

# **SP10-E1C10-E1C11 ALTERNATORS**

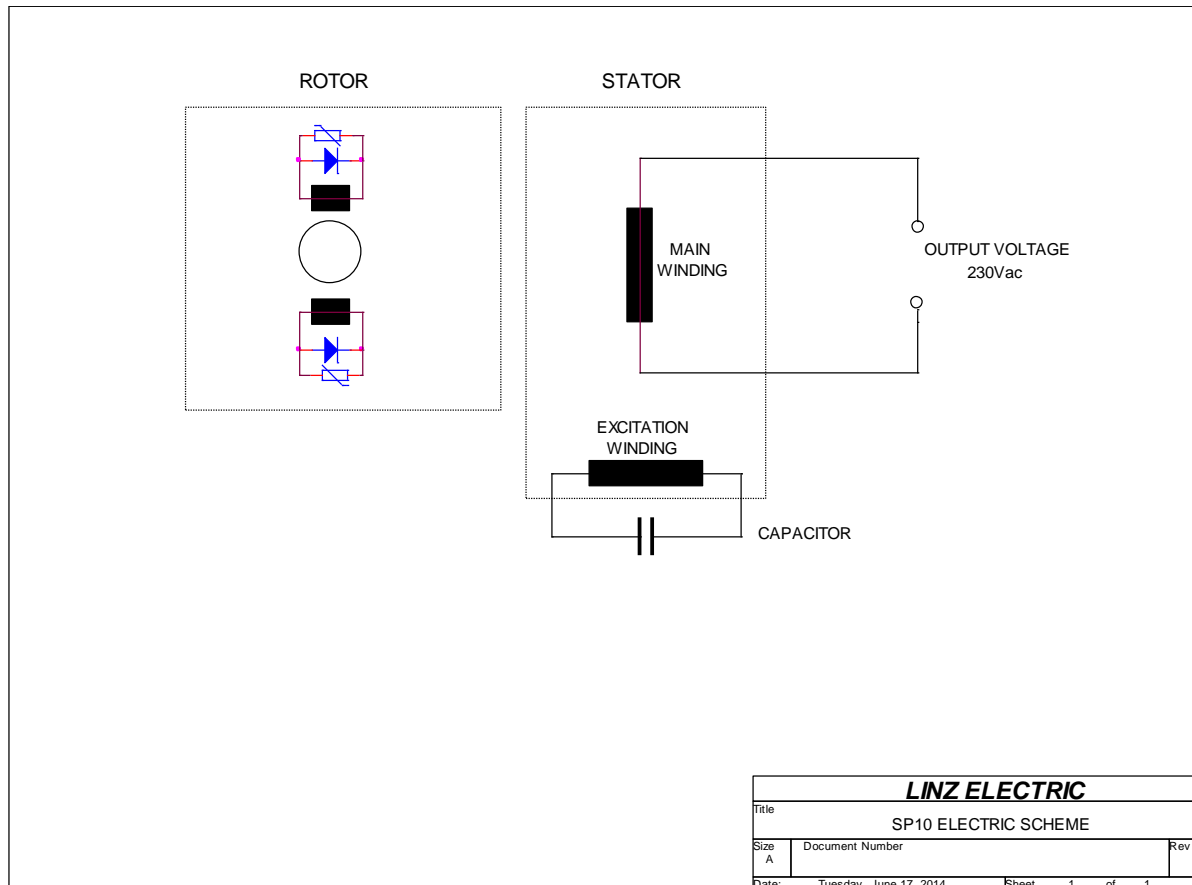
**July 2017**



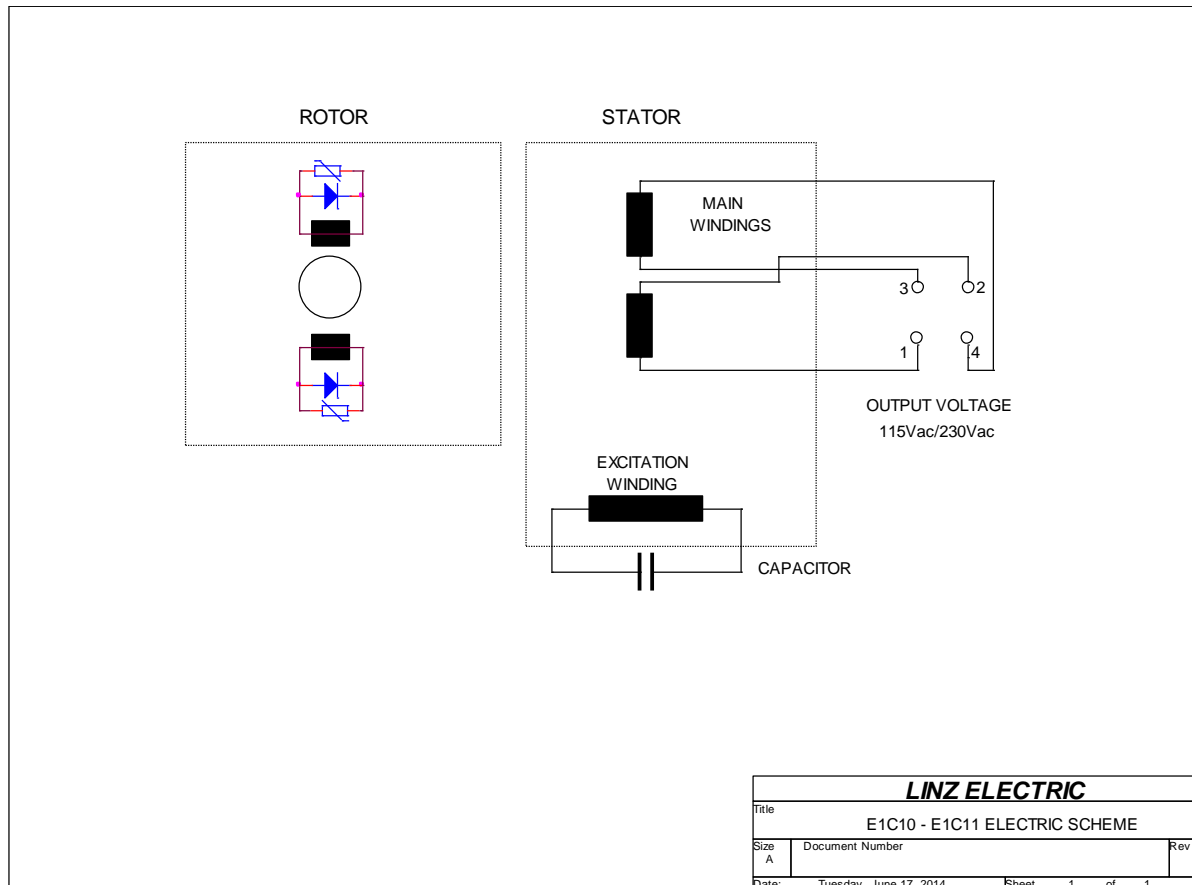
## **SAFETY NOTE**

**All trouble shooting