

Overland

Models 69 and 71 (1913)
Auto-Lite Lighting System
Remy Magneto Ignition

Battery.—Battery is 6 volt, 80 ampere-hour. The two wire system is used.

Ignition.—Magneto breaker contacts should separate .018 inch to .022 inch. Should they become badly burned or pitted, affecting the ignition, resurface with a very fine, flat jeweler's file or a strip of worn No. 00 sand paper.

Timing.—Contacts should begin to separate when the top dead center mark "U. P. 1 and 4" on the flywheel is 1-3/16 inches past the indicator, spark control lever and breaker assembly in the fully retarded position.

Firing Order.—The firing order is 1, 3, 4, 2.

Spark Plug Gaps.—Spark plug gaps should be .020 inch to .025 inch.

Oiling.—Put 4 or 5 drops of light machine oil in each of the magneto bearing oilers every month. At the same time put a very small trace of vaseline on the fiber bumper of the contact arm, applying with a toothpick. If car is driven more than 1000 miles in a month these attentions must be given every 1000 miles.

Starter.—These cars were not equipped with electric starter as standard equipment. If car possesses electric starter, it has been added by the owner.

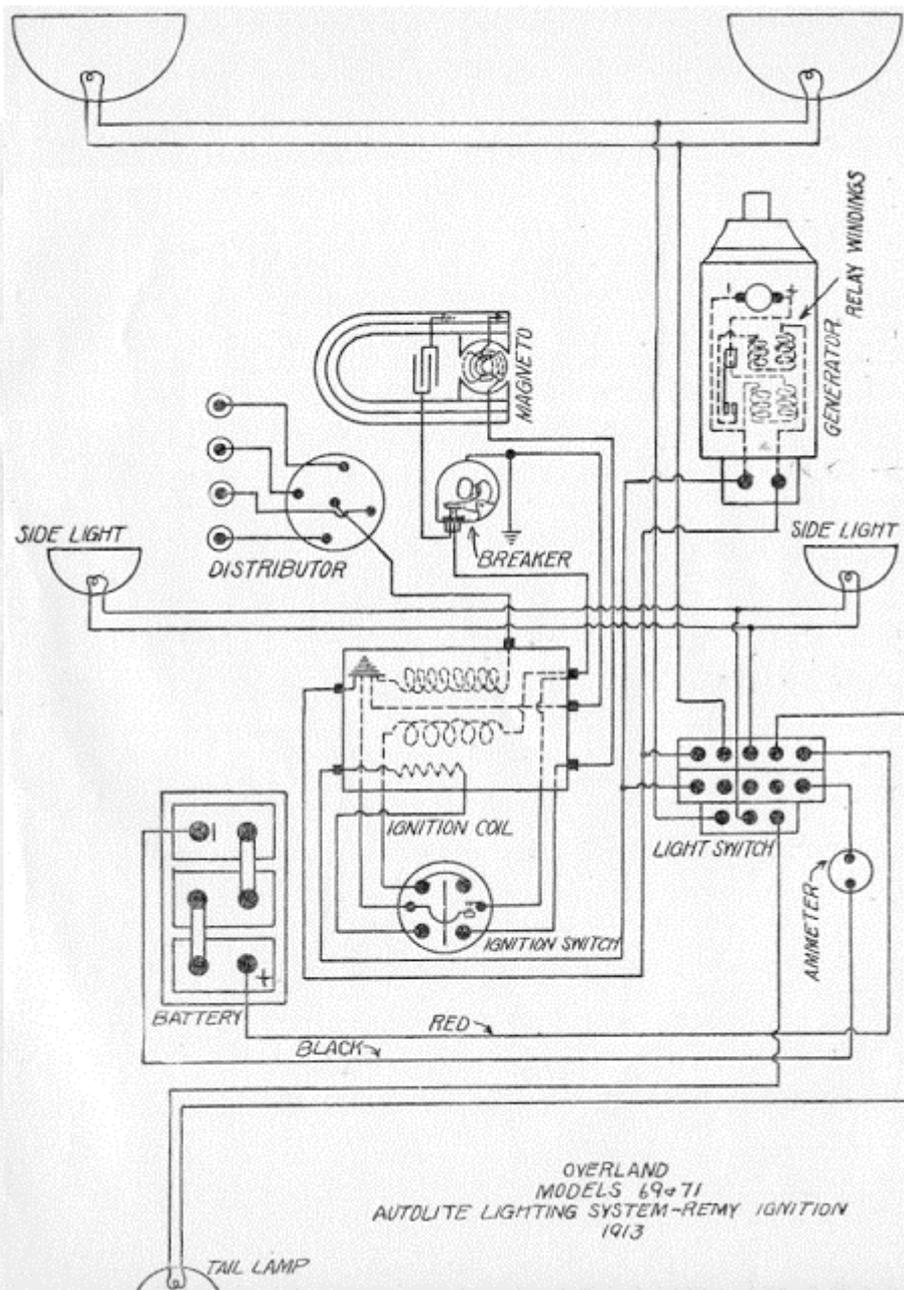
Generator.—The generator is of the permanent field type. Output regulation is by a mechanical governor. With proper adjustment of the governor the maximum armature speed should be 1850 R. P. M., and the output 12 amperes. The generator should deliver 5 amperes at 1100 R. P. M., and 10 amperes at 1620 R. P. M. If output falls considerably below 12 amperes, first clean out any oil or grease which may have collected within the governor drum. If that does not increase the output, move the weights on the governor arm inward until the desired output is obtained.

Oiling.—Generator bearings are packed with soft cup or ball bearing grease. They should be thoroughly cleaned out and repacked with grease every six months.

Relay.—Relay is mounted under the arch of the generator magnets. Relay should close at 800 R. P. M. of generator armature. Charging current should be .5 to 1.5 amperes at closing, and discharge current 0 to 1 ampere at opening of relay contacts. The relay may be removed from the generator for adjustment by removing the brush covers, taking the leads off the brush connections, taking out the screws in the end plate that carries the generator terminals, and then drawing the relay and the brush leads out from under the magnets. Clean relay contacts by drawing a piece of unglazed paper between them. If badly burned or pitted, resurface with a piece of well worn No. 00 sand paper, drawing a piece of unglazed paper between them to remove all grit. Adjust before again putting into service.

Lamps.—Head lamps are 6-7 volt, 5 cp. Side lamps are 6-7 volt, 4 cp. Dash lamp is 6-7 volt, 2 cp. Tail lamp is 6-7 volt, 2 cp.

Model Number.—Generator is No. C-60.



Overland

Model 79B (1914) (Serial Nos. 1-45006)
Gray and Davis Starting and Lighting System

Battery.—Battery is 6 volt, 85 ampere-hour. The positive (+) terminal is grounded at the starting motor.

Ignition.—Breaker contacts should separate .025 inch. Should they become badly burned or pitted, resurface with a very fine flat jeweler's file or a strip of worn No. 00 sand paper.

Timing.—Timer contacts should begin to separate when the mark "U-P 1 and 4" on the flywheel is 1-3/16 inches past the indicator, spark control lever and breaker assembly in the fully retarded position.

Firing Order.—The firing order is 1, 3, 4, 2.

Spark Plug Gaps.—Spark plug gaps should be .020 inch to .025 inch.

Oiling.—Put 2 or 3 drops of light machine oil in each of the magneto oilers every two weeks. At the same time put a very small amount of vaseline on the cam, applying with a toothpick. If car is driven more than 500 miles in two weeks, these attentions must be given every 500 miles.

