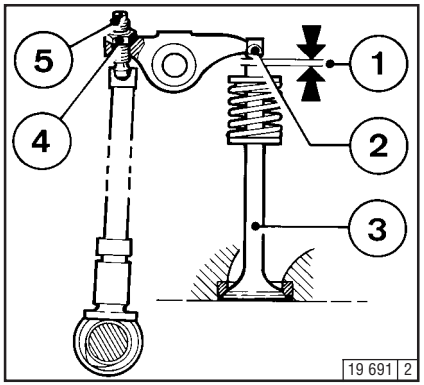
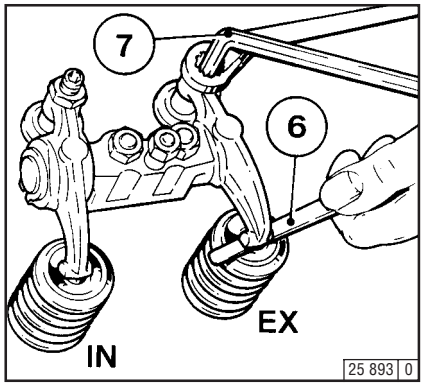
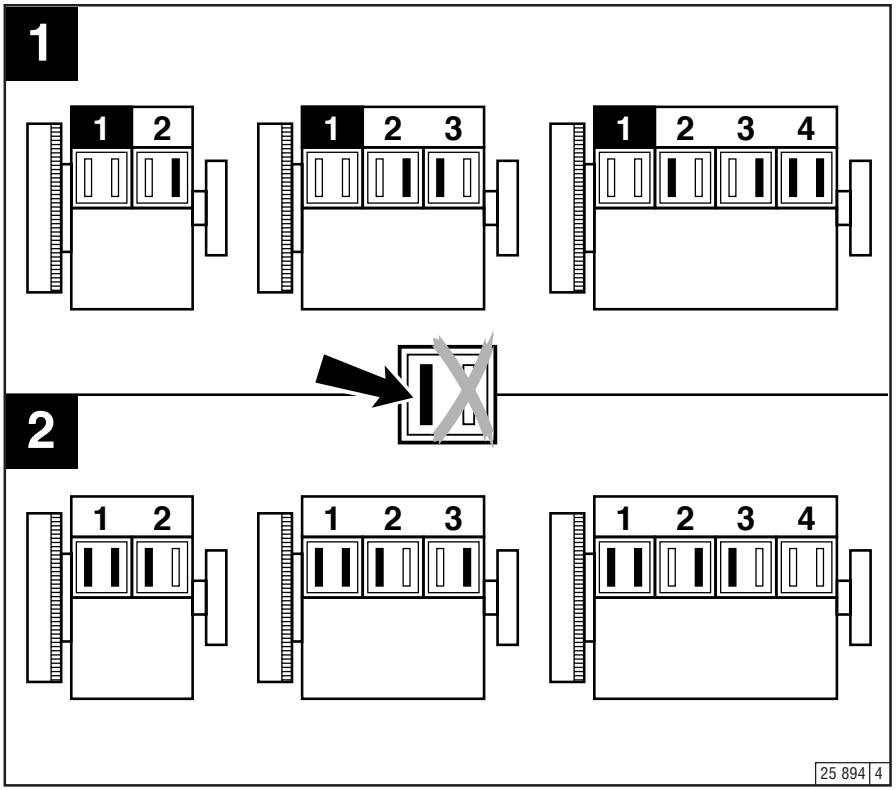
6.6.1 Checking / Adjusting Valve Clearances





- Remove the cylinder head cover.
- Position crankshaft as per schematic 6.6.1.1.
- Before adjusting valve clearance, allow engine to cool down for at least 30 minutes. The oil temperature should be below 80 °C.
- Check valve clearance 1 between rocker arm / tappet contact face 2 and valve stem 3 with feeler gauge 6 (there should be only slight resistance when feeler blade is inserted).
  For permissible valve clearance, see 9.1.
- Adjust valve clearance if necessary:
  – Release locknut 4.
  – Use allen key 7 to turn setscrew 5 so that the correct clearance is attained after locknut 4 has been tightened.
- Check and adjust valve clearance on all remaining cylinders.
- Replace cylinder head cover (use new gasket if needed).

6.6.1.1 Valve Clearance Adjustments Schematic



- **Crankshaft Position 1:**
  Turn crankshaft until both valves in cylinder 1 overlap (exhaust valve about to close, inlet valve about to open). Adjust clearance of valves marked in black on schematic. Mark respective rocker arm with chalk to show that adjustment has been done.

- **Crankshaft Position 2:**
  Turn crankshaft one full revolution (360°). Adjust clearance of valves **marked in black** on schematic.

Model		BF3L 1011F/L	BF4L 1011F/FT
Number of cylinders		3	4
Cylinder arrangement		vertical in line	
Bore	[mm]	91	
Stroke	[mm]	105/112	105
Total displacement	[cm³]	2184	2732
Compression ratio	[ε]	17	
Working cycle / Combustion system		4-stroke diesel with turbocharging and direct injection	
Direction of rotation		counter clockwise	
Weight without cooling system	[kg]	Refer to head-office	
Weight without starter, with alternator as per DIN 70020-A ca.	[kg]	233	256
Engine power	[kW (PS)]	1)	
Speed	[1/min]	1)	
Lubrication		pressure lubrication	
SAE oil		20 W 20	
Max. oil temperature in the oil sump	[°C]	130	
at: 900/min (low idling speed)	[bar]	1,4 3)	
1800 /min	[bar]	2,2 3)	
max. 3000 /min	[bar]	3 3)	
Oil change quantity (oil sump without cooling system) ca.	[ltr.]	7,5	10 2)
Oil change quantity with filter (Standard 0.5 ltr.) ca.	[ltr.]	8	10,5 2)
Valve clearance with cold engine (Engine cooling time at least 30 mins.: oil temperature below 80°C)	[mm]	inlet 0,3 + 0,1 / exhaust 0,5 + 0,1	
Injector opening pressure: vehicle/genset engine	[bar]	210 / 250 + 8	
Start of delivery	[°crank angle b TDC]	1)	
Firing order of the engine		1 - 2 - 3	1-3-4-2
V-Belt tension: Pretension / Retension (after the engine has been running under load for 15 mins):	[N]	450 / 350 ±20	

1) Engine power, speed, start of delivery are stamped on engine rating plate, see also 2.1.
2) Ca. value can vary depending on oil sump and or coolor design (external cooling system). **The upper oil dipstick marking should always be taken as authoritative**.
3) Values for engines without engine oil heating.