LUCAS

Jaguar
MG
Triumph

DESCRIPTION

The Lucas starter is a series wound 4-pole, 4-brush motor. Inertia type uses a remote solenoid and has wedge shaped brushes which contact the commutator end face. The armature shaft extends through the drive end plate and carries the inertia drive. Pre-engaged type uses either wedge shaped or conventional brushes and has a housing mounted solenoid. Solenoid shifts the roller type starter clutch and pinion to engage the flywheel ring gear when starter is energized.

APPLICATION

Car Model	Model No.
Jaguar	
6 Cylinder	3M100
12 Cylinder	M45
MG	
Midget	M35J
MGB	2M100
Triumph	
TR7	2M100
Spitfire	M35J

TESTING

PERFORMANCE TESTS

No Load Test – With starter on bench and using a good 12-volt battery, connect an ammeter in series to starter. Starter should rotate smoothly at specified RPM and current draw.

Lock Test – Use suitable tester and set up according to instructions. With starter locked in test stand and voltage adjusted, ammeter and starter torque readings should be as specified. See *Starter Performance Specifications*.

OVERHAUL

DISASSEMBLY

NOTE – *Disregard Step 1) when working on inertia drive models.*

1) Disconnect link between lower solenoid terminal and starting motor yoke. Remove nuts securing solenoid unit. Remove solenoid from drive end bracket, being careful to disengage solenoid plunger from starter drive engagement lever.

2) Remove commutator end cover and through bolts. Remove brushes from holders. On inertia type starters, remove drive end bracket with armature from housing. If it is necessary to

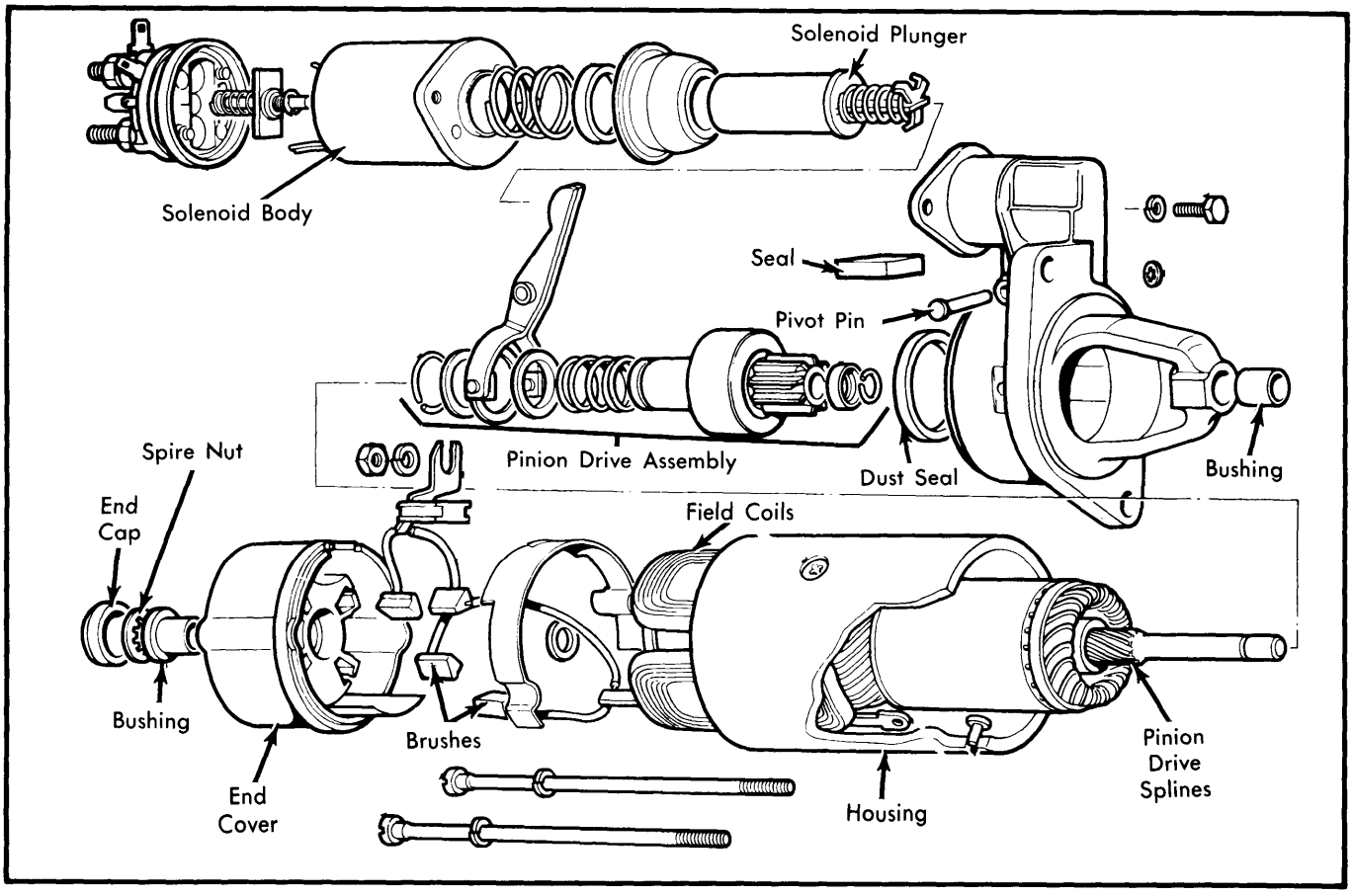

Fig. 1 Exploded View of Lucas Pre-Engaged Starter

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remove drive end bracket from armature, remove inertia drive and withdraw armature shaft from bracket.