Starter.—Starter is chain connected to the engine crankshaft. There is an overrunning clutch to prevent engine driving starter. Starter should take 100 amperes at 6 volts when armature is revolving at 3600 R. P. M. Greater current indicates damp, grounded or short circuited windings or commutator bars, or tight bearings. Discharged, dry, or sulphated battery, defective battery connections, defective switch contacts, defective starter connections, dirty commutator, high mica, dirty or sticking brushes, defective connections between armature coils and commutator bars or open circuits are the chief causes of low speed and low current. The clutch is shown in cross section in Fig. 2, Page 188. To disassemble clutch, first remove screws "Z", then remove screws "D", take off retainer "C", remove nut and cotter pin "G", take off retaining washer "X", remove screws "F" remove entire clutch mechanism in direction indicated by arrow "J", remove clutch center "A", remove ball bearing "S", remove ball bearing seat "W" and remove retaining Plate "E".

Oiling.—Bearings are packed with grease. They should be cleaned out and repacked with grease every six months. Put several drops of light engine oil in each of the clutch oilers every week.

Generator.—Generator regulation is by speed regulating governor. As the armature shaft rotates, the weights are thrown out from the center, partially overcoming the spring pressure, thus lessening the friction between the driving and driven discs. As this action is directly proportional to the speed, the armature speed and voltage are held practically constant after a certain predetermined rate is reached. The clutch should be so adjusted that the armature will be driven at 1250 R. P. M., engine running at the equivalent to 10 miles per hour car speed. Generator should deliver 8 amperes at 6.5 volts when running at this speed (1250 R. P. M.). To adjust regulator, first remove cover (No. 1, Fig. 1), then loosen screw (No. 4, Fig. 3) one full turn. Then insert two screwdrivers on opposite sides of shaft, just back of block (See Fig. 4), compress spring and tighten set screw. Bringing governor springs up 1/16 of an inch will increase output 2 amperes. Engine and generator should be normally warm from operation when governor is adjusted. Generator and governor are shown in cross section in Fig. 1. As these machines have all been in use for a number of years, the governor parts on some machines have worn out, or are otherwise in an unsatisfactory condition. If it is not desired to keep up the governor, the machine can easily be changed into a reverse series field regulated type. As machine is built, it charges the battery as a straight shunt generator, compounding only when lights are turned on, the current through the series field tending to increase the output.

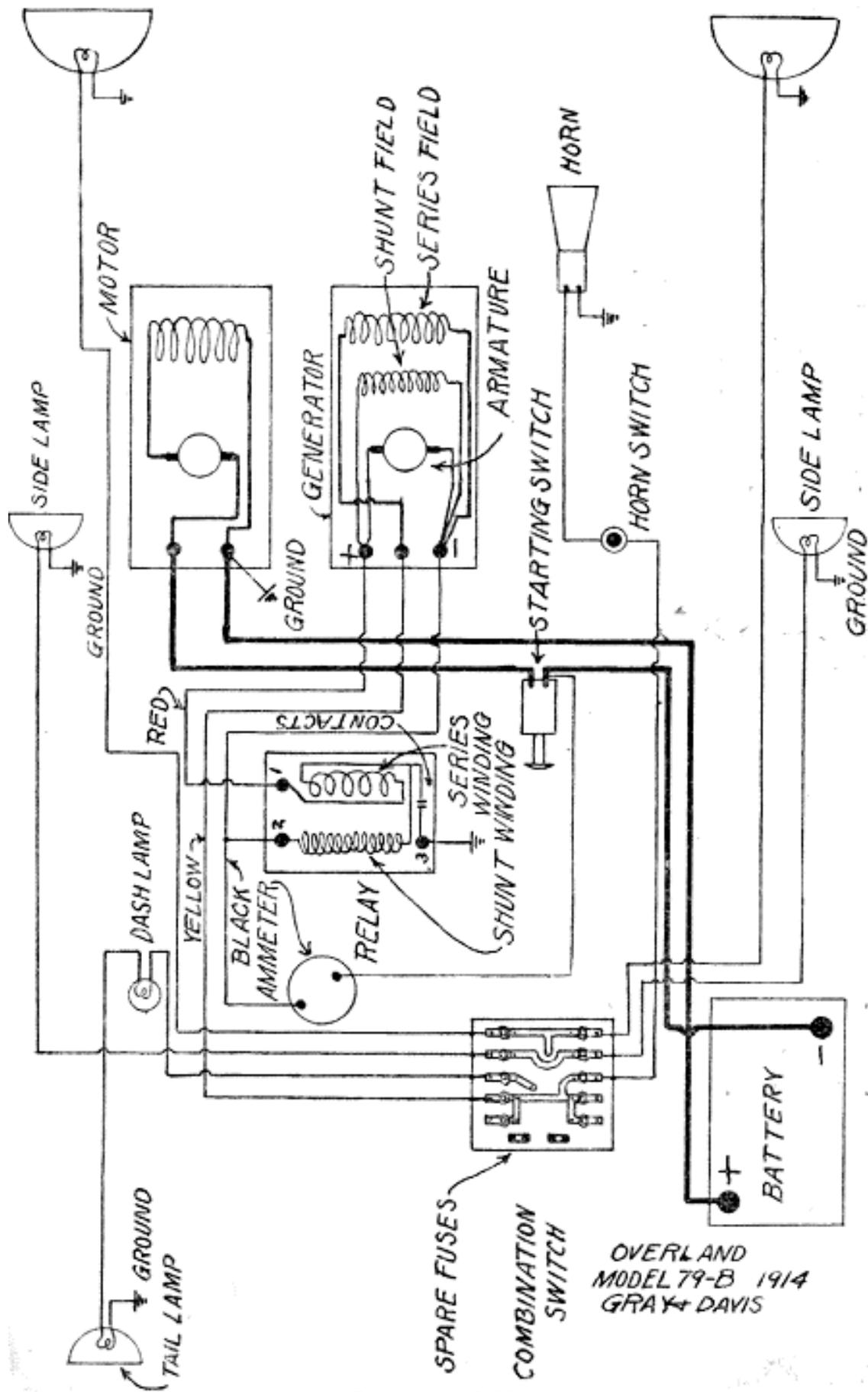


PLATE No. 187

Connections of machine as originally wound are shown in Fig. 5. To make the change it will be necessary to provide a means of connecting the armature permanently to the driving shaft. Then remove the series field lead from the negative terminal and connect it to terminal A (Fig. 6). The central post now becomes the positive terminal of the generator, and the lead to the series winding of the relay is changed accordingly. The lead to the lighting switch should then be moved to the negative terminal. It will be noted that there are no external connections to the terminal A. A resistance unit must then be inserted in the shunt field circuit. Use iron resistance wire for this resistance. The exact amount is best determined by experiment as it will vary with the size and kind of wire used. Increasing the length or decreasing the size will decrease the output. Decreasing the length or increasing the size will increase the output. The turns of the coil must be separated so that no two turns touch and well insulated so that it cannot "ground" on any of the metal parts of the machine. It must be secured firmly in place so that it cannot move about due to road shocks. Charging rate should be 3 to 7 amperes at, or more than, 12 miles per hour, lamps off, depending on the state of charge of battery being high when battery is badly discharged and low when battery is nearly or fully charged. Relay should close at 10-12 miles per hour. Clean relay contacts by drawing a piece of unglazed paper between them. If badly burned or pitted, resurface with a piece of well worn No. 00 sand paper, drawing a piece of unglazed paper between them and adjusting before again putting into service.

Oiling.—Oil the driving chain well and put several drops of light engine oil in each of the bearing and clutch oilers every two weeks. If car is driven more than 500 miles in two weeks the oiling must be done every 500 miles.

Lamps.—Head lamps are 6-8 volts, 15 cp. Side lamps are 6-8 volts, 4 cp. Dash and tail lamps are in series. They are each 3-4 volts, 2 cp. All other lamps are 6-8 volts, 4 cp. Single contact base is used on all lamps.

Fuses—Lighting fuses are 10 ampere.