must be done with the  
gen-set shut down**

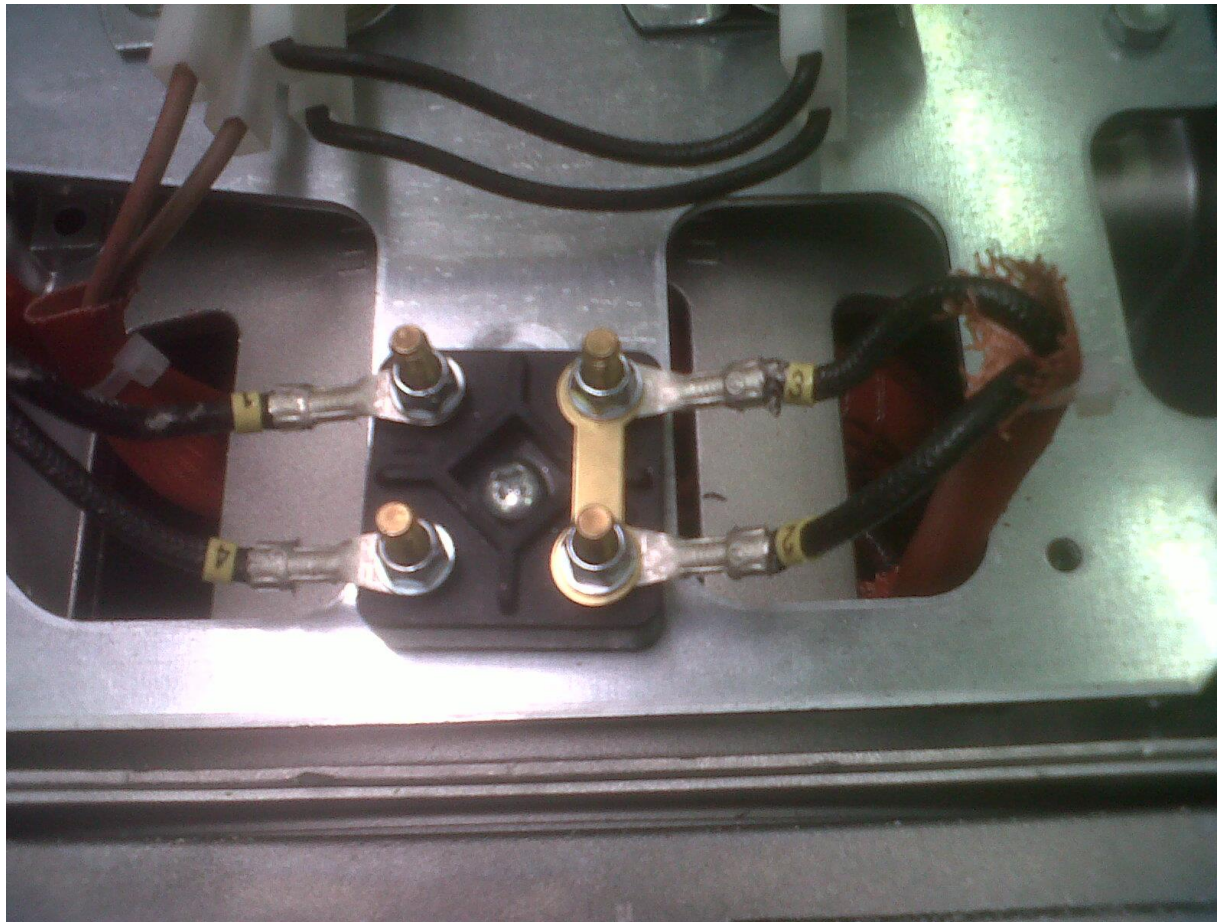
# SP10 WIRING DIAGRAM



# E1C10 – E1C11 WIRING DIAGRAM

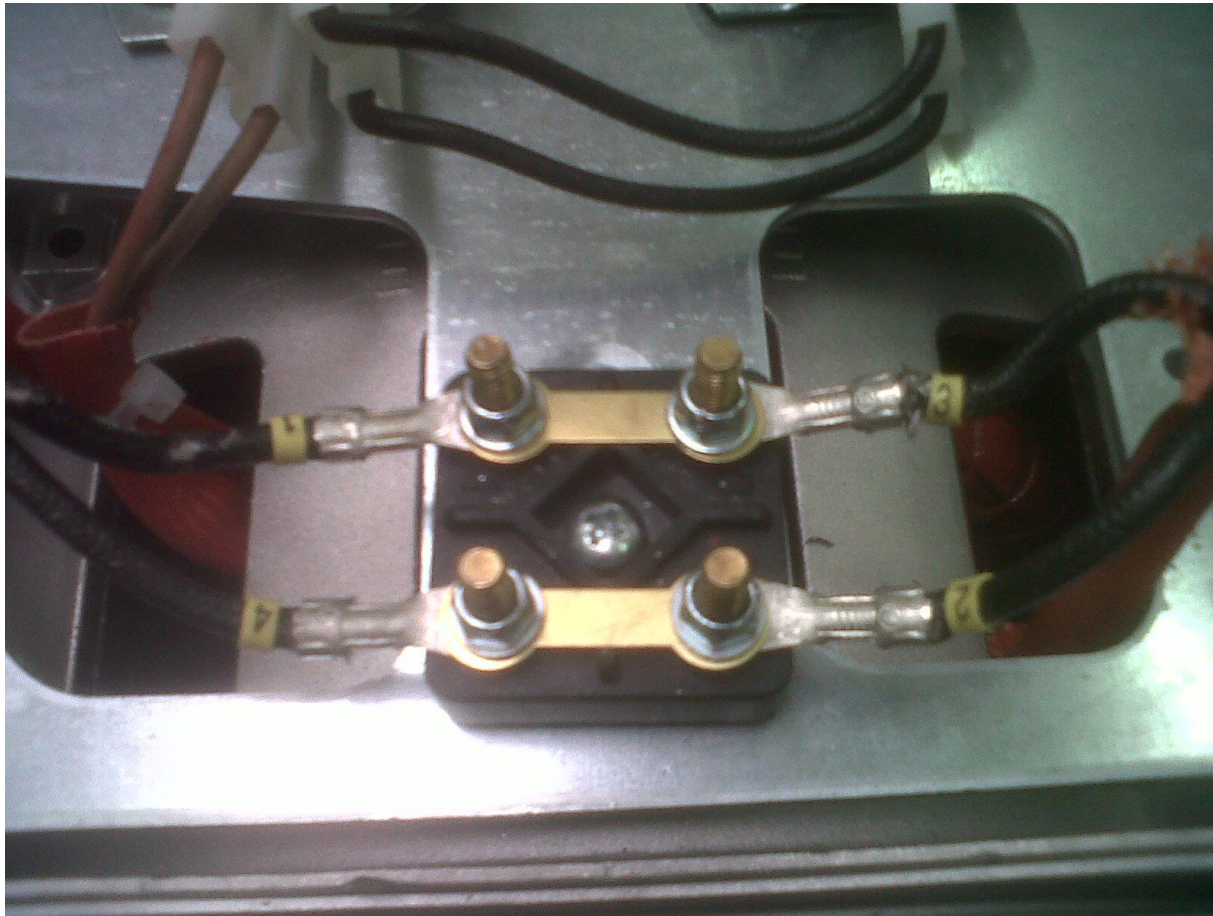


