CAR MODEL SECTION To 1931

In presenting the information on car models all unnecessary reading matter has been eliminated. The facts needed by service men are presented briefly — by means of diagrams and tabulated specifications.

NOTE: Whenever the data on a car model is not completed on one page, it is always carried over onto the opposite page, placing all the data on any car directly before the eyes.

AJAX

1925-26

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

BATTERY:—U.S.L. Type 3-HVX-5X, 6 volt. The negative (—) terminal is grounded. The starting capacity is 105 amperes for 20 minutes. Lighting capacity is 5 amperes for 18.4 hours. The battery is 7 7/16 by 9¾ by 9⅛ inches.

IGNITION:—Coil Model IG-4061. Distributor Model IG-4110. Breaker contacts separate .020 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface with a fine flat jeweler's file. The surface of the contacts should be flat and parallel. The distributor is of the full automatic type. Automatic advance begins at 400 R.P.M. of the engine and reaches a maximum of 30° (engine) at 2600 R.P.M.

Mounting:—Distributor is mounted on the cylinder head. To remove distributor, disconnect primary lead and take off distributor cap with cables intact. Then loosen advance arm clamp screw and lift distributor from place.

Oiling:—Refill the grease cup under the distributor head with medium cup grease and turn down one turn every two weeks. Put one drop of light engine oil on the breaker arm hinge and place a small amount of vaseline on the face of the breaker cam every month or each 1000 miles if the car is driven more than 1000 miles in a month.

Timing:—Breaker contacts begin to separate when piston entering power stroke reaches top dead center with the breaker assembly fully retarded. To set timing, crank engine over until piston No. 1 reaches top dead center on compression stroke, when the dead center mark on the flywheel will be opposite the indicator in the peephole at the right of the engine. To set timing, loosen advance clamp screw and rotate distributor housing until contacts begin to open. Tighten the clamp screw and connect the spark plugs as indicated on the diagram.

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

Spark Plugs:—Spark plug diameters are ⅞ inch. Gaps are .025 inch.

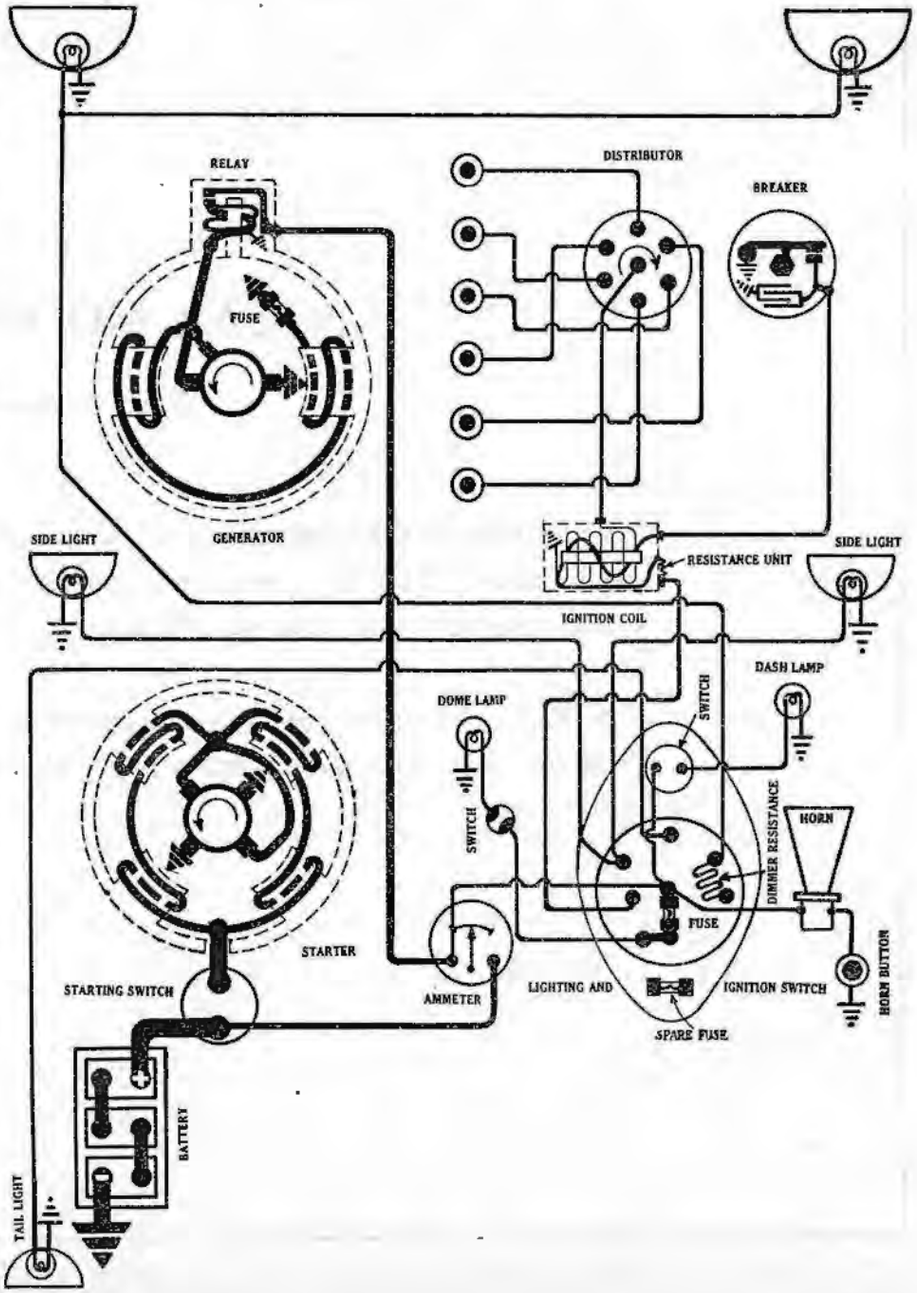
VALVE TIMING:—INLET VALVES. Head diameter, 1 13/32 inches. Stem diameter, 5/16 inch. Stem length, 4 13/16 inches. Valve lift, ¼ inch. Spring pressure, 45 pounds. Tappet clearance, .005 inch (hot). Inlet valves open 5 degrees after top dead center and close 45 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 13/32 inches. Stem diameter, 5/16 inch. Stem length, 4 13/16 inches. Valve lift, ¼ inch. Spring pressure, 45 pounds. Tappet clearance, .005 inch (hot). Exhaust valves open 45 degrees below dead center and close 5 degrees after top dead center. Valve stem guides are removable. Valves with oversize stems are not made.

STARTER.—Model MP-4101. 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 185 R.P.M., taking 140 amperes at 4.8 volts. The starter brush tension should be 1½-1¾ pounds each. Starter switch is Model SW-4001.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	4000	5.5	75
1 lb. ft.	2800	5.25	150
2 lb. ft.	2000	5.0	200
4 lb. ft.	1250	4.5	300
5 lb. ft.	1000	4.2	350
12 lb. ft.	Lock	3.	650



AJAX

1925-26

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

Mounting:—Starter is flange mounted at right of engine on forward side of rear motor support. To remove starter, disconnect cable and take out two flange mounting bolts. Then pull starter forward to clear drive and lift from place.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the drive end of the starter every month or each 1000 miles if the car is driven more than 1000 miles in a month. The commutator end bearing is of the self-lubricating type and requires no attention.

GENERATOR.—Model GTB-4004. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system. To adjust the charging rate, remove the commutator band and loosen the nut under the third brush holder. Then shift the third brush in the direction of generator rotation to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the nut after making the adjustment. The maximum output of 14 amperes is reached at 1700 R.P.M. of the armature or 22 M.P.H.

Generator Data.

Cold Test (70°)			Hot Test (150°)		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.5	700	0	6.5	825
4	6.9	850	4	6.9	1025
10	7.5	1200	9	7.45	1450
14	7.9	1800	11	8.	1800
10	7.7	2900	8	7.5	2800

Motoring freely the generator draws 3.9 amperes at 6.3 volts while turning at 525 R.P.M. The shunt field draws 3.2 amperes at 6 volts. Each coil, tested separately takes 6.6 amperes at 6 volts. A fuse is located in the shunt field circuit. It is mounted on the commutator end plate and may be reached by removing the cover band.

Mounting:—Generator is flange mounted at left of engine on rear face of front engine support and is belt driven from the crankshaft. The fan is driven from the generator shaft. To remove generator, loosen two flange mounting bolts and slide generator toward engine. Slip off drive belts. Take out mounting bolts, remove pulleys and lift generator from place.

Belt Adjustment. To take up drive belt, loosen mounting bolts and shift generator away from engine. The belt tension should be just sufficient to drive generator and drive belt without slipping.

Oiling:—Put 3 or 4 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY.—Model CB-4007. Relay contacts close at 700 R.P.M. of the generator armature or 10 M.P.H. with a generator voltage of 6.5 volts, and open at 650 R.P.M. with a discharge current of 0-1 ampere. Charging current at closing of relay is 1-2 amperes. Relay contacts separate .050 inch. Air gap between relay armature and coil core is .030 inch, contacts closed.

LIGHTING.—Switch Model B & S Type 39890. Head lamps are 6-8-volt, 21 cp. S. C. Cowl and tail lamps are 6-8-volt, 3 cp. S. C. dash lamp is 6-8-volt, 2cp. S. C. dome lamp is 6-8-volt, 4cp. S. C.

NOTE:—Switch was supplied by the Auto-Lite Company as their Model XA-254.

FUSES:—Generator field fuse is 5 amperes.

AJAX

AFTER APRIL FIRST (1926)
AUTO-LITE GENERATING, STARTING AND LIGHTING SYSTEM
AUTO-LITE IGNITION

BATTERY:—U.S.L. Type 3-HVX-5X, 6 volt. The negative (—) terminal is grounded. The starting capacity is 105 amperes for 20 minutes. Lighting capacity is 5 amperes for 18.4 hours. The battery is 7 7/16 by 9¾ by 9⅛ inches.

IGNITION:—Coil Model IG-4065. Distributor Model IG-4110. Breaker contacts separate .020 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface with a fine, flat jeweler's file. The surface of the contacts should be flat and parallel. The distributor is of the full automatic type. Automatic advance begins at 200 R.P.M. of the distributor and reaches a maximum of 15° (distributor) at 1300 R.P.M. This is equivalent to a flywheel advance of 30° at 2600 R.P.M. of the engine.

Mounting:—Distributor is mounted on the cylinder head. To remove distributor, disconnect primary lead and take off distributor cap with cables intact. Then loosen advance clamp screw and lift distributor from place.

Oiling:—Refill the grease cup under the distributor head with medium cup grease and turn down one turn every two weeks. Put one drop of light engine oil on the breaker arm hinge and place a small amount of vaseline on the face of the breaker cam every month or each 1000 miles if the car is driven more than 1000 miles in a month.

Timing:—Breaker contacts begin to separate when piston entering power stroke reaches top dead center with the breaker assembly in the fully retarded position. To set timing, crank engine over until piston No. 1 reaches top dead center on compression stroke when the dead center mark on the flywheel will be opposite the indicator in the peephole at the right of the engine. To set timing, loosen advance clamp screw and rotate distributor housing until contacts begin to open. Tighten the clamp screw and connect the spark plugs as indicated on the diagram.

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

Spark Plugs:—Spark plug diameters are ⅞ inch. Gaps are .025 inch.

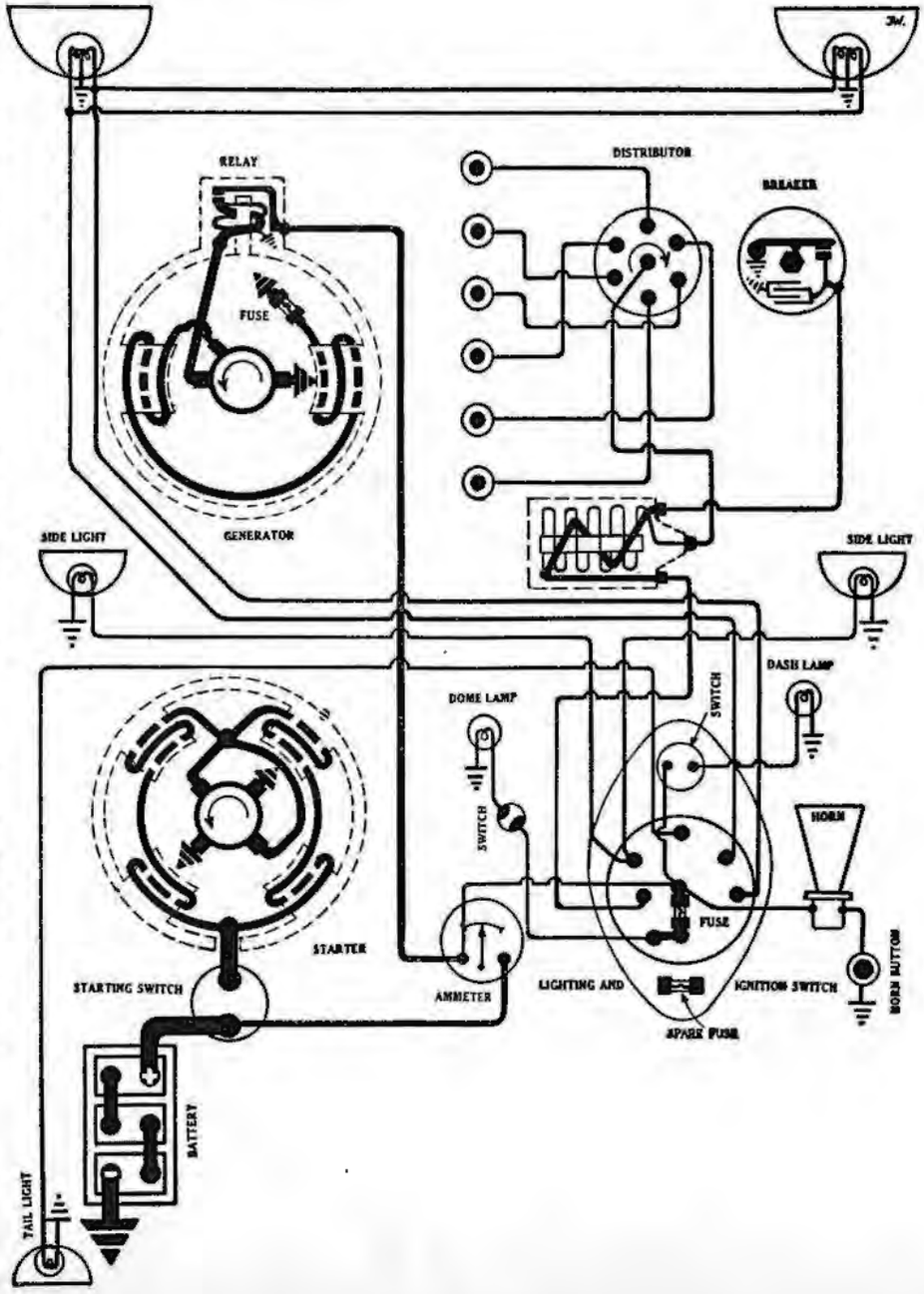
VALVE TIMING:—INLET VALVES. Head diameter, 1 13/32 inches. Stem diameter, 5/16 inch. Stem length, 4 13/16 inches. Valve lift, ¼ inch. Spring pressure, 45 pounds. Tappet clearance, .005 inch (hot). Inlet valves open 5 degrees after top dead center and close 45 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 13/32 inches. Stem diameter, 5/16 inch. Stem length, 4 13/16 inches. Valve lift, ¼ inch. Spring pressure, 45 pounds. Tappet clearance, .005 inch (hot). Exhaust valves open 45 degrees before lower dead center and close 5 degrees after top dead center. Valve stem guides are removable. Valves with oversize stems are not made.

STARTER:—Model MN-4108. 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 184 R.P.M. taking 160 amperes at 4.7 volts. Starter brush tension should be 1¼-1½ pounds. Starter switch is Model SW-4001.

Starter Data

Torque	R.P.M.	Volts	Amperes	
0 lb. ft.	Free	5.5	45	(Without Bendix)
0 "	Free	5.5	50	(With Bendix)
.6 "	2700	5.5	100	
2.5 "	1500	5	200	
5 "	850	4.5	300	
7.5 "	650	4	400	
11.5 "	Lock	3	540	



AJAX

AFTER APRIL FIRST (1926)
AUTO-LITE GENERATING, STARTING AND LIGHTING SYSTEM
AUTO-LITE IGNITION

Mounting:—Starter is flange mounted at right of engine on forward side of rear motor support. To remove starter, disconnect cable and take out two flange mounting bolts. Then pull starter forward to clear drive and lift from place.

Oiling:—Put 4 or 5 drops of light engine oil in oiler on the drive end of the starter every month or each 1000 miles if the car is driven more than 1000 miles in a month. The commutator end bearing is of the self-lubricating type and requires no attention.

GENERATOR:—Model GYA-4201. 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, remove the commutator cover band and shift the third brush mounting bracket by tapping the third brush mounting stud with a screwdriver. Shifting the third brush in a counter-clockwise direction increases the charging rate and in the opposite direction decreases the charging rate. The mounting bracket is held in any desired position by friction between the third brush mounting stud and the generator end plate.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
2	6.6	620	2	---	700
5	7	700	5	---	840
10	7.3	860	10	---	1100
14	7.7	1050	14	---	1600
16	7.9	1200			
19	8	1300			

Motoring freely, generator draws 5 amperes at 6 volts. Shunt field current is 3.8 amperes at 6.2 volts. Generator brush spring tension is 1¼-1½ pounds each.

Mounting:—Generator is flange mounted at left of engine on rear face of front engine support and is belt driven from the crankshaft. The fan is driven from the generator shaft. To remove generator, loosen two flange mounting bolts and slide generator toward engine. Slip off drive belts. Take out mounting bolts, remove drive pulleys and lift generator from place.

Belt Adjustment. To take up drive belt, loosen mounting bolts and shift generator away from engine. The belt tension should be just sufficient to drive generator and drive belt without slipping.

Oiling:—Put 3 or 4 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY:—Model CB-4007. Relay is mounted on top of the generator. Relay contacts close when the voltage of the generator reaches 7-7.5 volts and open with a discharge current of .5-2.5 amperes. Contacts separate .025-.035 inch. Air gap between relay armature and coil core is .010-.030 inch, contacts closed.

LIGHTING:—Switch B. & S., Type 40153. Head lamps are each 6-8 volt, 21 cp. double filament using second 21 cp. filament for dimming. Dash lamp is 6-8 volt, 2 cp. S.C. Dome lamp is 6-8 volt, 4 cp. S.C. Side and tail lamps are each 6-8 volt, 3 cp. S.C.

FUSES:—Generator field fuse is 5 ampere.

AMBASSADOR

MODEL D1 (1925-26)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

BATTERY:—Vesta, Type R6-DJ-13Y Form 235, 6 volt. Starting capacity is 105 amperes for 20 minutes. Lighting capacity is 5 amperes for 12 hours. The positive (+) terminal is grounded.

IGNITION:—Coil Model 2182. Distributor Model 5278, 5294. Distributor is mounted on the generator. Contacts separate .015-.0225 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface on a medium hard oilstone or with a fine, flat jeweler's file. The tension of the breaker arm spring should be 13-16 ounces.

Oiling:—Put 8 or 10 drops of light engine oil in the oiler on the side of the distributor housing every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

Timing:—Breaker contacts begin to separate when piston entering power stroke reaches top dead center with the spark control lever and breaker assembly in the fully retarded position. To set timing, retard spark lever and crank engine until piston No. 1 reaches this position. Then loosen the adjustment nut on the side of the distributor housing and rotate the distributor until breaker contacts begin to separate. Then tighten the nut. Make certain that the rotor is under the segment connected to the spark plug in cylinder No. 1.

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 286 and 313. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 2¼-2½ pounds each. Starter switch is Model 1953.

Model 286 Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	4	60
8 "	Lock	3	450

Model 313 Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	4	60
11 "	Lock	3	450

Oiling:—Starter bearings are self oiling. They require no attention.

GENERATOR:—Models 301, 312, 325, 332. The direction of rotation is counter-clockwise, looking at the commutator end. Current regulation is by the third brush system. To adjust the generator output, loosen the generator cover band and shift the third brnsh mounting plate by means of the handle on the plate. Shifting the third brush in the direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. The brush spring tension should be 1¼-1¾ pounds each.

Models 301, 312, 332 Generator Data (Hot)

Amperes	R.P.M.
5	800
15 min.	1600

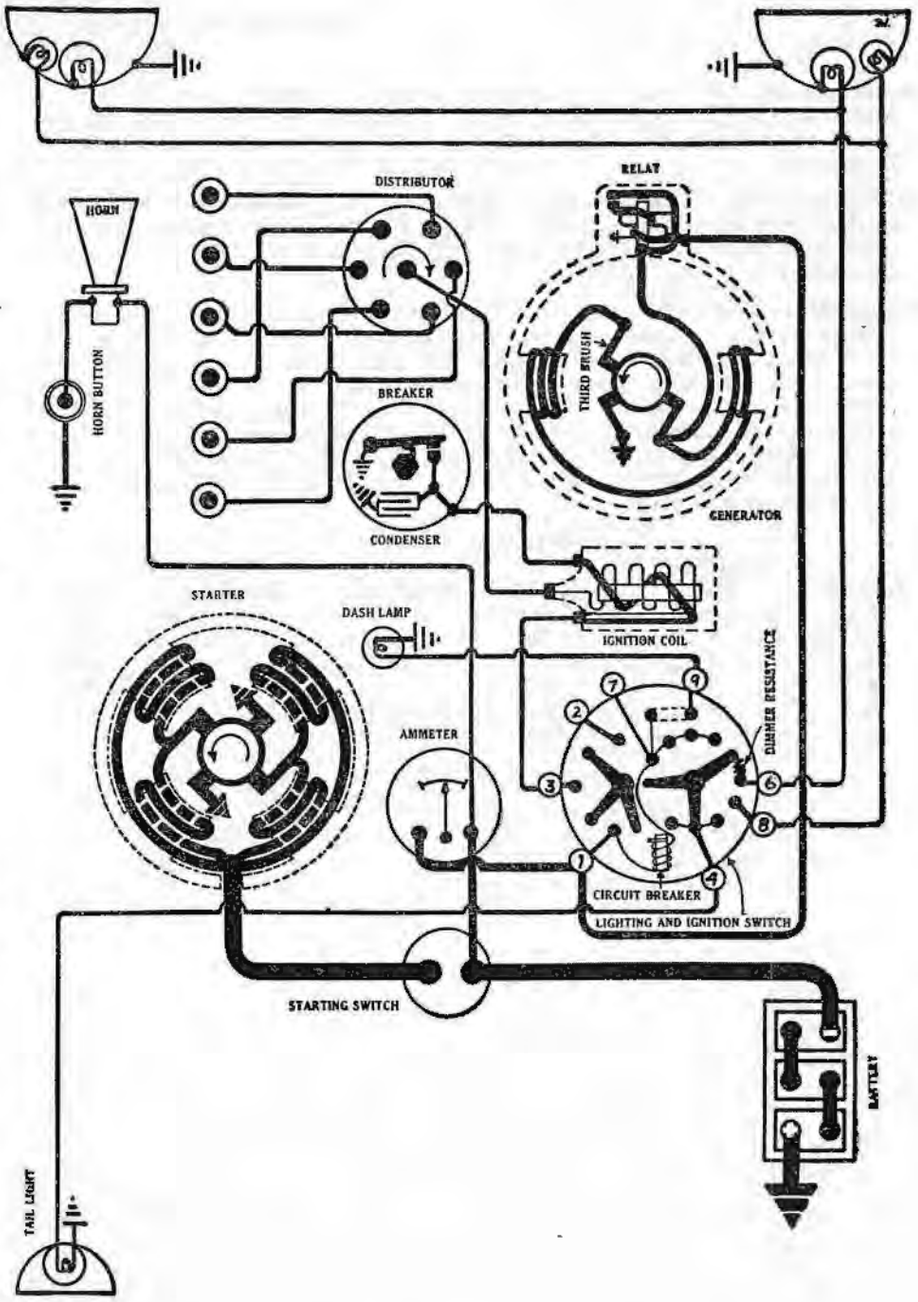
NOTE:—Model 325 is of the compensating type. See Equipment Section for complete data on this model.

