



1D - Series

MANUAL Charging System Check

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2. GENERAL INFORMATION

2.1 Information on this document

This troubleshooting manual was compiled with care using technical information provided by HATZ and adapted for use by Impulse. The document is intended to support fault diagnosis within the charging system of the machine. All diagnostic work described in this manual must be carried out exclusively by trained and authorized personnel, who have read and understood the pump's operating instructions prior to starting the troubleshooting process. The manual is not a substitute for the official operating manual of the machine but should be used as a supplementary aid during service and maintenance.

2.2 Exclusion of liability

The manufacturer cannot be held liable for personal injury, damage to property or damage to the machine itself caused by improper use, foreseeable misuse, or failure to follow or adequately follow the safety measures and procedures described in this manual. This also applies to changes made to the machine and the use of unsuitable spare parts.

3. COMPONENT OVERVIEW

The system consists of the following parts:

- Coil
- Magnet Ring
- Voltage Regulator

Chapter 4 explains how to check the coil-to-magnet ring air gap, coil and how to measure the boundary conditions of the regulator. Therefore you need a feeler gauge and multimeter.



magnet ring
Hatz part no: 015 390 01



coil
Hatz part no: 015 391 10



voltage regulator
Hatz part no: 018 710 04

4. CHARGING SYSTEM CHECK

4.1 Checking Coil-to-magnet ring distance

Before performing any electrical measurements, it is crucial to first verify the distance between the coil and the magnet ring. A key mechanical setting that directly affects the function of the charging system.

For all 1D-series Hatz engines supplied to Impulse, the standard coil-to-magnet ring air gap is 0.70 mm.

To check this distance, follow these steps:

1. Remove upper and lower cover plug
2. Measure upper and lower coil-to-magnet ring air gap

If this distance is incorrect, the system may:

- Fail to generate sufficient alternating voltage
- Deliver unstable or incorrect measurement values
- Prevent accurate fault diagnosis

If the gap is found to be incorrect, it must be set according to the official adjustment procedures and documentation provided by Hatz.



0.70 mm feeler gauge



Measure upper coil-to-magnet ring air gap



In case of uncertainty regarding the correct gap, contact Hatz directly with the engine serial number to confirm the correct specification

4.2 Checking the Coil

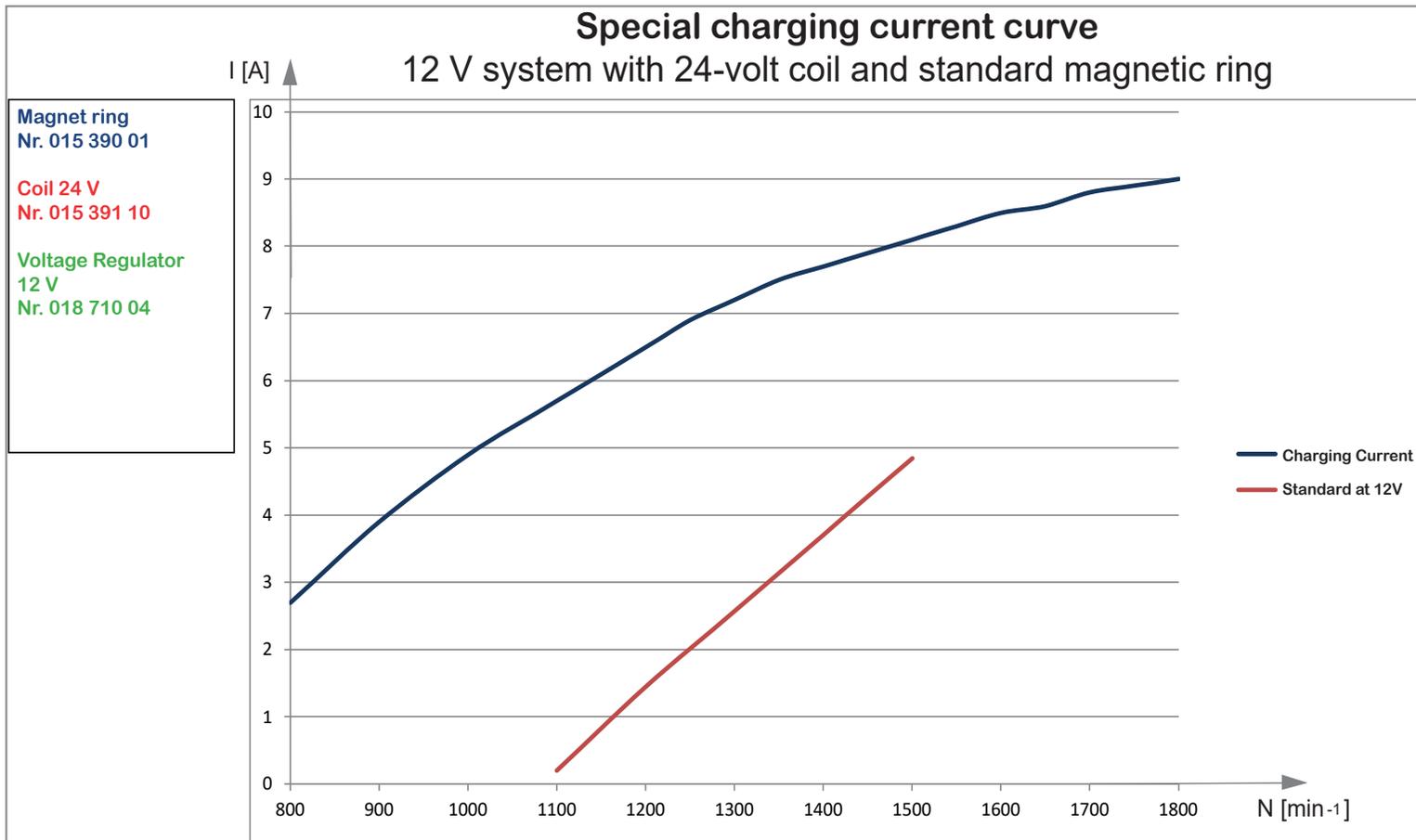
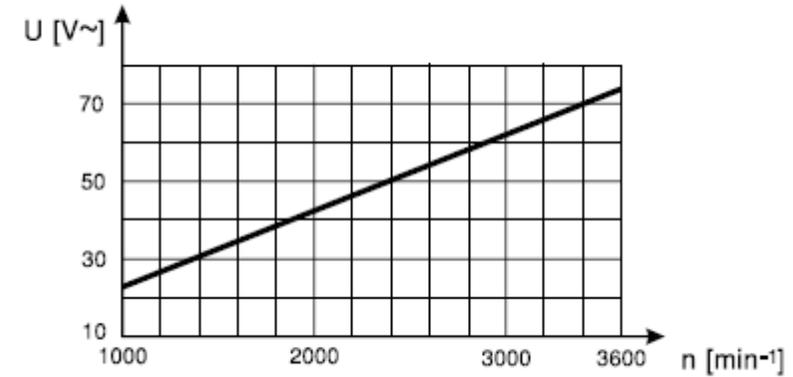
To check the coil, follow these steps:

1. Disconnect the connector from the coil
2. Start the engine
3. Measure the alternating voltage on the wires

See Ampere & Voltage graphs
(Also attached in appendices)



Voltage / RPM curve



4.3 Checking the Regulator

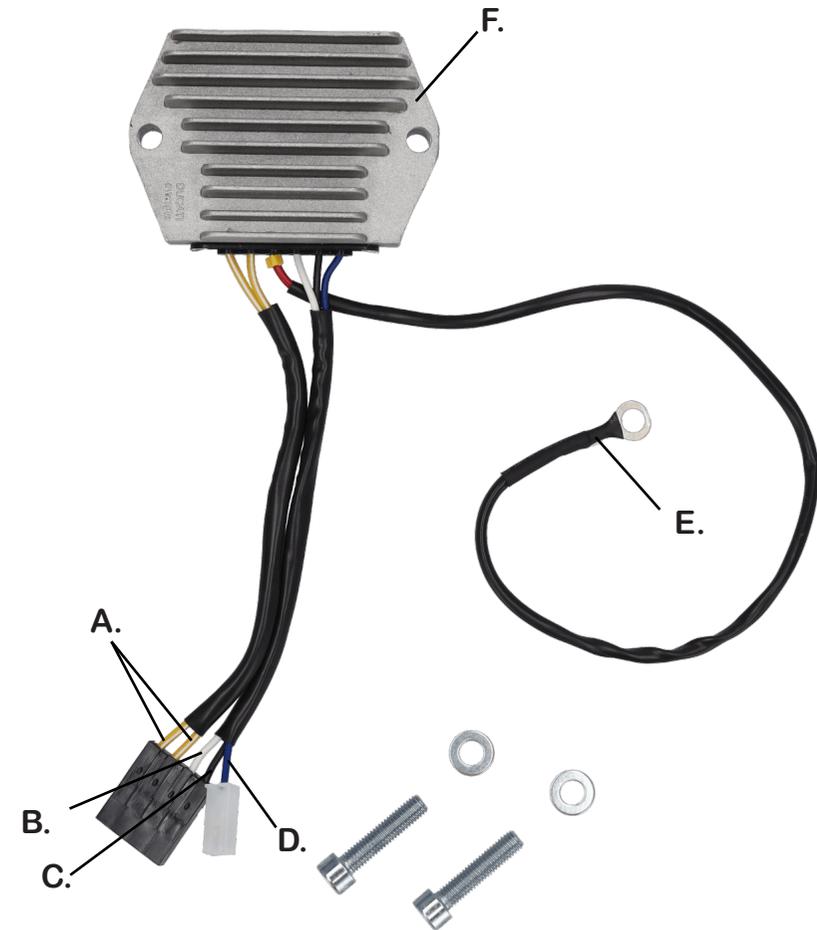
You cannot measure the voltage regulator, but you can measure the boundary conditions.

The voltage regulator has a four-pole connector with;

- A.) Two yellow wires = incoming alternating voltage
- B.) White wire = no. 2 D+ (control lamp)
- C.) Black wire = no. 24 switched positive
- D.) Blue wire = no. 22 W connection
- E.) Red wire with M8 eye = Battery positive
- F.) Housing needs ground (minus)

If the alternating voltage is present, When the contact is on, there is voltage on wire 24 (C.) and the regulator is connected to ground with the housing, the regulator should function.

