Contents

SECTION 05—Introduction and Safety Information
- Group 05—Safety
- Group 10—General Information
- Group 15—Electrical System Basic Information and Wiring Diagrams

SECTION 10—Delco-Remy Alternators
- Group 05—Delco-Remy Alternator Theory of Operation
- Group 10—Delco-Remy (Delcotron) 10SI, 12SI and 15SI Alternator Repair
- Group 15—Delco-Remy (Delcotron) 21SI Alternator Repair

SECTION 15—Motorola Alternators
- Group 05—Motorola Alternator Theory of Operation
- Group 10—Motorola 8E-Series Alternator Repair
- Group 15—Motorola HC-, MA-, MR-Series Alternator Repair
- Group 20—Motorola A-, RA-, 8AR-Series Alternator Repair
- Group 25—Motorola SA-Series Alternator Repair
- Group 30—Motorola TA-Series Alternator Repair

SECTION 20—Niehoff Alternators
- Group 05—Niehoff Alternator Theory of Operation
- Group 10—Niehoff 12-Volt, 110-Amp Alternator Repair
- Group 15—Niehoff 24-Volt, 50-Amp Alternator Repair

SECTION 25—Denso Alternators
- Group 05—Denso Alternator Theory of Operation
- Group 10—Denso Alternator with Add-On Regulator Repair
- Group 15—Denso Alternator with Built-In Regulator Repair

SECTION 30—Robert Bosch Alternators
- Group 05—Robert Bosch Alternator Theory of Operation
- Group 10—Robert Bosch Alternator Repair

SECTION 35—Valeo Alternators
- Group 05—Valeo Alternator Theory of Operation
- Group 10—Valeo Alternator Repair
- Group 15—Valeo A13N-Series Alternator Repair

SECTION 40—Magneton Alternators
- Group 05—Magneton Alternator Theory of Operation
- Group 10—Magneton Alternator Repair

SECTION 45—Leece-Neville Alternators
- Group 05—Leece-Neville Alternator Theory of Operation
- Group 10—Leece-Neville Alternator Repair

SECTION 50—Prestolite Alternators
- Group 05—Prestolite Alternator Theory of Operation
- Group 10—Prestolite Alternator Repair

SECTION 60—Delco-Remy Starter Motors
- Group 05—Starting Circuit Theory of Operation
- Group 10—Delco-Remy 10/20/22/25/27/28MT Starter Motor Repair
- Group 15—Delco-Remy 30MT, 35MT, 37MT Starter Motor Repair
- Group 20—Delco-Remy 40MT, 41MT, 42MT, 50MT Starter Motor Repair

SECTION 65—John Deere/Denso Starter Motors
- Group 05—Starting Circuit Theory of Operation
- Group 10—John Deere/Denso Conventional Starter Motor Repair
- Group 15—John Deere/Denso Gear Reduction Starter Motor Repair

SECTION 70—Robert Bosch Starter Motors
- Group 05—Starting Circuit Theory of Operation
- Group 10—Robert Bosch Starter Motor Repair

SECTION 75—Iskra Starter Motors
- Group 05—Starting Circuit Theory of Operation
- Group 10—Iskra Starter Motor Repair

SECTION 80—Valeo Starter Motors
- Group 05—Starting Circuit Theory of Operation
- Group 10—Valeo Starter Motor Repair

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

COPYRIGHT © 2000
DEERE & COMPANY
Moline, Illinois
All rights reserved
A John Deere ILLUSTRUCTION® Manual
Previous Editions
Copyright © 1994, 1997

Handle Fluids Safely—Avoid Fires

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



TS227 –UN–23AUG88

DX,FLAME –19–29SEP98–1/1

Prevent Battery Explosions

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).



TS204 –UN–23AUG88

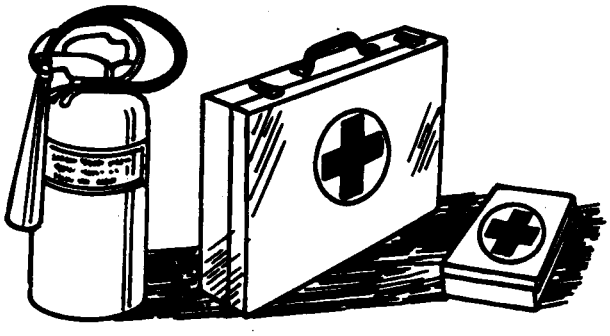
DX,SPARKS –19–03MAR93–1/1

Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



TS291 –UN–23AUG88

DX,FIRE2 –19–03MAR93–1/1

Bushing, Bearing and Seal Driver Set D01045AA

Remove front bearing.



RG11162 –UN–21SEP00

D01045AA

OUO1004,0000B4E –19–21SEP00–4/4

Other Material

Number	Name	Use
(U.S.)	Delco-Remy Lubricant No. 1948791	Lubricate alternator bearings.
(U.S.)	400-Grit Silicon Carbide Paper or 00 Sandpaper	Polish slip rings.

OUO1004,0000B50 –19–21SEP00–1/1

Delco-Remy (Delcotron) 10SI, 12SI, and 15SI Charging Circuit Repair Specifications

Item	Measurement	Specification
Delco-Remy Model 12SI Alternator Pulley Nut	Torque	100 N•m (75 lb-ft)
Delco-Remy Model 10SI and 15SI Alternator Pulley Nut	Torque	80 N•m (60 lb-ft)

OUO1004,0000B51 –19–21SEP00–1/1

Delco-Remy (Delcotron) Alternator Operation

The drawing at right shows alternator circuitry. Schematic of regulator (E) has been simplified. The regulator is a non-adjustable, sealed, solid-state unit mounted inside the alternator.

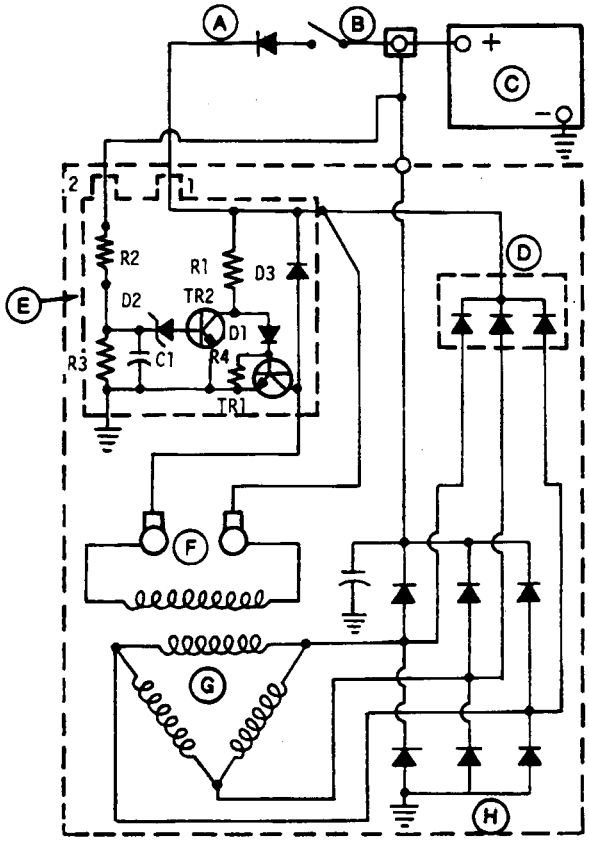
NOTE: To prevent battery run-down, R3 resistor has extremely high resistance. It still allows a constant drain on battery but this is insignificantly small. R3 and R4 are needed to provide voltage differential for turning on transistors.