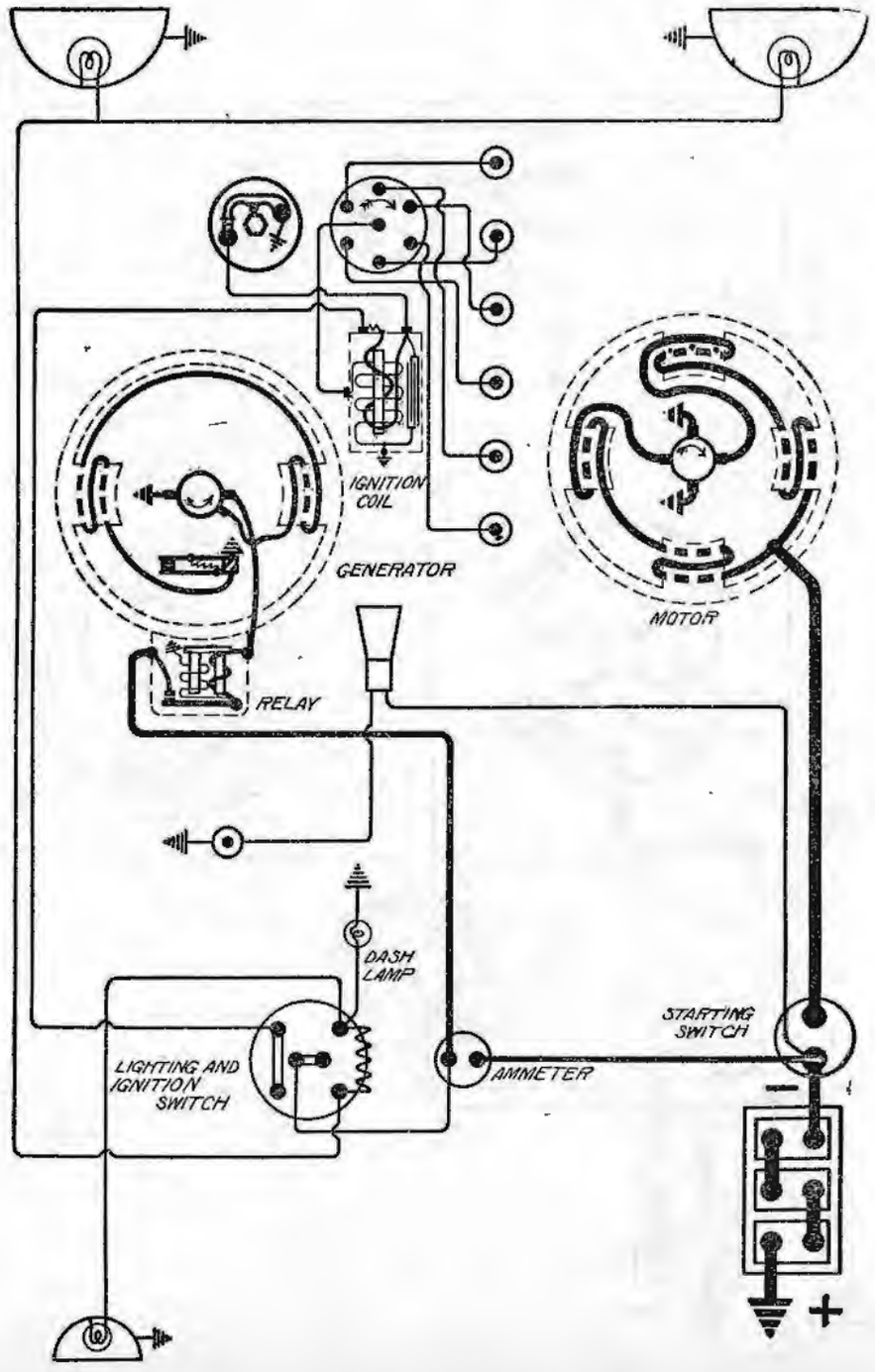
Oiling:—Put 8 or 10 drops of light engine oil in each of the generator bearings oilers every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY:—Relay is mounted on top of the generator. Relay contacts close when the voltage of the generator reaches 6.75-7.5 volts and open with a discharge current of 1-3 amperes. Relay contacts separate .025-.035 inch. Air gap between relay armature and coil core is .015-.020 inch, contacts closed.

LIGHTING:—Switch Model 1276. Head and stop lamps are 6-8 volt, 21 cp. S.C. Side lamps are 6-8 volt, 4 cp. S.C. Tail and dash lamps are each 6-8 volt, 2 cp. S.C.

CIRCUIT BREAKER:—A vibrating circuit breaker is mounted on the back of the switch. A current of 25-30 amperes causes this device to vibrate. While operating the current is 10-15 amperes.





ANDERSON

SERIES 40 (1921-22) 50 (1923-24-25)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

BATTERY:—1920-21 Willard, Type SJW-N4, 6 volt, 111 ampere hour. **1922, Willard Type SJRN-4,** 6 volt, 111 ampere hour. The positive (+) terminal is grounded.

IGNITION:—Coil Model 284-B. Distributor Model 366-D. Breaker contacts separate .022 inch. When the condition of the contacts affects the ignition, resurface with a fine flat jeweler's file or worn No. 00 sandpaper.

OILING.—Refill the cup under the distributor head with soft cup grease and turn down two turns every two weeks. Put a small amount of vaseline on the fiber bumper of the contact arm, applying with a toothpick. If the car is driven more than 500 miles in two weeks, these attentions must be given every 500 miles.

TIMING.—Breaker contacts begin to separate when the top dead center mark on the flywheel is ½ inch 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 are .025 to .030 inch.

STARTER:—Model 705-A, 722-A. Starter is connected to the engine through a set of reduction gears and a Bendix drive. The direction of rotation is clockwise, viewed from the commutator end. Starter switch is Model 199-K.

Starter Data

Torque	R.P.M.	Amperes	Volts

Starter Data—Model 705-A

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	2600	5	75
22 "	Lock	3	600

Model 722-A

0 lb. ft.	2500	5	70
28 "	Lock	3.15	570

Above tests are made without the reduction gears.

OILING.—Put 5 or 6 drops of light engine oil in each of the starter oilers every month.

GENERATOR:—Model No. 913-B. Generator current regulation is by the third brush system. A thermostat, located in the brush rigging of the generator, cuts a resistance into the field circuit at a temperature of 175°F., reducing the charging rate 6 amperes. The thermostat is intended to change the charging rate as the demands of seasons or car operation requires. Never touch the thermostat points. Maximum current output is reached at 2000 R.P.M. of the armature or 28 miles per hour.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
7	7.2	825			
20	8.5	1800	11	8.2	1800

Field winding takes 5 amperes at 6.4 volts. Pressure of main brushes on commutator is 17-20 ounces. Pressure of the third brush is 13-17 ounces. Position of third brush is adjusted by turning a screw exposed in the commutator end plate. Move the third brush in the direction of armature rotation to increase the charging rate, and in the opposite direction to decrease the charging rate. Reseat the brush after adjusting position.

OILING:—Put 5 or 6 drops of light engine oil in each generator oiler every 2 weeks.

RELAY.—Relay closes at 8-10 miles per hour or 525-575 R.P.M. of the armature and opens at 7-9 miles per hour or 475-525 R.P.M. of the armature. Relay contacts separate .012-.015 inch. Air gap between relay armature and coil core is .012-.015 inch, contacts closed. Clean relay contacts by drawing unglazed paper between them.

LAMPS:—Remy Switch, Model 198-E. Head lamps are 6-8 volt, 21 cp. Dimmer lamps are 6-8 volt, 4 cp. Dash and tail lamps are 6-8 volt, 2 cp. On 1920-21 cars, head lamps are 6-8 volt, 20 cp.

FUSES.—Fuses are 5 ampere.

ANDERSON

MODEL 41 (1923-24-25)

WESTINGHOUSE GENERATING, STARTING AND LIGHTING SYSTEM

WESTINGHOUSE IGNITION

BATTERY.—Willard, Type SJRN-4, 6 volts, 111 ampere-hours capacity. **The positive** (+) terminal is grounded.

IGNITION.—Type SC. Coil Model No. 288,761. Distributor Model No. 303,018. Breaker contacts separate .011 to .015 inch. They are made of tungsten. If the condition of the contact points affects the ignition, remove and resurface on a medium oilstone.

Oiling.—Place 4 or 5 drops of light engine oil into the oiler on the outside of the breaker box every two weeks. If the car is driven more than 500 miles in two weeks, this care must be given every 500 miles.

Timng.—The breaker contacts begin to separate when the top dead center mark on the flywheel is one-half of an inch past indicator. The spark control lever and breaker assembly fully retarded.

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

Spark Plugs.—The spark plug gaps are .025-.030 inch.

STARTER.—Frame No. 711. Model No. 355,708. The direction of rotation is counter-clockwise, looking at the commutator end. The starter cranks the engine at 140 R.P.M., taking 145 amperes. Lock torque is 17 pound-feet, current being 525 amperes, 4.0 volts.

Starter Test Data

Torque	R.P.M.	Amperes	Volts
2.5 lb. ft.	1250	150	5.5
17.0 lb. ft.	0	525	4.0

Brush tension is 2.5 to 3.0 pounds.

Oiling.—Fill the oil cups with light engine oil every month. If the car is driven more than 1000 miles in a month, this care must be given every 1000 mies.

GENERATOR:—Frame No. 35-ATI, Style No. 355,705. The direction of rotation is counter-clockwise, looking at the commutattor end. The third brush system is employed for current regulation. The maximum charging rate is 16 amperes, reached at 1450 R.P.M. of armature or 28 M.P.H., car speed in high gear.

Generator Test Data

Hot Test			Cold Test		
Amperes	R.P.M.	Volts	Amperes	R.P.M.	Volts
0	625	6.5	0	475	6.5
7	950	6.6	8	750	8.0
11	1450	7.7	15-16	1450	8.0

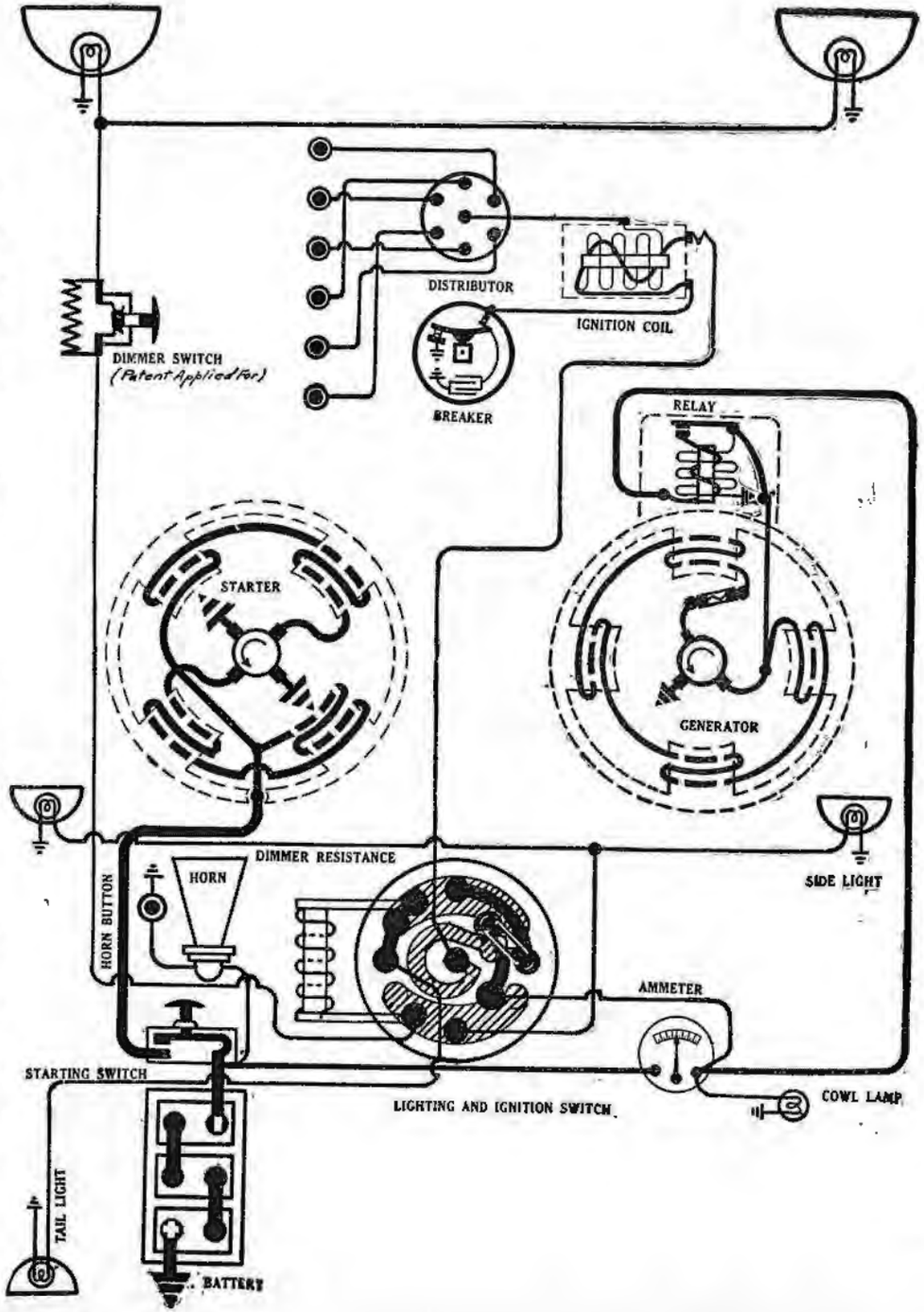
The brush tension is 20-24 ounces. To adjust generator output, loosen the slotted hexagonal bolt on the endplate and shift the third brush in a counter-clockwise direction to increase the charging rate.

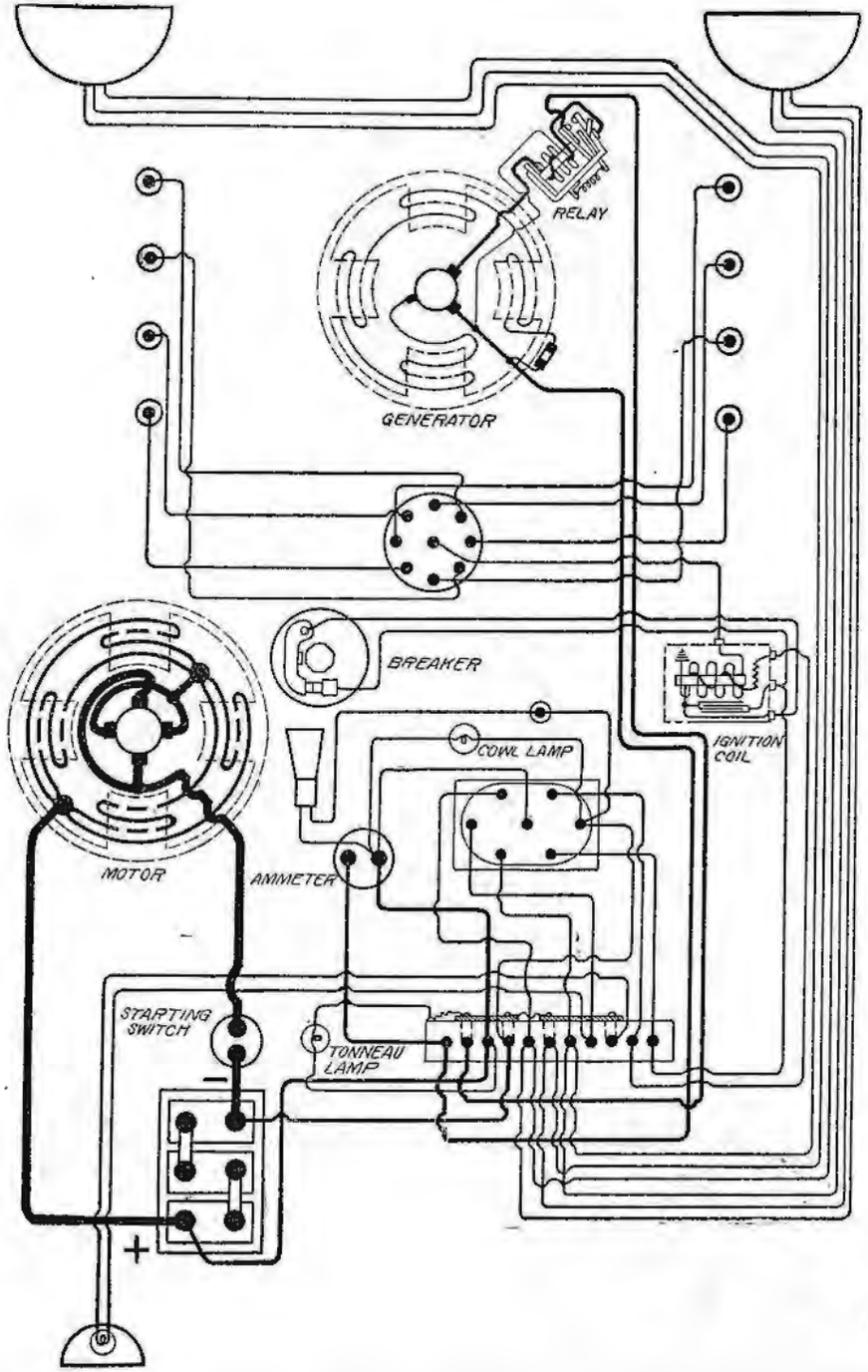
Oiling.—Place 4 or 5 drops of light engine oil in the generator oil cups every two weeks. If the car is driven more than 500 miles in tow weeks, this care must be given every 500 miles.

RELAY.—Model No. 302,210. Relay closes at 7.85 M.P.H., or 475 R.P.M. of armature, and opens at 6.7 M.P.H., or 405 R.P.M. The relay contacts separate .035 to .050 inch. The air gap between armature and coil core is .014 to 017 inch, contacts closed.

LAMPS:—Briggs and Stratton Switch, Model 37750. Head lamps are 6-8 volt, 21 cp. A dimmer resistance is used. Dash, tail and dome lamps are 6-8 volt, 2 cp.

FUSES.—Generator fuse is 5 amperes. Lighting fuse is 15 amperes.





APPERSON

MODEL 8-22 (1922)

BIJUR GENERATING, STARTING AND LIGHTING SYSTEM

REMY IGNITION

BATTERY:—(8-18 and 8-20), Willard, Type SJWN-3, 6 volt 104.2 Ampere hour **(8-22), Exide, 3-XC-15,** 6 volt, 104.2 ampere hour. The two wire system is used.

IGNITION.—Coil Model No. 284-H. Distributor Model No. 367-C. Breaker contacts separate .022 inch. When the condition of the points affects the ignition, resurface with a fine, flat jeweler's file or worn No. 00 sandpaper. Ignition current is 4½-5 amperes, engine idle, breaker contacts and ignition switch closed.

OILING.—Refill the cup under the distributor head with soft cup grease and turn down two turns every two weeks. Put a small amount of vaseline on the fiber bumper of the contact arm, applying with a toothpick. If the car is driven more than 500 miles in two weeks, these attentions must be given every 500 miles.

TIMING.—Breaker contacts begin to separate when the top dead center mark on the flywheel is ½ inch past the indicator, spark control lever and breaker assembly in the fully retarded position.

SPARK PLUG GAPS.—Spark plug gaps are .025 to .030 inch.

FIRING ORDER.—The firing order is 1, 6, 3, 5, 4, 7, 2, 8.

STARTER.—Type E.D.160, M-1114. Rotation is counter-clockwise, looking at commutator end. Lock torque is 16.5 pound-feet, current 665 amperes, 3.6 volts. Pressure of brushes on commutator is 25 ounces.

OILING.—Put 5 or 6 drops of light engine oil in each of the starter oilers every month.

GENERATOR.—Type L-61, M-1193. Rotation is counter-clockwise, looking at commutator end. Generator current regulation is by third brush system. Maximum charging rate is 15 amperes, reached at 20 miles per hour, or 1400 R.P.M. of armature. Charging rate is varied by inserting a special toothed wrench in the adjusting hole in the commutator end plate and shifting the third brush assembly through a ratchet engagement. Turn the adjusting wrench to the right (facing commutator end) to increase the charging rate, and to the left to decrease the charging rate. Maximum current output must not exceed 15 amperes at 1400-1600 R.P.M. Pressure of brushes on commutator is 14 ounces.

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

RELAY.—Relay is mounted in generator frame. Relay closes at 8-9 miles per hour or 550-600 R.P.M. of armature, and opens at 6-7 miles per hour or 500-550 R.P.M. of armature. Relay contacts separate .045 inch. Air gap between armature (moving member) and coil core is .035 inch, contacts closed. To adjust relay, connect a voltmeter across the main brushes of the generator. Then insert a special socket wrench in the small adjusting hole in commutator end plate and adjust relay spring tension until the contacts close when the voltage reaches 6.5 volts. Clean relay contacts by drawing unglazed paper between them. If badly burned or pitted, resurface with well worn No. 00 sandpaper. Remove all grit. Adjust before again putting into service.

LAMPS.—Head lamps are 6-8 volt, 18 cp. Dimmer lamps are 6-8 volt, 4 cp. Dash, tail and tonneau lamps are 6-8 volt, 2 cp.

FUSE.—Fuse is 10 ampere.

APPERSON

MODEL 6-23 (1923) 6-24 (1924)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

BATTERY.—Prest-O-Lite, Type 613 S.H.C., 6 volts, 100 ampere-hour capacity. The starting capacity is 130 amperes for 20 minutes. The lighting capacity is 5 amperes for 22.5 hours. The negative (-) terminal is grounded.

IGNITION:—Coil Model 284-L. Distributor Models 366-V, 626-H. Breaker contacts separate .020-.025 inch. They are made of tungsten. If the condition of the contact points affects the ignition, remove and resurface on a medium hard oilstone or with a fine jeweler's file. It is not necessary to grind the contact points if they are burned or pitted. Just brighten up the point and remove the raised portion of the opposite point.

Oiling.—Fill grease cups with medium soft cup grease and turn down every two weeks. Apply a very small amount of vaseline on the breaker cam every two weeks. If the car is driven more than 500 miles in two weeks, this care must be given every 500 miles.

Timing.—Breaker contacts begin to separate when piston No. 1 is at top dead center, on compression stroke, spark control lever and breaker assembly fully retarded, or 15° early before reaching top dead center, measured on flywheel, spark control lever and breaker assembly fully advanced.

Firing Order:—The firing order is 1-4-2-6-3-5 on 1923 cars and 1-5-3-6-2-4 on 1924 cars.

Spark Plugs.—The spark plug gaps are .025-.035 inch.

STARTER.—Model No. 720-L. The starter is connected to the engine by an outboard Bendix drive. The direction of rotation is counter-clockwise, looking at commutator end. The starter is mounted with a No. 2 S. A. E. flange.

Starter Test Data.

Torque	Amperes	Volts	R.P.M.
0 (Running Free)	65	5.00	6000
15 ft. lbs.	570	3.15	0 (Lock)

The brush tension is 20-28 ounces.

Oiling.—Fill the oil cup with light engine oil every month. If the car is driven more than 1000 miles in a month, this care must be given every 1000 miles.

GENERATOR.—Model No. 917-L. The direction of rotation is counter-clockwise, looking at commutator end. The third brush system and thermostatic control are used for current regulation. To increase the current output, shift the third brush in the direction of rotation (counter-clockwise). To decrease the generator charging rate, shift the third brush in the opposite direction (clockwise). The thermostat is automatic.

