

# Maintenance

A liquid crystal display conveys information to the operator relative to the ZF transmission. At the same time, it reports the nature of a problem (if one exists). When servicing the loader, a specialised apparatus can be used to adjust the clutch disks to compensate for their wear. Additionally, by connecting a lap top computer, a complete transmission diagnostic can be performed.



## Large Capacity Transmission Oil Cooler

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



## Swing Out Cooling Fan

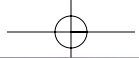
Our fan assembly has been designed with the one touch swing out mechanism and cleaning the radiator core is very easy.



## Transmission Diagnosis

The transmission can be diagnosed using a laptop computer to interface with the diagnostic system.





# MEGA 400V



**Remote Engine oil & Coolant Drain**  
Remote drain valves have been installed in an easily accessible location for convenient draining of fluids. (Coolant - upper, Engine oil - lower)



**Central Remote Hydraulic Check Port**  
The centralized remote hydraulic check ports allow main, steering, brake charge, pilot, unloading and transmission clutch pressures to be checked at a convenient central location.



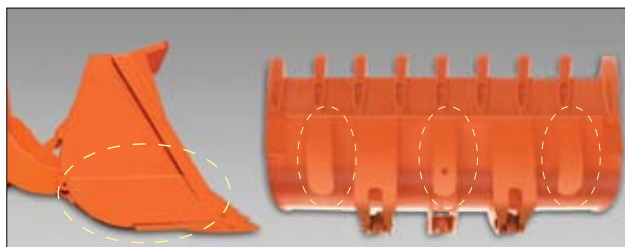
**Remote Greasing Lubrication Ports**  
The front pins can be lubricated from the outside of the machine without crawling under the machine or in awkward positions through the lubrication ports.



**Propeller Shaft**  
A protective cover has been installed to protect the oil seal from dust, foreign objects and premature wear.



A good accessibility at the articulation joint is essential for an easy maintenance.



**Reinforced Bucket**  
The lower and side panels of the bucket have been reinforced with additional plates (opt).  
- Reinforcement : At both sides - 1 point each  
At lower panel - 3 point



**Oil Gauge**  
An oil level indicator at the centre of the machine is clearly visible.



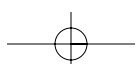
**Transmission Filter**  
The transmission filters are within easy reach and like the rest of the machine's service components, can be checked from ground level.



**Air-cleaner Filter**  
The high capacity air cleaner eliminates harmful particles from the air and extends the life of the engine and replacement intervals.



**Brake & Pilot Filter**  
The pilot filter is easy to replace and a clogged filter warning system has been added for extra protection.





# Reliability

Every morning, when the operators commence work, they know that things will go smoothly- because Doosan has taken care of it. The product is solid. Operators know that they have significant reserves at hand and that they won't have to push the machine to its limit. The Doosan Daewoo Mega 400-V wheel loader is designed and built to last. For Doosan, 'reliable' means availability, accessibility and simplicity.



## ❖ Anechoic chamber Test

For absolutely accurate noise measurements-mainly of engines and hydraulic components which generate noise.

Noise reduction test programmers are conducted here which contribute to quieter finished products.



## ❖ Climate Chamber Test

Within the chamber, capable of accommodating the largest excavator, machines are tested in extremes of heat, cold and humidity.

These conditions simulate the worst to be found anywhere in the world.



## ❖ Rolling Road Chassis Dynamometer Testing

Road travelling performance of articulated wheel loaders is measured and assessed in this facility. Acceleration braking, tractive effort, heat dissipation and gearing are all studied under controlled conditions in this modern facility.



## ❖ 24/7 Ware house operation

Quick responding parts system secures your reliability in running our product.