## 230Vac SERIES CONNECTION





# 115Vac PARALLEL CONNECTION



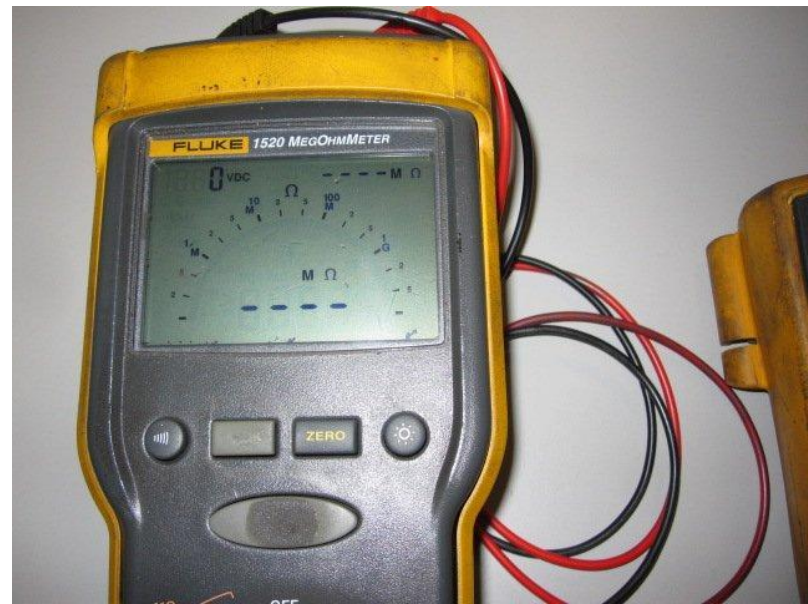
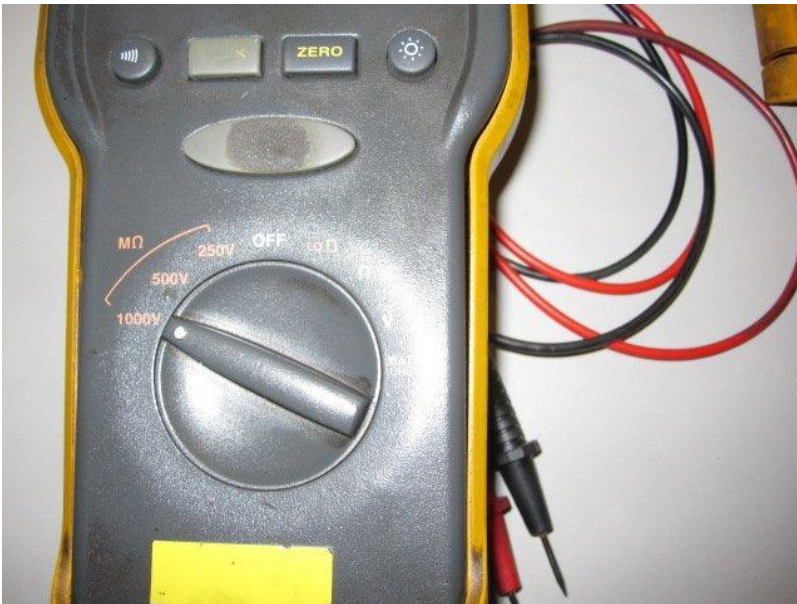
# TROUBLE SHOOTING (1)

