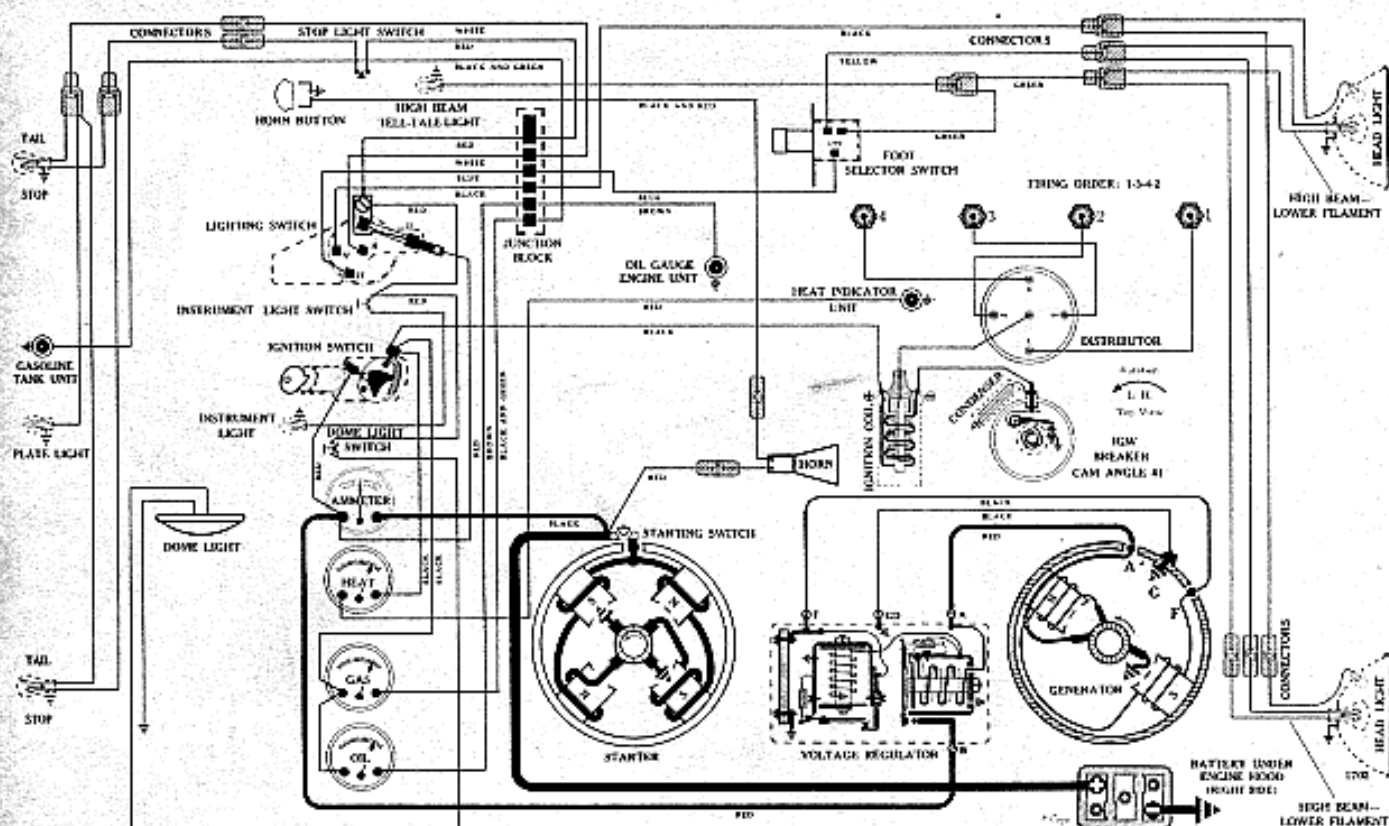


OVERLAND

Engine { Bore 3-1/8
Stroke 4-3/8

Model 39, 4 cyl., (1939)



BATTERY

U.S.L., A-13, 6 volts.
Negative Terminal Grounded.

Starting Capacity—96 amps. for 20 minutes.

Minutes of Discharge at 300 Amps., Zero Degrees F.—1.9

Lighting Capacity—3.9 amps. for 20 hours (78 amp. hour).

Case—Length, 8-7/8; width, 7; height, 8-5/8 inches.

STARTER

A-L Test 162 Rotation, L. H., Con. End
Auto-Lite, MZ-4064

Connection to Engine—Bendix Drive, Type RC10HD.

Running Free—60 amps. at 5-1/2 volts, 5000 R.P.M.

Stall Data—7.8 pound-feet, 420 amps. at 3 volts.

Brush Spring Tension—42 to 53 ounces on each (new brushes). Brush spring tension should be measured by a scale hooked under the brush spring at the bend just beyond the brush, and the reading taken at moment spring leaves the brush. The pull should be exerted at right angles to force exerted by the brush spring.

Starting Switch—Auto-Lite, SW-3737-D, mounted on starter. Switch should not close with less than 2.3 pounds pull, applied at right angles to hole in end of lever.