3) On pre-engaged models, remove seal between drive end bracket and starter housing. Remove engagement lever pivot pin and separate armature with drive assembly from drive end bracket. Remove circlip and thrust washer from drive end and take drive assembly off of armature.

PARTS RELACEMENT AND TESTING

Armature – Check armature for open, shorted or grounded circuits. Check for lifted commutator segments and loose turns in armature winding. Check armature for scoring. A scored armature could indicate a loose pole shoe or a bent armature shaft. Do not attempt to true a distorted shaft or machine armature core; replace if damaged.

Commutator – Clean commutator with cloth moistened in suitable solvent and, if necessary, with fine sandpaper. If further clean up is necessary, turn down in a lathe, removing only as much metal as is absolutely necessary. Do NOT undercut insulators between commutator segments.

Brushes & Springs – Check that brushes move freely in holders by holding back brush springs and pulling gently on connecting wires. If movement is sluggish, remove brush from holder and clean with solvent moistened cloth. Replace brushes and springs when they have reached minimum specifications.

Starter Model	Min. Brush Length In. (mm)	Min. Spring Ozs. (g)
M35	3/8 (9.5)	28 (800)
M45	5/16 (8)	30 (850)
2M100 & 3M100	3/8 (9.5)	36 (1020)

Field Coils – Check for open or grounded coils using test lamp or voltmeter and battery connected in series. If any coil is defective, replace all coils. Mark housing and pole shoes for installation in original position. Remove pole piece screws and pry pole shoes, coils and insulation pieces from housing. To install, reverse removal procedure.

Bushings – In event of excessive wear or damage, remove old bushings with suitable mandrel or extractor. Ensure that new porous bronze bushings have been soaked in light engine oil for at least 24 hours and press into position. Fit new bushing using highly polished mandrel .0005" (.013 mm) larger than diameter of shaft.

NOTE – *Do NOT ream bushing after fitting due to possible damage to porosity of new bearing.*

Pre-Engaged Starter Solenoid – **1)** With all cables and connectors disconnected from solenoid, connect a 10-volt power supply between starter terminal and small unmarked solenoid terminal. Connect a test lamp across main terminals and note test lamp lighted, indicating contacts are closed. While holding gear in engaged position, open circuit and observe light go out, indicating contacts have opened.