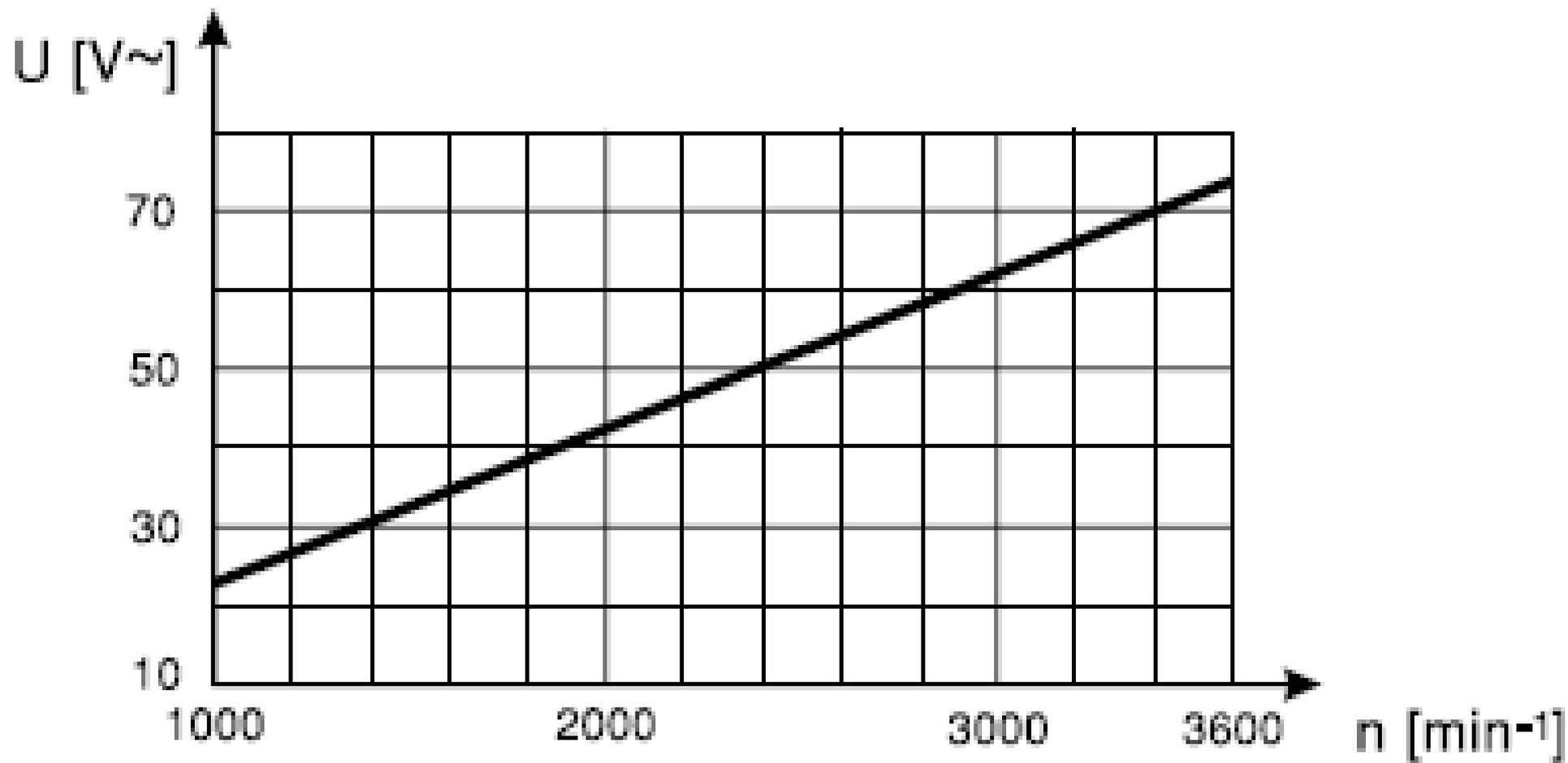
If all boundary conditions are present and the regulator does not charge, the regulator is probably defective.



