

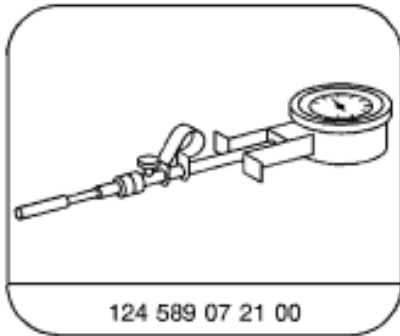
B 2 Idle Test, Adjustment

Listing of Test Steps

1	Test equipment	connect/disconnect.
2.0	Throttle control linkage	check throttle valve for free movement and condition. Lubricate bearings, gate levers and ball sockets.
2.1	Idle stop	check, adjust
3	Ignition timing with and without vacuum ⇒ Engine: at Idle	check (see Test and Adjustment Data, Section A).
4	Engine rpm (at Idle)	check.
5	On-off ratio control	check.
6	CTP speed under load	check in TR "D" (with service and parking brake applied) and with all consumers turned on.

B 2 Idle Test, Adjustment

Special Tools



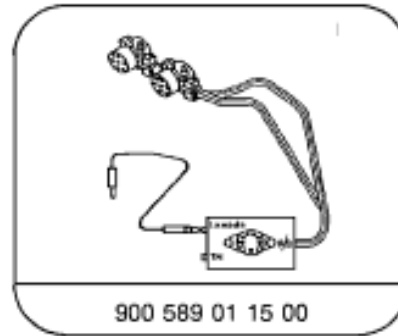
124 589 07 21 00

Remote thermometer



909 589 09 21 00

On-off ratio tester



900 589 01 15 00

On-off ratio signal adapter

Equipment

Engine analyzer ¹⁾	Bear DACE (Model 40-960) Sun MEA-1500MB
Digital multimeter ¹⁾	Sun DMM-5 Fluke Model 23 with 80i-410 current probe

¹⁾ Available through the MBUSA Standard Equipment Program.

Note:

Two adapters 900 589 01 15 00 are required for testing engine 120

B 2 Idle Test, Adjustment

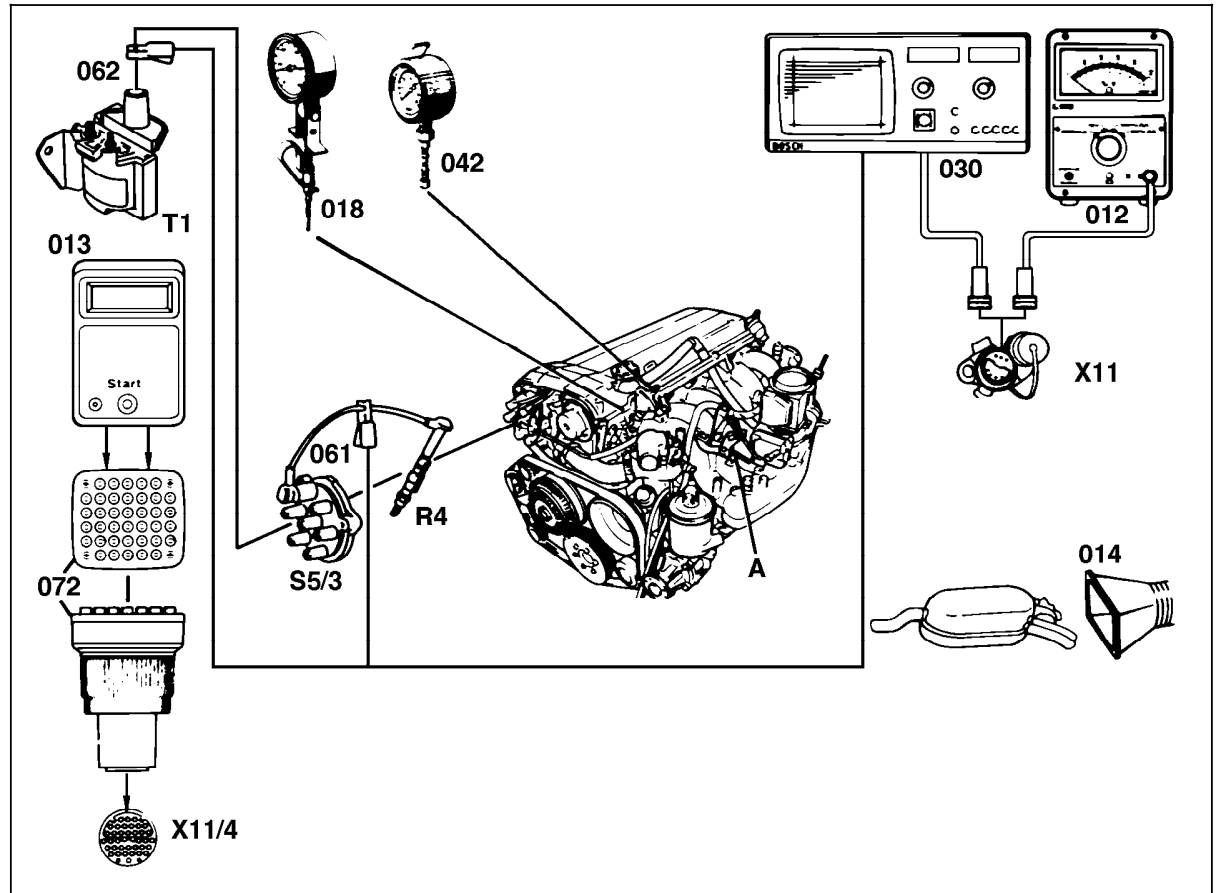
**Connection Diagram – Test Equipment
Engine 104 LH-SFI**



