

DUCATI energia s.p.a.

1990-09-10
RTX31

508

2 CYLINDERS 4 - STROKE (360°)

IGNITION SYSTEM FOR

BOMBARDIER - ROTAX

CODE 431 71 31 00 976 855

SERVICE INSTRUCTIONS

HISTORICAL DOCUMENTS: FOR EDUCATIONAL PURPOSES ONLY (Engine no longer in production, information may be outdated!)

CAPACITOR DISCHARGE IGNITION SYSTEM

1 - INTRODUCTION

The Ducati energia capacitor discharge ignition system (CDI) consist of a flywheel generator a control unit with integrated ignition coil (Transducer) and a phase sensitive trigger coil (Pick-up).

The 12 pole flywheel generator is an outer rotor type with 12 permanent magnets molded in a ring form. It has a matching 12 pole stator with two windings for the transducers supply while the remaining 10 windings are used for feeding the auxiliary loads and for battery recharge systems.

The externally located pick-up is a molded coil that delivers the trigger signals (2 x revolution) to the transducer by sensing the transition of two couples of tiles located on the outer diameter of the rotor.

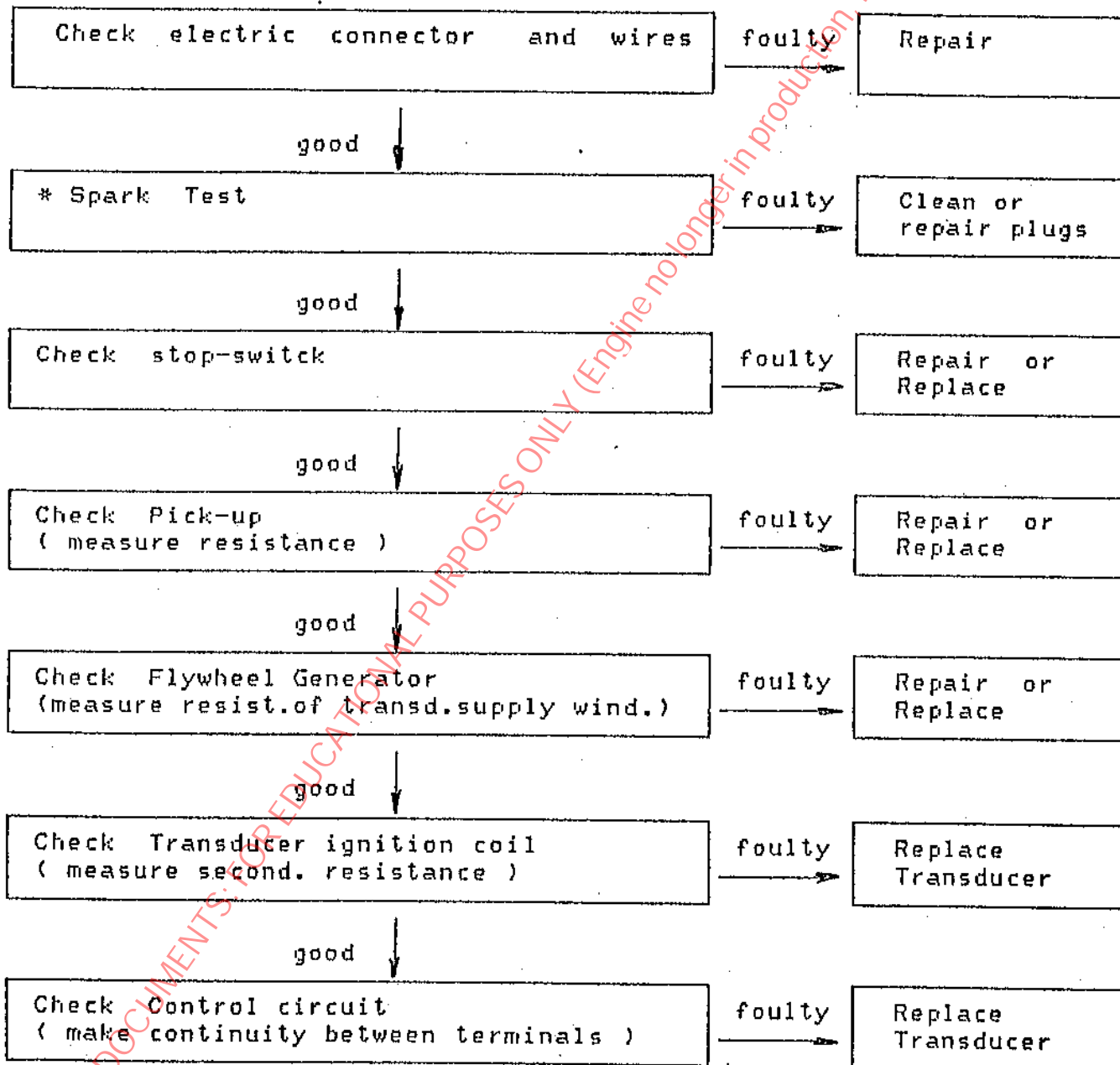
The highest one is the timing point for starting while the other is the timing advance for running speed. The angular displacement between them is the value of the total time advance.

