Grader Specifications

F 156
F 156 A

Service weight	**up to 15.8 t**
Engine output	**112 kW**
Standard mouldboard	**3 660 mm**
Thrust	**up to 84/112 kN**

- **Hydrodynamic drive**
- **No-spin differential for high thrust forces**
- **Direct-controlled load-sensing hydraulics**
- **Automatic levelling (optional)**
- **EDC Electronic Drive Control**
- **Encapsulated precision-roller slewing ring**
- **ROPS/FOPS deluxe cab**

O&K

Precise grading. Powerful traction. Efficient

CE symbol according to EC Machinery Directive.

TÜV certificate for compliance with DIN ISO EN 9001.

Hydraulically adjustable slewing yoke for mouldboard radius over 90°

Load sensing hydraulics for precision control

Wheel lean adjustment for slope work

All-wheel drive with Electronic Drive Control for optimum traction on difficult terrain

Roller-mounted internal-gearing swing ring, completely encapsulated. Backlash- and maintenance-free mounting

operation: The F 156 from O&K.

Spacious cab with outstanding visibility, control console locks in a choice of 4 working positions

Superb all-round visibility; rounded tail for extra rearward safety

Air-cooled 6-cylinder direct injection Deutz engine for fast crowding

Maintenance-friendly design, easy to service

Nivomatic 6, with 5-fold ultrasonic measurement and/or proportional laser sensing (optional)

No-spin differential for full power transmission to the rear wheels, tandem axle articulates

A workplace that boosts productivity

The O&K grader cab is a model of ergonomics. The operator' station is positioned for maximum visibility all-round through large, tinted windows to the front, the sides, and also right down to the ground. Even when seated, the operator has full view of both mouldboard ends. When reversing, the rounded tail-end allows excellent and safe visibility of any persons or objects within the machine's proximity.

For working standing or seated the operator can lock the neatly laid out control console in one of four positions for easy access to the controls at all times. The operator adopts the most comfortable, least tiring position.

A highly effective heating/ventilation system creates an agreeable working climate and prevents window fogging.

Alongside such exceptional operating comfort and visibility, the oversized ROPS/FOPS cab has plenty of additional safety features, e.g. a rollover protection or a seat proving a firm hold even when working along slopes. Sliding doors allow easy access from either side.

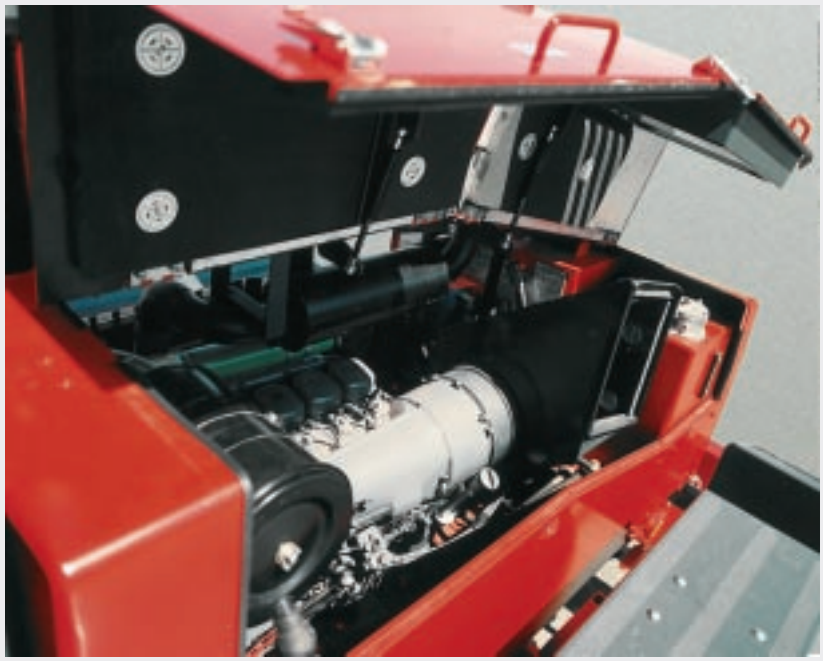
All-wheel drive with EDC Electronic Drive Control

On the all-wheel drive model, the front wheels are driven by a swashplate pump and hub-mounted motors. Electronic drive control EDCV uses a differential lock to match oil volume and hence the front-wheel speed automatically to that of the rear wheels.

Besides ensuring maximum use of engine power, EDCV delivers very high thrust forces for superb earthmoving and grading performances, especially when the going gets tough. Combined with wheel lean, the outcome is precision tracking. To take the stress off the drive components, front-wheel-drive can be disconnected during road travel.