## ❖ ROPS Cabin (Rollover Protective Structure)

ROPS Meets The Following Criteria

- SAE J 394
- SAE 1040
- ISO 3471



## ❖ FOPS Cabin (Falling Objects Protective Structure)

FOPS Meets The Following Criteria

- SAE J 231
- ISO 3449



## ❖ The hoses and cylinders

The hoses and cylinders that are exposed are especially well protected.

# Standard equipment & Optional equipment

## Standard Equipment

### Engine

- Two stage air cleaner with pre-cleaner and external plugging indicator as at the dashboard
- External drains for engine oil and cooling liquid changes
- Maintenance warning lamp
- Hydraulic fan with adjustable speed for extreme temperatures

### Electric System

- Alternator 60A / 24 V
- Working lights: 2 at the front and 2 at the rear (4 x 70 W)
- Driving lights: low and high beams
- Tail, indicators, stop, reversing lights
- Reversing alarm

### Drive line

- Gear box which can be de clutched when braking
- Gear box with diagnosis and monitoring indicator, and electronic plug for a fast adjustment
- Selection of Manual or Automatic mode
- Starting safety system
- Kickdown and travelling direction selection: lever at left of the steering wheel or on the joystick
- Limited slip differential on front and rear axles
- Dual braking circuit with pump and accumulator
- Tyres 26.5-25-20PR L3

### Lifting and Hydraulic system

- Robust Z bar lifting system
- Standard general purposes 3.9m<sup>3</sup> bucket
- Single lever joystick
- Hydraulic control valve with two sections
- Boom adjustable lift Kick out
- Bucket kick out
- Fast couplers for hydraulic check

### Steering system

- Load sensing steering system

### Cab

- Air-conditioning / heating with re-circulation function
- Double Filtered air cab
- Air Suspended seat with safety belt
- Adjustable steering column
- Compartment for cans
- Floor mat
- Tinted glasses
- Left and right sliding windows
- Front and rear wiper
- Front and rear washers
- Sun visor
- Interior cab light
- Interior rear view mirrors (1)
- Exterior rear view mirrors (2)
- Machine monitoring (condition, control & maintenance indicators in front of the driver by gauges and lamps)
- Main switches in front of the driver
- Switches for the general functions in the right console
- Electrical horn
- Cigarette lighter
- Cassette radio AM / FM

### External equipments

- Lower protection plates
- Lifting hooks
- Articulation lock in the transport position
- Towing hitch
- Tools compartment
- Fender

## Optional equipment

Some of these optional equipments may be standard in some markets.

Some of these optional equipments cannot be available on some markets. You must check with the local Doosan dealer to know about the availability or to release the adaptation following the needs of the application.

### Ground engaging tools

- Various types of buckets, fork frame, timber grapples and accessories

### Tyres

- L3, L4, L5 following various types of manufacturers

### Hydraulic

- Hydraulic valve with 3 sections
- FNR mono lever and 3rd function lever for third hydraulic
- Two hydraulic levers with 3rd function electric s/w for the third hydraulic
- Two hydraulic levers with 3rd function electric s/w for the third hydraulic with FNR function
- Load isolation system (LIS)
- Emergency steering pump driven by electric motor
- External cooling system for front axle

### Electric system

- Rotating beacon
- Additional lighting

### Cab

- Special filtration against polluted environment
- Rear Camera (CCTV) and monitor

### Various

- Additional counterweight
- Fuel filling pump
- Tool Kit
- Mudguard

### External equipments

- Full fender
- Wheel chocks

# Specifications



## Engine

### General description

The High performance Doosan DE12TIA 6 cylinders, direct injection, turbo charged, air-air intercooler engine offers low fuel consumption and low exhaust emissions, which are well below the requirements of the Phase II legislation.

(Phase I Area : Doosan DE12TIA Engine)

### Power

- GROSS SAE J1349

Rated:

210 kW .....  
281 HP ..... @ 2,100 rpm  
286 ps .....

- NET SAE J 1349

Rated:

206 kW .....  
276 HP ..... @ 2,100 rpm  
280 ps .....

