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ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS
(By Command of the Defence Council)

POWER
P 328/11
Part 2

STARTER NO 3 MK 1 FV 546101 AND MK 2 FV 546165

TECHNICAL HANDBOOK - INSPECTION STANDARD PART 2

Inspection and testing of assemblies and sub-assemblies

Errata

Note: This Page 0, Issue 1 is to be filed immediately in front of Page 1 of this regulation.

Amend as follows:

1. Page 2 serial 2.a.(1) and (2) column d.

Delete: High 1.23
Low 1.00

High 2.64
Low 2.16

Insert: High 0.54
Low 0.46

High 1.22
Low 1.02

2. Page 2 serial 2.b. column d.

Delete: High 1.22
Low 1.02

Insert: High 0.92
Low 0.78

70511 (83)
Veh Br E/CH01/8

Issue 1, May 80 (12C)

STARTER NO 3 MK 1 FV 546101 AND MK 2 FV 546165

TECHNICAL HANDBOOK - INSPECTION STANDARD

Part 2. - Inspection and testing of assemblies and sub-assemblies

INTRODUCTION

1. a. This regulation details the Unit, Field and Base standard to be applied to starter No 3 Mk 1 and Mk 2.

b. Where standards detailed in this regulation differ from those stated in Power P 324/11 this regulation will be the authority.

c. For procedure of general application to be applied to electrical rotating machines refer to T & M A 028 Chap 066.

d. In Section 2 the term infinity is defined as the maximum reading of the insulation tester scale.

REFERENCES

2. a. EMER Power P 324/11 Starter No 3 Mk 1 and Mk 2

b. T & M A 511 Testing of armatures, d.c.

TEST EQUIPMENT

Ser	Catalogue No	Designation	Purpose
1	LV6/MT2 78671	Torque bar	Testing clutch setting
2	N/K	Suitable test bench	On-load testing
3	Z4/6625-99-943-3163	Bridge set, universal CT 350	Measuring low resistance values and insulation testing
4	X2/5210-99-447-3804	Gauges tension No7	Testing brush spring pressures
	or		
	X2/5210-99-447-3803	Gauges tension No8	
5	Z4/6625-99-200-2271	Apparatus seal testing	Seal testing
6	Z4/6625-99-943-1525	Multimeter, Avo model 7 or Similar instrument	Voltage and resistance measurement
7	F1/6680-99-456-2169	Tachometer, hand-held 0-10000 rev/min	Speed measurement

Section 1 - Examination of components, sub-assemblies and assembly

4. Schedule

Ser	Description	Acceptable quality levels (AQLs)			Remarks
		Base	Field	Unit	
a	b	c	d	e	f
1	Brush gear				
	a. Brush length	High 0.75 in. Low 0.60 in.	High 0.75 in. Low 0.55 in.	High 0.75 in. Low 0.5 in.	
	b. Brush spring pressure		High 40 ozf Low 32 ozf		
2	Resistance values				
	a. Mk 1 starter				
	(1) Auxiliary series winding		High ~~1.23~~ 0.54 Ω Low ~~1.00~~ ~~2.64~~ 0.46 Ω		
	(2) Shunt winding		High ~~2.64~~ 1.22 Ω Low ~~2.16~~ 1.02 Ω		
	b. Mk 2 starter				
	(1) Auxiliary series winding		High 0.54 Ω Low 0.46 Ω		
	(2) Shunt winding		High 1.22 Ω Low 1.02 Ω		
	c. Solenoid switch coil		High 7.5 Ω Low 6.0 Ω		
3	Armature				
	a. (1) Commutator dia		High 2.441 in. Low 2.396 in.		
	(2) Eccentricity		0.0012 in.		Maximum
	b. Undercutting				
	(1) Width		High 0.031 in. Low 0.027 in.		
	(2) Depth		High 0.032 in. Low 0.030 in.		

