

Connection Diagrams – Dual Ignition System

Engines 119 CFI/LH-SFI



When diagnosing starting or warm up complaints, do not check engine at operating temperature, instead proceed according to specific complaint.

Diagnostic plug (060) to diagnostic socket (X11)	connect, disconnect
Diagnostic plug (060) to dual ignition adaptor	connect, disconnect
Knob to position “T1/1 & T1/2”	turn
Plug of dual ignition adaptor (055) to diagnostic socket (X11) <sup>2)</sup>	connect, disconnect
TN signal/on-off ratio signal connector <sup>3)</sup>	connect, disconnect
Trigger clamp (061) on ignition cable “1”	connect, disconnect
Kilovolt clamp (062) and (063) on ignition cable “4” of ignition coil T1/1 and T1/2	connect, disconnect
Oil thermometer (064) in engine oil dipstick tube	insert, remove
DC inductive clamp <sup>1)</sup> (065) to battery G1 ground	connect, disconnect
Exhaust vent hose (014) to exhaust pipe	connect, disconnect
Vacuum connection with Y-adaptor (068) to DI control module (N1/3)	connect, disconnect
Vehicle data	enter.



Engine oil temperature approximately 80 °C	warm engine up.
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1) On model 129, connect to ground strap between engine, transmission and body (vehicle right side), or for inductive clamp connection to positive battery lead, remove passenger side floor mat and connect to positive cable.  
On model 140, connect to ground strap between engine, transmission and body (vehicle lower left side).

2) Up to 06/93.

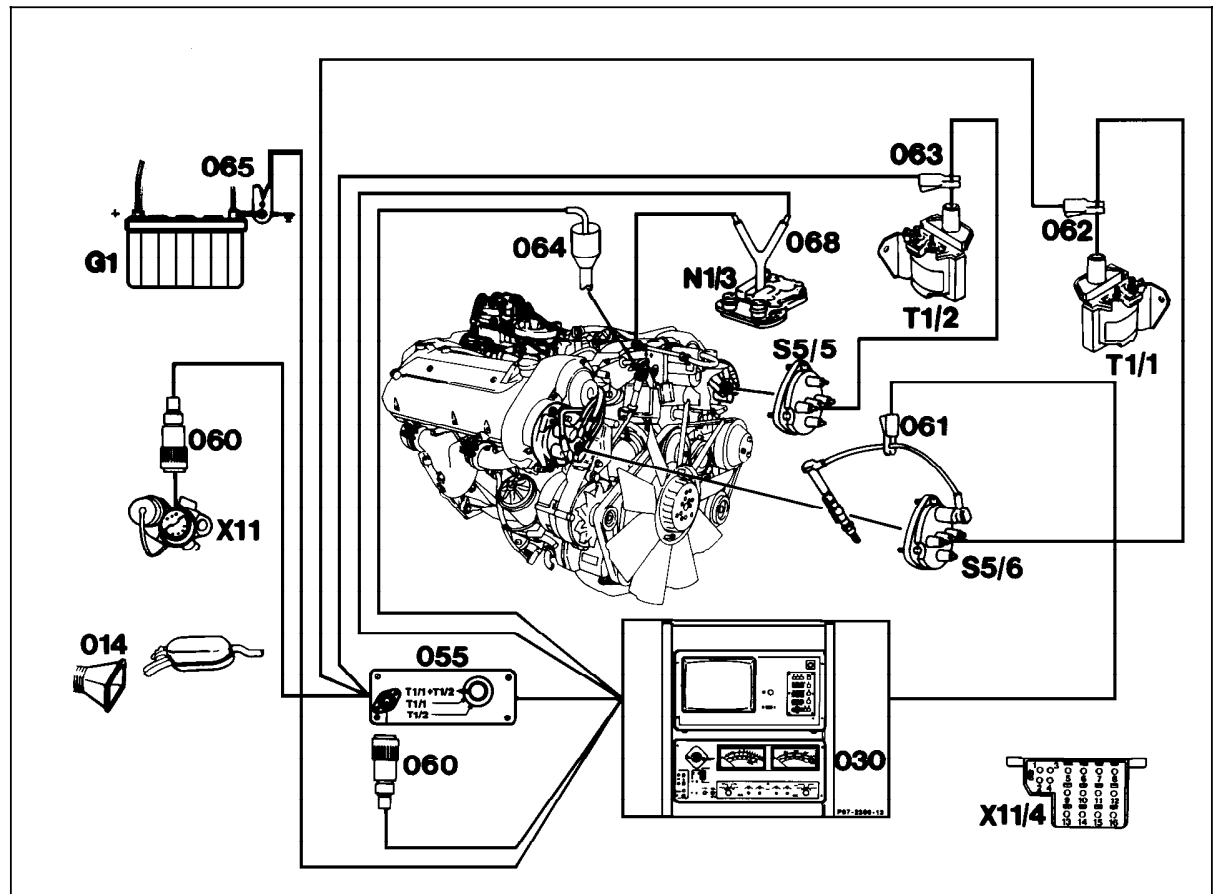
3) Starting 07/93.

