210 kW (282 HP) at 2100 rpm

(Straight / full turn) 17.8 / 15.5 t

3.5 ~ 4.5 m^3

DL420A | Wheel Loader

DL420A

DL420A – A POWERFUL WHEEL LOADER

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DO YOU WANT LOWER RUNNING COSTS, THE MOST EFFICIENT TECHNOLOGY AND FIRST-CLASS OPERATOR COMFORT?

The key phrase used during the development of the DL420A was "giving optimum value to the end user". This translates, in concrete terms, into:

- Increased productivity thanks to the use of the powerful 11 litre engine and the excellent synchronization of the drive train with the hydraulic system
- Improved ergonomics, increased comfort and excellent all-round visibility ensuring safe and pleasant working conditions
- Improved reliability through the use of new high-performance materials, the development of new computer-assisted design techniques and by intensive and systematic test programs. All of these combine to increase the life of vital components and reduce operating costs
- Reduced maintenance increases uptime and reduces operating costs

TAKE A TOUR

COMFORT AND CONVENIENCE

- Spacious, comfortable cab
- Large storage compartments
- Large windows for better visibility
- Rear screen antenna
- Air suspension seat, rear view camera, heated mirrors (optional)

Cooling compartment separated from the engine compartment to prevent warm and dusty air from entering and allow better control of air intake

3-stage air filter with Turbo 3 cyclone dust separator

POWER AND FUEL EFFICIENCY

- Doosan DE12TIS engine (210 kW at 2100 rpm)
- High torque at low rpm for better response
- Clutch cut-off via brake pedal
- 4-gear transmission

"Lift arm raise kick-out" and "return to dig" functions

Hydraulically driven fan as standard

Wide range of attachments

Load isolation system (option)

3rd spool (option)

Latest generation ZF axles with automatic limited slip differentials

Fenders, radiator grille, engine bonnet and other parts made of robust steel

Clean, solid articulation hinge design

4-gear ZF powershift transmission with automatic and manual shift modes

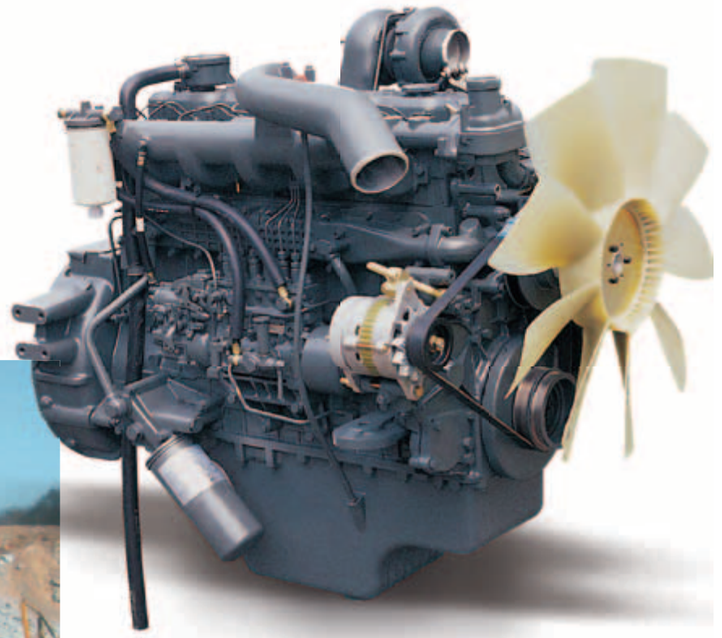
Easy access to maintenance components from the ground

DL 420A

More power that lifts productivity to new heights

Strength and intelligence – a winning combination

Exceptional power combined with the finest workmanship results in a machine that will perform at the highest level. The DL420A enhances your output from every angle. Impressive digging power and high traction make penetration easy and allow you to tackle the hardest materials.
Work is quick and efficient with a powerful hydraulic system.