Armature—Auto-Lite, MZ-2089.

IGNITION

Rotation, L. H., Top View
(Two Different Distributors Used)
Auto-Lite, IGS-4007-B or IGS-4129

A-L Test 618 Auto-Lite, IGS-4007-B

(Full Automatic Spark Advance in conjunction with Integral Vacuum Chamber)

Breaker—Contact separation .020 inch.

Cam Angle—47 degrees.

Percentage of Dwell—52%.

Contact Spring Tension—16 to 20 ounces.

Timing—Exact top dead center. Loosen screw holding flywheel inspection hole cover, located in left top side of flywheel housing, and swing cover to one side. Flywheel mark "TC-IGN" (located at exact top dead center) should register with the pointed end of inspection plate screw.

Spark Plugs—14-MM (Champion type J-8); Gap .025 inch. Firing Order—1-3-4-2.

Vacuum Chamber (Auto-Lite, IGT-1028-ES; Test No. 614)—7 degrees advance (Dist.). Starts with vacuum of 5 inches of mercury. Requires a vacuum of 15 inches for full travel.

Vacuum Chamber Advance Table—

Inches of Mercury	Degrees Dist. Advance
5.00.....	Start
6.42.....	1
7.85.....	2
9.28.....	3
10.71.....	4
12.14.....	5
13.57.....	6
15.00.....	7

Automatic Advance—9-1/2 degrees (Distributor).

Eng. R.P.M.	Dist. R.P.M.	Degrees Advance (Dist.)
600.....	300.....	Start
852.....	426.....	1
1104.....	552.....	2
1356.....	678.....	3
1610.....	805.....	4
1862.....	931.....	5
2114.....	1057.....	6
2368.....	1184.....	7
2620.....	1310.....	8
2872.....	1436.....	9
3000 (Max.).....	1500.....	9-1/2

Breaker Plate—Auto-Lite, IGS-2044-D (stamped with the figure 7).

Condenser—Auto-Lite, IG-2671-K.

Contact Point—Auto-Lite, IGP-33.

Breaker Lever and Point—Auto-Lite, IGP-3028-L.

Rotor—Auto-Lite, IG-1657.

Distributor Cap—Auto-Lite, IG-1324.

Flexible Lead (Insulated)—Auto-Lite, IGS-78.

Ignition Coil—Auto-Lite, IG-4090.

A-L Test 618 Auto-Lite, IGW-4129

(Full Automatic Spark Advance in conjunction with Vacuum Chamber which moves the entire Distributor.)

Breaker—Contact separation .020 inch.

Cam Angle—41 degrees.

Percentage of Dwell—40%.

Vacuum Distributor Control (Auto-Lite, VC-4007; Test No. 626)—7 degrees advance (Dist.). Starts with vacuum of 3.60 inches of mercury. Requires a vacuum of 15 inches for full travel.

Vacuum Chamber Advance Table—

Inches of Mercury	Degrees Dist. Advance
3.60.....	Start
5.22.....	1
6.85.....	2
8.48.....	3
10.11.....	4
11.74.....	5
13.37.....	6
15.00.....	7

Automatic Advance—9-1/2 degrees (Distributor).

Eng. R.P.M.	Dist. R.P.M.	Degrees Advance (Dist.)
600.....	300.....	Start
852.....	426.....	1
1104.....	552.....	2
1356.....	678.....	3
1608.....	804.....	4
1862.....	931.....	5
2114.....	1057.....	6
2366.....	1183.....	7
2618.....	1309.....	8
2870.....	1435.....	9
3000 (Max.).....	1500.....	9-1/2

Condenser—Auto-Lite, IGB-1025. Capacity .20 to .25 microfarads.

Contact Point—Auto-Lite, IGP-33.

Breaker Lever and Point—Auto-Lite, IGW-3028.

Rotor—Auto-Lite, IGB-1239.

Distributor Cap—Auto-Lite, IGB-1241.

(All other data the same as IGS-4007-B Distributor.)

GENERATOR

Rotation, L. H., Com. End
Auto-Lite, GCJ-4811-A

Performance Data—Gen. cold.

Amps.	R.P.M.	Volts
0.....	825.....	6.20
2.....	870.....	6.38
4.....	915.....	6.55
6.....	960.....	6.70
8.....	1020.....	6.89
10.....	1075.....	7.05
12.....	1135.....	7.22
14.....	1200.....	7.38
16.....	1270.....	7.53
18.....	1340.....	7.70
20.....	1430.....	7.89
22.....	1545.....	8.05
24.....	1720.....	8.20
25.....	1850 (Max.).....	8.30

Motoring Freely—4.0 to 4.4 amps. at 6 volts.

Max. Stall Current—28 to 30 amps. at 5.2 volts.

Field Test—1.9 to 2.1 amps. at 6 volts.

Brush Spring Tension—53 ounces max. on each (new brushes).

Armature—Auto-Lite, GCJ-2006-F.

