



Ignition Systems
for
Russian Motorcycles
Part IV-4: Ignition Coils

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Ignition Coils

- **Ignition Coils for Contact (Breaker) Systems**
 - **KM-01 Coil** ↔ **PM-05 Breaker/ Distributor**
 - **IG-4048 Coil** ↔ **PM-05 Breaker/ Distributor**
 - **B25 Coil** ↔ **PM-05 or PM-11 Breaker/ Distributor**
 - **B-201 Coil** ↔ **PM-302 Breaker/ Distributor**
 - **B-204 Coil** ↔ **PM-302/302A Breaker/ Distributor**
 - **Primary Winding Resistance of 5-Ohms**
- **Ignition Coils for Contact-Less (Electronic) Systems**
 - **Type I –to- Type V Ignition Systems**
 - **Most Electronic Ignition Coils Have 1 -to- 2-Ohms**
 - **Type I Ignition Coil: 5-Ohms**
 - **Types II, III, IV and V Ignition Coils: 1 -to- 2-Ohms**
 - **Ducati Ignition System**
 - **Ural Power Arc Ignition System**

Each ignition coil is associated (paired) with a distinctive, corresponding ignition system.²

Table I: IMZ (ИМЗ) - Ural (Урал) Model/Year vs. Electrical System

Model	Year	Engine Size	Voltage	Generator/ Alternator	Regulator	Ignition Coil	Breaker/ Distributor	Battery
M-72	1941-56	750cc	6-Volt	G-11, G-11A (1952)	PP-1, PP-31 (1950)	KM-01, B2B, IG-4085B (1950)	PM-05	3MT-7 (7A-hr) or 3MT-14 (14A-hr)
M-72M	1956-61	750cc	6-Volt	G-11A (1952)	PP-31A	KM-01	PM-05	
M-72K	1954-60	750cc	6-Volt	*Magneto*	None	-	PM-05	None
M-61	1961-63	650cc	6-Volt	G-11A (1952)	PP-30, PP-31A (1956)	B11, KM-01	PM-05	3MT-12 (12A-hrs)
M-62	1963-65	650cc	6-Volt	G-414 (1957)	PP-31	B2B (1963)	PM-05	3MT-6 (6A-hrs) or 3MT-12 (12A-hrs)
					PP-302, PP-302A	B201, B201A	PM-302, PM-302A	
M-63 (Ural-2)	1965-80	650cc	6-Volt	G-414 (1957)	PP-302 (1963), PP-302A	B2B (1963)	PM-11A	
						B201, B201A	PM-302, PM-302A	
M-66 (Ural-3)	1971-75	650cc	6-Volt	G-414 (1957)	PP-302 (1963), PP-302A	B201, B201A	PM-302, PM-302A	
M-67	1974-76	650cc	12-Volt	G-424 (1974)	PP-302A, PP-330	B204	PM-302, PM-302A	6MTS-9 (9A-hrs) or 2X 3MT-6 (2X 6A-hrs)
M-67.36	1976-95	650cc	12-Volt	G-424 (1974)	PP-330, 33.3702 (1992)	B204	PM-302, PM-302A	
8.103 and 8.107 Series "650"	1994-98	650cc	12-Volt	G-424 (1974)	PP-330, 33.3702 (1992)	B204	PM-302A (1982)	6MTS-9 or 6CT-18-36A (18-to-36A-hrs)
						BC3 (BZ3) Contact-less Ignition System Type I (1994), II (1997), III (1998)		
8.103, 8.103X, 8.123, 8.123X 650 & 750 Series	1999-2003	750cc	12-Volt	14.3771 (1998)	Internal to Alternator (YA212A11E)	Contact-less Ignition System Type IV (2002)		Varta YB18L
8.103, 8.103X, 8.123, 8.123X "750" Series	2004-present	750cc	12-Volt	Nippon Denso (2004)	Internal to Alternator	Type V (2004) Ducati (2006), Power Arc		6MTS-18, Interstate FAYTX-20HL

Notes:

- M-64 (1961) and M-65 (1965) were prototypes.
- Alternators progress in output voltage and power from Г-11 (G-11) generator of 6-Volts/45-Watts in 1941, Г-11A of 6 V/45 W in 1952, Г-414 6V/65 W in 1957, Г-424 of 12V/150W in 1974, 14.3771 of 12V/350W in 1998.5, to the present-day Nippon-Denso alternator of 12V/770W.
- M-73 (1976) was an M-72 (750cc) with engageable sidecar wheel.
- M-75 (1943) was experimental model with 500cc engine (6-Volt) on M-72 frame. M-76 (1947) was experimental (820cc).
- Г-424 alternator (150 Watts) has external relay/regulator (PP-302 or PP-330). 14.3771 and Nippon Denso alternators have internal regulators.
- 12-Volt ignition coil B2B (manual spark advance) paired with PM-05 distributor, B201/B201A (ignition coil for automatic spark advance) paired with PM-302/PM-302A. B2B (B2Б) and B201 coils for 6-Volts and B204 for 12-Volts.
- PP-1, PP-30, PP-31 reverse-relay/voltage regulator for generator G-11/11A systems were replaced with PP-302/302A voltage regulator³ for G-414, and finally P-330 for the G-424 alternator.
- 33.3702 Solid-State Voltage Regulator replaced the PP-330 in 1992.