## Connection Diagrams – Dual Ignition System

### Engine 119 CFI

Figure 1

- G1 Battery
- N1/3 DI control module
- 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)
- 014 Exhaust vent hose
- 030 Engine analyzer
- 055 Dual ignition adaptor
- 060 Diagnostic plug
- 061 Trigger clamp (cylinder 1)
- 062 Kilovolt clamp, right (on ignition coil)
- 063 Kilovolt clamp, left (on ignition coil)
- 064 Oil thermometer
- 065 DC inductive clamp
- 068 Y-adaptor (vacuum)



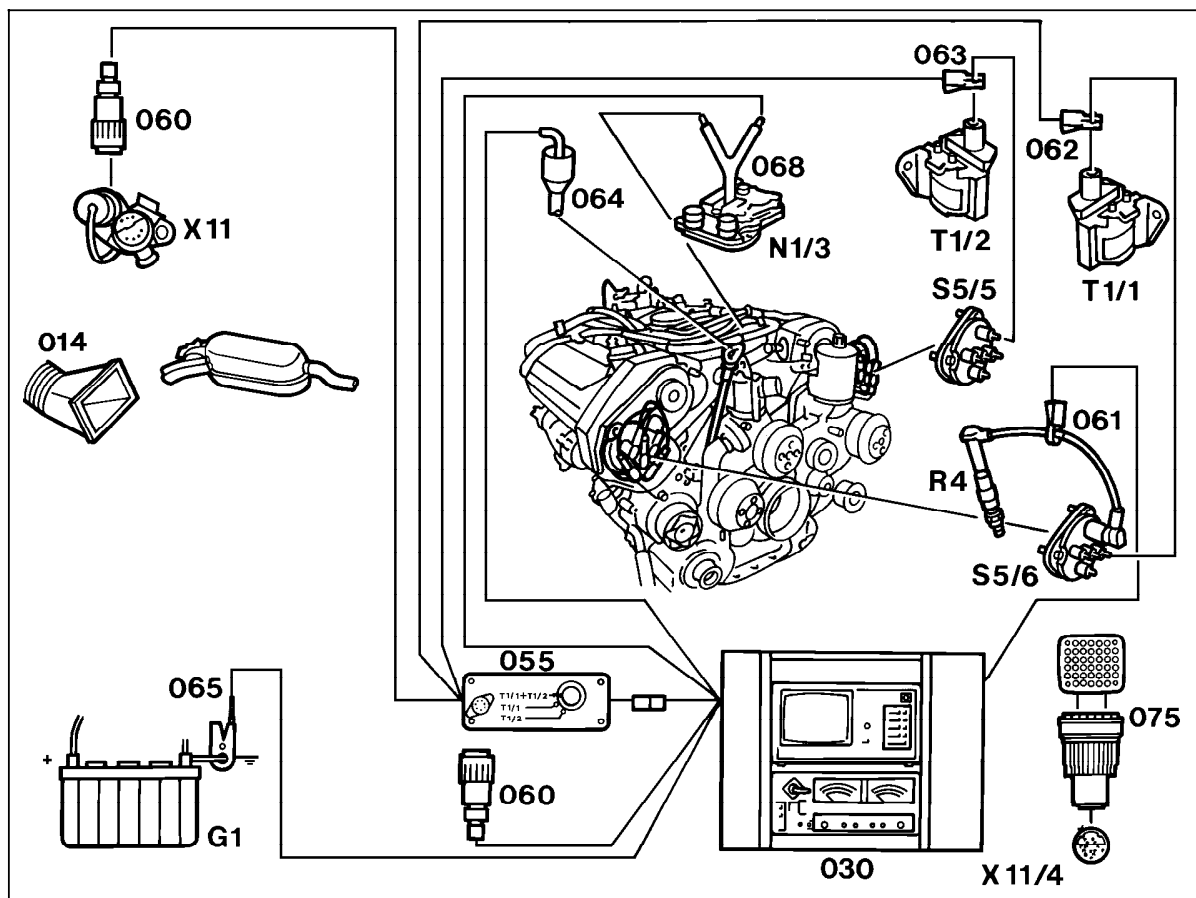
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## Connection Diagrams – Dual Ignition System