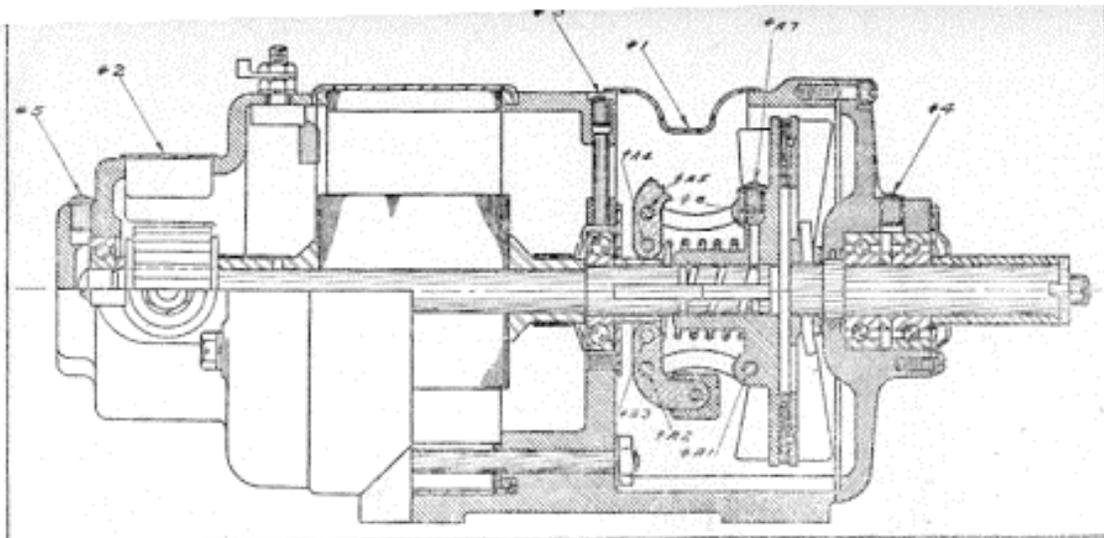


Fig. 1

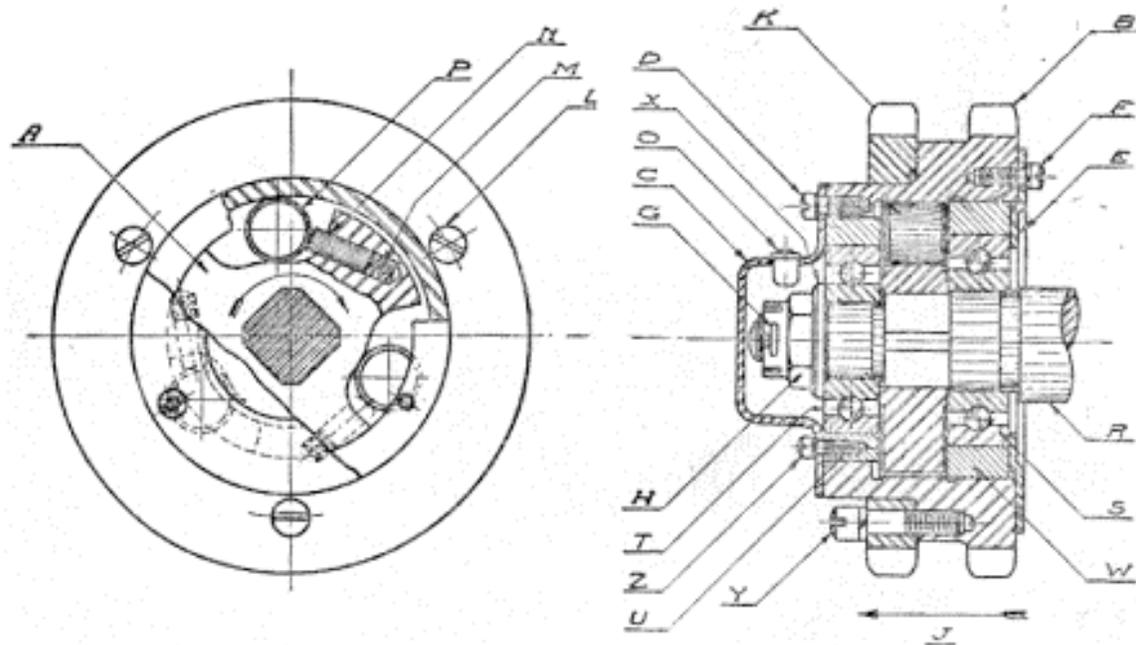


Fig. 2

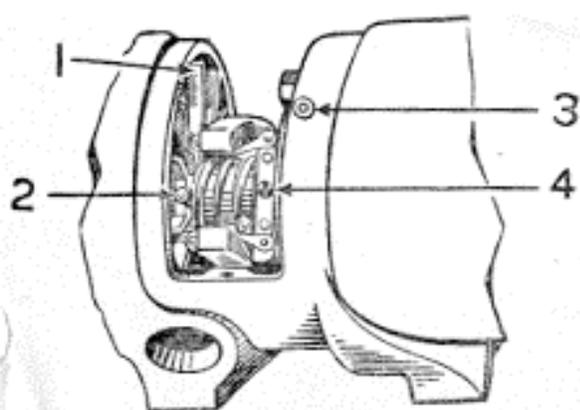


Fig. 3

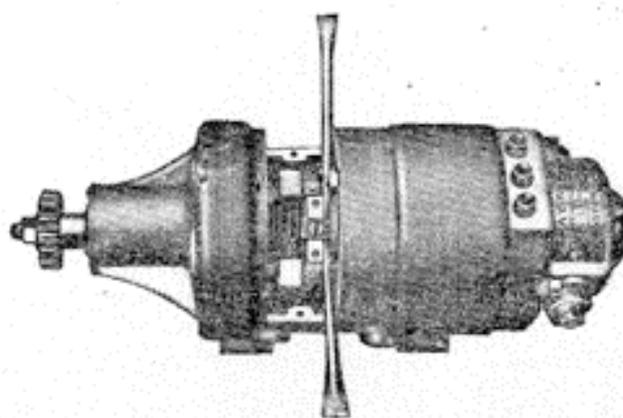


Fig. 4

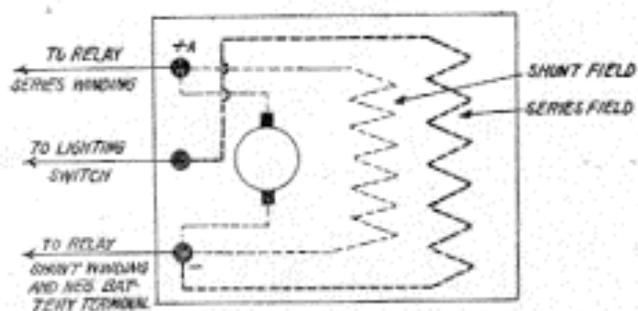


Fig. 5

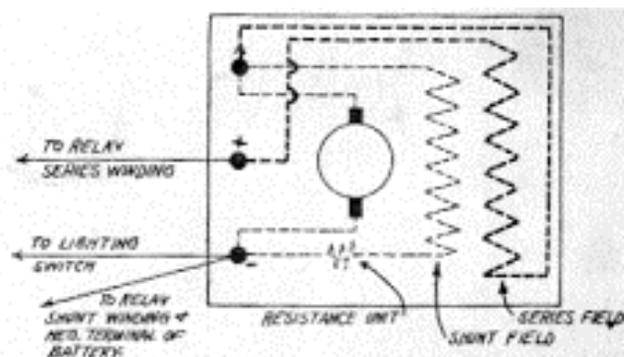


Fig. 6

Models 80, 81 and 82 (1915)
Auto-Light Starting and Lighting System
Dixie Magneto Ignition

Battery.—Battery is 6 volt, 100 ampere-hour. The negative (—) terminal is grounded at the starting motor.