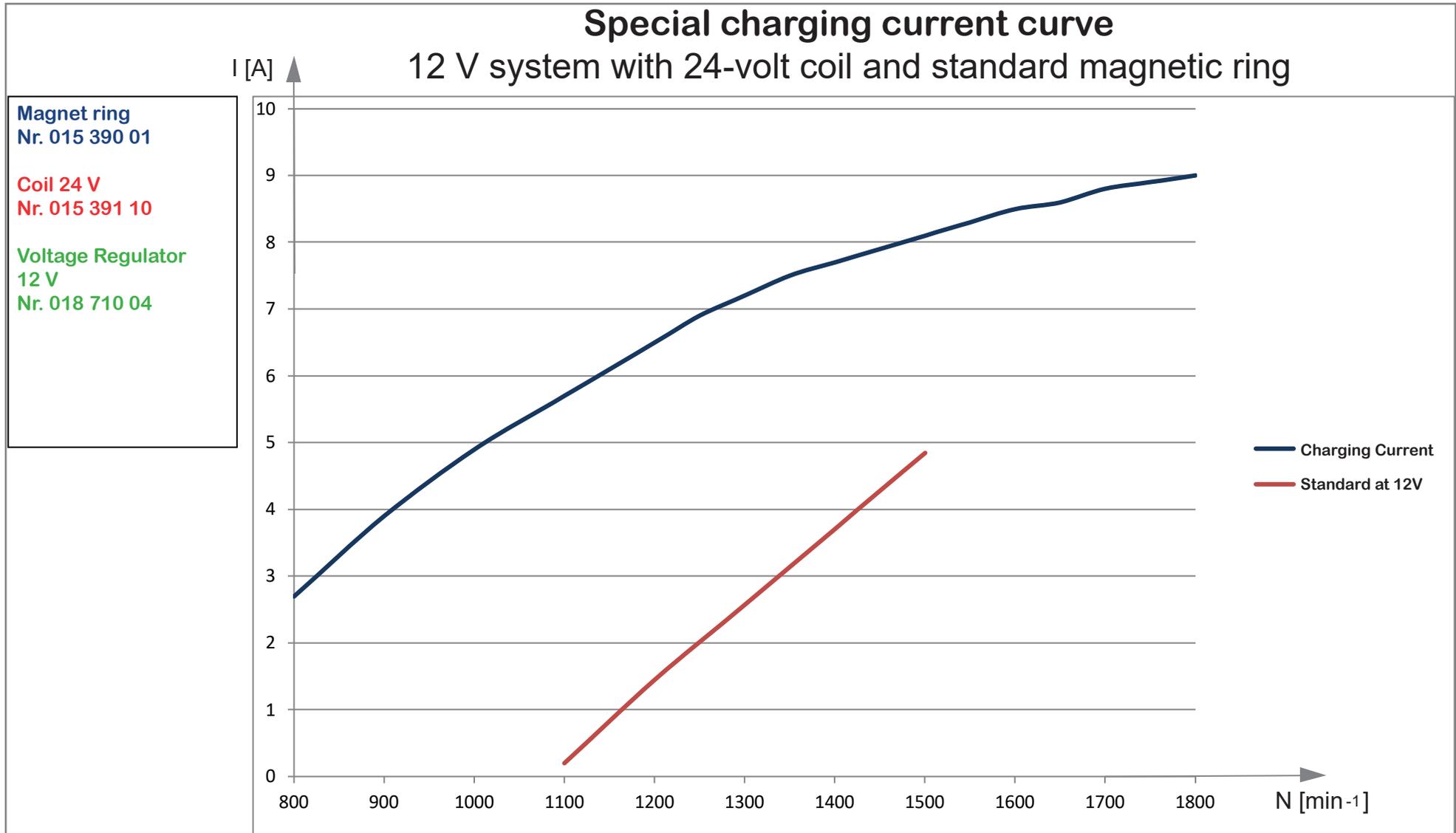
5. APPENDICES

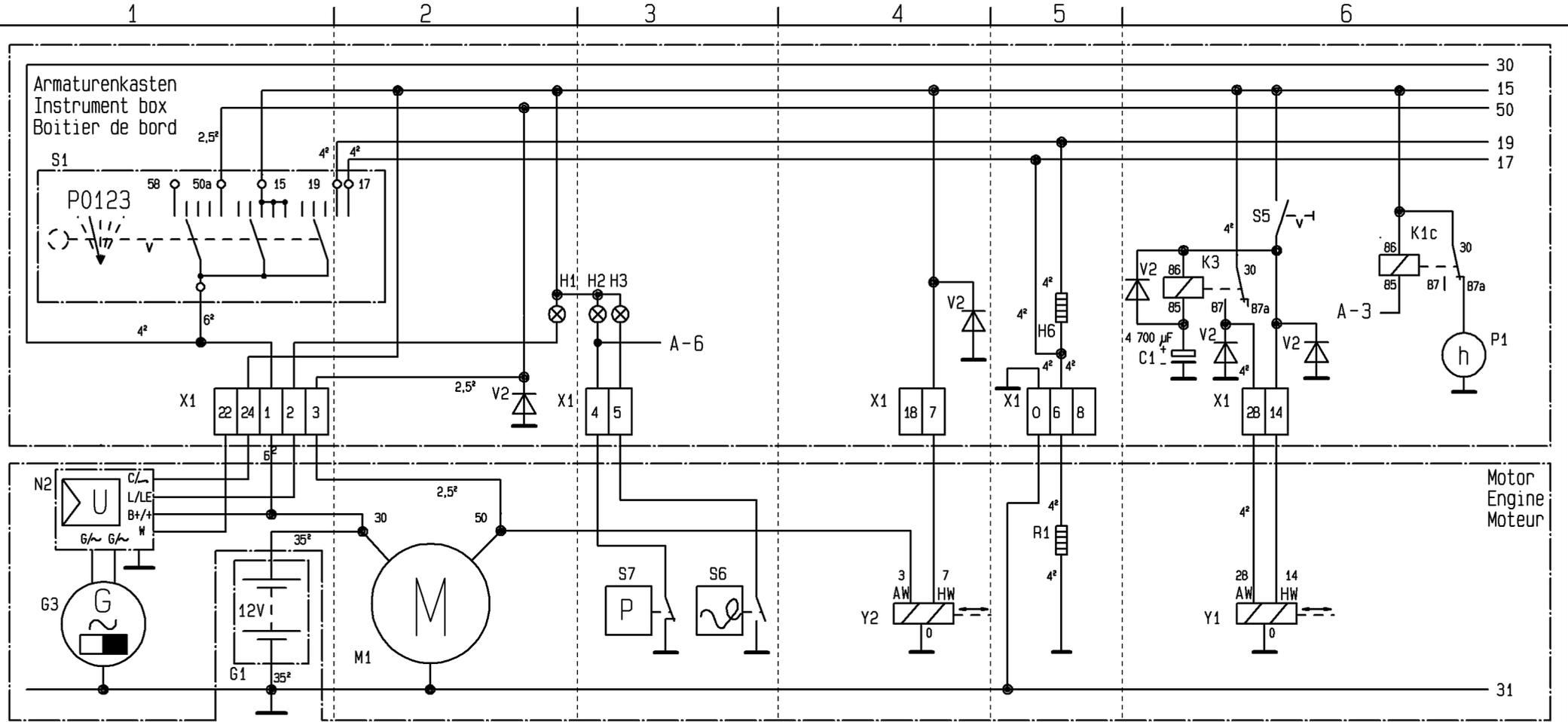
1. Voltage / RPM Graph
2. Special charging current curve
3. 1D81 Wiring Diagram
4. Defects Cause Remedy

Voltage / RPM Graph



Special charging current curve





Stromversorgung / Ladeeinrichtung
Power supply / Charging device
Alimentation electr. / Chargeur

Startereinrichtung
Starting device
Dispos. de demarr.

Überwachung + Anzeige
Monitoring + display
Surveillance + temoin

Motorabstellung
Motor shut-down
Arret du moteur

Vorglühen
Preheating
Prechauffage

Optionen / Options
* Drehzahlverstellung
* Speed adjustment
* Reglage de regime

* Betriebsstundenzähler
* Hours-run meter
* Compteur horaire

Sämtliche Leitungen ohne Querschnittsangabe sind 1².
All wires without conductor cross section data are 1².
Tout les cables sans indication de section sont de 1².

Hubmagnet zur Drehzahlverstellung: Anzugsstrom: 44,5 A, Haltestrom 0,6 A
Solenoid for speed adjustment: inrush current: 44.5 A, holding current: 0.6 A
El.-aimant reglage regime: courant d'action.: 44,5 A, courant de maint.: 0,6 A

Hinweis: Jede Änderung der Verdrahtung erfordert eine Rücksprache mit dem Werk!
Instruct.: Any changes in the wiring require a consultation of the factory!
Remarque: Avant de modifier le cablage, contacter l'usine!