An alternator (unlike a generator) uses a rotating magnetic field with stationary windings. The magnetic field is externally excited. This means that it requires an outside current source. The rotor (F) consists of two interlocking soft iron sections and a wire coil wrapped around an iron core. When current is passed through the wire coil, the rotor becomes an electromagnet.

The rotating magnetic field induces an alternating current in the stator windings (G). This is converted to direct current by six diodes in the rectifier bridge (H).

A capacitor inside rear housing protects rectifier bridge and diode trio (D) from voltage surges. It also suppresses radio interference.

This alternator uses an “A” field circuit with regulator located after field. Full output is obtained by grounding field.



Delco-Remy (Delcotron) Alternator

A—Diode
B—Switch
C—Battery
D—Diode Trio
E—Regulator
F—Rotor (Field)
G—Stator
H—Rectifier Bridge

RG,RG34710,2025 –19–15MAR97–1/1

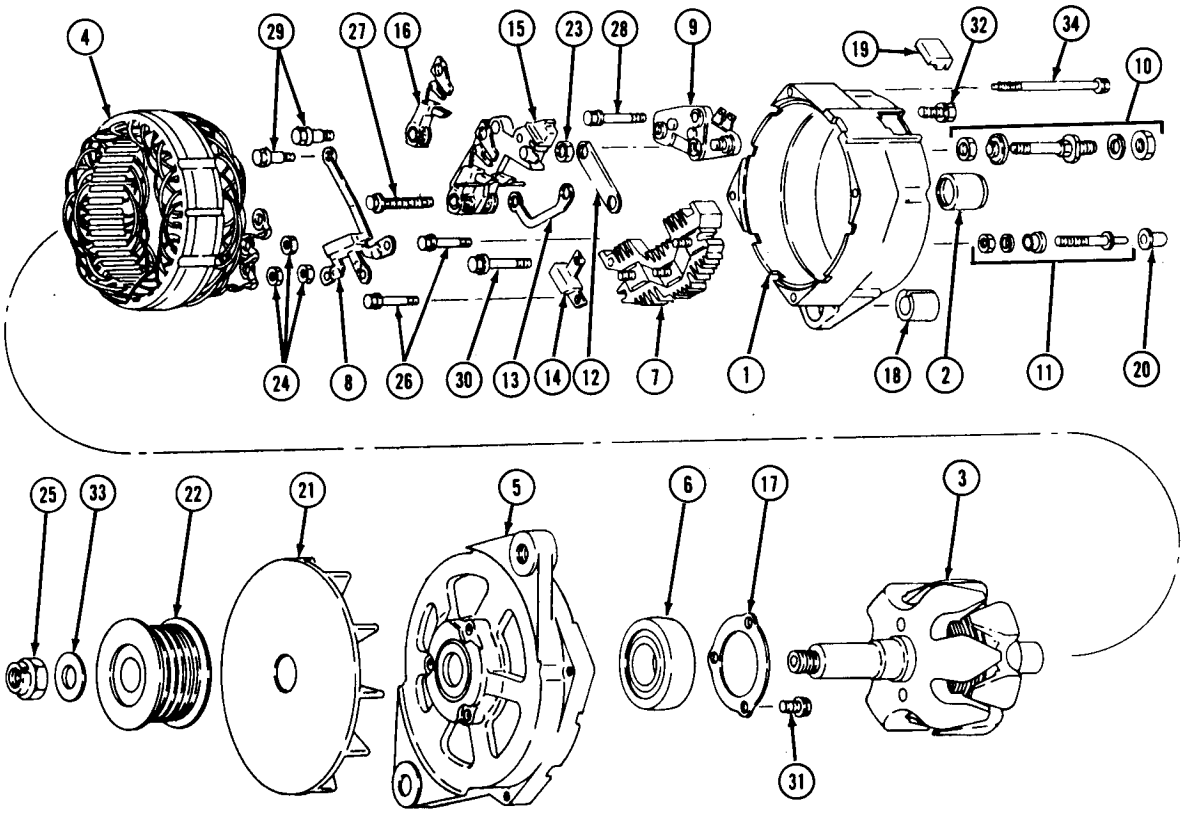
Delco-Remy (Delcotron) Regulator Operation

The solid-state regulator is mounted inside the alternator. It controls output by controlling current through field. In operation, regulator has the following three phases.

Continued on next page

RG,RG34710,2026 –19–18OCT00–1/4

Disassemble Delco-Remy 21SI Alternator



Delco-Remy 21SI Alternator

1—Slip Ring End Housing
2—Slip Ring End Bearing
3—Rotor Assembly
4—Stator Assembly
5—Drive End Frame
6—Drive End Bearing
7—Rectifier Bridge Assembly
8—Diode Trio
9—Regulator
10—BAT Terminal Assembly
11—"I" Terminal Assembly
12—Regulator Stud Connector
13—"I" Terminal Connector
14—Capacitor
15—Brush Holder Assembly
16—Brush and Arm
17—Drive End Retainer Plate
18—Hinge Bushing
19—Regulator Terminal Cover
20—Terminal Cap
21—Fan
22—Pulley
23—Regulator Nut
24—Rectifier Bridge Nut
25—Shaft Nut
26—Rectifier Bridge Nut/Washer Assembly
27—Brush Holder Attaching Screw (Pivot)
28—Regulator Attaching Screw (Ground)
29—Regulator Attaching Screw (Insulated)
30—Capacitor Attaching Screw
31—Bearing Retainer Plate Attaching Screw
32—Slip Ring End Frame Ground Screw and Load Washer
33—Shaft Nut Washer
34—Through Bolt

RG,RG34710,2053 –19–15MAR97–1/1

Diagnosing Starter Motor Malfunctions

Fails to Operate, No Current Draw

Open field circuit (all field windings)

Open armature windings

Defective brush contact with commutator

Open solenoid windings

Defective solenoid contacts

Fails to Operate, High Current Draw

Grounded field windings or armature windings

Seized bearings

Low Speed, Low Current Draw

High internal resistance

Defective brush contact with commutator

Low Speed, High Current Draw

Excessive friction

Shorted armature

Grounded armature or field windings

High Speed, High Current Draw

Shorted field windings

NOTE: This test will not detect individual open-circuited field coils—the stator would have a slow cranking speed but would pass this test.