Ignition.—Breaker contacts should open exactly .020 inch. When necessary, resurface contacts with a fine flat jeweler's file, or a strip of worn No. 00 sandpaper.

Spark Plug Gaps.—The spark plug gap must be the same (.020 inch). It is very important that these distances be exact, as this car is especially sensitive to improper gaps.

Magneto is treated on Page 189. Starting is aided by making the ignition system duplex. See Page 51.

Timing.—Contacts should begin to separate when the top dead center mark, "U.P. 1 and 4" or "U. P. 1 and 6," is $1\frac{1}{4}$ inches past the indicator, spark control lever and breaker assembly in fully retarded position.

Firing Order.—The firing order of the four cylinder cars is 1, 3, 4, 2. The firing order of the six cylinder cars is 1, 5, 3, 6, 2, 4.

Oiling.—Fill magneto oil cups every month. At the same time put a drop of light machine oil on the breaker contact lever bearing.

Starter.—The starter is connected to the engine by a pinion shifted by the operator on Models 80 and 81. Model 82 is equipped with the Bendix drive. On Models 80 and 81 there is a device mounted on top of the gear housing, to prevent the gears being accidentally meshed when the engine is running, or the starter being used when the lighting switch is locked. This device is shown on next page. When the "Start" button in the lighting switch is pressed, the current flowing through the solenoid produces an electro-magnet, which draws up the iron plunger permitting the depressing of the starting switch on the floor of the car, which in turn meshes the pinion with the flywheel gear and closes the switch contacts. When the "Start" button in the lighting switch is released, the iron plunger is allowed to drop down, locking the main starting switch in the off position. The brown wire coming out of the switch leads to the solenoid. A ground in this wire will cause the solenoid to fail to release the switch.

On Model 82 cars, equipped with the Bendix drive, there is a similar device to lock the starting switch "Off." It operates the same as the one described above. The switch will not operate if the "Start" button is not pressed.

Care.—The rear motor bearing is packed with grease. This grease should be renewed every season. Use soft cup grease in the cup at the gear end. Tighten this cup a turn every week. Do not lubricate the Bendix drive. Keep spiral clean with gasoline. The manually operated, sliding gear, and the flywheel gear on this type, should be cleaned with kerosene and lubricated with a mixture of graphite and oil every month.

Brushes.—Use only the special copper-carbon composition brushes as furnished by the manufacturers. Ordinary carbon brushes will cause trouble.

Generator.—Generator current regulation is by reverse series winding. The diagram shown below applies to the Model GC generator supplied on the Models 80 and 81 cars. The Model GA generator supplied on Model 82 cars does not have the lower field coils.

Output.—The normal generator output at 1800-2000 R.P.M., or about 18 miles per hour car speed, is 14 amperes. Variation in the output can be accomplished by adjusting brush tension. Before changing tension of brushes see that the commutator is clean and the connections are intact.

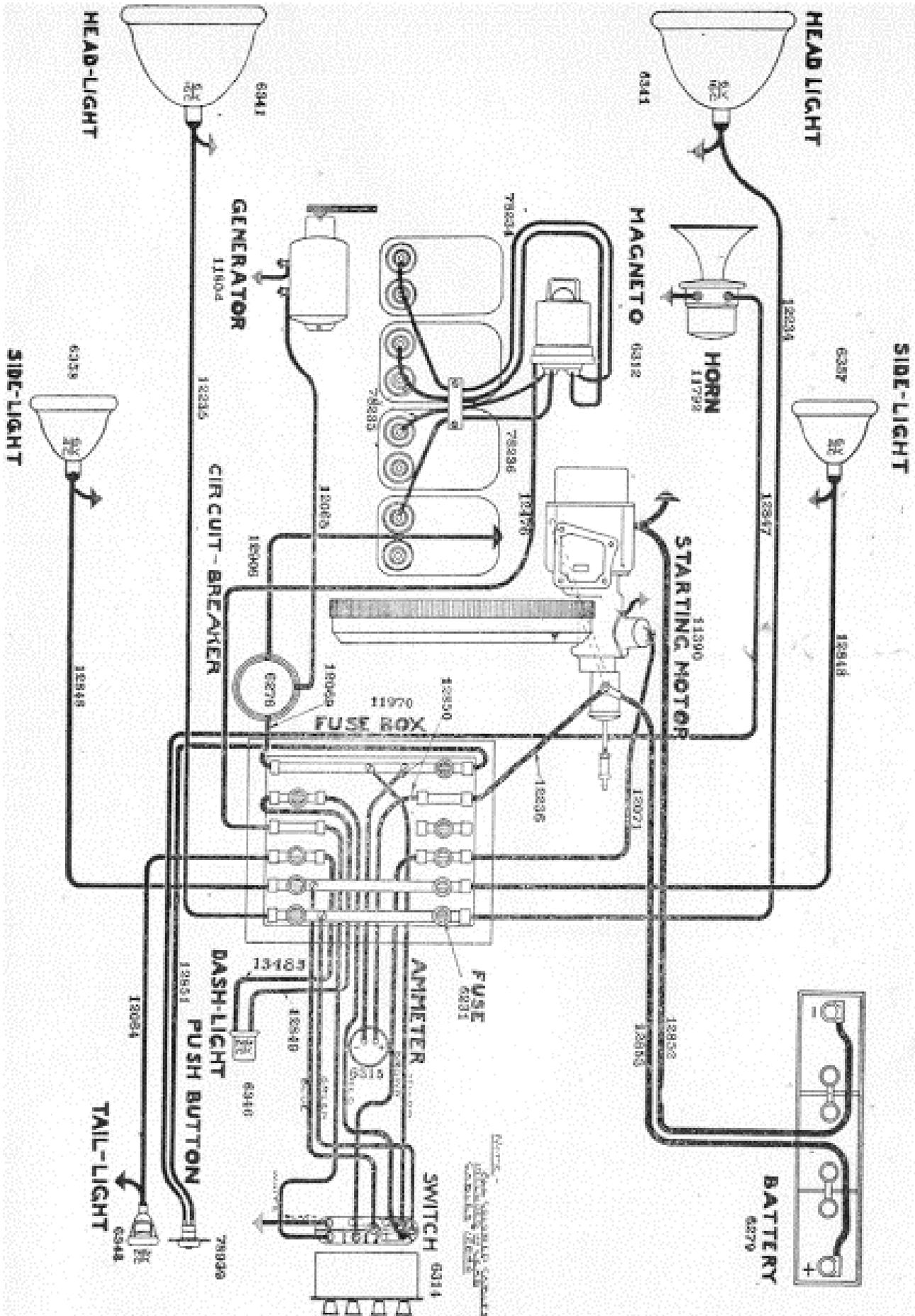
The shunt winding is grounded (through the series winding) at the negative (—) generator terminal.

Tests.—To test shunt field with generator in the car, raise brushes and insert a piece of fiber, dry wood or heavy cardboard between brushes and commutator. Then close relay by touching the contact lever. The ammeter should indicate one ampere. To test armature, remove the driving chain to allow generator to run free as a motor, and then close relay contacts. The generator on Models 80 and 81 should run at 650 to 750 R. P. M., and take 3 to $3\frac{1}{2}$ amperes if armature is O. K. The generator on Model 82 should run at 275 R. P. M., and take 2 to $2\frac{1}{2}$ amperes.

Relay should close at 8-10 and open at 6-7 miles per hour. If car is operated with relay removed or out of order, the generator terminals must be connected. Service conditions may cause the relay contacts to ground on the metal cover. In such event the cover must be removed and insulated. Clean contacts by drawing a piece of soft paper between them. The maximum charging rate should be 10-12 amperes.

