Electrical Test Program – Test (Engine Does Not Run)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		**DI control module (N1/3)** Voltage supply Circuit 15	N1/3 2 (A.2) — V — 3 (A.3)	Connect K to N1/3 Ignition: **ON**	11 – 14 V	Open circuit in wire to ground, left front wheel housing (W3/2), Open circuit in wire to base module (N16/1).
1.1		Ground wire at W3/2	N1/3 2 (A.2) — V — X11/4 2	Ignition: **ON**	11 – 14 V	W3/2.
2.0		**DI control module (N1/3)** Voltage supply Circuit 30	N1/3 2 (A.2) — V — 16 (B.8)	Ignition: **ON**	11 – 14 V	Open circuit in wire to ignition/starter switch (S2/1).
3.0		Ignition coil Voltage supply **Engine 104**	W3 — V — T1 Term. 15	Ignition: **ON**	11 – 14 V	Open circuit in wire from ignition coil (T1) to ignition/starter switch (S2/1),
		Engine 119	W3 — V — T1/1 or T1/2 Term. 15	Ignition: **ON**	11 – 14 V	Open circuit in wire from ignition coil (T1/1) or ignition coil (T1/2) to ignition/starter switch (S2/1).

Electrical Test Program – Test (Engine Does Not Run)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
4.0		**CKP sensor (L5)**	N1/3 [1] 18 — (–) (+) — 17	Engine: **Start**	Signal, see 25, figure 1 and 2.	⇒ 4.1, ⇒ 4.2, Segments on starter ring gear.
			N1/3 [2] 18 — (V) — 17	Engine: **Start**	> 0.4 V ∽	
4.1		Resistance of L5	N1/3 18 — (Ω) — 17	Ignition: **OFF** Unplug connector (2) for L5 at DI control module (N1/3) (25, Figure 5).	680 – 1200 Ω	L5 defective.
4.2		Insulation of L5	N1/3 2 — (Ω) — 17		> 200 kΩ	L5 defective.
5.0		**Magnets for CKP sensor** **Engine 119 only**	N1/3 18 — (–) (+) — 17	Engine: **Start**	Signal see 25, Figure 2.	Replace flexplate with ring gear and magnets

[1] Test with oscilloscope.
[2] Test with multimeter only if oscilloscope is not available.

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⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
6.0		**Dwell angle**	Engine analyzer	Engine: **Start**	**Engine 104** 1 – 30° or 1 – 50% **Engine 119** 9 – 49° 10 – 54%	CKP sensor (L5), ⇒ 4.0 Rest current shut-off inoperative, ⇒ 6.0 DI control module (N1/3).
6.1		Rest current shut-off **Engine 104**	T1 Term. 1 – Term. 15	Ignition: **ON**	0 V	N1/3, Ignition coil (T1),
			T1 Term. 1 – Term. 15	Engine: **Start**	0.3 – 0.5 V	**< 0.3 V:** Open circuit in wire from T1 to N1/3. **> 0.5 V:** T1
		Engine 119	T1/1 or T1/2 Term. 1 – Term. 15	Ignition: **ON**	0 V	N1/3, T1/1 or T1/2,
			T1/1 or T1/2 Term. 1 – Term. 15	Engine: **Start**	0.3 – 0.5 V	**< 0.3 V:** Open circuit in wire from T1/1 or T1/2 to N1/3. **> 0.5 V:** T1/1 or T1/2

Electrical Test Program – Test (Engine Does Not Run)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
7.0	15	**Ignition coil (T1) or ignition coil 1 (right cylinder bank) (T1/1)** Primary voltage **Engine 104:** T1 **Engine 119:** T1/1	Engine analyzer 	Primary pattern, Measurement range 400 V, duration 100%, Voltage signal pick-up connected to T1 or T1/1. Engine: **Start**	200 – 350 V	N1/3, T1 or T1/1.
8.0	16	**Ignition coil 2 (left cylinder bank) (T1/2)** Primary voltage **Engine 119 only!**	Engine analyzer 	Primary pattern, Measurement range 400 V, duration 100%, Voltage signal pick-up connected to T1/2. Engine: **Start**	200 – 350 V	N1/3, T1/2.

