B 2 Testing, adjusting idle speed

Op. no. of operation texts and work units or standard texts and flat rates ..... 07-2053 or 2056

Brief description

1	Testers	connect according to connection diagram, disconnect.
2.0	Accelerator control	check ease of operation and condition of throttle valve. Lubricate all bearing points and ball sockets.
2.1	Idle stop	check, adjust.
3	Ignition angle with and without vacuum ⇒ Engine: **Idling**	test (Test and Adjustment Data, Index A).
4	Idle speed	test.
5.0	Lambda control (KAT)	test.
5.1	Idle emissions level (without KAT)	test, adjust.
6	Smooth engine running	check with selector lever in position "D" (parking and service brakes applied) and electrical components switched on.

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Special tools

Commercially available tools and testers

Designation	e.g. make, order no.
Engine tester with oscilloscope or engine diagnosis tester	Bear, Bosch, Crypton, Hermann, SUN
Lambda control tester	Hermann, L 115, L 116 Bosch, KDJE-P600
Twin socket	Hermann, ECD 53
Adapter CD 1223 for vehicles without 9-pin diagnostic socket, as of 07/93 (two CD 1223 are required for diagnosis of M120).	Hermann Elektronic No. 0. 355. 223. 01

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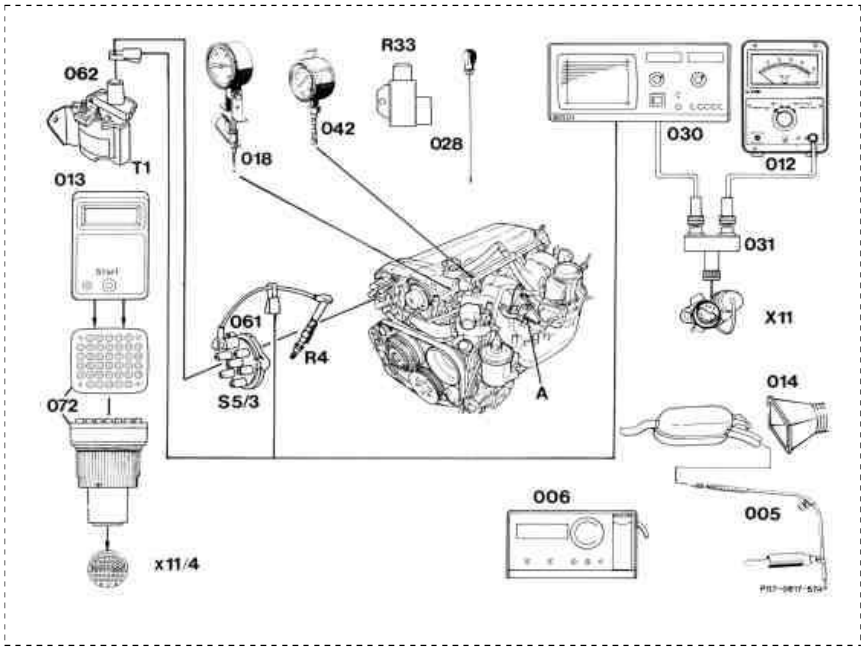
Connection diagram engine 104

⚠
Set cylinder selector switch of engine tester to 6 cylinders.

Fig. 1

A	Accelerator control
R4	Spark plugs (cylinder 1)
R33	CO potentiometer, additive performance map adjustment
S5/3	High voltage distributor
T1	Ignition coil
X11	Diagnosis socket, 9-pin
X11/4	Test coupling for diagnosis, 38-pin (pulse signal)
005	Exhaust probe
006	CO analyzer
012	Lambda control tester
013	Pulse counter
014	Extraction funnel
018	Oil telethermometer
028	Puller
030	Engine tester with oscilloscope
031	Twin socket
042	Pressure measuring device
061	Trigger clamp (to cylinder 1)
062	Kilovolt clamp (to ignition coil)
072	Pulse counter adapter