Oiling.—Ball bearings are packed with grease. Put one drop of light engine oil in each of the generator oilers every two weeks to keep grease soft. If the car is driven more than 500 miles in two weeks, the oiling must be done every 500 miles.

Lamps.—Head lamps are 6-8 volts, 15 cp. Dash and tail lamps are in series. They are each 3-4 volts, 2 cp. Other lamps are 6-8 volts, 4 cp.



HEAD LIGHT

SIDE-LIGHT

HEAD-LIGHT

SIDE-LIGHT

BATTERY
6279

STARTING MOTOR
11390

HORN
11798

MAGNETO
6312

GENERATOR
11904

FUSE BOX
11970

CIRCUIT - BREAKER

AMMETER
6314

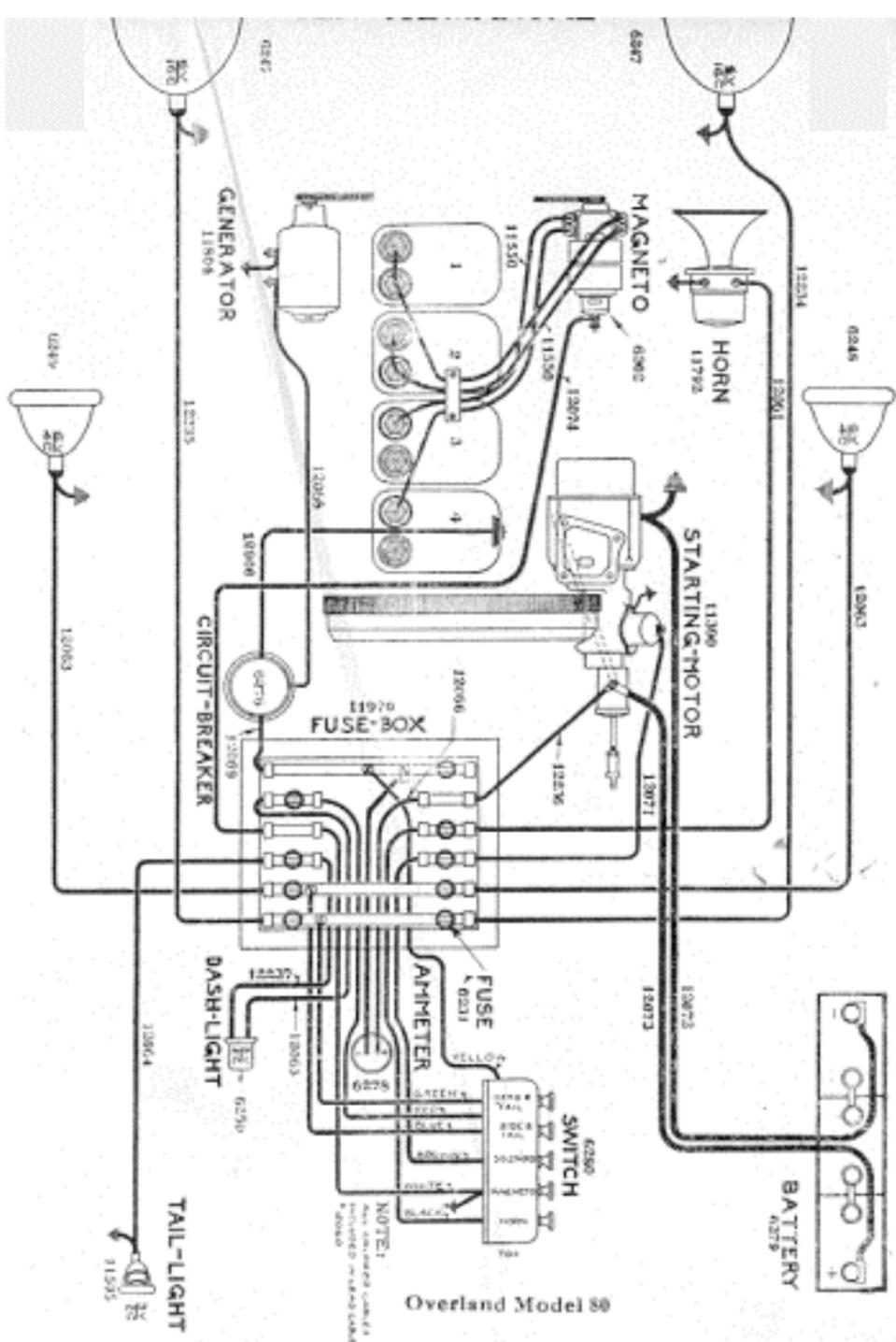
SWITCH
6314

DASH-LIGHT
6310

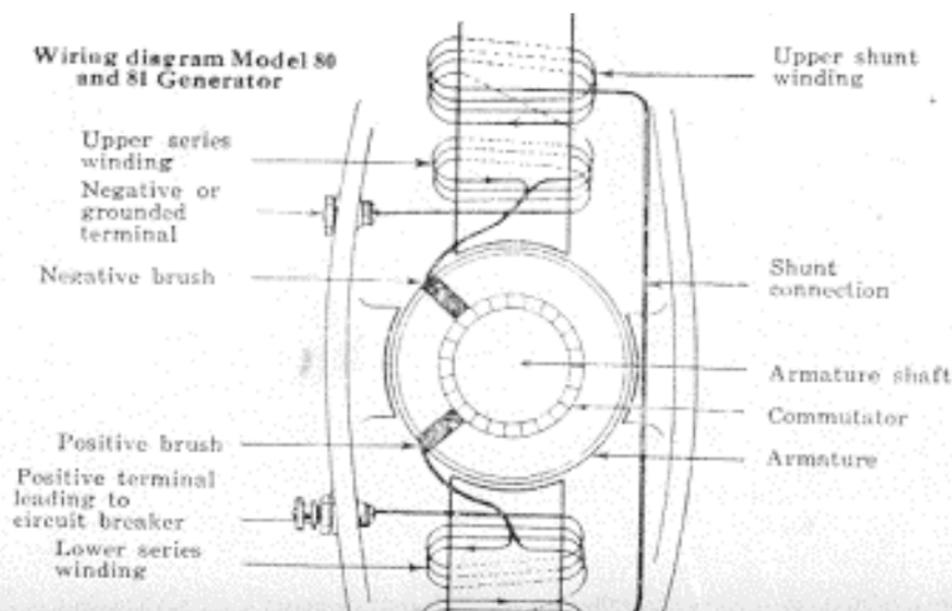
PUSH BUTTON

TAIL-LIGHT
6343

General
Electric
MOTOR
CORPORATION

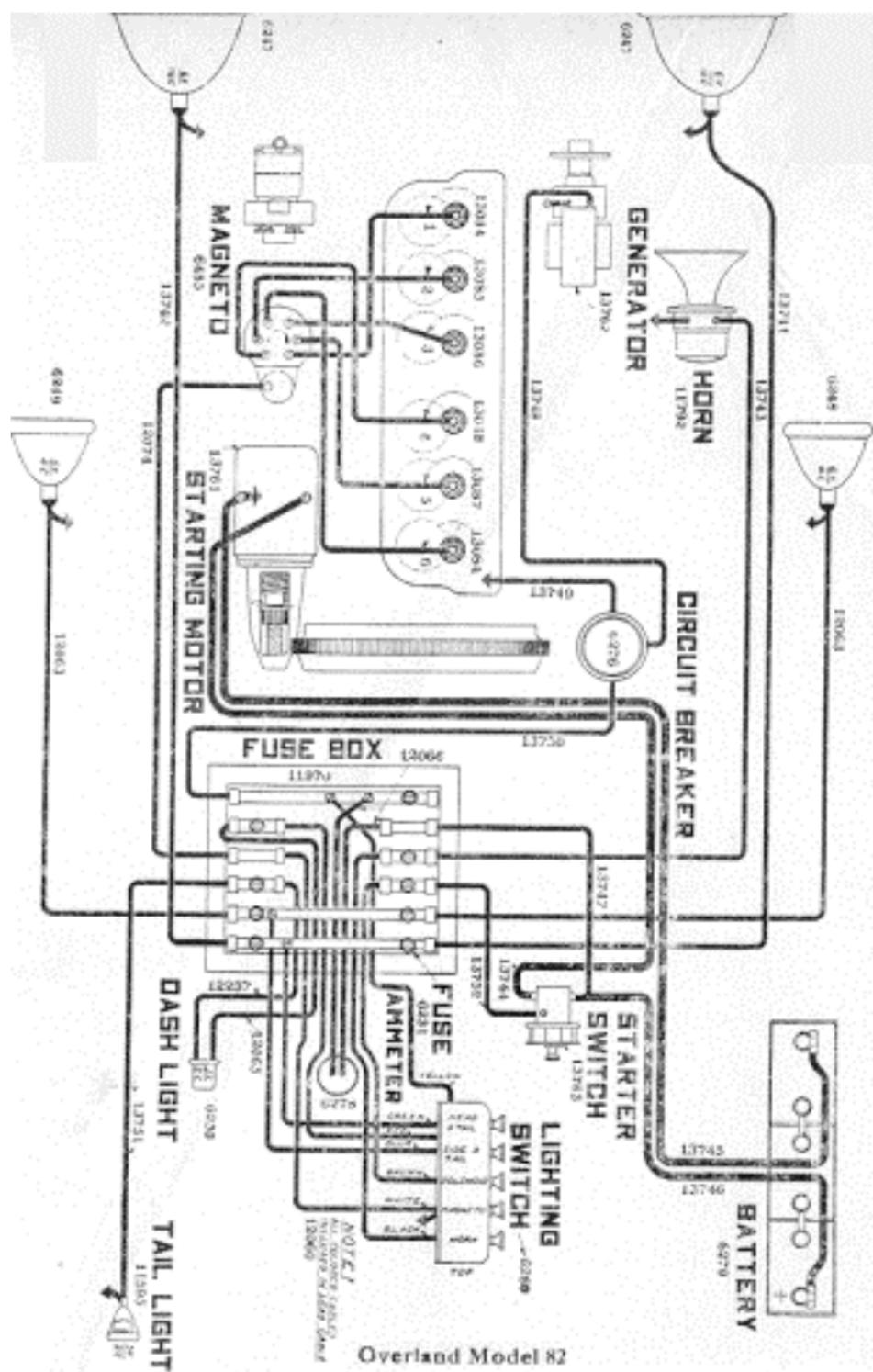