Set engine analyzer to 6 cylinder position.

Figure 1

- A Throttle linkage
- R4 Spark plug (cylinder 1)
- S5/3 High-voltage distributor
- T1 Ignition coil
- X11 Diagnostic socket (9-pole)
- X11/4 Data link connector, (DTC readout, 38-pole)
- 012 On-off ratio tester
- 013 Impulse counter scan tool
- 014 Exhaust vent hose
- 018 Oil thermometer
- 030 Engine analyzer with oscilloscope
- 042 Pressure gauge
- 061 Trigger clamp (on cylinder 1)
- 062 Kilovolt clamp (on ignition coil)
- 072 Impulse counter scan tool adaptor



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B 2 Idle Test, Adjustment

Connection Diagram – Test Equipment Engine 119 LH-SFI with Diagnostic Socket (X11)

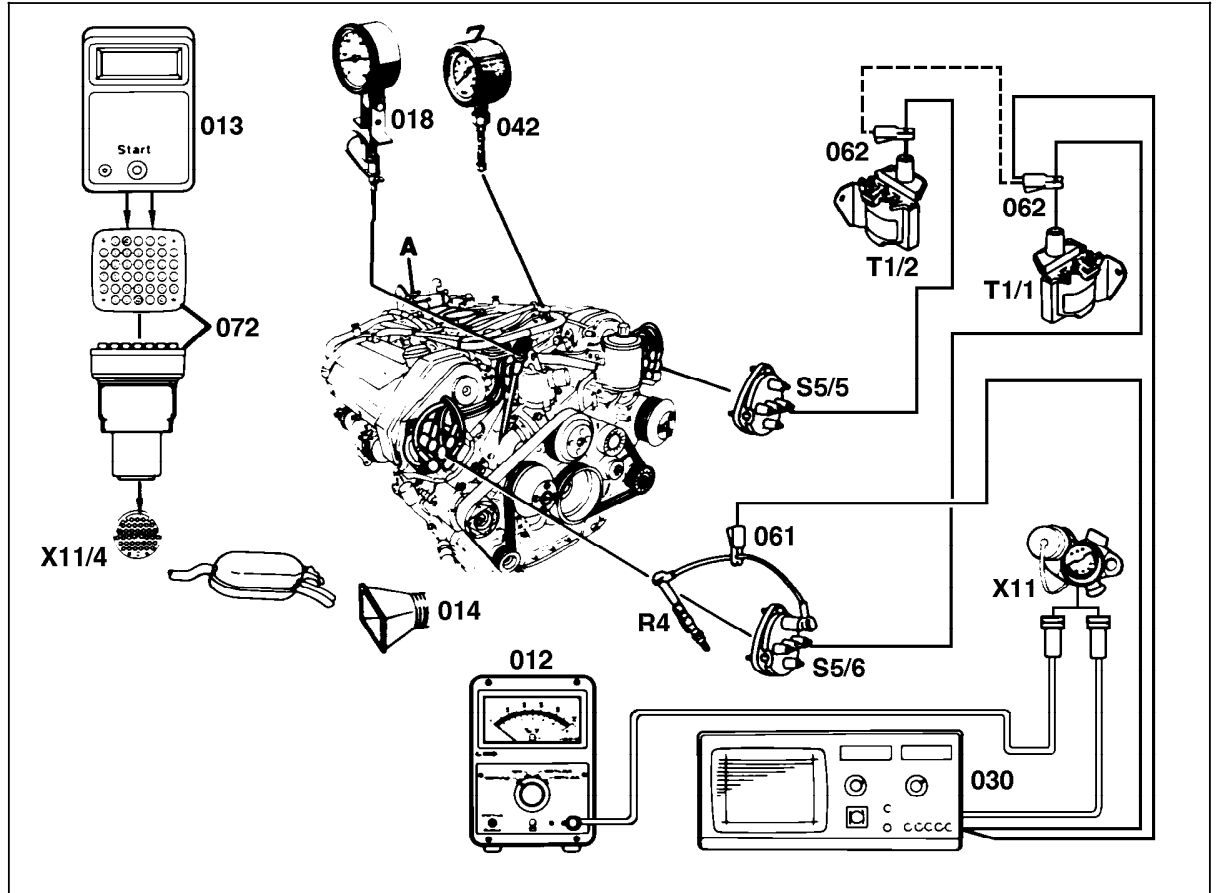
Without Diagnostic Socket (X11) see Connection Diagram 21/5.



Set engine analyzer to 4 cylinder position. Without the diagnostic adaptor tool only one ignition circuit can be checked at a time.

Figure 2

- A Throttle linkage
- R4 Spark plug (cylinder 1)
- S5/5 Left high-voltage distributor
- S5/6 Right high-voltage distributor
- T1/1 Ignition coil 1 (right cylinder bank)
- T1/2 Ignition coil 2 (left cylinder bank)
- X11 Diagnostic socket (9-pole)
- X11/4 Data link connector, (DTC readout)
- 012 On-off ratio tester
- 013 Impulse counter scan tool
- 014 Exhaust vent hose
- 018 Oil thermometer
- 030 Engine analyzer with oscilloscope
- 042 Pressure gauge
- 061 Trigger clamp (on cylinder 1)
- 062 Kilovolt clamp (on ignition coil)
- 072 Impulse counter scan tool adaptor