Powerful Deutz diesel.
Efficient and kind to the environment

The powerful, air-cooled, direct-injection Deutz engine with turbocharger ensures fast crowd. The hydrodynamic drive consisting of a torque converter and powershift transmission reliably transfers the forces via the rugged ZF transmission and the tandem rear axle on to the ground. All speeds can be switched jolt-free and under load with the electric transmission control. Thrust is then automatically adapted to the changing road resistance. The no-spin differential assures slip-free power transfer at the rear wheels.

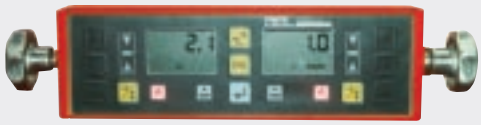


Nivomatic 6 for ultrasonic and laser operation – readied for 3-D control

System components are all digitized. The console is compact and allows full work area visibility. It is easy to operate yet facilitates maximum precision. Nivomatic 6 applies two different techniques for automatic height and transverse slope adjustment.

Ultrasound: The 5-fold ultrasonic system uses sonic-skiing to scan the ground surface, wire or pavement edge to offset any irregularities at the edge and achieve the highest level of precision. A sixth sensor has a temperature compensation function.

Laser: Height-regulating laser beam using a proportional sensor that evaluates each individual cell for proportional and hence high-precision control.

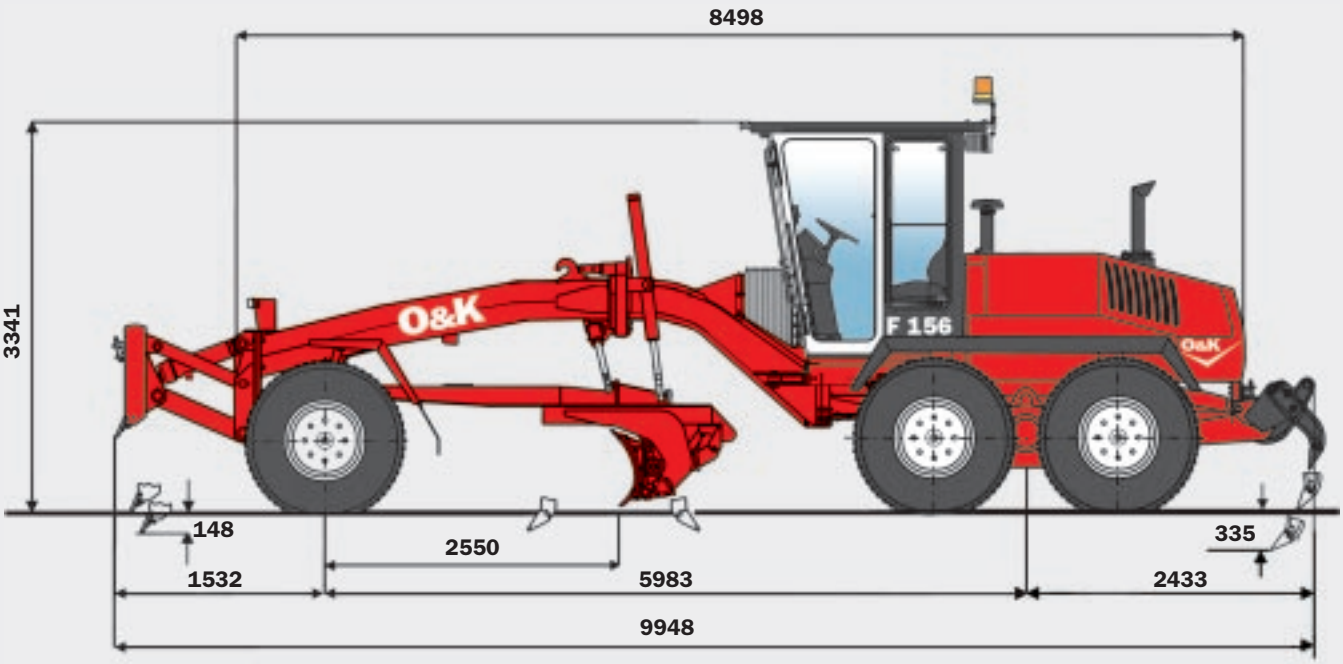


Sensitive, fluid mouldboard movement. Effortless and precise control.

The roller-mounted slewing ring, with internal gearing, sealed and backlash free, develops very low friction while generating extraordinary torque for fluid, smooth mouldboard functions. The mouldboard has a slewing radius of over 90°, fine-tuned through sophisticated geometry and a hydraulically adjustable slewing yoke. Stepless cutting angle adjustment is also hydraulic. A wide variety of ground conditions and tasks are easily handled.