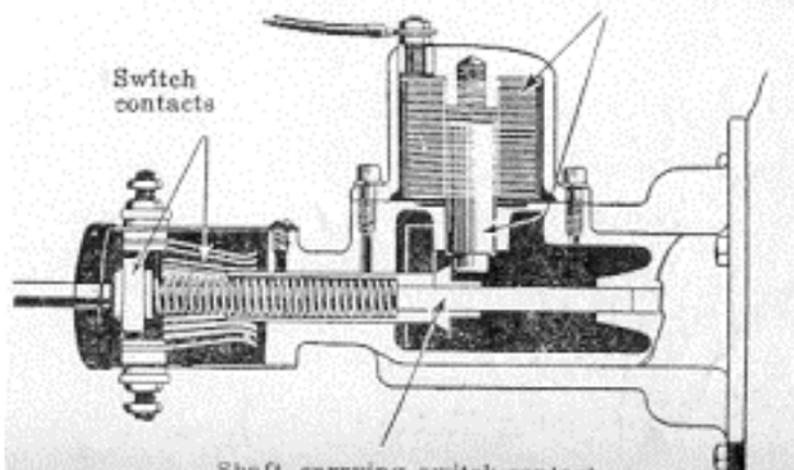


Wiring diagram Model 80 and 81 Generator



Sectional view of Starting Switch and Gear Release. Model 80 and 81

Solenoid-operated gear latch



Overland 75

AUTO-LITE TWO-UNIT STARTING AND LIGHTING SYSTEM

DIXIE MAGNETO IGNITION

Storage battery is 6 volt, 75 ampere-hour. It will supply all the lights bright for 10 hours or all lights, head dim, for 30 hours.

Lubricate magneto every 1,000 miles by putting 1 or 2 drops light oil in holes provided. Break occurs when mark 1-4 UP on flywheel is $1\frac{1}{4}$ in. past indicator, spark fully retarded. Firing order is 1, 4, 3, 2.

Starter is connected to engine by Bendix gear.

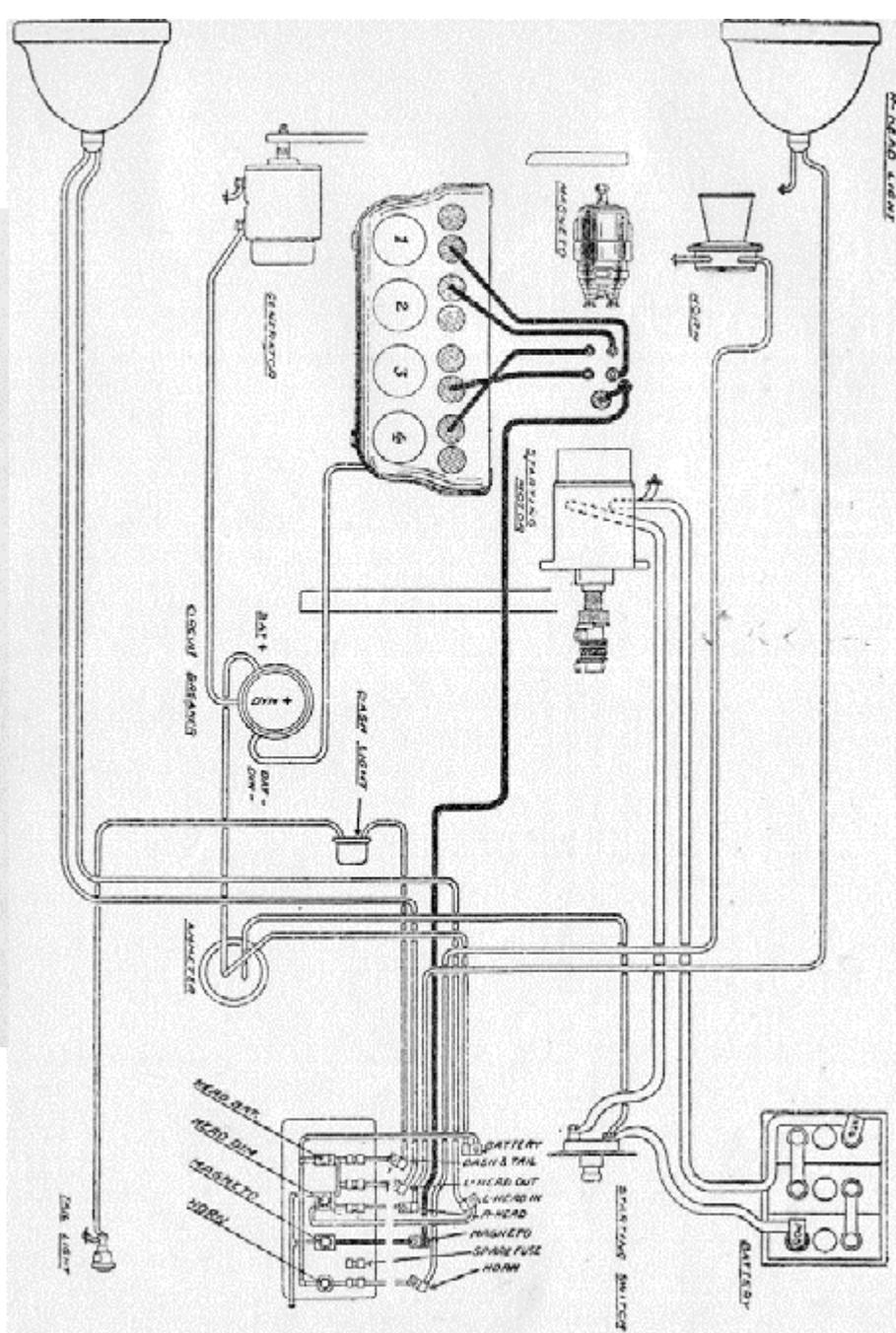
Ammeter shows rate of charge or discharge.