RG,RG34710,2199 –19–15MAR97–1/1

Essential Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

SERVICEGARD is a trademark of Deere & Company

OUO1004,0000B4E –19–21SEP00–1/4

Digital Multimeter JT05791

Test electrical components for voltage, resistance, or current flow. It is especially good for measuring low voltage or high resistance circuits.



RW11274 –UN–12DEC88

JT05791

OUO1004,0000B4E –19–21SEP00–2/4

Alternator Pulley Tool Set JD306A

Remove and install alternator pulley retaining nut.



R26528 –UN–31JAN89

JD306A

Continued on next page

OUO1004,0000B4E –19–21SEP00–3/4

Index

Page

B

Bosch alternator
- Alternator operation. 30-05-1
- Exploded view. 30-10-8
- Repair and test 30-10-5
- Sectional view. 30-10-4
- Specifications, repair. 30-10-2
- Specifications, test 30-10-3

Bosch starter motor
- Cutaway view 70-10-6
- Exploded view. 70-10-7
- General information. 70-05-1
- Repair and test 70-10-4
- Specifications, repair. 70-10-2
- Specifications, test 70-10-3
- Starter motor operation 70-05-2
- Starting circuit operation 70-05-1
- Troubleshooting 70-10-5

D

Delco-Remy alternator
- Alternator operation. 10-05-1
- Regulator operation. 10-05-1

Delco-Remy starter motor
- General information. 60-05-1
- Starter motor operation 60-05-2
- Starting circuit operation 60-05-1

Delco-Remy starter motor (10MT, 20MT, 22MT, 25MT, 27MT, 28MT)
- Cutaway view 60-10-6
- Repair and test 60-10-6
- Specifications, repair. 60-10-3
- Specifications, test 60-10-4
- Troubleshooting 60-10-5

Delco-Remy starter motor (30MT, 35MT, 37MT)
- Cutaway view 60-15-6
- Repair and test 60-15-7
- Specifications, repair. 60-15-3
- Specifications, test 60-15-4
- Troubleshooting 60-15-5

Delco-Remy starter motor (40MT, 41MT, 42MT, 50MT)
- Cutaway view 60-20-6
- Repair and test 60-20-6
- Specifications, repair. 60-20-3
- Specifications, test 60-20-4
- Troubleshooting 60-20-5

Delco-Remy 10SI, 12SI, and 15SI alternator
- Repair and test 10-10-4, 10-15-4
- Specifications, repair. 10-10-2, 10-15-2
- Specifications, test 10-10-3, 10-15-3

Denso alternator
- Alternator operation. 25-05-1
- Regulator operation. 25-05-2

Denso alternator (with add-on regulator)
- Repair and test 25-10-3
- Specifications, repair. 25-10-2
- Specifications, test 25-10-2

Denso alternator (with built-in regulator)
- Repair and test 25-15-5
- Specifications, repair. 25-15-3
- Specifications, test 25-15-4

Denso/John Deere starter motor
- General information. 65-05-1
- Starting circuit operation 65-05-1

Denso/John Deere starter motor (conventional type)
- Exploded view. 65-10-14
- Repair and test 65-10-7
- Specifications, repair. 65-10-4
- Specifications, test 65-10-5
- Starter operation 65-05-2

Denso/John Deere starter motor (gear recuction type)
- Exploded view. 65-15-6
- Repair and test 65-15-4
- Specifications, repair. 65-15-2
- Specifications, test 65-15-3
- Starter operation 65-05-3

E

Electrical system
- Circuit malfunctions. 05-15-1
- Grounded circuit 05-15-5
- High resistance circuit. 05-15-2
- Open circuit 05-15-3
- Seven step test procedure 05-15-8
- Shorted circuit. 05-15-7
- Test equipment. 05-15-10

I

Inch torque values 05-10-1

Iskra starter motor
- Exploded view. 75-10-5
- General information. 75-05-1
- Identification 75-10-7
- Repair and test 75-10-7
- Specifications, repair. 75-10-3

10
15
18

18. Tighten the slip ring end housing components in the following order to specifications listed below:

    a. Inside output terminal nut (A).

    b. Rectifier bridge attaching screws (B).

    c. Insulated capacitor attaching screw (C).

    d. “R” terminal nut (D). It may be necessary to hold terminal on outside while tightening.

    e. Regulator mounting screw (E).

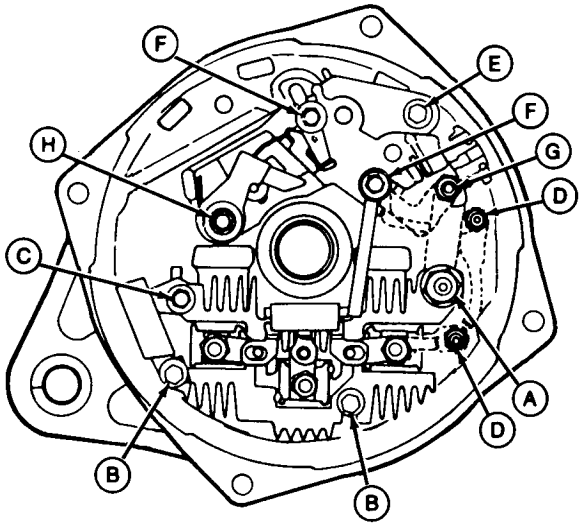
    f. Insulated regulator attaching screw.

    g. Regulator nut (G) (if used).

    h. Brush holder attaching (pivot) screw (H).

Slip Ring End Housing Components—Specification

Inside Output Terminal Nut (A)—Torque	5.5 N•m (50 lb-in.)
Rectifier Bridge Attaching Screws (B)—Torque	3.0 N•m (25 lb-in.)
Capacitor Attaching Screw (C)—Torque	2.5 N•m (22 lb-in.)
“R” Terminal Nut (D)—Torque	2.5 N•m (22 lb-in.)
Regulator Mounting Screws (E)—Torque	2 N•m (20 lb-in.)
Regulator Mounting Nut (G)—Torque	2.5 N•m (22 lb-in.)
Brush Holder Pivot Attaching Screw (H)—Torque	2 N•m (20 lb-in.)



RG6990 –UN–30NOV93

Slip Ring End Housing Components

A—Inside Output Terminal Nut
B—Rectifier Bridge Attaching Screws
C—Insulated Capacitor Attaching Screw
D—“R” Terminal Nut
E—Regulator Mounting Screw
F—Insulated Regulator Nut (If Used)
G—Regulator Nut
H—Brush Holder Attaching (Pivot) Screw

Continued on next page

RG,RG34710,2058 –19–15MAR97–9/10

31. Connect a voltmeter (A) to slip rings. (Make sure slip rings are clean.)

32. Connect an ammeter (D), a variable resistor (B), and 12-volt power source (C) in series. Attach to slip rings.

NOTE: Use a second volt-ohm-amp meter for the ammeter, and JT28001 Battery Load Tester as the variable resistor.