Load-sensing hydraulics is highly efficient and allows high-precision controllability. A directly actuated axial-piston pump delivers only as much oil as is needed at any given time. Where time is of the essence a high-speed function comes into play. Pressure compensation in the control valves allows the mouldboard to be lifted/lowered parallel.

Dimensions and weights



Track = 2150 mm **across tyres = 2595 mm**

With standard tyres 17.5 R 25 EM

Service weight		**F 156**	**F 156 A**
Basic unit			
(excluding equipment listed below):			
Total weight	kg	13 300	13 700
Front axle	kg	3 500	3 700
Rear axle	kg	9 800	10 000
Additions:			
Front blade	kg	+ 900	+ 900
Ballast, front	kg	+ 760	+ 760
Mouldboard ripper (6 teeth)	kg	+ 100	+ 100
Rear ripper (3 teeth)	kg	+ 530	+ 530
Rear ripper (5 teeth)	kg	+ 580	+ 580
Ballast, rear	kg	+ 350	+ 350
Nivomatic 6 (fully aut.)	kg	+ 200	+ 200
Gross vehicle weight rating	kg	15 500	15 800

Service weight includes all lubricants, a full tank, standard tyres, and operator

Engine

Deutz 4-stroke diesel engine	BF 6 L 913

Air-cooled • Direct injection with turbocharger

Engine output ISO 9249	112 kW / 2300 RPM
Torque at 1,650 RPM	490 Nm
Cylinders / displacement	6 / 6128 cm^3
Bore / stroke	102 mm / 125 mm
Voltage	24 V
2 batteries	12 V / 88 Ah each
Alternator	980 W / 35 A
Starter	4.8 kW

Exhaust emission values according to COM 1 and TIER 1

Hydraulics

Load sensing with variable displacement pump • Power savings by pump swash-back, zero oil delivery under no-function conditions • Closed system with pressurized tank • Pressure relief valve

Hydraulic pump	Swashplate, variable displacement
Output	max. 138 l/min
Max. pressure	200 bar
Pressure relief setting	215 bar

Torque converter

Single-stage, integrated with transmission. Torque automatically adapts to changing travel conditions

	F 156	F 156 A
Conversion ratio	1.9 : 1	2.6 : 1

Cooling by heat exchanger

Transmission

Full powershift transmission, 6 forward and 3 reverse speeds, shifting-on-the-go • Electric single-lever shifting, with reverse lock in gears 3 to 6

Speeds in km/h

	Speeds		Forward		Reverse	
	F 156	F 156 A	F 156	F 156 A	F 156	F 156 A
1 Gear	4.6	4.7	4.6	4.7	84	112
2 Gear	7.1	7.2	11.6	11.7	84	112
3 Gear	11.6	11.7	26.1	25.7	52	92
4 Gear	18.0	18.0			33	57
5 Gear	26.1	25.7			22	38
6 Gear	38.5	37.0			14	18

Crowding forces (kN)

Front axle

Oscillating axle, with wheel spindle steering and hydraulic axle lean

Axle articulation	+/- 15°
Lean angle left/right	+/- 17°
Ground clearance	600 mm

Rear axle, tandem drive

O&K grader axle drive with automatic no-spin differential • Oscillating tandem with power transfer through heavy-duty roller chains • Planetary gear reduction at the wheel hubs

Articulation	+/- 15°
Dimensions tandem box:	
Height	512 mm
Width	184 mm
Wall thickness	22 mm
Chain pitch	38 mm
Tandem wheelbase	1544 mm

F 156 A – all-wheel drive

Selectable in addition to the hydrodynamic rear-wheel drive: hydrostatic front-wheel drive with EDC Electronic Drive control.

A bi-directional swashplate pump (forward/reverse) hydrostatically drives wheel-hub mounted motors in each of the front wheels in a closed circuit • Hydraulic no-spin differential prevents one-sided wheel spin and proportions torque when cornering

Brakes

4 encapsulated, oil-cooled disc brakes acting on the tandem wheels.

Parking brake: drum-type, acting on the transmission.

Steering

Operated from the adjustable steering and control console • Front wheel spindle steering, all-hydraulic, volume control.

Steering wheel lock, left/right	45°

Artic frame, hydraulically actuated with 2 double-flow steering cylinders

Artic. angle	+/- 28°
Minimum turning radius:	
across tyres	7300 mm
across front blade	8200 mm

Tyres

Tyre size	17.5-25 E 91

17.5-25, 15.5 R 25 EM, 17.5 R 25, 13.00-24 TG, 14.00-24 TG

Contact O&K for recommended tyres for specific applications.