Generator Test Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.5	675			
7	7.0-7.3	850	9-12 (Max.)	7.5	1800-2000
18-20 (Max.)	8.4	1900			

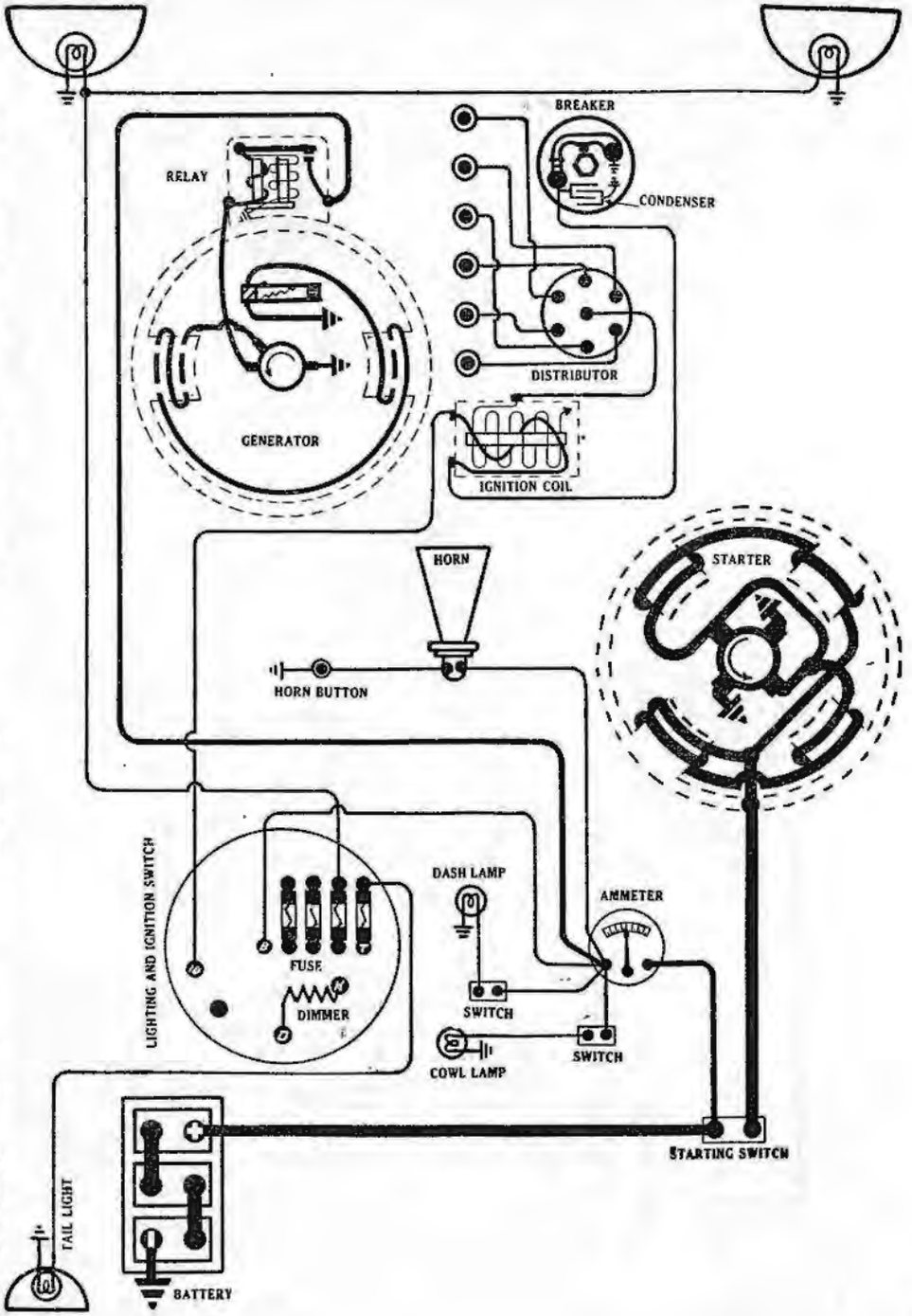
The brush tension is 14-18 ounces. The generator field draws a current of 5 amperes at 6 volts.

Oiling.—Fill oil cups at each end of the generator housing every two weeks. If the car is driven more than 500 miles in two weeks, this care must be given every 500 miles.

RELAY:—Model No. 265-B. Relay closes at 9-10 miles per hour, car speed in high gear, or at 675 R. P. M. of armature. The relay contact points separate .010-.016 inch, contacts fully separated. The air gap between relay armature and coil core is .010-.020 inch, relay contacts fully closed. Clean relay contact points by drawing unglazed paper between them. If the same are badly pitted or burned, remove and resurface on a medium hard oilstone.

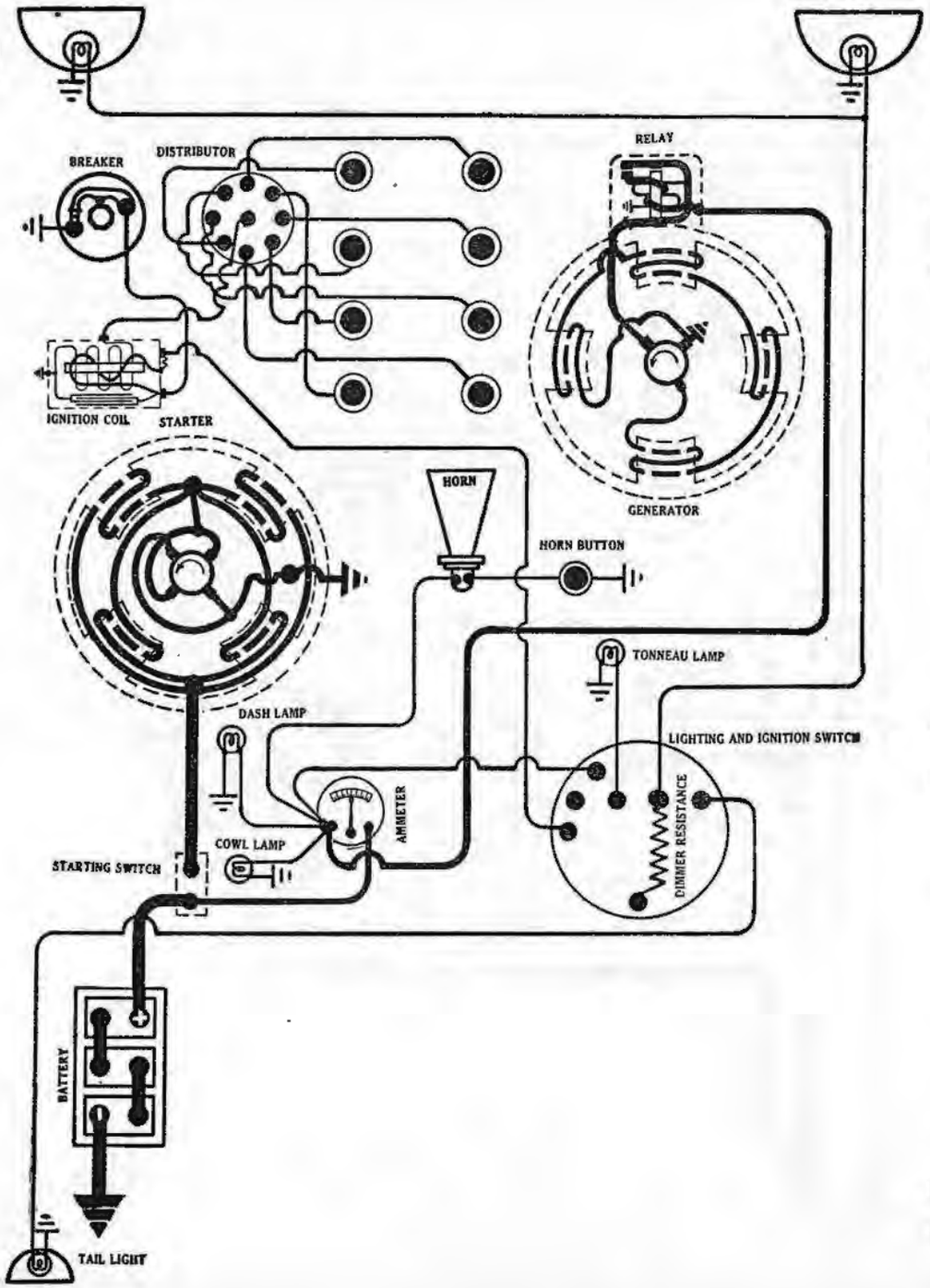
LIGHTING:—Remy Switch, Model 471-E. Headlights are each 6-8 volt, 21 cp. Headlights when dimmed are 4 cp. Dash, dome, cowl, tail and tonneau lights are each 6-8 volt, 2 cp.

FUSES.—All fuses are 10 amperes capacity.



APPERSON

MODEL 8-23 & 8-24 (1923-24).
BIJUR GENERATING, STARTING AND LIGHTING SYSTEM.
REMY IGNITION.



BATTERY: — **Prest-O-Lite, Type 613-SHC,** 6 volt, 100 ampere hour. The starting capacity is 130 amperes for 20 minutes. The lighting capacity is 5 amperes for 22.5 hours. The negative (-) terminal is grounded.

IGNITION — Coil Model No. 284-H. Distributor Model No. 367-C. The breaker contacts separate .025 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface on a medium hard oilstone or with a fine flat jeweler's file.

OILING: — Fill grease cup with medium soft cup grease and turn down two turns every two weeks. Put a very small amount of vaseline on the surface of the breaker cam every two weeks or each 500 miles.

TIMING: — Breaker contacts begin to separate when piston No. 1 is on top dead center on compression stroke, spark control lever and breaker assembly in the fully retarded position; or 15° before reaching top dead center (measured on the flywheel) with the spark control lever and breaker assembly fully advanced.

FIRING ORDER: — The firing order is 1, 6, 3, 5, 4, 7, 2, 8. (Cylinders are numbered 1, 2, 3, 4 from the radiator on the right hand block, viewed from drivers seat, and 5, 6, 7, 8 on the left hand block).

SPARK PLUG GAPS: — The spark plug gaps are .030 inch.

STARTER: — **Model ED.-160, M-1729.** The starter is connected to the engine by means of a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter running free at 6500 R. P. M. takes 35 amperes at 6 volts.

Starter Test Data.

Torque.	R. P. M.	Volts.	Amperes.
0 lb. ft.	6500	6.	35
2	2000	5.4	125
6	1000	4.8	275
8	700	4.5	350
10	450	4.25	440
16	Lock	3.5	600

The tension of each of the starter brushes should be 24 ounces.

OILING: — Put 5 or 6 drops of light engine oil in each of the starter bearing oilers every month or each 1000 miles.

GENERATOR: — **Model L-220, M-1731.** Generator current regulation is by the third brush system. The direction of rotation is counter-clockwise looking at the commutator end. To adjust the charging rate, remove the commutator cover band and loosen the 8/32 lock nut that holds the third brush bracket stationary. Then shift the third brush bracket in the direction of rotation (counter-clockwise) by means of the screw to increase the charging rate and in the opposite direction to decrease the charging rate. The maximum charging rate is 12-14 amperes reached at 1400 R. P. M. of the generator armature.

Generator Test Data.

Cold Test (100°F)			Hot Test (200°F)		
Amperes.	Volts.	R. P. M	Amperes.	Volts.	R. P. M.
0	7.5	400	0	7.5	500
6	8.1	625	6	8.1	725
10	8.3	900	10	8.3	1000
12	8.5	1100	12	8.5	1200
7	7.9	3200	7	7.9	3300

Motoring freely the generator makes 380 R. P. M. taking 5-6 amperes at 6.1 volts. The shunt field draws 5.1 amperes at 6.1 volts. The tension of each of the generator brushes should be 20 ounces.

OILING: — Put 5 or 6 drops of light engine oil in each of the generator bearing oilers every month or each 1000 miles.

RELAY: — Relay is mounted on top of the generator. Relay contacts close when the voltage of the generator reaches 6.7 volts and open with a discharge current of 2 amperes. Relay contacts separate .020 inch. The air gap between the relay armature (moving member) and coil core is .015 inch, contacts closed.

LIGHTING:—Bijur Switch, Model T161-M865, or Remy, Model 473-A. Headlights are 6-8 volt, 21 cp. Dash, tail, tonneau and dome lights are each 6-8 volt, 2 cp.

FUSES:—Generator field fuse is 10 amperes.

APPERSON

MODEL 6-24, 6-25 (1924-25)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

BATTERY.—Prest-O-Lite, Type 613-SHK. 6 volt. Starting capacity is 130 amperes for 20 minutes. Lighting capacity is 5 amperes for 22.5 hours. The negative (—) terminal is grounded.

IGNITION:—Coil Model 284-P. Distributor Model 626-J, 636-D. Breaker contacts separate .020-.025 inch. Resurface contacts with a fine flat jeweler's file or on a medium hard oilstone. Distributor is of the semi-automatic type. Manual advance is 25 degrees. Automatic advance is 30 degrees.

Oiling.—Fill the grease cup on the side of the distributor housing with medium heavy grease and turn down two turns every two weeks or each 500 miles. Put a small bit of grease on the face of the breaker cam every month.

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 720-G. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 20-28 ounces. Starter switch is Model 406-A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Oiling.—Put 5 or 6 drops of light engine oil in the starter oilers every month or each 1000 miles.

GENERATOR.—Model 917-W. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system combined with a thermostat. The thermostat contacts open at approximately 165° F. cutting a resistance into the field circuit and reducing the output 40-50%. To adjust generator output, remove commutator cover band and loosen the third brush adjusting screw on the generator end plate. Then shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	7	675			
7	7.2	850	11	7.5	1900
19	8.4	1900			

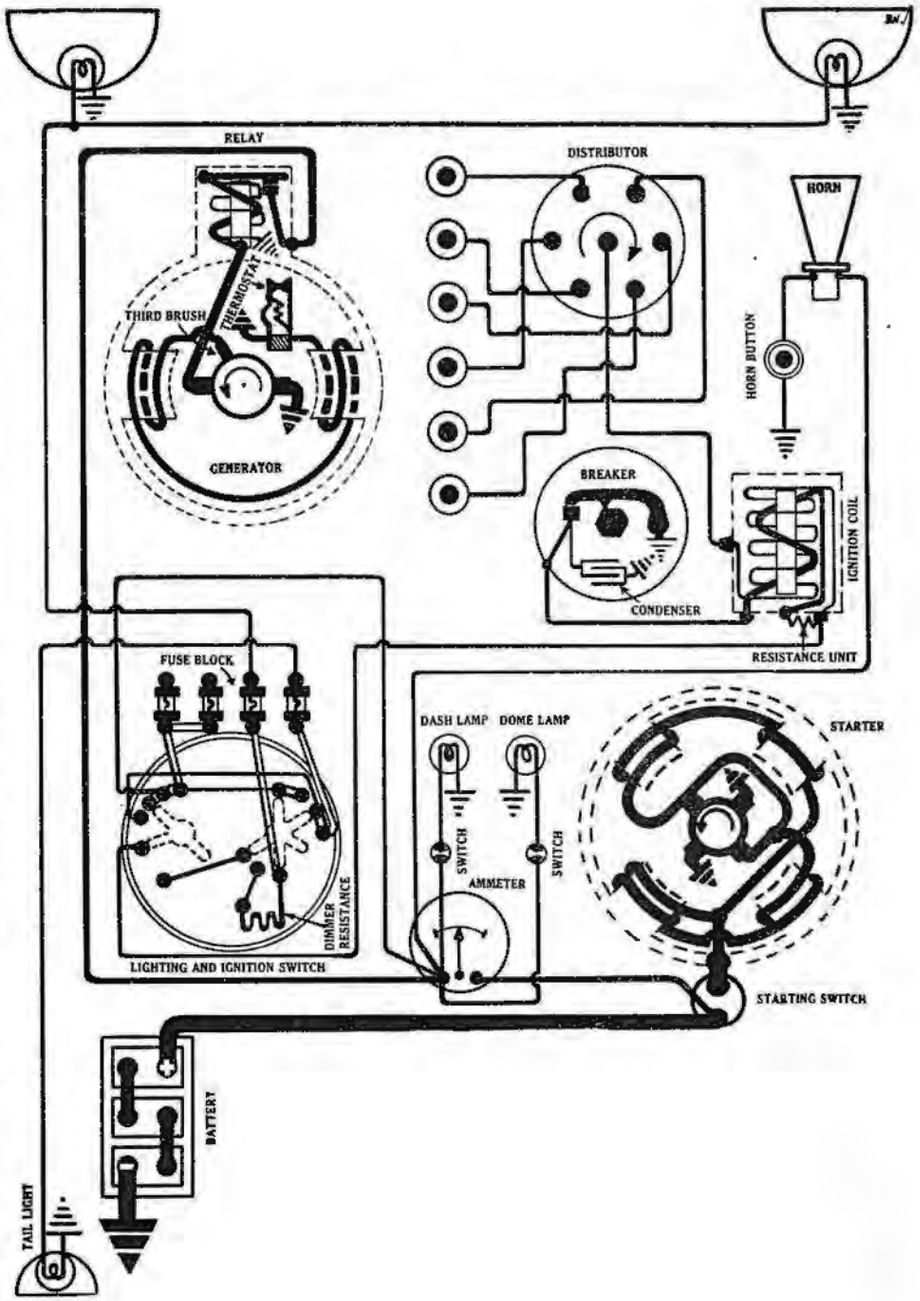
Shunt field current is 5 amperes at 6 volts. Generator brush tension is 22-28 ounces.

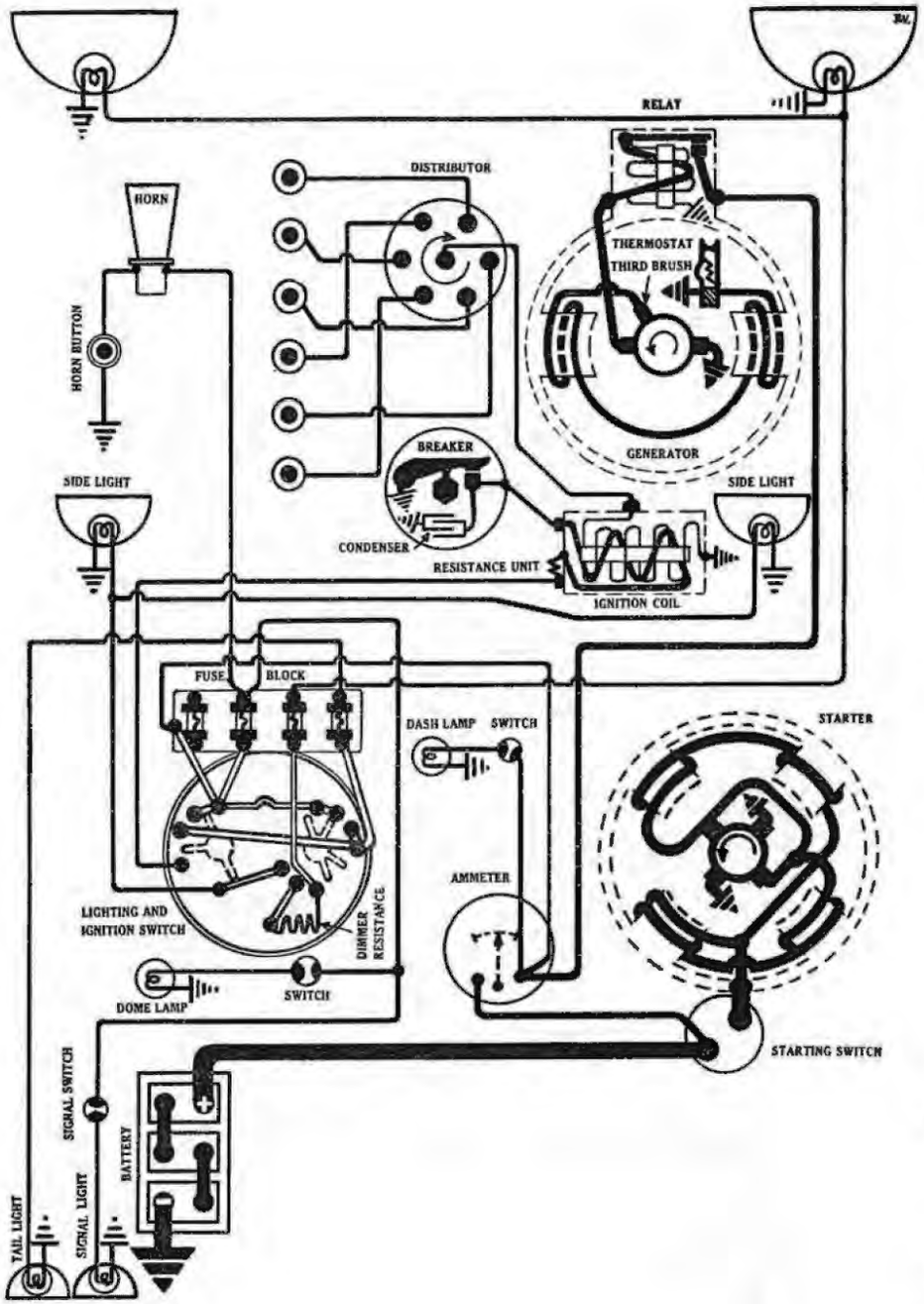
Oiling.—Put 5 or 6 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles.

RELAY.—Model 265-B. Relay is mounted on top of the generator. Relay contacts close when the voltage of the generator reaches 7-7.5 volts at approximately 675 R.P.M. of the generator armature and open with a discharge current of 0-3 amperes. Charging current at closing of contacts is 2 amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, coutacts closed.

LIGHTING.—Switch Model 471-E. Head lamps are 6-8 volt, 21 cp. S. C. With dimmer resistance in circuit head lamps are approximately 4 cp. Dash, dome, side, tonneau and tail lamps are each 6-8 volt, 2 cp.

FUSES.—Lighting fuses are 10 amperes.





APPERSON

SIX (1925-26)

REMY GENERATING, STARTING AND LIGHTING SYSTEM

REMY IGNITION

BATTERY:—Prest-O-Lit, Type 613-SHK, 6 volt. Starting capacity is 130 amperes for 20 minutes. Lighting capacity is 5 amperes for 22.5 hours. The negative (—) terminal is grounded.

IGNITION.—Coil Model 284-P. Distributor Models 626-P and 636-D. Breaker contacts separate .020-.025 inch. Resurface contacts with a fine, flat jeweler's file or on a medium hard oilstone. Distributor is of the semi-automatic type. Automatic advance is 30°. Manual advance is 15° on the Model 626-P and 25° on the Model 636-D.

Oiling:—Fill the grease cup on the side of the distributor housing with medium heavy grease and turn down two turns every two weeks or each 500 miles. Put a small bit of grease on the face of the breaker cam every month.

Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches top dead center with the spark control lever and breaker assemgly 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 720-J, Q. Starter is connected to engine throngh a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 20-28 ounces. Starter switch is Model 406-A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Oiling:—Put 5 or 6 drops of light engine oil in the starter oilers every month or 1000 miles.

GENERATOR.—Model 941-B. The direction of rotation is connter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system combined with a thermostat. The thermostat contacts open at approximately 165° F. cntting a resistance into the field circuit and reducing the output 40-50%. To adjust generator output, remove commutator cover band and loosen the third brush adjusting screw on the generator endplate. Then shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	7	675			
7	7-7.3	750	11	7.5	1900
21	8.35-8.5	1450			

Shunt field current is 5 amperes at 6 volts. Generator brush tension is 22-28 ounces.

Oiling:—Put 5 or 6 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles.

RELAY:—Model 265-B. Relay is mounted on top of the generator. Relay contacts close when the voltage of the geuerator reaches 7-7.5 volts at approximately 675 R.P.M. of the generator armature and open with a discharge current of 0-3 amperes. Charging current at closing of contacts is 2 amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, contacts closed.

LIGHTING:—Switch Model 471-E. Head lamps are 6-8 volt, 21 cp. S.C. With dimmer resistance in circuit head lamps are approximately 4 cp. Dash, dome, side, tonneau and tail lamps are each 6-8 volt, 2 cp.

FUSES:—Lighting fuses are 10 amperes.

APPERSON

STRAIGHT AWAY EIGHT (1925-26)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

BATTERY.—Prest-O-Lite, Type 613-S.H.K. 6 volt. Starting capacity is 130 amperes for 20 minutes. Lighting capacity is 5 amperes for 22.5 hours. The negative (—) terminal is grounded.

IGNITION.—Coil Model 284-L. Distributor Model 648-A. Breaker contacts separate .018-.024 inch. Resurface contacts with a fine, flat jeweler's file or on a medium hard oilstone. Double contacts are used. They must be synchronized to open at the same instant. See Timing. Distributor is of the semi-automatic type. Manual advance is 20 degrees. Automatic advance is 15 degrees. The breaker arm spring tension should be 17.5-20.5 ounces.