15
15
16

33. Set battery load tester to maximum resistance.

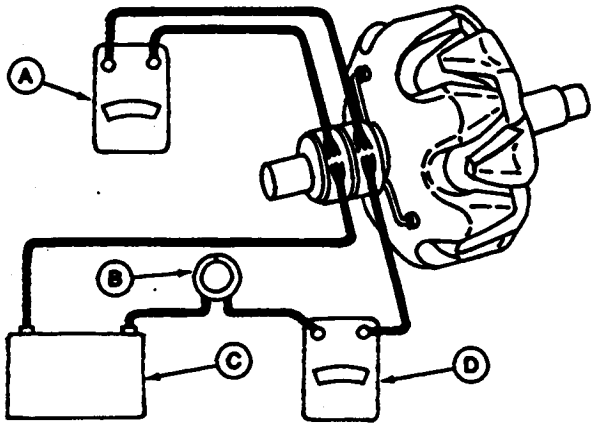
34. Connect other slip ring to the power source.

35. Adjust battery load tester to obtain full battery voltage.

IMPORTANT: Do not remove rotor leads from slip rings at this time. It will cause an arc, damaging slip ring surface.

ROTOR WINDING TEST SPECIFICATIONS [Measured at 21—27°C (70—80°F)]			
System Voltage	**Rated Amps**	**Current Draw (Amps)[a]**	**Winding Resistance (Ohms)**
12	37	1.95—2.55	4.2—5.5
12	51/55	1.65—2.55	4.0—5.2
12	62	2.1—2.5	4.1—4.7
12	72	1.8—2.0	5.0—5.4
12	90	4.1—4.4	2.3—2.4
24	42	1.28—1.88	11.0—14.0
[a]Current draw at 10V for 12-Volt systems and 20V for 24-Volt systems.			

Shorted windings are indicated by excessive current draw, and open windings by no current draw.



N37053 –UN–22SEP88

Voltmeter and Ammeter

A—Voltmeter
B—Variable Resistor
C—12-Volt Power Source
D—Ammeter

Continued on next page

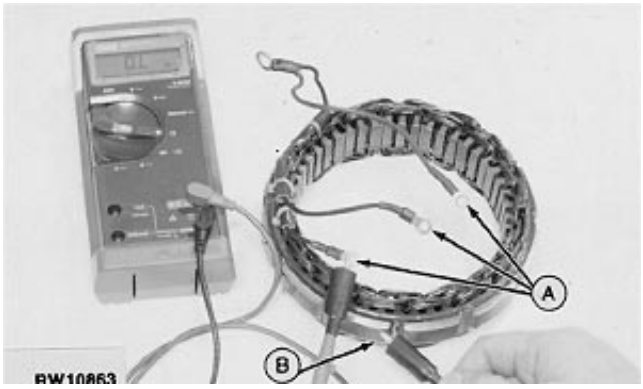
RG,RG34710,2073 –19–15MAR97–25/30

15. Inspect stator for physical damage. Look for broken insulation, rotor striking laminations or foreign material that may restrict circulation of cooling air.

    Discoloration or burned odor may indicate overheating, which may cause short circuits. Replace stator if either condition exists.

16. Connect ohmmeter to each stator lead (A) and stator frame (B). Replace stator if test indicated continuity.

A—Stator Leads
B—Stator Frame



RW10863 –UN–17NOV89

Inspect Stator Lead and Frame

15
25
7

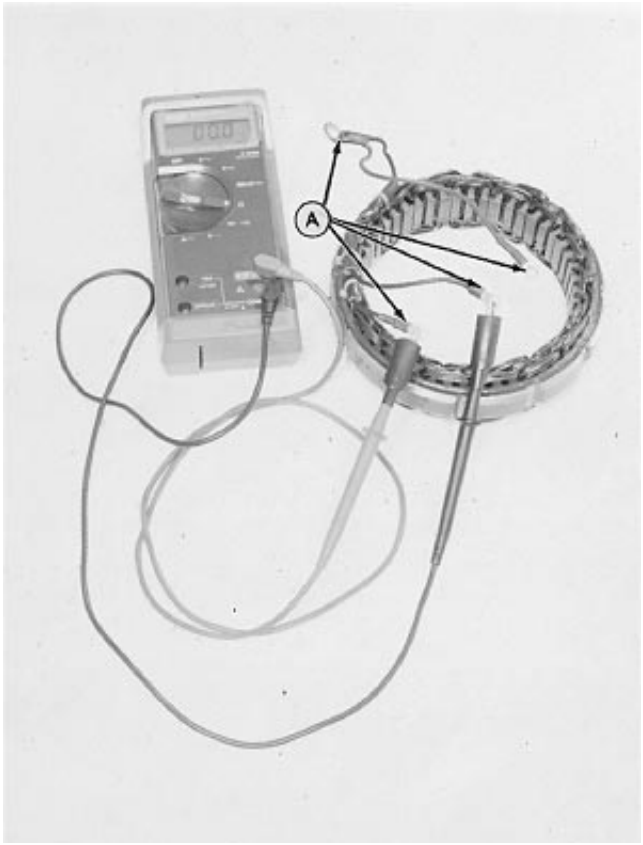
RG,RG34710,2082 –19–15MAR97–8/22

17. A short-circuit in the stator can be difficult to identify. Use an ohmmeter that is sensitive to resistance of 0 to 1 ohm.

    Connect ohmmeter between each pair of terminals (A). Resistance should be approximately 0.1 ohm. (Ohmmeter needle should deflect to zero if leads are touched together.) If resistance is above 0.4 ohm, replace stator.

    A stator will occasionally exhibit an open circuit or short circuit only when hot, making the defect even more difficult to diagnose.

A—Stator Terminals



RW10864 –UN–17NOV89

Ohmmeter

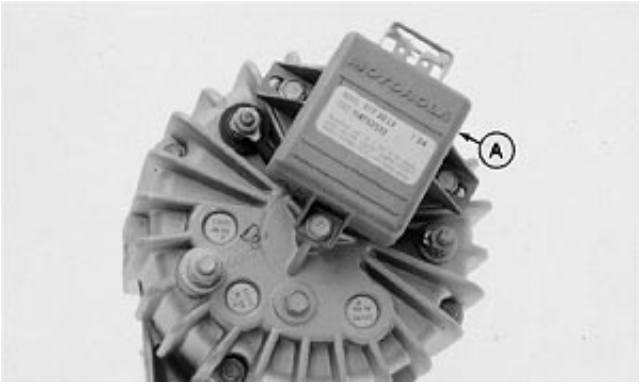
Continued on next page

RG,RG34710,2082 –19–15MAR97–9/22

15. Install voltage regulator (A) and wiring leads.

16. Refer to your machine technical manual for installation of alternator.

A—Voltage Regulator



T6106AF –UN–02APR90

Voltage Regulator

15
30
21

RG,RG34710,2088 –19–15MAR97–15/15

8. Assemble hardened washer (B) and nut (A). Tighten to specifications.

Specification

Rotor Nut—Torque ..... 68 N•m (50 lb-ft)