## TOOLS NEEDED:



# TROUBLE SHOOTING (2)

## 1. Megger- Insulation Test





## TROUBLE SHOOTING (3)

### 2. Fluke® Multimeter



## TROUBLE SHOOTING (4)

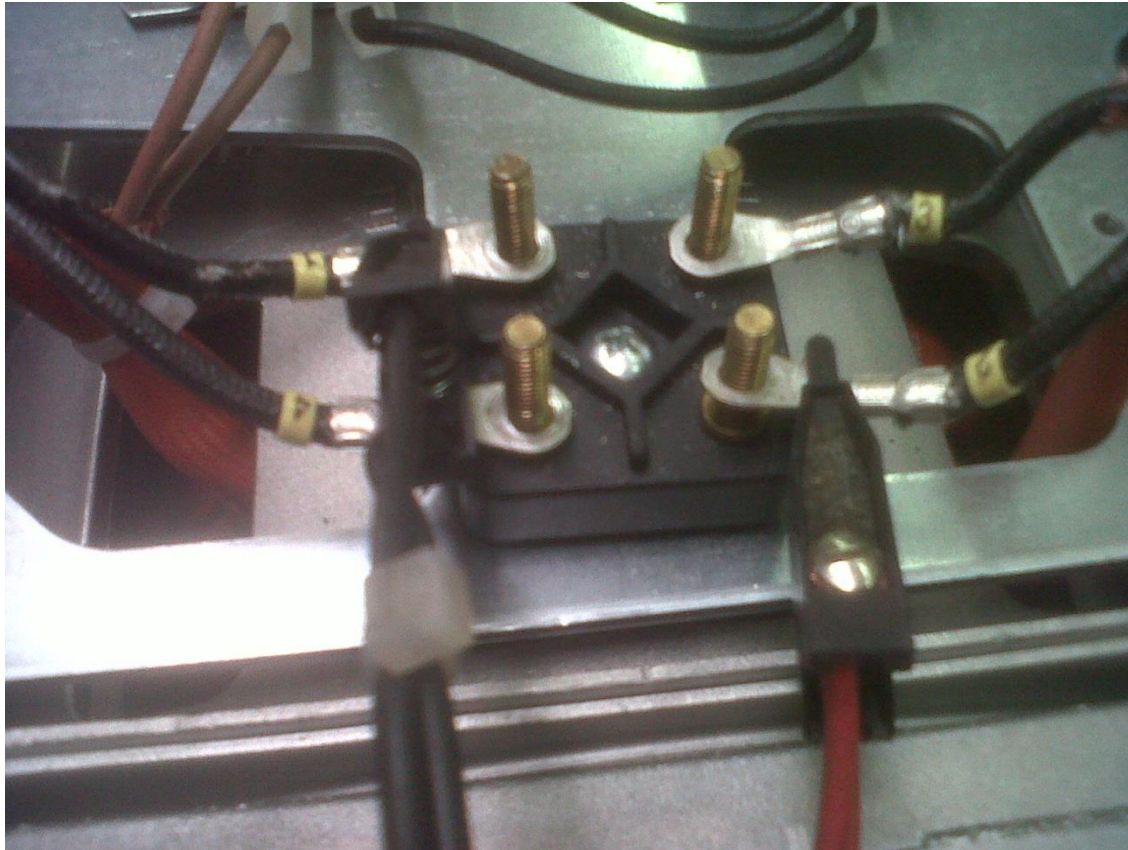
### 3. Bearing Puller



## TROUBLE SHOOTING (5)

- 1) Check for burnt parts
- 2) Check all winding resistances
- 3) Check insulation between each winding and ground, and among windings
- 4) Check/replace capacitor
- 5) Check rotating diodes
- 6) Apply separate excitation
- 7) Check coupling and all mechanical parts

