre, a power density among the highest.



Practice has shown that the efficiency of a demining machine is not proportional to its engine power.



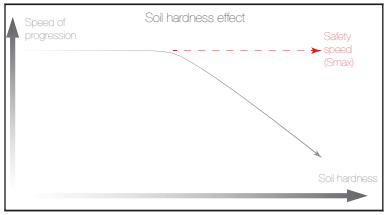
The automatic control system adapts the forward speed of the machine depending on the type of terrain. This ensures optimum efficiency of the Diesel engine.



THE DIGGER D-250 REALLY MAKES A DIFFERENCE...

...BUT NOT TO THE DETRIMENT OF SECURITY

A too high working speed does not guarantee a full clearance. Indeed, some mines can be "missed". The DIGGER D-250 takes into account this parameter: the speed may be reduced to avoid any risk



Examples of yields of the machine depending on soil types

Soft soil, no vegetation

Area per hour (without overlapping) : 1800 m² / hour

(Forward speed electronically limited to 1800 m² / hour to ensure work quality)

Stony soil, no vegetation

Area per hour (without overlapping) : 1500 m² / hour

Hard and dry soil, no vegetation

Area per hour (without overlapping) : 800 m² / hour

Stony soil, low-density vegetation

Area per hour (without overlapping) : 1200 m² / hour

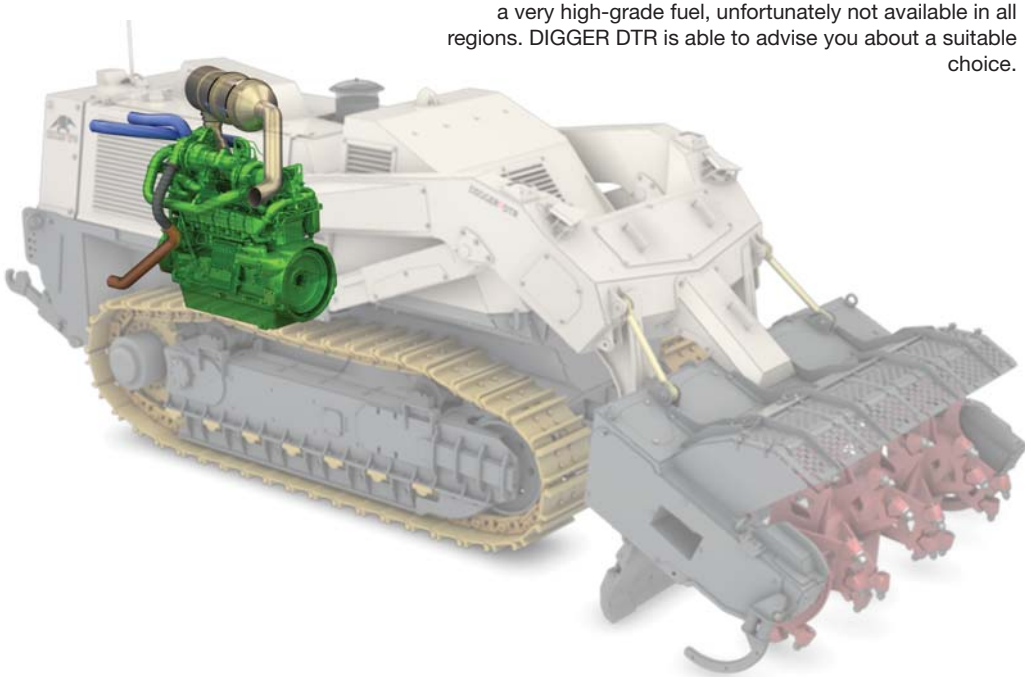
Stony soil, medium-density vegetation

Area per hour (without overlapping) : 1000 m² / hour

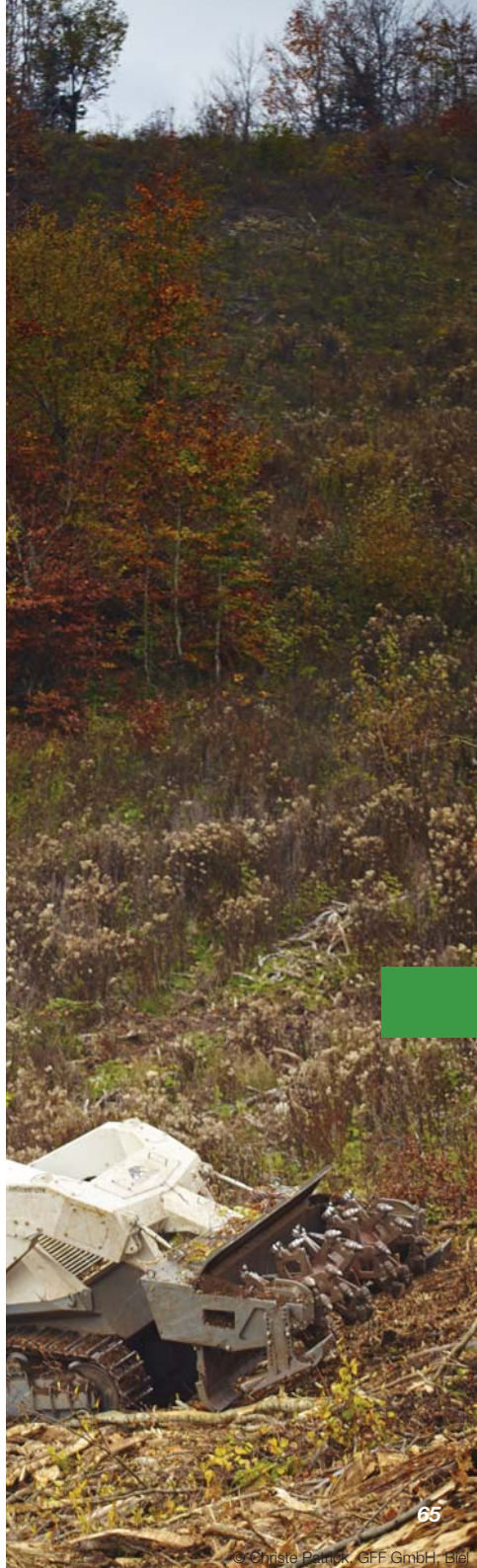
PERFORMANCES – Environmental protection

The pollution standards becoming increasingly drastic, the DIGGER D-250 can be equipped with an engine complying with the EURO III b exhaust emission standards.

Particle filters, exhaust gas recirculation and accurate temperature management of the Diesel engine are some examples of necessary components in order to comply with the current antipollution standards.



An engine complying with the EURO III b standards requires a very high-grade fuel, unfortunately not available in all regions. DIGGER DTR is able to advise you about a suitable choice.

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DIGGER DTR
LOGISTICS

LOGISTICS

LOGISTICS

Logistics was considered an integral part of the specifications when the DIGGER D-250 was conceived.

Starting from our assembly workshops up to the last kilometre leading to the minefield, everything is thought out to ensure efficiently its transport.

The DIGGER D-250 can fit into a 20' ISO shipping container or a LOCKHEED C-130 HERCULES ™ airplane without having to remove the demining tool.

For national transports, a truck equipped with a palletized loading system (Multi-lift) can be used to transport the machine and its parts kits without the need of a trail.

The 20' ISO shipping container can also be transported by this means.

The remaining space in the maritime container can be filled with the various kits, thus enabling the machine to be immediately operational upon its arrival. Reduced transport cost, modularity, speed, this is the most efficient means of international freight transport.

The last kilometre from the unloading of the truck to the minefield can be done easily by piloting the DIGGER D-250. Its 6 km/h maximum forwarding speed does not slow down the pilot who is walking behind.


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TECHNOLOGIES DE DEMINAGE
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TECHNOLOGIES DE DEMINAGE

DIGGER DTR SERVICES

DIGGER DTR SERVICES

DIGGER DTR is proud to maintain the best service possible for its customers, even years after the purchase. For us, the customer service is not a detail once the sale has taken place, we make it a point of honour.

Our stock of spare parts covers an area of 250 square metres. Its thousands parts are monitored in real time by a powerful computer system.

Whether handling large parcels or not, DIGGER DTR is specialized in international shipments and their logistics management. Years of experience make the difference.

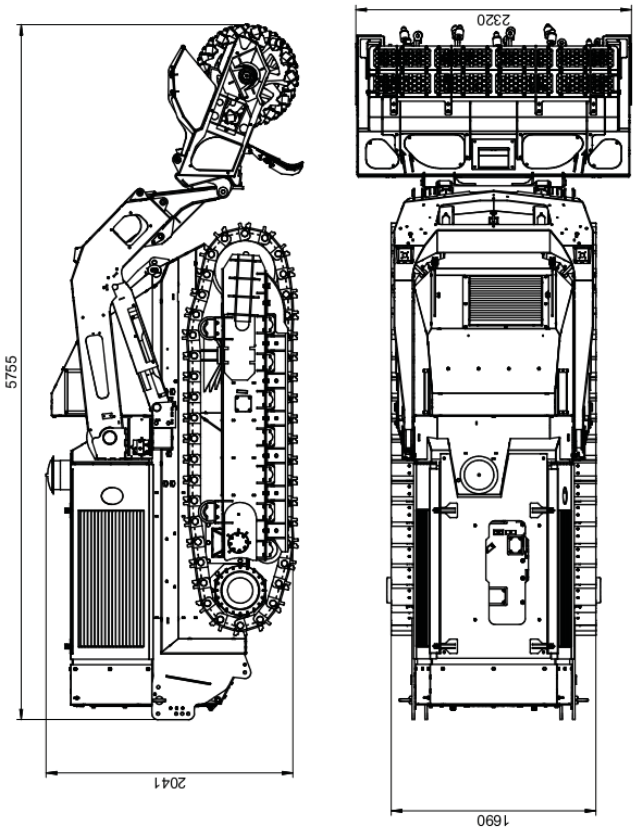
Each customer benefits of a free phone support throughout his machine's entire service life.
Our after sales service allows on a permanent basis to provide an immediate support to our customers.

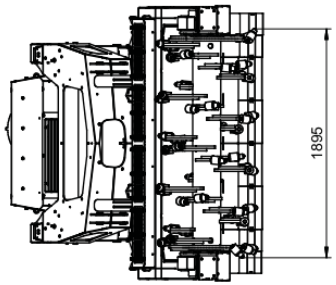
Wherever you are operating, our customer service technicians will assist you.

We view the training of our customers as the key to the success of an operation. We offer a tailor-made training, best suited to the skill levels of your staff. We can also assist you in the recruitment and certification of your staff as well as in developing Standard Operating Procedures (SOP).

DIGGER DTR
DATASHEET

DATASHEET





DIMENSIONAL DATA

Overall length, with tool	5755 mm
Overall width, vehicle	1690 mm
Overall width, tool	2320 mm
Working width	1895 mm
Height	2041 mm
Fits in 20' container	Yes
Mass, vehicle alone [with fuel & lubricant]	9790 kg
Mass, working tool with frame [Tiller]	2120 kg
Mass, total [with tiller]	11910 kg

UNDERCARRIAGE SPECIFICATION

Track	Steel
Ground pressure	0.56 kg/cm^2
Ground clearance	0.3 m
Undercarriage type	Oscillating
Maximum slope	35°
Maximum slant	30°
Maximum forward & backward speed	6 km/h
Track control modes	Variable speed drive
	Fixed speed increments
	Load sensing
Track pulling force	14 tons

REMOTE CONTROL

Maximum operating range	500 m
Transmitter battery autonomy	> 20 h
Possible power source	220 V - 110 V - 24 V - 12 V
Vehicle parameters display feedback	Yes

FRONT TOOLS

Quick coupler type	Caterpillar
Demining tools [can be used with the same frame]	Tiller
	Flail
Digging depth capacity	+5 to -25 cm
Digging depth control	Automatic , skids or sensors (optional)
Tool displacement range, from shoe	+4 to -0.5 m
Other tools	Caterpillar bucket
	Caterpillar forklift
	Caterpillar blade
	Caterpillar tools

REAR TOOLS

Quick coupler type	Agricultural
Tools	Reinforced blade
	Winch
	Backhoe

ENGINE SPECIFICATIONS

Engine type	John Deere, 6 cylinders
Displacement	6800 cm^3
Engine max power [ISO-3046, 2534]	250 hp at 2200 RPM
	186 kW at 2200 RPM
Engine max torque	1025 Nm at 1400 RPM
Average fuel consumption during operations	30-35 L/h
Fuel consumption at full power	43-47 L/h
Fuel tank available capacity	225 L
Fuel autonomy [at average fuel consumption]	8 h
Cooling system	Liquid cooling
Cooling fan flow inversion	Yes, automatic (option)
Lubrication oil capacity	32 L
Emission standards [two options]	Euromot 3 : Stage II
	Euromot 3 : Stage IIIb
Max. ambient temperature without power derating	50°C

HYDRAULICS

Oil tank capacity	160 L
Pumps & motors brand	Bosch-Rexroth™

ARMOURING

Hull & undercarriage	10 mm Quard™ 400
Tool frame	10 - 8 mm Quard™ 400
Fairing & arms	10 - 8 - 4 mm Quard™ 400

VEHICLE ELECTRICAL SYSTEM

Battery voltage	24 V
Battery capacity	120 Ah
Equipment safety monitoring & protection	Engine oil level
	Hydraulic oil level
	Engine temperature
	Hydraulic temperature
	General internal temperature
	Fuel level
Embedded electronics	Diagnostics LED display
	CAN bus diagnostics
	Plug and Play
Additional options	Remote camera system
	Centimetric accurate GPS
	Digging depth sensor
	Reversible rear fan

Photos:
- © Christe Patrick, GFF GmbH, Biel
- Arnaud Bernardin (LQJ)
- DIGGER DTR

CG images:
- V3D, Alain Mathez

Video
Presentation
DIGGER D-250

Video
AT mine explosion

Video
Vegetation clearance

Video
Backhoe (base)

Video
Backhoe (with options)

Video
GPS camera

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