Table II: KMZ (KM3) - Dnepr (Днепр) Model/Year vs. Electrical System

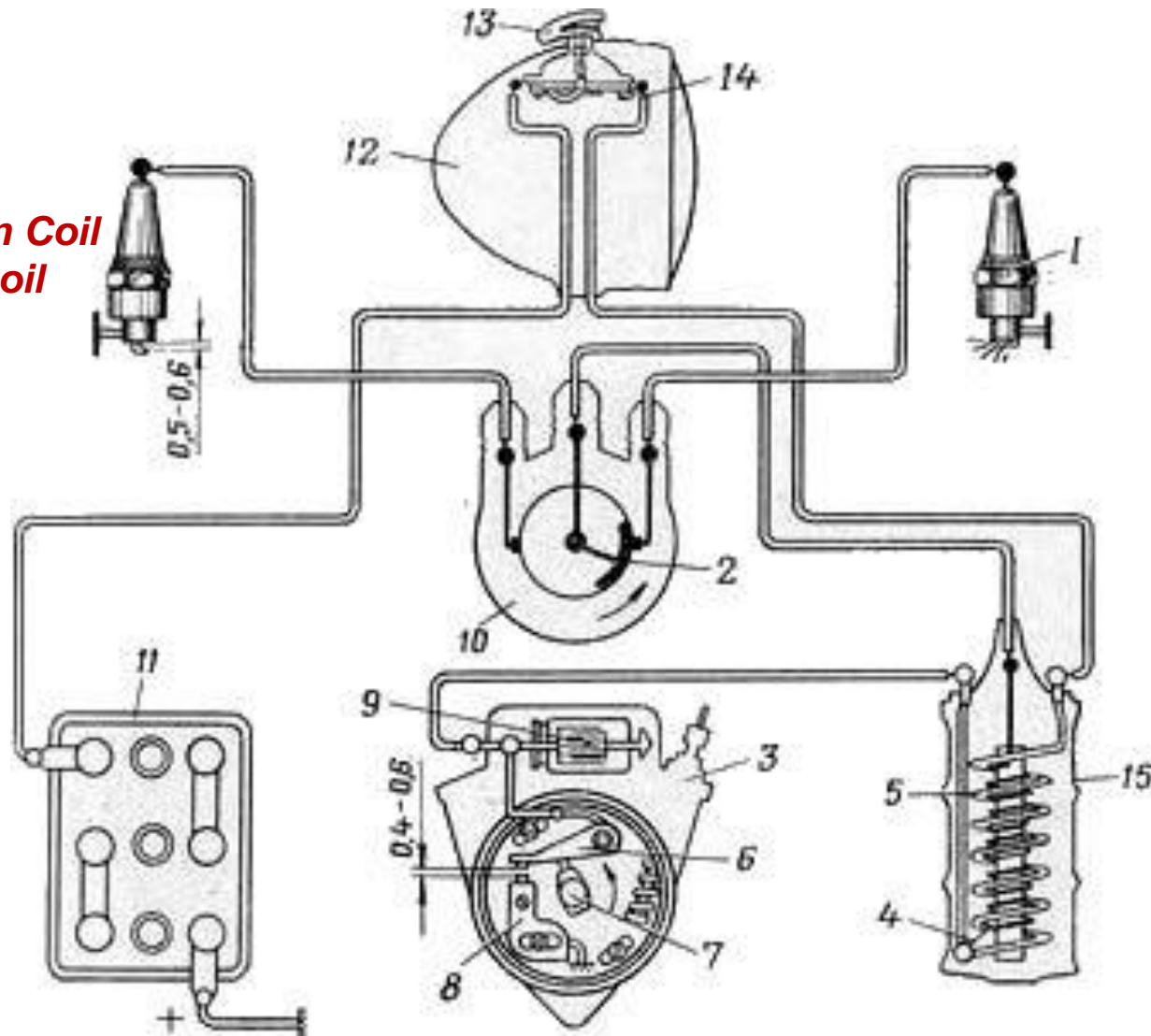
Model	Year	Engine Size	Voltage	Generator/ Alternator	Regulator	Ignition Coil	Breaker/ Distributor	Battery
M-72	1951-56	750cc	6-Volt	G-11A (1952)	PP-31 (1950)	KM-01, B-2B	PM-05	3MT-7 (7A-hr) or 3MT-14 (14A-hr)
M-72N (H)	1957-59	750cc	6-Volt	G-11A (1952)	PP-31A (1956)	KM-01	PM-05	
K-750	1956-63	750cc	6-Volt	G-11A (1952)	PP-31A (1956)	IG-4085	PM-05, PM-11A	3MT-7, -10, -14
	1963-67			G-414 (1957)	PP-302 (1963)	B2B (1963), B201	PM-302	3MT-12 or -14
K-750M	1963-77	750cc	6-Volt	G-414 (1957)	PP-302 (1963)	B2B (1963)	PM-05	3MT-6
						B201	PM-302	
MT-12 (Dnepr-12)	1974-82 2WD 1982-85 1WD	750cc	6-Volt	G-414 (1957)	PP-302 (1963), PP-302A	B2B (1963)	PM-05	3MT-12
						B201	PM-302	
MB-750	1964-73	750cc	6-Volt	G-414 (1957)	PP-302 (1963)	B2B (1963)	PM-05	3MT-12
						B201	PM-301/PM-302	
MB-750M	1973-77	750cc	6-Volt	G-414 (1957)	PP-302 (1963), 33.3702 (1992)	B2B (1963)	PM-05	3MT-12
						B201	PM-302	
K-650/MT-8	1967-70	650cc	6-Volt	G-414 (1957)	PP-302 (1963), PP-302A	B2B	PM-05, PM-11A	3MT-12
						B201	PM-302	
K-650/MT-9	1971-74	650cc	6-Volt	G-414 (1957)	PP-302 (1963), PP-302A	B2B	PM-05	3MT-6 or 3MT-12
						B201A	PM-302	
MB-650	1968-91	650cc	12-Volt	G-424 (1974)	PP-330	B204	PM-302, PM-302A(1982)	6MTS-9 or 2X 3MT-6
MB-650M1	1985-late 90s	650cc	12-Volt	G-424 (1974)	PP-330	B204	PM-302A	
MT-10	1973-76	650cc	12-Volt	G-424 (1974)	PP-330	B204	PM-302, PM-302A (1982)	
MT-10.36	1976-88	650cc	12-Volt	G-424 (1974)	PP-330	B204	PM-302A (1982)	
MT-11 (Dnepr-11)	1985-95	650cc	12-Volt	G-424 (1974)	PP-330, 33.3702 (1992)	B204	PM-302A (1982)	
MT-16 (Dnepr-16)	1986-95	650cc	12-Volt	G-424 (1974)	PP-30, PP-31, PP- 330, 33.3702 (1992)	B201, B204	PM-302, PM-302A (1982)	6MTS-9 (9A-hr)

Notes:

1. MT-14 (1977) was a prototype.
2. MB-650 is military version of MT-16 and MB-750 is a military version of the MT-12
3. Alternators progress in output voltage and power from Г-11 (G-11) generator of 6-Volts/45-Watts in 1941, Г-11A of 6 V/45 W in 1952, Г-414 6V/65 W in 1957, Г-424 of 12V/150W in 1974, 14.3771 of 12V/350W in 1998.5, to the present-day Nippon-Denso alternator of 12V/770W.
4. MT-11 and MT-16 remained in production until 1991 when they were re-named the Dnipro-11 (Dnepr-11) and Dnipro-16 (Dnepr-16).
5. Model #'s: H = N, MW = MB = MV
6. 33.3702 Solid-State Voltage Regulator replaced the PP-330 in 1992.
7. Г-424 alternator (150 Watts) has external relay/regulator (PP-302 or PP-330). 14.3771(350 Watts) alternator has internal regulator.
8. 12-Volt ignition coil B2B (manual spark advance) paired with PM-05 distributor, B201/B201A (ignition coil for automatic spark advance) paired with PM-302/PM-302A. B2B (B2B) and B201 coils for 6-Volts and B204 for 12-Volts.