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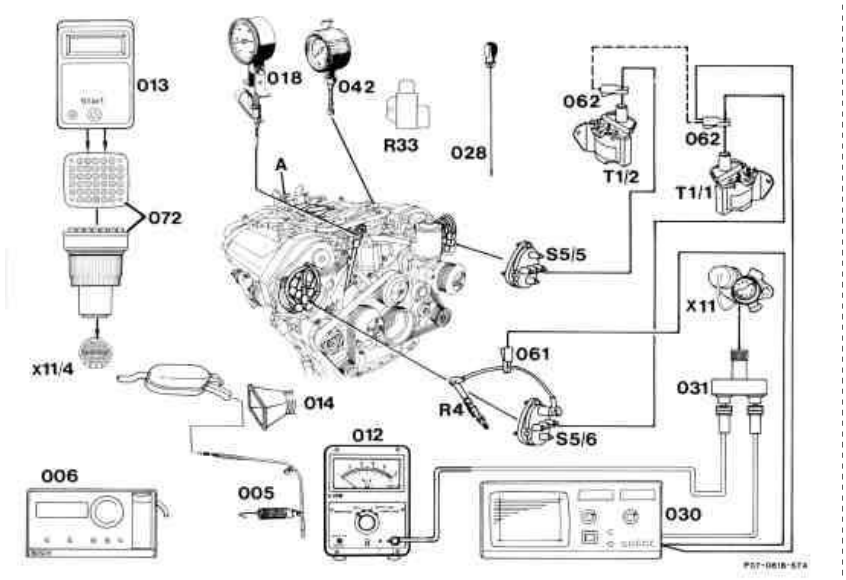
Connection diagram engine 119 with diagn. socket (X11)
Connection diagram without diagnostic socket as "Testing, adjusting engine"
⚠
Set cylinder selector switch of engine tester to 4 cylinders. Without diagnosis adapter only **one** ignition circuit can be measured.

Fig. 2



A	Accelerator control
R4	Spark plugs (cylinder 1)
R33	CO potentiometer, additive performance map adjustment
S5/5	Left high voltage distributor
S5/6	Right high voltage distributor
T1/1	Ignition coil 1 (right bank of cylinders)
T1/2	Ignition coil 2 (left bank of cylinders)
X11	Diagnosis socket, 9-pin
X11/4	Test coupling for diagnosis, 38-pin (pulse signal)
005	Exhaust probe
006	CO analyzer
012	Lambda control tester
013	Pulse counter
014	Extraction funnel
018	Oil telethermometer
028	Puller
030	Engine tester with oscilloscope
031	Twin socket
042	Pressure measuring device
061	Trigger clamp (to cylinder 1)
062	Kilovolt clamp (to ignition coil, alternatively T1/1, T1/2)
072	Pulse counter adapter

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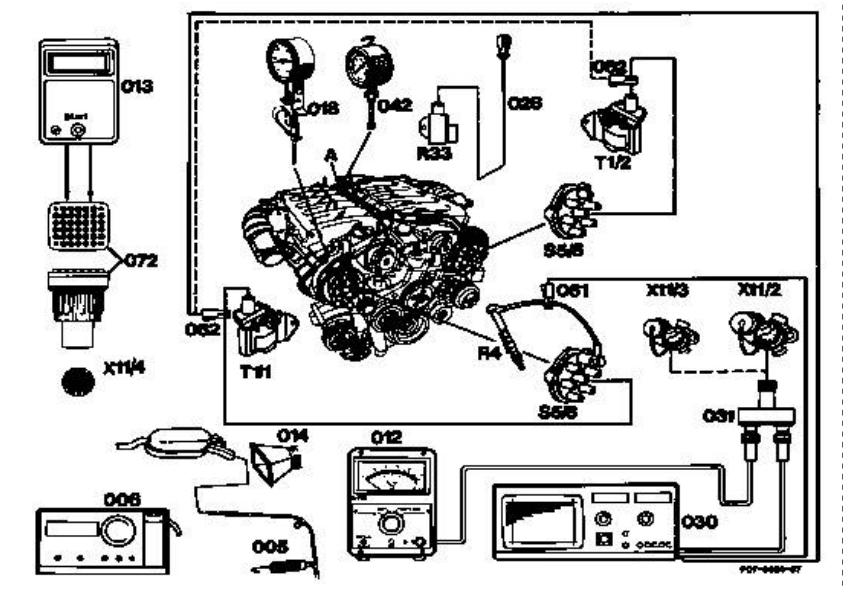
Connection diagram engine 120 with diagn. socket (X11)
Connection diagram without diagnostic socket as "Testing, adjusting engine"
⚠
Set cylinder selector switch of engine tester to 6 cylinders. Without diagnosis adapter only **one** ignition circuit can be measured.