A—Nut
B—Hardened Washer



RW3291 –UN–02MAR90

Hardened Washer and Nut

20
10
26

RG,RG34710,2098 –19–15MAR97–9/10

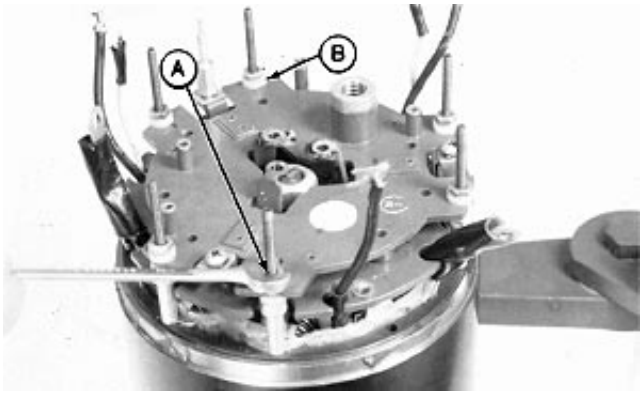
IMPORTANT: Coat all screw heads on regulator and rectifier assembly with silicone rubber compound.

9. Assemble remaining alternator parts in reverse order of disassembly, starting with step 9 back to step 1.

Specification

Regulator Field Lead-to-Standoff Screw and Y-Lead-to-Load Dump Screw—Torque ..... 0.9—1.1 N•m (8—10 lb-in.)
Output and Relay Leads-to-Standoff Screw—Torque ..... 2.3 N•m (20 lb-in.)
Ground Lead-to-Load Dump Screw—Torque ..... 1.1—1.7 N•m (10—15 lb-in.)
Flanged Nuts—Torque ..... 5.1 N•m (45 lb-in.)

10. Refer to your machine technical manual for alternator installation.



RW3290 –UN–02MAR90

Assemble Remaining Parts

A—Nuts (6 Used)
B—Insulators (6 Used)

RG,RG34710,2098 –19–15MAR97–10/10

Inspect Rear Bearing

1. Check bearing ID and OD for damage.
2. Make sure bearing turns freely.

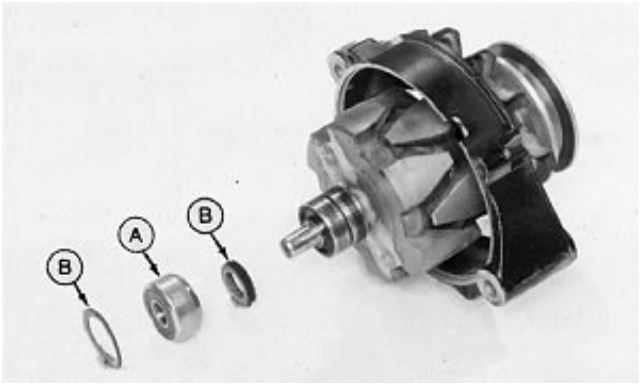
   Replace bearing as required.

RG,RG34710,2114 –19–15MAR97–1/1

Install Rear Bearing

IMPORTANT: Do not clean bearing in solvent.

1. Install a pin to hold brushes fully retracted. Clean grease and chips from bearing cavity.
2. Wipe bearing (A), bearing cavity and felt washers (B) with a clean cloth.
3. Coat bearing with a thin coat of grease to aid in installation of bearing in rear housing.
4. If a small hole 2 mm (1/16 in.) was drilled during disassembly, seal with a silicone sealer to prevent contaminant entry.



RW12629 –UN–10NOV88

Install Rear Bearing

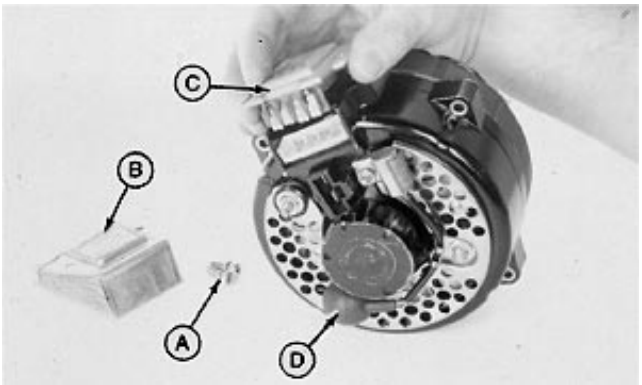
A—Bearing
B—Felt Washers

RG,RG34710,2115 –19–15MAR97–1/1

Remove Stator, Rectifier Bridge and Brush Assembly

1. Remove screws (A), regulator cover (B) and regulator (C).
2. Disconnect condenser wire (D) and remove condenser.

A—Screws
B—Regulator Cover
C—Regulator
D—Condenser Wire



RW10654 –UN–10NOV88

Regulator Components

Continued on next page

RG,RG34710,2116 –19–15MAR97–1/2

Robert Bosch Charging Circuit Test Specifications

			Rating	
John Deere Part No.	Robert Bosch Part No.	Model/Series	Volts	Amps
AE52707	F120 061 422	—	12	120
AE53101	9 120 060 042, 0 120 484 017, 0 120 484 019	K1	12 (14)	120
AH137883	0 120 484 011	K1	12 (14)	95
AL32141	0 120 339 512	—	12 (14)	33
AL35998	0 120 488 218	—	12	55
AL67175	0 120 402 318	—	12	55
AL78689	0 120 488 267	K1	12 (14)	55
AL78690	0 120 484 016	K1	12 (14)	85
AL78692	0 120 484 017	K1	12 (14)	120
AL81436	0 120 488 290	K1	12 (14)	55
AL81437	0 120 484 020	K1	12 (14)	85
AL81438	0 120 488 019	K1	12 (14)	120
AT161324	0 120 488 206	K1	24 (28)	45
AT168711	0 120 468 136	N1	24 (28)	80
AT173624	0 120 488 205, 0 120 060 040	K1	12 (14)	65
AT175194	9 120 060 041	K1	12 (14)	95
AT175195	9 120 060 039	K1	24 (28)	45
AT175839	0 120 468 055	N1R	12 (14)	135
AT185696	F 005 0022	—	24	45
AT208541	0 120 500 078	—	24	80
AT220393	F 005 A0 0023	—	12	65
AT220394	F 005 A0 0024	—	12	95
AT85458	0 122 469 004	N1	24 (28)	50
AT185951	F 005 A0 0025	—	12	120
AZ23575	0 120 339 549	—	12 (14)	35
AZ38462	0 120 484 012, 0 120 402 566	K1	12 (14)	95
RE36267	0 120 484 011	K1	12 (14)	90
RE36268	0 120 468 055	N1	12 (14)	135

Item	Specification
Stator winding resistance	0.40—0.44 ohms
Rotor winding resistance	4.0—4.40 ohms

RG,RG34710,2145 –19–08SEP00–1/1

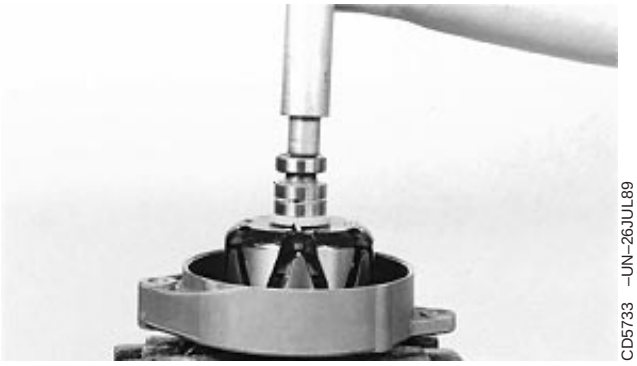
3. Press rear bearing onto rotor using a suitable driver.