### Max Torque:

130 kgf.m .....  
1,275 Nm ..... @ 1,200 rpm  
941 lbf.ft .....

### Displacement:

11,051 cc (674cu.in)

### Bore x stroke:

φ123 x 155 mm (4.8" x 6.1")

3 stages Air cleaner including a very efficient pre-cleaner, main and safety elements.

Hydraulically driven puller type fan with possibility of adjustment, pivoting fan for easier cleaning

### Battery

System voltage : 24 V  
Quantity : 12 V x 2  
Capacity(AMP) : 150 Ah

### Starter power:

6.6 kW (8.8 Hp)

### Alternator output:

60 A



## Axles

The front and rear axles with planetary hub reductions are built on the base of very reputed components.

Fitted as standard, the front and rear limited slip differentials, ensure the traction is optimal in all circumstances.

The front axle is also equipped with an external oil cooling system with circulation pump and cooler (option).

### Maker and model:

ZF MT-L3000 Series

### Max torque transfer at the front and at the rear:

45 %

### Oscillation angle:

+/- 12 °

### Max vertical movement of the rear wheel:

124 mm

### Brake:

Dual circuit multi-plate wet discs. Hydraulic actuation with pump and accumulator.

A Spring applied and hydraulically released parking brake is mounted on the transmission shaft.



## Transmission

"Full Power Shift " transmission. It can be used in manual or automatic modes.

This transmission is based on components having excellent worldwide reputations. It is equipped with a modulation system allowing soft gear shifting and inversion of travel direction. Safety devices also protect the transmission of bad operations.

The gear and direction shifting is operated by a single lever to the left of the steering wheel. A travel direction control is also mounted on the hydraulic joystick.

The transmission is remote mounted from the engine for better accessibility.

With a special electronic device, the transmission can be tested and adjusted easily for optimum performance and efficiently.

The transmission can be de-clutched by the operation of brake pedal to increase the power available to the hydraulic pumps.

A safety device prevents the starting of the engine when not in neutral.

### Torque converter:

Single stage, one phase  
Max Torque ratio  
2.99

### Gear box:

Maker and model  
ZF 4 WG 260

### Speed Forward / Rearward:

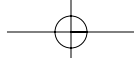
(Tyres 26.5-25- 20PR-L3)

1	8.3 / 8.3 km/h (5.2/5.2 mph)
2	13.6 /13.6 km/h (8.5/8.5 mph)
3	29.0 / 29.0 km/h (18.0/18.0 mph)
4	42.0 km/h (26.1 mph)

### Max traction force:

21.5 tons





## Hydraulic System

The hydraulic system uses tandem vane pumps with automatic wear compensation.

Pilot actuation with standard single lever.

Automatic and adjustable systems for bucket kick out and boom stop at top position are standard.

The leveling function is also mounted on the wheel loader.

Major hydraulic lines are equipped with special seals (ORFS)

### Max flow main:

(With steering)

240 ℓ / min (63.4g / min)

(Without steering)

434 ℓ / min (114.7g / min)

### Relief Pressure:

200 bars

### Pressure of the pilot circuit:

28 bars

### Filtration capacity on the return line:

10 microns

### Loading cycles time:

Lifting speed (loaded):

6.2 seconds

Dumping speed (loaded):

1.2 seconds

Lowering speed (empty):

3.7 seconds



## Operators' Cab

The modular cab allows excellent visibility in all directions. The optimal ventilation is obtained by numerous ventilation outlets. Touch buttons control the air re-circulation air conditioning and heating systems. The air of the cab is filtered.

All necessary information for the operator are centralized in front of him.

The main functions are actuated via switches located on a console at the right of the operator.

Generous storage places are well located. The cab, mounted on viscous element and equipped with an air suspended seat, offers a better comfort for the operator.