The transducer incorporates a storage capacitor a static switching circuit performed by an SCR or thyristor a rectifier system for charging the storage capacitor and a high energy dual output ignition coil.

All parts are vacuum molded in a single housing with high dielectrical strength epoxy resin to achieve a compact and long life unit designed for the most severe environments.

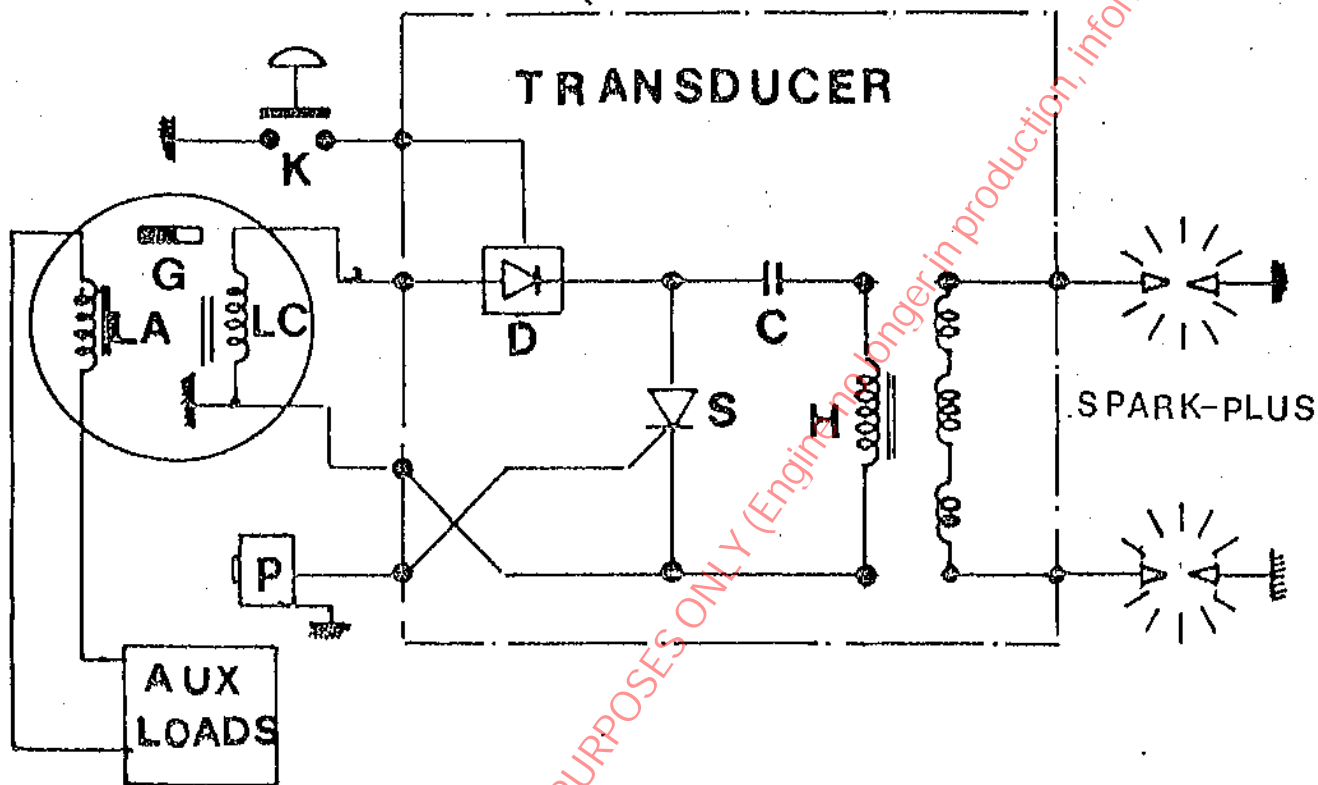
2-3 Procedure for ignition check.