Generator chain driven from crank shaft. Ball bearings are provided. They are packed with grease. Oil with 1 or 2 drops of oil every 1,000 miles. Voltage regulation is by reverse series field. Both brushes must be insulated from frame. Relay closes at $7\frac{1}{2}$ miles per hour. Maximum output of 14 amperes is reached at 20 miles per hour. Output at 15 miles per hour is 10 amperes. Generator must be short circuited if it is to be run with battery disconnected.

Combined ignition and lighting switch is on steering column. (See Plate No. 7.)

All fuses are 20 amperes.

Should the car be hard to start on the magneto, a very small amount of labor will change the magneto to a dual type. To make this change, remove the brass grounding clip which connects the coil winding to the frame of the magneto. Then solder a piece of wire to the upper terminal and run this wire to the negative terminal of the starting switch, taking care to insulate it from the magneto frame and the frame of the car. A ground in this circuit will cause the magneto to fail. When the starting switch is closed the magneto will operate as a dual type, and when the switch is opened it will operate as an independent type, as before the change was made.



Overland

AUTO-LITE TWO-UNIT, 6-VOLT STARTING AND LIGHTING SYSTEM CONNECTICUT BATTERY OR DIXIE MAGNETO IGNITION

Battery is 6 volt, 80 to 120 ampere-hour. The negative terminal is grounded through the starting motor frame.

The spark gap should be about $1/50$ in. The firing order of the Four is 1, 3, 4, 2. Contacts open .020 in. Surface with a fine file. The breaker lever should be lubricated with a drop of light oil every 1,000 miles. The bearings of the magneto are provided with oil cups. Lubricate with a few drops light oil every 1,000 miles. Break should

occur when the mark $\frac{1}{4}$ is $1\frac{1}{4}$ in. past indicator.
U.P.

Lighting and ignition switch is mounted on steering column. Two types have been used. On the new type the circuit is controlled by buttons. (See Plates No. 50, 51 and 7.) On the older type the ignition and lighting circuits are controlled by levers. The lower lever controls the ignition and the upper one the lighting circuit. Horn button is on top of switch box.

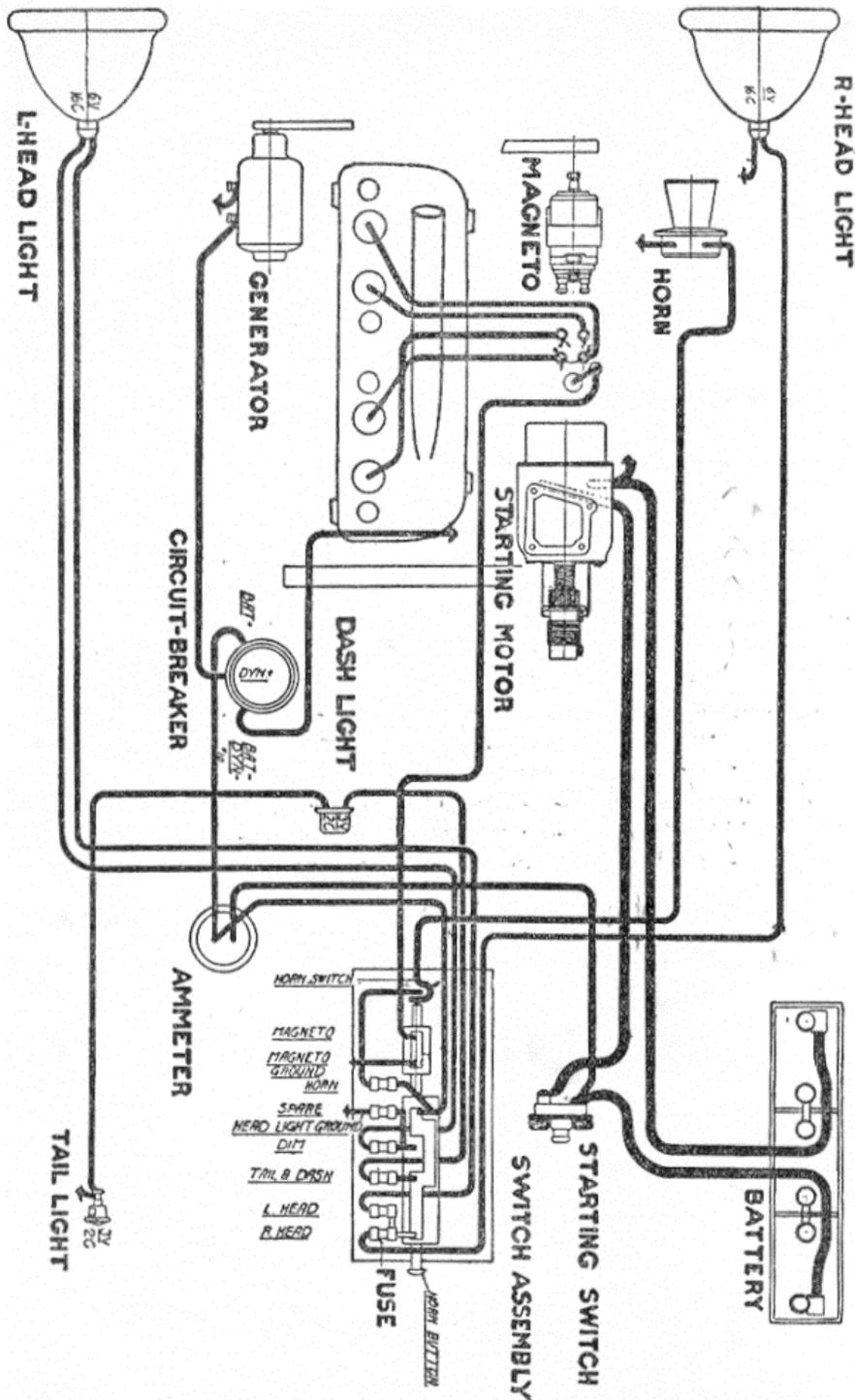
All fuses in light, horn and ignition circuits are 10 ampere.

Ammeter shows rate of charge or discharge.

Starting motor is connected to engine by Bendix drive. Ball bearing on commutator end is packed with cup grease. Use only the special brushes furnished by manufacturer.

Voltage regulation by reverse series winding on older models. Some of the new models have third brush control. Relay closes at $7\frac{1}{2}$ miles per hour. Maximum of 14 amperes is reached at 20 miles per hour. The output at 15 miles per hour is about 10 amperes. If the maximum charging current falls below 10 amperes, increase the spring pressure on the brushes by moving spring to next notch. This procedure is easily understood when machine is seen.