AIR-TO-AIR INTERCOOLER ENGINE

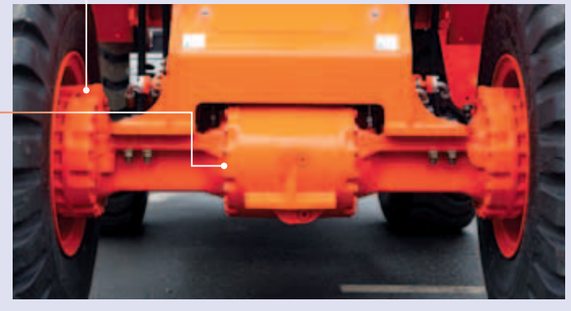
- Highly efficient, delivering the highest power output in its class
- Environmentally friendly
- Meets U.S. EPA Tier II regulations and European Stage II regulations governing the reduction of harmful NOx and PM emissions

Automatic transmission
The transmission is particularly smooth and the gear ratios are optimized. There are no shocks, resulting in an appreciable level of comfort for the operator. The traction force is optimum under all working conditions.
The combination of these characteristics enables the loader to maintain high speed under all conditions, enhances breakout forces and thus optimizes bucket filling at each cycle.

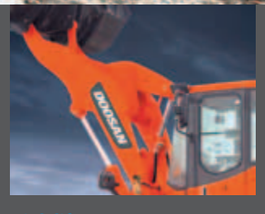
The transmission has three modes of operation:
• Manual
• Automatic (automatic shift for all gears)
• Semi-automatic (automatic with a “kick-down” for first gear)

Axles
Improved internal oil flow greatly reduces the temperature difference between the hub and the differential, as well as prevents premature disc wear due to overheating of the internal hub components.

Limited-slip ZF differential
The front and rear axles are fitted with limited-slip differentials.
This automatically ensures maximum tractive effort and easy driving over soft and muddy ground. It also reduces the risk of skidding and, at the same time, prevents excessive tyre wear.
The brake discs integrated into the planetary reduction gears in the hubs are metal reinforced, ensuring long hours of operation and reduced maintenance.

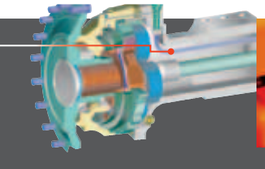


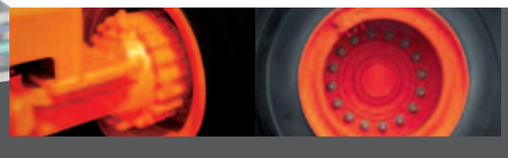
Hydraulic power steering
Works with a flow amplifier and priority valve. And the emergency steering system (option) is a safety feature in the event of a malfunction of the steering system while travelling.



High lift
Better dump reach and height at bucket pivot point.

The brake piping has been integrated into the axle housing and is protected from damage from external shock when the machine drives over rough terrain.





Increased axle durability and machine stability
The brake discs have been repositioned to the rear part of the reduction gear where the rotation speed is lower. As a result, the discs are exposed to lower rpm, heat generation is reduced and the life span of the discs is greatly extended. This positioning provides excellent machine stability. An automatic disc clearance regulator has been integrated into the design and the disc clearance is maintained at the optimum level at all times as the discs wear out. This prevents any lag in brake response. Another convenient feature is that brake disc wear can easily be measured without disassembling the hub.

Comfort at its best – take a seat!

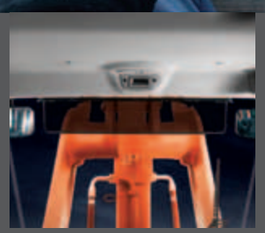
The workspace you've always wanted

The productivity of your wheel loader is directly linked to the operator's performance. That's why Doosan has placed comfort at the very centre of its design priorities for the DL420A. More space, better visibility, air conditioning, a comfortable seat and plenty of storage space make it easy to work for hours without fatigue or discomfort. There's no need to pay extra for the options you want – most of them are standard features on this loader.

Air conditioning & defroster system
Double filtered air cab, air ducts are distributed throughout the cab with proportional sensitive controls and air re-circulation facility. We offer the same comfort as a passenger car.

Air-suspension seat (option)
The DL420A is equipped with a very comfortable, fully adjustable seat.

Precise control levers
Different options are available to match what the operator is accustomed to as well as an optional auxiliary lever.



Sunvisor & room mirror
Featured as standard for extra comfort when operating.

Steering column
The steering column is adjustable for reach and rake and features both tilting and telescopic functions.

Arm rests
Correct positioning with clear controls makes the operator's task easier.

Central indicator panel
A high-visibility indicator panel allows the operator to check essential loader functions.

