

SKL 200 SERVICE - MANUAL

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DIESEL ENGINE

Deutz Manufacturer: Type: F4M 2011

Performance according to

(ECE-R24/ISO1585/ISO9249): kW 44 at 2,400 min⁻¹ Construction: 4 cylinders in line Cooling: external oil cooling Injection: direct injection

Capacity: cm³ 3,100 2,550 +50 min⁻¹ High idle: 850 +50 min⁻¹ Low idle: Spec. fuel consumption under full load: g/kWh 218 Tappet clearance - inlet cold: 0.30 mm Tappet clearance - outlet cold: 0.50 mm

Torque of cylinder head studs 30 / 80 / 160 Nm

(only in case of repair): Tightening angle 90°

Further data: see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage: 12

Battery: V/Ah/A 12 / 80 / 720 (EN)

Generator: 14 / 95 V/A V/kW/PS Starter: 12 / 2.3 / 3.1 Cold start aid: heater plug

Lighting: acc. to German motor vehicle construction and use

regulation ("StVZO") and Euronorm.

H4 halogen headlamp.

Two working lights at the front.

TRANSMISSION

Travel pump: A 4 VG 56 DA with pressure cut-off type

Displacement: max. cm³/rev. 56

20/36 km/h version: 51D080 Danfoss Travel motor type

Displacement 20/36 km/h version: max. cm³/rev. 80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 70: 20 km/h - version:

tortoise / rabbit km/h 0 to 7.0 / 0 to 20 36 km/h - version: TL 70 S:

Gearbox position 1, tortoise / rabbit: 0 to 6.5 / 0 to 18 km/h / 0 to 36 0 to 13 Gearbox position 2, tortoise / rabbit: km/h

Cardan shaft rev. at 20 km/h - version adjustment at nominal speed

tyres tortoise / rabbit

min⁻¹ standard: 650 / 2.100 12.5-20: min⁻¹ 335/80 R20 SPT 9: option: 650 / 2.050 min⁻¹ 335/80 R20 XM 27TL: 650 / 2,080

Cardan shaft rev. at 36 km/h - version adjustment at nominal speed

tortoise rabbit / 1./2. gear 1./2. gear tyres

min⁻¹ 635 / 1,300 1.860 / 3,780 standard: 12,5-20: min⁻¹ option: 335/80 R20 SPT 9: 635 / 1,300 1.800 / 3,680 335/80 R20 XM 27TL: min⁻¹ 635 / 1,300 1.840 / 3,750 PRESSURE AND SETTING VALUES travel

Suction pressure: max. bar $0.5^{\pm 0.1}$ Charge pressure (high idle): bar $30^{\pm 1}$ High pressure (SV): bar 480 Pressure cut-off: bar 450 Case pressure at + 50° C: max. bar 2.5

Regulation start, dynamic: min⁻¹ 2,300 ⁻⁵⁰ at 180 bar

(see setting instructions, chapter 5, measuring method 2)

Start-up speed: min⁻¹ 1,150

Engine stalling (rabbit) - dynamic: min⁻¹ 2,200 ⁻¹⁰⁰ at 220 bar HP

Brake inching beginning / end: bar 5 - 13
Pressure switch (hydrostatic brake): bar 22

STEERING

Steering unit: type Danfoss OSPC 250 LS dyn.

Steering pump: make Cassappa

Displacement: I/min 37
Steering pressure (high idle): bar 175

Priority valve: type Danfoss OLS 80 dyn.

WORKING HYDRAULICS

Working pump: make Cassappa

Displacement: I/min 65

(= slewing 28 l/min and steering 37 l/min summation)

Valve bank: type Parker P 70 CF Servo-controlled valve: type Brown PRSV

PRESSURE AND SETTING VALUES working (at high idle)

Main pressure relief valve I: max. bar 250

Line relief pressures:

- lifting frame lift: (B2) bar 280

- lifting frame lower: (A2) bar anti-cavitation

- shovel dump in: (B3) bar 280 - shovel dump out: (A3) bar 130 - additional control circuit: (A1+Y9 / B1+Y8) bar 230 / 230

Main pressure relief valve II: max. bar 250

Line relief pressures:

- slewing left: (A1+Y31) bar 230 - slewing right: (B1+Y32) bar 230

- pilot pressure (charge pressure): bar 30 ^{±1}

WORKING CYCLES

Lifting frame lift: s 4.7
Lifting frame lower: s 3.3
Shovel dump in: s --Shovel dump out: s ---

Slewing right / left: s 3.2 to each side

AXLES

Front axle: make/tvpe ZF / AP - R - 720 // 4472 025 009 with self-locking differential - 20 km/h-version: Rear axle: ZF / AP - R - 720 // 4472 025 010 with self-locking differential - 20 km/h-version: make/type ZF / AP - R - 720 // 4472 025 009 Front axle: with self-locking differential - 36 km/h-version: make/type ZF / AP - R - 720 // 4472 025 011 Rear axle: make/type with self-locking differential - 36 km/h-version:

BRAKE SYSTEM

Service brake: hydraulically operated drum brake,

front axle

Parking brake: drum brake at the front axle

Master cylinder: make ATE (mineral oil)

LUBRICANTS

Engine: see engine instruction book

Hydraulic oil: see Schaeff hydraulic oil recommendation

table

Transmission oil: MIL-L 2105 B or API-GL 5 resp.,

SAE 85 W 90 LS or SAE 90 LS

Multi-purpose grease: acc. to DIN 51825. Dripping point over

170° C. Lithium-saponified.