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B 2 Idle Test, Adjustment

Connection Diagram –Test Equipment

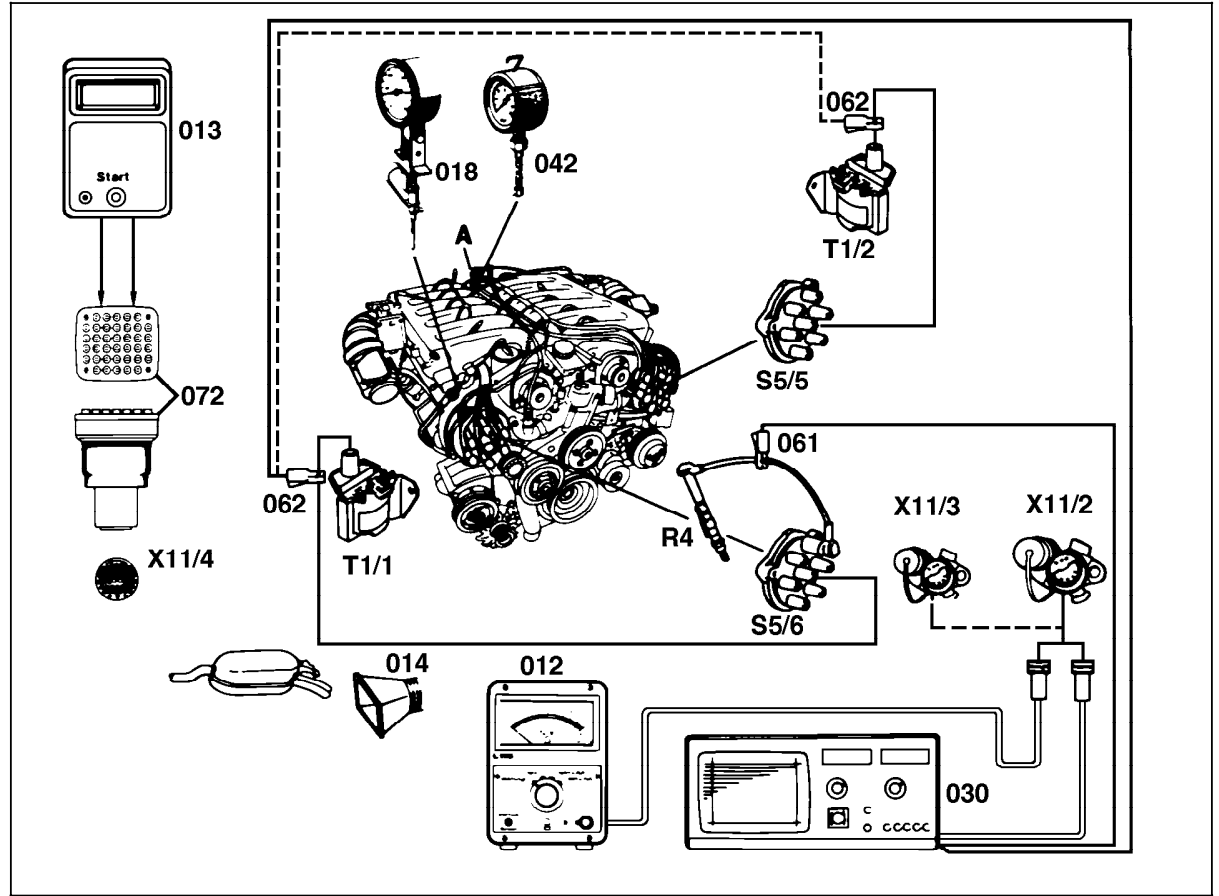
Engine 120 LH-SFI with Diagnostic Socket (X11)
 Connection diagram without diagnostic socket (X11) see 21/5.



Set engine analyzer to 6 cylinder position. Without the diagnostic adaptor tool only one ignition circuit can be checked at a time.

Figure 3

- A Throttle linkage
- R4 Spark plug (cylinder 1)
- S5/5 Left high-voltage distributor
- S5/6 Right high-voltage distributor
- T1/1 Ignition coil 1 (right cylinder bank)
- T1/2 Ignition coil 2 (left cylinder bank)
- X11/2 Left diagnostic socket (9-pole)
- X11/3 Right diagnostic socket (9-pole)
- X11/4 Data link connector, (DTC readout, 38-pole)
- 012 On-off ratio tester
- 013 Impulse counter scan tool
- 014 Exhaust vent hose
- 018 Oil thermometer
- 030 Engine analyzer with oscilloscope
- 042 Pressure gauge
- 061 Trigger clamp (on cylinder 1)
- 062 Kilovolt clamp (on ignition coil, T1/1 or T1/2)
- 072 Impulse counter scan tool adapter



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B 2 Idle Test, Adjustment

Connection chart for test equipment without diagnostic adapter for two circuit ignition systems