Third Brush Adjustment—Loosen cover band. Shift third brush by hand. Mounting plate held in any position by friction clamp washers. In no case should third brush be adjusted nearer than 1 commutator bar to the insulated main brush. 3 bars (max.) is approximately correct.

RELAY-REGULATOR

Auto-Lite, VRD-4004-A Neg. Ground

A combination of Cut-Out Relay and Vibrating Point Voltage Regulator.

Cut-Out Relay

Resistance of Voltage Winding—35 to 39 ohms.

Points Close—6.4 to 7.0 volts.

Points Open—.5 to 3.0 amps. discharge.

Contact Gap—.015 inch minimum (points open).

Armature Air Gap—.034 to .038 inch (points open).

Voltage Regulator

Resistance of Voltage Winding—10.4 to 11.2 ohms.

Resistance Unit—Auto-Lite, TC-51-T, marked "20"; Ohms 19 to 21.

Armature Air Gap—.0595 to .0625 inch (the distance between core and underside of armature when contacts just open).

Contact Point Gap—.010 to .020 inch (armature pressed down against stop pin).

Operating Voltage—7.5 to 7.6 (70° F.).

LIGHTING

Switch—H. A. Douglas Mfg. Co., No. 5400-C.

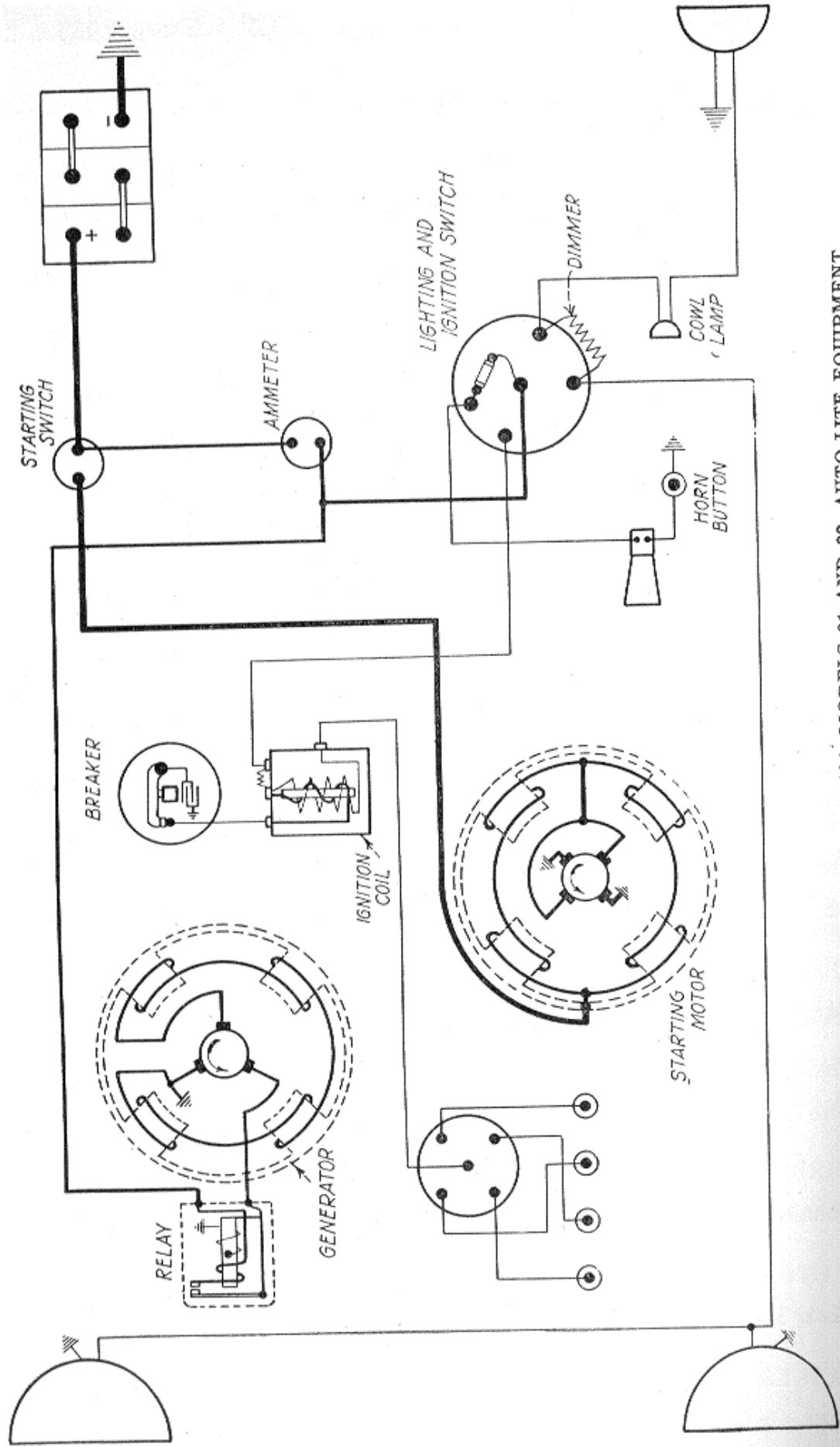
Location—Behind instrument board.