Mounting:—Ignition coil is mounted on the generator. Distributor is mounted on the cylinder head. To remove distributor, disconnect primary lead and manual spark control and take off distributor cap with cables intact. Then take out locking screw in side of shaft housing and lift distributor from place.

Oiling.—Fill the grease cup on the side of the distributor housing with medium heavy grease and turn down two turns every month or each 1000 miles. Put a small bit of grease on the face of the breaker cam under the fiber bumper of the contact arm every month.

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. To set timing, crank engine over until piston No. 1 enters compression (the up stroke with both valves closed) and stop when piston reaches top dead center with the dead center mark on the flywheel opposite the indicator on the flywheel housing. Fully retard the manual spark control. Then loosen the lock nut on the breaker cam and carefully locate the cam so that the contacts are beginning to open. Tighten the lock nut and connect the spark plugs as indicated on the diagram. If contacts are properly synchronized both sets will open at the same instant.

Synchronization of Contacts. To synchronize contacts, connect six volt test lamps across each set of contacts so that the lamps light as the contacts open. Turn engine over until the first set of contacts open and the first lamp lights. Then loosen lock screws on breaker plate and shift plate until the second set of contacts also open. Tighten lock screws and check synchronization by cranking engine over and noting that both lamps light at the same instant. A fine adjustment can be made by changing the gap of one set of contacts slightly. Contact gap must be held within limits of .018-.024 inch

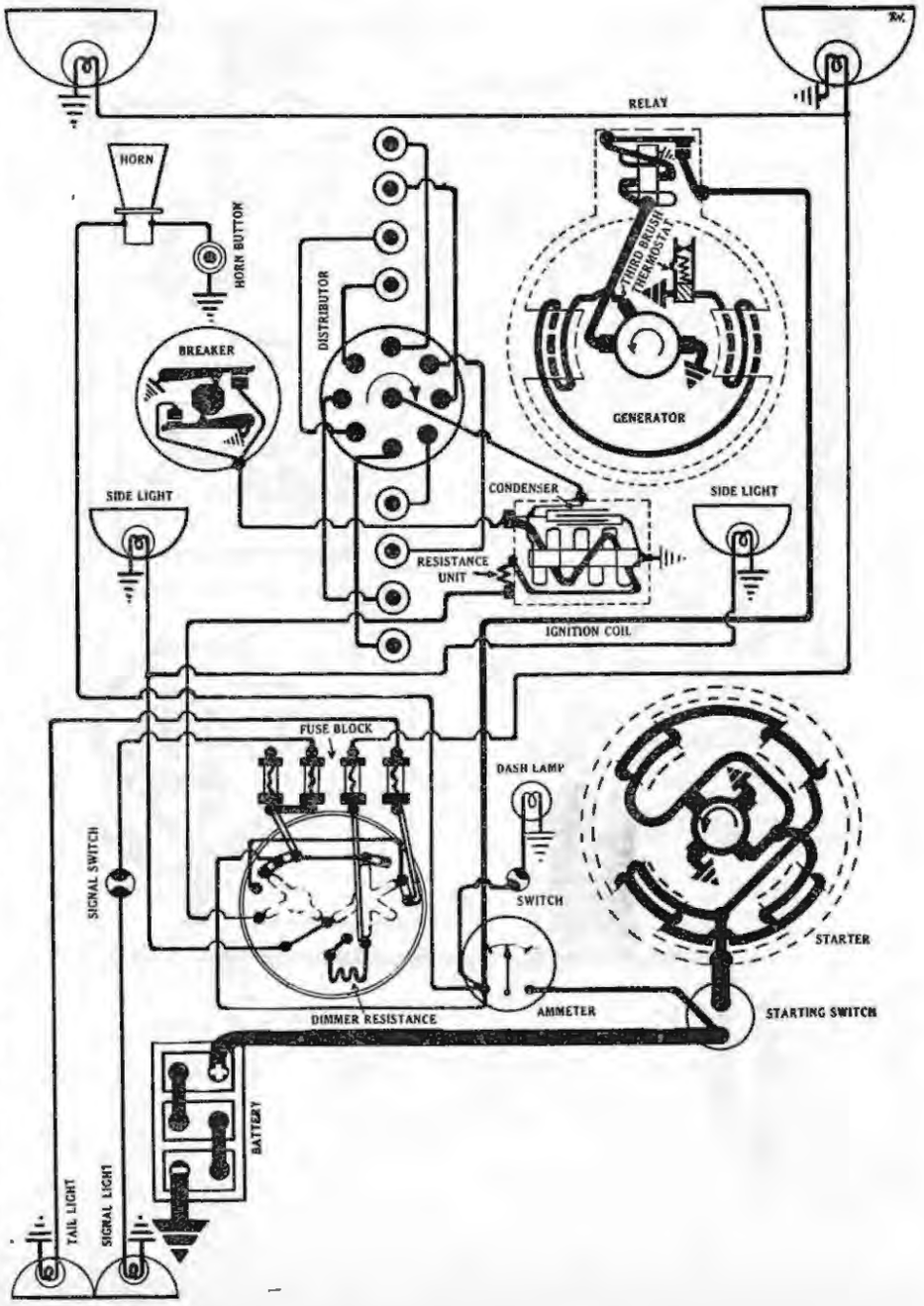
Firing Order.—The firing order is 1-6-2-5-8-3-7-4.

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

VALVE TIMING:—INLET VALVES. Head diameter, 1 5/8 inches. Stem diameter, 11/32 inch. Stem length, 5 1/2 inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds (valve closed), 62.5 pounds (valve open). Tappet clearance, .004 inch (hot). Inlet valves open at top dead center and close 35 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 15/32 inches. Stem diameter, 11/32 inch. Stem length, 5 1/2 inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds. (valve closed), 62.5 pounds (valve open). Tappet clearance, .006 inch (hot). Exhaust valves open 42 degrees before lower dead center and close 5 degrees after top dead center. Valve stem guides are removable. Valves with oversize stems are made.

STARTER.—Model 720-J. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end.



APPERSON

STRAIGHT AWAY EIGHT (1925-26)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

Starter brush tension should be 20-28 ounces. Starter switch is Model 406-A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Mounting:—Starter is flange mounted at right of engine on forward face of flywheel housing. To remove starter, disconnect cable and take out flange mounting cap screws. Then pull starter forward to clear drive and lift from place.

Oiling.—Put 5 or 6 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles if the car is driven more than 1000 miles in a month.

GENERATOR.—Model 917-V. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by third brush combined with a thermostat. Thermostat contacts open at approximately 165° cutting a resistance into the shunt field circuit and reducing the ontput 40-50%. To adjust generator output remove the commutator cover band and loosen the third brush adjusting screw on the generator end plate. Then shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	7	675			
7	7.2	850	11	7.5	1900
19	8.4	1900			

Shunt field current is 5 amperes at 6 volts. Generator brush spring tension should be 22-28 ounces.

Mounting:—Generator is base mounted at right of engine and is driven by an extension of the water pump shaft. To remove generator, remove ignition coil, disconnect generator lead and drive coupling and take out base mounting screws. Then lift generator from place.

Oiling:—Put 5 or 6 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY.—Model 265-B. Relay is mounted on the generator. Relay contacts close when the voltage of the generator reaches 7-7.5 volts at approximately 675 R.P.M. and open with a discharge current of 0-3 amperes. Charging current when contacts close is 2 amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, contacts closed.

LIGHTING.—Switch Model 471-E. Head and stop lamps are 6-8 volt, 21 cp. S. C. Dash, side, dome and tail lamps are each 6-8 volt, 2 cp. S. C.

FUSES.—Lighting fuses are 10 amperes.

AUBURN

MODEL 6-43 (1923-24)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

BATTERY.—Exide, Type 3-XC-13-1. 6 volt. Starting capacity is 98 amperes for 20 minutes. Lighting capacity is 5 amperes for 16.8 hours. The positive (+) terminal is grounded.

IGNITION:—Coil Model 284-K. Distributor Model 366-N. Breaker contacts separate .020-.025 inch. They are made of tungsten. Resurface contacts on a medium hard oilstone or with a fine flat jeweler's file. Distributor is of the manual type. Manual advance is 40°.

Oiling:—Refill the grease cup under the distributor head and turn down two turns every two weeks or each 500 miles. Put a small bit of vaseline on the face of the breaker cam under the fiber bumper every two weeks.
Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches top dead center with the spark control lever in the fully retarded position.
Firing Order:—The firing order is 1-5-3-6-2-4.
Spark Plugs:—Spark plug diameters are ⅞ nich. Gaps are .022 inch.

STARTER:—Model 720-J. Starter is connected to the engine through a Bendix drive. Direction of rotation is counter-clockwise, looking at the commutator end . Starter brush tension is 20-28 ounces each. Starter switch is Model 404-F and 406-A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Oiling:—Put 4 or 5 drops of light engine oil in the oiler at the commutator end of the starter every month or each 1000 miles.

GENERATOR.—Model 922-A. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system combined with a thermostat. Thermostat contacts open at 165°F. cutting a resistance into the field circuit and reducing the charging rate by approximately 50%. To adjust the generator charging rate, loosen the small round-headed screw on the generator endplate and shift the third brush mounting bracket. Shifting the third brush in a counter-clockwise direction increases the charging rate and in the opposite direction decreases the charging rate. Tighten the screw after making the adjustments.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	7.2	550			
7	7.2	675	11	8.2	1800
20	8.5	1650			

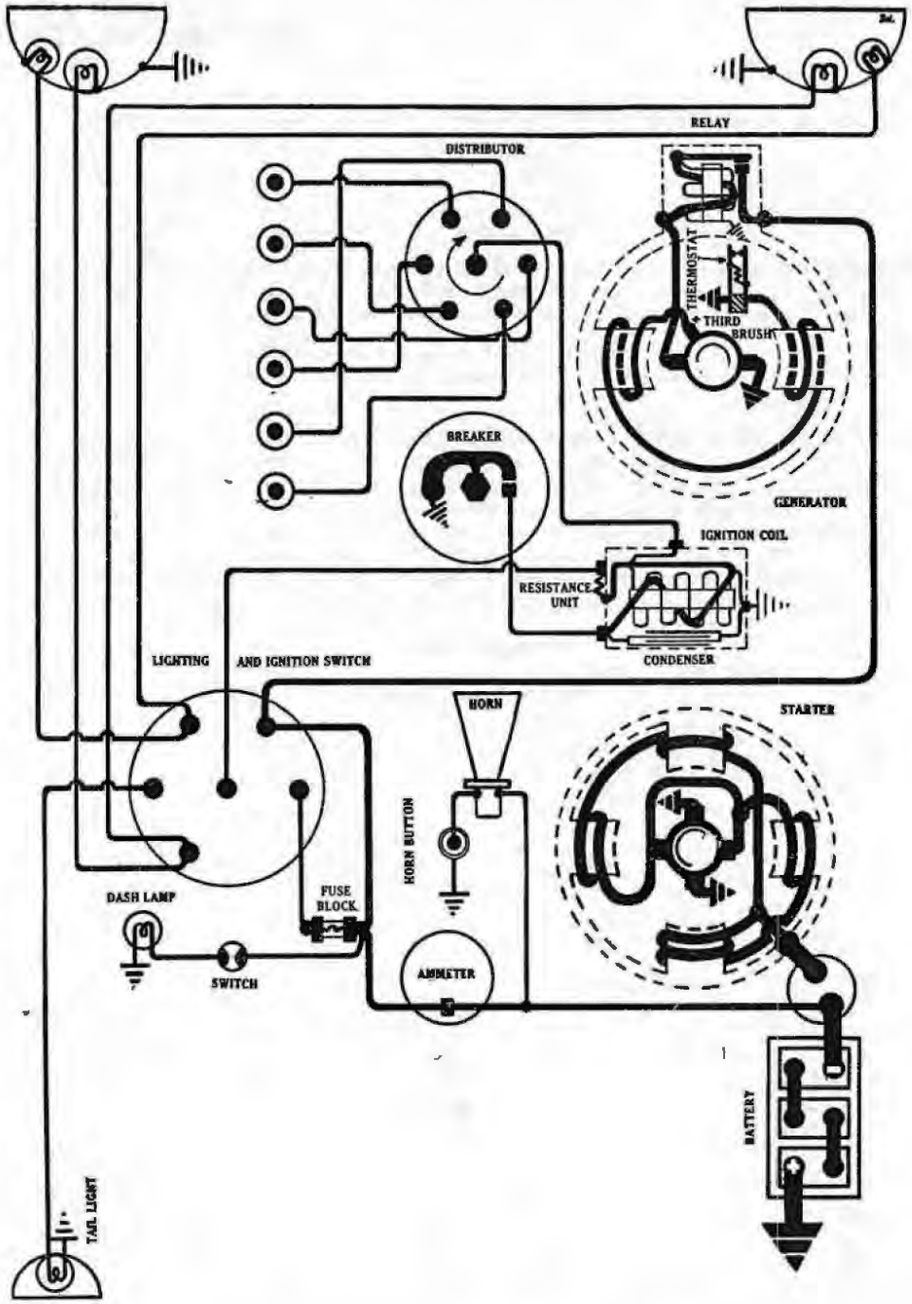
Shunt field current is 5 amperes at 6 volts. Brush tension should be 16 ounces each.

Oiling:—Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every month or each 1000 miles.

RELAY:—Model 265-B. Relay contacts close at 550 R.P.M. of the generator when the voltage reaches 7.2 volts and open with a current discharge of 0-2.5 amperes. Contacts separate .014 inch. Air gap between relay armature and coil core is .014 inch, contacts closed.

LIGHTING:—Briggs and Stratton Switch, Model 2260. Head and stop lamps are each 6-8 volt, 21 cp. Side, tail and dash lamps are each 6-8 volt, 2 cp.

FUSES:—Lighting fuses are 20 amperes.

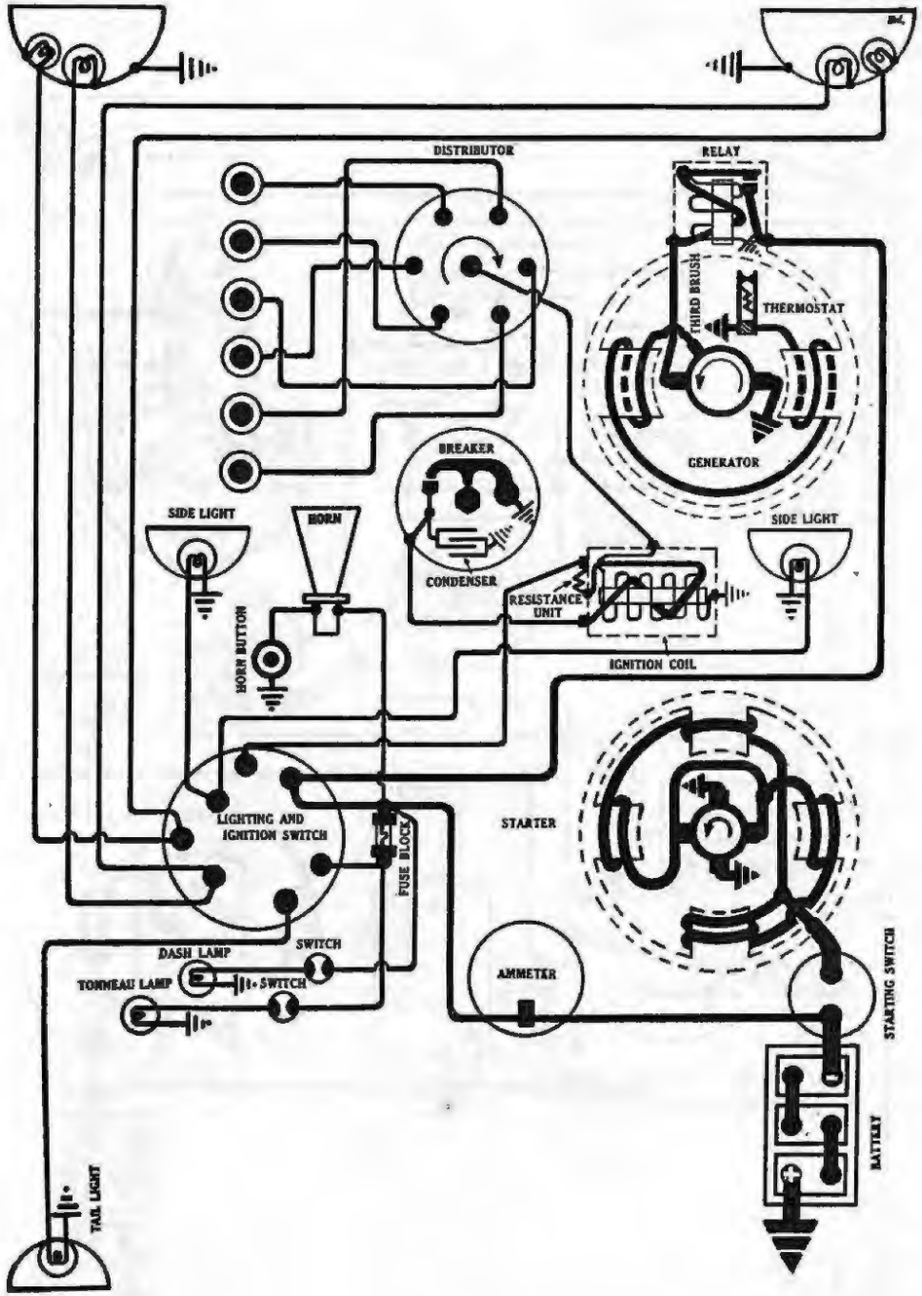


AUBURN

MODEL 6-63 (1923-24)

REMY GENERATING, STARTING AND LIGHTING SYSTEM

REMY IGNITION



BATTERY.—Exide, Type 3-XC-15-1. 6 volt. Starting capacity is 114 amperes for 20 minutes. Lighting capacity is 5 amperes for 20 hours. The positive (+) terminal is grounded.

IGNITION:—Coil Model 284-K. Distributor Model 626-H. Breaker contacts separate .020-.025 inch. They are made of tungsten. Resurface contacts on a medium hard oilstone or with a fine, flat jeweler's file. Distributor is of the semi-automatic type. Manual advance is 25°. Automatic advance is 30°.

Oiling.—Refill the grease cup under the distributor head and turn down two turns every two weeks or each 500 miles. Put a small bit of vaseline on the face of the breaker cam under the fiber bumper every two weeks.

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

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

Spark Plugs.—Spark plug diameters are ⅞ inch. Gaps are .022 inch.

STARTER.—Model 720-J. Starter is connected to the engine through a Bendix drive. Direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension is 20-28 ounces each. Starter switch is Model 404-F, 406-A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Oiling:—Put 4 or 5 drops of light engine oil in the oiler at the commutator end of the starter every month or each 1000 miles.

GENERATOR:—Model 917J and R. Direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system combined with a thermostat. Thermostat contacts open at 165° F. cutting a resistance into the field circuit and reducing the charging rate by approximately 50%. To adjust the generator charging rate, loosen the small round-headed screw on the generator end plate and shift the third brush mounting bracket. Shifting the third brush in a counter-clockwise direction increases the charging rate and in the opposite direction decreases the charging rate. Tighten the screw after making the adjustments.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	7.2	675			
7	7.2	850	11	8.2	1900
19	8.4	1900			

Shunt field current is 5 amperes at 6 volts. Generator brush tension is 22-28 ounces each.

Oiling.—Put 4 or 5 drops of light engine oil in each of generator bearing oilers every month or each 1000 miles.

RELAY:—Model 265-B. Relay contacts close at 675 R.P.M. of the generator when the voltage reaches 7.2 volts and open with a current discharge of 0-2.5 amperes. Contacts separate .014 inch. Air gap between relay armature and coil core is .014 inch, contacts closed.

LIGHTING:—Remy Switch, Model 472-G. Head and stop lamps are each 6-8 volt, 21 cp. Side, tail and dash lamps are each 6-8 volt, 2 cp. Dome and pillar lamps are each 6-8 volt, 4 cp.

FUSES.—Lighting fuses are 20 amperes.

AUBURN

MODEL 8-63 (1925)

REMY GENERATING, STARTING AND LIGHTING SYSTEM

REMY IGNITION

BATTERY.—U. S. L., Type XY-15-X. 6 volt. Starting capacity is 119 amperes for 20 minutes. Lighting capacity is 5 amperes for 20.8 hours. The positive (+) terminal is grounded.

IGNITION.—Coil Model 284-L. Distributor Model 648-A. Breaker contacts separate .018-.024 inch. They are made of tungsten. Resurface contacts with a fine, flat jeweler's file or on a medium hard oilstone. Distributor has both manual and and automatic advance. Maximum manual advance is 20 degrees. Maximum automatic advance is 15 degrees. Breaker arm spring tension is 17.5-20.5 ounces. Breaker has two sets of contacts operating on an eight sided cam. Contacts must be synchronized so as to open at the same instant. See Timing.

Mounting:—Distributor is mounted on the cylinder head. Ignition coil is mounted on the generator. To remove distributor, disconnect primary lead and manual spark control and take off distributor cap with cables intact. Then take out locking screw in side of shaft housing and lift distributor from place.

Oiling.—Refill the grease cup under the distributor head with medium cup grease and turn down two turns every month or each 1000 miles. Put a small bit of grease on the face of the breaker cam under the fiber bumper every month.

Timing.—Breaker contacts separate when the piston entering power stroke reaches top dead center with manual spark control fully retarded. To set timing, crank engine over until piston No. 1 reaches top dead center on compression stroke when the dead center mark on the flywheel should be directly opposite the indicator on the housing. Fully retard manual spark control. Then loosen lock nut on breaker cam and carefully locate cam so that contacts are beginning to open. If contacts are properly synchronized both sets should open at the same instant.

Synchronization of Contacts. To synchronize contacts crank engine over until the first set of contacts begin to open. Then loosen the lock screws and shift the breaker plate until the second set begin to open. Tighten the lock screws. Fine adjustments can be made by changing the gap of one set of contacts slightly. Contact gaps should be set at .022 inch and must be held within limits of .018-.024 inch.

Firing Order.—The firing order is 1-6-2-5-8-3-7-4.

Spark Plugs.—Spark plug diameters are ⅞ inch. Gaps are .022 inch.

