SERVICE MANUAL

E16 - E18
Excavators

Print No. 604.13.396

NEW HOLLAND CONSTRUCTION

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E16 - E18

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FUNCTION AND FEATURES OF HYDRAULIC CIRCUIT

The hydraulic circuits are built up with the following functions and features in order to achieve easy operation, safety and high working efficiency.

Performance	Device	Function	Features
Easy Operation and Safety	Travel	• Straight traveling • Expansion and retraction of crawler width (*)(one touch changing width of dozer) • Preventing overrunning of travel motor • Travel lock	• Securing straight traveling at combined operations of travel and other operations • Improving working performance at narrow space of working area • Preventing overrunning on a slope • Safety lock lever locks operation of travel lever
	Slew	• Slew lock (at parking)	• Preventing slewing drift at parking on a slope due to attachment's own weight (Slew Lock with lever operation for 2 facing directions of forward and backward)
	Attachment	• Hydraulic pilot control system • Pilot lock system	• Easy handling • Safety lock lever locks pilot circuit
	Others	• Closed pressurized hydraulic oil tank • Suction strainer • Line filter in pilot circuit • Return filter	• Preventing contamination of hydraulic oil and improving self sucking up efficiency • Removing dirt of suction side • Preventing malfunction in pilot operating circuit • Preventing contamination of hydraulic oil
High Working Performance	Pump	• Constant power control (Pump: P1 + P2)	• Effective use of engine power with variable pump (with 2 discharge ports)
	Travel	• 2 speeds traveling	• Improving working efficiency with 2 travel speeds shifting
	Attachment	• Recirculation of return oil at light load digging with arm	• Speed-up for light load digging with arm

(*) Maked item is applied for **ADJUSTABLE CRAWLER FRAME WIDTH**

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TROUBLESHOOTING

Troubles	Possible causes	Remedy
External oil leakage	• O-ring is defective.	• Replace all the seal parts.
Internal oil leakage	• Thrust ring is defective. • Excessive wear on sliding surfaces.	• Replace all the seal parts. • Replace the assembly.
Shaft sticks	• Shaft and body are stuck together.	• Carry out grinding and honing. If excessive looseness cause oil leakage, replace the assembly.
Flange looseness	• Capscrew tightening isinsufficient.	• Retighten with the specified torque.

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SPECIFICATIONS AND PERFORMANCE

2TNE68

*Output conditions : Intake back pressure ≤ 250 mmAq, Exhaust back pressure ≤ 550 mmAq, other conditions complying with JIS D 1005–1986. After minimum 30 hour's run-in.

	Item		Model / Unit	2TNE68										
SPECIFICATIONS	Application		—	VM						CH		VH		
	Type		—	Vertical, 4-cycle water-cooled diesel engine										
	Combustion system		—	Special swirl pre-combustion chamber										
	No. of cylinders – Bore X Stroke		mm	2 – 68 X 72										
	Displacement		C³	0.523										
	Firing order		—	1 – 2										
	Revolution speed		rpm	2000	2200	2400	2600	2800	3000	3000	3600	3200	3400	3600
	Output*	Continuous rating	kW(HP)	—	—	—	—	—	—	7.72 (10.5)	9.12 (12.4)	—	—	—
		Max. rating	kW(HP)	5.74 (7.8)	6.25 (8.5)	6.84 (9.3)	7.43 (10.1)	7.94 (10.8)	8.46 (11.5)	8.46 (11.5)	10.0 (13.6)	8.68 (11.8)	9.19 (12.5)	9.64 (13.1)
	Max. revolution speed at no load		rpm	2180 +100 0	2375 +100 0	2570 +100 0	2780 +100 0	2970 +100 0	3180 +100 0	3180 +100 0	3780 +100 0	3425 +100 0	3640 +100 0	3850 +100 0
	Min. revolution speed at no load			≤800						≤1500		≤800		
	Direction of rotation		—	Counterclockwise (viewed from flywheel)										
	Power take off		—	Flywheel										
	Compression ratio		—	23.0										
	Fuel injection timing (FID, b.T.D.C.)		deg	14±1						16±1				
	Compression pressure		MPa (kgf/cm²)	3.24±0.1 (33±1), at 250 rpm										
	Fuel injection pressure		MPa (kgf/cm²)	11.8 +1.0 0 (120 +10 0)										
	Recommended diesel gas oil		—	ISO 8217 DMA, BS 2869 A1 or A2 (Cetane No. 45 min.)										
	Lubrication system		—	Forced lubrication with trochoid pump										
	Lubricating oil capacity Max/Effective		C³	1.6/0.6						2.3/1.0				
	Recommended lubricating oil		—	API grade CC class or higher										
	Cooling system		—	Liquid cooling/Radiator										
	Cooling water capacity			0.6 (for engine only)										
	Cooling fan No. of blade X dia.		mm	Discharge type, 5 X Ø290										
	Crank V-pulley dia./ Fan V-pulley dia.		mm	Ø95/Ø85										
	Governor		—	Mechanical centrifugal governor (All speed type)										
	Starting system		—	Electrical										
	*1 Dimensions L X W X H		mm	373.5 X 417 X 498 / 383.5 X 417 X 498						383.5 X 409 X 540		373.5 X 417 X 540 / 383.5 X 417 X 540		
	*1 Dry weight		kg	55 / 65						65		55 / 65		
PERFORMANCE	Governing perform-ance (full speed range)	Transient speed difference	%	≤12						≤10		≤12		
		Steady state speed band	%	≤9	≤8	≤7		≤6		≤5		≤7		
		Recovery time	sec	≤6										
		Fluctuation of revolution	rpm	≤30						≤20		≤30		
	L.O. press.	Rated operation	MPa (kgf/cm²)	0.25±0.05 (2.5±0.5)		0.29±0.05 (3.0±0.5)			0.34±0.05 (3.5±0.5)					
		Idling		≥0.06 (≥0.6)										