If engine trouble is thought to be caused by a CDI system defect then check it in the following steps:



* SPARK TEST

- 1) Disconnect the high voltage wire from the spark plug and allow a gap of 5 to 6 mm. between the wire and the engine body (ground).
- 2) Rotate the engine and if sparks take place the CDI system is considered to be in good conditions.



ELECTRICAL SYSTEM
(SIMPLIFIED DIAGRAM)

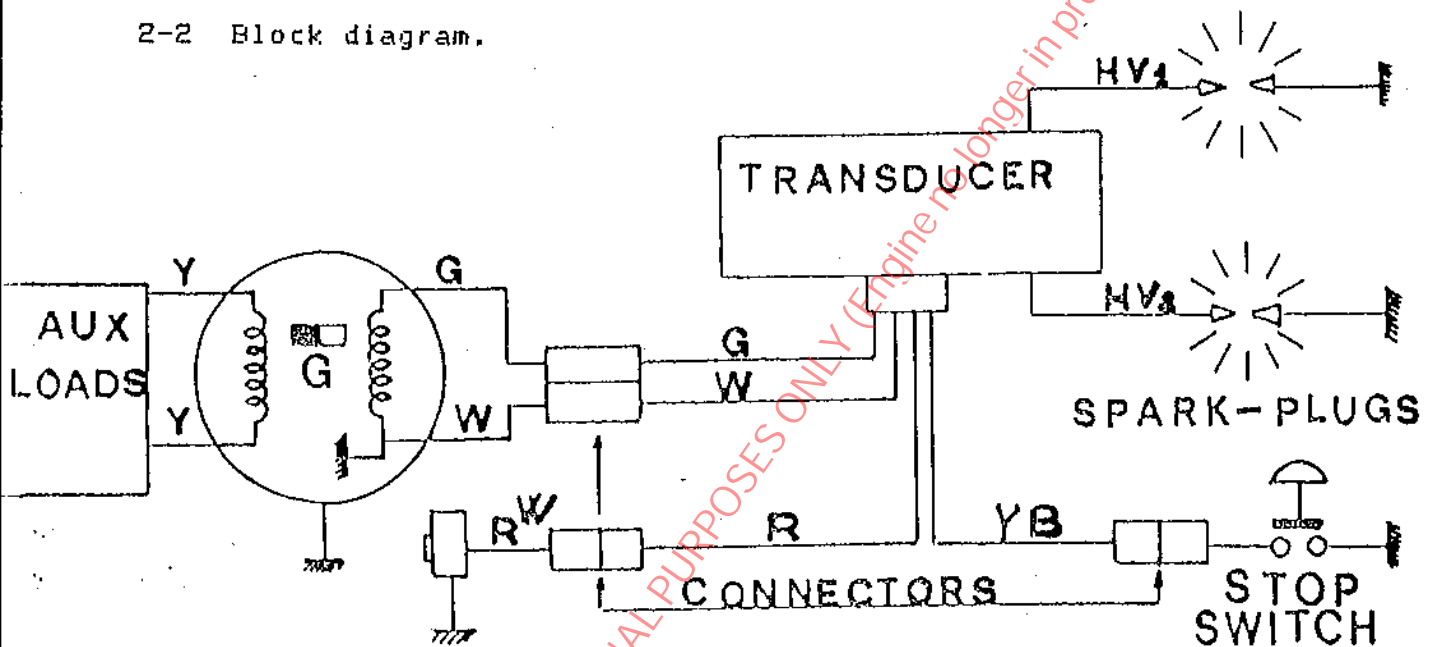
- G - 12 POLE GENERATOR
- LA - AUXILIARY LOADS SUPPLY WINDINGS
- LC - TRANSDUCER SUPPLY WINDINGS
- P - PICK-UP (ANGULAR TRIGGER SYSTEM)
- D - STORAGE CAPACITOR RECTIFIER SYSTEM
- C - STORAGE CAPACITOR
- S - STATIC IGNITION SWITCH (SCR)
- H - HIGH VOLTAGE IGNITION COIL
- K - STOP SWITCH OR KILL-SWITCH

2 - TROUBLE SHOOTING

2-1 Precautions.