**Access door:** 1

### Emergency exits: 2

The cab conforms ROPS ISO 3471 and FOPS:ISO 3449

### Guaranteed external noise level Lwa:

(following 2000/14/EC) 109 dB(A)



## Steering

The steering system is a load sensing type with a flow amplifier and a priority valve.

### Steering angle:

40°

### Oil flow:

194 ℓ / min (51.2g / min)

### Relief pressure:

185 bars

### Steering cylinders (2):

bore x stroke: 100 x 450 mm (3.9" x 1'6")

Emergency steering system with hydraulic pump driven by electric motor.



## Lifting System

The lifting system with two cylinders and Z configuration is designed for the toughest jobs. It ensures powerful breakout force (22ton with a 3.7m<sup>3</sup> bucket) and the bucket movement are fast.

The bucket angles are well kept in good positions on all the range of bucket movement.

### Lifting cylinders (2)

bore x stroke : 180 x 928 mm (7.1" x 3'1")

### Bucket cylinders (1)

bore x stroke : 200 x 600 mm (7.9" x 2')



## Maintenance

Maintenance is easy due to excellent access.

The radiator fan swivels to aid cleaning.

The transmission is electronically controlled. An error coding system allows easy diagnosis of the systems and proper intervention.

**Engine (oil):** 25 ℓ (6.6 gal)

**Radiator (cooling liquid):** 50 ℓ (13.2 gal)

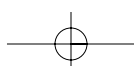
**Fuel:** 365 ℓ (96.4 gal)