Brake medium: ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS see instruction book

CAPACITIES Itr.

Engine oil with oil filter and oil cooler - change:
Hydraulic oil (tank and system) - first filling:
Hydraulic oil tank (change):
Fuel tank:
Front axle - central housing:

approx. 13.0 engine oil
hydraulic oil
approx. 55.0 hydraulic oil
hydraulic oil
approx. 75.0 diesel
approx. 4.0 transmission oil

Front axle - wheel hub: approx. 0.3 transmission oil, each

Rear axle - central housing and reduction gearbox: approx. 4.5 transmission oil approx. 0.3 transmission oil, each

Service brake: approx. 0.25 ATF oil

DIESEL ENGINE Tier 3

Manufacturer: Deutz

Type: D 2011 L04W

Performance according to

(ECE-R24/ISO1585/ISO9249): kW 44 at 2,400 min⁻¹ Construction: 4 cylinders in line

Cooling: water

Injection: direct injection

Capacity: cm³ 3,600 2,350 +50 min⁻¹ High idle: 850 +50 min⁻¹ Low idle: Spec. fuel consumption under full load: 225 g/kWh Tappet clearance - inlet cold: 0.30 mm Tappet clearance - outlet cold: 0.50 mm

Torque of cylinder head studs Nm 30 / 80 / 160

(only in case of repair): Tightening angle 90°

Further data: see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage: V 12

Battery: V/Ah/A 12 / 100 / 850 (EN)

Generator: V/A 14 / 95
Starter: V/kW/PS 12 / 2.3 / 3.1
Cold start aid: heater plug

Lighting: acc. to German motor vehicle construction and use

regulation ("StVZO") and Euronorm.

H4 halogen headlamp.

Two working lights at the front.

TRANSMISSION

Travel pump: type A 4 VG 56 DA with pressure cut-off

Displacement: max. cm³/rev. 56

Travel motor 20/36 km/h version: type 51D080 Danfoss

Displacement 20/36 km/h version: max. cm³/rev. 80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 70: 20 km/h - version:

tortoise / rabbit km/h 0 to 7.0 / 0 to 20

TL 70 S: 36 km/h - version:

Gearbox position 1, tortoise / rabbit: km/h 0 to 6.5 / 0 to 18 Gearbox position 2, tortoise / rabbit: km/h 0 to 13 / 0 to 36

Cardan shaft rev. at **20 km/h - version** adjustment at nominal speed

tyres tortoise / rabbit

standard: 12,5-20: min⁻¹ 650 / 2,100 option: 335/80 R20 SPT 9: min⁻¹ 650 / 2,050 335/80 R20 XM 27TL: min⁻¹ 650 / 2,080

Cardan shaft rev. at **36 km/h - version** adjustment at nominal speed

tortoise / rabbit tyres 1./2. gear / 1./2. gear standard: 12,5-20: min⁻¹ 635 / 1,300 1.860 / 3,780

option: 335/80 R20 SPT 9: min⁻¹ 635 / 1,300 1.800 / 3,680 335/80 R20 XM 27TL: min⁻¹ 635 / 1,300 1.840 / 3,750

PRESSURE AND SETTING VALUES travel

Suction pressure: max. bar $0.5^{\pm 0.1}$ Charge pressure (high idle): bar $30^{\pm 1}$ High pressure (SV): bar 480 Pressure cut-off: bar 450 Case pressure at + 50° C: max. bar 2.5

Regulation start, dynamic: min⁻¹ 2,300 ⁻⁵⁰ at 230 bar

(see setting instructions, chapter 5, measuring method 2)

Start-up speed: min⁻¹ 1,150

Engine stalling (rabbit) - dynamic: min⁻¹ 2,000 ⁻¹⁰⁰ at 220 bar HP

Brake inching beginning / end: bar 5 - 13
Pressure switch (hydrostatic brake): bar 22

STEERING

Steering unit: type Rexroth LAGC100-15/LD240-1

Steering pump: make Cassappa

Displacement: cm³/rev. 29
Steering pressure (high idle): bar 175

Priority valve: type Rexroth LPS80RM/LD7-643-0

WORKING HYDRAULICS

Working pump: make Cassappa

Displacement: I/min 65

(= slewing 28 l/min and steering 37 l/min summation)

Oil flow divider type Kracht KM1/14+KM1/11

Valve bank: type Parker P 70 CF Servo-controlled valve: type Brown PRSV

PRESSURE AND SETTING VALUES working (at high idle)

Main pressure relief valve I: max. bar 250

Line relief pressures:

- lifting frame lift: (B2) bar 280

- lifting frame lower: (A2) bar anti-cavitation

shovel dump in: (B3) bar 280
shovel dump out: (A3) bar 130
additional control circuit: (A1+Y9 / B1+Y8) bar 230 / 230