- a) Do not open (or short) any connection while the engine is running.
- b) Do not apply mechanical shocks to the transducer.
- c) Remove the flywheel rotor only with the appropriate puller. Other tools like hammer, pliers, etc. are hazardous and may cause permanent damage to the flywheel.

2-2 Block diagram.

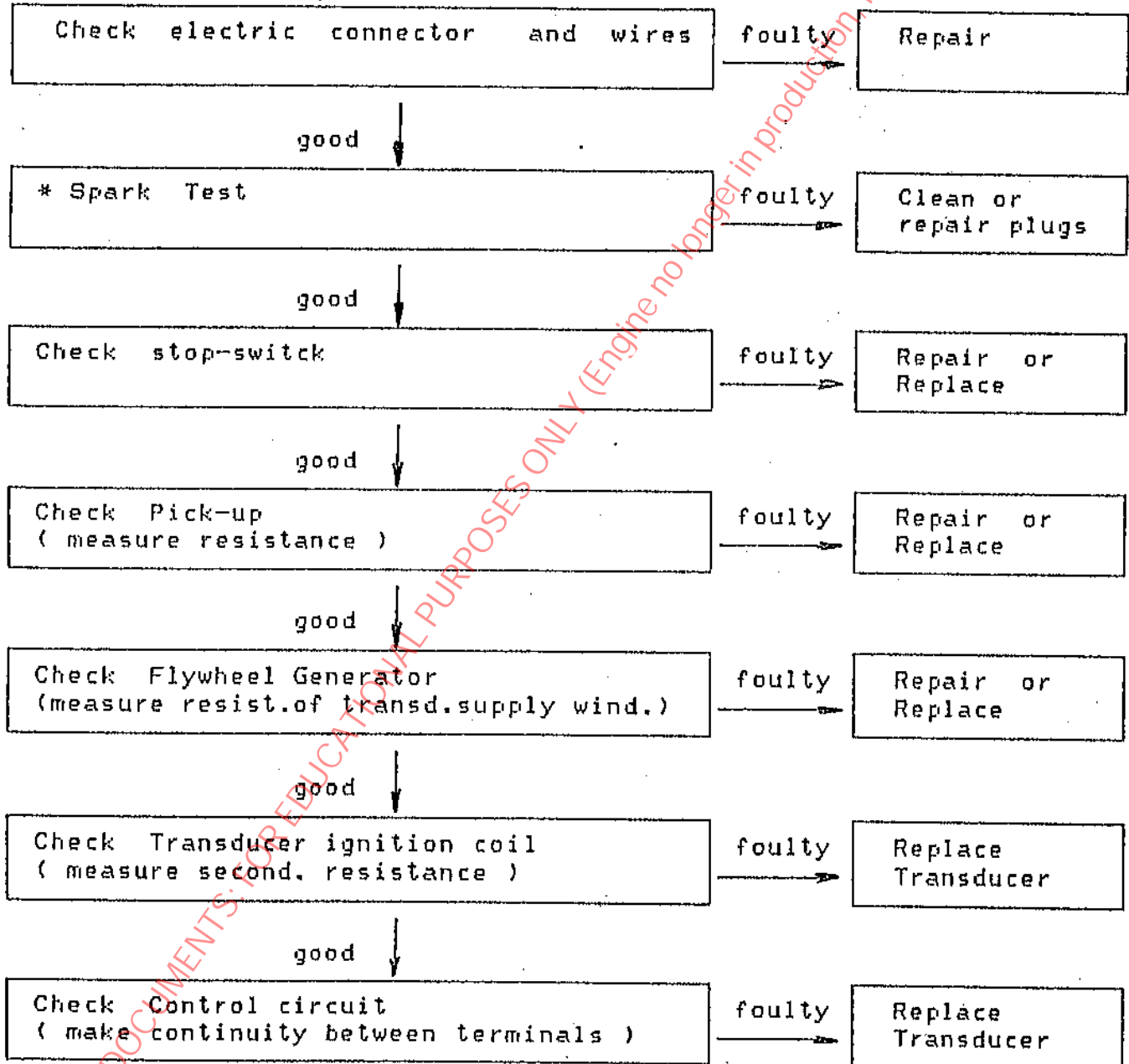


SYMBOL	COLOUR
G	GREEN
W	WHITE
R	RED
Y	YELLOW
RW	RED WHITE
YB	YELLOW BLACK

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2-4 Trouble shooting table.