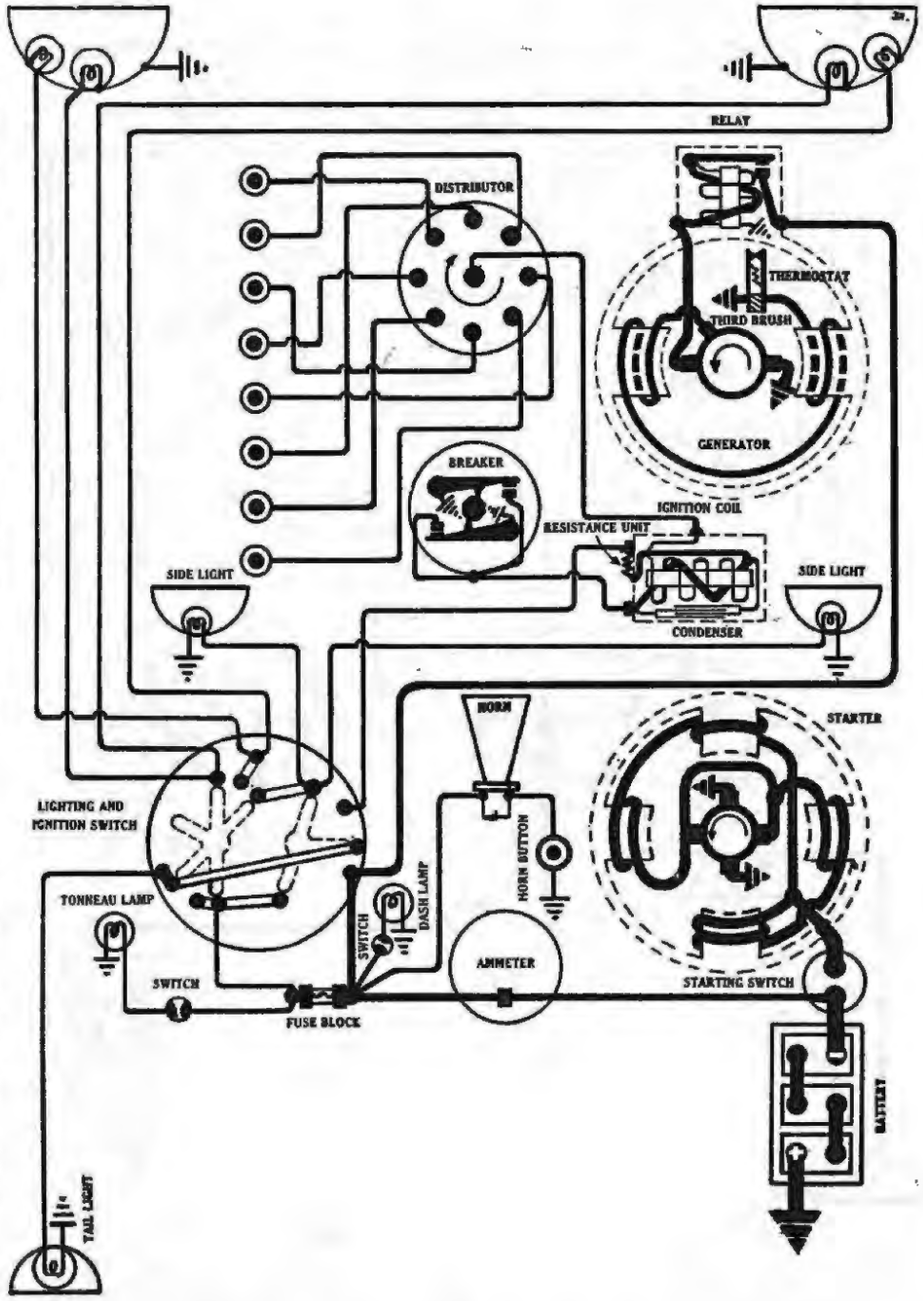
VALVE TIMING:—INLET VALVES. Head diameter, 1⅝ inches. Stem diameter, 11/32 inch. Stem length, 5½ inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds (valve closed), 62.5 pounds (valve open). Tappet clearance, .004 inch (hot). Inlet valves open at top dead center and close 35 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 15/32 inches. Stem diameter, 11/32 inch. Stem length, 5½ inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds (valve closed), 62.5 pounds (valve open). Tappet clearance, .006 inch (hot). Exhaust valves open 42 degrees before lower dead center and close 5 degrees after top dead center. Valve stem guides are removable. Valves with oversize stems are made.

STARTER.—Model 720-J. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 20-28 ounces each. Starting switch is Model 406-A.

Starter Data

Torque	R.P.M.	Amperes	Volts
0 lb. ft.	6000	65	5
15 "	Lock	570	3.15



AUBURN

MODEL 8-63 (1925)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

Mounting:—Starter is flange mounted at right of engine on forward face of flywheel housing. To remove starter, disconnect cable and take out flange mounting cap screws. Pull starter forward to clear drive and lift from place.

Oiling.—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles.

GENERATOR.—Model 917-V. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system combined with a thermostat. Thermostat contacts open at 165°F. and cut a resistance into the shunt field circuit, reducing the charging rate approximately 50%. To adjust generator output loosen the round headed screw on the outside of the generator and plate and shift the third brush mounting arm by hand. Shifting the third brush in the direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. Tighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M
2	7.2	675			
7	7.2	850	11	7.5	1900
19	8.4	1800			

Shunt field current is 5 amperes at 6 volts. Generator brush tension should be 22-28 ounces each.

Mounting:—Generator is base mounted at right of engine and is driven by an extension of the water pump shaft. To remove generator, remove ignition coil and disconnect generator lead and drive coupling. Then take out base mounting screws and lift generator from place.

Oiling.—Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every month or each 1000 miles.

RELAY.—Model 265-B. Relay is mounted on the generator. Relay contacts close at 675 R.P.M. of the generator armature when the voltage reaches 7.2 volts, and open with a discharge current of 0-3 amperes. Relay contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, contacts closed.

LIGHTING.—Switch Model 471-E. Head lamps are each 6-8 volt, 21 cp. Dimmer lamps are 6-8 volt, 4 cp. Tonneau lamp is 6-8 volt, 4 cp. Dash and tail lamps are each 6-8 volt, 2 cp.

FUSE.—Lighting fuse is 20 amperes.

AUBURN

MODEL 4-44 (1925-26)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

BATTERY.—U. S. L., Type XY-13X. 6 volt. Starting capacity is 102 amperes for 20 minutes. Lighting capacity is 5 amperes for 17.4 hours. The positive (+) terminal is grounded.

IGNITION:—Coil Model 284-L. Distributor Model 366-U. Breaker contacts separate .018-.024 inch. They are made of tungsten. Resurface contacts with a fine, flat jeweler's file or on a medium hard oilstone. Distributor is of the manual type. Manual advance is 40°.

Mounting:—Distributor is mounted at right of engine. To remove distributor, disconnect primary lead and manual advance control and take off distributor cap with cables intact. Then take out mounting screw and lift distributor from place.

Oiling.—Fill the grease cup under the distributor head with medium cup grease and turn down two turns every month or each 1000 miles. Put a small bit of grease on the face of the breaker cam under the fiber bumper every month.

Timing.—Breaker contacts begin to separate when piston entering power stroke reaches top dead center with the spark control lever and breaker assembly in the fully retarded position. To set timing, crank engine over until piston No. 1 reaches top dead center entering power stroke when the flywheel mark '1-4' will be directly opposite the indicator on the flywheel housing. Fully retard mannal spark control. Then loosen lock nut on breaker cam and locate cam so that contacts are beginning to open. Tighten the lock nut and connect the spark plugs as indicated on the diagram.

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

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

VALVE TIMING:—INLET VALVES. Head diameter, 1 5/16 inches. Stem diameter, 3/8 inch. Stem length, 7 9/32 inches. Spring pressure, 49 pounds (valve closed). Tappet clearance, .004 inch. Inlet valves open at top dead center and close 35 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 5/16 inches. Stem diameter, 3/8 inch. Stem length, 7 9/32 inches. Spring pressure, 49 pounds (valve closed). Tappet clearance, .006 inch (hot). Exhanst valves open 42 degrees before lower dead center and close 5 degrees after top dead center. Valve stem guides are removable. Valves with oversize stems are not made.

STARTER.—Model 714-A. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 20-24 ounces. Starting switch is Model 406-A.

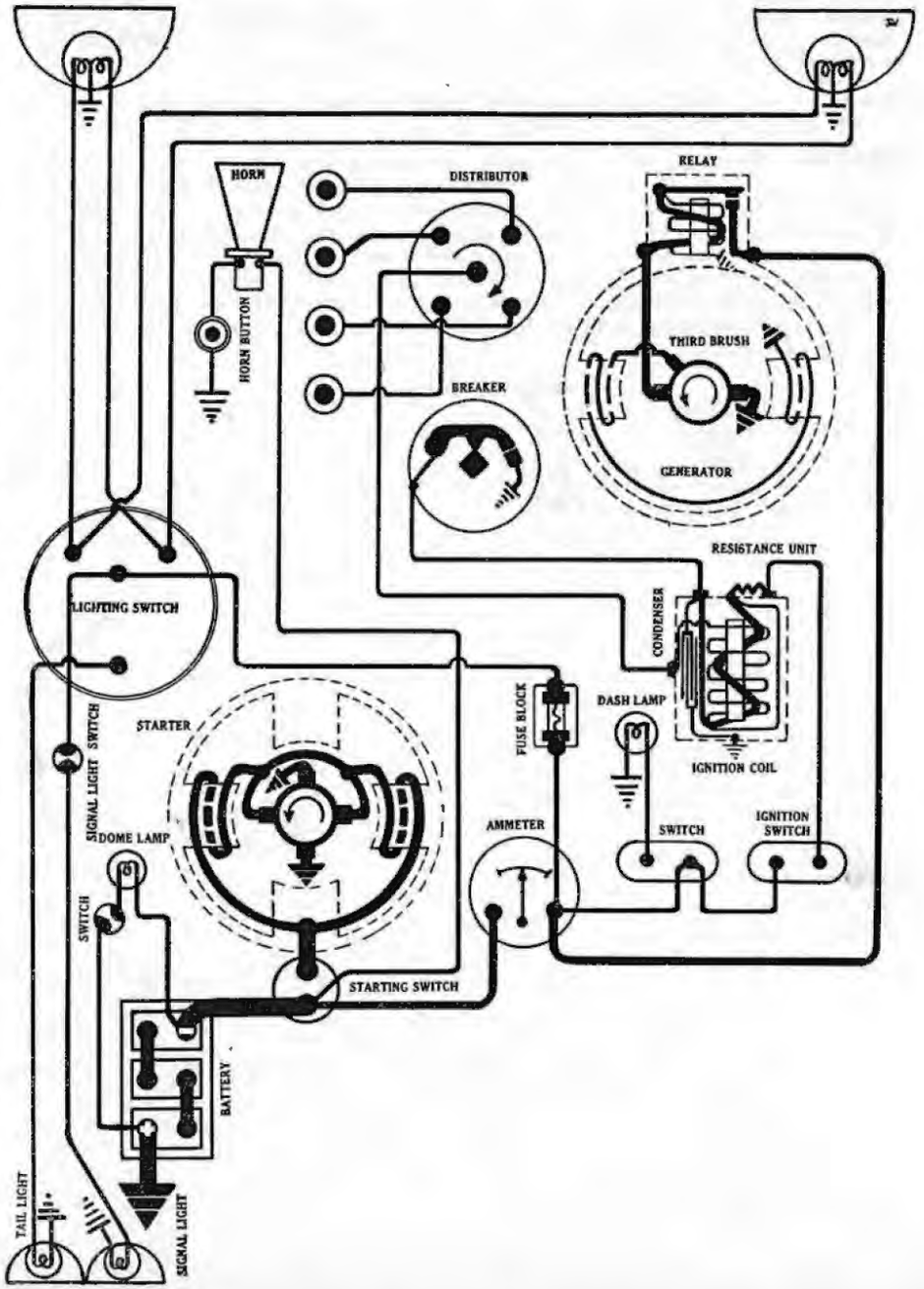
Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	5000	5	65
12 "	Lock	3.63	475

Mounting:—Starter is flange mounted at left of engine on forward face of flywheel housing. To remove starter, disconnect cable and take out three flange mounting cap screws. Pull starter forward to clear drive and lift from place.

Oiling.—Put 4 or 5 drops of light engine oil in the starter bearing oilers every month or each 1000 miles.

GENERATOR:—Model 941-D. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system. To adjust charging rate loosen the small round headed screw on the generator end plate and shift the third brush mounting arm by hand. Shifting the third brush



AUBURN

MODEL 4-44 (1925-26)

REMY GENERATING, STARTING AND LIGHTING SYSTEM

REMY IGNITION

in the direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. Tighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
7	7-7.3	750			
15-17	7.95-8.15	1400	11-14	7.55-7.85	1800
15		2500			

Shunt field current is 5 amperes at 6 volts. Generator brush tension should be 24-28 ounces each.

Mounting:—Generator is flange mounted at right of engine on rear face of timing chain case. To remove generator, disconnect lead and take off chain case cover plate. Remove nut on end of generator shaft and take out three flange mounting cap screws. Pull generator to the rear, leaving the drive sprocket in the engine. Tie up the timing chain and do not crank engine over with generator out.

Oiling.—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the generator every month or each 1000 miles.

RELAY.—Model 265-B. Relay is mounted on the generator. Relay contacts close at 675 R.P.M. of the generator armature when the voltage reaches 7.25 volts and open with a current discharge of 0-3 amperes. Charging current at closing of contacts is 2 amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .014-.018 inch, contacts closed.

LIGHTING.—Briggs & Stratton Switch Model 39720. Head lamps are 6-8 volt, 21 cp. D.C. with double filament for dimming. Dimmer filaments are 6-8 volt, 2 cp. Dome lamp is 6-8 volt, 4 cp. D.C. Dash and tail lamps are each 6-8 volt, 2 cp. S.C.

FUSES.—Lighting fuses are 20 amperes.

AUBURN

MODEL 6-66 (1925-26)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

BATTERY.—U. S. L., Type XY-13X. 6 volt. Starting capacity is 102 amperes for 20 minutes. Lighting capacity is 5 amperes for 17.4 hours. The positive (+) terminal is grounded.

IGNITION:—Coil Model 284-A, P. Distributor Model 636-F. Breaker contacts separate .018-.024 inch. They are made of tungsten. Resurface contacts on a medium hard oilstone or with a fine, flat jeweler's file. Distributor is of the manual and automatic advance type. Manual advance is 25°. Automatic advance is 30°.

Mounting:—Distributor is mounted on the cylinder head. To remove distributor, disconnect primary lead and manual spark control and take off distributor cap with cables intact. Then take out the set screw in the side of the shaft housing and lift distribntor from place.

Oiling.—Refill the grease cup under the distributor head with medium cup grease and turn down two turns every month or each 1000 miles. Put a small bit of grease on the face of the breaker cam under the fiber bumper of the contact arm every month.

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. To set timing, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed) and stop when piston reaches top dead center with the flywheel mark 'UDC.1-6' at the indicator in the inspection hole in the flywheel housing. Fully retard mannal spark control. Then loosen advance arm clamp screw and rotate distributor until contacts begin to open. Tighten the clamp screw and connect the spark plugs as indicated on the diagram.

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.

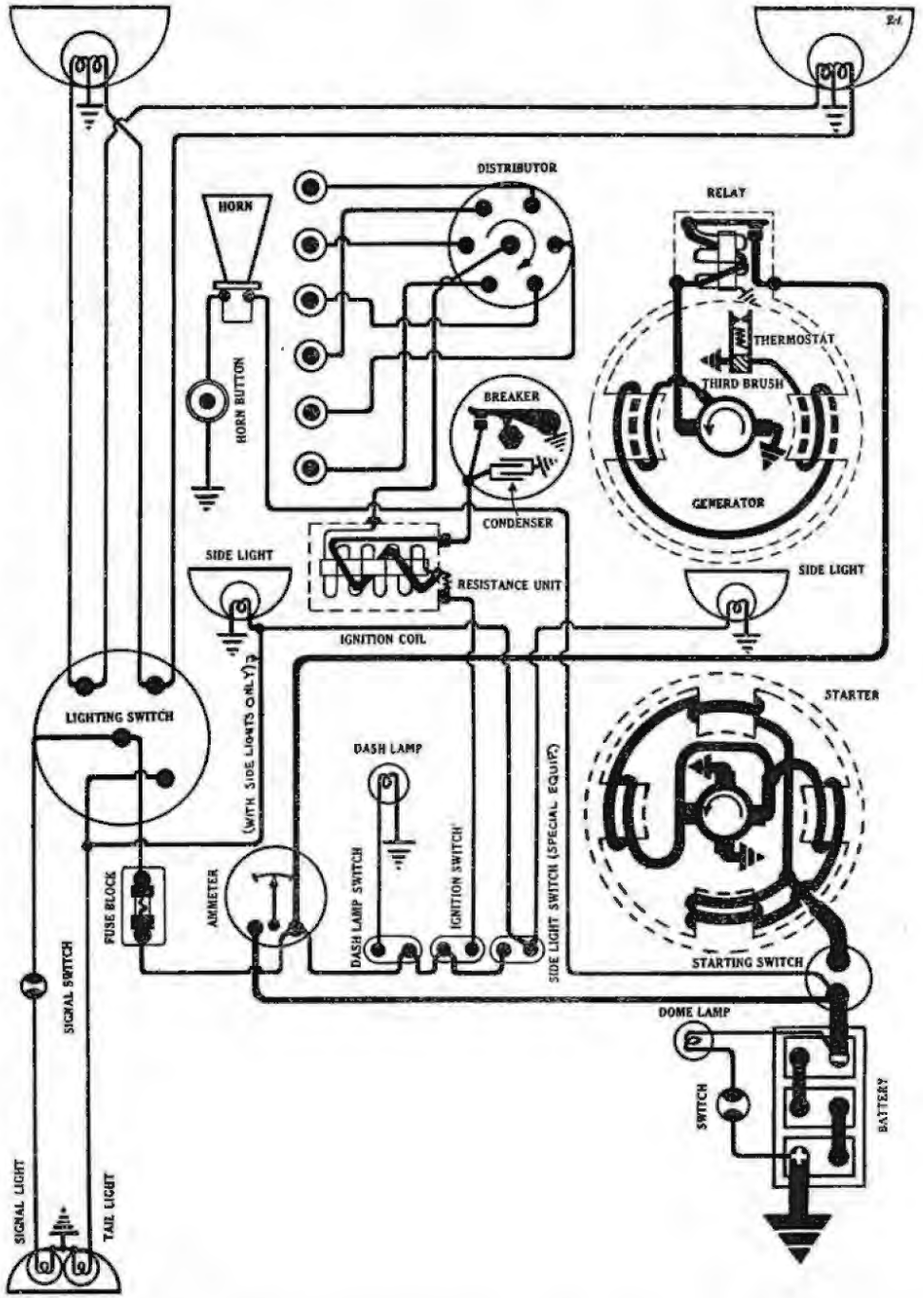
VALVE TIMING:—INLET VALVES. Head diameter, 1 5/8 inches. Stem diameter, 11/32 inch. Stem length, 5 1/2 inches. Valve lift, 11/32 inch. Spring pressure, 36 ponnds (valve closed), 62.5 pounds (valve open). Tappet clearance, .004 inch (hot). Inlet valves open 5 degrees after top dead center and close 40 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 15/32 inches. Stem diameter, 11/32 inch. Stem length, 5 1/2 inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds (valve closed), 62.5 pounds (valve open). Tappet clearance, .006 inch (hot). Exhaust valves open 42 degrees before lower dead center and close at top dead center.

To Check Valve Timing. Turn engine over until piston No. 1 is on top dead center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 inch. Turn engine over one complete revolution and stop with piston at top dead center when the flywheel mark 'UDC.1-6' should be opposite the indicator on the housing. The No. 1 inlet valve should begin to open at this point.

To Set Valve Timing. Turn crankshaft until piston No. 1 is on top dead center. Rotate camshaft until the two punch marks on the camshaft sprocket are directly opposite the punch mark on the crankshaft sprocket and in line with a straight edge laid across the two shaft centers. Assemble the chain in this position.

STARTER:—Model 720-J, Q. Starter is connected to engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 20-28 ounces each.



AUBURN

MODEL 6-66 (1925-26)
REMY GENERATING, STARTING AND LIGHTING SYSTEM
REMY IGNITION

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 lb. ft.	Lock	3.15	570

Mounting:—Starter is flange mounted at right of engine on forward face of flywheel housing. To remove starter, disconnect cable and take out three flange mounting cap screws. Then pull starter forward to clear drive and lift from place.

Oiling.—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles.

GENERATOR.—Model 941-D. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system combined with a thermostat. Thermostat contacts open at 165°, cutting a resistance into the shunt field circuit and reducing the charging rate approximately 50%. To adjust charging rate loosen the round headed screw on the outside of the generator end plate and shift the third brush mounting arm. Shifting the third brush in the direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. Tighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
2	7.25	675			
7	7-7.3	750	11	7.5	1900
21	8.35-8.5	1450			

Shunt field current is 5 amperes at 6 volts. Generator brush tension should be 22-28 ounces each.

Mounting:—Generator is flange mounted at the right of the engine on the rear face of the timing chain case. To remove generator, disconnect lead and take out three flange mounting cap screws. Pull generator to the rear to disengage the drive coupling and lift from place. Do not crank engine over with the generator out or the chain will slip on the drive sprocket.

Oiling.—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the generator every month or each 1000 miles.

RELAY.—Model 265-B. Relay is mounted on the generator. Relay contacts close when the voltage of the generator reaches 7.25 volts at 675 R.P.M. of the generator armature and open with a discharge current of 0-3 amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, contacts closed.

LIGHTING.—Briggs and Stratton Switch Model 39720. Head lamps are 6-8 volt, 21 and 2 cp. D.C. Head lamp bulbs are double filament. Dome lamp is 6-8 volt, 4 cp. D.C. Stop lamp is 6-8 volt, 4 cp. S.C. Dash and tail lamps are 6-8 volt, 2 cp. S.C.

FUSES.—Lighting fuses are 20 amperes.

AUBURN

MODEL 8-88 (1926)

REMY GENERATING, STARTING AND LIGHTING SYSTEM

REMY IGNITION

BATTERY.—U. S. L., Type XY-15X. 6 volt. Starting capacity is 119 amperes for 20 minutes. Lighting capacity is 5 amperes for 20.8 hours. The positive (+) terminal is grounded.

IGNITION.—Coil Model 284-L. Distributor Model 648-B. Breaker contacts separate .022 inch. They are made of tungsten. When the condition of the contacts affects the ignition, resurface on a medium hard oilstone or with a fine, flat jeweler's file. Breaker arm spring tension is 17-21 ounces. Distributor is semi-automatic. Maximum manual advance is 20 degrees. Maximum automatic advance is 15 degrees. Breaker has two sets of contacts operating on an eight sided cam. Contacts must be synchronized so as to open at the same instant. See Timing.

Mounting:—Distributor is mounted on the cylinder head. To remove distributor, disconnect primary lead and manual advance control and take off distributor cap with cables intact. Then loosen locking screw in shaft housing and lift distributor from place.

Oiling.—Fill the grease cup under the distributor head with medium cup grease and turn down two turns every month or each 1000 miles.

Timing.—Breaker contacts begin to separate when the piston entering power stroke reaches top dead center with the spark control lever in the fully retarded position. To set timing, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed) and stop when piston reaches top dead center when the dead center mark on the front flywheel should be directly opposite the ridge in the chain case cover. Fully retard manual spark control and loosen lock nut on top of breaker cam. Carefully locate cam so that contacts are beginning to open. Tighten the lock nut and connect the spark plugs as indicated on the diagram. If the contacts are properly synchronized they will both open at the same instant.

Synchronization of Contacts. Turn engine over until the first set of contacts (mounted directly on the breaker plate) begin to open. Then loosen the three lock screws on the sub-plate (on which the second set of contacts is mounted) and shift the plate until the second set of contacts open. Tighten the lock screws and check the contact gap. It must be held within limits of .018-.024 inch.

Firing Order.—The firing order is 1-6-2-5-8-3-7-4.

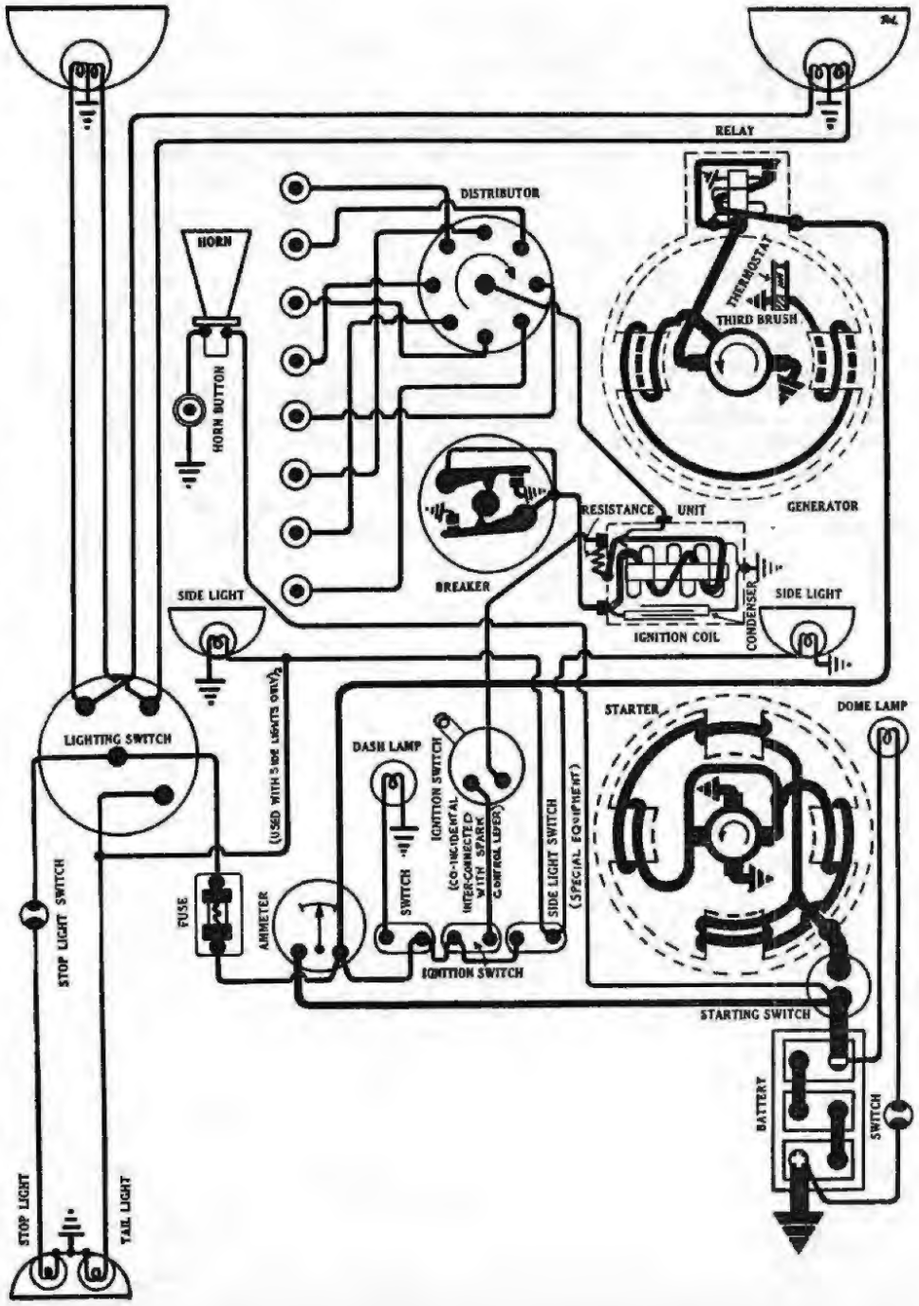
Spark Plugs.—Spark plug diameters are 7/8 inch. Gaps are .025 inch.