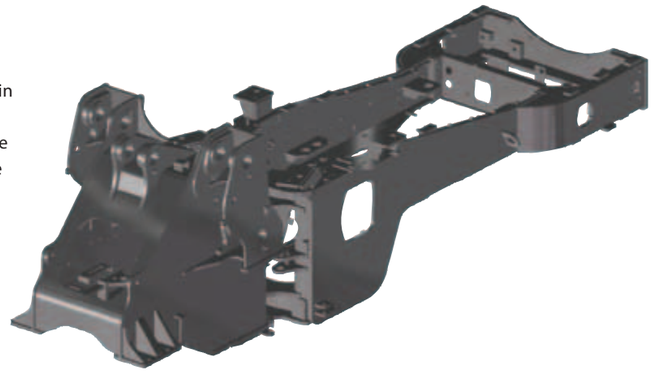
Lateral console
The ergonomically laid out switch panel in line with the natural movements of the body allows very convenient operation. Provision is made to install switches for additional equipment if required.

Doosan reliability – whatever the job!

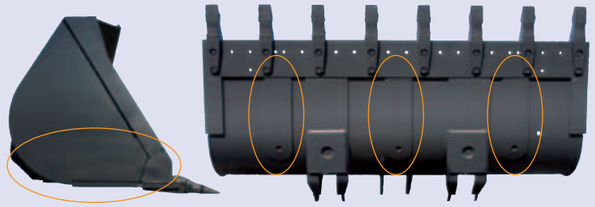
Dependable performance for low lifetime cost

Doosan has been building heavy construction equipment for 40 years. This long experience is reflected in the superior design and development of our wheel loaders as well as by an extensive logistics network. The operator knows that the DOOSAN loader is a tough, durable product with large power reserves, which he can rely on to work for long periods.
For DOOSAN, reliability means simplicity of design, durability and maximum uptime.

Designed to last
We pay the highest attention to the design and manufacture of structural components.
Finite Element Analysis is used to ensure an extended lifetime for main structures such as the chassis, joints and lift arm. After modelling, they are subjected to intensive laboratory and field testing in extreme conditions. Ongoing statistical analysis is used to continually increase the level of reliability.



Reinforced bucket
The lower and side panels of the bucket have been reinforced with additional plates.
Reinforcements:
• On both sides - 1 area
• On lower panel - 3 areas



ORFS - all ports
To ensure perfect tightness, all ports, even the low pressure ports which are used for the pilot lines, are ORFS type.

2-Piece type tooth
(Pin-on-tooth + bolt-on adapter)

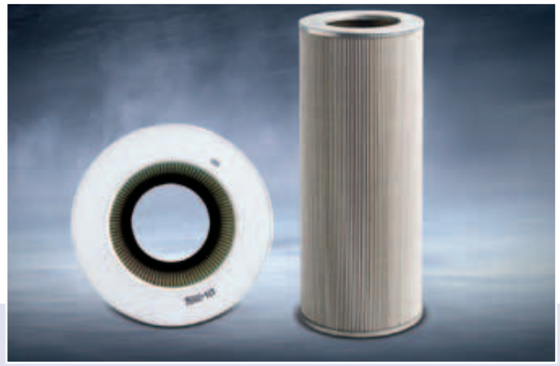
Radiators installed on rubber mounts
The aluminium radiators are installed on rubber mounts to effectively dampen vibration.

Propeller shaft
A cover has been fitted to protect the oil seal from dust and foreign objects, thus wear and damage are reduced.

Radiator grill
The radiator grille is made of reinforced steel for increased shock resistance.

Easy maintenance for more uptime

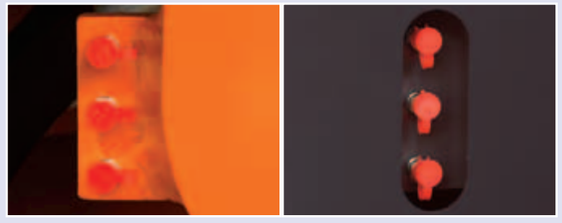
A liquid crystal display conveys information about the ZF transmission. At the same time, it reports the nature of any problem. When servicing the loader, a special tool can be used to adjust the clutch discs to compensate for their wear. Additionally, by connecting a laptop computer, a complete transmission diagnostic can be performed.
Short and simple maintenance operations at long intervals mean that your machine is available on site when you need it. Our service centre in the heart of Europe has more than 40000 parts in stock to supply you with top quality components as quickly as possible.