Engine analyzer version	Cylinder no. setting on engine analyzer	Type of measurement	Circuit on Diagnostic socket			Trigger clamp on ignition cable	kV-Clamp on ignition cable ignition circuit
			X11 Engine 119	X11/2 Engine 120 L.	X11/3 Engine 120 R.		
Bear DACE (Model 40-960) SUN MEA-1500MB	Engine 119 : 4 Engine 120 : 6	RPM/ dwell angle of Ignition circuit →	T1/1		T1/1		
		RPM/ dwell angle of Ignition circuit →		T1/2			
		Timing of Ignition circuit →	T1/1		T1/1	Cylinder 1	Engine 119: T1/1 Engine 120: T1/1
		Timing of Ignition circuit →	T1/2	T1/2		Engine 119: cyl. 2 ¹⁾ Engine 120: cyl. 12	Engine 119: T1/2 Engine 120: T1/2
		Oscilloscope primary/secondary → and voltage at terminal 15/1 of Ignition coil	T1/1		T1/1	Engine 119: cyl. 1 Firing order 1-4-6-7 Engine 120: cyl. 1 Firing order 1-5-3-6-2-4	Engine 119: T1/1 Firing order 1-4-6-7 Engine 120: T1/1 Firing order 1-5-3-6-2-4
		Oscilloscope primary/secondary → and voltage at terminal 15/1 of Ignition coil		T1/2		Engine 119: cyl. 5 Firing order 5-8-3-2 Engine 120: cyl. 12 Firing order 12-8-10-7-11-9	Engine 119: T1/2 Firing order 5-8-3-2 Engine 120: T1/2 Firing order 12-8-10-7-11-9

¹⁾ On engine 119 subtract 90 °crankshaft from measured value.,
Example: measured: 107 °crankshaft, 107-90= 17 °crankshaft timing

B 2 Idle Test, Adjustment

Note:

The on-off ratio control system test should not be performed on a very hot engine, for example, after a fast drive or after an output test on a dynamometer.

Test step/Test sequence	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒ 1 Connect test equipment according to diagram	Ignition: OFF	-	-
⇒ 2 Check condition and free movement of throttle linkage and throttle valve	Ignition: OFF Actuate throttle linkage	Smooth operation, no binding should be evident.	Lubricate all bearings and ball sockets.
⇒ 2.1 Check idle speed position	Ignition: OFF Accelerator pedal at CTP	Throttle valve lever must rest against CTP stop (audible contact).	Adjust CTP stop on engine (SMS, Job No. 30-1010)
⇒ 3 Check ignition timing with and without vacuum	Engine: at Idle Selector lever in "P" Climate control system: OFF	See Test and adjustment data (section A)	Check ignition system (DM Engines, Vol. 2 – 5.2 or 5.3)

¹⁾ Observe Preparation for Test, see 22.

B 2 Idle Test, Adjustment

Test step/Test sequence	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒ 4 Warm engine oil to operating temperature	Engine rpm: maintain at approx. 3000 rpm	Engine oil temperature approx. 80 °C	–
⇒ 5 Check CTP rpm	Engine: at Idle Selector lever in “P”, Climate control system “OFF”.	See Test and adjustment data (section A)	Test program: Check EA/CC/ISC system (DM Engines, Vol. 3 – 6.2 or 6.3), Check CC/ISC system (DM Engines, Vol. 3 – 7.1)
⇒ 6 Check on-off ratio control system	Selector lever in “P”, Climate control system OFF. Disconnect and plug purge line (A or B) at switchover valve (Figure 1, 3 and 4). Reconnect line after measurement. Engine: at Idle	See Test and adjustment data (section A)	Check electrical components with socket box tester (DM Engines, Vol. 2 – 3.1 or 3.2)

¹⁾ Observe Preparation for Test, see 22.

B 2 Idle Test, Adjustment

Test step/Test sequence	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒ 7 Check CTP speed under load	Engine: at Idle TR "D" (service and parking brake applied), Switch on all electrical consumers, Turn steering wheel to full lock.	Engine must continue to idle within specified range.	Test program: Check EA/CC/ISC system (DM Engines, Vol. 3 – 6.2 or 6.3), Check CC/ISC system (DM Engines, Vol. 3 – 7.1)

¹⁾ Observe Preparation for Test, see 22.