**Hydraulic oil:** 265 ℓ (70 gal)

**Gear box and torque converter:** 54 ℓ (14.3 gal)

**Front axle:** 45 ℓ (11.9 gal)

**Rear axle:** 42 ℓ (11.1 gal)

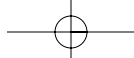


# Operational data

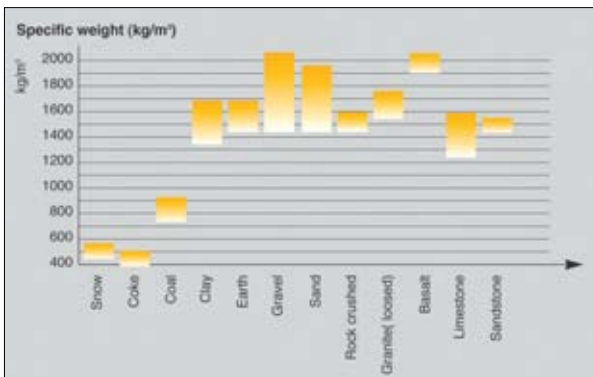
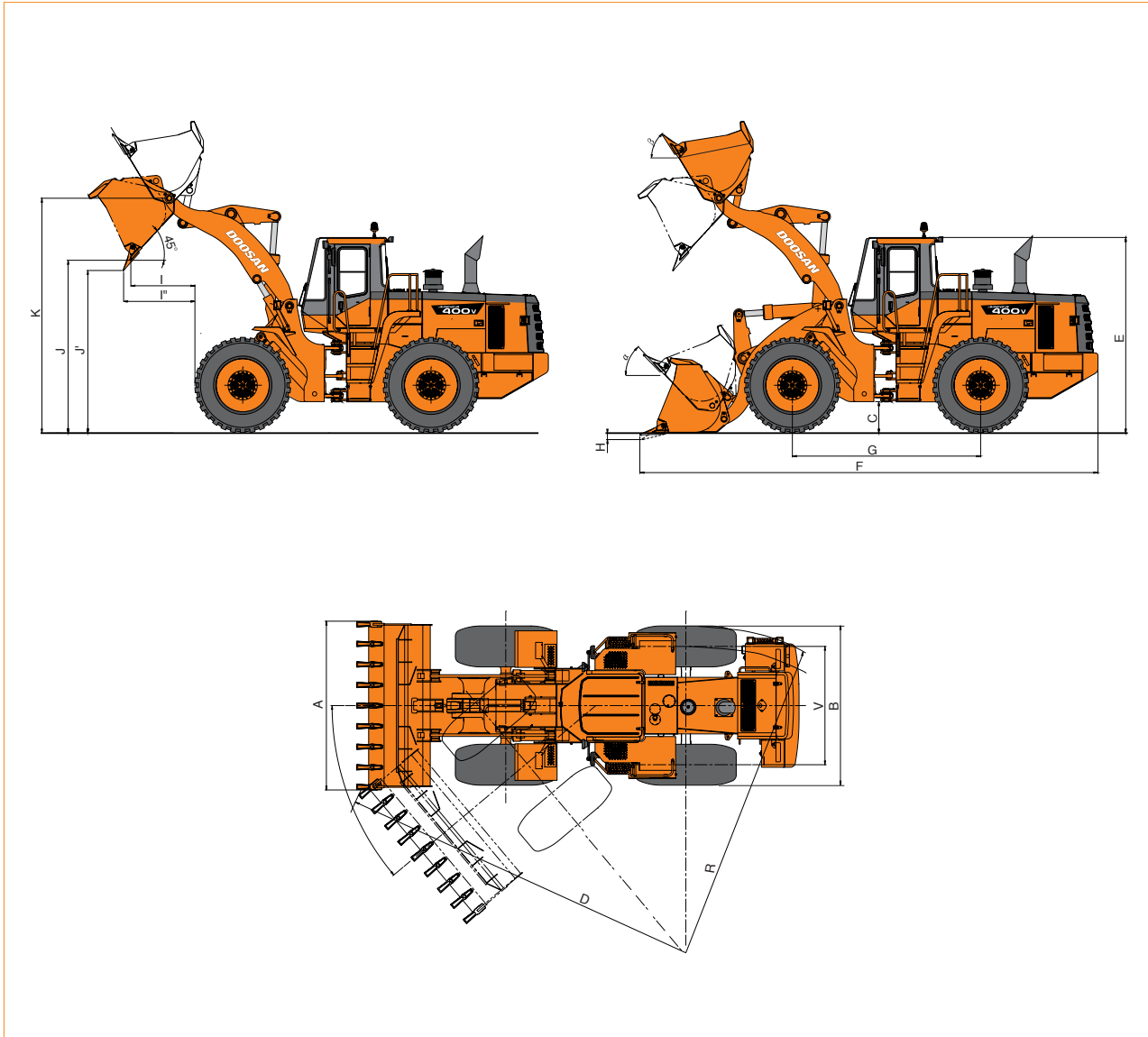
Bucket type			Rock	General purpose	Heavy duty	Ligth material
Configuration		Unit	V type teeth & segments	Straight	Straight	Straight
Bucket code (equipped with tooth)			M400-R35-D-T	M400-GP39-D-T	M400-HD39-D-T	M400-L45-D-T
Bucket code (Equipped with Extra blade)				M400-GP41-D-B	M400-HD41-D-B	M400-L45-D-B
Capacity heaped ISO/SAE (with teeth)		m <sup>3</sup> (cu.yd)	3.5 (4.6)	3.9 (5.1)	3.9 (5.1)	4.5 (5.9)
Capacity heaped ISO/SAE (with extra blade)		m <sup>3</sup> (cu.yd)	-	4.1 (5.4)	4.1 (5.4)	4.7 (6.2)
Bucket width	A	mm (ft . in)	3,230 (10'7")	3,280 (10'9")	3,280 (10'9")	3,434 (11'3")
Breakout force		kN	190	216	216	190
Static tipping load (straight position)		kg (lb)	17,777 (39,190)	18,180 (40,079)	18,180 (40,079)	17,753 (39,138)
Static tipping load (articulated position 40°)		kg (lb)	15,372 (33,888)	15,880 (35,008)	15,880 (35,008)	15,348 (33,836)
Dump height (at 45°, with teeth)	J	mm (ft . in)	2,892 (9'6")	2,985 (9'10")	2,985 (9'10")	2,844 (9'4")
Dump reach (at 45° / under teeth )	I	mm (ft . in)	1,480 (4'10")	1,370 (4'6")	1,370 (4'6")	1,500 (4'11")
Dump height (at 45°, without teeth, with extra blade)	J'	mm (ft . in)	-	3,080 (10'1")	3,080 (10'1")	2,949 (9'8")
Dump reach (at 45° / under teeth, with extra blade )	I''	mm (ft . in)	-	1,265 (4'2")	1,265 (4'2")	1,393 (4'7")
Digging depth	H	mm (ft . in)	97 (4")	130 (5")	130 (5")	125 (4.9")