CAUSE SYMPTON	FLYWHEEL GENERATOR			TRANSDUCER	
	TRANSD.SUPPLY WINDING	AUX. LOAD WINDING	PICK-UP	CIRCUIT	H.V.COILS
Engine does not start	-Open -Short	_____	-Open -Short	Short between G-W / R-W	-Open -Short
Engine stalls A.T. Low speed	Layer short	_____	_____	Charge Rectifier not good	Layer short
Engine irregular A.T. Low speed	Layer short	_____	Air-gap not correct (0.5mm)	_____	Layer short
Engine irregular A.T. Hight speed	Layer short	_____	_____	Charge Rectifier not good	Layer short
No current to auxil. loads	_____	-Open -Short	_____	_____	_____

NOTE:

Before making any control of the parts as shown by the table, always check the connectors, the wiring and the stop switch.

2-5. Parts inspection procedure.

- a) Disconnect the connectors between the parts and measure the resistance or continuity across the terminals as indicated in the below tables with a general purpose circuit tester.
- b) Make shure that the circuit tester is adjustable to zero ohm on each position of the resistance selector switch. If not replace the dry cells.

CHECK TABLES

PART NAME		Wire type or colour	Resistance
FLYWHEEL	Transd. supply winding	G - W	Ω 230 \div 330
	Auxiliary winding	Y - Y	Ω 0.1 \div 0.2
GENERATOR	Pick-up	RW - W gnd	Ω 140 \div 190
TRANSDUCER	Second. winding	HV1 - HV2	K Ω 4.8 \div 6.8
HV COILS	Insulation	HV out-W gnd	open
ENGINE	Stop	YB - W gnd	short
STOP-SWITCH	Drive	YB - W gnd	open

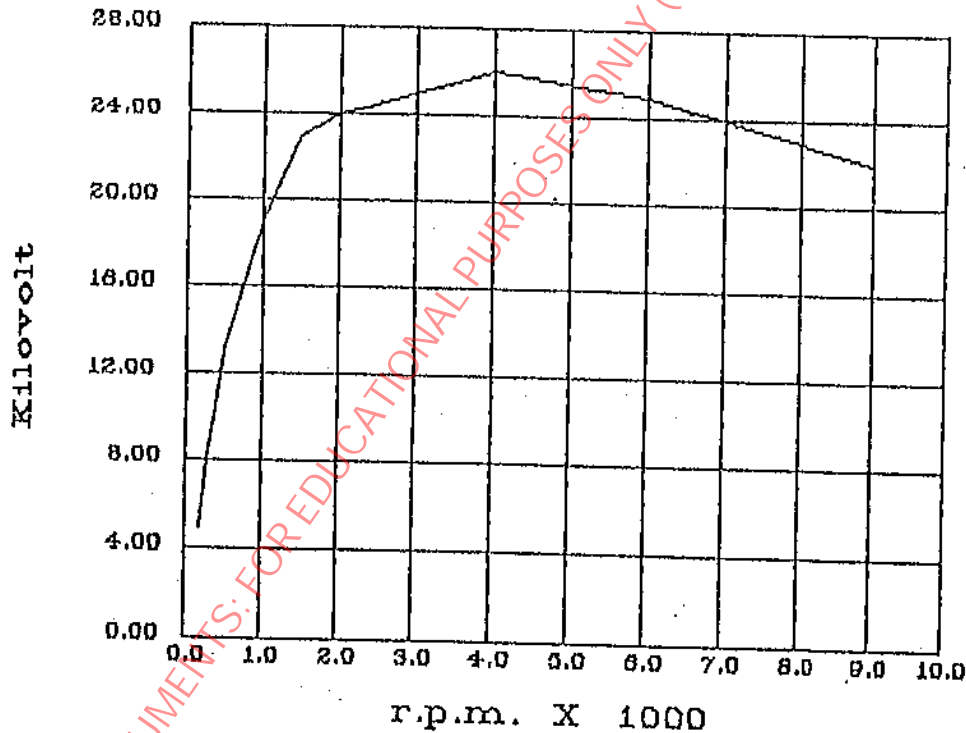
TESTER WIRE PLUS	TRANSDUCER CONTROL CIRCUIT				
	TESTER WIRE (MINUS)				
	\	G	W	R	YB
	G	\	\geq 100 K Ω	open	open
	W	\geq 100 K Ω	\	open	open
R	\geq 100 K Ω	K Ω 0.5 \div 3	\	open	
YB	K Ω 1 \div 5	\geq 100 K Ω	\geq 100 K Ω	\	