Press Rear Bearing onto Rotor

RG,RG34710,2176 –19–15MAR97–2/11

4. Install rotor into front housing.



Install Rotor

RG,RG34710,2176 –19–15MAR97–3/11

5. Install stator.

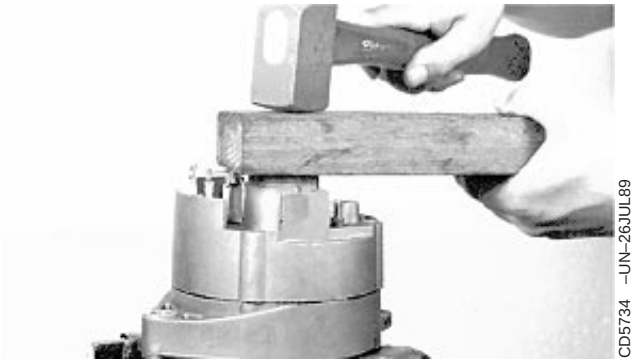


Install Stator

RG,RG34710,2176 –19–15MAR97–4/11

35
10
9

6. Install rear housing, taking care that marks made when disassembling are in line. Use a new O-ring in rear bearing bore.



Install Rear Housing

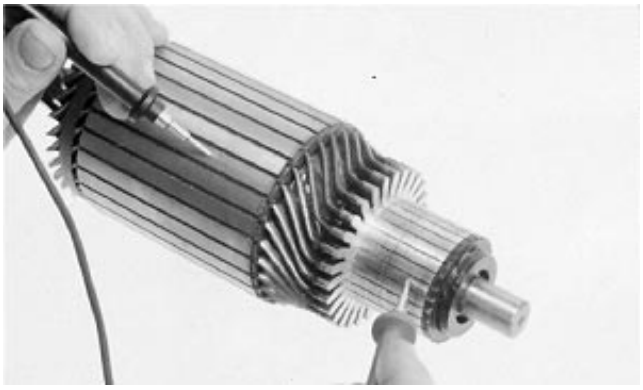
Continued on next page

RG,RG34710,2176 –19–15MAR97–5/11

Make Armature Ground Test

1. Set ohmmeter to read on highest scale.
2. Place one test lead on the armature core or shaft. Place other lead on commutator.

   If the test meter indicator swings toward zero, the armature is grounded. Replace armature.



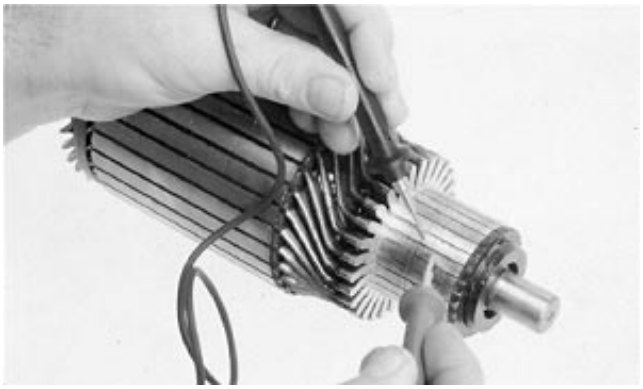
Make Armature Ground Test

RG,RG34710,2207 –19–15MAR97–1/1

Make Open Circuit Test

1. Set ohmmeter to read on lowest scale.
2. Place one test lead on ohmmeter segment. Place other test lead on an adjacent segment.
3. Repeat this operation for all segments by moving one lead at a time.

   If the test meter indicator does not swing to zero and remain stationary, the armature coil between these two segment is open. Replace armature.



Make Open Circuit Test

RG,RG34710,2208 –19–15MAR97–1/1

Make Ground Circuit Test for Field Windings

1. Set ohmmeter to read on highest scale.
2. Connect one test lead to the field frame and the other test lead to the field connector.

   If the test meter indicator swings toward zero, the field coils are grounded. Replace the field windings.



Make Ground Circuit Test

RG,RG34710,2209 –19–15MAR97–1/1

Inspect Plunger, Shift Lever, and Overrunning Clutch Assembly

1. Remove plug (19, see exploded view in this group) and inspect shift lever spring (33) and shift lever assembly for wear or damage.
2. Press plunger inward and check tension on plunger spring (29). Spring should not compress easily. Replace plunger assembly if spring is weak.
3. Inspect overrunning clutch drive (16) for wear or damage. Rotate the pinion. Pinion gear should rotate smoothly (but not easily) in one direction. The pinion gear should not rotate in the opposite direction.
4. If pinion gear does not rotate smoothly or if it is worn, chipped, or burred, replace clutch drive assembly.

IMPORTANT: Do not clean overrunning clutch drive with solvent. Solvent would dissolve lubricant in clutch mechanism. Clean only by wiping with a clean cloth. Do not lubricate drive.

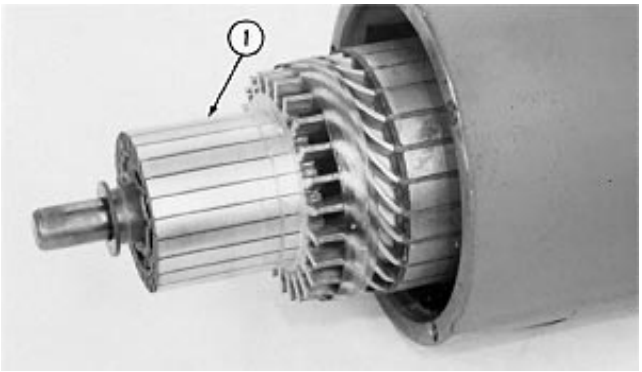
RG,RG34710,2248 –19–09OCT00–1/1

Assemble Starter Motor

1. Carefully install armature (1) into field frame. Be sure spacer is installed on end of armature shaft before installing into main frame.

IMPORTANT: To avoid possible damage to brush holders, it is best to install brush assembly dismantled.