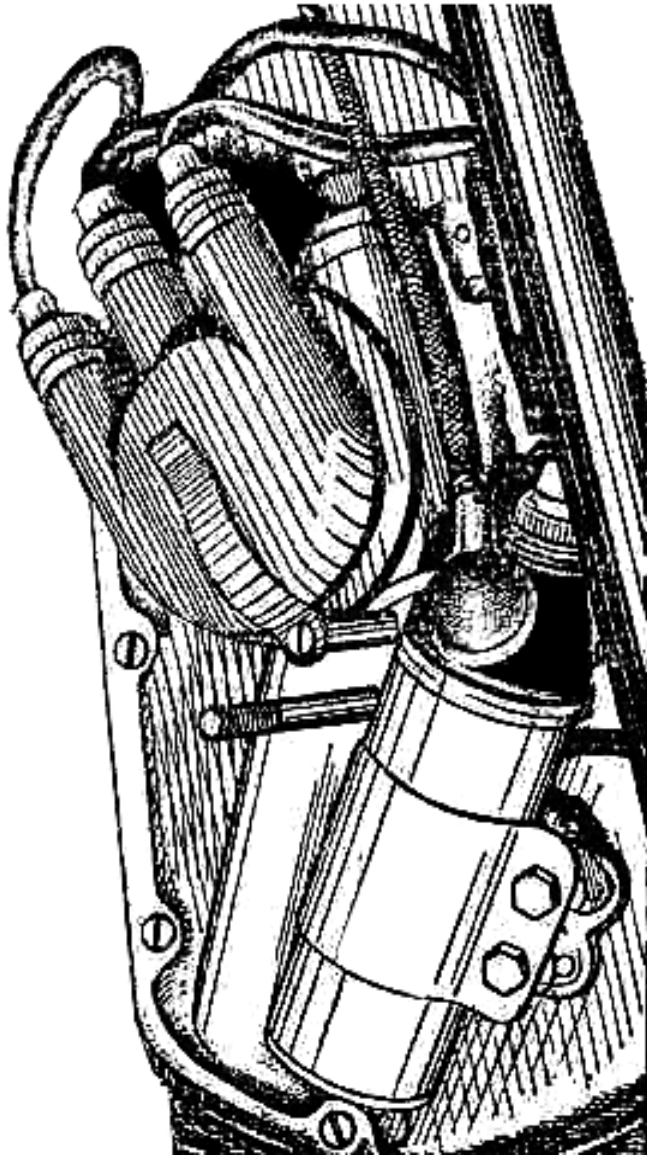
6-Volt Ignition System with Manual Adjustment of Ignition Timing

- 1 - Spark Plug (candle)
- 2 - Distributor Rotor
- 3 - Breaker
- 4 - Secondary Winding of Ignition Coil
- 5 - Primary Winding of Ignition Coil
- 6 - Breaker Hammer
- 7 - Camshaft Breaker Contact
- 8 - Breaker Anvil
- 9 - Condenser (Capacitor)
- 10 - Distributor
- 11 - Storage Battery
- 12 - Headlight
- 13 - Ignition Lock Key
- 14 - Ignition Lock Contact
- 15 - Ignition Coil

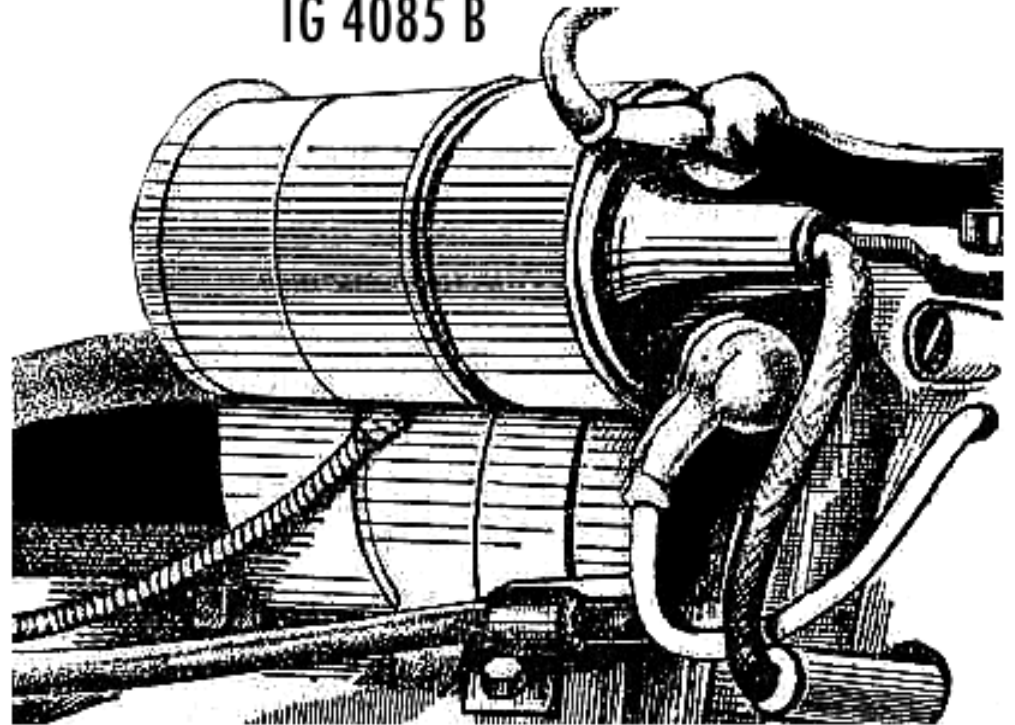


The on/off voltage produced by the contacts of the breaker are magnified by the ignition coil and distributed to the spark plugs.