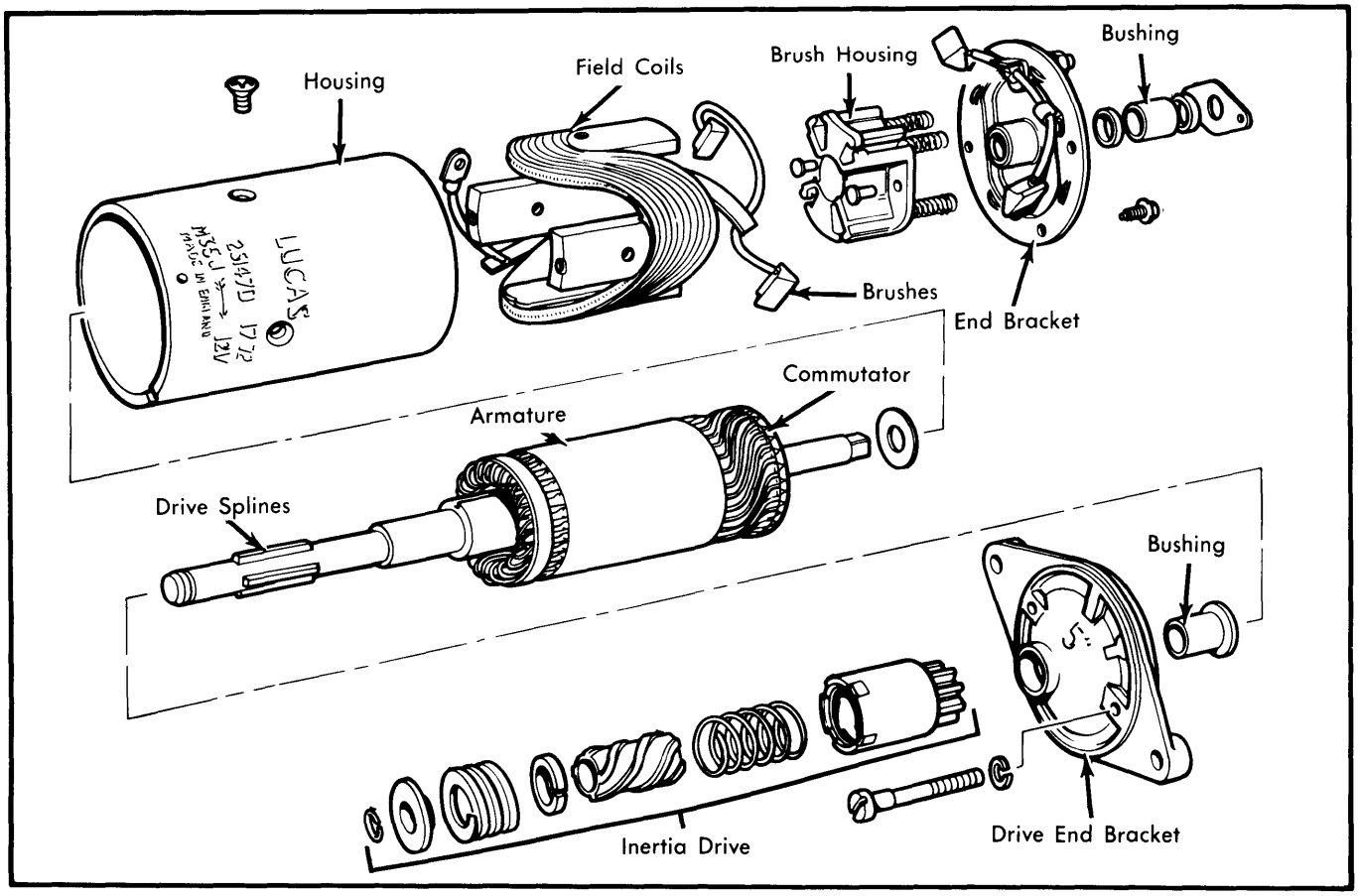

Fig. 2 Exploded View of Lucas Inertia Type Starter

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2) To check winding continuity, connect ohmmeter between starter terminal and ground on solenoid body. Resistance should be 1.01-1.07 ohms. To check pull-in winding, check across small unmarked terminal and starter terminal. Resistance should be .36-.42 ohms for Jaguar and .25-.27 ohms for other models.

3) To check hold in winding, connect ohmmeter between ground on solenoid body and unmarked terminal. Resistance for Jaguar should be 1.49-1.71 ohms and .76-.80 ohms for remaining models.

REASSEMBLY

1) Ensure that all parts are clean and reverse disassembly procedure. *See Figs. 1 and 2 for assembly order.*

2) On pre-engaged models, set pinion movement after assembling starter. Connect small center terminal of solenoid unit to a 12-volt battery with switch and jumper wire. Connect other terminal of battery to one of the solenoid mounting screws. Close switch and note distance between pinion and thrust washer on armature shaft extension.

3) Correct clearance should be .005-.015" (.127-.381 mm). To adjust clearance, loosen eccentric pin securing nut and turn pivot pin to obtain proper clearance. Tighten pivot pin locking nut.

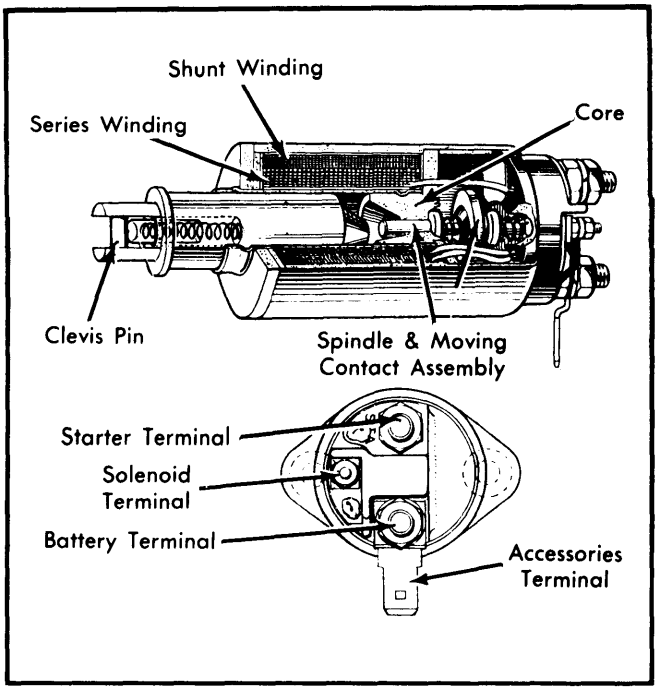

Fig. 3 Lucas Starter Solenoid

STARTER PERFORMANCE SPECIFICATIONS

Model	No Load Test ①		Lock Test		
	Amps.	RPM	Amps.	Volts	Torque
M35J	65	8,000-10,000	350-375	①	over 7 ft.lbs.
M45	100	5,000-7,000	940	①	over 29 ft.lbs.
2M100	40	6,000	463	①	over 14.4 ft.lbs.
3M100	100	5,000-6,000	940	①	over 29 ft.lbs.

① – Use 12 volt fully charged battery.