VALVE TIMING:—INLET VALVES. Head diameter, 1 5/8 inches. Stem diameter, .3425-.341 inch. Stem length, 4 7/8 inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds (valve closed), 62.5 pounds (valve open). Tappet clearance, .006 inch (hot). Inlet valves open at top dead center and close 45 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 15/32 inches. Stem diameter, .3425-.341 inch. Stem length, 4 7/8 inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds (valve closed), 62.5 pounds (valve open). Tappet clearance, .008 inch (hot). Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center. Valve stem guides are removable. Valves with oversize stems are made.

To Check Valve Timing. Turn engine over until piston No. 1 is on top dead center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 inch. Crank engine over one complete revolution and stop with piston on top dead center when dead center mark on front flywheel is opposite ridge in chain case. The No. 1 inlet valve should begin to open at this point.

To Set Valve Timing. Turn crankshaft until piston No. 1 is on top dead cen-



AUBURN

MODEL 8-88 (1926)

REMY GENERATING, STARTING AND LIGHTING SYSTEM

REMY IGNITION

ter. Rotate camshaft until the punch mark on the camshaft sprocket is directly opposite mark on crankshaft sprocket with both marks in line with a straightedge laid across the two shaft centers. Assemble the timing chain.

STARTER.—Model 720-Q. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 20-28 ounces. Starter switch is Model 406-A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Mounting:—Starter is flange mounted at right of engine on forward face of flywheel housing. To remove starter, disconnect cable and take out flange mounting cap screws. Pull starter forward to clear drive and lift from place.

Oiling.—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles.

GENERATOR.—Model 941-D. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system. A thermostat located in the third brush circuit opens at 165° F. cutting a resistance into the shunt field and reducing the output approximately 50%. To adjust generator output loosen the small round headed screw on the outside of the generator end plate and shift the third brush mounting arm. Shifting the third brush in the direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. Tighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
2	7.25	675			
7	7-7.3	750	11	7.5	1900
21	8.35-8.5	1450			

Shunt field current is 5 amperes at 6 volts. Generator brush tension is 22-28 ounces each.

Mounting:—Generator is flange mounted at right of engine on rear of timing chain case. To remove generator, disconnect lead and take out flange mounting cap screws. Pull generator to the rear to diseugage drive coupling and lift from place.

Oiling.—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the generator every month or 1000 miles.

RELAY.—Model 265-B. Relay is mounted on top of the generator. Relay contacts close at 675 R.P.M. of the generator armature when the voltage reaches 7.25 volts and open with a discharge current of 0-3 amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, contacts closed.

LIGHTING.—Briggs & Stratton Switch Model 39720. Head lamps are 6-8 volt 21 cp. Head lamp bulbs have double filament. Dimmer filament is 6-8 volt, 2 cp. Dome lamp is 6-8 volt, 4 cp. D. C. Stop lamp is 6-8 volt, 4 cp. S. C. Dash and tail lamps are 6-8 volt, 2 cp. S. C.

FUSES.—Lighting fuse is 20 amperes.

AUBURN

MODEL 6-66A (1927)

DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM

DELCO-REMY IGNITION

BATTERY:—U. S. L., Type XY-13-X6. 6 volt. Starting capacity is 90 amperes for 20 minutes. Lighting capacity is 5 amperes for 17.4 hours. The positive (+) terminal is grounded.

IGNITION:—Coil Model 525-A. Distributor Model 637-W. Breaker contacts separate .018-.024 inch. They are made of tungsten. Resurface contacts on a medium hard oilstone or with a fine flat jeweler's file. Distributor is of the manual and automatic advance type. Maximum manual advance is 22 degrees (engine). Automatic advance begins at 600 R.P.M. of engine. Maximum automatic advance is 25 degrees reached at 2000 R.P.M. of engine. Breaker arm spring tension is 17-21 ounces.

Mounting:—Distributor is mounted at right of engine by S.A.E. Type A mounting. To remove distributor, disconnect primary lead and manual spark control and take off distributor cap with cables intact. Then take out mounting screw and lift distributor from place.

Oiling:—Refill the grease cup under the distributor head with medium cup grease and turn down two turns every month or each 1000 miles. Put a small bit of grease on the face of the breaker cam under the fiber bumper of the contact arm every month.

Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches top dead center with the spark control llever and breaker assembly in the fully retarded position. To set timing, crank engine over until piston No. 1 reaches firing position when the dead center mark on the flywheel should be exactly opposite the indicator on the flywheel housing. Fully retard mannal spark control. Then loosen advance arm clamp screw and rotate distributor cap until contacts begin to open. Tighten the clamp screw and connect the spark plugs as indicated on the diagram.

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.

VALVE TIMING:—Inlet valves open 4 degrees after top dead center and close 46 degrees after lower dead center with .004 inch tappet clearance. Exhaust valves open 41 degrees before lower dead center and close 1 degree after top dead center with .006 inch tappet clearance. To check valve timing, crank engine over until piston No. 1 reaches top dead center entering power stroke and set tappet clearance of No. 1 exhaust valve at .012 inch. Crank engine one complete revolution and stop with piston slightly past dead center with the flywheel mark 'EC' opposite the indicator. No. 1 exhaust valve should close at this point.

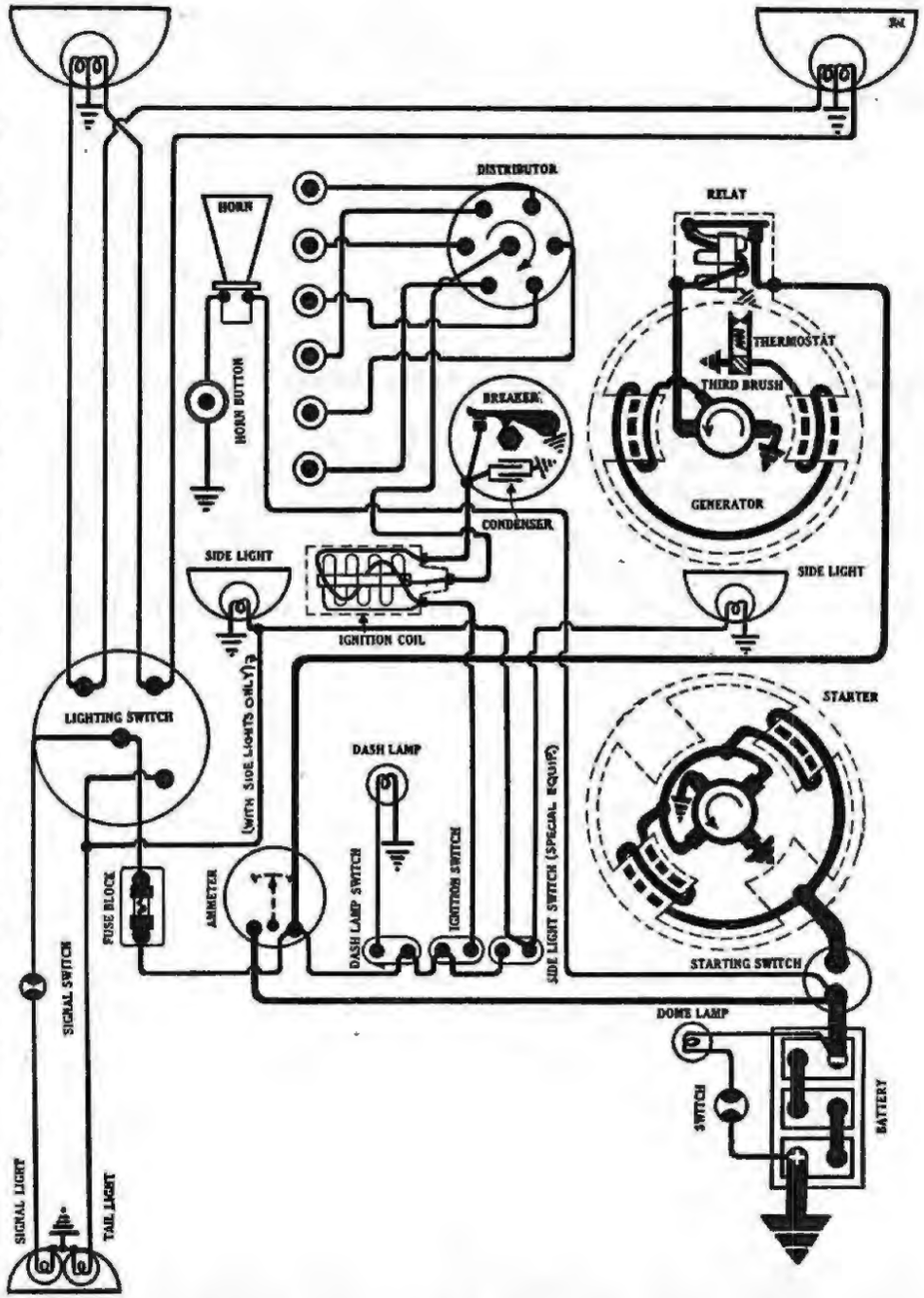
STARTER:—Model 714E. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 24-28 ounces each. Starter switch model is 406A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	5000	5	65
12 lb. ft.	Lock	3.63	475

Mounting:—Starter is flange mounted at the right of the engine on the forward face of the flywheel housing. To remove starter, disconnect cable and take out flange mounting cap screws. Pull starter forward to clear drive and lift from place.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles.



AUBURN

MODEL 6-66A (1927)
DELCO-REY GENERATING, STARTING AND LIGHTING SYSTEM
DELCO-REMY IGNITION

GENERATOR:—Model 940E. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system combined with a thermostat. Thermostat contacts open at 165°, cutting a resistance into the shunt field circuit and reducing the charging rate approximately 50%. To adjust the charging rate, loosen the screw on the end bearing and shift the third brush mounting arm. Shifting the third brush in the counter-clockwise direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. Tighten the screw after making the adqjustment.

Generator Data

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.5	1450	9-12	7.5	2000

Shunt field current is 4 amperes at 6 volts. Generator brush tension should be 14-18 ounces each.

Mounting:—Generator is flange mounted at right of engine on rear face of timing chain case. To remove generator, disconnect lead and take off inspection cover on front face of chain case. Take out flange mounting screws. Lift off timing chain or take off nut on end of generator shaft. Pull generator out, leaving the sprocket in the engine, and tie up the chain. Do not crank engine over with the generator out.

Chain Adjustment. To take up timing chain, loosen the flange mounting screws and shift the generator away from the engine until the chain begins to hum with the engine running. Back off the generator until the chain runs noiselessly and tighten the mounting screws.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the generator every month or each 1000 miles.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay contacts close when the voltage of the generator reaches 7.25 volts at 675 R.P.M. of the generator armature and open with a discharge current of 0- 3amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, contacts closed.

LIGHTING:—Briggs and Stratton Switch Model 39720. Head lamps are 6-8 volt, 21 and 2 cp. D.C. Head lamp bulbs are double filament. Dome lamp is 6-8 volt, 4cp. D.C. Stop lamp is 6-8 volt, 4 cp. S.C. Dash and tail lamps are 6-8 volt, 2 cp. S.C.

ACCESSORIES:—Rochester gas gauge. National Gauge ammeter.

FUSES:—Lighting fuse is 20 amperes.

AUBURN

MODEL 8-77 (1927)

DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM

DELCO-REMY IGNITION

BATTERY:—U. S. L., Type XY-13 X 6, 6 volt. Starting capacity is 90 amperes for 20 minutes. Lighting capacity is 5 amperes for 17.4 hours. The positive (+) terminal is grounded.

IGNITION:—Coil Model 525-A. Distributor Model 658-B. Breaker contacts separate .022 inch. They are made of tungsten. When the condition of the contacts affects the ignition, resurface on a medium hard oilstone or with a fine flat jeweler's file. Breaker arm spring tension is 17-21 ounces. Distributor is semi-automatic. Maximum manual advance is 15 degrees (engine). Automatic advance begins at 600 R.P.M. of engine. Maximum automatic advance is 17.5 degrees reached at 2000 R.P.M. Breaker has two sets of contacts operating on a four lobe cam. Contacts open alternately at intervals of 45 degrees corresponding to the 90 degree firing interval of the engine. Contacts must be synchronized for satisfactory engine performance. See Timing.

Mounting:—Distributor is mounted on the cylinder head. To remove distributor, disconnect primary lead and manual spark control and take off distributor cap with cables intact. Take out hold-down screw and lift distributor from place.

Oiling:—Fill the grease cup under the distributor head with medium cup grease and turn down two turns every month or each 1000 miles.

Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches top dead center with the spark control lever in the fully retarded position. To set timing, crank engine over until poston No. 1 enters compression (the up stroke with both valves closed) and stop when piston reaches top dead center with the flywheel mark 'DC.1-8' opposite the indicator in the inspection hole in the flywheel housing. Fully retard manual spark control. Loosen advance arm clamp screw and rotate distributor until the first set of contacts (mounted directly on the breaker plate) begin to open. Tighten the clamp screw and connect the spark plugs as indicated on the diagram. The second set of contacts (mounted on the movable snb-plate) begin to open 45 degrees after this point.

Synchronization of Contacts. To synchronize contacts, use special Delco-Remy tool, Part No. 820738, and follow complete directions in Equipment Section. Contacts can be synchronized without special equipment after distributor has been timed to the engine (as above) by cranking engine over 90 degrees to firing position of piston No. 6. Then loosen lock screws on movable snb-plate and shift plate by turning eccentric adjusting screw until the second set of contacts begin to open. Tighten the lock screws and check the contact gap. If outside limits of .018-.024 inch, reset at .022 inch and repeat synchronization.

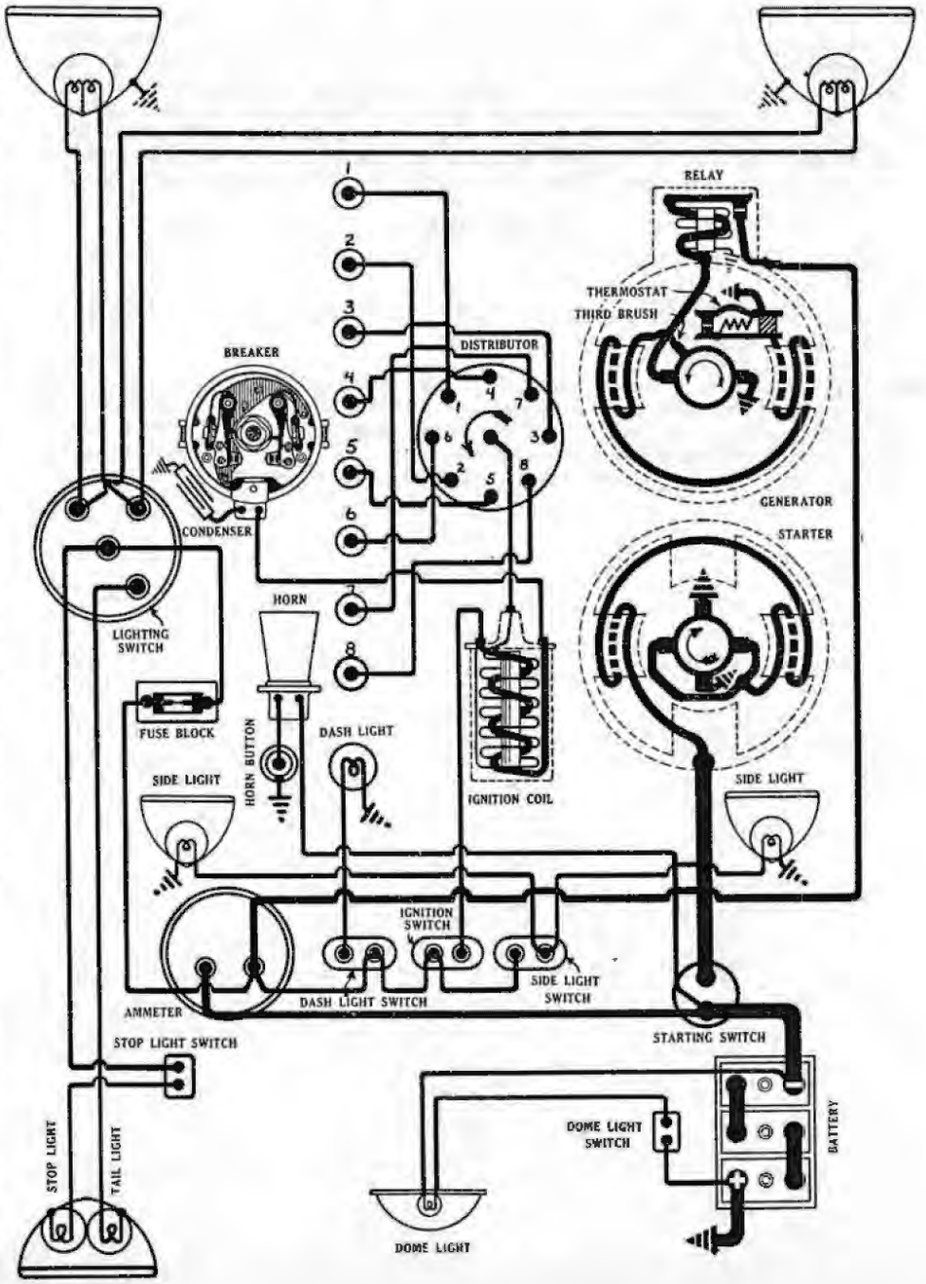
Firing Order:—The firing order is 1-6-2-5-8-3-7-4.

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

VALVE TIMING:—INLET VALVES. Head diameter, 1 17/32 inches. Stem diameter, .3425-.3410 inch. Stem length, 5¼ inches. Valve lift, 11/32 inch. Spring pressure, 49 ponnds (valve closed), 88 pounds (valve open). Tappet clearance, .006-.008 inch (hot). Inlet valves open at top dead center and close 45 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 13/32 inches. Stem diameter, .3425-.341 inch. Stem length, 5¼ inches. Valve lift, 11/32 inch. Spring pressure, 49 ponnds (valve closed), 88 pounds (valve open). Tappet clearance, .006-.008 inch (hot). Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center.

To Check Valve Timing. Turn engine over until piston No. 1 is at top dead inch. Crank engine over one complete revolution and stop with piston on top



AUBURN

MODEL 8-77 (1927)

DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM

DELCO-REMY IGNITION

center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 dead center when flywheel mark 'DC.1-8' is opposite the indicator. The No. 1 inlet valve should be about to open at this point.

STARTER:—Model 716-A. Starter is connected to the engine through a set of reduction gears and a Bendix drive. The direction of rotation is clockwise (armature shaft), looking at the commutator end. Starter brush tension should be 24-28 ounces. Starter switch is Model 406-A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	5000	5	65
12 lb. ft.	Lock	3.63	475

Mounting:—Starter is flange mounted at right of engine on forward face of flywheel housing. To remove starter, disconnect cable and take out three flange mounting cap screws. Pull starter forward to clear drive and lift from place.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles. Remove the grease plug in the reduction gear case and repack gears with graphite grease every six months.

GENERATOR:—Model 949-C. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system. A thermostat located in the third brush circuit opens at 165°F. cutting a resistance into the shunt field and reducing the output approximately 50%. To adjust generator output loosen the small round-headed screw on the outside of the generator endplate and shift the third brush mounting arm. Shifting the third brush in the direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. Thighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.5	1450	9-12	7.5	2000

Shunt field current is 4 amperes at 6 volts. Generator brush tension is 24-28 ounces.

Mounting:—Generator is mounted on special swinging bracket at right of engine and is belt driven from the crankshaft. The water pump is mounted directly on the commutator end of the generator. To remove generator, first drain radiator and remove water pnmp hose connections. Loosen adjustment clamp bolt and swing generator toward engine. Slip off drive belt. Then take out two bolts forming bracket hinge and lift generator and water pump from place. The water pump can then be taken off the generator.

Belt Adjustment. To take up drive belt, loosen adjustment clamp bolt and bracket hinge bolts and swing generator away from engine. Tighten adjustment bolt. The belt should be just tight enough to drive the generator and water pump without slipping.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the generator every month or each 1000 miles.

RELAY:—Model 265-B. Relay is mounted on top of the generator. Relay contacts close at 675 R.P.M. of the generator armature when the voltage reaches 7.25 volts and open with a discharge current of 0-3 amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, contacts closed.

LIGHTING:—Briggs & Stratton Switch, Model 39720. Head lamps are 6-8 volt, 21 cp. Head lamp bulbs have double filament. Dimmer filament is 6-8 volt, 2 cp. Dome lamp is 6-8 volt, 4 cp. D.C. Stop lamp is 6-8 volt, 4 cp. S.C. Dash and tail lamps are 6-8 volt, 2 cp. S.C.

FUSES:—Lighting fuse is 20 amperes.

ACCESSORIES:—National Gauge gas gauge; Cuno cigar lighter; National Gauge ammeter.

AUBURN

MODEL 8-88 (1927)

DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM

DELCO-REMY IGNITION

BATTERY:—U.S.L., Type XY-13X-6, 6 volt. Starting capacity is 90 amperes for 20 minutes. Lighting capacity is 5 amperes for 17.4 hours. The positive (+) terminal is grounded.

IGNITION:—Coil Model 525-A. Distributor Model 658-A. Breaker contacts separate .022 inch. They are made of tungsten. Resurface contacts with a fine flat contact file or on a medium hard oilstone. Distributor is semi-automatic. Manual advance is 15 degrees. Automatic advance begins at 300 R.P.M. Maximum automatic advance is 17 degrees reached at 1800 R.P.M. Breaker uses two sets of contacts on a four sided cam. Contacts open alternately at intervals of 45 degrees corresponding to 90 degrees of crankshaft rotation. This firing interval is very important and must be correctly set. See Synchronization of Contacts.

Mounting:—Distributor is mounted on top of the engine block. To remove distributor, disconnect breaker leads and remove high tension cables or remove distributor head. Then loosen distributor clamp screw under distributor cup and lift distributor from place.

Oiling:—Fill the grease cup under the distributor head with medium cup grease and turn down two turns every month or each 1000 miles.

Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches top dead center with the spark control lever in the fully retarded position. To set timing, crank engine over until pistou No.1 enters compression stroke (the up stroke with both valves closed) and stop with piston at top dead center when the flywheel mark 'DC.1-8' will be opposite the indicator on the housing. Fully retard manual spark control Then loosen advance arm clamp screw and rotate distributor until the first set of contacts (mounted directly on the breaker plate) begin to open. Tighten the clamp screw and connect the spark plugs as indicated on the diagram. The second set of contacts (mounted on the movable sub-plate) begin to open 45 degrees after this point when piston No. 6 reaches firing position.