TESTER POINTER Use 1 K Ω or 10 K Ω range

IGNITION VOLTAGE ON 50 pF LOAD
(Tolerance +\ - 5%)

r.p.m.	KVOLT 50pF
200	5.00
300	8.00
500	13.00
1000	19.00
1500	23.00
2000	24.00
4000	26.10
6000	25.00
8000	23.00
9000	22.00

IGNITION VOLTAGE ON 50 pF LOAD



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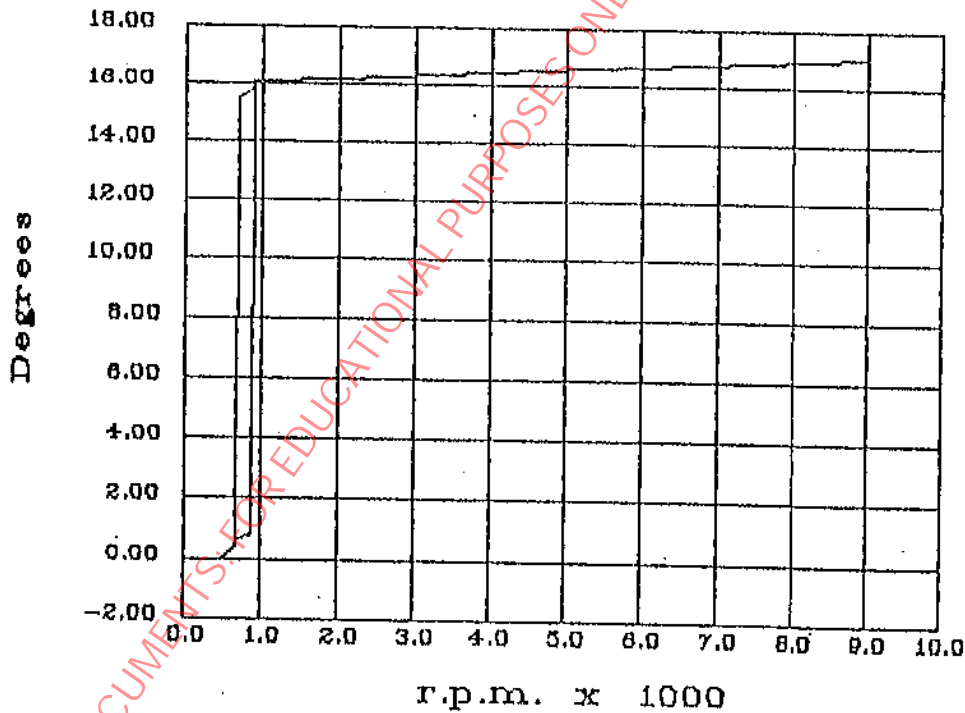
IGNITION TIMING TYPICAL VALUE WITH 0.50 mm GAP

1 = min.

2 = max.

r.p.m.	Timing	Timing
500	0.00	0.00
690	0.50	0.50
700	15.50	0.75
890	15.75	0.85
900	16.10	16.10
1000	16.15	16.15
2000	16.20	16.20
4000	16.50	16.50
6000	16.75	16.75
9000	17.10	17.10

IGNITION TIMING



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BATTERY RECHARGING DIAGRAM
(Tolerance $\pm 5\%$)

r.p.m.	Ampere D.C.
600	0.00
1000	1.80
1500	6.40
2000	8.70
2500	9.80
3000	10.60
4000	11.20
6000	11.60
8000	11.80
9000	11.90

RECHARGING DIAGRAM (BATTERY 14V)