# MAIN WINDING RESISTANCES WHERE TO MEASURE (1)



Main terminals 1-2 & 3-4

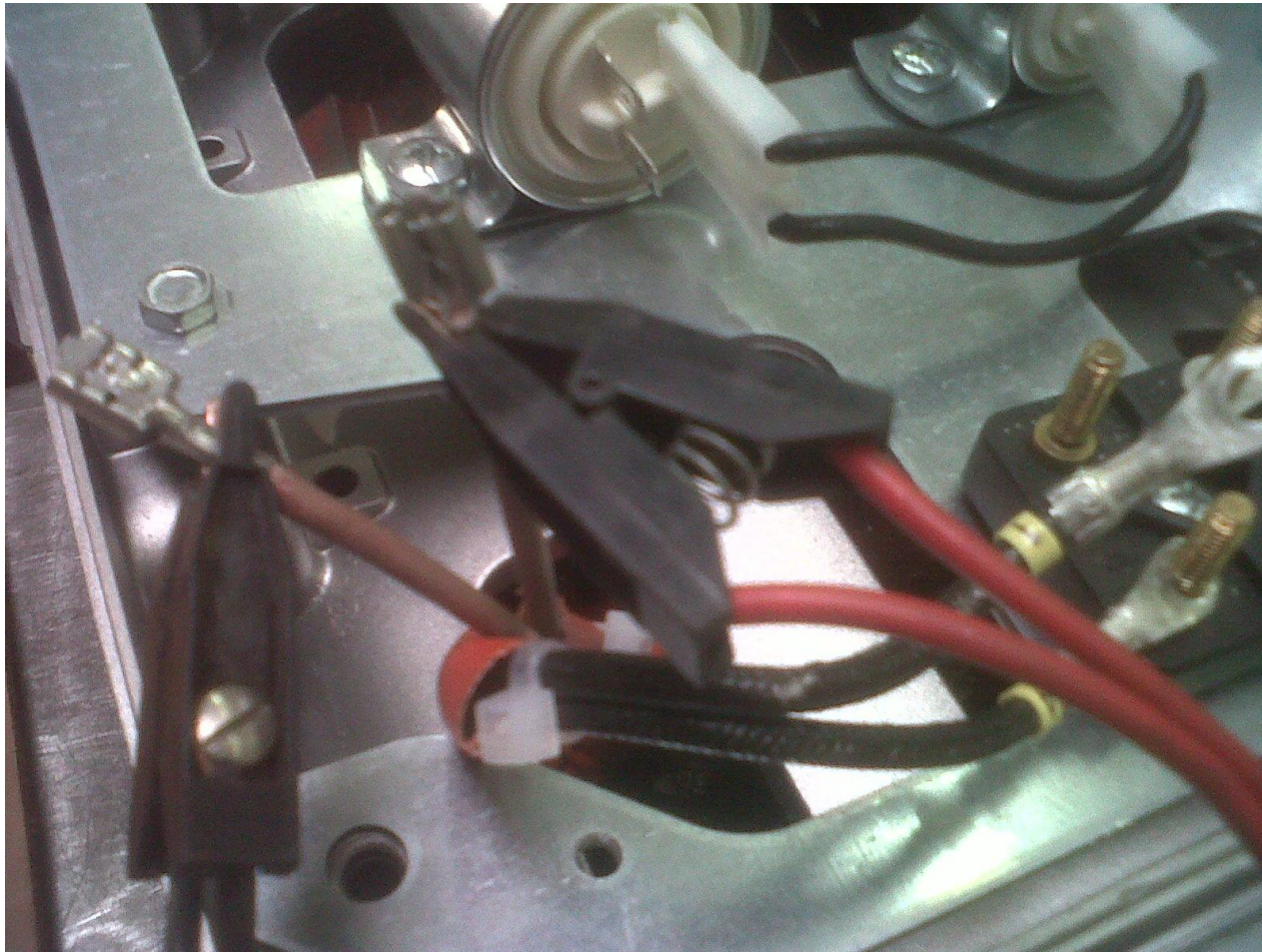


# MAIN WINDING RESISTANCES WHERE TO MEASURE (2)



$$R(1-2) = R(3-4)$$

# CAPACITOR WINDING RESISTANCE WHERE TO MEASURE





# SP10-E1C10-E1C11 ROTOR WINDING RESISTANCES - WHERE TO MEASURE



# SP10 WINDING RESISTANCES

**Winding resistences SP10 (Ohms @ 20°C)**

Type	power (kVA)		stator						rotor	cap.
			principal		excitation		battery charger			
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz		
SP10S A	1,7	2	4,21	3,32	17,66	13,58	0,15	0,11	4,61	10
SP10S B	2,2	2,7	2,94	2,35	8,63	7,2	0,1	0,088	3,42	14
SP10S C	2,6	3,2	2,48	1,92	7,36	5,62	0,097	0,85	3,37	16
SP10S D	3	3,7	1,98	1,54	6,13	4,67	0,093	0,081	3,52	16
SP10S E	3,5	4,3	1,55	1,2	4,89	3,75	0,08	0,075	3,54	20
SP10M F	4,2	5	1,2	0,92	3,85	2,84	0,083	0,071	3,93	25
SP10M G	5	6	0,97	0,76	3,21	2,45	0,074	0,062	4,27	25