Synchronization of Contacts:—Contacts must be synchronized to secure proper firing interval of 45 degrees between opening of each set of contact. Use Delco-Remy Tool, Part No. 820738, and follow directions in the Equipment Section of the manual. Contacts can be synchronized without tool after distributor is timed to engine. With one set of contacts adjusted to open with piston No. 1 on top dead center, crank engine over 90 degrees until piston No. 6 reaches top dead center. The second set of contacts should begin to open at this point. Adjust by loosening two lock screws on breaker plate and turning eccentric adjusting screw until contacts begin to separate. Tighten the lock screws and check contact opening. If it is outside limits of .018-.024 inch, reset contact opening and repeat synchronizing operation.

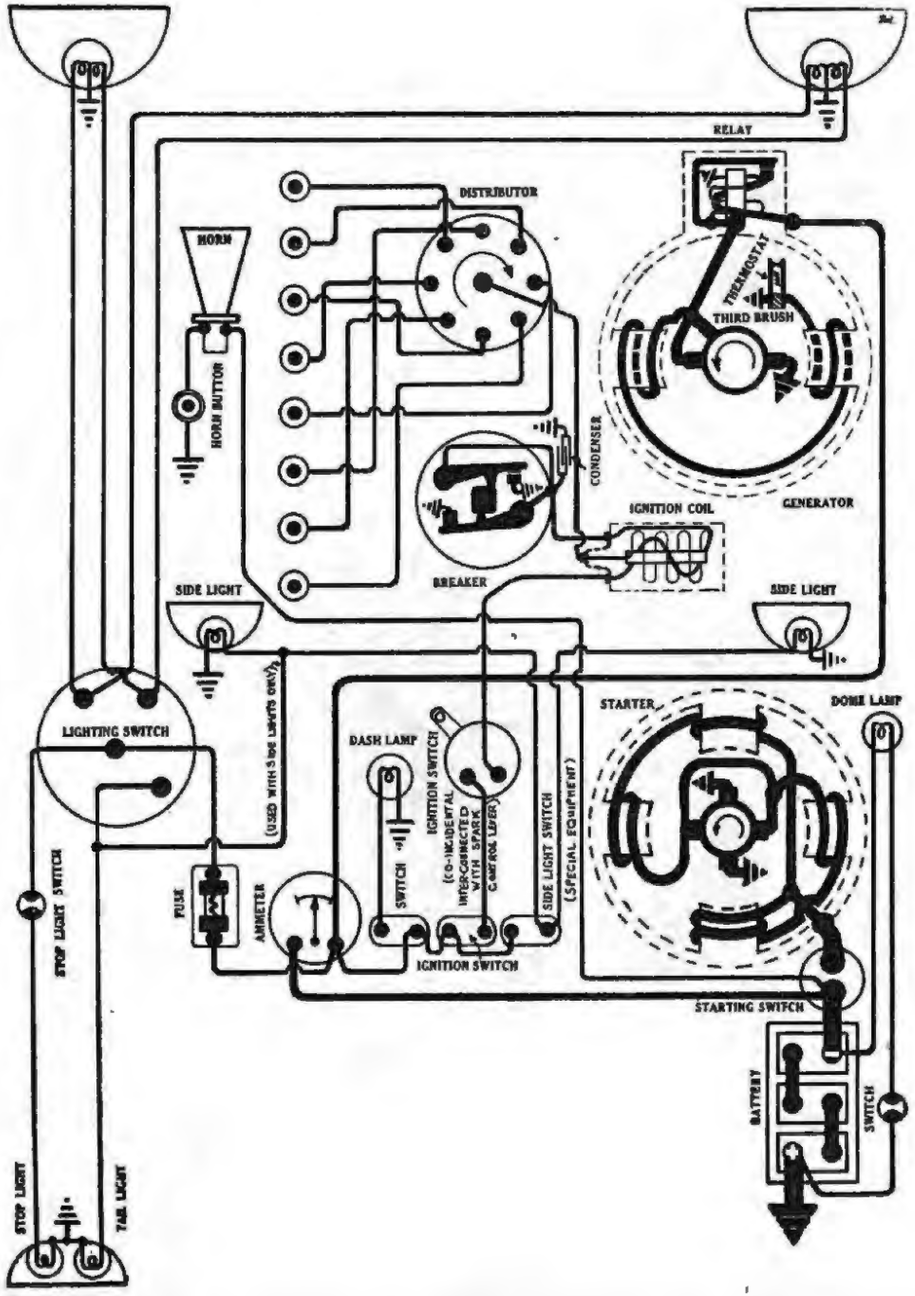
Firing Order:—The firing order is 1-6-2-5-8-3-7-4.

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

VALVE TIMING:—INLET VALVES:—Head diameter is 1 15/32 inches; stem diameter is 11/32 inch; stem length is 5½ inches. Tappet clearance is .006 inch (hot). Spring pressure is 36 pounds with valves closed. Inlet valves open at top dead center and close at 40 degrees after lower dead center.

EXHAUST VALVES:—Head diameter is 1 15/32 inches; stem diameter is 11/32 inch; stem length is 5½ inches. Tappet clearance is .006 inch (hot). Spring pressure is 36 pounds with valves closed. Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center. Valve stem guides are removable. Oversize valve stems are made.

To Check Valve Timing. Crank engine over until piston No. 1 reaches top



AUBURN

MODEL 8-88 (1927)

DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM

DELCO-REMY IGNITION

dead center entering power stroke and set tappet clearance of No. 1 inlet valve at .010 inch. Crank engine over one complete revolution and stop when piston reaches top dead center with the dead center mark on the flywheel opposite the indicator on the housing. The No. 1 inlet valve should begin to open at this point.

To Set Valve Timing. Turn crankshaft until No. 1 piston is at top dead center. Rotate camshaft until the mark on the camshaft sprocket is directly opposite the mark on the crankshaft sprocket with both marks in line with a straightedge laid across the two shaft centers. Assemble the chain.

STARTER:—Model 720-Q. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 24-28 ounces. Starter switch is Model 406-A.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Mounting:—Starter is flange mounted at right of the engine on the forward face of the flywheel housing. To remove starter, disconnect cable and take out three flange mounting cap screws. Pull starter forward to clear drive and lift from place.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles.

GENERATOR:—Model 949-A. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system. A thermostat located in the third brush circuit opens at 165°F. cutting a resistance into the shunt field and reducing the output approximately 50%. To adjust generator output loosen the small round headed screw on the outside of the generator end plate and shift the third brush mounting arm. Shifting the third brush in the direction of armature rotation increases the charging rate and in the opposite direction decreases the carging rate. Tighten the screw after making the adjustment.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.5	1450	9-12	7.5	2000

Shuntfield current is 4 amperes at 6 volts. Generator brush tension is 24-28 onnces each.

Mounting:—Generator is mounted at the right of the engine on the rear face of the timing chain case. To remove the generator, first drain the radiator and remove the water pump hose connections. Remove the inspection cover plate on the front face of the chain case. Take out the flange mounting cap screws. Swing generator toward engine, lift off timing chain and pull generator out. Tie up the timing chain and do not crank the engine with the generator out.

Chain Adjustment. To adjust the chain, loosen the generator flange mounting screws and swing the generator away from the engine until the chain begins to hum. Back off the adjustment until the chain runs noiselessly and tighten the mounting screws.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the generator every month or each 1000 miles.

RELAY:—Model 265-B. Relay is mounted on top of the generator. Relay contacts close at 675 R.P.M. of the generator armature when the voltage reaches 7.25 volts and open with a discharge current of 0-3 amperes. Contacts separate .020 inch. Air gap between relay armature and coil core is .016 inch, contacts closed.

LIGHTING:—Briggs & Stratton Switch Model 39720. Head lamps are 6-8 volt 21 cp. Head lamp bulbs have double filament. Dimmer filament is 6-8 volt, 2 cp. Dome lamp is 6-8 volt, 4 cp. D.C. Stop lamp is 6-8 volt, 4 cp. S.C. Dash and tail lamps are 6-8 volt, 2 cp. S.C.

FUSES:—Lighting fuse is 20 amperes.

ACCESSORIES:—National Gauge gas gauge; Cuno cigar lighter; National Gauge ammeter.

AUBURN

MODEL 76 (1928)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—U.S.L., Type XY-13X-6, 6 volts, 13 plates. The positive (+) terminal is grounded. Starting capacity (20 minute rate) is 90 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 17 hours. Battery is mounted on right frame member under front seat.

IGNITION:—Coil Model 525-C. Ignition current is 2 amperes at 6 volts with engine running and 5 amperes at 6 volts with engine stopped. Coil is mounted on the dash. Ignition switch is an Electrolock, Type 5-A.

Distributor Model 641-A. Breaker contacts separate .020 inch with breaker arm on lobe of cam. Resurface contacts with a fine flat contact file or on a medium hard oilstone. Distributor is semi-automatic. Maximum manual advance is 20 degrees (engine). Automatic advance begins at 400 R.P.M. of engine. Maximum automatic advance is 22 degrees reached at 2600 R.P.M. Breaker arm spring tension is 17-21 ounces.

Mounting:—Distributor is mounted on cylinder head. To remove distributor, disconnect manual advance rod and primary lead and remove head with cables intact. Then use a pry under extension on distributor sleeve; prying lightly and tapping opposite side of sleeve will pull the distributor out of motor head. Electrolock must be removed with the distributor as a unit. Whenever the distributor is taken off the car, first disconnect wires on Electrolock and free Electrolock at the dash. Full details on the Electrolock are given in the Equipment Section.

Oiling:—Turn grease cup one complete turn every 1000 miles. Refill with good grade of medium cup grease.

Timing:—To replace distributor after removing, take out large pipe plug in flywheel housing at starter flange; turn motor over until No. 1 piston is coming up on the compression stroke, turn over slowly and watch flywheel markings through plug hole, stop turning when mark '1-6 D.C.' lines up in hole; adjust distributor so as to be ready to break on No. 1; press distributor sleeve into place with extension straight out at right angle to motor; rock distributor shaft slightly so as to engage shaft coupling without damage.

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

Spark Plugs:—Spark plugs are 7/8-18 S.A.E. Gaps are .025 inch.

VALVE TIMING:—INLET VALVES:—Head diameter, 1 3/8 inches; stem diameter, 11/32 inch; stem length, 5 25/32 inches. Valve lift, 11/32 inch. Spring pressure, 47 pounds. Tappet clearance, .006-.008 inch. Inlet valves open at top dead center and close 45 degrees after lower dead center.

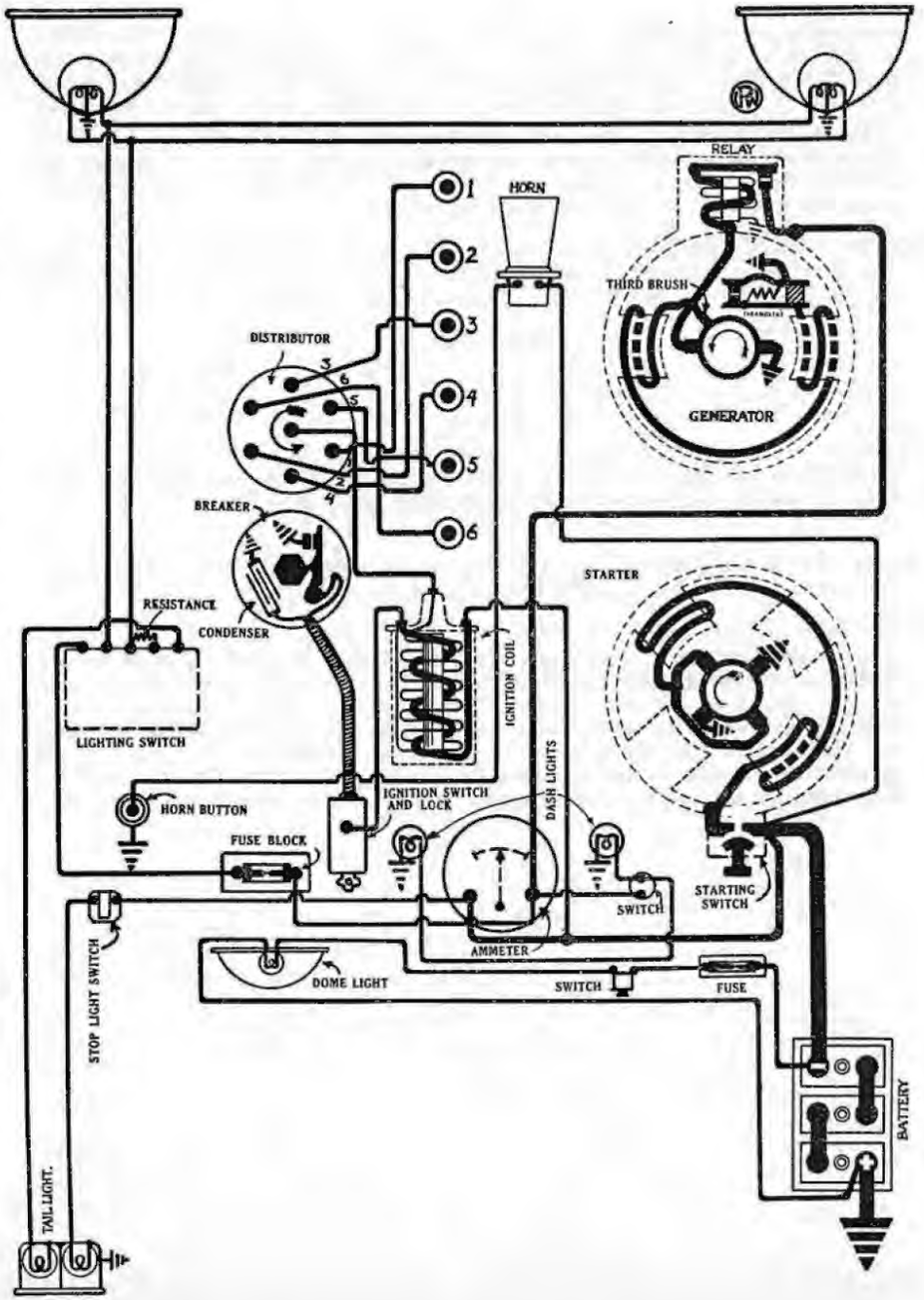
EXHAUST VALVES:—Head diameter, 1 1/4 inches; stem diameter, 11/32 inch; stem length, 5 25/32 inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds. Tappet clearance, .006-.008 inch. Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center. Valve stem guides are removable. Oversize valve stems are not made.

To Check Valve Timing. Crank engine over until piston No. 1 is on top dead center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 inch. Crank engine over one complete revolution and stop with piston on top dead center when dead center mark on flywheel is opposite indicator in inspection hole in housing. The No. 1 inlet valve should begin to open at this point.

STARTER:—Model 716-C. Starter is connected to the engine through a set of reduction gears and a Bendix drive. The direction of rotation is clockwise (armature shaft), looking at the commutator end. Brush spring tension is 24-28 ounces.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	3000	5	70
15 "	Lock	3.7	450



AUBURN

MODEL 76 (1928)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

Mounting:—Starter is flange mounted at right of engine on forward side of flywheel housing. To remove starter, remove cable, take out fulcrum pin in switch lever, take out the 3 cap screws on flange and lift out starter.

Oiling:—Put 4 or 5 drops of light oil in the oiler on the commutator end of the starter every 1000 miles. The drive end bearing is oilless. Remove grease plug and add graphite grease to reduction gears every six months.

GENERATOR:—Model 949-C, 955-H. The direction of rotation is counter-clockwise, looking at the commutator end. Current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 165 degrees F. putting the resistance across the thermostat contacts in series with the shunt field and reducing the output approximately 40%. To adjust generator output, loosen the small round headed screw on the generator end plate and remove the commutator cover band. Then shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. With standard car setting, maximum charging rate is 21 amperes (cold) or 12 amperes (hot) reached at 1450 R.P.M.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.5	1450	9-12	7.5	2000

Motoring generator draws 5 amperes at 6 volts. Shunt field current is 4 amperes at 6 volts. Brush spring tension is 24-28 ounces.

Mounting:—Generator is mounted on special swinging brakcet at the right of the engine and is belt driven from the crankshaft. The water pump is mounted directly on the commutator end of the generator. To remove generator, first drain radiator and remove water pump hose connections. Loosen adjustment clamp bolt, swing generator toward engine and slip off drive belt. Then take out two bolts forming bracket hinge and lift generator from place. The water pump can then be taken off the generator.

Belt Adjustment. Belt tension is adjusted by loosening the adjustment clamp bolt and swinging generator away from the engine. The belt should be just tight enough to drive the generator and water pump without slipping.

Oiling:—Put 4 or 5 drops of light oil in the generator oilers every 1000 miles.

RELAY:—Model 265-B. Relay is monnted on the generator. Relay closes at 575 R.P.M. of armature or 12 M.P.H. when the generator voltage reaches 7-7.5 volts and opens with a discharge current of 0-2.5 amperes. Charging current is approximately 2 amperes at closing of contacts. Relay contacts separate .015-.025 inch. Air gap is .014-.021 inch with contacts closed.

LIGHTING:—Soreng-Manigold Switch, Model 360-A. Switch is mounted at lower end of steering column. Head lights are 6-8 volt, 21 and 3 cp. (special double filament bulbs using 3 cp. filament for dimming). Stop light is 6-8 volt, 15 cp. S.C. Mazda No. 87. Dome light is 6-8 volt, 6 cp. S.C. Mazda No. 81. Dash and tail lights are each 6-8 volt, 3 cp. S.C. Mazda No. 63.

FUSES:—Lighting fuse is 20 amperes.

AUBURN

MODELS 88 AND 88 SPEEDSTER (1928)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—U.S.L., Type XY-13X-6, 6 volt, 13 plates. The starting capacity (20 minutes rate) is 90 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 17 hours. Battery is mounted on right frame member under front seat. The positive (+) terminal is grounded.

IGNITION:—Coil Model 525-C. Ignition current is 2 amperes at 6 volts with engine running and 5 amperes at 6 volts with engine stopped. Ignition coil is mounted on the dash.

Distributor Model 657-E, K. Breaker contact gap is .022 inch with breaker arm on lobe of cam. Adjust contact opening by loosening lock screw on stationary contact plate and turning eccentric adjusting screw to secure proper opening. Resurface contacts with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 17-21 ounces. There are two sets of contacts on a four sided cam opening alternately at intervals of 45 degrees corresponding to 90 degrees of crankshaft rotation. This firing interval must be correctly set. See Timing. Distributor is semi-automatic. Maximum manual advance is 15 degrees (engine). Automatic advance begins at 600 R.P.M. of engine. Maximum automatic advance is 15-17½ degrees reached at 2000 R.P.M.

Mounting:—Distributor is mounted on cylinder head. To remove distributor, disconnect manual advance rod and primary lead and remove head with cables intact. Then use a pry under extension on distributor sleeve. Prying lightly and tapping opposite side of sleeve will pull the distributor out of the motor head. The Electrolock ignition switch (Type 5-A) must be removed with the distributor as a unit. Whenever the distributor is taken off the car, first free the Electrolock at the dash. Full details on the Electrolock will be found in the Equipment Section.

Oiling:—Turn grease cup one complete turn every 1000 miles. Refill with good grade medium cup grease.

Timing:—Synchronization of Contacts. To synchronize contacts, use Delco-Remy Tool, Part No. 820738, and follow directions in Equipment Section. Contacts can be synchronized without tool after distributor is timed to the engine, by cranking engine over 90 degrees from firing position of piston No. 1 when piston No. 6 will reach top dead center entering power stroke. The second set of contacts should separate at this point. If they do not, loosen lock screws on breaker plate and turn eccentric adjusting screw until contacts begin to separate. Check contact opening with breaker arm on lobe of cam. If it is not within limits of .018-.024 inch, reset contact opening at .022 inch and repeat synchronization.

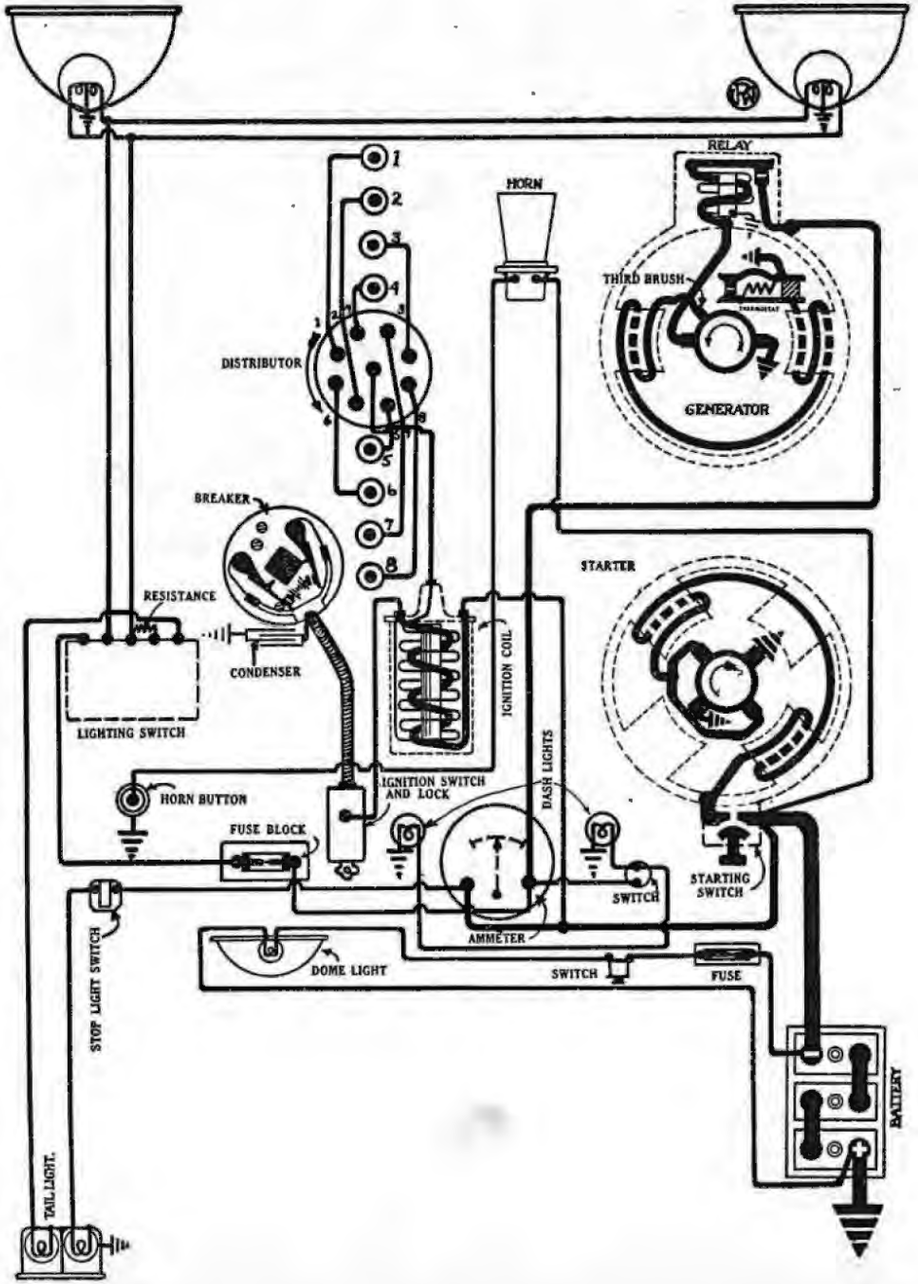
To Time Distributor to Engine:—Remove large pipe plug in flywheel housing at starter flange; turn motor over until No. 1 piston is coming up on the compression stroke, turn over slowly and watch flywheel markings through plug hole, stop turning when mark '1-8 D.C.' lines up in hole; adjust distributor so as to be ready to break on No. 1; press distributor sleeve into place with extension straight out at right angles to motor, rock distributor shaft slightly so as to engage shaft coupling without damage.

Firing Order:—The firing order is 1-6-2-5-8-3-7-4.

Spark Plugs:—Spark plugs are ⅞-18 S.A.E. Standard. Gaps are .025 inch.