Fuse—Single 20 amp. fuse (type SFE-20) on switch back. Protects all lighting circuits.

Foot Selector Switch—H. A. Douglas Mfg. Co., No. 5530.

Lamps—HEAD—2320; PARK—55; INDICATOR—51; INSTRUMENT

--51; DOVE—63; LICENSE PLATE—63; STOP AND TAIL—1158.



OVERLAND WIRING DIAGRAM, 1923-1924, MODELS 91 AND 92, AUTO-LITE EQUIPMENT

O V E R L A N D

Model 91 & 92 Year 1923-24

Auto-Lite

Starter & Generator Auto-Lite

Ignition

GENERATOR Model

Regulation

Max. Chg. rate

G. P.

Third Brush

15 Amps.

Amps.
Cut-in

Volts
Warm Test

R.P.M.

Amps.
Cut-in

Volts
Cold Test

R.P.M.

0

7.05

475

0

6.5

390

10

8.0

1200

15

7.5

1200

RELAY Model

Closes

Opens

Contact Gap

Air Gap

G. P.

9 MPH

7 MPH

.025-.035

.012

STARTING Motor Model

M. G.

Drive

Rotation

Bendix

Anti-Clockwise

BATTERY U. S. L. Type

CDM-311-X

Capacity

Bat. to Frame Con.

6

Volts 85 Amps.

Negative

IGNITION Coil Model

DISTRIBUTOR Model

Breaker Contact Gap

I. G.

I. G.

.018

FIRING ORDER

1-3-4-2

Ignition Timing

SPARK PLUG

2 1/2" before TDC

Size 1/2" Gap .025

LIGHTING

Headlamps

Dash & Tail

Side Lamps

Single

Contact

6 V 21

C.P.

3 V 2

C.P.

6 V 4

C.P.

ENGINE

Bore 3 1/2

Stroke 4

No. 4

Cylinder

L

Valve tappet clearance

Head Inlet .003

Exhaust .004

CARBURETOR

COOLING

PISTON RING

OILING SYSTEM

Tillotson

Thermo

3 1/2 X 3/16

Cap 6 qt Type C. S.

CLUTCH

Plate 8"

REAR AXLE

Semi

Gear Ratio

TRANSMISSION

4.50

Own

BRAKES

Rear wheel

Trans. or wheel W

Brake lining width & length

Service 1 1/2 X 31 1/2 Hand 1 1/4 X 10

WHIPPET SIX

(1927)

AUTO-LITE GENERATING, STARTING AND LIGHTING SYSTEM AUTO-LITE IGNITION

BATTERY:—U.S.L. Type 3-CVX-6x, 6 volt. Starting capacity is 115 amperes for 20 minutes. Lighting capacity is 5 amperes for 21 hours. The negative (—) terminal is grounded.

IGNITION:—Coil Model IG-4065. Distributor Model IG-4116-B. Breaker contacts separate .020-.024 inch. They are made of tungsten. Resurface contacts on a medium hard oilstone or with a fine, flat contact file. Ignition current is 1-3 amperes with engine running and 3.4-5 amperes with engine stopped. Distributor is semi-automatic. Manual advance is 30° (on flywheel). Automatic advance begins at 400 R.P.M. and reaches a maximum of 20° (on flywheel) at 2800 R.P.M. of the engine.

Oiling:—Put 5 drops of light engine oil in the oiler on commutator every 1000 miles. Drive end is oiled by splash from gears.

Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches top dead center with the spark control lever and breaker assembly in the fully retarded position.

Firing Order:—The firing order is 1-5-3-6-2-4.

Spark Plugs:—Spark plug diameters are 7/8 inch. Gaps are .025 inch.