Nr.	Datum	Name	Änderung

HATZ
DIESEL
Motorenfabrik HATZ
GmbH + Co. KG
Ruhstorf / Rott

1 D 30 - 1 D 80:
12 V - Anlage
12 V - equipment
Equipment 12 V

CAD	Datum	Name	Stromlaufplan Schematic diagram Schema de cablage	Blatt 1- von 2 Bl.
gez.:	13.11.95	Lohmüller	039 752 21. 0874	B1.1
gepr.:				

Fahrzeugleitungen mit Anschlußpunkten / Electrical wires with connecting points / Cables avec bornes de connexion

X1 / 0	010 972 00. 0514 Fahrzeugleitung mit Kabelschuh	Masse ⊥
X1 / 1	010 887 00. 0514 Fahrzeugleitung, 300 lang, 6mm ²	S1 / 30
X1 / 2	010 321 00. 0584 Fahrzeugleitung, 400 lang	H1
X1 / 3	010 902 01. 0514 Diode komplett mit Leitung	Masse ⊥
X1 / 3	010 892 00. 0514 Fahrzeugleitung, 300 lang, 2,5mm ²	S1 / 50a
X1 / 4	010 321 00. 0584 Fahrzeugleitung, 400 lang	H2
X1 / 5	010 321 00. 0584 Fahrzeugleitung, 400 lang	H3
X1 / 6	035 362 00. 0284 ** FLKW 4, schw., 300 lang, 4mm ²	H6
X1 / 6	010 888 00. 0514 ** Fahrzeugleitung, 140 lang, 4mm ²	S1 / 17
X1 / 7	011 501 01. 0444 Diode komplett mit Leitung	Masse ⊥
X1 / 7	010 903 00. 0514 Fahrzeugleitung	S1 / 15
X1 / 24		
X1 / 14	010 891 00. 0824 * Fahrzeugleitung, 300 lang	S1 / 15
X1 / 28	011 501 01. 0444 * Diode komplett mit Leitung	Masse ⊥
X1 / 28	015 174 00. 0824 * Fahrzeugleitung, 200 lang	K1d / 87

S1 / 15	010 976 00. 0444 Fahrzeugleitung, 150 lang	H1
S1 / 15	015 175 00. 0824 * Fahrzeugleitung, 150 lang	K3 (86)
S1 / 15	015 173 00. 0824 * Fahrzeugleitung am Hubmagnet	K3 / 30
		K3 / 86
		K3 / 85
		C1 / +
S1 / 19	010 889 00. 0514 ** Fahrzeugleitung, 120 lang, 4mm ²	H6
H1	008 476 00. 0514 Fahrzeugleitung, 100 lang	H2, H3
C1 / -	015 176 00. 0824 * Fahrzeugleitung am Kondensator	Masse ⊥

Erläuterungen:
Explanation:
Explication:

Anschlußpunkt
Connecting point
Borne de connexion

X1 / 18

Gerätezeichen (z.B. X1 = Klemmleiste)
Design. of electr. comp. (e.g. X1 = terminal strip)
Design. des composants electr. (p.ex.: X1 = bornier)

Klemme
Terminal
Borne

* Nur für Drehzahlverstellmagnet
** Nur bei Anlage mit Vorglüheinrichtung

1 D 30 - 1 D 80:

12 V - Anlage

12 V - equipment

Equipment 12 V

HATZ
DIESEL
Motorenfabrik HATZ
GmbH + Co. KG
Ruhstorf / Rott

CAD	Datum	Name	Stromlaufplan Schematic diagram Schema de cablage	Blatt 2- von 2 Bl.
gez.:	11.12.95	Lohmüller	039 752 21. 0874	B1.2
gepr.:				

Neue Gerätekezeichen in
HATZ-Stromlaufplänen (nach DIN 40719)

New Code for HATZ Circuit Diagr.
(acc. to german stand. spec. DIN40719):

Nouvelle design. des dispositifs des
schemas cabl. HATZ (sel. DIN 40719):

Nuove sigle identific. apparecchi negli
schemi elettr. HATZ (norme DIN 40719):

Nuevo codigos en los esquemas
electricos HATZ (segun DIN 40719):

KNR. BEZEICHN. DER ELEKTR. KOMP.

Code DESIGNATION OF ELECTR. COMP.

Code DESIGN. DES COMP. ELECTR.