Schedule 1 - contd

a	b	c	d	e	f
3 (con)	c. (1) Armature core dia		High 3.685 in. Low 3.682 in.		
	(2) Eccentricity		0.004 in.		Maximum
	d. Armature core step				
	(1) Distance from commutator end face		High 5.505 in. Low 5.500 in.		
	(2) Core step dia		High 3.700 in. Low 3.698 in.		
4	Pole shoes				
	a. Dia between pole shoes at centre line		3.730 in.		Maximum
	b. Dia between opposite pole shoe tips at centre line		3.720 in.		Minimum
	c. Distance of step from yoke end face		High 3.113 in. Low 3.097 in.		
	d. Dia of step at centre line of pole shoes		3.746 in.		Maximum
	e. Dia of opposite pole shoe wing tips at step		3.736 in.		Minimum
5	Solenoid switch				
	a. 1st contact gap		High 0.044 in. Low 0.036 in.		
	b. 2nd contact gap		High 0.150 in. Low 0.134 in.		
	c. Trigger catch to trigger, gap		High 0.084 in. Low 0.076 in.		
	d. Angle of moving contact faces		3^{o} 49'		
	e. Force required to overcome return spring		High 85 ozf Low 75 ozf		
	f. Force required to overcome total spring pressure to close both contacts		High 29 lbf Low 25 lbf		

Schedule 1 - contd

a	b	c	d	e	f
	g. Force required to overcome trigger spring applied at tripping face with solenoid de-energised		High 10.5 ozf Low 7.5 ozf		
6	Clutch Check the clutch slip in accordance with Power P 324/11 para 11.c. Clutch slip		High 120 lbf ft Low 100 lbf ft		
7	D E bearing Inside dia	High 1.380 in. Low 1.379 in.	High 1.381 in. Low 1.379 in.	High 1.382 in. Low 1.379 in.	
8	C E bearing Inside dia	High 0.851 in. Low 0.849 in.	High 0.852 in. Low 0.849 in.	High 0.853 in. Low 0.849 in.	

Section 2 - Testing of assembly and sub-assemblies

5. Schedule

a	b	c	d	e	f
1	Solenoid switch Test the pull-in voltage to close both contacts		15V		Maximum
2	Functional tests a. No load test (1) Mk 1 starter Supply voltage Speed Current		23.5V High 4200 rev/min Low 3700 rev/min High 200A Low 150A		

Schedule 2 - contd

a	b	c	d	e	f
	(2) Mk 2 starter				
	Supply voltage	24.0V			
	Speed	High 4200 rev/min Low 3700 rev/min			
	Current	High 270A Low 170A			
	b. Locked torque test				
	(1) Mk 1 starter				
	Supply voltage	8.2V			Note. These standards apply to a battery of 194 Ah capacity
	Torque	90 lbf ft			
	Current	High 1980A Low 1880A			
	(2) Mk 2 starter				
	Supply voltage	7V			
	Torque	75 lbf ft			
	Current	High 1880A Low 1800A			
	c. Engagement test				
	(1) Mk 1 starter				
	Supply voltage	24V			With 2nd contact insulated
	Current	High 120A Low 100A			
	Armature thrust (initial)	40 lbf			Minimum
	Speed	High 600 rev/min Low 400 rev/min			
	(2) Mk 2 starter				
	Supply voltage	24V			
	Current	High 140A Low 100A			
	Armature thrust (initial)	42 lbf			Minimum
	Speed	High 800 rev/min Low 300 rev/min			

Schedule 2 - contd

a	b	c	d	e	f
3	Waterproof test Connect pump of leak locator outfit, type A to test point. Pressurize to 6 lbf in^2. Immerse complete assembly in one foot of water for one minute	No air bubbles should emerge			
4	Insulation test Test the insulation resistance between each heavy duty connector and multi-pin connector, pin A to bare metal of case	High Infinity Low 1 MΩ			

END