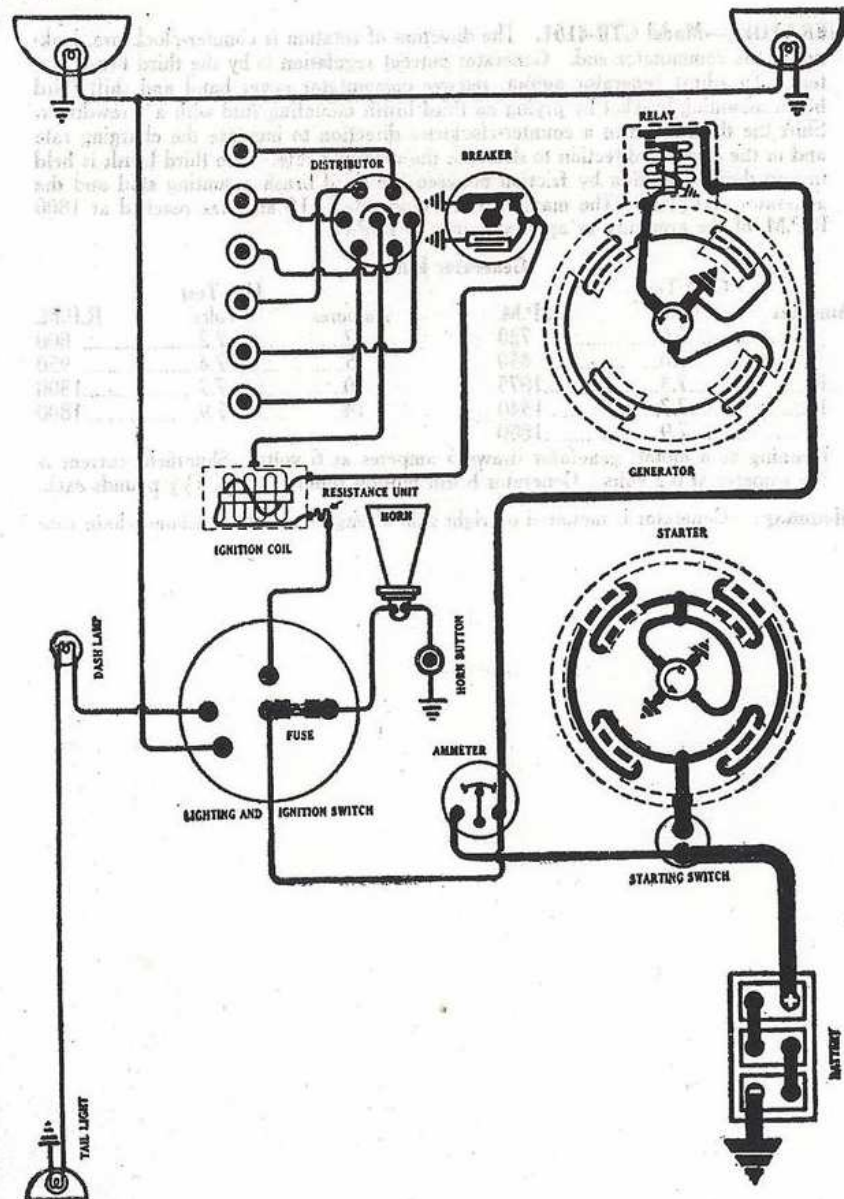
STARTER:—Model MN-4104. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter cranks the engine at 228 R.P.M. taking 160 amperes at 5.25 volts. Starter brush tension is 1 1/4-1 1/2 pounds each.

Starter Data.

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	5.5	45 (Without Bendix)
0 "	Free	5.5	50 (With Bendix)
.5 "	2800	5.5	100
2.4 "	1450	5.0	200
4.8 "	950	4.5	300
7.2 "	650	4.0	400
13.6 "	Lock	3.0	540

Oiling:—Put 5 to 10 drops of light engine oil in the oiler on the drive end of the starter every month or each 1000 miles. The commutator end bearing is oilless.

GENERATOR:—Model GP-4105. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system. To adjust generator output, loosen the commutator cover band and shift the third brush mounting plate by tapping on the third brush mounting stud with a screwdriver. Shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. The third brush is held in any desired position by friction between the third brush mounting stud and the generator end plate. The maximum charging rate is 17 amperes at 8 volts.



WHIPPET SIX

(1927)

AUTO-LITE GENERATING, STARTING AND LIGHTING SYSTEM AUTO-LITE IGNITION

Generator Data

Cold Test			Hot Test		
Amperes	R.P.M.	M.P.H.	Amperes	R.P.M.	M.P.H.
2.....	440.....	8	2.....	660.....	11.5
5.....	540.....	9.5	5.....	700.....	12
10.....	760.....	13	10.....	1200.....	21
14.....	1050.....	18.4			

Motoring freely, generator draws 5 amperes at 6 volts. Shuntfield current is 3 amperes at 6.2 volts. Generator brush spring tension should be $1\frac{1}{4}$ - $1\frac{1}{2}$ pounds each.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of

the generator every two weeks or each 500 miles. The drive end bearing is oiled by splash from the gear case.

RELAY:—Model CB-4007. Relay is mounted on the generator. Relay contacts close when the voltage of the generator reaches 7-7.5 volts and open with a discharge current of $\frac{1}{2}$ - $2\frac{1}{2}$ amperes. Contacts separate .025-.035 inch; air gap between relay armature and coil core is .010-.030 inch, contacts closed.