Height at bucket pivot point	K	mm (ft . in)	4,300 (14'1")	4,300 (14'1")	4,300 (14'1")	4,300 (14'1")
Max angle at carry position	$\alpha$	°	47	47	47	47
Max angle at fully raised	$\beta$	°	59	59	59	59
External radius at tire side	R	mm (ft . in)	6,642 (21'9")	6,642 (21'9")	6,642 (21'9")	6,642 (21'9")
External radius at bucket edge	D	mm (ft . in)	6,889 (22'7")	7,062 (23'2")	7,062 (23'2")	7,025 (23'0")
Wheel basis	G	mm (ft . in)	3,500 (11'6")	3,500 (11'6")	3,500 (11'6")	3,500 (11'6")
Width at tyres	B	mm (ft . in)	2,983 (9'9")	2,983 (9'9")	2,983 (9'9")	2,983 (9'9")
Thread	V	mm (ft . in)	2,300 (7'7")	2,300 (7'7")	2,300 (7'7")	2,300 (7'7")
Tyres			26.5-25 VMT	26.5-25 VMT	26.5-25 VMT	26.5-25 VMT
Ground clearance	C	mm (ft . in)	510 (1'8")	510 (1'8")	510 (1'8")	510 (1'8")
Overall length	F	mm (ft . in)	8,720 (28'7")	8,600 (28'2")	8,600 (28'2")	8,758 (28'8")
Overall height	E	mm (ft . in)	3,556 (11'7")	3,556 (11'7")	3,556 (11'7")	3,561 (11'8")
Operating weight		kg (lb)	22,631 (49,892)	22,610 (49,846)	22,387 (49,354)	22,642 (49,916)
Specification changes according tyres changes					VSDL (L5)	800/65 R29
Operating weight		kg (lb)			1,040 (2,292)	920 (2,028)
Static tipping load (articulated position 40°)		kg (lb)			600 (1,322)	510 (1,124)
Vertical dimensions changes (J/H/K/C/E)		mm (ft . in)			20 (0.7")	34 (1")

Variations according bucket equipment (teeths or with extra blade)

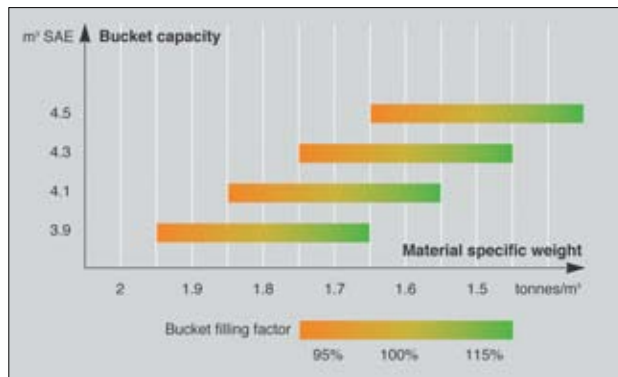




## Dimensions



The specific weight of material largely depends on moisture rate, compacting value, percentage of various components etc... This chart is given only for information.



The bucket filling factor depends also of the nature of material, the working conditions and the operator ability.

