

# Test Specifications for Injection Pump and Governor

<b>Injection Pump</b> PES 4 M 50/320 R 3 or R 3/24 Special characteristics: injection pump with double control helix Helix pitch $\frac{5}{12}$ mm.	<b>with Governor</b> EP/MN 60 M 4 d	<b>DAI Sheet</b> 1,9 c. dated July 10, 1959
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## A. Adjustment Data of the Injection Pump

**Feed Begin at a Pre-stroke of 1.7 + 0.1 mm (from BDC)**

1	2	3	4	5	6
Speed r.p.m.	Control Rod Travel mm	Feed Quantity cm <sup>3</sup> /100 strokes	Feed Quantity Differential cm <sup>3</sup> /100 strokes	Feed Quantity Drop (between 1000 and 200 r.p.m.) cm <sup>3</sup> /100 strokes	Pre-tension of Spring (Adaptation Valve) mm
1000	9	0.9–1.3			
	15	3.0–3.5	0.2		
	18	3.8–4.4			
200	9	0.8–1.2			

Adjust delivery of equal quantities within outlined  limits

## B. Adjustment Data of the Governor

1	2	3	4	5	6	7	8	9	10	11
Travel of Adaptation mm	Leak-proof Test		Point of Adjustment Control Rod Travel Limit		Control Rod Travel Test			Adaptation		
	Vacuum Drop mm Water Col.	Time Min. sec.	Vacuum mm Water Col.	Control Rod Travel mm	with Governor Design	Vacuum mm Water Col.	Control Rod Travel mm	Vacuum mm Water Col.	Control Rod Travel mm	
2.2+0.1	500–480	10	—	—	—	—	590 600* 625 750	12.7 12.7 9.8–12.5 2 – 5.5	25 150 500 580	14.9–15 14.4–14.7 12.8–13.2 12.7

\* Exactly adjust begin of governing between 600–620 mm WG by placing washers WMS 22 S 18 . . . 19 X below the control spring.  
 For checking control travel (column 4–11) n = 500 r.p.m.

## C. Adjustment of Injection Pump with Mounted Governor

0	1	2	3	4	5	6	7	8	9
Injection Pump	Adjustment of Full-Load Stop Screw			Testing of Feed Quantity Characteristics			Adjustment of Idling Stop		
	r.p.m.	Vacuum mm Water Col.	cm <sup>3</sup> /1000 strokes	r.p.m.	Vacuum mm Water Col.	cm <sup>3</sup> /1000 strokes	r.p.m.	Vacuum mm Water Col.	Control Rod Travel from Full-Load to Idling mm
R 3 u. R 3/24	2000	590	30.5–31.5	1000 500 250	190 0 app. 650	30.5–32 30.5–32 to 6–8*	—	** see page over-leaf	

With full load adjustment (columns 3 and 6) individual measurement 1000 strokes

All test values are valid only for BOSCH injection pump test stands.

## Back of test sheet DAI 1,9 c

### \*\*) Adjustment of idling stop

At 500 r.p.m. and disengaged governor stop cam set control rod to full load position by increasing the WG to 590 mm (exactly keep to this value) and then measure the control rod travel obtained. Further increase WG until the control rod has adjusted to 3.0 mm less travel as compared to full load position, measured at WG 590 mm. In this position slowly press the stop cam to the end position observing the control rod.

Provided the position of the spring capsule is correct, the control rod will now adjust to a travel which is by  $2.0 \pm 0.5$  mm less than that in full load position, measured at WG 590 mm.

If the adjustment travel value is too high or too low, the position of the stop pin (7) in the spring capsule housing (2) should be varied by placing washers (5) between stop pin shoulder and lock ring (6) (see Figure 07-1/1).

**Caution!** This variation also varies the pre-tension in the spring capsule. This should be compensated for by placing washers (4) between additional spring (3) and stop pin bottom in order to obtain the specified pre-tension of 50-90 grams.

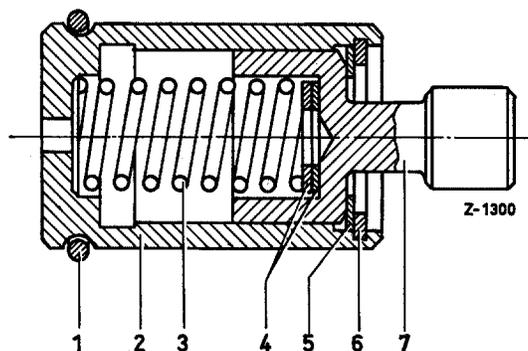


Figure 07-1/3

#### Spring capsule EPMK 52 P 1 Z

- 1 Snap ring NMR 50/11 X
- 2 Spring capsule housing EPMK 52 P 1 X
- 3 Spring WSF 11 P 186 X
- 4 Washers WMS 2040 P 28 or 29 X
- 5 Washer WMS 25 P 125 X
- 6 Lock ring NMR 33/3 X
- 7 Stop pin EPBO 202 P 1 X

With the cam in initial lift position and pressing the governor lever in direction STOP, the control rod should move to zero.

The control travel of 12.7 in section B), column 9, is an approximate value. Because of the different adjusting mechanism of this pump, the full load control travel may fluctuate. Accordingly, ascertain therefore the control travel which is required to obtain the full load quantity, section C), column 3. Then also the values in section B), column 9 and 11 vary upwards or downwards by the amount deviating from the control travel of 12.7 mm.