1—Armature



RG2992 –UN–17JUL89

Install Armature

Continued on next page

RG,RG34710,2249 –19–15MAR97–1/4

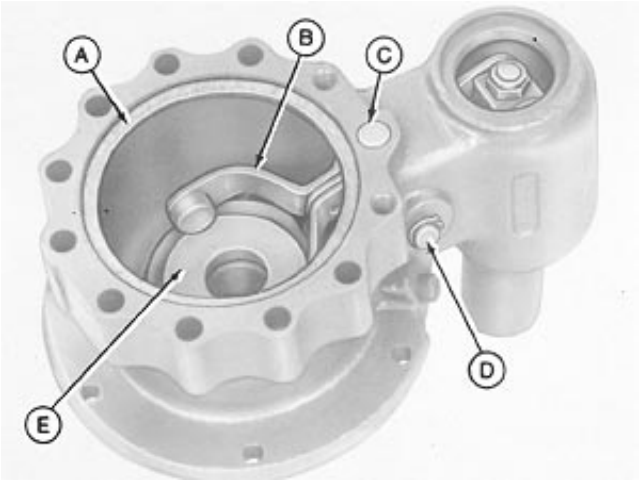
Assemble Starter Motor

NOTE: Always use new O-rings, packing, and gaskets when assembling starter motor.

1. Lubricate bearing surfaces with Delco-Remy No. 1960954 Lubricant or its equivalent.

2. Install seal plug (C), gasket (A), and brake washer (E) into shift lever housing.

A—Gasket
B—Shift Lever
C—Seal plug
D—Shift Lever Shaft
E—Brake Washer



Shift Lever Housing

RG,RG34710,2282 –19–15MAR97–1/8

3. Install wear pads (C) and overrunning clutch (D).

4. Make sure plunger (B) moves shift lever back and forth easily.

NOTE: Do not install adjusting hole plug (A) until pinion clearance has been checked.

A—Adjusting Hole Plug
B—Plunger
C—Wear Pads
D—Overrunning Clutch



Shift Lever

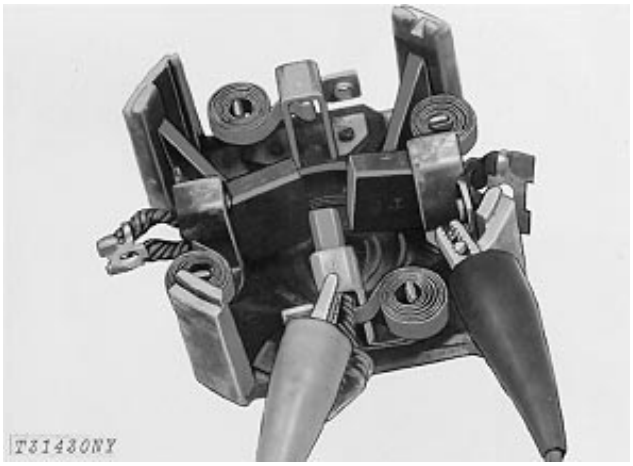
Continued on next page

RG,RG34710,2282 –19–15MAR97–2/8

Test Brush Holder for Grounds

1. Set ohmmeter on its highest scale.
2. Place one test lead on commutator end frame. Place other lead on brush holder.

   If needle swings toward zero, the positive brush holder is grounded and should be replaced.



Test Brush Holder for Grounds

RG,RG34710,2313 –19–15MAR97–1/1

Measure Brush Spring Tension

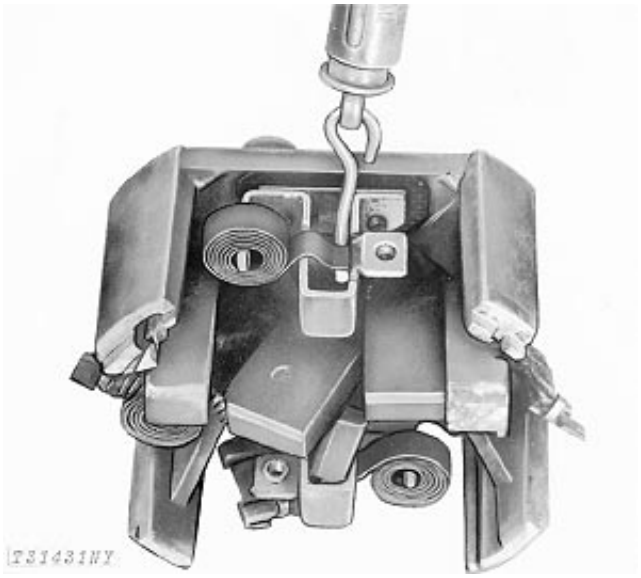
Measure spring tension with a spring scale.

Brush spring tension should be as specified, just as the spring leaves the brush holder.

Specification

Brush Spring—Minimum Tension..... 11 N (40 ounce-force)

When measuring tension, scale should be parallel with edge of brush holder.