Sig. DESCRIZIONE DEI COMP. ELETTTRICI

COD. NOMBRE DE LAS COMP. ELECTRICOS

A1	Armaturenkasten	A1	Instrument box	A1	Boitier de bord	A1	Cruscotto	A1	Caja de instrumentos
A2	Armaturenblech	A2	Instrument panel	A2	Tableau de bord	A2	Scatola cruscotto	A2	Tablero de instrumentos
A3	Start-Stop-Automatik	A3	Automatic start stop device	A3	Start-stop automatique	A3	Disp. avviamento ed arresto automat.	A3	Arranque y parada autom.
A4	Starterschutzmódul	A4	Starter protection module	A4	Module de protection du demarreur	A4	Modulo protezione motorino	A4	Modulo protecc. arranque.
B1	Temperaturfühler	B1	Temperature sensor	B1	Transmetteur de temperature	B1	Sensore temperatura	B1	Sensor de temperatura
B2	Drehzahl-Impulsgeber	B2	Rev. pulse counter	B2	Indicateur d'impulsions du regime	B2	Generatrice contagiri	B2	Sensor de revoluciones
B3	Öldruckgeber	B3	Oil pressure sensor	B3	Mano-contacteur d'huile	B3	Trasmittitore	B3	Sensor de presion aceite
B4	Signalhorn	B4	Horn	B4	Klaxon	B4	Segnale acustico	B4	Bocina
C1	Kondensator	C1	Capacitor	C1	Condensateur	C1	Condensatore	C1	Condensador
E1	Heizeinrichtung für Kraftstofffilter	E1	Heater device for fuel filter	E1	Dispos. de chauff. du filtre a carb.	E1	Riscaldatore filtre combustibile	E1	Calatorator filtro comb.
F1	Sicherung	F1	Fuse	F1	Fusible de securite	F1	Protezione	F1	Fusible
G1	Batterie	G1	Battery	G1	Batterie	G1	Batteria	G1	Bateria
G2	Drehstromgenerator	G2	3-phase generator	G2	Alternateur	G2	Alternatore esterno	G2	Alternador externo
G3	Schwungrad-Lichtmaschine	G3	Flywheel alternator	G3	Alternateur dans volant	G3	Alternatore interno al volano	G3	Alternador de volante
H1	Anzeigelampe Generatorkontrolle	H1	Indicator lamp for batt. /generator	H1	Lampe temoin de charge batterie	H1	Spia ricarica batteria	H1	Luz control generador
H2	Anzeigelampe Öldruck	H2	Indicator lamp for oil pressure	H2	Lampe temoin de la press. d'huile	H2	Spia pressione olio	H2	Luz control presion aceite
H3	Anzeigelampe Motortemperatur	H3	Indicator lamp for engine temp.	H3	Lampe temoin de la temp. du culasse	H3	Spia temperatura	H3	Luz control temperatura
H4	Anzeigelampe Luftfilter	H4	Indic. lamp for air filter (mainten.)	H4	Indic. de colmat. du filtre a air	H4	Spia manutenzione filtro aria	H4	Luz de cambio filtro aire
H5	Anzeigelampe Riemenriß	H5	Indicator lamp for V-belt failure	H5	Lampe temoin en cas de rupt. (courr.)	H5	Spia rottura cinghia	H5	Luz de control corte correa
H6	Anzeige Glühüberwachung	H6	Glow plug indicator	H6	Resistance temoin de prechauffage	H6	Indicatore candeleto	H6	Contador precalentador
H7	Anzeigelampe Gebläseüberwachung	H7	Indicator lamp for blower	H7	Lampe temoin de ventilateur	H7	Spia ventilatore	H7	Luz de control de ventilacion
H8	Fernanzeige: Motor ein	H8	Remote indicator lamp: engine on	H8	Lampe temoin a distance: mot. marche	H8	Indic. remoto: motore in funzionamento	H8	Indicador remoto: motor en marcha
K1	Steuerrelais 1 für Start / Startsperrre	K1	Control relay 1 for start / anti-restart	K1	Relais de commande 1 anti-redemarrage	K1	Rele' di comando 1 p. avviam./blocc. avv.	K1	Rel. de mando 1 para arranque/bloqueo arr.
K2	Steuerrelais 2 für Vorglühen	K2	Control relay 2 for pre-glowing	K2	Relais de commande 2 de prechauffage	K2	Rele' di comando 2 per preriscaldato	K2	Relais de mando 2 para precalentador
K3	Steuerrelais 3 für Drehzahlverstellung	K3	Control relay 3 for speed adjustment	K3	Relais de commande 3 du reglage regime	K3	Rele' di comando 3 per acceleratore	K3	Relais de mando 3 para ajuste revol.
K4	Motorschutzrelais	K4	Engine protection relay	K4	Relais de protection du moteur	K4	Rele' protezione motore	K4	Relais proteccion motor
K5	Zeitrelais (Verzögerungsrelais)	K5	Time relay (delay)	K5	Relais temporise	K5	Rele' antiripetitore	K5	Relais de retardo
K6	Startsperrrelais	K6	Start-locking relay	K6	Relais de blocage du demarrage	K6	Rele' bloccaggio all' avviamento	K6	Relais bloqueo arranque
K7	Impulsrelais	K7	Impulse relay	K7	Relais d'impuls. (p. demarr. instantane)	K7	Rele' temporizzato	K7	Relais de accionamiento limitado
K8	Leistungsrelais	K8	Power relay	K8	Relais de puissance	K8	Rele di potenza	K8	Relais de potencia
M1	Startermotor	M1	Starter motor	M1	Demarreur electrique	M1	Motorino avviamento	M1	Motor de arranque
M6	Startergenerator	M6	Starter generator	M6	Dynastarter	M6	Dinamotore	M6	Dinamotor
N1	Regler für Startergenerator	N1	Regulator for starter generator	N1	Regulateur de la dynastarter	N1	Regolatore dinamotore	N1	Regulador dinamotor
N2	Regler für Schwungrad-Lichtmaschine	N2	Regulator for flywheel alternator	N2	Regul. de l'alternat. dans volant	N2	Regol. alternatore int. al volano	N2	Regulador alternador de volante
N3	Regler für Drehstromgenerator	N3	Regulator for 3-phase generator	N3	Regul. de l'alternat. (n'est pas integ.)	N3	Regol. alternatore (se non incorpor.)	N3	Regulador alternador
N4	Impulsgeber (für Syncro-Regl.)	N4	Impulse transmitter (f. Syncro-regul.)	N4	Emetteur d'impuls. pour regul. Syncro	N4	Reg. generat. contagiri (reg. Syncro)	N4	Impulsor para regulador (Syncro)
P1	Betriebsstundenzähler	P1	Hours-run meter	P1	Compteur horaire	P1	Contaore	P1	Contador de horas
P2	Drehzahlmesser	P2	Revolutions counter	P2	Tachymetre	P2	Contagiri	P2	Contador de revoluciones
P3	Druckanzeige	P3	Pressure indicator	P3	Indication de pression	P3	Indicatore di pressione	P3	Manometro
R1	Glühkerze	R1	Glow plug	R1	Bougie de prechauffage	R1	Candeleto preriscaldato	R1	Precalentador
R2	Heizflansch	R2	Heater flange	R2	Bride de prechauffage	R2	Anello preriscaldato	R2	Brida precalentadora
