



# SERVICE MANUAL

## Section 7 \_\_\_\_\_ ELECTRICAL SYSTEM

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## 7-1. GENERAL

This section contains functional descriptions and service instructions for the major components of the electrical system. Service instructions include removal, disassembly, cleaning, inspection, reassembly and installation procedures.

Complete preventive maintenance procedures are provided in Section 2 of this manual. Whenever feasible, the component manufacturer's service instructions are provided as a supplement to EIMCO information.

## 7-2. SYSTEM DESIGN SPECIFICATIONS

ITEM	DESIGN DATA
LIGHTING SYSTEM	
VOLTS	12 DC
HEADLIGHT	Sealed beam, 60 Watts
TAILLIGHT	Sealed beam, 60 Watts
STARTER CIRCUIT	
BATTERY	12 VDC
STARTER MOTOR	
Current	12 VDC
Horse Power	4.0
Rating	
CHARGING CIRCUIT	
ALTERNATOR	
Current	12 VDC
Amperes	55
Resistance	4.0 - 5.2





## 7-3. TROUBLE ANALYSIS TABLE

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
<b>LIGHTING SYSTEM</b>		
Rear or front lights out	Defective sealed beam lamp.	Replace sealed beam lamp.
	Light assembly wiring loose or broken.	Repair or replace wiring.
	30 ampere circuit breaker tripped.	Determine cause, push circuit breaker to reset.
	Defective light control toggle switch.	Replace toggle switch.
<b>CHARGING CIRCUIT</b>		
Ammeter not registering.	No output from alternator.	Repair or replace alternator.
	Broken or loose wire between the alternator output terminal and ammeter negative terminal.	Repair or replace the wire lead.
	Defective ammeter gauge.	Replace gauge.
	Broken or loose wire between battery and ammeter.	Repair or replace wire lead.
Fully charged battery and low charging rate or low battery and high charging rate	Normal alternator and regulator operation.	None.
Fully charged battery and high charging rate	Poor wiring conditions.	Repair or replace.
	High temperature battery or shorted cell which allows battery to accept higher charge than regulator is set for.	Service or replace.
	Defective alternator or regulator.	Service or replace.
Low battery or low or no charging rate	Loose connection, frayed or damaged wiring.	Check wiring.
	Defective battery.	Check or replace battery.
	Defective alternator or regulator.	Service or replace.
<b>ACCESSORY CIRCUITS</b>		
The accessory circuit trouble shooting procedures are best conducted by the process of elimination. If an accessory is found to be inoperative, some preliminary checks can be made to determine the probable cause of the trouble. Since this electrical system contains a circuit breaker, shorts in the accessory circuits will be indicated by the intermittent tripping of the circuit breaker. The accessories and wiring must then be checked for shorts. When trouble occurs in an accessory and the circuit breaker does not trip, a defective accessory or an open circuit is indicated and the accessories, wiring and switch connections must be checked for opens.		





## 7-4. ELECTRICAL CIRCUIT

### A. System Description (See Figure 7-1)

#### (1) Charging Circuit

(a) The charging circuit supplies current for charging the battery and for operating the accessories. When the battery is discharging, the alternator supplies current both for recharging the battery and operating the accessories. When the battery is fully charged alternator output is regulated to deliver only the current required for operating the accessories.

(b) Alternator current starts from the alternator output terminal and flows through line ① to the ammeter negative terminal. From the ammeter the current continues through line ② to the 30 ampere circuit breaker. From here, it flows through line ③ to the warning horns, through line ④ to the engine oil pressure switch, hour meter and back to the alternator, through line ⑤ to the dash-light switch and through line ⑥ to the front and rear headlight switches. The alternator keeps the battery charged through ground cable ⑦.

#### (2) Starter Circuit

(a) The starter circuit consists of the battery, starter switch and starter motor. This circuit is made up of two smaller circuits: the starter motor control circuit, and the starter motor power circuit.

(b) When the key in the starter switch is turned to the start position to energize the starter motor, starter motor control current flows from the positive terminal of the battery through a 200 ampere fuse to the starter solenoid. From here the current flows through line ⑧ to the positive terminal of the ammeter and through line ⑨ to the "Bat" terminal of the key lock switch. Current flows through the key lock switch to the transmission oil temperature gauge through line ⑩ and to the Preheat and Start switch through line ⑪. With the switch set on Preheat, current flows through line ⑫ to the engine glow plugs. With the switch on start, current flows through line ⑬ to energize the starter solenoid which in turn activates the starter to start the engine. Current then flows through the starter ground ⑭, through the machine frame to ground cable ⑦ of the battery completing the starter circuit.

## 7-5. ELECTRICAL COMPONENTS

### A. Alternator

Refer to the Motorola 25-49 Service Manual included in this section for detailed alternator information.

### B. Battery

Refer to the Field Examination for Battery, No. L-360A, included in this section for detailed information on the battery.

### C. Starter Motor

Refer to the Deutz Instruction Manual, No. 297 1225, included in this section for detailed information on the starter motor.

### D. Headlights (See Figure 7-2)

#### (1) Sealed Beam Removal

(a) Pry up around the front perimeter of the resilient rubber mounting ring to extract the sealed beam until from body assembly.

(b) With the sealed beam unit separated from the body assembly, disconnect the sealed beam unit from the wire assembly connector.

#### (2) Sealed Beam Installation

(a) Verify that the interior of the body assembly is free from any foreign matter.

(b) Connect the sealed beam unit to the wire assembly connector.

#### NOTE

FOR PROPER LIGHT DISTRIBUTION, POSITION THE INDEX TIT OF THE SEAL 1 BEAM UNIT INTO THE INDEX GROOVE OF THE RUBBER MOUNTING RING.

(c) Partially insert the sealed beam unit into the rubber mounting ring. Pry up around the perimeter of the ring while repositioning the sealed beam unit.



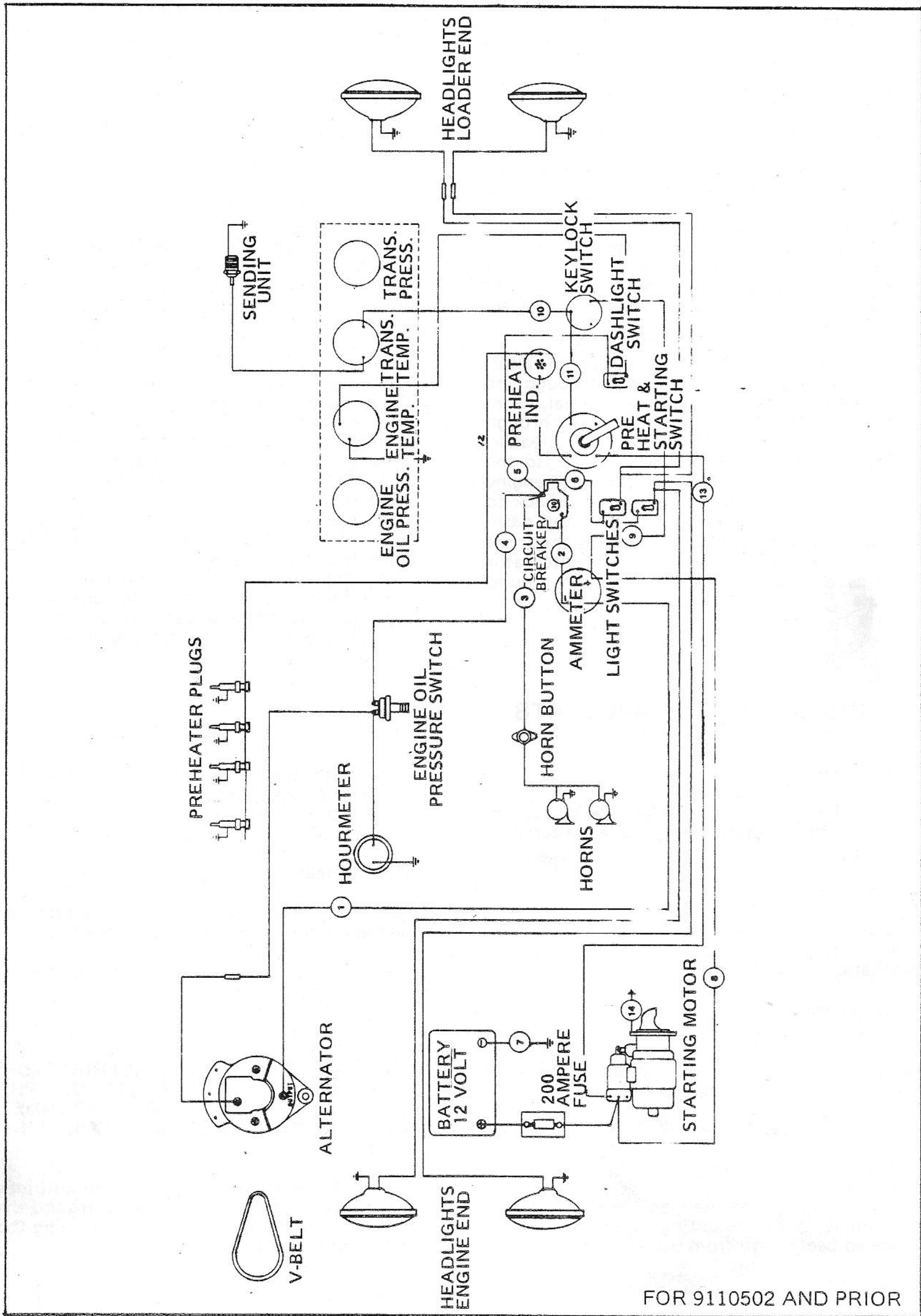


FIGURE 7 - 1. WIRING DIAGRAM





FIGURE 7-1. WIRING DIAGRAM

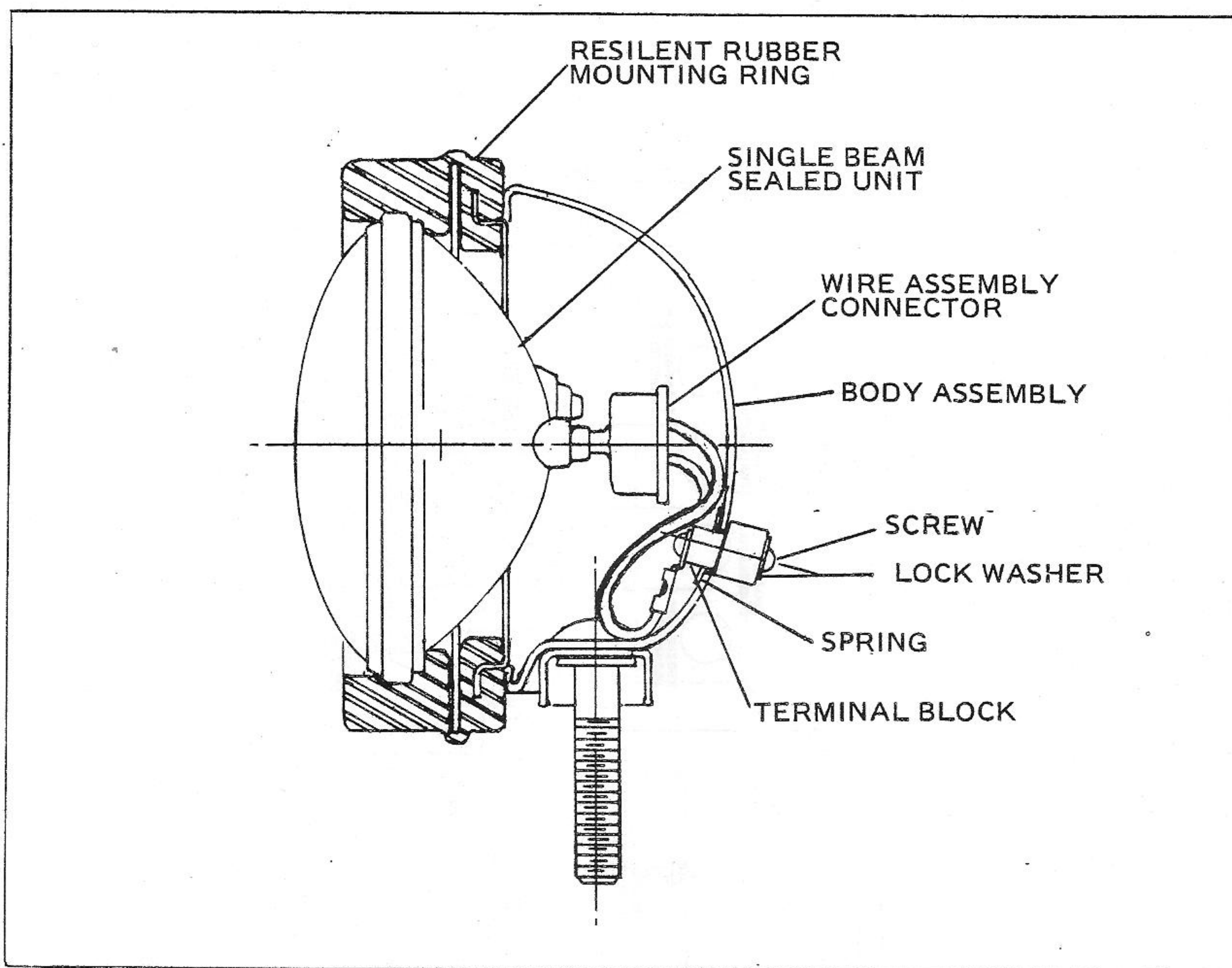


FIGURE 7 - 2. SEALED BEAM HEADLAMP

## 7-6. ATTACHMENTS

- a. FIELD EXAMINATION FOR BATTERY,  
Form L-360A
- b. MOTOROLA ALTERNATOR SERVICE  
MANUAL, No. 25-49.