KM-01

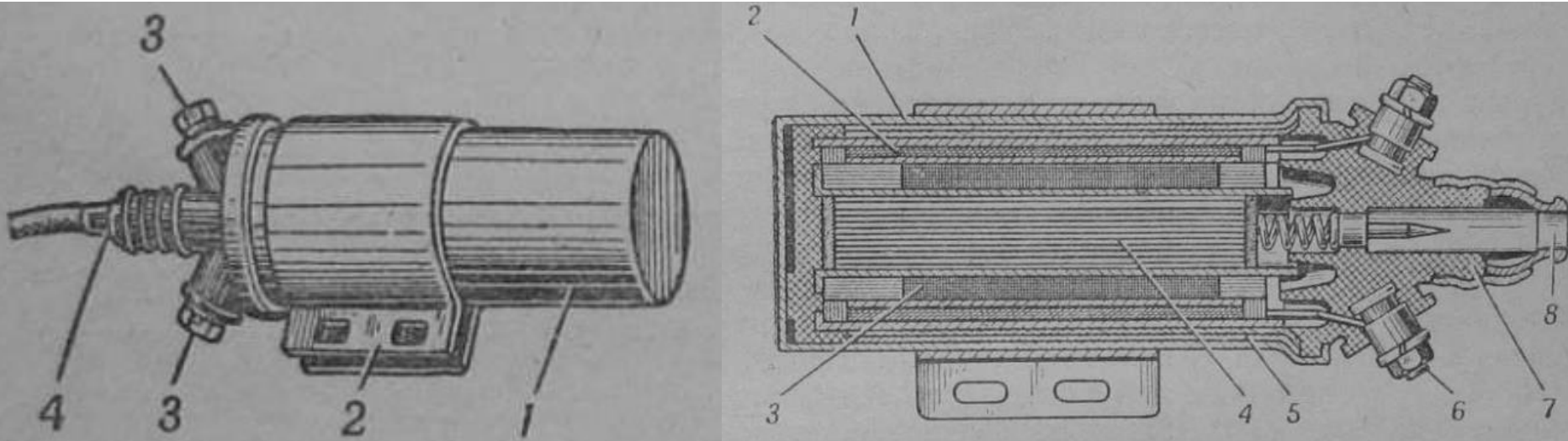


IG 4085 B



The first ignition coil used on a heavy Russian motorcycle (M-72) was the KM-01, which was replaced with the IG-4085B.

KM-01 6-Volt Ignition Coil for M-72

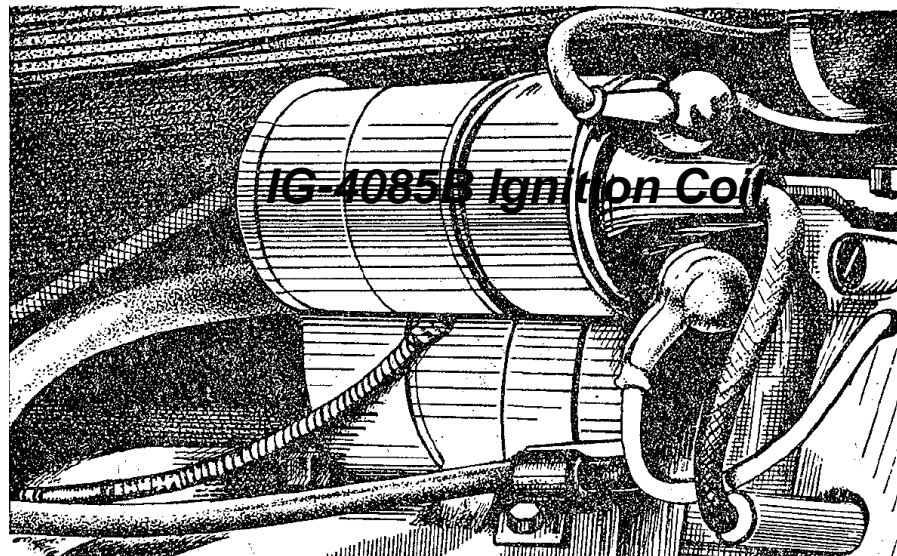


- 1. Case**
- 2. Mounting Bracket**
- 3. Primary Interrupted Winding**
- 4. Hi-Voltage Secondary Output**

- 5. Mounting Bracket**
- 6. Primary Interrupted Winding**
- 7. Insulator**
- 8. Hi-Voltage Output to Distributor and Spark Plugs**

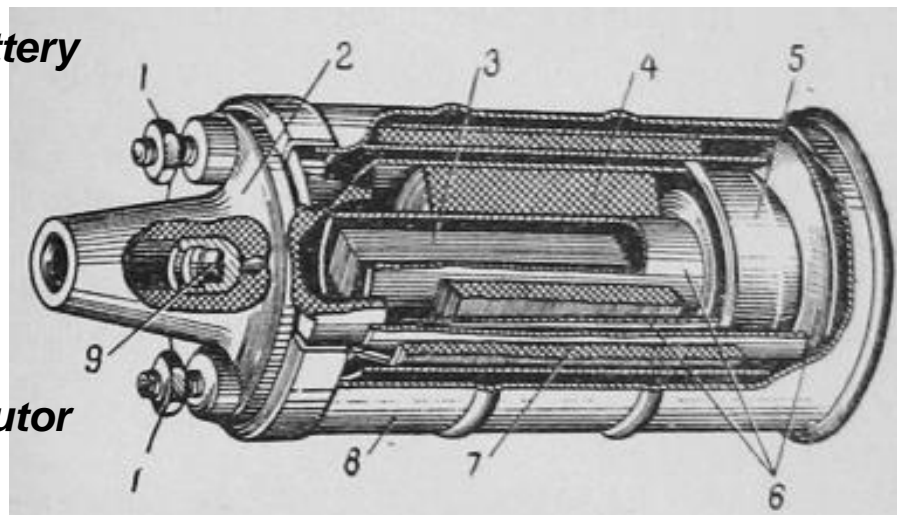
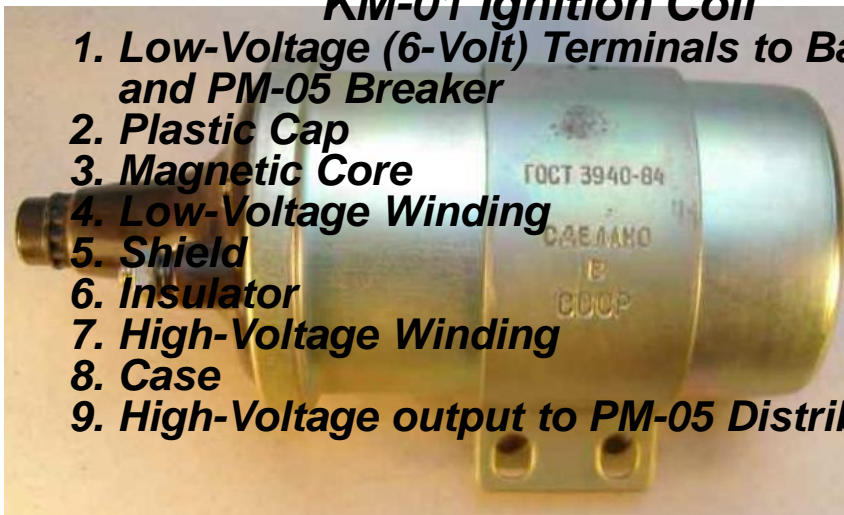
The ignition coil is a transformer. One end of the primary (low-voltage) winding is common to the secondary (high-voltage) winding. The beginning of the primary winding is connected thru the ignition switch to the battery, and ends when the contact breaker is closed to ground (mass).

IG-4085B and B2B (Б2Б) Ignition Coils (6-Volt) for Ural M-72 and Dnepr K-750, MB-750, MB-650, Dnepr 650, M-72



KM-01 Ignition Coil

- 1. Low-Voltage (6-Volt) Terminals to Battery and PM-05 Breaker**
- 2. Plastic Cap**
- 3. Magnetic Core**
- 4. Low-Voltage Winding**
- 5. Shield**
- 6. Insulator**
- 7. High-Voltage Winding**
- 8. Case**
- 9. High-Voltage output to PM-05 Distributor**



The IG-4085B and B2B coils later replaced the KM-01.