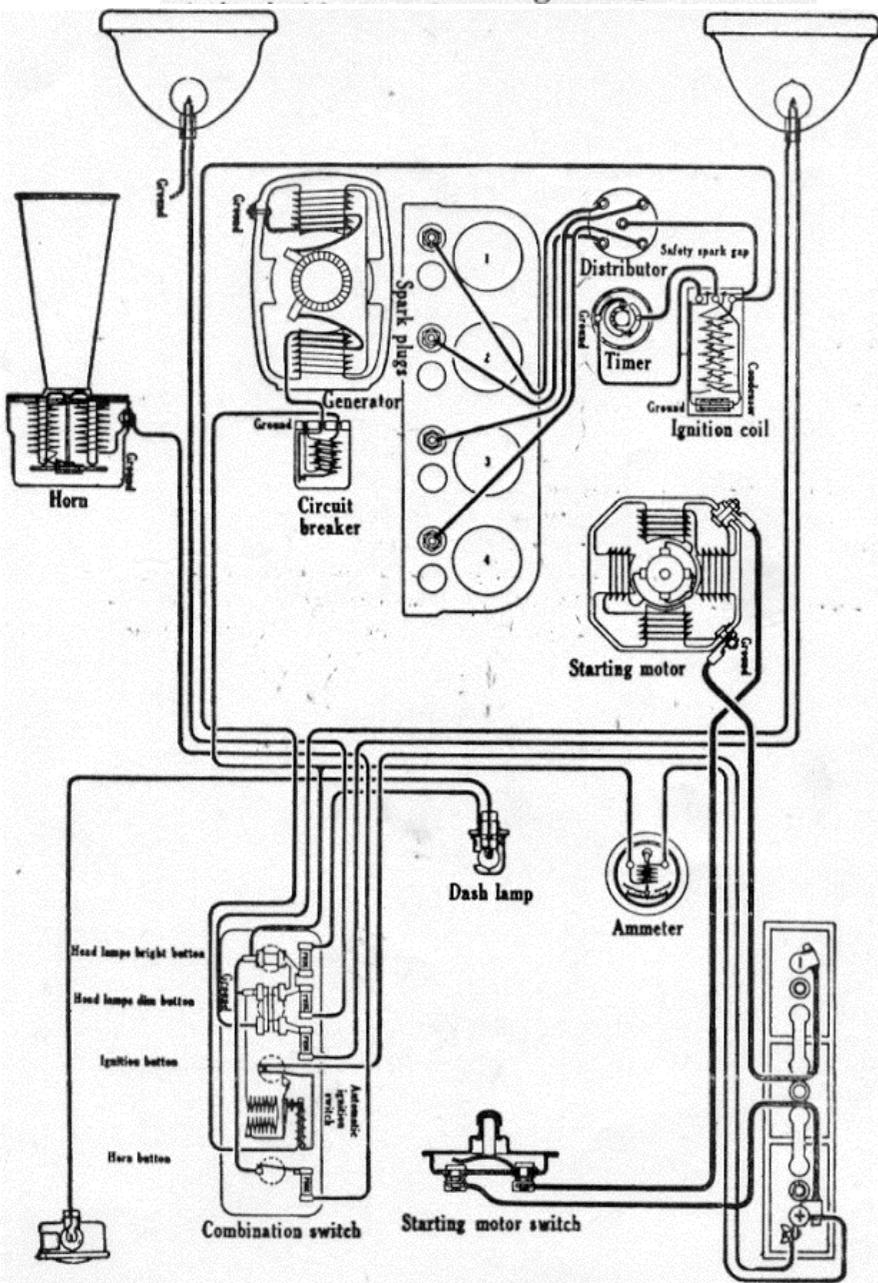
Generator is provided with ball bearings. They are packed with grease. Put in one drop oil every two weeks or 1,000 miles travel, to keep grease soft. Driving chain should be well lubricated with a good grade of lubricating oil. After oil has penetrated to innermost bearings of chain, wipe surplus oil from outside of chain to prevent collection of dust. The chain may need adjustment after the first 1,000 miles travel and every 10,000 miles after that. If it is required more often, see that sprockets are properly lined up and that chain is kept well lubricated and free from dirt. It should have just enough slack that there is no strain on links with engine idle. The chain may be tightened by loosening bolts holding generator and moving generator by adjusting screw on engine side. Both brush holders are entirely insulated from the frame. If generator is to be run with battery disconnected, the generator terminals must be short circuited. Lamp sizes are: Head lamp 6 v., 16 cp.; tail lamp 3 v., 2 cp; dash lamp 3 v., 2 cp. Dash and tail lamps are in series.



Overland

Model 85-4 (1917)

Auto-Lite Starting and Lighting System Connecticut Ignition



Battery.—Battery is 6 volt, 80 ampere-hour. The negative (—) terminal is grounded at the starting motor.

Ignition.—Breaker contacts should separate .016 inch to .018 inch. They are made of tungsten. They will operate properly even though quite rough. Should they become badly worn, affecting the ignition, the inner breaker mechanism should be renewed as directed on Page 50. In an emergency, contacts may be resurfaced enough to give service for 300 or 400 miles by drawing a piece of fine emery cloth between them.

Timing.—Contacts should begin to separate when the mark "1-4 U-P" on the flywheel is 1-1/4 to 1-7/16 inches past the indicator, spark control lever and breaker assembly in the fully retarded position.

Firing Order.—The firing order is 1, 3, 4, 2.

Spark Plug Gaps.—Spark plug gaps should be about .023 inch.

Ignition Cutout.—There is a thermostat in the combination switch to prevent discharging of battery through ignition should the switch be left "On" with engine idle and contacts closed. This device is fully described on Page 41.

Oiling.—Refill the cup under the breaker head with pure vaseline and turn down every month. If car is driven more than 1000 miles in a month, this must be done every 1000 miles. Do not put grease or oil in the cup.

Starter.—Starter is connected to engine through a Bendix drive. When running free, armature should revolve at about 4200 R. P. M., taking 50-55 amperes. Greater speed indicates grounded, short circuited or damp field windings. Greater current or vibrating of the ammeter needle indicates grounded or short circuited armature coils or commutator. Damp armature windings will cause high current or slow speed.

STARTER DATA, MODEL MC

Torque	R. P. M.	Amperes
1 lb. ft.	2650	100
2 lb. ft.	1900	145-150
3 lb. ft.	1000	185-190
4 lb. ft.	1400	225
5 lb. ft.	1250	250-255
6 lb. ft.	1000	290-300

Starter should develop 16 pound-feet lock torque, taking 450-460 amperes at 3.8 to 4.2 volts.

Oiling.—Clean and repack starter bearings with soft cup grease every six months. Put in one or two drops of oil every month to keep grease soft.

Generator.—Generator current regulation is by reverse series field. Relay should close at 8-10 miles per hour or 575-650 R. P. M., of generator armature. Charging current should be .6 to 1.5 amperes at closing and discharge current 0-1 at opening.

Amperes	GENERATOR DATA, MODEL GD	R. P. M.
5.0		800-1000
10.0		1350-1575
12.5		1700-2050
15.0		2250-3300
15-18		3300-3700

A variation of 1.5 amperes from these amounts is allowable. Generator output may be varied slightly by adjusting the brush pressure on commutator. The pressure should be 1-1/4 pounds. Shunt field should take about .8 ampere. If operated freely as a motor, armature should revolve at 450 R. P. M., taking 1.75 amperes. Much higher speed indicates damp, grounded or short circuited field coils. Greater current or lower speed indicates tight bearings, or damp, grounded or short circuited armature windings or commutator. Periodic swinging of ammeter needle indicates grounded or short circuited armature coils or commutator bars.

Oiling.—Put 5 or 6 drops of light engine oil in each of the generator oilers every two weeks. If car is driven more than 500 miles in two weeks, the oiling must be done every 500 miles.

Lamps.—Head lamps are 6-7 volts, 16 cp. Dash and tail lamps are in series. They are each 3-3 1/2 volts, 2 cp.

Fuses.—Fuses are 20 ampere.

Model Numbers.—Generator is Model GD. Starter is Model MC. On early models battery is Willard OHSLB or Prestolite 613 WO2. On the later models U. S. L. type AD-313 battery is used.