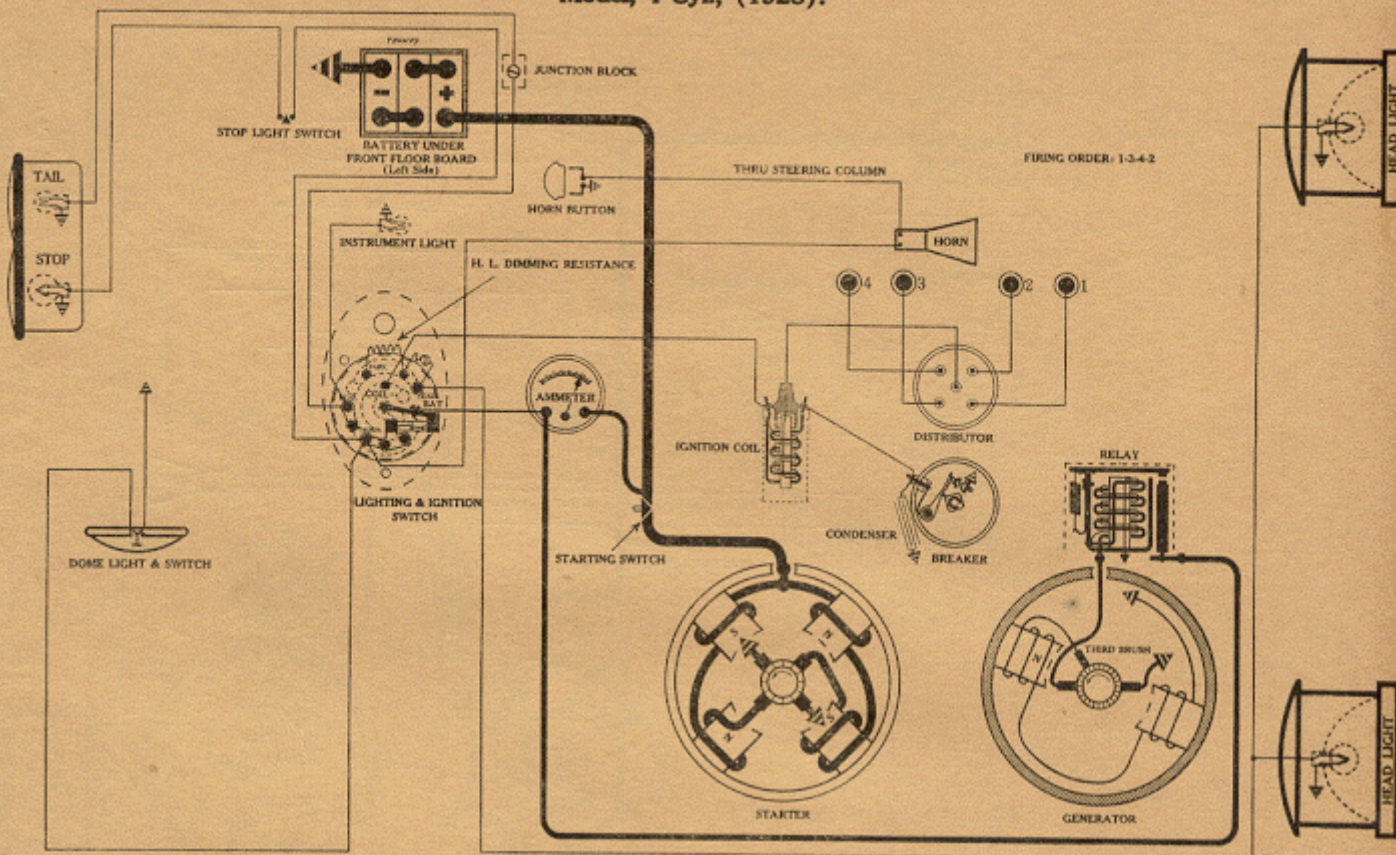
LIGHTING:—Briggs and Stratton Switch Model 39320. Head lamps are 6-8 volt, 21 cp. S. C. Dash and tail lamps are connected in series. They are each 3-4 volt, 2 cp. S. C.

FUSES:—Generator field fuse is 5 amperes. Lighting fuse is 20 amperes.

Scan courtesy of Auckland Vintage Car Club Library – John Stokes

WHIPPET

Model, 4 Cyl., (1928).



BATTERY

U. S. L., 3-CVX-5X-6, 6 volts. Negative terminal grounded
Starting Capacity—96 amps. for 20 minutes.
Lighting Capacity—5 amps. for 17 hours.
Box—Length, 9 1/16; width, 7 1/4; height, 9 1/4 inches.

STARTER

Rotation, L. H., Com. End
Auto-Lite, MZ-4001

Connection to Engine—Bendix drive.
Running Free—60 amps. at 5.5 volts.
Cranking Engine—180 amps. at 5.2 volts, 200 R. P. M.
Lock Torque—10 pound-feet, 490 amps., 3.6 volts.
Brush Spring Tension—1 1/4-1 1/2 lbs. on each.
Starting Switch—Auto-Lite SW4001.

IGNITION

Rotation, R. H., Top View
Auto-Lite, Dist. Type IGB-4001-A

Breaker—Contact separation .020 to .024 inch.
Contact Spring Tension—18-20 oz.
Timing—See detailed instructions P. 1, Sec. AA.
1—Locate T. D. C. 2—Locate rotor. 3—Set spark.
Spark Plugs—7/8 inch regular type A; Gap .025 inch.
Firing Order—1-3-4-2.
Manual Advance—(None).
Automatic Advance—28 degrees (on Flywheel).