Ignition Coil (6-Volt B2B)



Dnepr Part #: 650180

Ignition Coil B2B (Катушки B2Б)



B2B Ignition Coil
List Price: 500 rubles
(moto-velo.prom.ua)

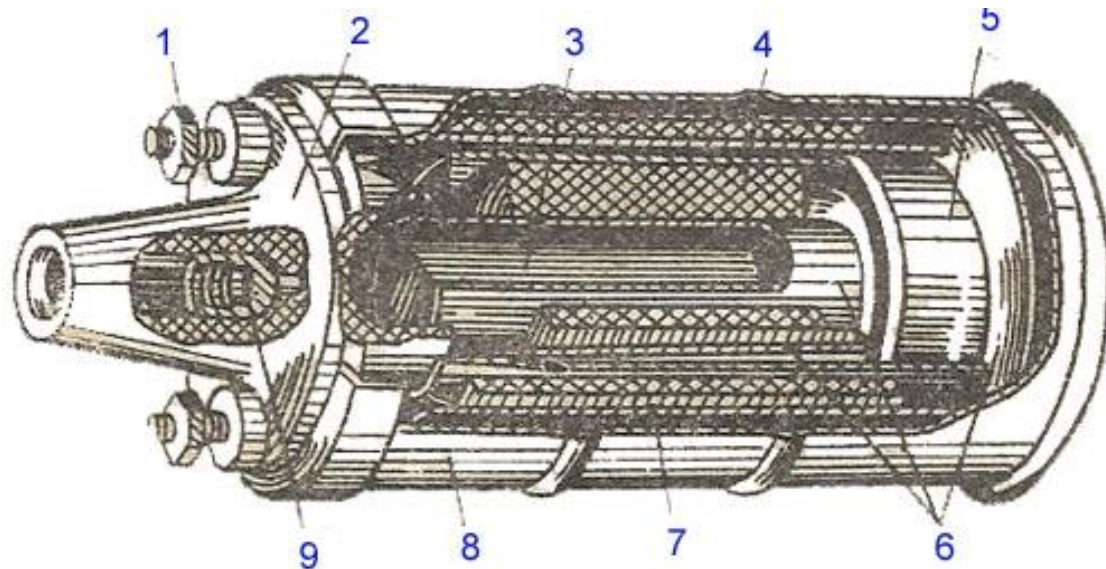


Ignition Coil B2B or B2Б
6-Volt
List Price: 500 rubles, New
(www.avito.ru)

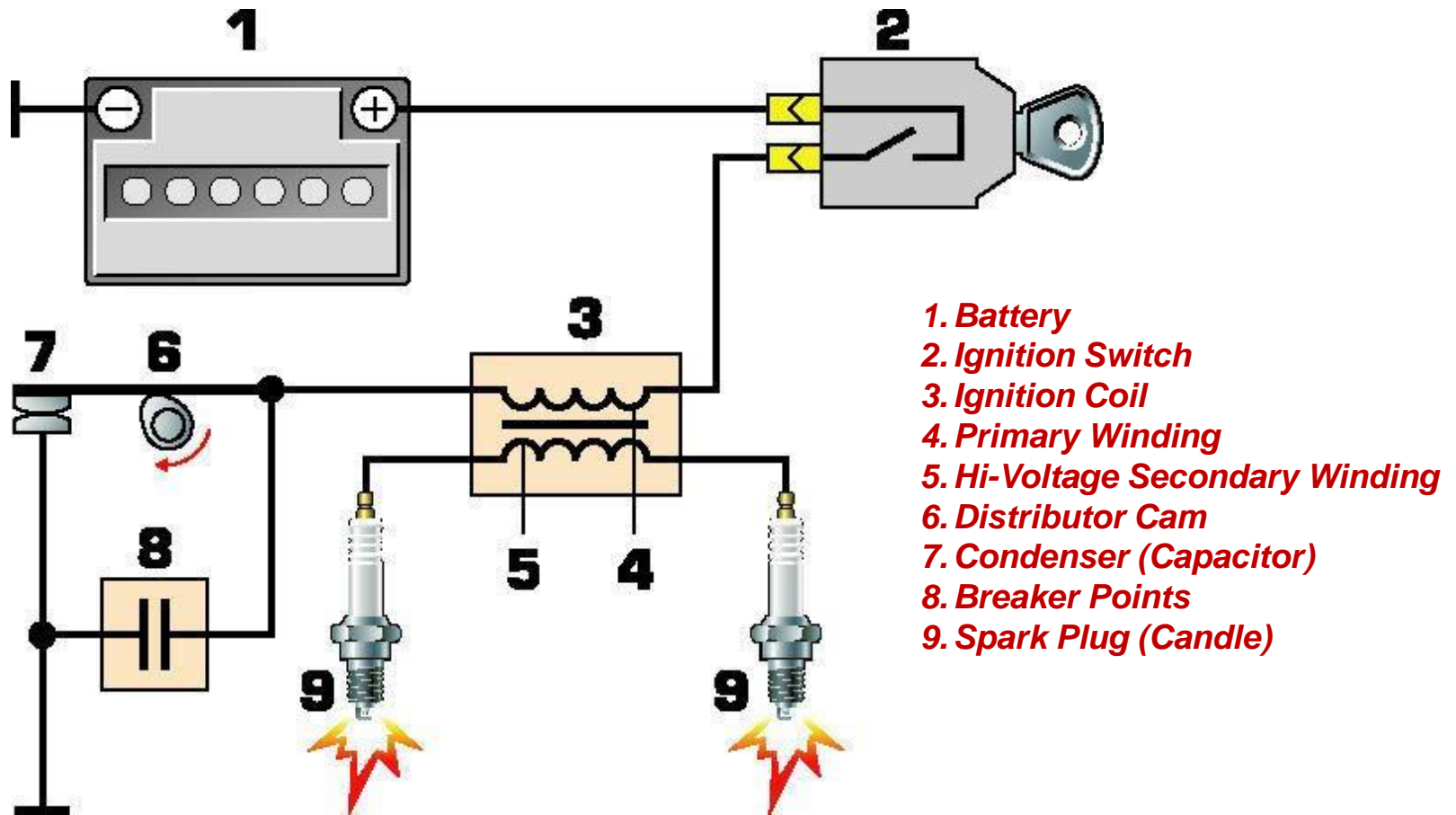


B2B (B2Б) Ignition Coils

- ***Dnepr Part #: 650180***
- ***Ignition Coil B-2B or IG-4085 Convert Low-Voltage Current (6-V) into a High-Voltage (12 to 15 thousand volts)***
- ***Consists of Core (3), Primary (7) and Secondary (4) Windings, Housing (8) and Insulator (2) with Output Terminals (1 and 9)***
- ***Secondary Winding Has 12 to 13 Thousand Turns of Wire with a Diameter of 0.07 to 0.1 mm, with a Resistance of Secondary Winding Is 4,000 ohms***
- ***Primary Winding Has 250 turns of Wire Diameter 0.8 mm, with a Resistance of About 1.5 ohms***
- ***Ignition Coil Consumes 4-amps at 6-volts***
- ***Coil Provides 6,000 Current Interruptions in Primary Circuit to a Spark Gap Length of 7 mm***