R3	Vorwiderstand für Glühanlage	R3	Series resistor for glowing device	R3	Resistance de prechauffage addition	R3	Resistenza addizionale candeleto	R3	Resistencia del precalentador
R4	Widerstand	R4	Resistor	R4	Resistance	R4	Resistenza	R4	Resistencia
R5	Vorwiderstand mit Thermostatschalter	R5	Series resistor with thermostat. switch	R5	Pre-resistance avec interr. thermo	R5	Resist. addizion. con interr. termico	R5	Resistencia con interrupt. termico
S1	Glühstartschalter (5 Schalterst.)	S1	Glow starting switch (5 pos.)	S1	Contact. a cle - 5 pos. avec prechauff.	S1	Interr. candeleto ed avviam. (5 pos)	S1	Interrup. p. precal. arranque (5 pos.)
S2	Hauptschalter	S2	Main switch	S2	Interrupteur principal	S2	Interruttore generale	S2	Interrupor principal
S3	Glühnählschalter (3 Schalterst.)	S3	Glow starting switch (3 pos.)	S3	Cle de demarr. et prechauff. (3 pos.)	S3	Interr. candeleto ed avviam. (3 pos)	S3	Interrup. p. precal. arranque (3 pos.)
S4	Start-Stop-Schalter	S4	Start-Stop-switch	S4	Commutateur start-stop	S4	Interruttore avviamento-arresto	S4	Interrup. arranque y parada
S5	Schalter für Drehzahlverstellung	S5	Switch for speed adjustment	S5	Comm. de commande de reglage du regime	S5	Interruttore contagiri	S5	Interrup. regulador revoluciones
S6	Temperaturschalter für Motortemp.	S6	Temperatue switch for engine temp.	S6	Interrupteur de temperature culasse	S6	Sensore temperatura	S6	Interrup. temperatura
S7	Öldruckschalter	S7	Oil pressure switch	S7	Transmetteur de pression d'huile	S7	Prossostato motore	S7	Interrup. de presion aceite
S8	Druckschalter für Luftfilter (Wartung)	S8	Press. switch for air filter (mainten.)	S8	Interrupt. de colmatage du filtre a air	S8	Sensore manutenzione filtro aria	S8	Interrup. pres. filtro aire
S9	Gebläse-Überwachungsschalter	S9	Switch for blower control	S9	Interr. de surveill. du ventilateur	S9	Sensore ventilatore	S9	Interrup. control ventilacion
S10	Temperaturschalter für Vorglühen	S10	Temperature switch for preheating	S10	Interr. de temp. pour prechauffage	S10	Interr. de temp. per precalentare	S10	Interrup. de temp. para precalentador
S11	Fern-Start-Schalter	S11	Remote start switch	S11	Interr. pour demarrage telecommande	S11	Interr. per avviamento-telecomando	S11	Interrupor para arranque remoto
S12	Fern-Stop-Schalter	S12	Remote stop switch	S12	Interr. pour arret telecommande	S12	Interr. per arresto-telecomando	S12	Interrupor para parada remota
T1	Übertrager für Drehzahlmessung	T1	Transformer for speed measurement	T1	Transformat. pour mesure du regime	T1	Trasformatore contagiri	T1	Transformador contador revol.
V1	Entkopplungsdiode	V1	Decoupling diode	V1	Diode de decouplage	V1	Diodo disaccoppiamento	V1	Diodo desacoplamiento
V2	Freilaufdiode (=Löschdiode)	V2	Suppressor diode	V2	Diode d'effacement	V2	Diodo autooscillante	V2	Diodo autooscillante
V3	Zener-Diode	V3	Zener diode	V3	Diode Zener	V3	Diodo Zener	V3	Diodo Zener
V4	Suppressor-Diode	V4	Surge suppressor diode	V4	Diode surtension transitoire	V4	Diodo oppressore	V4	Diodo supresor
W1	Masse, Minus-Rückleitung	W1	Earth / ground, minus return	W1	Cable de masse, cond. de ret. moins (-)	W1	Filo massa	W1	Cabla masa
W2	Geschirmte Leitung am Generator	W2	Screened cable at generator	W2	Conduite blindee a l'alternateur	W2	Protezione cavo alternatore	W2	Cable protegido en alternador
X1	Klemmleiste am Armaturenkasten	X1	Terminal strip at instrument box	X1	Bornier au tableau de bord	X1	Morsetteria cruscotto	X1	Borne caja instrumentos
X2	Flachsteckverteiler	X2	Tab connector block	X2	Prolongateur a 2 voies p. clips droits	X2	Connettore	X2	Conjunto conectores planes
X3	Stecker am Not-Stop-Schalter	X3	Plug at emergency stop switch	X3	Fiche male pour comm. d'arret secours	X3	Connettore maschio arresto emerg.	X3	Conector macho parada emerg.
X4	Steckdose am Not-Stop-Schalter	X4	Socket at start stop switch	X4	Prise fem. pour comm. d'arret secours	X4	Connettore femmina arresto emerg.	X4	Conector hembra parada emerg.
X5	Klemmenblock im Bedienkasten	X5	Terminal block in operators panel	X5	Bloc de connexion de tableau de bord	X5	Blocco morsetteria di cassa di operatore	X5	Terminal de conexion en tablero de instrumentos
X6	Klemmenblock im Klemmkasten	X6	Terminal block in terminal box	X6	Bloc de conn. de boitier de raccordem.	X6	Blocco morsetteria di cassa morsetteria	X6	Terminal de conexion en caja de conexion
Y1	Hubmagnet zur Drehzahlverstellung	Y1	Solenoid for speed adjustment	Y1	El.-aimant de reglage du regime	Y1	Elettroacceleratore	Y1	Electroiman ajuste revoluciones
Y2	Hubmagnet zur Motorabstellung	Y2	Solenoid for engine stop	Y2	Electro-aimant d'arret du moteur	Y2	Elettrostop	Y2	Electroiman parade motor
Y3	Servomagn. (Ventilmagn. f. Motorabst.)	Y3	Solenoid-valve for engine stop	Y3	El.-vanne magnetique d'arret du moteur	Y3	Elettrovalvola arresto motore	Y3	Electroimán valvula parada motor
Y4	Kraftstoffabsperrenteil	Y4	Fuel shut-off valve	Y4	Electro-vanne d'arret du carburant	Y4	Valvola chiusura combustibile	Y4	Valvula corte comb.
Y5	Hochdruckabsteuerventil	Y5	High-pressure shut off valve	Y5	El.-vanne d'arr. tabe haute press. inj.	Y5	Valvola massima pressione	Y5	Valvula alta presion parada motor
Z1	Entstördrossel	Z1	Interference suppression coil	Z1	Bobine antiparasitage	Z1	Dispositivo antiradiodisturbi	Z1	Bobina contra interfercias
Z2	Entstörkondensator	Z2	Suppression capacitor	Z2	Condensateur antiparasitage	Z2	Condensatore antiradiodisturbi	Z2	Condensador contra interferencias