Eng. R.P.M.	Degrees Advance (on Flywheel)	Dist. R.P.M.	Degrees Advance (on cam)
550	0-1	225	0-5
800	4-6	400	2-3
1200	12-14	600	6-7
1800	18-20	900	9-10
2200	22-24	1100	11-12
2600	26-28	1300	13-14

Coil—Auto-Lite, IG-4065.

GENERATOR

Rotation, L. H., Com. End
Auto-Lite, GAL-4102

Performance Data—Gen. cold.

Amps.	R.P.M.	Volts
0	650	6.5
2	720	6.6
5	850	7.
10	1075	7.3
14	1340	7.7
16	1800	8.

Motoring Freely—5-5 1/2 amps. at 6 volts.
Max. Stall Current—16-19 amps. at 6 volts.
Field Test—4.7 amps. at 6 volts across field coils in series.
Field Fuse—(None).
Brush Spring Tension—1 1/4 to 1 1/2 lbs. on each.
Third Brush Adjustment—Loosen cover band. See Fig. 13, P. 7, Sec. AA.

RELAY

Auto-Lite, CB-4007

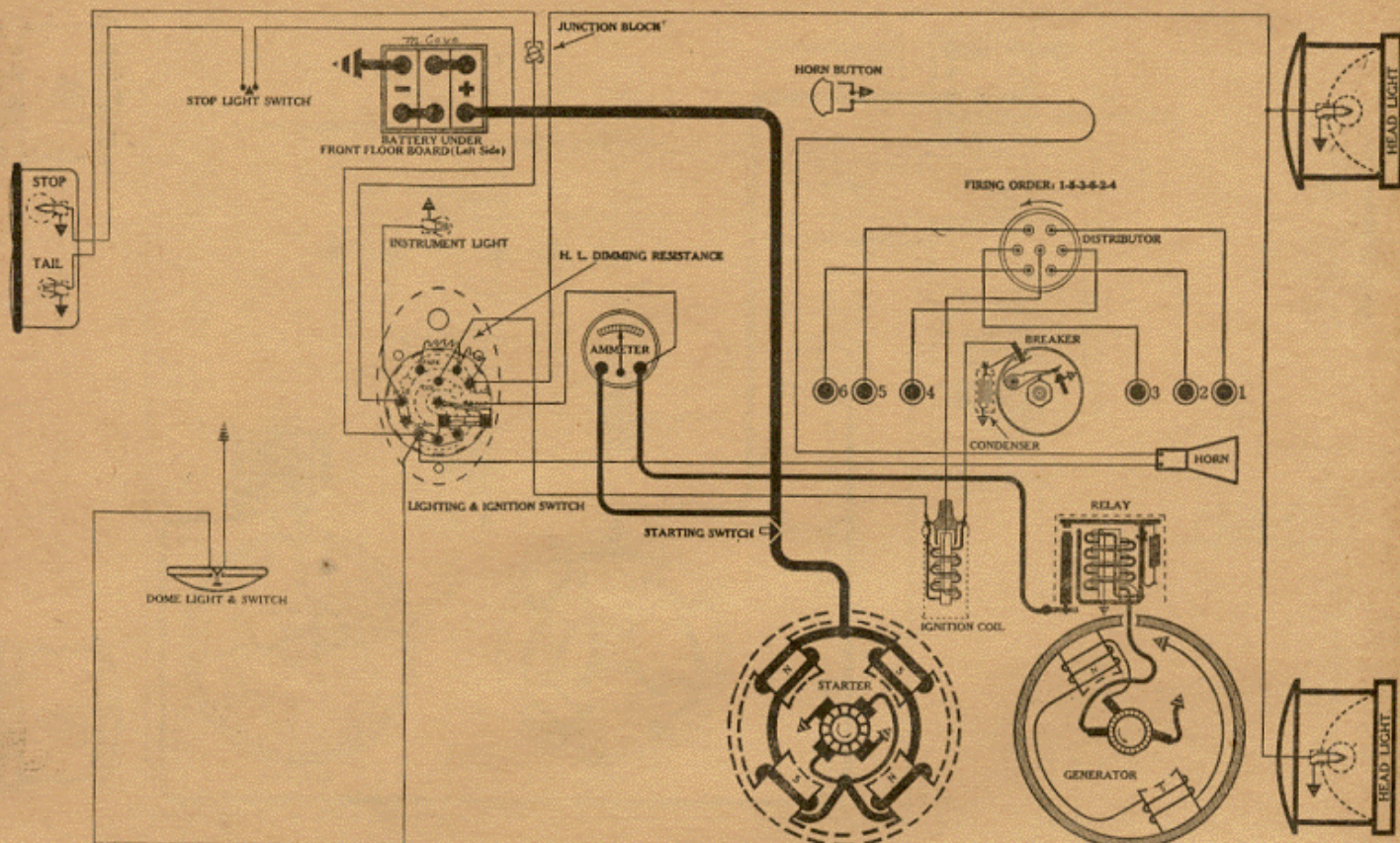
Closes—7-7.5 volts.
Opens—1/2-2 1/2 amps. discharge.
Contact Gap—.025-.035 inch.
Core Gap—.010-.030 inch, contacts closed.