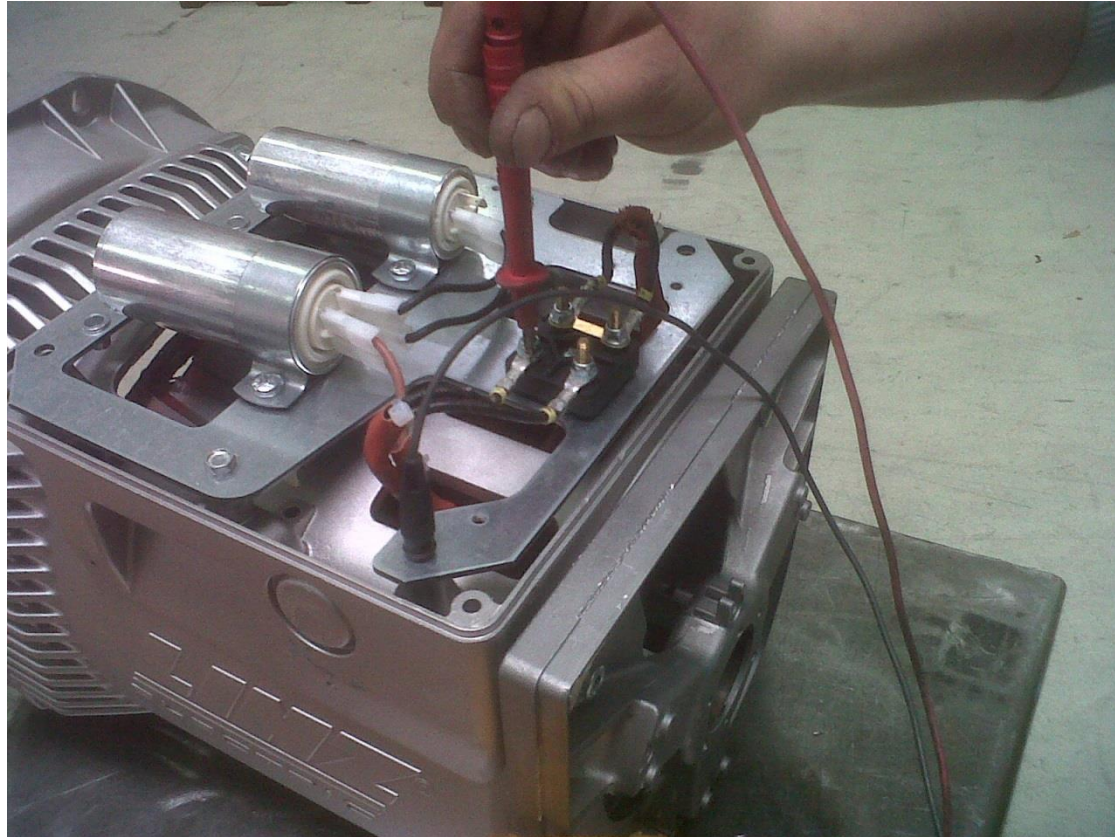


## E1C (2 POLES) WINDING RESISTANCES

Type	KVA		Winding resistances E1C/2 (0hm 20 °C)						Cap. (450 V.) µF	
			Stator				Rotor			
	50 Hz	60 Hz	Principal*		Excitation		Battery charger			(1pole)
			50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz		
E1C10S B	2.2	2.7	3.04	2.35	9.05	7.1	0.1	0.088	3.4	14
E1C10S D	3	3.7	1.97	1.54	5.9	4.65	0.093	0.081	3.27	16
E1C10S E	3.5	4.3	1.6	1.2	4.8	3.75	0.08	0.075	3.48	20
E1C10S F	4.2	5	1.15	0.92	3.7	2.85	0.083	0.071	3.7	25
E1C10S G	5	6	1	0.76	3.18	2.45	0.074	0.062	3.96	25
E1C10M H	6	7.25	0.66	0.52	1.95	1.53	0.07	0.060	4.61	30
E1C10M I	7	8.5	0.515	0.39	1.57	1.18	0.075	0.062	5.1	40