Flywheel alternators 1 D... SUPRA

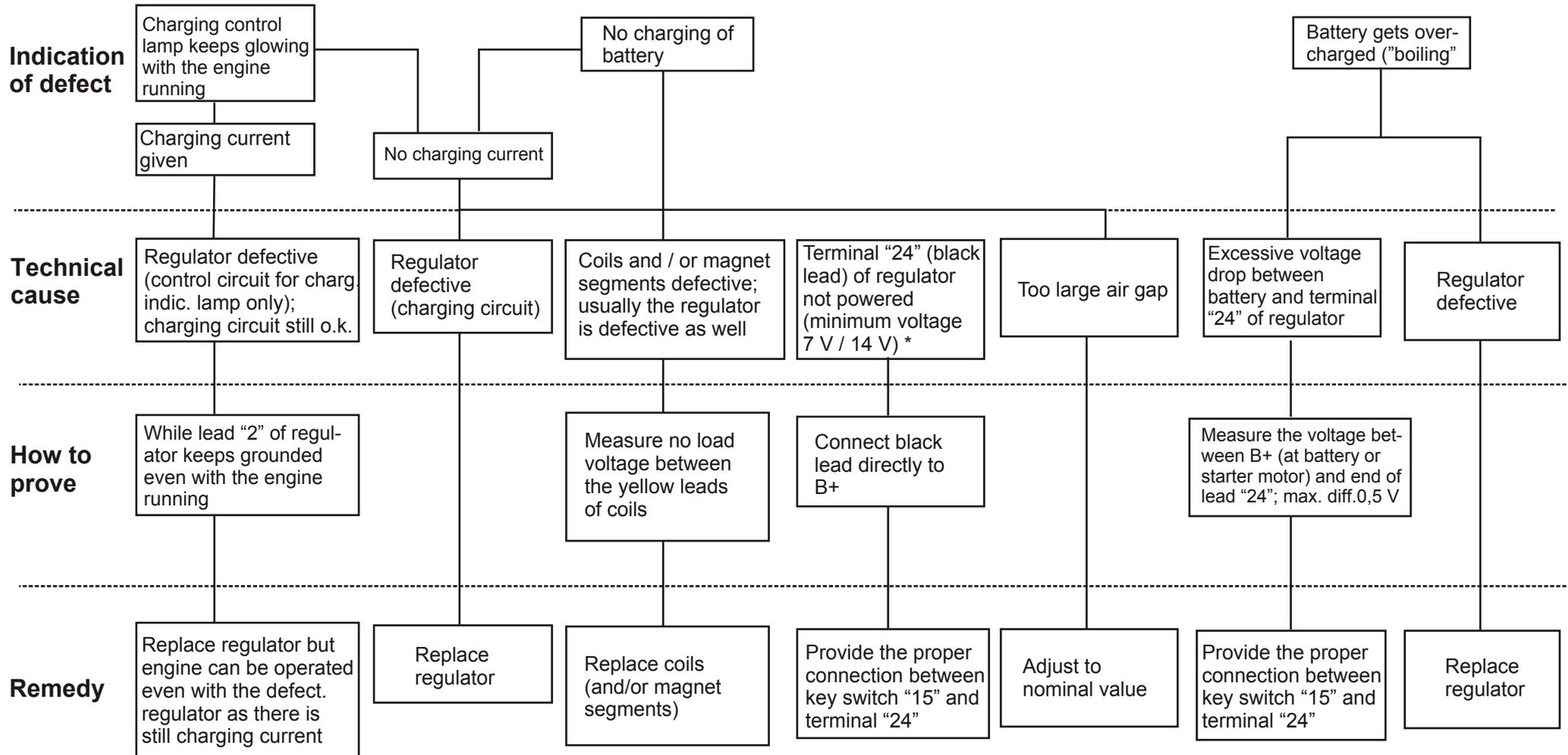
Defects - Cause - Remedy

Note: Prior to further tests and examination check the whole wiring system and all plugs connectors (see wiring diagrams) for proper arrangement and good electrical contact

Important: Voltage regulator needs proper ground contact to engine



Ed. 01, 2001
MSS-schi-es



* 7 Volt for 12 V-equipment / 14 Volt for 24 V equipment