Engine 119 LH-SFI up to 06/93 with Diagnostic Socket X11

Figure 2

- |       |  |
|-------|--|
| G1    | Battery                                  |
| N1/3  | DI control module                        |
| R4    | Spark plug                               |
| 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)        |
| 014   | Exhaust vent hose                        |
| 030   | Engine analyzer                          |
| 055   | Dual ignition adaptor                    |
| 060   | Diagnostic plug                          |
| 061   | Trigger clamp (cylinder 1)               |
| 062   | Kilovolt clamp, right (on ignition coil) |
| 063   | Kilovolt clamp, left (on ignition coil)  |
| 064   | Oil thermometer                          |
| 065   | DC inductive clamp                       |
| 068   | Y-adaptor (vacuum)                       |
| 075   | Impulse counter scan tool adaptor        |



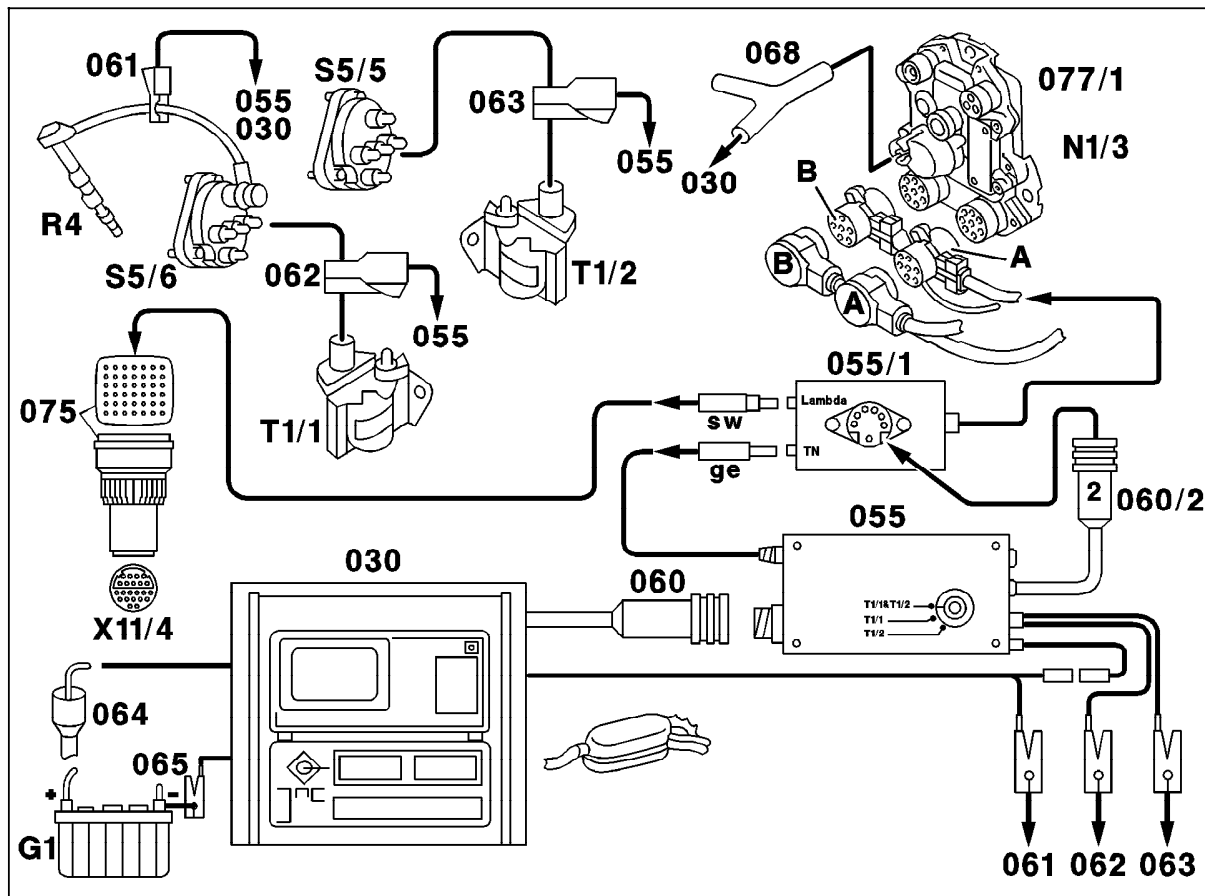
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## Connection Diagrams – Dual Ignition System