E1C10M L	8	9.75	0.45	0.35	1.15	0.95	0.073	0.058	5.60	45
E1C11MA	8	9.75	0.42	0.33	1.52	1.13			4.97	25+25
E1C11MB	10	12.5	0.286	0.22	1.04	0.82			5.83	45
E1C11MC	12	15	0.235	0.18	0.80	0.63			6.2	35+35
E1C13M D/2	15	18	0.18	0.135	0.46	0.36			5.87	40+40
E1C13M E/2	18	22	0.155	0.115	0.35	0.29			5.87	30+30+35

\* With connections for the higher voltage.

## INSULATION TEST (WITH MEGGER) (1)



Between windings and ground (case)

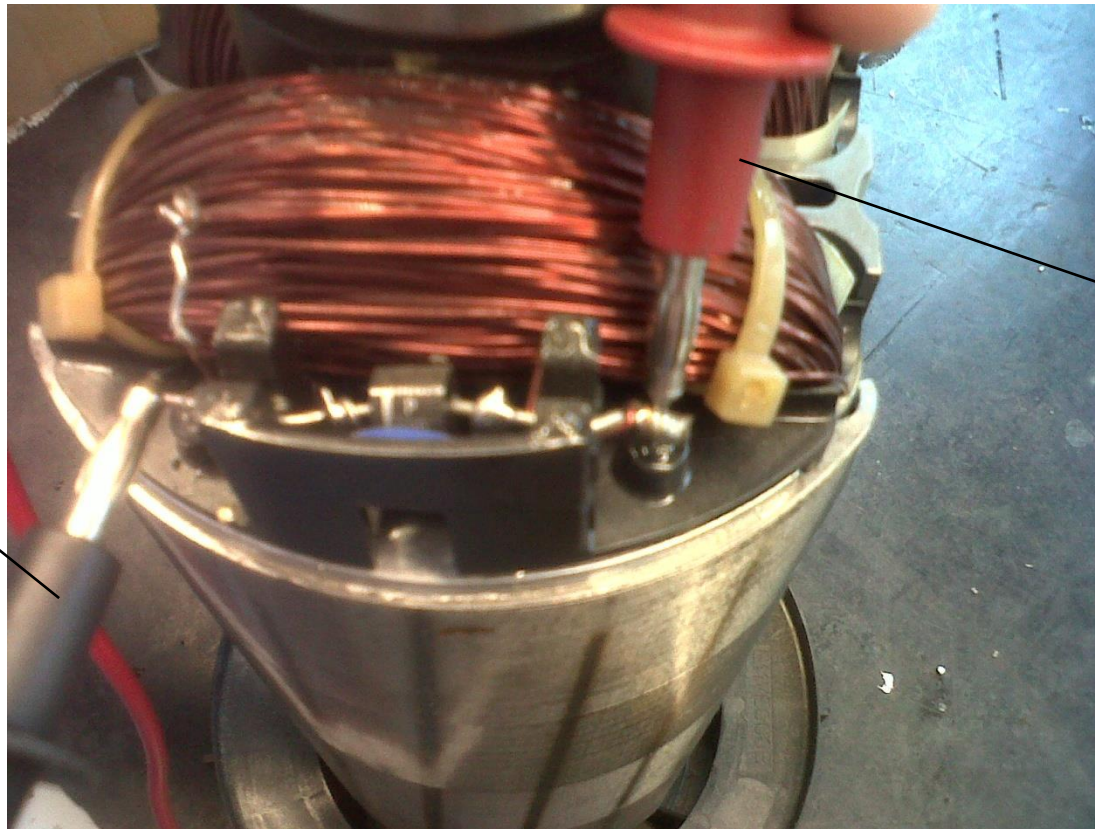
## INSULATION TEST (WITH MEGGER) (2)



$R > 10M\Omega$



## SP10-E1C10-E1C11 ROTATING DIODE TEST





## SP10-E1C10-E1C11 ROTATING DIODE TEST



## CAPACITOR TEST (1)



Check capacitor value (multimeter in capacitor position)