Electrical Test Program – Test (Engine Does Not Run)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
9.0	15	**Ignition coil (T1) or ignition coil 1 (right cylinder bank) (T1/1)** Firing voltage **Engine 104:** T1 **Engine 119:** T1/1	Engine analyzer 	Secondary pattern, Measurement range 20 kV, duration 100%, Voltage signal pick-up connected to T1 or T1/1. Engine: **Start**	8 – 20 kV	Primary winding of ignition coil, ⇒ 9.1, Secondary winding of ignition coil, ⇒ 9.2, DI control module (N1/3).
9.1	15	Primary winding of T1 or T1/1 **Engine 104:** T1 **Engine 119:** T1/1	T1 or T1/1 Term. 1 – Term. 15 	Ignition: **OFF** Disconnect terninals 1 and 15 from ignition coil.	0.3 – 0.6 Ω	T1 or T1/1.
9.2	15	Secondary winding of T1 or T1/1 **Engine 104:** T1 **Engine 119:** T1/1	T1 or T1/1 Term. 1 – Term. 4 	Ignition: **OFF** Disconnect cable of terminal 4 at ignition coil.	8 – 13 kΩ	T1 or T1/1.

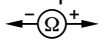
Electrical Test Program – Test (Engine Does Not Run)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
10.0	16	**Ignition coil 2 (right cylinder bank) (T1/2)** Firing voltage **Engine 119 only!**	Engine analyzer – ⏚ +	Secondary pattern, Measurement range 20 kV, duration 100%, Voltage signal pick-up connected to T1/2. Engine: **Start**	8 – 20 kV	Primary winding of ignition coil, ⇒ 10.1, Secondary winding of ignition coil, ⇒ 10.2, DI control module (N1/3).
10.1	16	Primary winding of T1/2 **Engine 119 only!**	T1/2 Term. 1 – Ω + Term. 15	Ignition: **OFF** Disconnect terninals 1 and 15 from ignition coil.	0.3 – 0.6 Ω	T1/2.
10.2	16	Secondary winding of T1/2 **Engine 119 only!**	T1/2 Term. 1 – Ω + Term. 4	Ignition: **OFF** Disconnect cable of terminal 4 at ignition coil.	8 – 13 kΩ	T1/2.

Electrical Test Program – Test (Engine Does Not Run)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
11.0		**High-voltage distributor (S5/3) or left high-voltage distributor (S5/5)** Firing voltage **Engine 104:** S5/3 **Engine 119:** S5/5	Engine analyzer ⊖ ⏚ ⊕	Secondary pattern, Measurement range 20 kV, duration 100%, Voltage signal pick-up connected to ignition cable, cylinder 5. Engine: **Start**	8 – 20 kV	Distributor cap ⇒ 11.1, Rotor ⇒ 11.2.
11.1		Distributor cap (individual terminals)	Distributor cap inside ⊖ Ω ⊕ outside	Ignition: **OFF** Remove distributor cap. Unplug ignition cables (disconnect cables one at a time).	700 – 1300 Ω per terminal	Distributor cap defective.
11.2		Rotor	Rotor center ⊖ Ω ⊕ point	Ignition: **OFF** Remove distributor cap.	700 – 1300 Ω and visual inspection.	Rotor defective.

Electrical Test Program – Test (Engine Does Not Run)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
12.0		**Right high-voltage distributor (S5/6)** Firing voltage **Engine 119 only!**	Engine analyzer 	Secondary pattern, Measurement range 20 kV, duration 100%, Voltage signal pick-up connected to ignition cable, cylinder 1. Engine: **Start**	8 – 20 kV	Distributor cap ⇒ 12.1, Rotor ⇒ 12.2.
12.1		Distributor cap (individual terminals)	Distributor cap inside  outside	Ignition: **OFF** Remove distributor cap. Unplug ignition cables (disconnect cables one at a time).	700 – 1300 Ω per terminal	Distributor cap defective.
12.2		Rotor	Rotor center  point	Ignition: **OFF** Remove distributor cap.	700 – 1300 Ω and visual inspection.	Rotor defective.