LIGHTING

Switch—Briggs & Stratton, No. 40097.
Fuses—Single 20 amp. fuse mounted vertically on switch back.
Lamps—See P. 3, Sec. AA. HEAD—1129; INSTRUMENT—63; DOME—63; TAIL—63.

WHIPPET

Model, 6 Cyl., (1928).



BATTERY

U. S. L., 3-CVX-6X-6, 6 volts. Negative Terminal Grounded
Starting Capacity—115 amps. for 20 minutes.
Lighting Capacity—5 amps. for 21 hours.
Box—Length, 10 7/16; width, 7 7/16; height, 9 1/4 inches.

STARTER

Rotation, L. H., Com. End
Auto-Lite, MZ-4001

Connection to Engine—Bendix drive.
Running Free—60 amps. at 5.5 volts.
Cranking Engine—180 amps. at 5.2 volts, 200 R. P. M.
Lock Torque—10 pound-feet, 490 amps., 3.6 volts.
Brush Spring Tension—1 1/4 to 1 1/2 lbs. on each.
Starting Switch—Auto-Lite, SW-4001.

IGNITION

Rotation, L. H., Top View
Auto-Lite, Dist. Type IGB-4009

Breaker—Contact separation .020 to .024 inch.
Contact Spring Tension—18-20 oz.
Timing—See detailed instructions P. 1, Sec. AA.
1—Locate T. D. C. 2—Locate rotor. 3—Set spark.
Spark Plugs—3/8 inch regular type A; Gap .025 inch.
Firing Order—1-5-3-6-2-4.
Manual Advance—12 degrees (on Flywheel).
(Operated by pull wire from instrument board).
Automatic Advance—28 degrees (on Flywheel).

Eng. R.P.M.	Degrees Advance (on flywheel)	Dist. R.P.M.	Degrees Advance (on cam)
550	0-1	225	0-5
800	4-6	400	2-3
1200	12-14	600	6-7
1800	18-20	900	9-10
2200	22-24	1100	11-12
2600	26-28	1300	13-14

Coil—Auto-Lite, IG-4065.

GENERATOR

Rotation, L. H., Com. End
Auto-Lite, GAL-4106

Performance Data—Gen. cold.

Amps.	R.P.M.	Volts
0	650	6.5
2	720	6.6
5	850	7.
10	1075	7.3
14	1340	7.7
16	1800	8.

Motoring Freely—5-5 1/2 amps. at 6 volts.
Max. Stall Current—16-19 amps. at 6 volts.
Field Test—4.7 amps. at 6 volts across field coils in series.
Field Fuse—(None).
Brush Spring Tension—1 1/4 to 1 1/2 lbs. on each.
Third Brush Adjustment—Loosen cover band. See Fig. 13, P. 7, Sec. AA.

RELAY

Auto-Lite, CB-4007

Closes—7-7.5 volts.
Opens—1 1/2-2 1/2 amps. discharge.
Contact Gap—.025-.035 inch.
Core Gap—.010-.030 inch, contacts closed.

LIGHTING

Switch—Briggs & Stratton, No. 40097.
Fuses—Single 20 amp. fuse mounted vertically on switch back.
Lamps—See P. 3, Sec. AA. HEAD—1129; INSTRUMENT—63; DOME—63; TAIL—63.

Willys-Overland

Model 89-6 (1918)

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 "1-6 D-C" on the flywheel is $1\frac{1}{8}$ inches past the indicator, spark control lever and breaker assembly in the fully retarded position.

Firing Order.—The firing order is 1, 5, 3, 6, 2, 4.

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

Ignition Thermostat.—There is a thermostat in the ignition switch case to open the circuit should switch be left "On," engine idle, contacts closed. This device is treated 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 the engine through a Bendix drive. It should crank the engine at 100 to 125 R. P. M., taking about 250 amperes. Cold engine, tight bearings, heavy oil or other obstructions will cause a greater current flow and reduce the speed.

Oiling.—Clean and repack starter bearings with soft cup grease every six months.

Generator.—Generator current regulation is by reverse series field. Relay should close at 8-10 M. P. H., or 300-380 R. P. M., of generator armature. Charging current should be .6 to 1.5 amperes at closing and discharge current 0 to 1 ampere at opening.

Amperes	GENERATOR DATA, MODEL GA	R. P. M.
5	550-560
10	980-1120
12.5	1365-1570
15	1850-2400
16-18	3000-3750

A variation of 1.5 amperes from these rates is allowable. Output may be varied slightly by adjusting brush pressure on commutator. The pressure should be 1 to $1\frac{1}{4}$ pounds. If operated freely as a motor, armature should revolve at 200 R. P. M., taking 2 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. Shunt field should take about 1.4 amperes.

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 3-3.5 volts, 2 cp.

Fuses.—Fuses are 20 ampere.

