

15–501 Testing and adjusting ignition timing (firing point)

Job No. of flat rates or standard texts and flat rates data 15–100.

Testing and adjusting values

A. Standard version

Standard

Standard CAT (uncontrolled)

Ignition timing

Engine	Ignition distributor Bosch No.	Testing and adjusting value ¹⁾ of ignition timing without vacuum 3000/min	Ignition timing with/without vacuum			Vacuum adjustment in direction of		Installation value of ignition distributor at starting speed without vacuum
			Idle with	1500/min without	3000/min without	"retard" at idle	"advance"	
116.960 116.960 NV 116.961 116.961 NV	0 237 404 003 0 237 405 014	30 ²⁾ 3)	TDC ± 3°	15–19°	30°	8–12°	8–12°	10° before TDC
116.962 116.963	0 237 401 010	25 ²⁾ 4)	13–19°	11–15°	25°	–	15–17°	TDC
117.960 117.960 NV 117.961 117.961 NV	0 237 404 006 0 237 405 016	30 ²⁾ 3)	TDC ± 3°	14–22°	30°	8–12°	8–12°	10° before TDC
117.962 117.963	0 237 401 010	25 ²⁾ 4)	13–19°	11–15°	25°	–	15–17°	TDC

1) If manually compressed engines are operated with fuel under 98 RON (min. 88 MON), or low-compression engines under 92 RON (min. 82 MON), adjust ignition timing (firing point) in direction of "retard" and match to octane rating of fuel used. The reference value for this adjustment is: Set firing point back by 1–2° crank angle per 1 RON. Max. setback should not exceed 6° crank angle.

Attention!

Taking firing point back is considered an "emergency measure". Reduced output and increased fuel consumption will result. In addition, the engine should not be operated under full load. **As soon as fuel with specified octane number is available, set again to full advance.**

- 2) When adjusting ignition timing, pull off both vacuum lines for ignition adjustment. Switch off air conditioning.
- 3) If manually compressed engines are operated with unleaded super fuel (RON 95), adjust ignition timing to 25°. See information for use of unleaded fuels (15–509).
- 4) If manually compressed engines are operated with unleaded super fuel (RON 95), adjust ignition timing to 20°. See information for use of unleaded fuels (15–509).

Standard version NV CAT (controlled)

Ignition distributor Bosch No.	Testing and adjusting value of ignition timing with vacuum at idle ¹⁾ at idle ¹⁾	Ignition adjustment		Vacuum adjustment in direction of		Installation value of ignition distributor at starting speed without vacuum
		without vacuum 1500/min	3500/min	"retard" at idle	"advance" at idle	
0 237 401 010	TDC without vacuum	11–15°	22–26°	–	15–17°	TDC

1) Switch off refrigerant compressor.

B. National version (AUS) (CH) (J) (S) (USA)

Testing and adjusting values

Ignition distributor Bosch	Testing and adjusting value of ignition timing with vacuum at idle ³⁾	Ignition timing		Vacuum adjustment in direction of		Installation value of ignition distributor at starting speed without vacuum	Engine
		without vacuum 1500/min	3500/min	"retard" at idle	"advance" at 3500/min		

(AUS) 1981

Identification: silver information label on cross member in front of radiator

0 237 405 013	5° after TDC	7–13°	22–28°	9–11°	–	5° before TDC	116
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(AUS) starting 1982

0 237 405 024	5° after TDC	8–12°	23–27°	9–11°	–	5° before TDC	
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(CH) starting 1983

Identification: green information label on cross member in front of radiator

0 237 405 024	5° after TDC	8–12°	23–27°	9–11°	–	5° before TDC	116
0 237 405 028 ⁴⁾	TDC	7–13°	21–28°	4–6°	14–18°		116, 117

(J) 1981/82

Identification: information label in Japanese language

0 237 405 021	5° before TDC ⁵⁾	10–14°	22–26°	9–11°	18–22°	5° before TDC	116
0 237 401 012				–			

(J) starting 1983

0 237 401 010	TDC without vacuum	11–15°	22–26°	–	15–17° at idle	TDC	116, 117
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(S) 1981

Identification: blue information label in Swedish language on cross member in front of radiator

0 237 405 013	5° after TDC	7–13°	22–28°	9–11°	–	5° before TDC	116
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(S) 1982/83

0 237 405 024	5° after TDC	8–12°	23–27°	9–11°	–	5° before TDC	116
0 237 504 028 ⁴⁾	TDC	7–13°	21–28°	4–6°	14–18°		116, 117

(USA) 1981/82

Identification: black information label in English language on cross member in front of radiator

0 237 405 021	5° before TDC ⁵⁾	10–14°	22–26°	9–11°	18–22°	5° before TDC	116
0 237 401 012				–			

(USA) starting 1983

0 237 401 010	TDC without vacuum	11–15°	22–26°	–	15–17° at idle	TDC	116, 117
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1) Switch off refrigerant compressor.

4) Starting March 1981

5) (J) (USA) 1981: adjustment at operating temperature of engine. Vacuum retard is switched off above approx. 50 °C engine temperature.

Dwell angle

Engine	Dwell angle at 1/min Ignition system TSZ 4		TSZ 8 z Terminal TD Starting speed
	approx. 1500	approx. 5000 ¹⁾	
116.960 116.961 117.960 117.961	25–39°	33–40°	—
116.962 116.963 117.962 117.963	—	—	5–23°

¹⁾ Perform test at 5000/min. only in the event of complaints about misfiring and high engine speeds.

Conventional tools

Revolution counter, stroboscope

Digital tester

e. g. Bosch, MOT 001.03

Testing and adjusting

1 Test ignition timing (firing point) with stroboscope or digital tester at specified speed with or without vacuum.

2 Loosen ignition distributor fastening, if required, and set adjusting value of ignition timing, (firing point) by turning ignition distributor.

Screw down ignition distributor and check ignition timing (firing point) once again.

3 Check centrifugal and vacuum adjustment of ignition distributor. For this purpose, run through specified test values with or without vacuum adjustment.

On vehicles with air conditioning or automatic climate control, switch off air conditioning for testing ignition timing at idle, since with air conditioning or automatic climate control engaged vacuum retard will be cancelled via an electric switchover valve (vacuum adjustment of ignition timing 15–502).