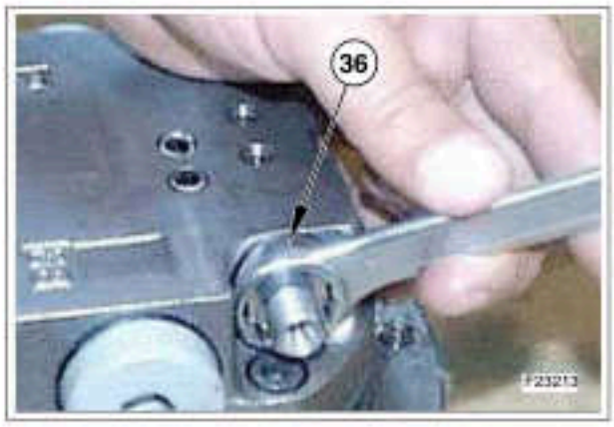
*1. Designation of engine dimension and dry weight in numerals.
CL/CH application: engine with flywheel housing
VM/VH application: engine with back plate/with flywheel hausing

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24. Remove the O-ring seals (**34**) from its seat in the plugs (**33**).



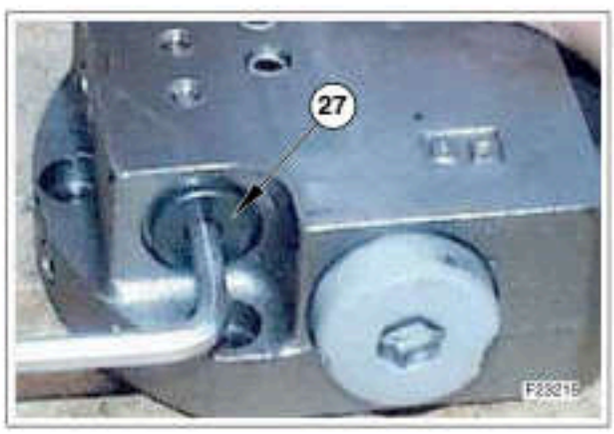
25. Unscrew the plug (**36**) from the base plate.



26. Remove the O-ring seal (**37**) from its seat in the plug (**36**).



27. Unscrew and remove the plug (**27**) from the base plate.



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5. Take out the springs (**20**).



DANGER

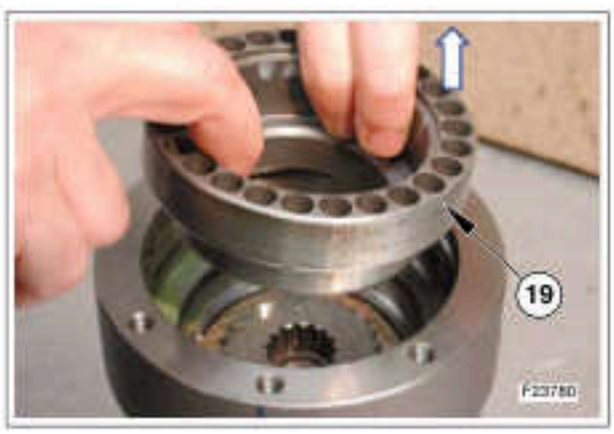
*Tighten 2 socket head screws M8x15 and two safety washers into the thread holes of the gearbox housing (**10**) by a male hex head wrench. This step is necessary to prevent that the brake piston (**19**) comes out dangerously during the disassembling procedure indicated at the following step.*



6. Pumping compressed air into the brake port until the brake piston (**19**) comes out.



7. Remove the brake piston (**19**).



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