Hydraulic oil return filter
The hydraulic oil return filter, made of glass fibre, eliminates up to 99.5% of foreign particles. It effectively protects the hydraulic circuit and extends service intervals.

Central joints
The central joints of the machine are particularly robust.
The attachment points are positioned to withstand bending and torsion forces. A large amount of space has been left to allow easy access to internal components.

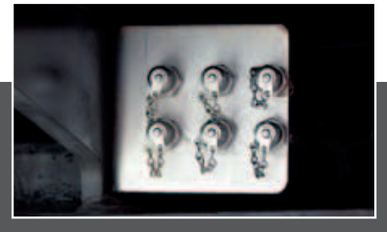
Air cleaner
The forced-air cleaner removes 99% of particles. It is preceded by a high capacity Turbo pre-filter. The cleaning and cartridge replacement intervals are very long.



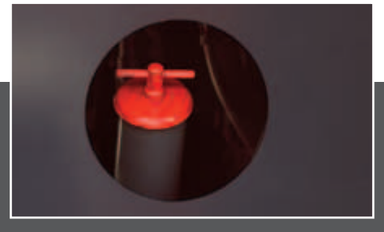
Remote greasing ports
The front pins can be lubricated from the outside of the machine without having to crawl under it or make awkward movements to reach the lubrication ports.

Easy access
All maintenance and control points are easy to reach from ground level.

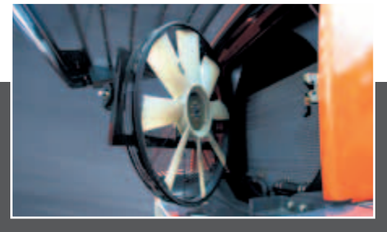
Transmission filters
The transmission filters are easy to reach and can be checked from ground level, like all other maintenance components.



Hydraulic test points
The pressure test points (main pressure, steering, braking, etc.) are grouped together for easy access.



Convenient transmission oil filling
The oil filler pipe is located near the articulation joint for easy access.



Reversible fan
The radiator fan is reversible to make cleaning of the coolers easier when the machine is operating in dusty environments.

Transmission diagnostics
The laptop PC "monitoring" function allows the status of the transmission to be checked very easily. Disc brake wear is automatically compensated and can be checked without disassembly.

Remote engine oil & coolant drain
Remote drain valves have been installed in an easily accessible location for convenient draining of fluids. (coolant, engine oil)

Large capacity transmission oil cooler
The large capacity transmission oil cooler ensures durable and stable operation of the transmission.

Technical specifications

DL 420A

✱ Engine

• Model

DOOSAN DE12TIS
The high performance Doosan DE12TIS 6 cylinder, direct injection, turbo charged, air–air intercooler engine offers low fuel consumption and low exhaust emissions, which are well below the requirements of the Tier II legislation.

• No. of cylinders

6

• Rated power (Net)

206 kW (276 HP) at 2100 rpm (SAE J1995)

• Rated power (Gross)

210 kW (282 HP) at 2100 rpm (SAE J1995)

• Maximum torque (Gross)

130 kgf/m (1275 Nm) at 1200 rpm

• Engine rpm low / high

975 ± 25 / 2350 ± 50 rpm

• Piston displacement

11051 cm^3

• Bore x stroke

123 mm x 155 mm

• Starter

24 V / 6.6 kW

• Batteries

2 x 12 V / 150 Ah

• Air filter

3-stage air filter with Turbo 3 cyclone dust separator

• Cooling

Reversing fan to facilitate cleaning in manual mode

✱ Lift arm

Z-kinematics with simple lifting piston system designed for heavy duty (20 ton with a 3.9 m^3 bucket). The breakout force combines with a bucket angle that is maintained throughout the range of movement. Bucket angles are optimised in the travelling position and at ground level. Load Isolation System (LIS) can be fitted for improved comfort and output (optional).

Cylinders	Quantity	Bore x rod diameter x stroke (mm)
Lift	2	180 x 95 x 928
Bucket	1	200 x 105 x 600

✱ Transmission

4-Gear powershift transmission with 3 operating modes: manual, fully automatic or semi-automatic with "kick-down" function. Based on high quality components. Equipped with a modulation system for protection and smooth gear and direction changes. A manual transmission control lever is located to the left of the operator. Direction change function also available in automatic or semi-automatic mode. The transmission can be disengaged by the brake pedal to deliver full engine power to the hydraulics. A safety device prevents the engine from starting if the transmission is not in neutral.