Main pressure relief valve II: max. bar 250

Line relief pressures:

- slewing left: (A1+Y31) bar 230 - slewing right: (B1+Y32) bar 230

- pilot pressure (charge pressure): bar 30 ^{±1}

WORKING CYCLES

Lifting frame lift: s 4.7
Lifting frame lower: s 3.3
Shovel dump in: s --Shovel dump out: s ---

Slewing right / left: s 3.2 to each side

AXLES

ZF / AP - R - 720 // 4472 025 200 Front axle: make/type with self-locking differential - 20 km/h-version: make/type ZF / AP - R - 720 // 4472 025 201 Rear axle: with self-locking differential - 20 km/h-version: Front axle: with self-locking differential - 36 km/h-version: make/type ZF / AP - R - 720 // 4472 025 200 Rear axle: with self-locking differential - 36 km/h-version: make/type ZF / AP - R - 720 // 4472 025 202

BRAKE SYSTEM

Service brake: hydraulically operated drum brake,

front axle

Parking brake: drum brake at the front axle

Master cylinder: make ATE (mineral oil)

LUBRICANTS

Engine: see engine instruction book

Hydraulic oil: see TEREX hydraulic oil recommendation

table

Transmission oil: MIL-L 2105 B or API-GL 5 resp.,

SAE 85 W 90 LS or SAE 90 LS

Multi-purpose grease: acc. to DIN 51825. Dripping point over

170° C. Lithium-saponified.

Brake medium: ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES	ltr.	
Engine oil with oil filter - change: Hydraulic oil (tank and system) - first filling: Hydraulic oil tank (change): Fuel tank: Front axle - central housing: Front axle - wheel hub: Rear axle - central housing and reduction gearbox: Rear axle - wheel hub: Service brake:	approx. 9.0 approx. 55.0 approx. 46.0 approx. 75.0 approx. 4.0 approx. 0.3 approx. 4.5 approx. 0.3 approx. 0.3	engine oil hydraulic oil hydraulic oil diesel transmission oil transmission oil, each transmission oil, each
Coolant fluid	approx. 15,0	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE Tier 3

Manufacturer: Deutz

Type: D 2011 L04W

Performance according to

(ECE-R24/ISO1585/ISO9249): kW 44 at 2,400 min⁻¹ Construction: 4 cylinders in line

Cooling: water

Injection: direct injection

Capacity: cm³ 3,600 2,350 +50 High idle: min⁻¹ 850 ⁺⁵⁰ Low idle: min⁻¹ Spec. fuel consumption under full load: 225 g/kWh Tappet clearance - inlet cold: 0.30 mm Tappet clearance - outlet cold: 0.50 mm

Torque of cylinder head studs Nm 30 / 80 / 160

(only in case of repair): Tightening angle 90°

Further data: see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage: V 12

Battery: V/Ah/A 12 / 100 / 850 (EN)

Generator: V/A 14 / 95
Starter: V/kW/PS 12 / 2.3 / 3.1
Cold start aid: heater plug

Lighting: acc. to German motor vehicle construction and use

regulation ("StVZO") and Euronorm.

H4 halogen headlamp.

Two working lights at the front.

TRANSMISSION

Travel pump: type A 4 VG 56 DA with pressure cut-off

Displacement: max. cm³/rev. 56

to Se. No. TL0070373

Travel motor 20/36 km/h version: type 51D080 Danfoss (80 cm³/rev.)

to Se. No. TL0070374

Travel motor 20/36 km/h version: type A6VM80 Hydromatik (80 cm³/rev.)

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 70: 20 km/h - version:

tortoise / rabbit km/h 0 to 7.0 / 0 to 20

TL 70 S: 36 km/h - version:

Gearbox position 1, tortoise / rabbit: km/h 0 to 6.5 / 0 to 18 Gearbox position 2, tortoise / rabbit: km/h 0 to 13 / 0 to 36

Cardan shaft rev. at 20 km/h - version adjustment at nominal speed

tyres tortoise / rabbit

standard: 12,5-20: min⁻¹ 650 / 2,100 option: 335/80 R20 SPT 9: min⁻¹ 650 / 2,050 335/80 R20 XM 27TL: min⁻¹ 650 / 2,080

Cardan shaft rev. at **36 km/h - version** adjustment at nominal speed

tortoise / rabbit

tyres 1./2. gear / 1./2. gear standard: 12,5-20: min⁻¹ 635 / 1,300 1.860 / 3,780 option: 335/80 R20 SPT 9: min⁻¹ 635 / 1,300 1.800 / 3,680