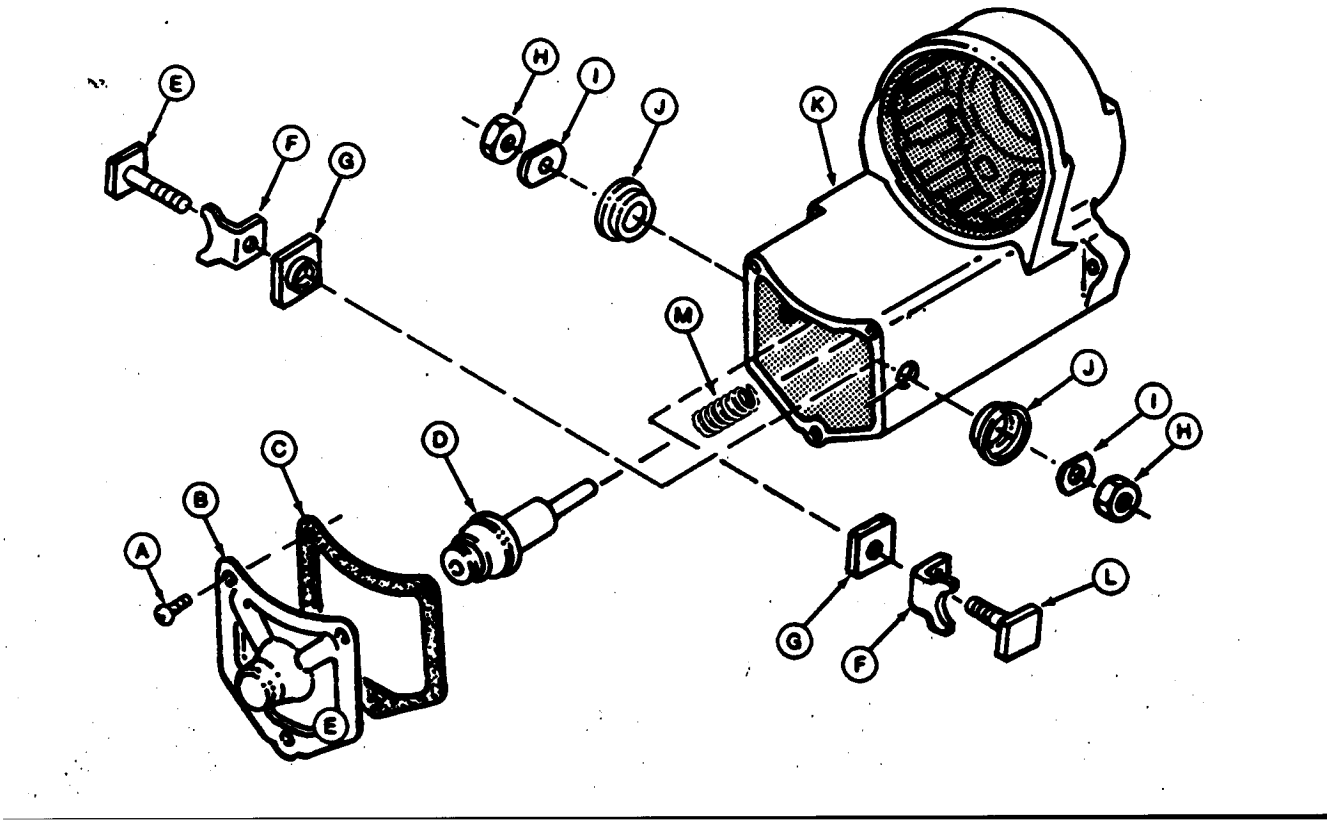


Measure Brush Spring Tension

RG,RG34710,2314 –19–15MAR97–1/1

65
15
26

Assemble Solenoid Assembly



Exploded View of Solenoid Assembly

A—Screw (3 Used)
B—Solenoid Cover
C—Gasket
D—Plunger
E—Bolt
F—Plate (2 Used)
G—Bushing (2 Used)
H—Nut (2 Used)
I—Special Washer (2 Used)
J—Bushing
K—Solenoid Housing
L—Bolt
M—Plunger Spring

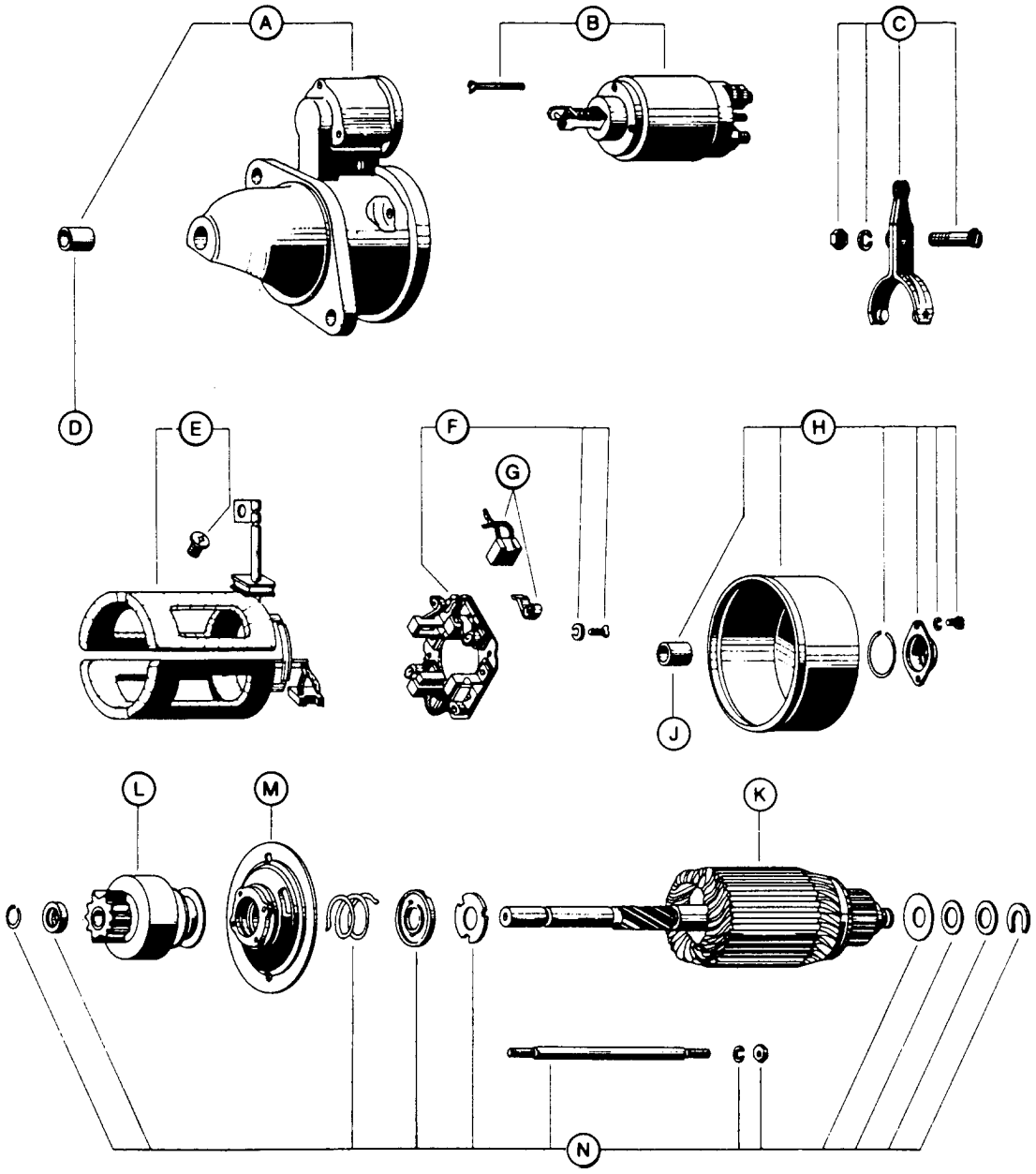
1. Inspect all solenoid components shown and replace as necessary if broken or worn.

2. The complete solenoid housing must be replaced if there is a solenoid problem other than the loose parts shown.

Continued on next page

RG,RG34710,2333 –19–15MAR97–1/4

Exploded View of Iskra Starter Motor (AZJ-Series)



CD30491 –UN–03FEB97

Iskra Starter Motor (AZJ-Series)

A—Drive End Housing
B—Solenoid[1]
C—Engaging Lever[1]
D—Bushing
E—Field Winding
F—Brush Holder
G—Brushes[1] (4 Used)
H—Commutator End Frame
J—Bushing
K—Armature
L—Overrunning Clutch Pinion[1]
M—Center Bearing
N—Service Parts Kit[1]

[1] Available as service parts.

RG,RG34710,2372 –19–15MAR97–1/1

PREVIEW ONLY

You're viewing 24 of 576 pages

The full manual includes:

- All 576 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

John Deere Alternators Technical Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual