RESTRICTED

TECHNICAL MANUAL
No. 9-879

WAR DEPARTMENT
Washington, 18 October 1943

MOTORCYCLE, SOLO

(Harley-Davidson Model WLA)

Dissemination of restricted matter.—The information contained in restricted documents, and the essential characteristics of restricted materiel, may be given to any person known to be in the service of the United States, and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except by authorized military public relations agencies. (See also paragraph 18b, AR 380-5, 28 September 1942.)

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PART ONE—VEHICLE OPERATING INSTRUCTIONS

PART TWO—ORGANIZATIONAL MAINTENANCE

*For supersession of quartermaster manuals, refer to paragraph 2.

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PART ONE—OPERATING INSTRUCTIONS

Section I

INTRODUCTION

1. SCOPE.

a. This technical manual* is published for the information and guidance of the using arm personnel charged with the operation, maintenance, and minor repair of this materiel.

b. In addition to a description of the Harley-Davidson motorcycle, this manual contains technical information required for the identification, use, and care of the materiel. The manual is divided into two parts. Part One, section I through section VI, gives vehicle operating instructions. Part Two, section VII through section XXV, gives vehicle maintenance instructions to using arm personnel charged with the responsibility of doing maintenance work within their jurisdiction.

c. In all cases where the nature of the repair, modifications, or adjustment is beyond the scope or facilities of the unit, the responsible ordnance service should be informed so that trained personnel with suitable tools and equipment may be provided, or proper instructions issued.

2. SUPERSESSION OF QUARTERMASTER MANUALS.

a. This technical manual, together with TM 9-1879, supersedes and replaces the following Quartermaster Corps publications:

(1) TM 10-1175—Maintenance manual, motorcycle, solo, Harley-Davidson (Model 42-WLA), 11 September 1941.

(2) TM 10-1177—Maintenance manual, motorcycle, solo, Harley-Davidson (Models 1940-41-42), 11 September 1941.

(3) TM 10-1331—Maintenance manual, motorcycle, chain drive Harley-Davidson (Model 42 WLA, solo).

(4) TM 10-1359—Instruction folder (45-A) motorcycles, solo, Harley-Davidson (Model 1941 WLA 45), 25 November 1941.

(5) TM 10-1361—Instruction folder (45-B) motorcycle, solo, Harley-Davidson (Model 1941 WLA 45), 25 November 1941.

*To provide operating instructions with the materiel, this technical manual has been published in advance of complete technical review. Any errors or omissions will be corrected by changes or, if extensive, by an early revision.

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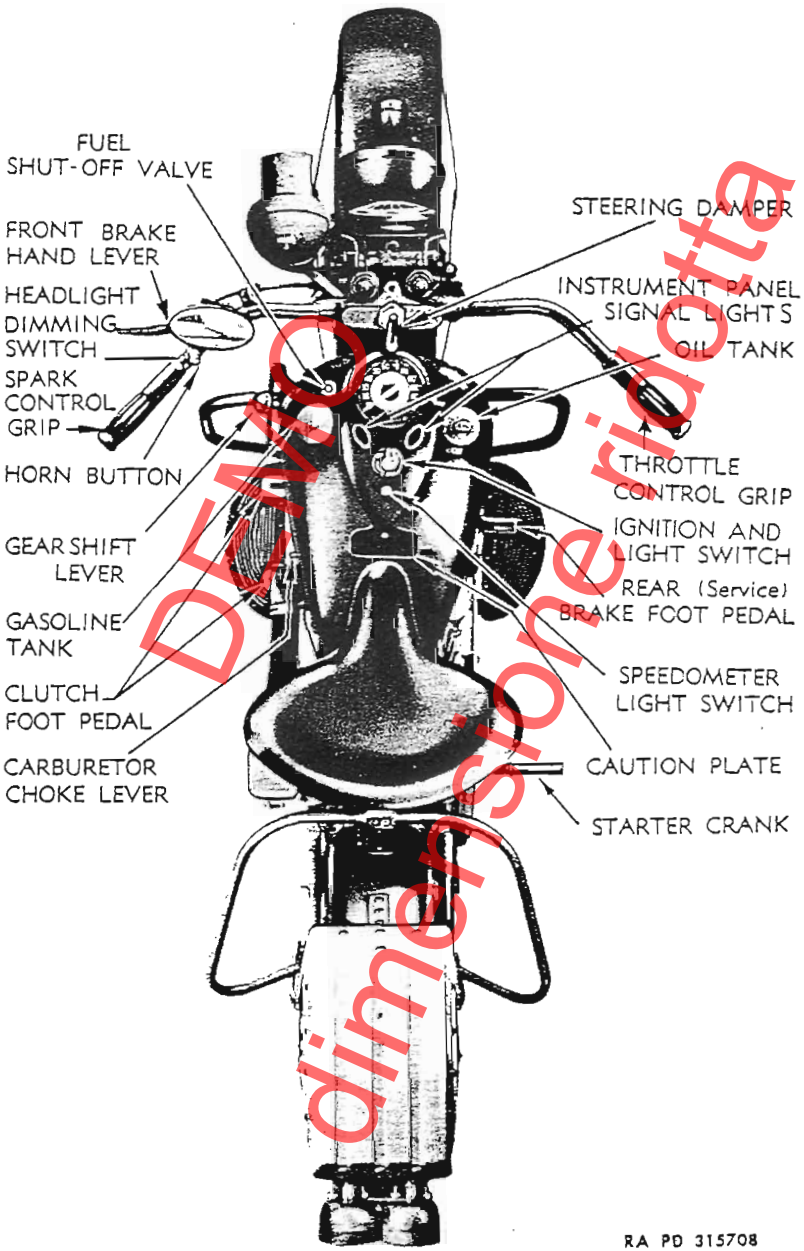

Figure 1—Top View of Motorcycle

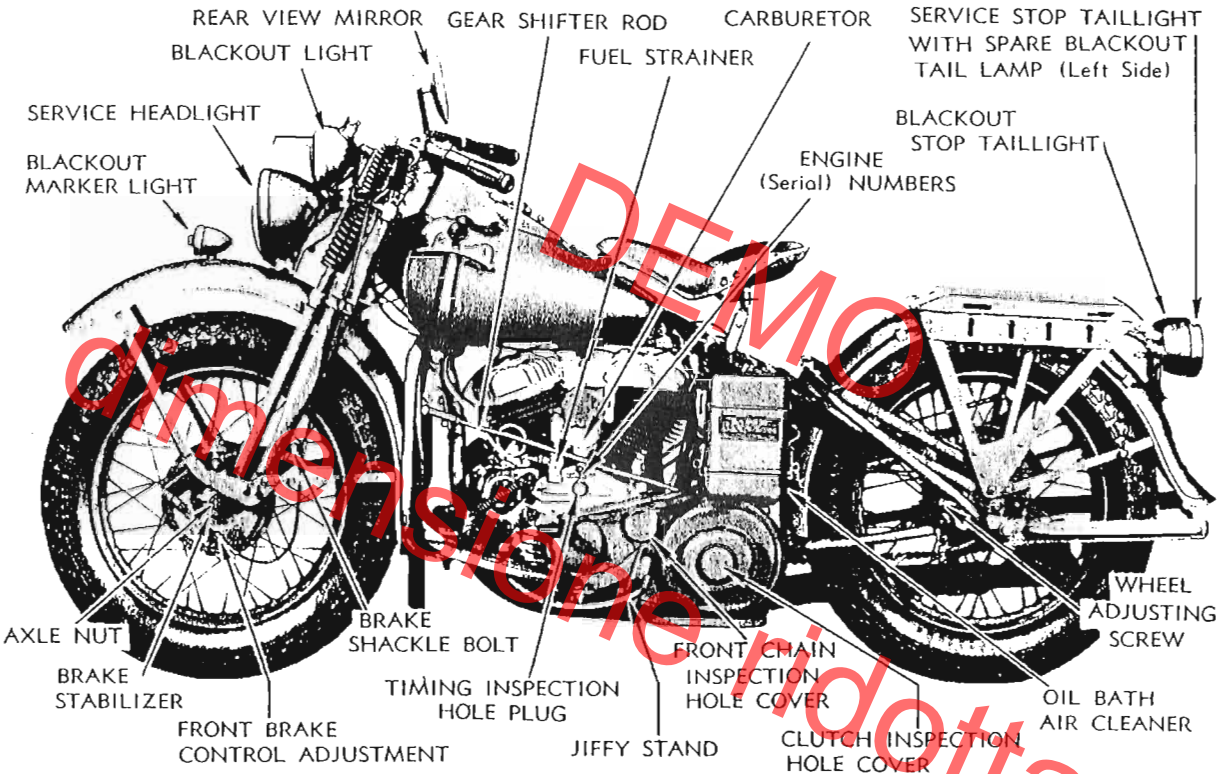

Figure 2—Left Side View of Motorcycle

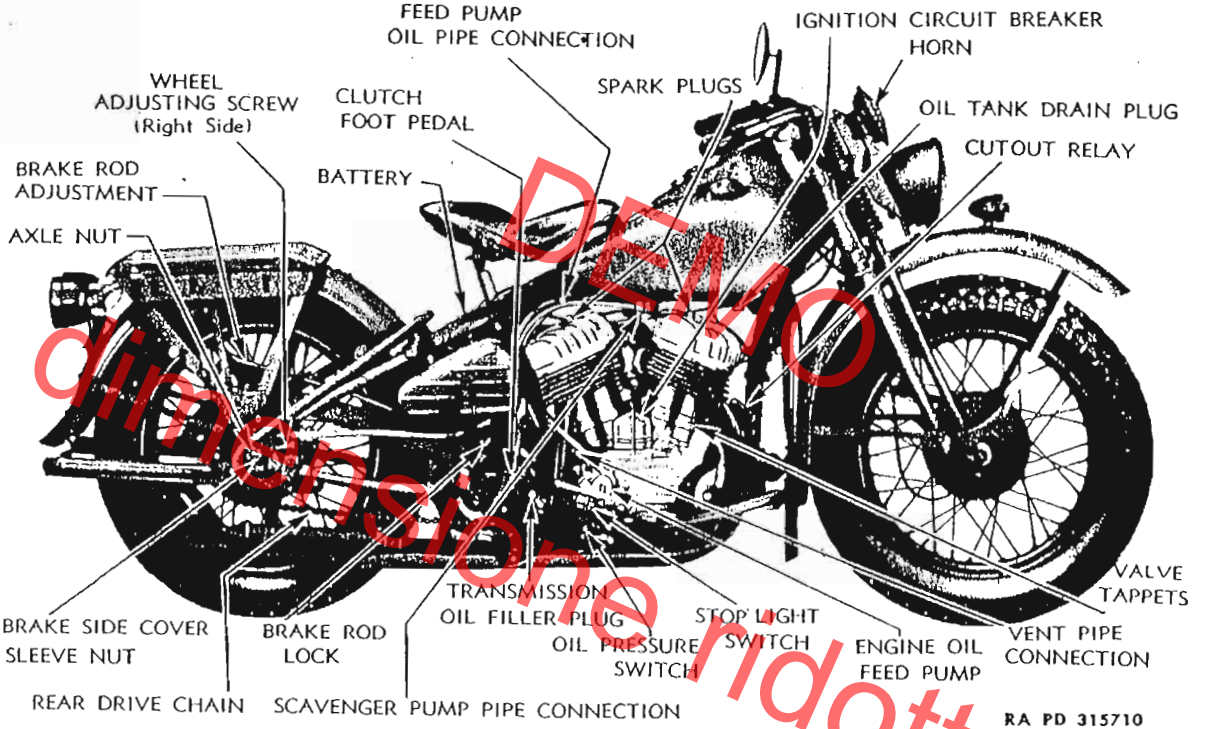

Figure 3—Right Side View of Motorcycle

Section II

DESCRIPTION AND TABULATED DATA

3. DESCRIPTION (figs. 1, 2, and 3).

a. This 2-cylinder solo motorcycle is powered by a V-type, air-cooled gasoline engine, operating on conventional 4-stroke, 4-cycle principles. Air-cooled engines rely upon movement of air over cylinder and head radiating fins, and upon circulation of oil for dissipation of excessive heat. Motorcycle engines, therefore, under no conditions should be operated for more than 1 minute when motorcycle is not in motion.

4. DATA.

a. Vehicle Specifications.

Type of engine	2-cylinder, V-type L-head, air-cooled
Cylinder bore	2¾ in.
Stroke	3 13/16 in.
Engine number (serial) left side engine base, below front cylinder.	
Wheelbase	4 ft 11½ in.
Length over-all	7 ft 4 in.
Width over-all (handle bars)	3 ft 5 in.
Wheel size	18 in.
Tire size	4.00 x 18 in.
Tire type	Drop center
Weight of vehicle (without rider or armament)	540 lb
Ground clearance (skid plate)	4 in.
Kind and grade of fuel	Gasoline: 72 octane or higher
High gear ratio	4.59:1
Engine sprocket	31-tooth
Countershaft sprocket	17-tooth
Rear wheel sprocket	41-tooth

b. Performance.

Maximum allowable speed	65 mph
Miles per gallon (hard surface)	35

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Cruising range (without refill) ..... 100 miles
Fording depth (carburetor) ..... 18 in.

c. Capacities.

Fuel capacity (left tank) ..... 3⅜ U.S. gal
Oil tank capacity (right tank) ..... 1⅛ U.S. gal
Transmission capacity ..... ¾ pt

Section III

CONTROLS AND OPERATION

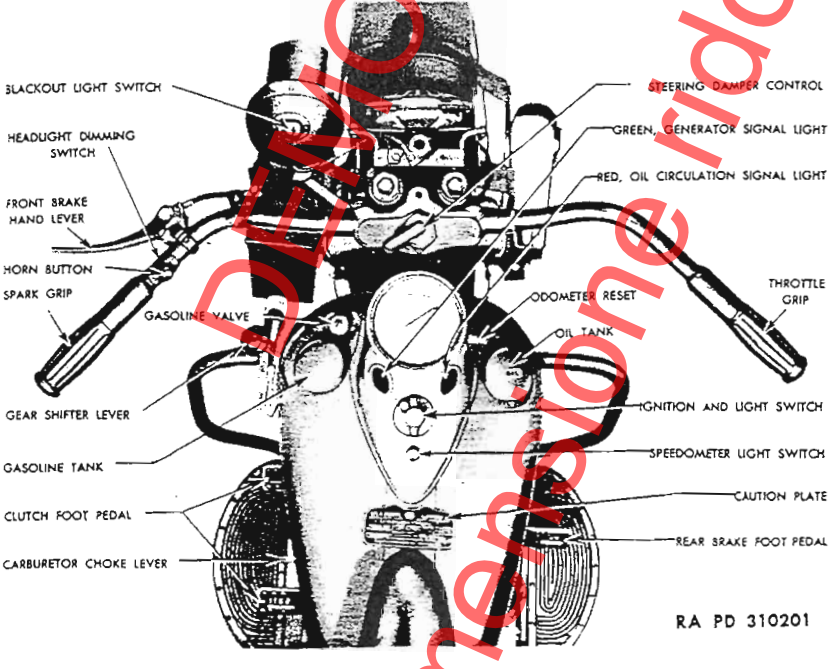

Figure 4—Controls

5. CONTROLS (fig. 4).

a. Controls are peculiar to the motorcycle. The rider must become thoroughly familiar with the location and use of all control devices before attempting to operate vehicle.

b. Gasoline Valve (figs. 5 and 6). Gasoline valve is located in left tank, forward. Valve is closed by turning to the right, finger tight. Turning to left opens valve. Valve is in normal operating position

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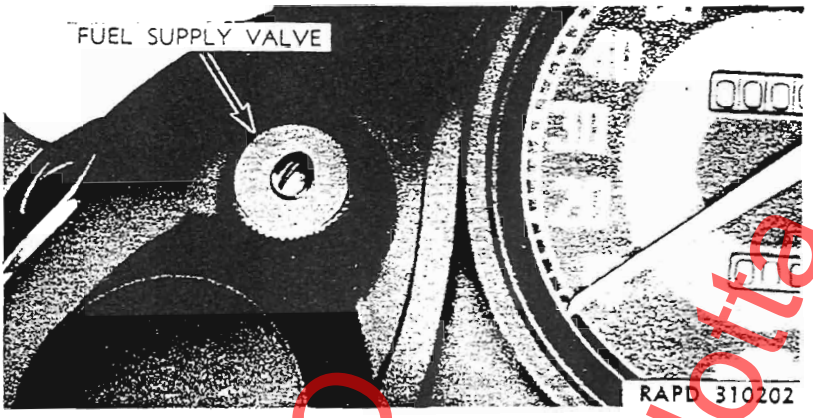

Figure 5—Fuel Supply Valve

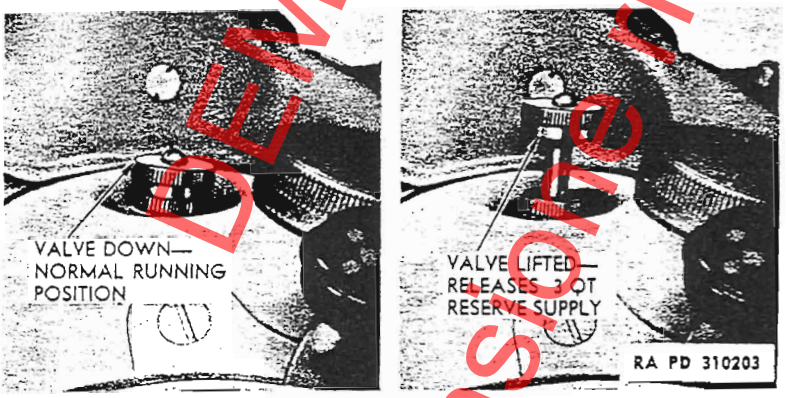

Figure 6—Fuel Supply Valve Positions

when turned to left, with valve head down. Lifting valve head releases emergency supply of fuel (3 quarts).

c. **Throttle.** The throttle is controlled by right handle bar grip. Turning grip inward opens throttle, turning it outward closes throttle.

d. **Spark.** Spark is controlled by left handle bar grip. Turning grip inward advances spark, turning it outward retards spark.

e. **Clutch** (fig. 7). Clutch is operated by left foot (rocker-type) pedal, connecting with steel cable, which actuates clutch release lever. Pedal is located on left side of motorcycle above footboard. Forward downward (toe) position of pedal engages clutch. Rear downward (heel) position of pedal disengages clutch. Foot pedal provided with friction device to retain it in either engaged or disengaged position.

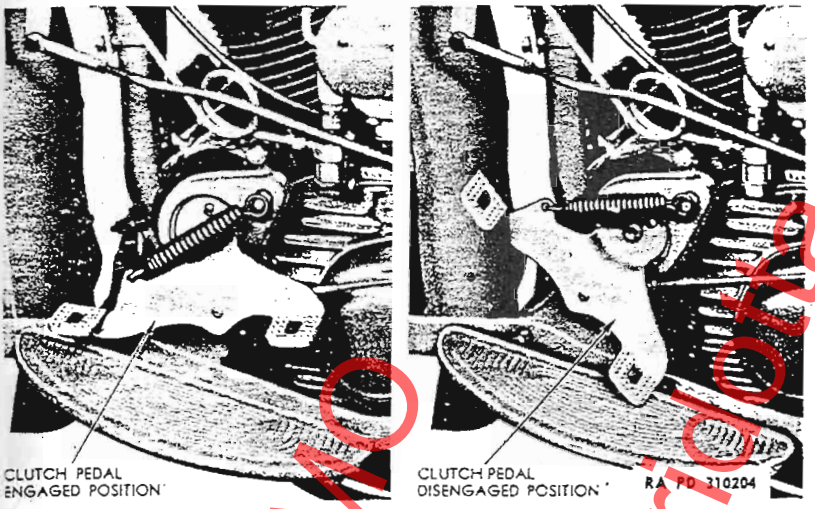

Figure 7—Clutch Pedal Positions

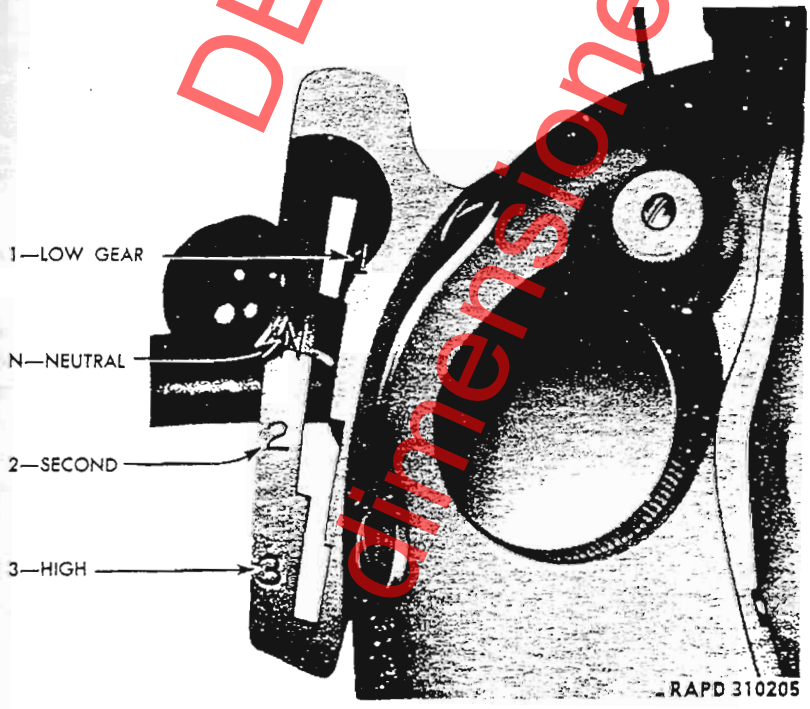

Figure 8—Gear Shifter Lever Positions

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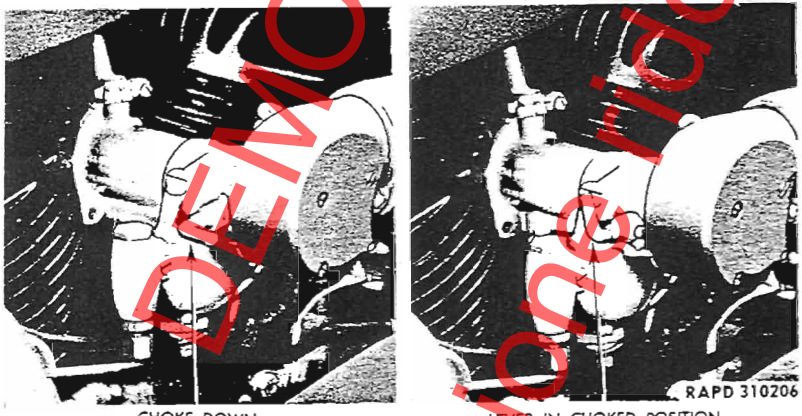
f. **Service Brake (Rear Wheel).** Foot pedal is located on right side of motorcycle at forward end of footboard.

g. **Auxiliary Brake (Front Wheel).** Auxiliary brake is operated by hand lever located on left handle bar. It is used in conjunction with service brake, as an emergency brake, or for holding vehicle while starting engine on grade. CAUTION: *Brake is to be applied lightly and cautiously on wet and slippery roads.*

h. **Gear Shifter** (fig. 8). Shifter lever is located on left tank, forward position, and operates within a guide. Shifter lever guide is notched for positive location of gears and each position is identified, front to rear: "1"—low gear; "N"—neutral; "2"—second gear; "3"—direct high gear.



CHOKE DOWN
NORMAL RUNNING POSITION

LEVER IN CHOKED POSITION

Figure 9—Carburetor Choke Lever Positions

i. **Steering Damper.** Steering damper is an adjustable friction device to damper turning action of forks, steady front wheel, and prevent wobble in rough terrain or at high speeds, and is located on top of steering head in center of handle bars. Move handle to right to apply desired friction.

j. **Foot Starter Crank** (fig. 1). The foot starter crank is located on right side of motorcycle. Gear shifter lever must be in neutral position, and clutch foot pedal in forward engaged position, before using foot starter crank. Starter crank normally is in upward position. Straddle motorcycle, place right foot on starter crank, and shift weight of body for forceful downward crank operation to start engine.

k. **Ignition and Light Switch.** Earlier models are provided with switch lock, later models are nonlocking. Switch is off in straightforward position. First position to right is for engine ignition only.

Second position to right is for ignition and blackout lights. To use vehicle service lights, depress button to turn switch to third right position.

l. **Instrument Panel Signal Lights.** Instead of an ammeter and oil pressure gage, signal lights indicate generator charging, and engine oil pressure.

(1) Green light is located on left side of instrument panel. When engine is running, and light is out, it indicates generator is charging.

(2) Red light is located on right side of instrument panel. When engine is running, and light is out, it indicates engine oil is circulating.

m. **Carburetor Choke** (fig. 9). Choke lever is in full prime position when all the way up, and in normal running position when all the way down.

6. ENGINE PRESTARTING INSTRUCTIONS.

a. Before the engine is started, perform the Before-operation Service outlined in paragraph 15. Special care must be taken during starting and warming-up period to avoid unnecessary engine wear.

b. The rider must acquire correct motorcycle engine starting habits, and learn to do the job the quickest, easiest, and most dependable way. The following pointers will be helpful to the beginner as well as to a seasoned rider:

(1) Mount (straddle) motorcycle to obtain firm grip on handle bars.

(2) Leave side stand (jiffy stand) outward to support vehicle while operating foot starter crank with right foot.

(3) Engine starting will be benefited by use of front wheel, hand-operated brake, to prevent vehicle from rolling or shifting during starting kicks. This is especially helpful if vehicle is parked on an incline or on soft, uneven surface.

c. The procedure outlined below is preparatory to starting either cold, warm, or hot engine:

(1) Place gear shifter lever in "N" (neutral) position (fig. 8).

(2) See that gasoline shut-off valve is open (fig. 5).

(3) Engage clutch (fig. 7).

(4) Spark control (left) grip must be turned inward to fully advanced position, or nearly so.

(5) Foot starter crank may travel ½ way downward before starting engine. See that a full vigorous starter stroke is used. A vigorous kick, using a full swing (not a jab) of right leg and hip, is correct engine starting practice.

TOOLS AND EQUIPMENT STOWAGE ON THE VEHICLE

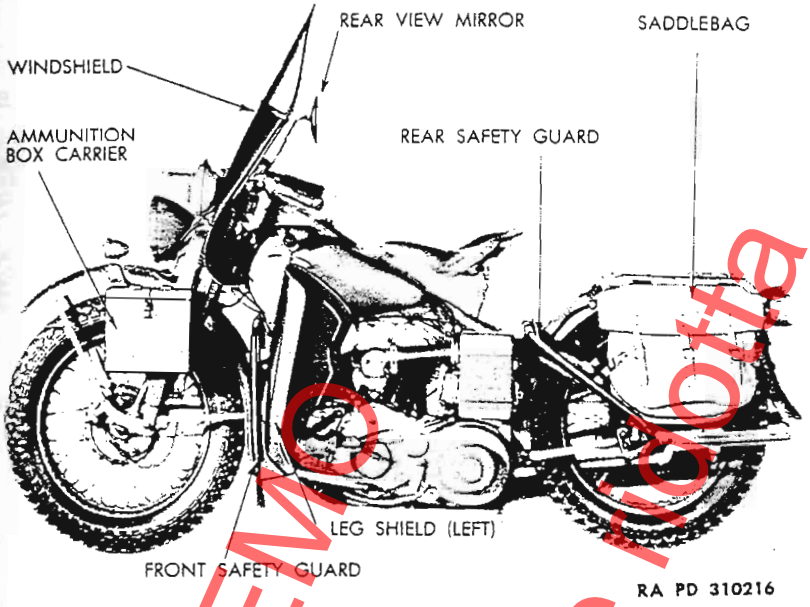


Figure 12—Vehicle Equipment, Left Side

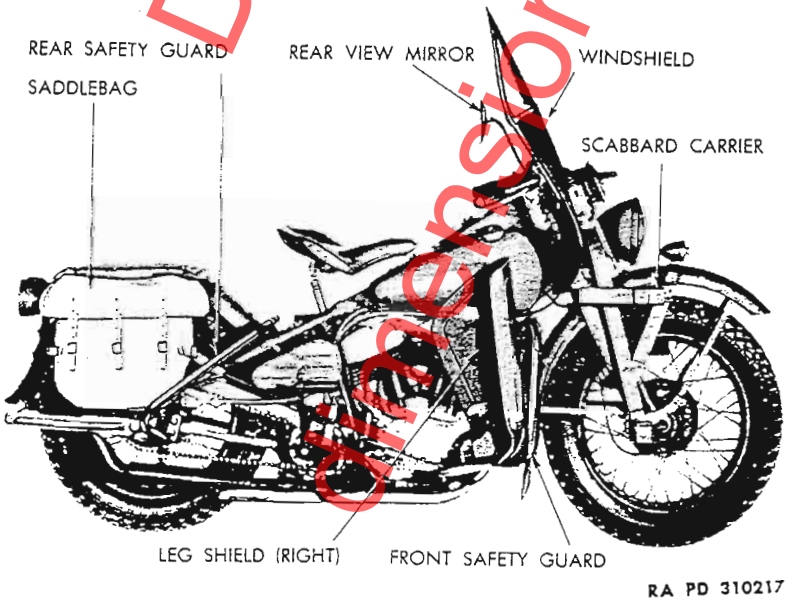


Figure 13—Vehicle Equipment, Right Side

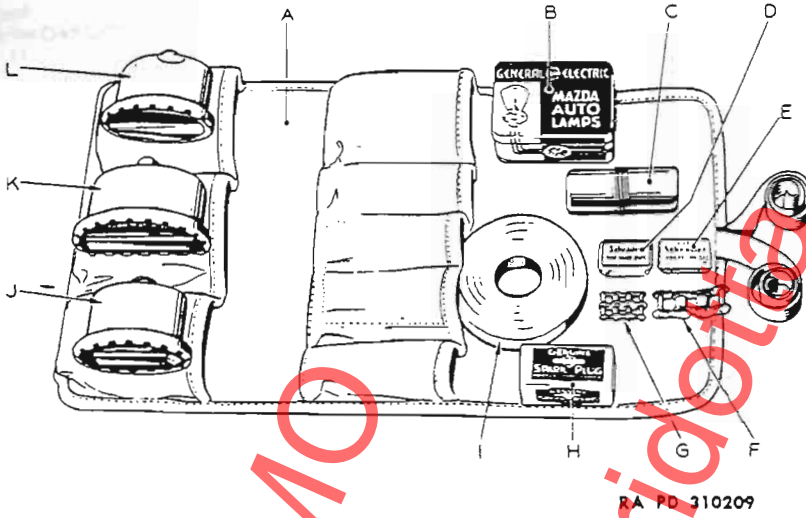


Figure 14—Vehicle Spare Parts

23. VEHICLE SPARE PARTS (fig. 14).

† a. Spare Parts.

	Item	Number Carried	Where Carried
A	Roll, parts kit	1	In saddlebag
H	Plug, spark (and gasket)	1	In kit roll
F	Link, rear chain repair	1	In kit roll
G	Link, front chain repair	1	In kit roll
K	Lamp-unit, tail blackout	1	In kit roll
J	Lamp-unit, stop blackout	1	In kit roll
L	Lamp-unit, tail and stop	1	In kit roll
B	Lamp bulk kit, head lamps, 5 bulbs	1	In kit roll
C	Kit, tire repair	1	In kit roll
I	Tape, friction	1	In kit roll
D	Caps, tire valve (5 in box)	1	In kit roll
E	Cores, tire valve (5 in box)	1	In kit roll

†EXCEPTION: *No spare parts kit supplied with earlier models. Rear chain repair link only spare part furnished.*

or not shifter rod is correctly adjusted so that when hand lever is moved to any gear position in tank shifter guide, transmission lever moves to the proper position to fully engage shifter clutch dogs and shifter cam spring plunger in cam-locating notch (inside transmission).

Figure 32—Adjusting Gear Shifter Rod

c. Adjusting Gear Shifter Control Linkage (fig. 32).

(1) Set hand lever in "N" (neutral) position in shifter guide.

(2) Remove nut and bolt to disconnect shifter rod from hand lever.

(3) With slight backward and forward movement of shifter rod, carefully "feel" transmission lever into exact position where shifter cam spring plunger (inside transmission) seats fully in cam-locating notch.

(4) Next, see that hand lever is in exact "N" (neutral) position in tank shifter guide.

(5) Readjust length of shifter rod by loosening rod end lock nut, and turning rod end (onto or off rod as necessary) until its bolt hole lines up with bolt hole in hand lever.

(6) Replace bolt and tighten nut.

(7) CHECK ADJUSTMENT. It is advisable to shift hand lever into "L" (low) and "S" (second) gear positions and check shifter rod adjustment to be sure of having best all-round adjustment.

(8) When shifter clutches become worn or damaged to the extent of jumping out of engagement under driving load, even though shifter control linkage is correctly adjusted, transmission must be removed and referred to higher authority for service.

55. REPLACEMENT OF FOOT STARTER CRANK.

a. Remove.

(1) Remove starter crank clamp bolt nut and remove bolt from crank.

(2) Pull starter crank off squared shaft.

b. Install. In installing foot starter crank, notch (for clamp-bolt clearance) must be in upward position in squared shaft to put return spring tension on crank.

(1) Use a 5/8-inch, open-end wrench and turn square shaft counterclockwise until bolt slot is upward. Hold shaft in this position and press starter crank onto shaft until clamping bolt can be inserted.

(2) Insert clamp bolt with bolt head toward rear wheel (crank in upward position) to provide clearance when starter crank is operated.

(3) Fit lock washer and nut and tighten nut securely.

56. REPLACEMENT OF STARTER CRANK SPRING (fig. 33).

a. Starter crank spring fits rather snugly behind rear edge of countershaft sprocket cover; however, it can be removed and installed without removing sprocket cover.

b. Remove.

(1) Remove foot starter crank (par. 55).

(2) With the blade of a screwdriver or with pliers, pry hooked end of spring off stud. NOTE: *If spring is broken, this operation will not be necessary*. Pull on spring end, at same time prying spring free of sprocket cover so as to pull spring off square shaft.

c. Install.

(1) Turn squared shaft so that clamp bolt notch is in bottom position. Engage square hole in spring on shaft with the hooked spring end to rear, in line with starter spring stud. Work spring onto

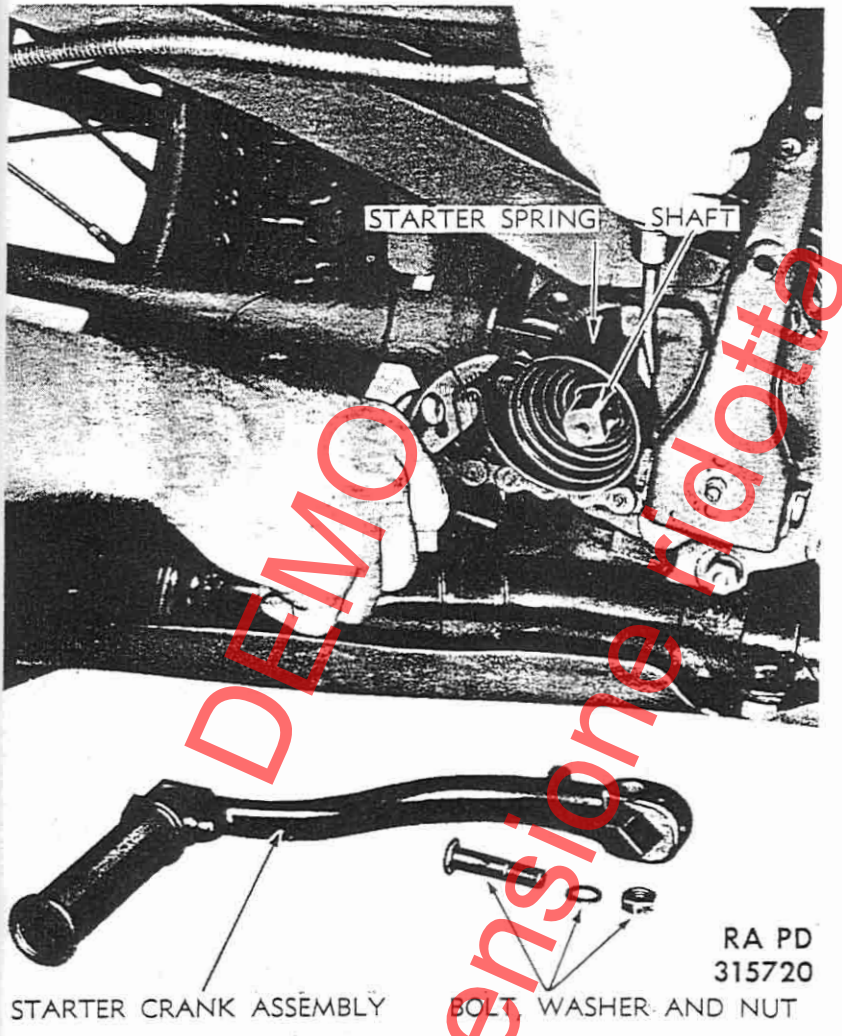


Figure 33—Removing Starter Crank Spring

shaft, prying it to rear to clear sprocket cover. Press all the way on squared shaft.

(2) Hook end of spring in place on spring stud.

(3) Install foot starter crank (par. 55).

57. REMOVE TRANSMISSION (figs. 34 and 35).

a. Transmission and clutch are assembled in one unit and must be removed and installed together. To make sure trouble is in trans-

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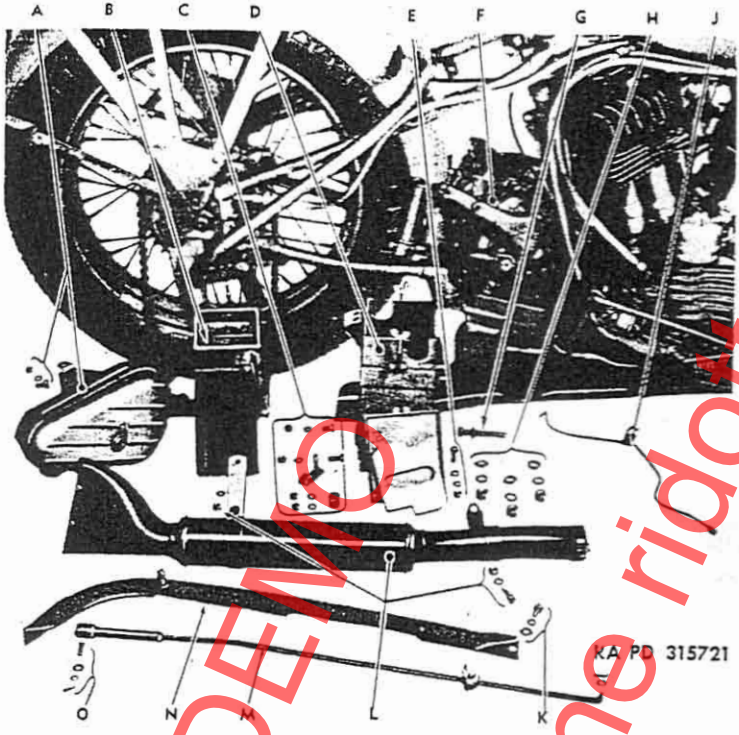

A—TOOL BOX AND BRACKET ASSEMBLY AND MOUNTING BOLT, WASHER AND NUT

B—BATTERY

C—BATTERY BOX REAR MOUNTING BOLTS, WASHERS, FITTINGS AND NUTS

D—BATTERY BOX ASSEMBLY AND COVER

E—BATTERY BOX FRONT MOUNTING BOLT, WASHERS AND NUT

F—TRANSMISSION AND CLUTCH ASSEMBLY

G—FRONT CHAIN ADJUSTING SCREW

H—TRANSMISSION MOUNTING STUD NUTS AND WASHERS

J—REAR CHAIN OILER PIPE

K—REAR CHAIN GUARD FRONT MOUNTING BOLT AND WASHERS

L—MUFFLER ASSEMBLY AND ATTACHING BOLT, WASHERS AND NUTS

M—REAR BRAKE ROD ASSEMBLY, WASHER AND COTTER PIN

N—REAR CHAIN GUARD

O—REAR BRAKE CLEVIS PIN, WASHERS AND COTTER PIN

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Figure 34—Disassembly for Transmission Removal from Right Side

mission, check clutch adjustment (par. 48) and transmission control linkage (par. 54) before replacing a faulty unit.

b. Remove.

(1) Drop rear end of skid plate (par. 111).

(2) Remove front chain guard (par. 102).

(3) Remove oil bath air cleaner and mounting bracket (par. 80). Lower bracket bolt also secures clutch cable tube to frame tube bracket on left side.

(4) Remove engine sprocket and front drive chain (par. 65).

(5) Remove the two mounting screws and locks in engine case to free inner front chain guard.

(6) Remove tool box from mounting bracket (par. 106). Remove bracket from frame.

(7) Remove rear brake rod (par. 96).

(8) Remove rear drive chain (par. 63).

(9) Remove rear drive chain guard (par. 102). Remove rear chain oiler pipe after disconnecting at oil pump.

(10) Remove battery box (par. 105).

(11) Remove nut, washer, and bolt securing clutch tube assembly bracket to frame bracket on right side of vehicle. Disengage clutch operating cable end from end of clutch release lever and remove cable and tube assembly.

(12) Remove gear shifter rod by disconnecting at hand shifter lever and at transmission gear shifter lever.

(13) Remove the three transmission mounting stud nuts, then remove lock washers and large plain washers (located under frame bracket), and lift transmission sufficiently to permit removal of front chain adjusting screw.

(14) Loosen upper U-bolts on ignition coil mounting, then remove the lower U-bolt nuts and shift coil on frame tube as far as possible toward the front.

(15) Remove transmission and clutch assembly from vehicle by lifting complete unit sufficiently to free mounting studs from frame bracket; then rotate top of transmission backward about ¼ turn (fig. 34) and remove unit from left side of frame (fig. 35).

58. INSTALL TRANSMISSION (figs. 34 and 35).

a. Install from Left Side. Working from left side of frame, tilt top of transmission backward, and as unit passes into position, rotate top forward, until unit is squarely in position and mounting studs pass through slots in frame mounting bracket.

(1) Shift ignition coil mounting back into correct position and tighten U-bolt nuts.

Figure 35—Disassembly for Transmission Removal from Left Side of Vehicle

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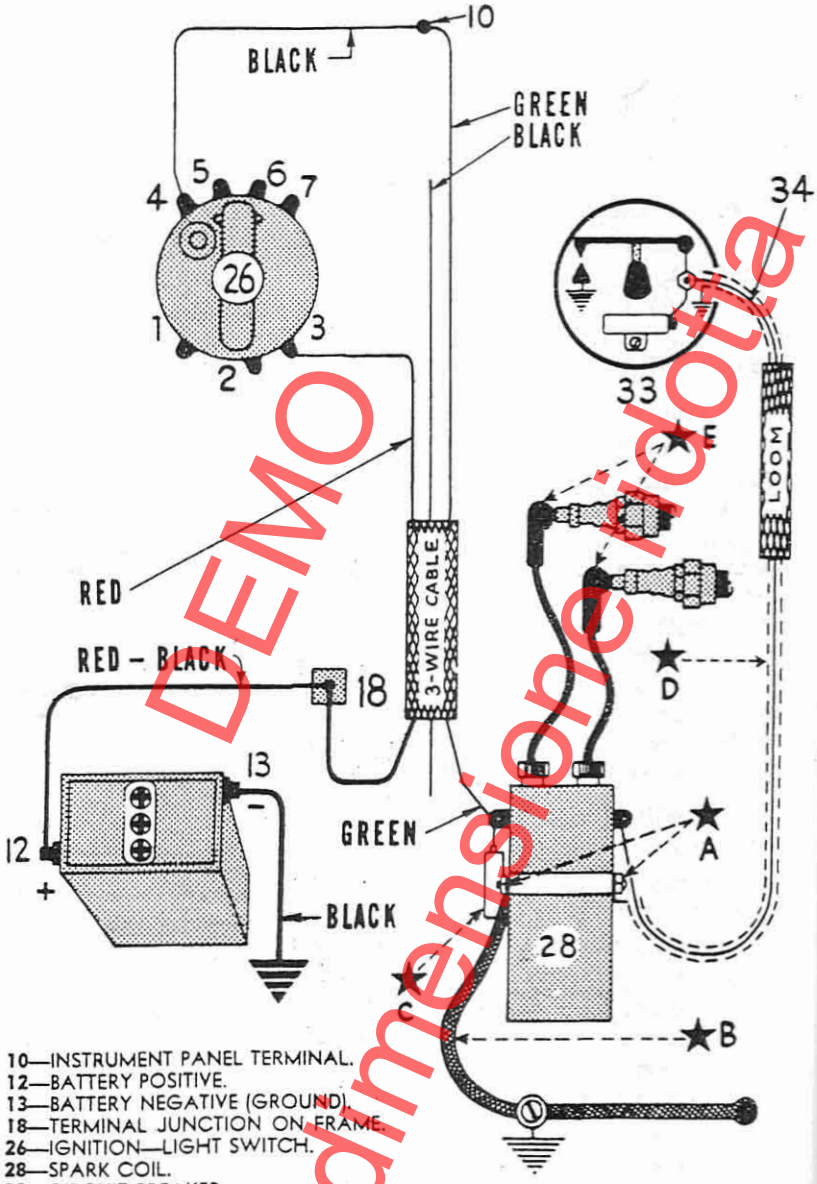

10—INSTRUMENT PANEL TERMINAL.
12—BATTERY POSITIVE.
13—BATTERY NEGATIVE (GROUND).
18—TERMINAL JUNCTION ON FRAME.
26—IGNITION—LIGHT SWITCH.
28—SPARK COIL.
33—CIRCUIT BREAKER.
34—COIL TO TIMER WIRE.
*A—RADIO BOND, COIL TO TIMER WIRE.
*B—RADIO BOND, COIL TO ENGINE.
*C—NOISE SUPPRESSION CONDENSER.
*D—SHIELDED COIL TO TIMER WIRE.
*E—SPARK PLUG SUPPRESSORS.

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Figure 48—Ignition to Battery Wiring Diagram

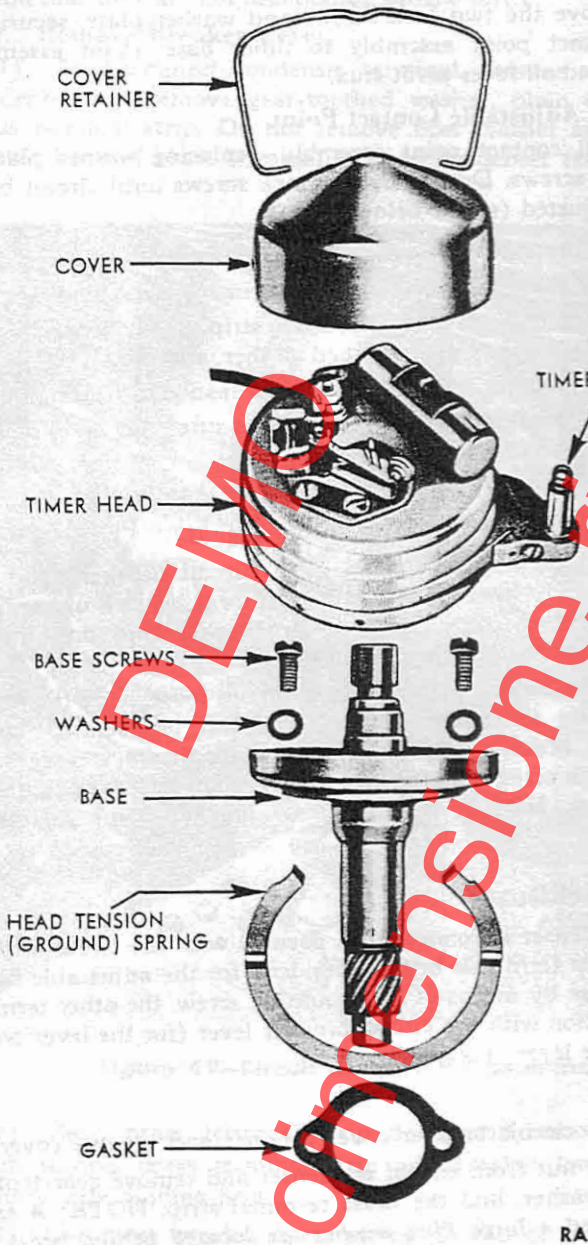
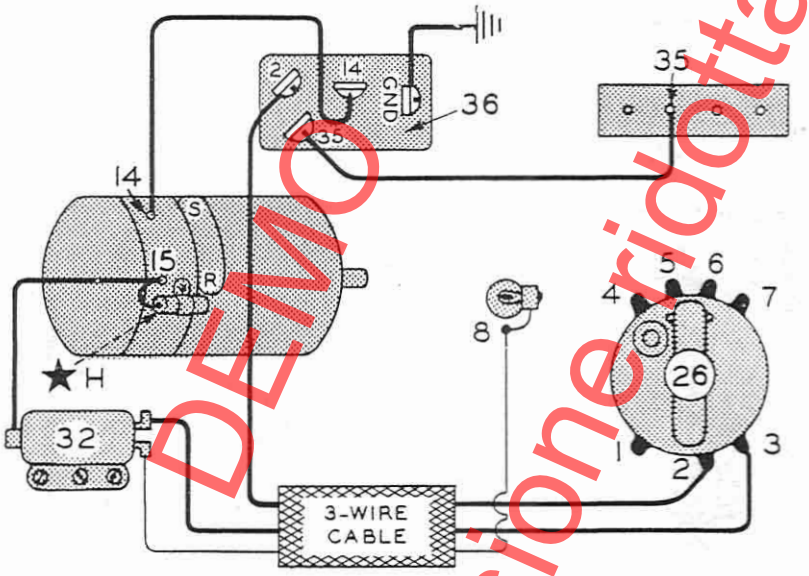


Figure 50—Circuit Breaker (Timer), Disassembled

c. **Stop and Taillight Switch.** This switch is operated by brake pedal and is located on end of rear support rod on right side of vehicle. Refer to wiring diagram (fig. 73) and paragraph 118 for wiring connections.

116. IGNITION AND LIGHT SWITCH.

a. Earlier models are provided with lock, later models are non-locking.



8—GENERATOR SIGNAL LIGHT.
14—GENERATOR TERMINAL TO SWITCH.
15—GENERATOR TERMINAL TO RELAY.
26—IGNITION-LIGHT SWITCH.
32—RELAY.
35—TERMINAL STRIP BINDING POST.
36—MAGNETIC SWITCH FOR BLACKOUT LIGHT.
*H—NOISE SUPPRESSION CONDENSER.

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Figure 77—Blackout Headlight Magnetic Switch on Later Models

b. **Remove.** Disconnect battery ground wire. Remove instrument panel cover (par. 119). Disconnect all wires from switch. Remove the four switch mounting screws and spacers. Switch is now free for removal.

c. **Install.** Mount switch on instrument panel base. Install four screws and spacers. Connect wires (fig. 73). Connect battery negative ground wire to frame. Turn switch on. Check lights and horn, tactical situation permitting. Install instrument panel cover (par. 119).

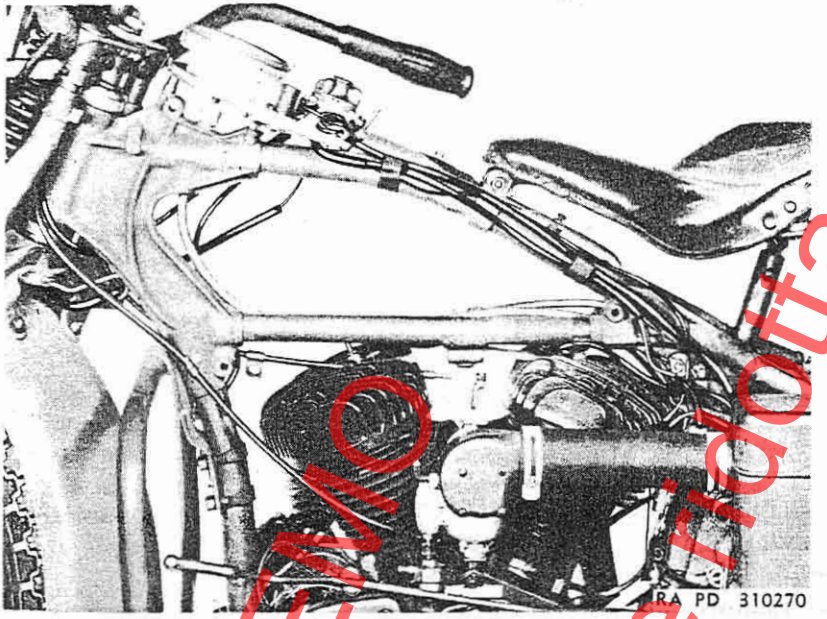

Figure 78—Wiring Cables, Left Side

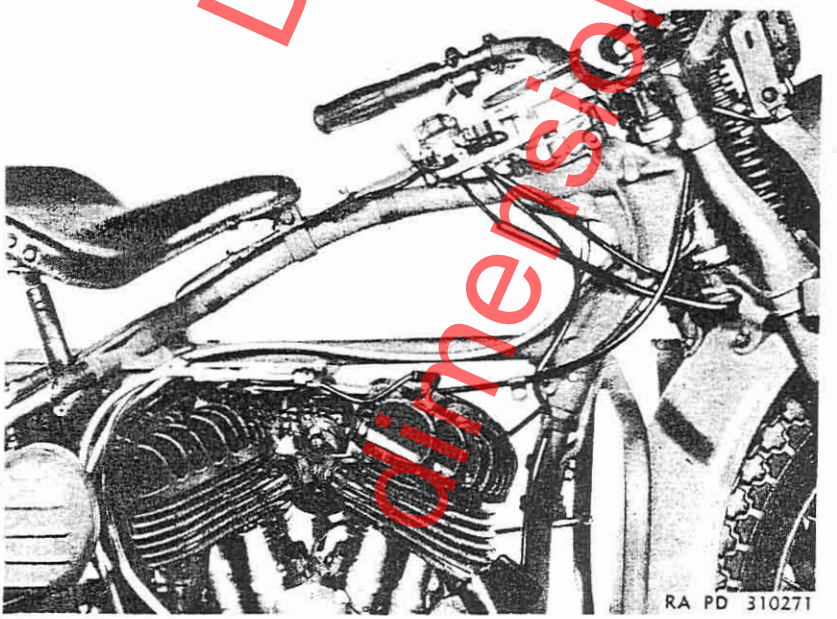

Figure 79—Wiring Cables, Right Side

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117. HORN.

a. Description. Horn is mounted to headlight bracket by means of four bolts, lock washers, and nuts. One horn terminal is connected with operating button, and other terminal is connected to No. 4 ignition and light switch terminal (fig. 73).

b. Adjust. Tone adjusting screw is located in rear side of horn. If horn fails to operate and moving the adjusting screw does not remedy the trouble, horn must be replaced. NOTE: *Do not change position of the adjusting screw located in center of diaphragm.*

118. WIRING.

a. Cable System. Since ignition and lights are controlled by the ignition and light switch, all wires terminate at the ignition and light switch. Cables for wire protection are used, making it necessary to replace cables rather than individual wires. A study of figure 73 will be helpful when removing or installing any of the wiring cables. Also study figures 78 and 79 and note how cables are arranged on frame, and how they lead to the switch panel.

b. Remove and Install Cables. When it becomes necessary to replace wiring cables leading to the ignition and light switch, both fuel and oil tanks must be removed (par. 107) and instrument panel cover removed (par. 119) for accessibility.

Section XXIV

INSTRUMENT PANEL

119. PANEL COVER (fig. 80).

a. Remove. Remove speedometer light switch knob and remove screw. Remove hexagon-head screw on front of cover. Remove two screws from side of cover. Remove two screws and washers which fasten plate to right side of cover. Lift cover off panel.

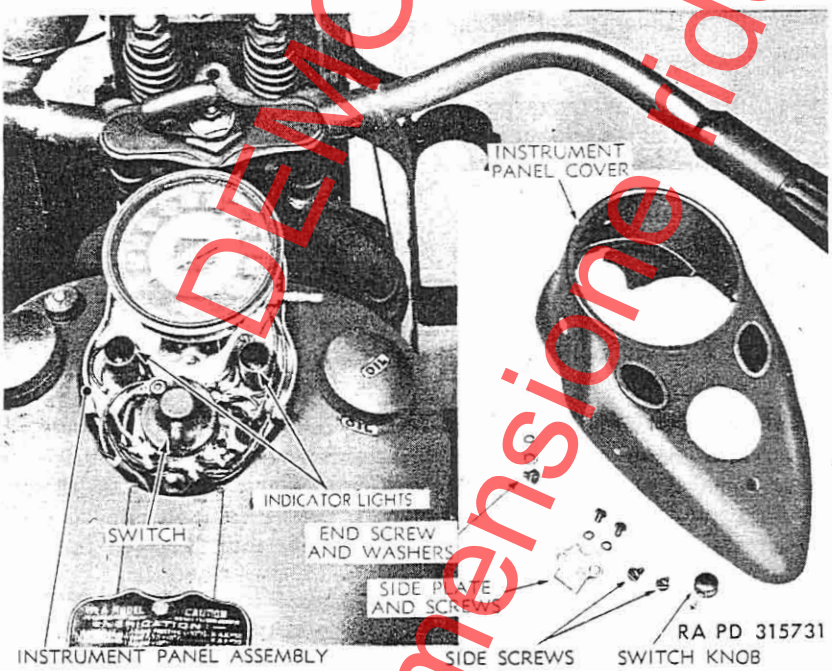

Figure 80—Panel Cover Removed

b. Install. Position cover on panel. Install two side mounting screws and washers and install hexagon-head screw, plain washer, and lock washer in front end of cover. Attach cover side plate, installing two screws and washers. Install speedometer light switch knob and screw.

120. INDICATOR LIGHTS.

a. Three 2-c.p. single-contact lamps are located on instrument panel. One for oil pressure (red) indicator light; one for generator-

charge (green) indicator light, and one for speedometer illumination.

b. Remove and/or Install. Remove and/or install panel cover (par. 119).

c. Test Generator-Charge (Green) Indicator Lamp. Disconnect black wire from relay terminal (top terminal at front end of relay) and ground on relay base. Turn ignition and light switch on. Lamp should light. If it does not light, check wire for condition and/or replace lamp after removing panel cover (par. 119).

d. Test Oil Pressure (Red) Indicator Lamp. Disconnect wire from oil pressure switch. Ground the wire on engine. Turn ignition and light switch on. Lamp should light. If it does not light, check wire for condition and/or replace lamp after removing panel cover (par. 119). If lamp and wiring are satisfactory, replace oil pressure switch.

121. SPEEDOMETER HEAD.

a. Remove. Remove instrument panel cover (par. 119). Loosen the two tank front mounting bolts and remove rear mounting bolt to free speedometer cable clamp. Disconnect speedometer cable at drive unit. Free cable from clip located below tool box. Remove two screws which mount head to frame. Pull head upward, working cable forward under tank, until head and cable connection nut is clear of frame. Unscrew cable nut. NOTE: *Cable may be secured to frame tube, between tanks, with friction tape. If so, cut tape.*

b. Install. Attach speedometer head to cable end and tighten nut. Pass cable down into frame hole, pulling on rear of cable at same time. Mount speedometer head to frame with two screws and lock washers. Install panel cover (par. 119). Secure cable clamp under head of tank rear mounting bolt. Secure cable in clip, located under tool box. Attach end of cable to drive unit. Tighten the two tank front mounting bolts.

Section XXV

TIRES, WHEELS, AND HUBS

122. DESCRIPTION.

a. Wheels have drop center rims to accommodate 4.00 x 18 tires. Front and rear wheels are not interchangeable. Front wheel hub is of ball-bearing design, having cone adjustment similar to that of a bicycle hub. Rear wheel hub is of roller-bearing design and must be taken apart for adjustment. Both wheels have "knock-out" type axles.

123. TIRES.

a. **Description.** Wheel rims are of the drop-center type, having a depression, or well, in center of rim. The rim well, being smaller in circumference than the rest of the rim, allows one casing bead to fit loosely in it while other bead is being worked over edge of rim. Bear in mind the importance of keeping one bead in rim well while other bead is being worked onto or off rim. NOTE: *It is not always necessary to completely remove casing from rim. Removing one side only allows inner tube to be removed and reinstalled, and also allows inside of casing to be inspected.*

b. **Remove.**

(1) Remove wheel from vehicle and lay wheel on its side. To remove front wheel, refer to paragraph 125. To remove rear wheel, refer to paragraph 127.

(2) Remove valve cap and valve core to free all air from tube.

(3) Press casing head into rim well to within a short distance of each side of valve.

(4) Using tire iron "B" in vehicle kit (fig. 11), start bead over edge of rim at valve. Do not use force when starting bead over edge of rim with tire iron, because bead wires may be broken or stretched, and tire ruined. With first bead in rim well, bead on other side can be started easily over edge of rim. After a portion of second bead is started over rim edge, casing can be further removed from wheel without aid of tire iron.

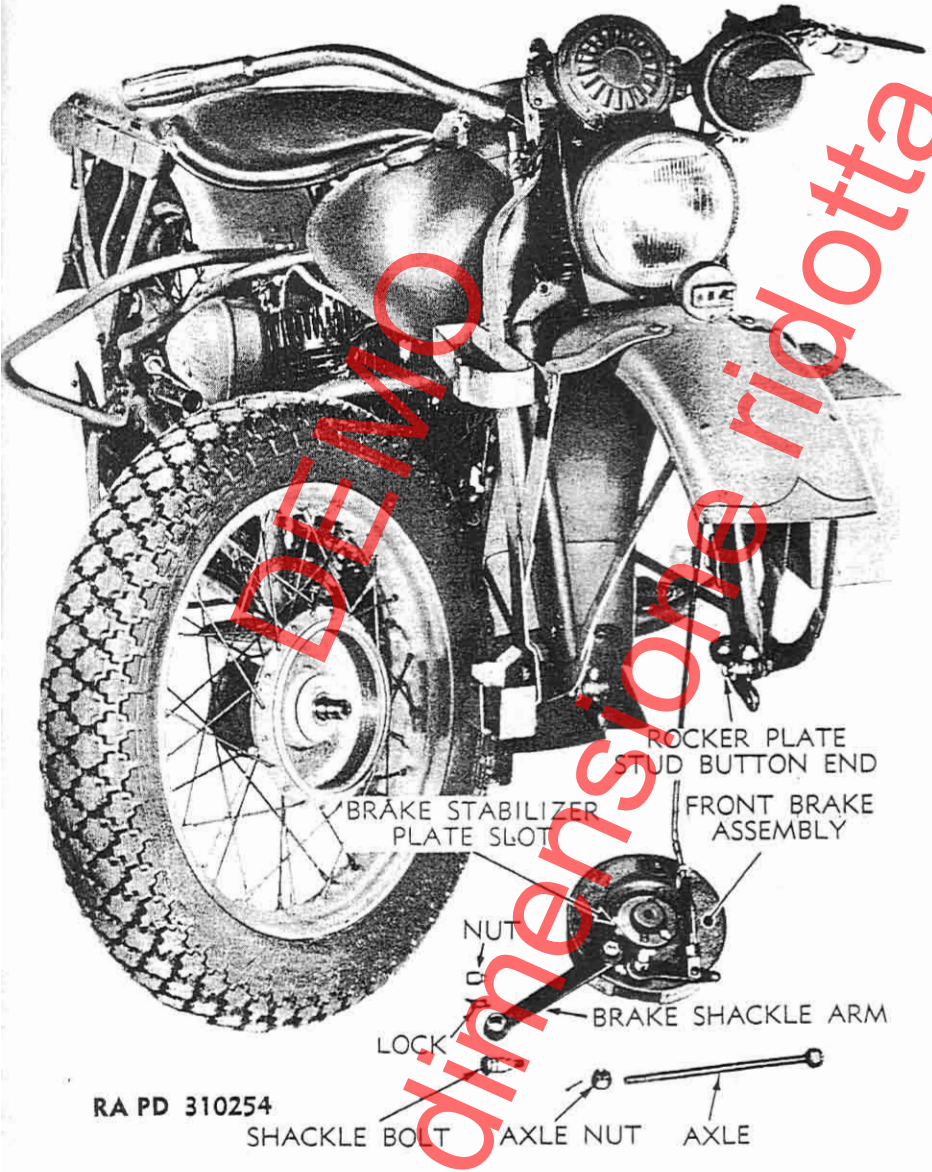

Figure 81—Disassembly for Front Wheel Removal