335/80 R20 XM 27TL: min⁻¹ 635 / 1,300 1.840 / 3,750

PRESSURE AND SETTING	S VALUES	travel	to Se. No. TL00700373 (Danfoss)
Suction pressure:		max. bar	0.5 ^{±0.1}
Charge pressure (high idle): High pressure (SV):		bar bar	30 ^{±1} 480
Pressure cut-off:		bar	450
Case pressure at + 50° C:		max, bar	2.5
Regulation start, dynamic:		min ⁻¹ min ⁻¹	230 bar
Start-up speed: Engine stalling (rabbit) - dyr	namic [.]	min ⁻¹	1,150 2,000 ⁻¹⁰⁰ at 220 bar HP
Brake inching beginning / er		bar	5 - 13
Pressure switch (hydrostation	c brake):	bar	22
PRESSURE AND SETTING (Hydromatik)	SVALUES	travel	from Se. No. TL00700374
Suction pressure:		max. bar	0.5 ^{±0.1}
Charge pressure (high idle)	:	bar	30 ^{±1}
High pressure (SV):		bar	430
Pressure cut-off: Case pressure at + 50° C:		bar max. bar	410 2.5
Regulation start:		bar	2,100 ⁻⁵⁰ at 200 bar HP
	setting instructions	, chapter 5, m	neasuring method 2)
Start-up speed:		min ⁻¹	1,150
Engine stalling (rabbit) - dyr Brake inching beginning / er		min ⁻¹ bar	2,000 ⁻¹⁰⁰ at 220 bar HP 5 - 13
Pressure switch (hydrostatic		bar	22
	,		
STEERING			
Steering unit:		type	Rexroth LAGC100-15/LD240-1
Steering pump:		make	Cassappa
Displacement: Steering pressure (high idle).	cm³/rev. bar	29 175
Priority valve:	<i>)</i> ·	type	Rexroth LPS80RM/LD7-643-0
WORKING HYDRAULICS			
Working pump:		make	Cassappa
Displacement:		I/min	65
·			8 l/min and steering 37 l/min summation)
Oil flow divider Valve bank:		type	Kracht KM1/14+KM1/11 Bucher HDM19
Servo-controlled valve:		type type	Brown PRSV
PRESSURE AND SETTING	S VALUES	working	(at high idle)
Main pressure relief valve I:		max. bar	250
Line relief pressures:			
lifting frame lift:lifting frame lower:	(B2)	bar	280 anti-cavitation
- shovel dump in:	(A2) (B3)	bar bar	280
- shovel dump out:	(A3)	bar	130
- additional control circuit:	(A1+Y9 / B1+Y8)	bar	230 / 230
Main pressure relief valve II	:	max. bar	250
Line relief pressures: - slewing left:	(A1+Y31)	har	230
- slewing right:	(B1+Y32)	bar bar	230
5 5	,		

30 ^{±1}

bar

- pilot pressure (charge pressure):

WORKING CYCLES

Lifting frame lift:	S	4.7
Lifting frame lower:	S	3.3
Shovel dump in:	S	
Shovel dump out:	S	

Slewing right / left: s 3.2 to each side

AXLES

Front axle: with self-locking differential - 20 km/h-version: make/type ZF/AP-R-720 or MT-L 3020 Rear axle: with self-locking differential - 20 km/h-version: make/type ZF/AP-R-720 or MT-L 3020

Front axle: with self-locking differential - 36 km/h-version: make/type ZF / AP - R - 720 or MT-L 3020 Rear axle: with self-locking differential - 36 km/h-version: make/type ZF / AP - R - 720 or MT-L 3020

BRAKE SYSTEM

Service brake: hydraulically operated drum brake,

front axle

Parking brake: drum brake at the front axle

Master cylinder: make ATE (mineral oil)

LUBRICANTS

Engine: see engine instruction book

Hydraulic oil: see TEREX hydraulic oil recommendation

table

Transmission oil: MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS

Multi-purpose grease: acc. to DIN 51825. Dripping point over

170° C. Lithium-saponified.

Brake medium: ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

tr.

Engine oil with oil filter - change: Hydraulic oil (tank and system) - first filling: Hydraulic oil tank (change): Fuel tank: Front axle - central housing: Front axle - wheel hub: Rear axle - central housing and reduction gearbox: Rear axle - wheel hub: Service brake: Coolant fluid	approx.	46.0 75.0 4.0 0.3 4.5 0.3 0.25	engine oil hydraulic oil hydraulic oil diesel transmission oil transmission oil, each transmission oil transmission oil, each ATF oil water with anti-corrosive
Coolant fluid	approx.	15,0	water with anti-corrosive and anti-freeze agent

(Gramm)

Air condition: approx. 800 (1.764 lb) R134a

DIESEL ENGINE

Manufacturer: KHD Type: F 4 M 2011

Performance according to DIN 70020: kW 44 at 2,400 min⁻¹

Cooling: engine oil / air; external oil cooling

Injection: direct injection

Capacity: 3,100 cm³ 2,550 .50 min⁻¹ High idle: 850 .20 min⁻¹ Low idle: Spec. fuel consumption under full load: g/kWh 235 Tappet clearance - inlet cold: 0.30 mm Tappet clearance - outlet cold: 0.50 mm

Engine oil pressure (at Service-Temp. 110°C) bar 1,4 at 900 min $^{-1}$ 2,2 at 1,800 min $^{-1}$

3,0 at 2,550 min ⁻¹

Torque cylinder head studs: Nm 30, 80, 160°

(only in case of repair): Tightening angle 90°

Further data: see engine instruction book

ELECTRICAL SYSTEM

Voltage: V 12

 Battery:
 V/Ah/A
 12 / 110 / 850

 Generator:
 V/A
 14 / 95

 Starter:
 kW/PS
 2.3 / 3.1

Starting aid: heater plug

Lighting: acc. to German motor vehicle construction and use regulation

and Euronorm

TRANSMISSION

Travel pump: type A 4 VG 40 DA with pressure cut-off

Displacement: cm³/rev. 0 to 40
Travel motor: type A 6 VM 55 DA

Displacement: max. cm³/rev. 55

Servo-controlled valve, pedal: type Rexroth 2TH6 RP20

TRAVEL RANGE

TW 70 20 km/h version

Symbol tortoise / rabbit: km/h 0 to 6 / 0 to 20

TW 70 30 km/h - Version:

4 pre-selectable travel ranges, electro-hydraulically operated:

Gearbox position 1, tortoise / rabbit: km/h 0 to 6 / 0 to 17 Gearbox position 2, tortoise / rabbit: km/h 0 to 11 / 0 to 30

Cardan shaft rev. 20 km/h version adjustment at nominal speed

tortoise / rabbit

with standard tyres: 365/70 R18: \min^{-1} 795 / 2,560 option: 8.25-20: \min^{-1} 735 / 2,370 500/45-20: \min^{-1} 770 / 2,490

Cardan shaft rev. 30 km/h version adjustment at nominal speed

tortoise / rabbit 1st / 2nd gear / 1st / 2nd gear

with standard tyres: 365/70 R18: \min^{-1} 300 / 1,305 / 855 / 3,560 option: 8.25-20: \min^{-1} 300 / 1,305 / 855 / 3,560

500/45-20: min⁻¹ 300 / 1,305 / 855 / 3,560

PRESSURE	AND	SETTING	VALUES	Travel
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Suction pressure:	bar	- 0.25
Charge pressure (high idle):	bar	30 ⁺²
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start (dynamic):	bar	290 • 10

min⁻¹ Start-up speed:

1,100 ⁺⁵⁰ (50 bar HP) 2,300 ⁺⁵⁰/₋₁₀₀ at 280⁺¹⁰ bar HP min⁻¹ Engine stalling (tortoise, dynamic):

STEERING

Rexroth LAGC SD 160 Steering unit: type

Steering pump: make Kayaba P3

Displacement: cm³/rev. 18 (≈ 43 l/min)

Steering pressure (high idle): bar 120

Priority valve: Rexroth LPS 80 type

WORKING HYDRAULICS

Working pump (variable displacement pump): type Kayaba PSVD2-26E Displacement: cm³/rev. 2 x 26 (≈ 2 x 62 l/min)

Gear pump: P3 Kayaba type

Displacement: cm³/rev. 18 (≈ 43 l/min)

Main relief valve: P1 + P2 245 bar Main relief valve: P3 205 bar

Servo-controlled valve (joystick) right / left: type Rexroth 4TH5 E70

Servo-controlled valve, linear lever (stabilising): type Hydro - Control HC-RC11

Servo-controlled valve, pedal

Rexroth 2TH6 RP20 (intermediate boom / articulation) type Kayaba KVSE-72-9 Valve bank: type

PRESSURE AND SETTING VALUES Working

Valve bank - KVSE-72

Main relief valve P1 + P2 245 bar

Line relief pressures:

280 / 280 - Boom - articulated boom (raise / lower): bar - Dipperstick: bar 280 / 280 - Bucket: 280 / 280 bar

- Intermediate boom - articulated boom / circular boom

280 / 150 in / out: bar - Additional control circuit / breaker: 280 / 280 bar Main relief valve P3 205 bar

Line relief pressures:

- Slewing (valves at slew motor): 205 / 205 bar

- Articulation: bar - Stabilising: bar

30 +2 Pilot pressure (charge pressure) - high idle: bar

SLEW DRIVE

Slew gear with slew motor: type Kayaba MSG-27P-23E-2

Slew pressure (valves at the slew motor): bar 205 (high idle)

CYCLE TIMES

Articulated boom -	raise / lower:	sec.	4.5 / 4.5
Intermediate boom -	raise / lower:	sec.	4.1 / 3.2
Dipperstick -	in / out:	sec.	3.5 / 2.9
Bucket -	in / out:	sec.	2.6 / 2.1

AXLES

Front axle:	20 km/h version	make/type	Clark-Hurth	211 / 52
Rear axle:	20 km/h version	make/type	Clark-Hurth	315 / 111 / 61
Front axle:	30 km/h version	make/type	Clark-Hurth	211 / 52
Rear axle:	30 km/h version	make/type	Clark-Hurth	357 / 111 / 237

BRAKES

Brake pump:	make	Kayaba
Displacement:	cm³/rev.	18
Brake shut-off valve:	make	Wabco 477
Switching range:	bar	120 - 150
Foot brake valve:	make	Wabco 467
Brake pressure:	bar	45

Beginning/ end of inching:

Parking brake:

Service brake:

bar

5 - 13

spring-loaded brake in the front axle
oil-immersed multi-disk brake, front

and rear axle

LUBRICANTS

Engine oil:	see engine instruction book

Hydraulic oil: see Schaeff hydraulic oil recommen-

dation table

13.0

Transmission oil: MIL-L 2105 B / API-GL 5,

SAE 85 W 90 LS or SAE 90 LS

Multi-purpose grease:

acc. to DIN 51825. Dripping point
over 170°C. Lithium-saponified.

NLGI grade 2 with EP additives

approx.

MAINTENANCE PARTS

Engine oil (change):

see operating manual

engine oil

CAPACITIES Itr.

Hydraulic oil (tank and system):	approx.	180.0	hydraulic oil		
Hydraulic oil (change):	approx.	110.0	hydraulic oil		
Fuel tank:	approx.	150.0	diesel		
Steering front axle - central housing:	approx.	4.0	transmission oil		
Rear axle - central housing:	approx.	4.4	transmission oil		
Reduction gear:	approx.	0.7	transmission oil		
Wheel hubs front axle:	approx.	0.9	transmission oil, each		
Wheel hubs rear axle:	approx.	0.9	transmission oil, each		
Swing gear:	lubrication by	lubrication by circulation of the hydraulic oil			
Service brake:	connected to	connected to the hydraulic system			

Service brake: connected to the hydraulic system
Cooling agent: engine oil

DIESEL ENGINE Tier 3

Manufacturer: Yanmar

4 TNV98-ZPTX Type: Performance according to DIN 70020: 49,3 at 2,400 min⁻¹ kW

Cooling: water cooling Injection: direct injection

Capacity: 3,300 cm³

2,550 .50 min⁻¹ High idle: 850 .50 min⁻¹ Low idle: Spec. fuel consumption under full load: g/kWh 220 Tappet clearance - inlet cold: 0.30 mm Tappet clearance - outlet cold: 0.50 mm

900 min ⁻¹ Engine oil pressure (at Service-Temp. 110°C) 1.4 at bar $1,800 \, \text{min}^{-1}$ 2,2 at

2,550 min $^{-1}$ 3.0 at

Torque cylinder head studs: Nm 30.80.160°

(only in case of repair): Tightening angle 90°

Further data: see engine instruction book

ELECTRICAL SYSTEM

V 12 Voltage:

Battery: V/Ah/A 12 / 110 / 850 Generator: 14 / 80 V/A kW/PS 3.0 / 4.1 Starter:

heater flange Starting aid:

Lighting: acc. to German motor vehicle

construction and use regulation

and Euronorm

TRANSMISSION

Travel pump: A 4 VG 40 DA with pressure cut-off type

Displacement: cm³/rev. 0 to 40 A 6 VM 55 DA Travel motor: type

max. cm³/rev. Displacement:

Rexroth 2TH6 RP20 Servo-controlled valve, pedal: type

TRAVEL RANGE

20 km/h version TW 70

0 to 6 / 0 to 20 Symbol tortoise / rabbit: km/h

TW 70 30 km/h - Version:

4 pre-selectable travel ranges, electro-hydraulically operated:

Gearbox position 1, tortoise / rabbit: km/h 0 to 6 / 0 to 17 Gearbox position 2, tortoise / rabbit: km/h 0 to 11 / 0 to 30

Cardan shaft rev. 20 km/h version adjustment at nominal speed

tortoise / rabbit

365/70 R18: min⁻¹ 795 / 2,560 with standard tyres: min⁻¹ 8.25-20: 735 / 2,370 option: min⁻¹ 500/45-20: 770 / 2,490

adjustment at nominal speed Cardan shaft rev. 30 km/h version

> tortoise rabbit 1st / 2nd gear / 1st / 2nd gear

min⁻¹ 300 / 1,305 with standard tyres: 365/70 R18: / 855 / 3,560 option: 8.25-20: min⁻¹ 300 / 1,305 / 855 / 3,560

min⁻¹ 500/45-20: 300 / 1,305 855 / 3,560 PRESSURE AND SETTING VALUES Travel

- 0.25 Suction pressure: bar 30 +2 Charge pressure (high idle): bar 480 High pressure (SV): bar Pressure cut-off: 450 bar Case pressure at + 50° C: max. bar 2.5 230 .40 Regulation start (dynamic): bar

Start-up speed: min^{-1} 1,100 $^{+50}$ (50 bar HP)

Engine stalling (tortoise, dynamic): min^{-1} 2,300 $^{+50}/_{-100}$ at 280 $^{+10}$ bar HP

STEERING

Steering unit: type Rexroth LAGC SD 160

Steering pump: make Kayaba P3

Displacement: cm³/rev. 18 (≈ 43 l/min)

Steering pressure (high idle): bar 120

Priority valve: type Rexroth LPS 80

WORKING HYDRAULICS

Working pump (variable displacement pump): type Kayaba PSVD2-26E Displacement: cm^3/rev . 2×26 ($\approx 2 \times 62 \text{ l/min}$)

Gear pump: P3 type Kayaba

Displacement: cm³/rev. 18 (≈ 43 l/min)

Main relief valve: P1 + P2 bar 245 Main relief valve: P3 bar 205

Servo-controlled valve (joystick) right / left: type Rexroth 4TH6 N

Servo-controlled valve, linear lever (stabilising): type Hydro – Control HC-RC11

Servo-controlled valve, pedal

(intermediate boom / articulation)typeRexroth 2TH6 RP20Valve bank:typeKayaba KVSE-72-9

PRESSURE AND SETTING VALUES Working

Valve bank - KVSE-72

Main relief valve P1 + P2 bar 245

Line relief pressures:

Boom - articulated boom (raise / lower): bar 280 / 280
Dipperstick: bar 280 / 280
Bucket: bar 280 / 280

- Intermediate boom - articulated boom / circular boom

in / out: bar 280 / 150 - Additional control circuit / breaker: bar 280 / 280

Main relief valve P3 Line relief pressures:

- Slewing (valves at slew motor): bar 205 / 205

- Articulation: bar --- Stabilising: bar ---

Pilot pressure (charge pressure) - high idle: bar 30 +2

SLEW DRIVE

Slew gear with slew motor: type Kayaba MSG-27P-23E-2

bar

205

Slew pressure (valves at the slew motor): bar 210 (high idle)

CYCLE TIMES

Articulated boom -	raise / lower:	sec.	4.5 / 4.5
Intermediate boom -	raise / lower:	sec.	4.1 / 3.2
Dipperstick -	in / out:	sec.	3.5 / 2.9
Bucket -	in / out:	sec.	2.6 / 2.1

AXLES

Front axle:	20 km/h version	make/type	Clark-Hurth	211 / 52
Rear axle:	20 km/h version	make/type	Clark-Hurth	315 / 111 / 61
Front axle:	30 km/h version	make/type	Clark-Hurth	211 / 52
Rear axle:	30 km/h version	make/type	Clark-Hurth	357 / 111 / 237

BRAKES

Brake pump: Displacement: Brake shut-off valve: Switching range: Foot brake valve:	make cm³/rev. make bar make	Kayaba 18 Wabco 477 120 - 150 Wabco 467
Brake pressure: Beginning/ end of inching:	bar bar	45 5 - 13

Parking brake: spring-loaded brake in the front axle Service brake: oil-immersed multi-disk brake, front

and rear axle

LUBRICANTS

Engine oil: see engine instruction book

Hydraulic oil: see Schaeff hydraulic oil recommen-

dation table

Transmission oil: MIL-L 2105 B / API-GL 5,

SAE 85 W 90 LS or SAE 90 LS

Multi-purpose grease:

acc. to DIN 51825. Dripping point
over 170°C. Lithium-saponified.

NLGI grade 2 with EP additives

MAINTENANCE PARTS

see operating manual

CAPACITIES Itr.

Engine oil (change):	approx.	10.0	engine oil
Hydraulic oil (tank and system):	approx.	180.0	hydraulic oil
Hydraulic oil (change):	approx.	110.0	hydraulic oil
Fuel tank:	approx.	150.0	diesel
Steering front axle - central housing:	approx.	4.0	transmission oil
Rear axle - central housing:	approx.	4.4	transmission oil
Reduction gear:	approx.	0.7	transmission oil
Wheel hubs front axle:	approx.	0.9	transmission oil, each
Wheel hubs rear axle:	approx.	0.9	transmission oil, each
Swing gear:	lubrication by circulation of the hydraulic oil		
Service brake:	connected to the hydraulic system		

Service brake: connected to the hydraulic system
Cooling agent: engine oil

DIESEL ENGINE

Manufacturer: **KHD**

BF 4 M 2012 - COM 2 Type:

Performance according to DIN 70020: kW 60 at 2,000 min⁻¹

Cooling: water

Injection: direct injection

Capacity: cm³ 4,040 2,150⁺⁵⁰ min⁻¹ High idle: min⁻¹ 800^{+50} Low idle: 208 0.3 ^{+0.1} Spec. fuel consumption under full load: g/kWh Tappet clearance - inlet cold: mm 0.5 +0.1 Tappet clearance - outlet cold: mm

Torque cylinder head studs: 30, 80, 90° Nm

Further data: see engine instruction book

ELECTRICAL SYSTEM

V 12 Voltage:

Battery: V/Ah/A 12 / 110 / 850 Generator: 14 / 95 V/A kW/PS 3.1 / 4 Starter:

Starting aid: heater flange

Lighting: acc. to German motor vehicle

construction and use regulation

and Euronorm

TRANSMISSION

Travel pump: type A 4 VG 56 DA with pressure

cut-off

Displacement: cm³/rev. 0 to 56

Travel motor: A 6 VM 107 DA type

Displacement: max. cm³/rev. 107

Servo-controlled valve, pedal: type Rexroth 2TH6 RP20

TRAVEL RANGE

TW 85 20km/h version

0 to 6 / 0 to 20 Symbol tortoise/rabbit km/h

TW 85 36km/h version

4 pre-selectable travel ranges, electro-hydraulically operated:

tortoise/rabbit Gear position 1: km/h 0 to 5 / 0 to 15 Gear position 2: 0 to 11 / 0 to 36 tortoise/rabbit km/h

Cardan shaft rev. with 20 km/h version adjustment at nominal speed

tortoise / rabbit

min⁻¹ 395 / 1,480 with standard tyres: 8.25-20:

min⁻¹ 395 / 1,475 365/70 R18: min⁻¹ 395 / 1,450 500/45-20:

Cardan shaft rev. with 25 km/h version adjustment at nominal speed

tortoise / rabbit

with standard tyres: min⁻¹ 395 / 1.850 8.25-20:

min⁻¹ 395 / 1,840 365/70 R18: min⁻¹ 395 / 1.810 500/45-20:

Cardan shaft rev. with 36 km/h version adjustment at nominal speed tortoise rabbit gear pos.1 / 2 gear pos. 1 / 2 min⁻¹ with standard tyres: 8.25-20: 350 / 850 1.105 / 2.660 min⁻¹ 365/70 R18: 350 / 850 1,100 / 2,650 min⁻¹ 500/45-20: 350 / 850 1,080 / 2,600 PRESSURE AND SETTING VALUES Travel - 0.25 Suction pressure: bar 30 +2 Charge pressure (high idle): bar High pressure (SV): 480 bar Pressure cut-off: bar 450 Case pressure at + 50° C: max. bar 2.5 270 .40 Regulation start (dynamic): bar min⁻¹ 1,100 ⁺⁵⁰ (50 bar HP) Start-up speed: min⁻¹ 1,900 *50 at 320 *10 bar HP Engine stalling (tortoise, dynamic): **STEERING** Steering unit: type Rexroth LAGC 200-14/LD 200-140 Steering pump: make Casappa Displacement: cm³/rev. 16,6 Steering pressure (high idle): bar 140 Priority valve: Rexroth LPS 40 R11 type **WORKING HYDRAULICS** Working pump (variable displacement pump): A 10 VO 071 DFLR type 0 to 71 Displacement: cm³/rev. Triple gear pumps: type Casappa Displacement: cm³/rev. 16.6+11.1 LS-pressure relief valve: bar 280 (valve bank 1) LS-regulator (stand-by pressure): 22 at 2.150 min⁻¹ bar (variable displacement pump)

Servo-controlled valve (joystick) right / left: type Rexroth 4TH 6 N Servo-controlled valve, linear lever (stabilizing): type Hydro – Control

MONO boom:

Servo-controlled valve, pedal (articulation): type Rexroth 2TH 6 RP 20

With articulated boom and circular boom:

Servo-controlled valve, pedal (intermediate boom /

articulation) type Rexroth 2TH 6 RP 20

Valve bank 1, articulated boom and circular boom /

MONO boom: type Rexroth 5 SX 14 / 4 SX 14

Valve bank 2: type Rexroth 4 SM 12

PRESSURE AND SETTING	G VALUES	Working		
Valve bank 1 - SX 14				
LS valve:		bar	280	
Main relief valve:		bar	310	
Line relief pressures:				
- Boom - articulated boom	(raise / lower):	bar	300 / 30	0
	(raise / lower):	bar	300 / 18	
	(raise / lower):	bar	300 / 18	
- Dipperstick:	(,	bar	300 / 30	
- Bucket:		bar	300 / 30	
- Intermediate boom - articu	ulated boom / circular b			
in / out:		bar	300 / 15	0
- Additional control circuit /	hreaker:	bar	300 / 30	
Valve bank 2 - SM 12	breaker.	bui	000700	0
Main pressure relief valve 2	(high idlo):	bor	230	
	. (High lale).	bar	230	
Line relief pressures:	otor):	bor	100/250	/ 100/250
- Slewing (valves at slew m	otor).	bar		/ 100/250
- Articulation:		bar		
- Stabilizing:		bar	 400 +10	(D.) (1)
- Option: front dozer blade:		bar	130 ⁺¹⁰	(Bosch safety valve in the undercarriage)
Cut-off valve:		make	Bergin	
Cut-off pressure (high idle):		bar	110	
Pilot pressure (charge pres		bar	30 ⁺²	
Filot pressure (charge pres	sure) - riigir iule.	Dai	30	
SLEW DRIVE				
Slew gear :		type	ZFP DR	- 140
Slew motor:		type	A 2 FM 2	
Slew pressure (valves at the	e slew motor):	bar	100 / 25	
Olew pressure (valves at the	e siew motor).	bai	100 / 25	0
CYCLE TIMES				
Mono boom -	raise / lower:	sec.	4.5 / 4.8	
Articulated boom -	raise / lower:	sec.	4.5 / 4.5	
Intermediate boom -	raise / lower:	sec.	4.0 / 3.0	
Dipperstick -	in / out:	sec.	4.0 / 3.6	
Bucket -	in / out:	sec.	2.6 / 2.0	
20001	, 544			
AXLES				
Front axle: standard		make/type	Clark-Hu	urth 311/212/99
Rear axle: standard		make/type		urth 162/53
rtodi dirio.		makerty pe	O.G.I.	3.1.1.102.00
Options:				
Front axle: 4 wheel steering		make/type		urth 311/212/110
Rear axle: 4 wheel steering		make/type	Clark-Hu	urth 212/348
			<u>.</u>	
Front axle: "S"-version		make/type		urth 357/212/199
Rear axle: "S"-version		make/type	Clark-Hu	urth 162/53
Front axle: "S"-version, 4 v		make/type		urth 357/212/199
Rear axle: "S"-version, 4 v	wheel steering	make/type	Clark-Hu	urth 212/348

Thank you very much for reading.

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