• Gearbox

ZF 4 WG 260

• Torque converter

Simple stage / mono phase / fixed wheel stator
4 Speed, full auto power-shift, countershaft, engine mounted with flexible plate
Stall ratio: 2985

• Speeds km/h (Tyre 26.5-25-20PR - L3)

Forward 1 / 2 / 3 / 4: 8.3 / 13.6 / 29.0 / 40.0
Reverse 1 / 2 / 3: 8.3 / 13.6 / 29.0

• Maximum traction

21.5 ton

• Maximum gradeability

58% / 30°

• Braking distance

13.8 m at 40 km/h

• Breakout force

197 kN (20 ton)

✱ Axles

• ZF Axles

Fully suspended front and rear drive axles with planetary reduction gears in the hubs. Front and rear equipped with limited slip differentials. Optimum traction in all conditions. 21.5 ton traction power allows operation on slopes of 58%.

• Differential lock ratio

Front (30%) / Rear (30%)

• Oscillation angle

+/- 12°

• Brakes

Dual multi-disc circuit with sintered metal discs for extended service life. Braking system activated by a pump and accumulator circuits. Spring-applied, hydraulically released parking brake mounted on the transmission shaft.

✱ Hydraulic system

The hydraulic system consists of tandem vane pumps.
The hydraulic control valve (2 spools) has a third port for powering an auxilary hydraulic function (option) and is controlled by standard single lever.
All hydraulic lines are equipped with special seals (ORFS).

• Main pumps

Tandem vane pump

• Maximum flow (with / without steering)

240 / 434 l/min

• Operating pressure

250 kgf/cm^2 (200 bar)

• Pilot system

Automatic functions for positioning the bucket for digging as well as a function for stopping the lift arm at the desired height and low position by manual adjustment are standard. A simple levelling function is also standard.

• Filters

In the oil return to the tank, the glass fibre filter has a filtering capability of 10 micron.

• Loading cycle (seconds)

Lift arm: up: 6.0 / down: 4.2
Bucket dump: 1.3

✱ Steering system

Sensing type with flow amplification valve and priority valve.

• Steering angle

40°

• Oil flow

194 l/min

• Steering cylinders (2)

Emergency steering system with electric motor-driven hydraulic pump (option).

Cylinders	Quantity	Bore x rod diameter x stroke (mm)
Steering	2	100 x 50 x 450

✱ Fluid capacities (litres)

Fuel tank:	367
Cooling system:	50
Engine oil:	25
Front axle:	45
Rear axle:	42
Gearbox and converter:	54
Hydraulic system:	265

✱ Cab

Spacious modular cab with excellent all-round visibility, ample storage space and cool box. Good overview of the bucket, tyres and loading area. Push button controlled air conditioning and heating with air recirculation function. Double cab air filter installed in the cab with extra protection for the operator in dusty or polluted environments. Viscous suspension mount for maximum comfort. High quality seat with air suspension (option). All operating information clearly displayed in front of the operator. Control functions are centralised on a console on the right. Adjustable seat, arm rests and steering column.

• Doors

1

• Emergency exits

2

• Safety standards

ROPS ISO 3471:2008 - SAE 1040
FOPS ISO 3449 - SAE J231

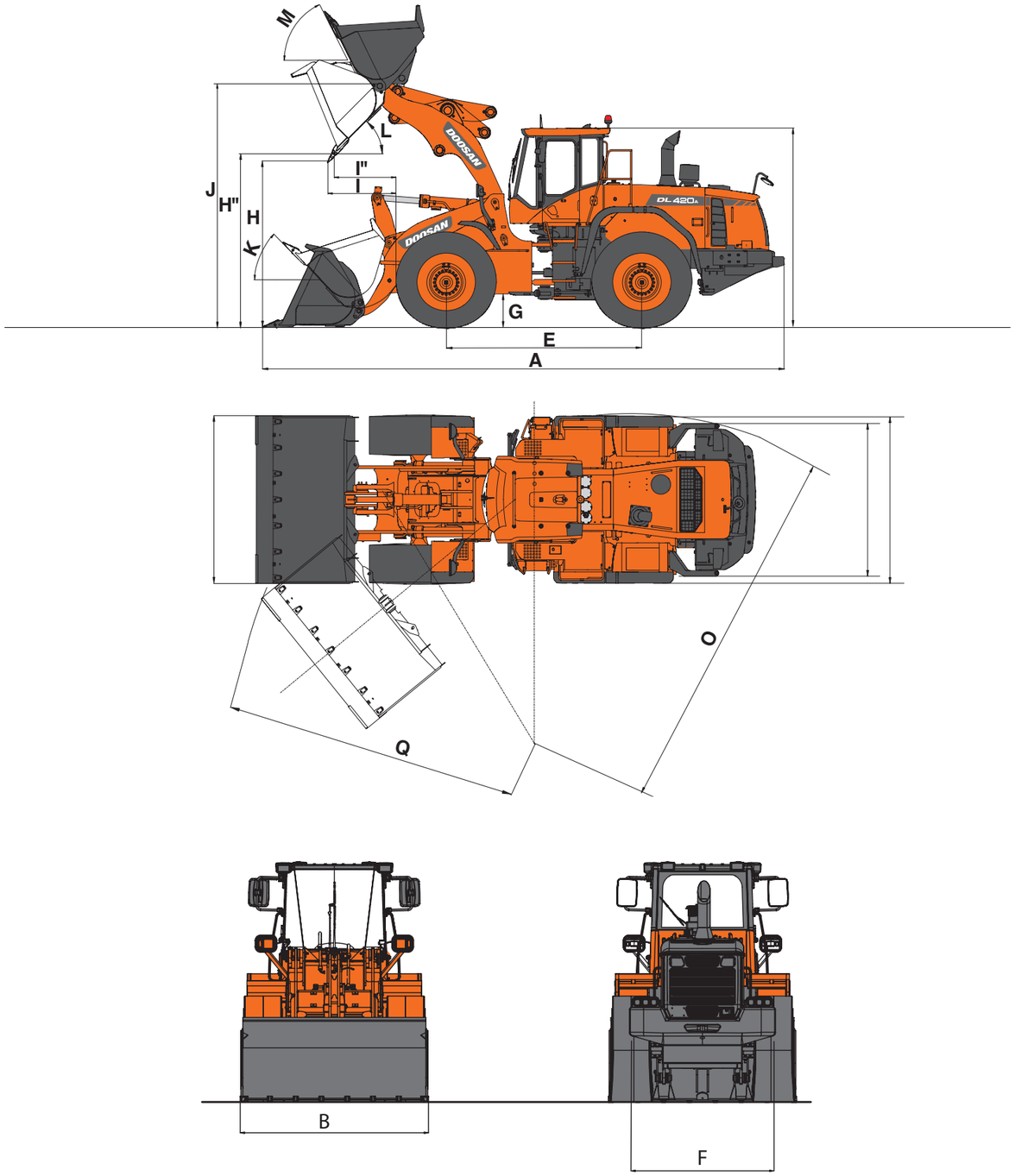
• Noise levels

LwA external noise: 112 dB(A) (ISO 6395, 2000/14/EC)
LpA operator noise: 74 dB(A) (ISO 6396)

✱ Pressure settings

Working (pump cut-off):	200 ± 10 bar
Steering relief (LS port side):	185 ± 5 bar
(steering pump side):	210 ± 5 bar
Pilot control:	28 + 2 bar
Brake accumulator charging:	120 bar
Service brake:	80 ± 3 bar
Fan motor:	170 ± 10 bar
Parking brake release:	120 ± 5 bar
Transmission selection pressure:	16~18 ± 1 bar