Engine 119 LH-SFI starting 07/93 without Diagnostic Socket X11

Figure 3

G1	Battery
N1/3	DI control module
R4	Spark plug
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)
X11/4	Data link connector (DTC readout)
030	Engine analyzer
055	Dual ignition adaptor
055/1	TN signal/on-off ratio signal adaptor
060	Diagnostic plug
060/2	Dual ignition adaptor diagnostic plug
061	Trigger clamp (cylinder 1)
062	Kilovolt clamp, right (on ignition coil)
063	Kilovolt clamp, left (on ignition coil)
064	Oil thermometer
065	DC inductive clamp
068	Y-adaptor (vacuum)
075	Impulse counter scan tool adaptor
077/1	TN signal plug (in wiring diagram connector "A", "B")



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**Connection Diagrams – Dual Ignition System****Testing with dual ignition adaptor (055)**

The dual ignition adaptor provides engine diagnosis on engines with dual ignition systems (engine 119) when using the Bear DACE (Model 40-960) engine analyzer.

With the dual ignition adaptor (055), the single ignition circuits T1/1 and T1/2 are combined to an 8-cylinder ignition circuit. This enables the display of the single circuits and the complete ignition circuit on the oscilloscope. Next to the standard measurements, the diagnostic measuring methods for dynamic compression test, idle quality test and ignition system analysis can be performed. The switch on the dual ignition adaptor allows the selection of measurements on a single ignition circuit, for example: dwell angle, ignition timing, on-off ratio and voltage values of the primary/secondary ignition circuit.

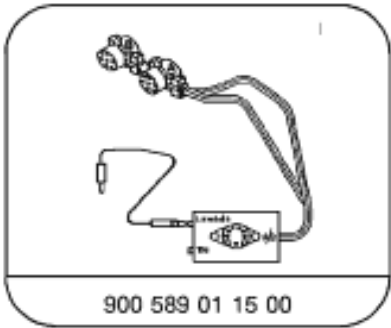
In the total display (switch position T1/1 & T1/2) with the oscilloscope in the parade setting, the ignition impulse of ignition circuit T1/1 is shown first. At the end of the fade-out process, switch over to ignition circuit T1/2 occurs and according to firing order the next cylinder, including dwell and current draw are displayed.

**Connection Diagrams – Dual Ignition System**

	Engine analyzer Cyl. number	Trigger clamp	Switch position Dual ignition adaptor (055)
Dwell angle	4 cylinder	Cylinder 1	T1/1 or T1/2
Ignition timing	4 cylinder	Cylinder 1 Cylinder 2	T1/1 T1/2  Measured angle minus 90° CKA
On-off ratio	8 cylinder	Cylinder 1	T1/1 or T1/1 & T1/2
Ignition oscilloscope	8 cylinder	Cylinder 1 Cylinder 5	T1/1 & T1/2 T1/1 firing order 1 – 4 – 6 – 7 T1/2 firing order 5 – 8 – 3 – 2
Compression	8 cylinder	Cylinder 1	T1/1 & T1/2
Idle quality	8 cylinder	Cylinder 1	Idle quality test. Set engine analyzer to TN signal

Connection Diagrams – Dual Ignition System

Special Tools



On-off ratio signal adapter

Equipment

Engine analyzer <sup>1)</sup>	Bear DACE (Model 40-960) Sun MEA-1500 MB
Dual ignition system adaptor	Bear 43-322

<sup>1)</sup> Available through the MBUSA Standard Equipment Program.