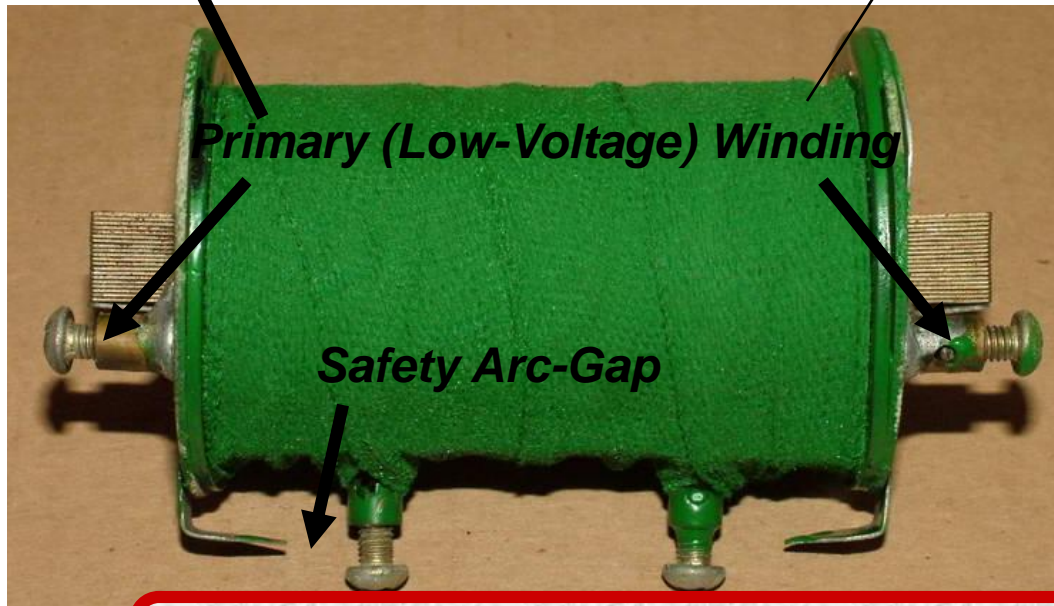
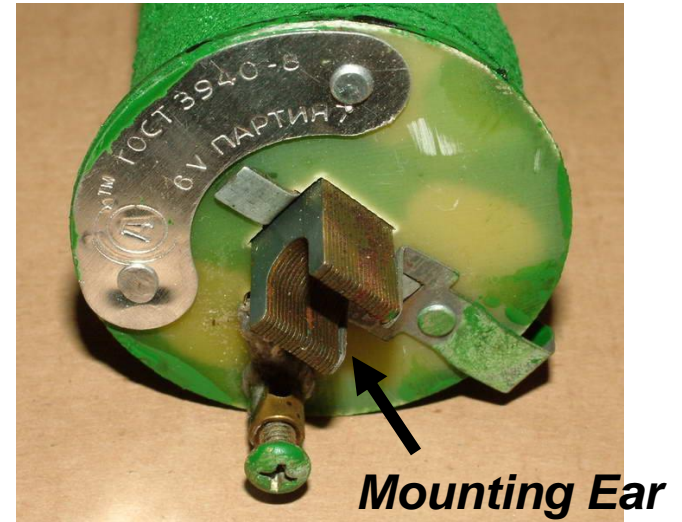
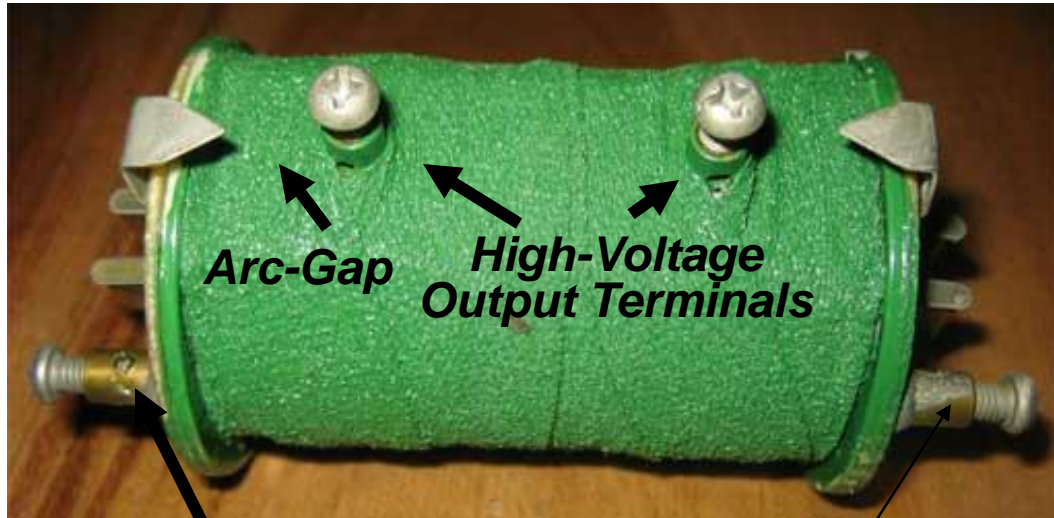


Simple Diagram of Ignition System with Mechanical Breaker (Contact)



This evolutionary stage shows the absence of the distributor, but the presence of the breaker points (contacts) – PM-302.