Fig. 3



A	Accelerator control
R4	Spark plugs (cylinder 1)
S5/5	Left high voltage distributor
S5/6	Right high voltage distributor
T1/1	Ignition coil 1 (right bank of cylinders)
T1/2	Ignition coil 2 (left bank of cylinders)
X11/2	Left diagnosis socket, 9-pin
X11/3	Right diagnosis socket, 9-pin
X11/4	Test coupling for diagnosis, 38-pin (pulse signal)
005	Exhaust probe
006	CO analyzer
012	Lambda control tester
013	Pulse counter
014	Extraction funnel
018	Oil telethermometer
028	Puller
030	Engine tester with oscilloscope
031	Twin socket
042	Pressure measuring device
061	Trigger clamp (to cylinder 1)
062	Kilovolt clamp (to ignition coil, alternatively T1/1, T1/2)
072	Pulse counter adapter

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Connection table for test and adjustment equipment without diagnosis adapter for two-circuit ignition systems engine 119, 120

Tester Version	Setting of no. of cylinders on tester	Test mode	Test cable from tester to diagnosis socket			Trigger clamp to ignition cable	kV clamp to ignition cable ignition circuit
			X11 Engine 119	X11/2 Engine 120 lt.	X11/3 Engine 120 rt.		
Bosch Mot 103	Engine 119 : **4**	RPM/dwell angle of ignition circuit→	T1/1	-	T1/1	-	-

Mot 002.03 Mot 301/401 Crypton TI336 Hermann D 421 Mo 941 D960S SUN DMA1000 MEA1500	Engine 120 : **6**	RPM/dwell angle of ignition circuit→	-	T1/2	-	-	-
		Ignition angle of ignition circuit→	T1/1	-	T1/1	Cylinder 1	Engine 119: T1/1 Engine 120: T1/1
		Ignition angle of ignition circuit→	T1/2	T1/2		Engine 119: cyl. 2 [1]) Engine 120: cyl. 12	Engine 119: T1/2 Engine 120: T1/2
		Primary/secondary oscilloscope → and voltage at term. 15/1 of ignition coil	T1/1	-	T1/1	**Engine 119: cyl. 1** Firing sequence on oscilloscope 1-4-6-7 **Engine 120: cyl. 1** Firing sequence on oscilloscope 1-5-3-6-2-4	**Engine 119: T1/1** Firing sequence on oscilloscope 1-4-6-7 **Engine 120: T1/1** Firing sequence on oscilloscope 1-5-3-6-2-4
		Primary/secondary oscilloscope → and voltage at term. 15/1 of ignition coil	-	T1/2	-	**Engine 119: cyl. 5** Firing sequence on oscilloscope 5-8-3-2 **Engine 120: cyl. 12** Fir. seq. on oscilloscope 12-8-10-7-11-9	**Engine 119: T1/2** Firing sequence on oscilloscope 5-8-3-2 **Engine 120: T1/2** Fir. seq. on oscilloscope 12-8-10-7-11-9

1) For engine 119, deduct 90° CA from reading, e.g. measured: 107° CA 107 - 90=17° CA ignition angle.

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Note
The lambda control or the idle emissions level must not be tested and adjusted when the engine is too hot, e.g. immediately after driving sharply or after measuring engine output on the dynamometer.

Test step/Test scope	Operation/Requirement	Specification	Possible cause/Remedy
⇒ 1 **Connecting test equipment according to connection diagram**	Ignition: **OFF**	-	-
⇒ 2 **Checking accelerator control linkage and throttle valve for ease of movement and condition**	Ignition: **OFF** Operate accelerator control linkage	Should operate freely; no pressure point must be perceptible	Lubricate all bearing points and ball sockets
⇒ 2.1 **Checking idle speed stop**	Ignition: **OFF** Accelerator pedal in idle position	Lever of throttle valve assembly actuator must be resting against idle stop (contact audible!)	Adjust idle speed setting at engine end (30-1010)
⇒ 3 **Test ignition angle with and without vacuum**	Engine: **Idling** Selector lever position "P" AC compressor "OFF"	Test and Adjustment Data (Index A)	Test electronic ignition system EZL (Engine Volume 2, Index 5.2 or 5.3)

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Test step/Test scope	Operation/Requirement	Specification	Possible cause/Remedy
⇒ 4 **Raising engine oil to normal operating temperature**	Engine speed: **hold at approx. 3000/min**	Engine oil temperature approx. 80 °C	-
⇒ 5 **Testing idle speed**	Engine: **Idling** Selector lever position "P" AC compressor "OFF"	Test and Adjustment Data (Index A)	Test program: Test electronic accelerator pedal/ Tempomat cruise control/idle speed control (Engine Volume 3, Index 6.2, 6.3) Tempomat cruise control/idle speed control (Engine Volume 3, Index 7.1) Idle speed control (Engine Volume 3, Index 7.2)
⇒ 6.0 **Testing lambda control**	**KAT**: Selector lever position "P" AC compressor "OFF" Detach regeneration line (A, or B) at regeneration switchover valve and seal (Figs. 6 - 9). Re-connect after measuring. Engine: **Idling**	Test and Adjustment Data (Index A)	Test program: Test electrical components (Engine Volume 2, Index 3.1 or 3.2)

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