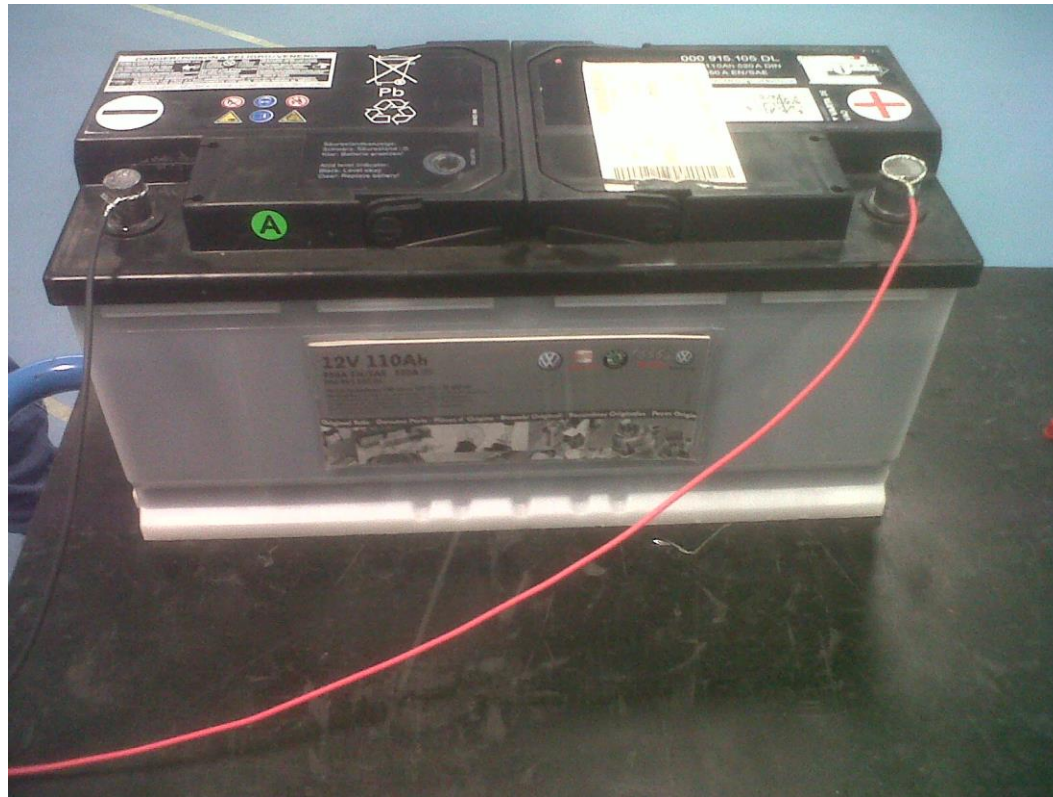


## CONTROLLO DEL CONDENSATORE (2)



Select capacitor position

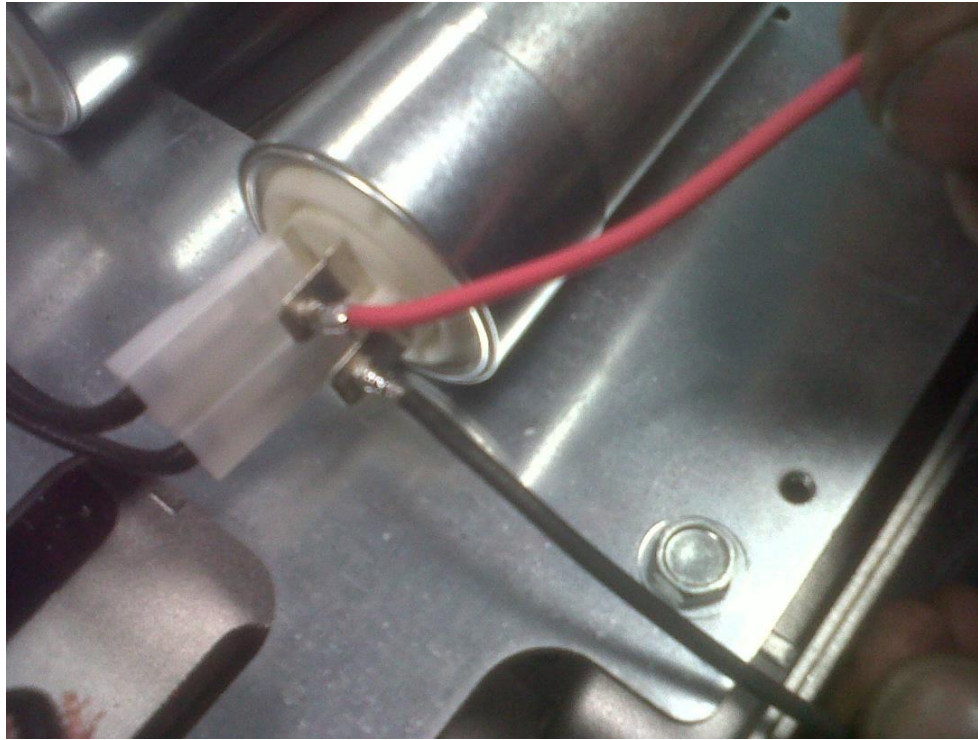
# FLASH EXTERNAL EXCITATION (1)



After carrying out all previous tests unsuccessfully, you will need to re-excite the alternator through a 12Vdc battery



## FLASH EXTERNAL EXCITATION (2)



While the alternator is running, apply the battery terminals with any polarity to Faston capacitor terminals for one or two seconds

## BEARING REPLACEMENT (1)





## BEARING REPLACEMENT (2)



Bearing Puller