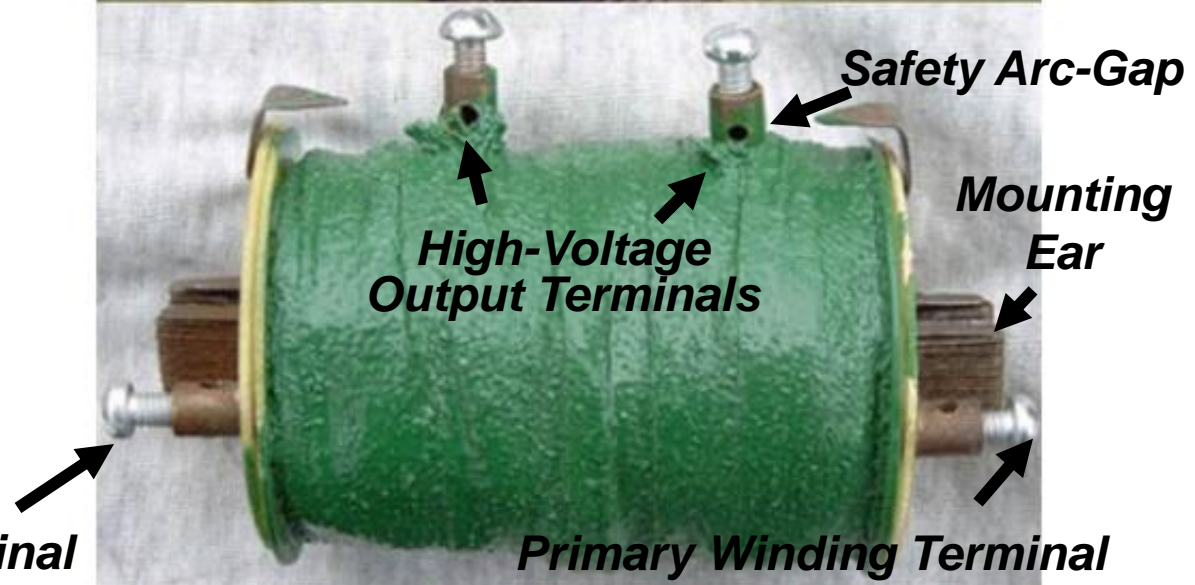
B-201 (Б201, 6-Volt) Ignition Coil (катушка зажигания) for Ural/Dnepr K-750, MB-750, MB-650, Днепр 650, М -72



The B-201 became the standard ignition coil for 6-Volt Urals and Dneprs.

B-201A (Бобина 6В Б201А) 6-Volt Ignition Coil for Ural, Dnepr Motorcycles

Input Voltage: 6-Volts
Gap between Discharges: 9 mm
**Primary Winding: 300 turns /
dia. 0.55 mm / wound on 3 layers**
**Secondary Winding: 19,000 ±200
turns / dia. 0.09 mm wire /
wound in two sections**

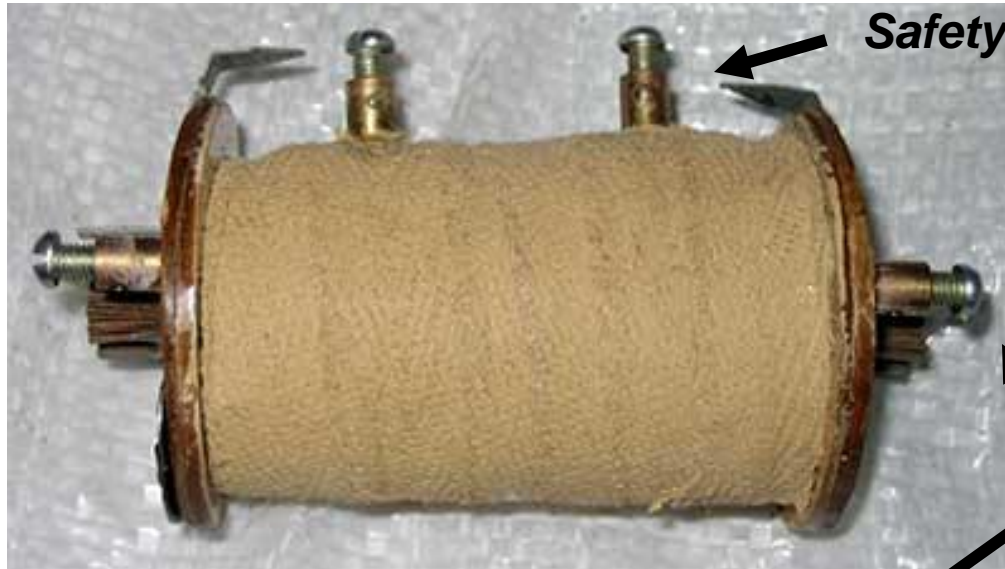


The B-201A became the replacement ignition coil for the B-201 on Ural/Dnepr motorcycles.

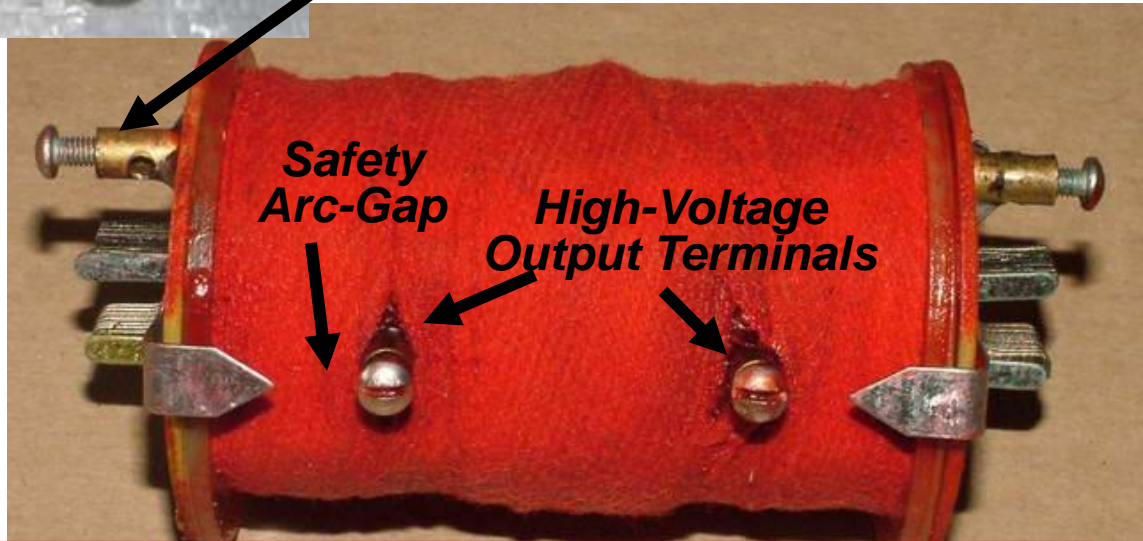
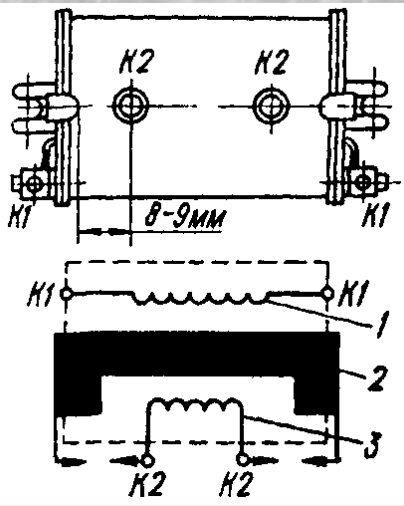
Winding Data for Russian Ignition Coils