Dimensions and operational data

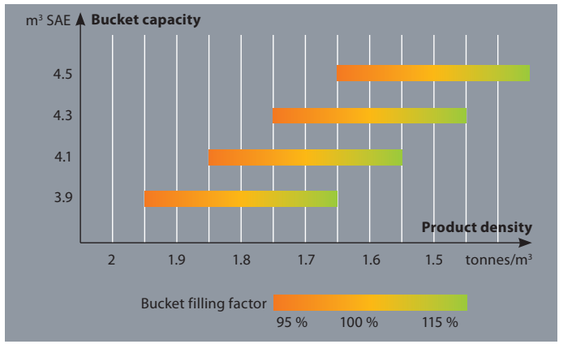


✱ Dimensions & operational data

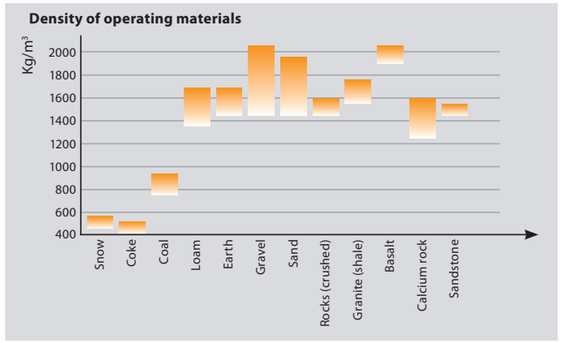
Bucket mounting			Pin-on										
Tyre size 26.5-25-20PR (L3)			General purpose								Rock	Light material			
Configuration			Teeth	Teeth	Teeth	Bolt-on edge	Bolt-on edge	Bolt-on edge	Teeth	Teeth & Segments	Teeth	Teeth	Bolt-on edge	Teeth
	Capacity heaped ISO/SAE	m^3	3.7	3.9	4.0	3.9	4.1	4.2	3.9	4.1	3.5	4.3	4.5	4.5
	Tooth type	-	Adapter tooth	Adapter tooth	Adapter tooth	-	-	-	Mono tooth	Adapter tooth	Adapter tooth	Adapter tooth	-	Mono tooth
B	Bucket width	mm	3040	3200	3270	3040	3200	3270	3200	3200	3230	3200	3200	3354
	Breakout force	kN	198	197	197	197	196	196	197	195	196	183	181	170
	Static tipping load (straight)	kg	18030	17840	17820	17830	17670	17635	17900	17635	17600	17620	17420	17125
	Static tipping load (at full turn)	kg	15250	15490	15070	15075	14935	14905	15135	14905	14875	14895	14720	14460
H	Dump height (at 45˚) – (fully raised)*	mm	2960	2960	2960	3085	3085	3085	2985	2960	2985	2985	3025	2855
I	Dump reach (at 45˚) – (fully raised)*	mm	1425	1425	1425	1285	1285	1285	1395	1425	1395	1480	1350	1535
	Dump height (at max dump) – (at max reach)*	mm	680	680	680	856	856	856	717	680	717	596	770	545
	Dump reach (at max dump) – (at max reach)*	mm	1460	1460	1460	1395	1395	1395	1465	1460	1465	1480	1425	1520
	Digging depth	mm	105	105	105	105	105	105	105	105	105	105	105	105
J	Height at bucket pivot point	mm	4295	4295	4295	4295	4295	4295	4295	4295	4295	4295	4295	4295
	Max tilt angle at carry position	°	47	47	47	47	47	47	47	47	47	47	47	47
M	Max tilt angle fully raised	°	55	55	55	55	55	55	55	55	55	55	55	55
K	Max tilt angle on ground	°	43	43	43	43	43	43	43	43	43	43	43	43
	Max tilt angle at max reach	°	54	54	54	54	54	54	54	54	54	54	54	54
	Max dump angle at max reach	°	73	73	73	73	73	73	73	73	73	73	73	73
	Max dump angle on ground	°	68	68	68	68	68	68	68	68	68	68	68	68
L	Max dump angle at fully raised	°	45	45	45	45	45	45	45	45	45	45	45	45
O	External radius at tyre side	mm	6570	6570	6570	6570	6570	6570	6570	6570	6570	6570	6570	6570
Q	External radius at bucket edge	mm	6970	6860	6970	6955	6845	6955	6875	6930	6875	7055	7035	7035
E	Wheel base	mm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
	Width at tyres	mm	2975	2975	2975	2975	2975	2975	2975	2975	2975	2975	2975	2975
F	Tread	mm	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
G	Ground clearance	mm	465	465	465	465	465	465	465	465	465	465	465	465
A	Overall length	mm	8890	8890	8890	8700	8700	8700	8850	8890	8850	8975	8790	9030
C	Overall height	mm	3535	3535	3535	3535	3535	3535	3535	3535	3535	3535	3535	3535
	Operating weight	kg	21785	21955	21980	21900	22060	22095	21915	22140	22210	22040	22150	22170

* Measured to the tip of the bucket teeth or bolt-on edge. All dimensions given with 26.5-25-20PR (L3) tyres.

Attachments



The filling factor depends on the type of material, the working conditions and the experience of the operator.



The specific weight of the material largely depends on the level of humidity, the degree of compaction, composition, etc.