B Test and Adjustment Jobs

Engines 104, 119, 120 LH-SFI

B 2 Idle Test, Adjustment

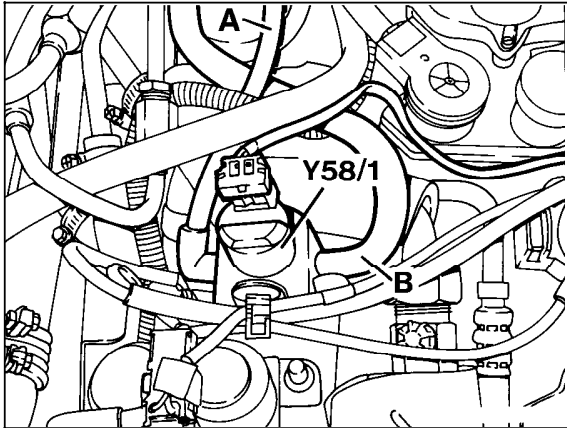


Figure 1
Model 140, Engine 104, 119
Y58/1 Purge control valve
B Purge line

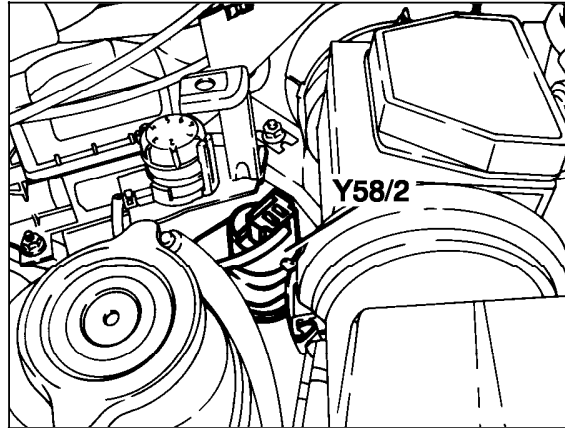


Figure 2
Model 140, Engine 120
Y58/2 Left purge control valve (located on right side of engine)

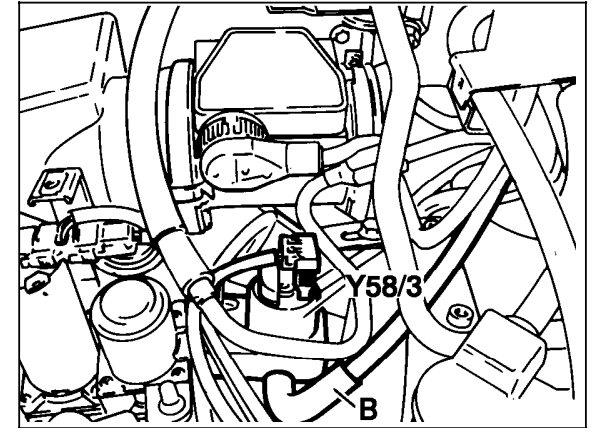
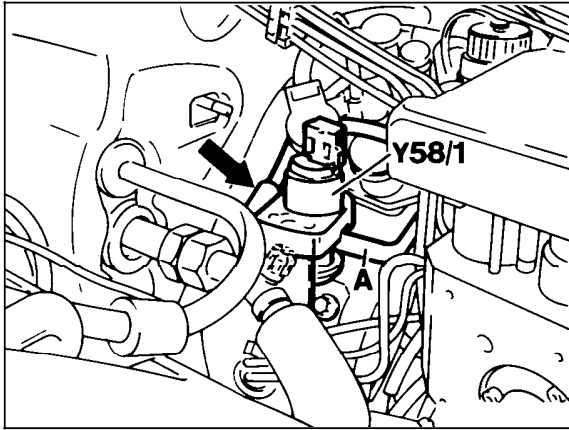


Figure 3
Model 140, Engine 120
Y58/3 Right purge control valve (located on left side of engine)
B Purge line

B 2 Idle Test, Adjustment



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Figure 4

Model 124, Engine 119

Y58/1 Purge control valve

A Purge line