<i>Type of Ignition Coil</i>	<i>Primary</i>			<i>Secondary winding</i>		
	<i># of Turns</i>	<i>Wire Diameter</i>	<i>Wire Marking</i>	<i># of Turns</i>	<i>Wire Diameter</i>	<i>Wire Marking</i>
<i>B300</i>	<i>320</i>	<i>0.31</i>	<i>PETV</i>	<i>16,000</i>	<i>0.06</i>	<i>PETV</i>
<i>B300B</i>	<i>105</i>	<i>0.31</i>	<i>PETV</i>	<i>16,000</i>	<i>0.06</i>	<i>PETV</i>
<i>B2B</i>	<i>275</i>	<i>0.77</i>	<i>PEL</i>	<i>15,000</i>	<i>0.09</i>	<i>PEL</i>
<i>B201A</i>	<i>300</i>	<i>0.51</i>	<i>SEW-2</i>	<i>19,000</i>	<i>0.07</i>	<i>PEL</i>
<i>B204</i>	<i>325</i>	<i>0.29</i>	<i>SEW-2</i>	<i>22,500</i>		<i>SEW-2</i>

Б204 (B-204) Ignition Coil 12-Volt for Ural/Dnepr

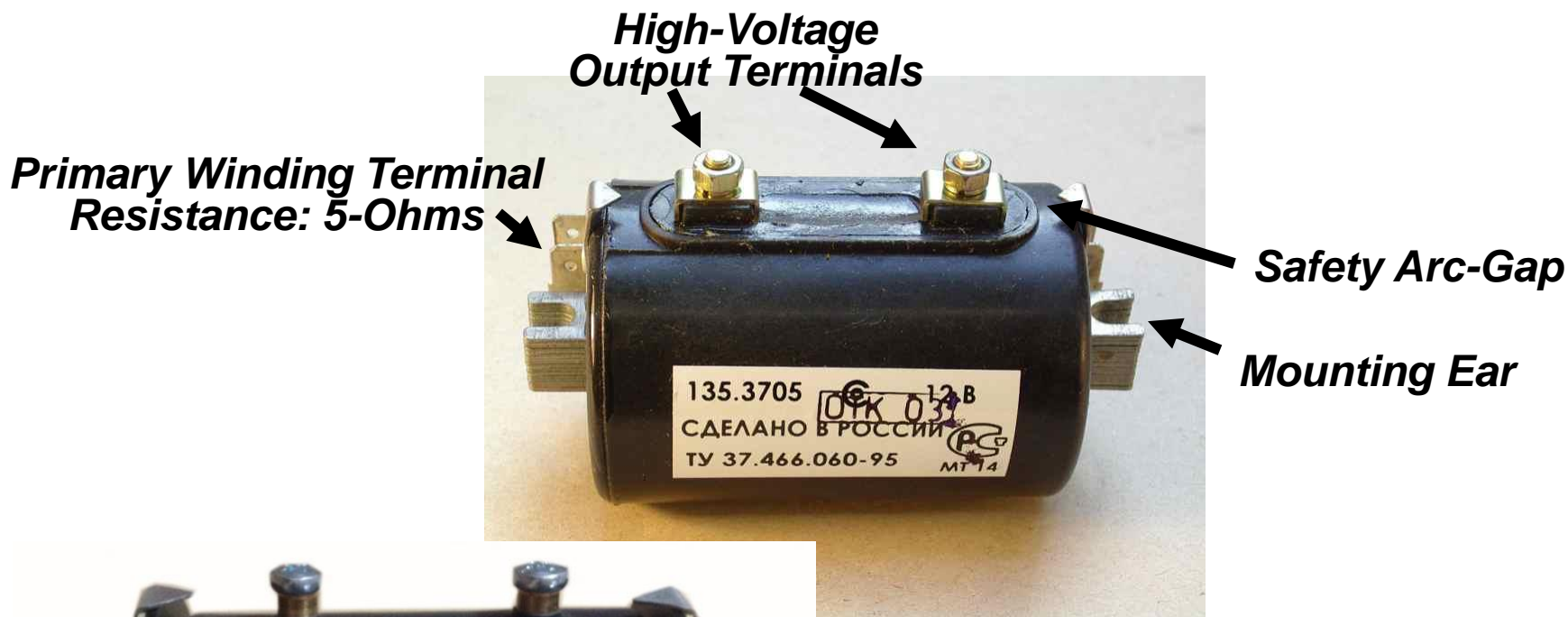


Primary Winding Terminal



Both plugs fire simultaneously on the left and right cylinders, one spark being formed when the compression stroke terminates in one cylinder and the other during the exhaust stroke.

Ignition Coil 12-Volt 135.3705 for Type II thru Type V Ignition Systems

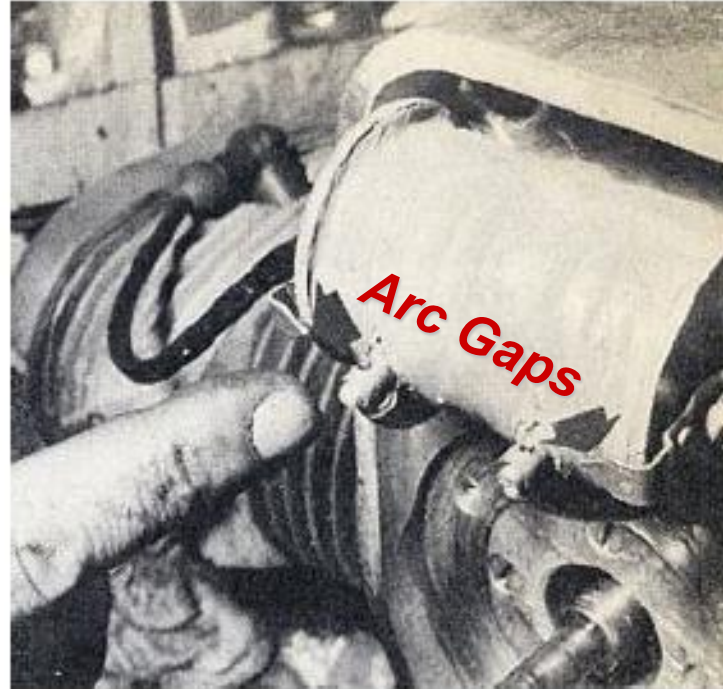


Dnepr Part #: 650171

The 135.3705 later replaced the B204 as more contact-less (electronic) ignition systems were developed.

Arc Gaps on B-201 and B-204 Ignition Coils

***Be careful not to bend
or alter the gaps!***



The ignition coil is double-ended with two spark safety gaps, which were set at 9 mm (0.355")⁸.

Electronic Ignition Coil 135.3705M



Electronic Ignition Coil 6-12 V (SOVEK) for Dnepr, Ural (650 cm³), K-750
Manufacturer Part Number: 135.3705M
List Price: \$22.00
(www.ebay.com)