Cab

Elastically mounted, noise-insulated ROPS/FOPS cab with two sliding doors locking into place • Either-side access, two rear sliding tinted side windows • Rear-frame mounted cab • Heater/defroster nozzles • Ventilation options: recirculation/outside air, filter unit

ROPS according to EEC sample testing and DIN/ISO 3471
FOPS to DIN/ISO 3449

Capacities

Engine	19 l
Transmission/torque converter	18 l
Axle drive	14 l
Tandem, articulating mount 2 x 26 l + 2 x 8 l	68 l
Wheel hub gears 5.5 l	22 l
Hydraulic tank	93 l
Hydraulic oil, total	170 l
Fuel tank	250 l

Mouldboard control

Load-sensing for maximum function controllability • Control levers for precision metering of adjustment speed • Pressure compensation in each of the control valve units permits parallel mouldboard lifting or simultaneous operation of two other functions, with no disruptive interaction • A pedal allows the operator to switch to max. output for faster functioning (high-speed mode) • Unlockable check valves maintain lift/cutting angles and wheel lean cylinders constant

Mouldboard mount

Rugged welded sectional design in A shape • L shape with 140 x 140 x 10 mm cross-section.

Slewing ring

Internal gearing, sealed, roller-mounted, backlash-free, self-adjusting • Driven by oil motor and mouldboard mechanism.

Diameter	1350 mm
Action radius	360°

Mouldboard

Wear-resistant high-grade steel with hardened guides • Replaceable, split main and side blades.

Length	3660 mm
Height / thickness	610 / 20 mm
Blade height / thickness	150 / 20 mm
Bolt diameter	16 mm

Mouldboard settings

Shifting to the right	755 mm
to the left	645 mm
Reach across tyres w/o artic. steering:	
right, horizontal	2350 mm
left, horizontal	1850 mm
Reach across tyres with artic. steering:	
right, horizontal	3180 mm
left, horizontal	2610 mm
Max. slope angle:	
right	100°
left	112°
Max. lifting height above ground	480 mm
Max. scraping depth	500 mm
Cutting angle adjustment, hydr.	50°

Frame

Front frame: stiff, welded section from high-strength fine-grain steel

Cross-section	300 x 300 mm
Wall thickness	20 mm
Rear frame	stiff, unitized frame
Cross-section	260 x 90 mm

Standard equipment

Elastically mounted, insulated, removable ROPS/FOPS cab • Tinted windows • 2 sliding windows side rear • Windscreen wipers front and rear • Washer • Sunshade front and rear windows • Engine oil heater with ample capacity, three ventilation modes (recirculated, fresh, mixed air) • Road traffic lighting • 2 cab-mounted spotlights • Ad-justable, vibration-cushioned seat • Adjustable steering and operating console

Electronic monitor with central acoustic warning signal for the following functions: torque converter oil temperature, transmission oil pressure, engine oil temperature, engine oil pressure, drive belt fan, parking brake, service brake pressure, battery charge

Additional warning lights and displays: fuel meter, operating hour meter, speedometer, hazard beacon, directional indicators, main beams, hydraulic tank, air filter contamination

Noise insulation • Standard toolkit • Fitted for road travel • Fitted to German safety standards • CE seal

Optional equipment

Dozer blade • Rear ripper • Mouldboard ripper
Ballast, front • Ballast, rear • Mouldboard 3,360 mm • Mouldboard 3,970 mm • Mouldboard side attachments, left and right • One-sided (right-hand) mouldboard extension 610 mm • Slip clutch for slew ring, overload safety device for mouldboard motor • Main battery switch • Electric refuelling • Hydr. float position for mouldboard • Eco-friendly hydraulic oil
Electr. ventilator for cab • A/C • Stereo cassette/radio • Hazard beacon, amber • Tachograph • Acoustic reverse-travel alarm • Oil bath dry air filter combination (instead of dry filter) • Gear lock for max.: 18 km/h • Front-mounted towing coupling • Rear-mounted towing coupling, with ripper removed • Special paint • Additional tools
Nivomatik - automatic mouldboard control: O&K Nivomatic, automatic mouldboard control for slopes with angle compensation • Ultrasonic height sensor single, double • Height sensor laser, single and double

Accessibility for fast maintenance

Extended maintenance intervals – such as on the fully encapsulated slewing ring or backlash-free mounting (which eliminates all need for any adjustment work) save maintenance time. Another advantage is the easy accessibility to all the inspection and maintenance items which lengthens uptime and raises productivity.

Front blade and rear ripper

A front blade and rear ripper make the F 156/A grader from O&K even more versatile.

Wheel lean adjustment

For neat and clean work along slopes and embankments, with zero thrust loss through any repeated steering adjustments.

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