Standard and optional equipment

DL 420A

✱ Standard equipment

Engine
Three-stage air cleaner with cyclone pre-cleaner, inner filter and external plugging indicator on the dashboard
Fuel filter
Hydraulically driven fan
External drains for engine oil and coolant changes
Maintenance warning lamp
Lifting and hydraulic system
Robust Z bar lifting system
General purpose bucket 3.9 m^3 (SAE, heaped)
Single lever joystick
Hydraulic control valve with 2 spools
Automatic lift arm kick-out
Automatic bucket return to dig
Levelling function
Fast couplers for hydraulic check
Fixed tandem vane pump system
Mono control lever (FNR)
Steering system
Load sensing steering system with flow amplifier
External equipment
Lifting hooks
Articulation lock in the transport position
Towing hitch
Tool compartment
Semi fenders with rubber protection
Mudguard
Lower protection plates
Electric system
Alternator 60 A / 24 V
Work lights: 2 at the front and 4 at the rear (6 x 70 W)
Travel lights: low and high beam
Tail indicators, stop, reversing lights
Reverse travel alarm
Fuel filling pump
Drive line and brake system
Transmission clutch cut-off via the brake pedal
Transmission with self-diagnosis and monitoring indicator with electronic plug for fast adjustment
Transmission mode selector switch (Manual / Auto 1 ‹–› 4 / Auto 2 ‹–› 4 with kick-down)
Starting safety system
Travel direction and kickdown selection lever at left of the steering wheel and on the joystick
Limited slip differentials on front and rear axles
Dual brake circuits with accumulator
Tyres: 26.5-25-20PR (L3)
Dual service brake pedals
Parking brake on the transmission, spring-applied hydraulic release
Cab
ROPS cab (SAE J 394, SAE 1040, ISO 3471) - FOPS cab (SAE J 231, ISO 3449)
Air conditioning
Double filtered air cab
Mechanical seat with 2″ safety belt
Adjustable steering column (inclination & telescopic)
Floor mat
Tinted glass
Left sliding window
Front and rear wiper and washer
Sun visor
Interior cab light
Interior and exterior rear view mirrors (2 + 2)
Machine monitoring (dials, gauges and lamps)
Main switches in front of the driver (starter & hazard switch)
Switches for the general functions in the right console
Horn
Cigarette lighter and 12 Volt power socket
Cup holder
Multiple storage compartments
Radio antenna built into rear window
MP3 / CD player
Digital clock

✱ Optional equipment

Tyres
L3, L5, various brands
Lifting and hydraulic system
Hydraulic control valve with 3 spools
Additional lever for 3rd function
Two hydraulic levers for 2 spools with FNR switch
Three hydraulic levers for 3 spools with FNR switch
Load isolation system (LIS)
Steering system
Emergency steering pump driven by electric motor
External equipment
Full fenders with rubber protector
Additional counterweight
Long lift arm (high lift)
Bottom protection plates
Lift arm float kick-out
Electric system
Rotating beacon
Additional lighting
Other
Tool kit
Mudguard, fully covering
Cab
Heated side mirror
Rear camera (CCTV) and monitor
Radio / CD / MP3
Fuel heater switch
Air suspension seat with 3″ belt
Attachments
Bucket: V-type 3.5 m^3
Bucket: Adapter Tooth 3.7 m^3, 3.9 m^3, 4.0 m^3, 4.3 m^3 – WC Welded 4.0 m^3
Bucket: Cutting Edge 3.9 m^3, 4.1 m^3, 4.2 m^3, 4.5 m^3 – WC Welded 4.2 m^3
Bucket: Mono Tooth 3.9 m^3, 4.5 m^3
Bucket: Segment Edge: 4.1 m^3
Various types of other attachments

Load Isolation System (LIS)
The bucket is suspended using a closed accumulator to reduce material loss as well as stress on the driver and machine structure. The system is automatic and depends on the speed of operation.

Fingertip control
3 lever control for lift arm, bucket and 3rd circuit. FNR switch for changing travel direction as well as kick-down, return to dig, lift arm raise kick-out and floating mode.

Some of these options may be standard in some markets. Some of these options may not be available for certain markets.
Please check with your local DOOSAN dealer for more information about availability or to adapt your machine to your application needs.

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Machine Tools

Engines

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- Complete parts & service support for all Doosan products
- Highest quality genuine parts
- Large, dedicated staff of factory-trained aftermarket professionals in the field

Specifications and design are subject to change without notice. Pictures of Doosan products may show other than standard equipment.

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