VALVE TIMING:—INLET VALVES:—Head diameter, 1⅜ inches; stem diameter, 11/32 inch; stem length, 5 25/32 inches. Valve lift, 11/32 inch. Spring pressure, 47 pounds. Tappet clearance, .006-.008 inch. Inlet valves open at top dead center and close 45 degrees after lower dead center.

EXHAUST VALVES:—Head diameter, 1¼ inches; stem diameter, 11/32 inch;



AUBURN

MODELS 88 AND 88 SPEEDSTER (1928)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

stem length, 5 25/32 inches. Valve lift, 11/32 inch. Spring pressure, 36 pounds. Tappet clearance, .006-.008 inch. Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center. Valve stem guides are removable. Oversize valve stems are not made.

To Check Valve Timing. Turn engine over until piston No. 1 is on top dead center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 inch. Turn engine over one complete revolution and stop when piston reaches top dead center with the dead center mark on the flywheel opposite the indicator on the housing. The No. 1 inlet valve should open at this point.

STARTER:—Model 716-C. The starter is connected to the engine through a set of reduction gears and a Bendix drive. The direction of rotation is clockwise (armature shaft), looking at the commutator end. Brush spring tension is 24-28 ounces.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	3000	5	70
15 "	Lock	3.7	450

Mounting:—Starter is flange mounted at right of engine on forward side of flywheel housing. To remove starter, disconnect cable and remove 3 flange mounting cap screws. Then pull starter forward and lift from place.

Oiling:—Put 4 or 5 drops of light oil in the oiler on the commutator end of the starter every 1000 miles. The drive end is oilless. Every six months remove the grease plug in the reduction gear case and repack gears with graphite grease.

GENERATOR:—Model 949-C, 955-H. The direction of rotation is counter-clockwise, looking at the commutator end. Current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 165 degrees F. putting the resistance across the thermostat contacts in series with shunt field and reducing the output approximately 40%. To adjust generator output, loosen the small round headed screw on the generator end plate and remove the commutator cover band. Then shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. With standard car setting, the maximum charging rate is 21 amperes (cold) or 12 amperes (hot) reached at 1450 R.P.M.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.5	1450	9-12	7.5	2000

Motoring generator draws 5 amperes at 6 volts. Shunt field current is 4 amperes at 6 volts. Brush spring tension is 24-28 ounces.

Mounting:—Generator is mounted on special swinging bracket at the right of the engine and is belt driven from the crankshaft. The water pump is mounted directly on the commutator end of the generator. To remove generator, first drain radiator and remove water pump hose connections. Then loosen adjustment clamp bolt, swing generator toward engine and slip off drive belt. Take out the two bolts forming the bracket hinge and lift the generator from place. The water pump can then be taken off the generator.

Belt Adjustment. To take up drive belt, loosen the adjustment clamp bolt and swing the generator away from the engine. The belt tension should be just sufficient to drive the generator and water pump without slipping.

Oiling:—Put 4 or 5 drops of light oil in the generator oilers every 1000 miles.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay closes at 575 R.P.M. or 12 M.P.H. when the generator voltage reaches 7-7.5 volts and opens with a discharge current of 0-2.5 amperes. Charging current at closing of contacts is approximately 2 amperes. Relay contacts separate .015-.025 inch. Air gap is .014-.021 inch with contacts closed.

LIGHTING:—Soreng Manigold Switch Model 360-A. Switch is mounted on lower end of steering column. Head lights are 6-8 volt, 21 and 3 cp. (double filament bulbs using 3 cp. filament for dimming). Stop light is 6-8 volt, 15 cp. S.C. Mazda No. 87. Dome light is 6-8 volt, 6 cp. S.C. Mazda No. 81. Dash and tail lights are each 6-8 volt, 3 cp. S.C. Mazda No. 63.

FUSES:—Lighting fuse is 20 amperes capacity.

AUBURN

MODELS 115 AND 115 SPEEDSTER (1928)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—**U.S.L., Type XY-15X-6,** 6 volt, 15 plates. The positive (+) terminal is grounded. Starting capacity (20 minute rate) is 119 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 21 hours. Battery is mounted on right frame member under front floor boards.

IGNITION:—**Coil Model 525-C.** Ignition current is 2 amperes at 6 volts with engine running and 5 amperes at 6 volts with engine stopped. Coil is mounted on the engine side of the dash.

Distributor Model 657-D, J. Breaker contact gap is .022 inch. To adjust contact opening, loosen lock screw on stationary contact plate and turn eccentric adjusting screw until proper contact opening is secured. Resurface contacts with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 17-21 ounces. There are two sets of contacts on a single cam opening alternately at intervalts of 45 degrees corresponding to 90 degrees of crankshaft rotation. This firing interval is very important and must be correctly set. See 'Synchronization of Contacts' under Timing. Distributor is semi-automatic. Maximum manual advance is 15 degrees (engine). Automatic advance begins at 600 R.P.M. of engine. Maximum automatic advance is 17 degrees reached at 3600 R.P.M.

Mounting:—Distributor is mounted on the cylinder head. To remove distributor, disconnect manual advance rod and primary lead and remove head with cables intact. Then use a pry under extension on distributor sleeve; prying lightly and tapping opposite side of sleeve. This will pull distributor out of motor head. Electrolock ignition switch (Type 5-A) must be removed with the distributor as a unit whenever the distributor is taken off the car. To remove Electrolock, disconnect leads and free Electrolock at the dash. Full details on the Electrolock will be found in the Equipment Section.

Oiling:—Turn grease cup one complete turn every 1000 miles. Refill with good grade of medium cup grease.

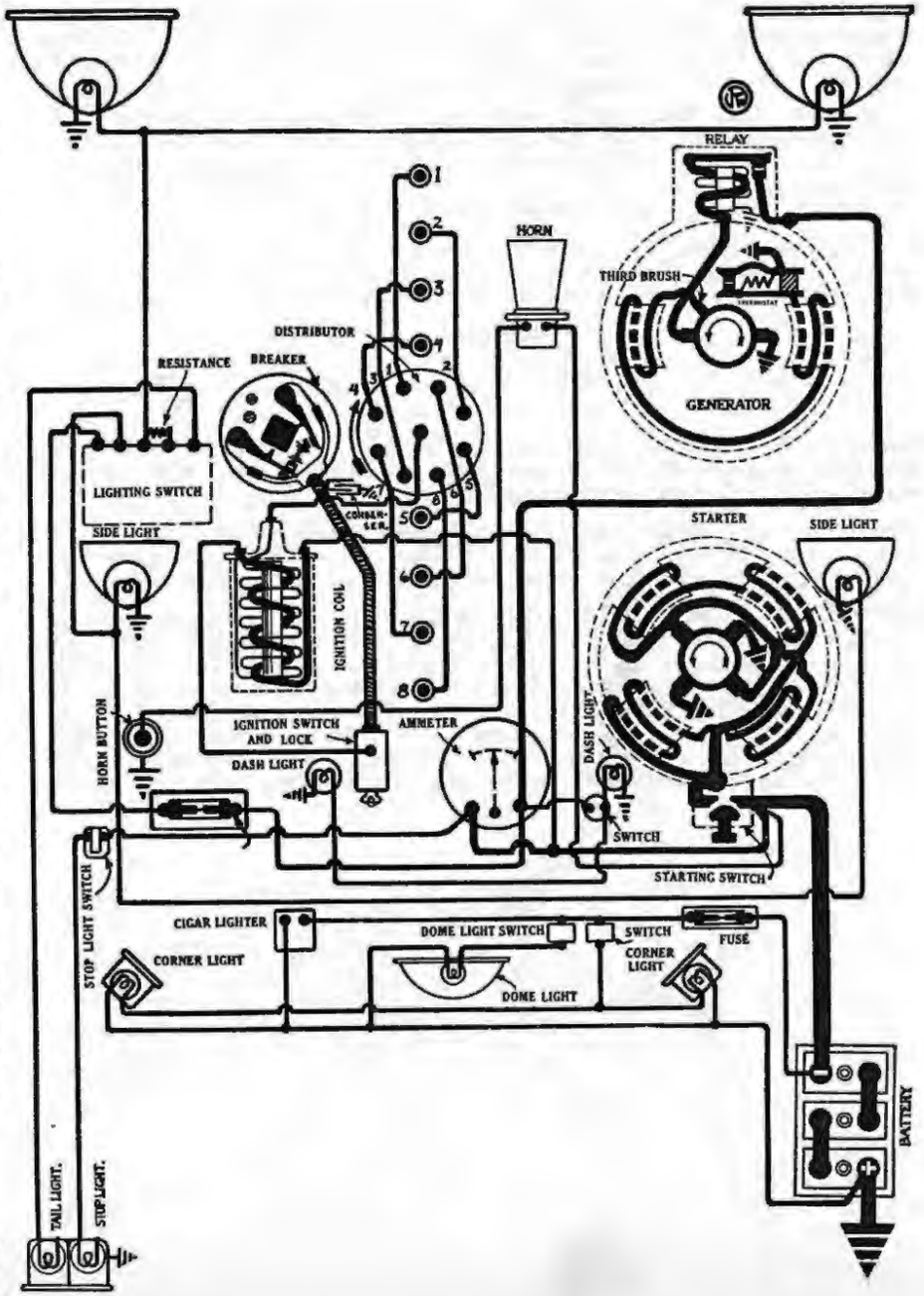
Timing:—**Synchronization of Contacts:**—To synchrnozize contacts use Delco-Remy Tool, Part No. 820738, and follow directions given in Equipment Section. The contacts can be synchronized without this tool after the distributor has been timed to the engine. Crank the engine over 90 degrees from the firing position of cylinder No. 1 when piston No. 6 will reach top dead center entering power stroke. The second set of breaker contacts should separate at this point. If they do not, loosen the lock screws on the breaker plate and turn the eccentric adjusting screw until contacts begin to open. Then tighten the lock screws and check contact opening with breaker arm on lobe of cam. If contact opening is not within limits of .018-.024 inch, reset at .022 and repeat synchronization.

Timing of Distributor to Engine:—Remove the plate on top of the flywheel housing. Turn the motor over until No. 1 piston is coming up on the compression stroke, turn over slowly and watch flywheel markings through hole in flywheel housing; stop turning when mark '1-8 D.C.' lines up in hole; adjust distributor so as to be ready to break on No. 1; press distributor sleeve into place with sleeve extension pointing to the right across motor; rock distributor shaft slightly so as to engage shaft coupling without damage.

Firing Order:—The firing order is 1-6-2-5-8-3-7-4.

Spark Plugs:—Spark plugs are 7/8-18 S.A.E. Standard. Gaps are .025 inch.

VALVE TIMING:—INLET VALVES. Head diameter, 1 5/8 inches. Stem diameter, .3425-.3410 inch. Stem length, 4 7/8 inches. Valve lift, 11/32 inch. Spring pressure, 45.5 pounds (valve closed), 83.5 pounds (valve open). Tappet clearance, .006 inch (hot). Inlet valves open at top dead center and close 40 degrees after



AUBURN

MODELS 115 AND 115 SPEEDSTER (1928)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

lower dead center on first cars using a Lycoming 4HM engine, or open 5 degrees before top dead center and close 40 degrees after lower dead center on later cars with Lycoming MD engine.

EXHAUST VALVES. Head diameter, 1 15/32 engines. Stem diameter, .3425-.3410 inch. Stem length, 4⅞ inches. Valve lift, 11/32 inch. Spring pressure, 45.5 pounds (valve closed), 83.5 pounds (valve open). Tappet clearance, .008 inch (hot). Exhanst valves open 50 degrees before lower dead center and close 10 degrees after top dead center. Valve stem gnides are removable. Valves with oversize stems are made.

To Check Valve Timing. Turn engine over until piston No. 1 is on top dead center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 inch. Crank engine over one complete revolution and stop with piston on top dead center with dead center mark on the flywheel opposite the indicator on the housing. The No. 1 inlet valve should open at this point.

To Set Valve Timing. Turn crankshaft until No. 1 piston is approximately on top dead center. Turn camshaft until punch on camshaft sprocket is in line with mark on crankshaft sprocket with both marks in line with a straightedge across the shaft centers. Assemble the timing chain.

STARTER:—Model 718-A. The direction of rotation is counter-clockwise, looking at the commutator end. Starter is connected to the engine through a Bendix drive.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Mounting:—Starter is flange mounted at right of engine on forward side of flywheel housing. To remove starter, disconnect cable, take out fulcrum pin in switch lever, take out the cap screws in the flange and lift out starter.

Oiling:—Put 4 or 5 drops of light oil in the oiler on the commutator end of the starter every 1000 miles. The drive end bearing is oilless.

GENERATOR:—Model 949-A, Z, 955-K. The direction of rotation is counter-clockwise, looking at the commutator end. Current regulation is by third brush shunt field combined with a thermostat. Thermostat contacts open at 165 degrees F. putting the resistance across the thermostat contacts in series with the shunt field and reducing the output approximately 40%. To adjust generator output, loosen the small round headed screw on the generator end plate and remove the commutator cover band. Then shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. With standard car setting, maximum charging rate is 21 amperes (cold) or 12 amperes (hot) reached at 1450 R.P.M.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.5	1450	9-12	7.5	2000

Motoring generator draws 5 amperes at 6 volts. Shunt field current is 4 amperes at 6 volts. Generator brush spring tension is 24-28 ounces.

Mounting:—Generator is flange mounted at right of engine on rear of timing chain case. To remove generator, take off hose connections at water pump, loosen plate on front of chain case and swing out of the way. Loosen generator flange nuts, push generator towards motor, lift off chain from sprocket; keep chain from dropping down in chain case by fastening up with wire. Radiator must be drained before generator is removed.

Chain Adjustment. To take up timing chain, loosen the generator mounting screws and pull generator away from the engine until chain begins to hum with engine running. Back off the adjustment until chain runs noiselessly and tighten the mounting screws.

Oiling:—Put 4 or 5 drops of light oil in the generator oilers every 1000 miles.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay closes at 575 R.P.M. of armature or 12 M.P.H. when the generator voltage reaches 7-7.5 volts and opens with a discharge current of 0-2.5 amperes. Relay contacts separate .015-.025 inch. Air gap is .014-.021 inch with contacts closed. Charging current at closing of contacts is approximately 2 amperes.

LIGHTING:—Soreng Manigold Switch Model 360-A. Switch is mounted on lower end of steering column. Head lights are 6-8 volt, 21 cp. S.C. Mazda No. 1129. Side lights are 6-8 volt, 6 cp. S.C. Mazda No. 81. Stop light is 6-8 volt, 15 cp. S.C. Mazda No. 87. Dome and corner lights are 6-8 volt, 6 cp. S.C. Mazda No. 81. Dash and tail lights are each 6-8 volt, 3 cp. S.C. Mazda No. 63.

FUSES:—Lighting fuse is 20 amperes capacity.

AUBURN

MODEL 6-80 (1929), SERIAL NUMBERS 2,981,851 UP
MODEL 6-85 (1929-30)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—U.S.L. Type XY-13X-6A, 6 volt. The positive (+) terminal is grounded. Starting capacity (20 minute rate) is 90 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 17 hours. Battery is mounted under front seat on right side.

IGNITION:—Coil Model 528-C. Coil is mounted under the cowl. Ignition current is 4 amperes at 6 volts with engine running and 6 amperes at 6 volts with engine stopped.

Distributor Model 641-F. Breaker contacts separate .020 inch. Set contact gap by loosening lock screw on stationary contact mounting plate and turning eccentric adjusting screw until proper gap is secured with breaker arm on lobe of cam. Resurface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 17-21 ounces. Distributor is semi-automatic. Maximum manual advance is 20 degreees (engine). Maximum automatic advance is 22 degrees. Ignition switch is an Electrolock. Electrolock must be removed as a unit with the distributor.

Mounting:—Distributor is mounted on the cylinder head and must be removed from the right side. To remove distributor, remove Electrolock from dash, disconnect manual advance rod and remove head with cable intact. Then loosen set screw in side of shaft housing and pry up on distributor until it can be lifted from place.

Oiling:—Fill the grease cup with medium grease and turn down one turn every month or each 1000 miles. Put a small bit of vaseline on the face of the breaker cam.

Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches a position 6 degrees (on the flywheel) past top dead center with the spark control lever in the fully retarded position. To set timing, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed). Fully retard spark lever. Continue to crank engine until piston reaches a position 6 degrees past top dead center when the flywheel mark '1-6DC' will be three teeth past the indicator on the flywheel housing. Loosen the advance arm clamp screw and rotate the distributor until contacts begin to separate. Tighten the clamp screw and connect the spark plug in cylinder No. 1 to the terminal directly opposite the rotor. Connect the remaining spark plugs in order 5-3-6-2-4 counterclockwise around the distributor head.

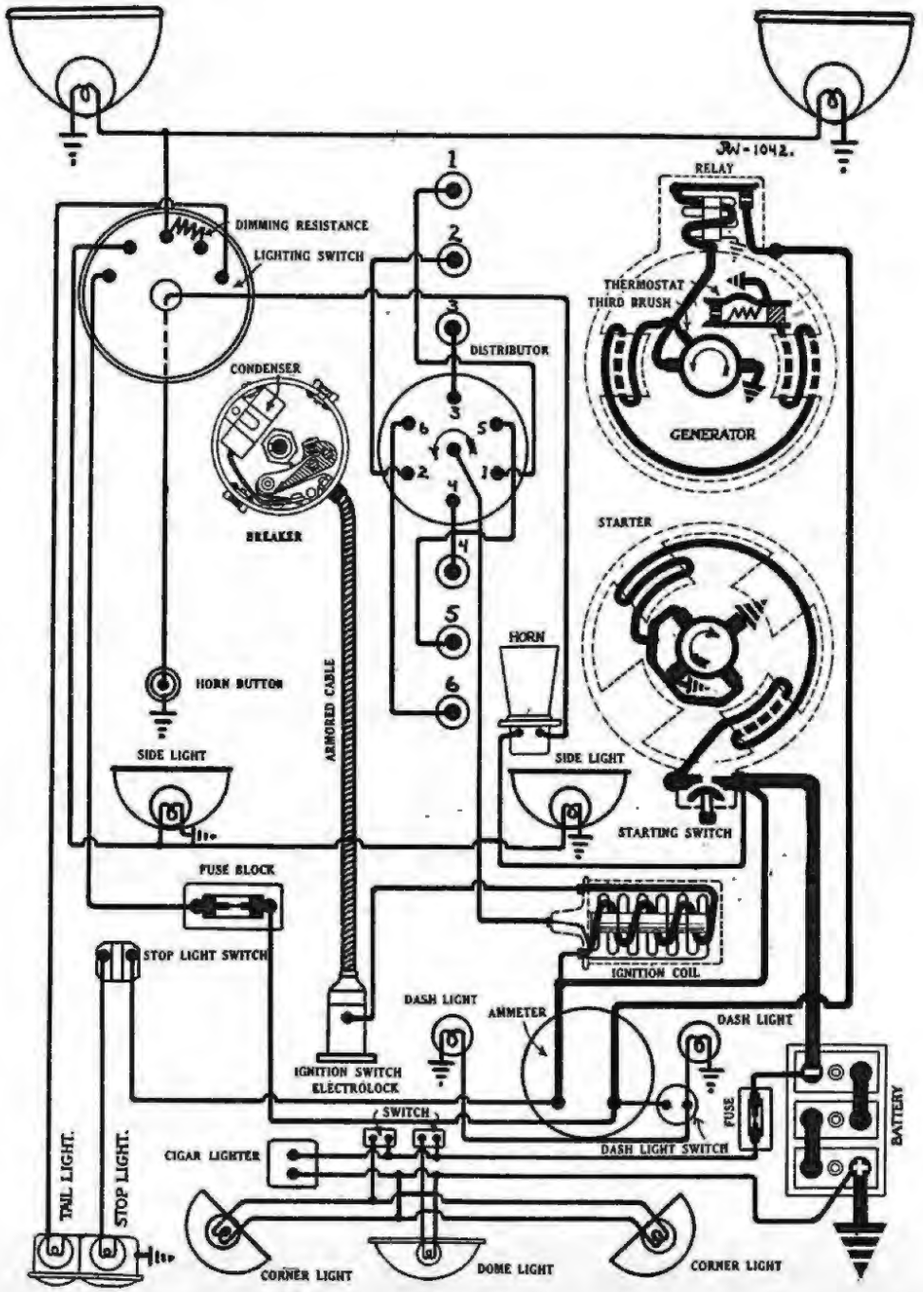
Firing Order:—The firing order is 1-5-3-6-2-4.

Spark Plugs:—Spark plugs are ⅞-18 S.A.E. Standard. Gaps are .030 inch.

VALVE TIMING:—INLET VALVES:—Head diameter, 1 17/32 inches. Stem diameter, .3425-.341 inch. Stem length, 5¼ inches. Valve lift, 11/32 inch. Spring pressure, 47 pounds (valve closed). Tappet clearance, .006 inch (hot). Inlet valves open at top dead center and close 45 degrees after lower dead center on 1929 cars and open 5 degrees before top dead center and close 40 degrees after lower dead center on 1930 cars.

EXHAUST VALVES:—Head diameter, 1 13/32 inches. Stem diameter, .3425 .341 inch. Stem length, 5¼ inches. Valve lift, 11/32 inch. Spring pressure, 47 pounds (valve closed). Tappet clearance, .008 inch (hot). Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center. The flywheel is marked '1-6DC' for inlet opening. Valve stem guides are removable. Oversize valves are made.

To Check Valve Timing:—Turn engine over until No. 1 piston is at top



AUBURN

MODEL 6-80 (1929), SERIAL NUMBERS 2,981,851 UP
MODEL 6-85 (1929-30)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

dead center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 inch. Turn engine over one complete revolution and stop with piston at top dead center when dead center mark '1-6.DC' is opposite the indicator on the housing. The No. 1 inlet valve should begin to open at this point.

STARTER:—Model 716-C. Starter is connected to the engine through a Bendix drive. The direction of rotation is clockwise (armature shaft), viewed from the commutator end. Brush spring tension is 24-28 ounces. Starter cranks the engine at 90 R.P.M. drawing 150 amperes at 6 volts.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	3000	5	70
15 "	Lock	3.7	450

Mounting:—Starter is flange mounted at right of engine on forward side of flywheel housing. To remove starter, disconnect cable and remove flange mounting cap screws. Pull starter forward and lift from place.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles. The drive end bearing is oilless. Every six months remove the plug in the gear compartment and pack gears with graphite grease.

GENERATOR:—Model 955-H. The direction of rotation is counter-clockwise, viewed from the commutator end. Generator current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 175°F. cutting the resistance across the thermostat contacts in series with the field and reducing the output approximately 40%. To adjust charging rate, remove the commutator cover band and loosen the small round headed screw on the generator end plate. Then shift the third brush by hand in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. With standard car setting, maximum charging rate is 21 amperes (cold) reached at 1650 R.P.M.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.35-8.5	1450	9-12	7.35-7.65	1800-2000

Motoring, generator draws 5.5 amperes at 6 volts. Shunt field current is 4-6.1 amperes at 6 volts. Brush spring tension is 14-18 ounces.

Mounting:—Generator is mounted on special swinging bracket at right of engine and is belt driven from the crankshaft. The water pump is mounted directly on the rear of the generator and is driven by the generator shaft. To remove generator, first drain radiator and remove water pump hose connections. Then loosen adjustment clamp bolt and swing generator toward the engine. Slip off the drive belt. Then remove two bolts in the bracket under the generator and lift generator from place. The water pump can be removed by taking out the cap screws on the generator bosses.

Belt Adjustment:—To adjust belt tension, loosen the adjustment clamp bolt and swing the generator away from the engine until the correct belt tension is secured. Tighten the clamp bolt. Do not make the drive belt too tight or it will crowd the generator bearings.

Oiling:—Put 4 or 5 drops of light engine oil in each generator oiler every month or each 1000 miles.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay contacts close at 600 R.P.M. when the generator voltage reaches 6.75 volts and open with a discharge current of 0-2.5 amperes. Relay contacts separate .015-.025 inch. Air gap is .014-.020 inch with contacts closed.

LIGHTING:—Soreng-Manegold Switch, Model 360-A. Switch is mounted at lower end of steering column. Dimming is through a resistance mounted on the switch. Headlights are 6-8 volt, 21 cp. S.C. Mazda 1129. Side lights are 6-8 volt, 3 cp. S.C. Mazda 63. Stop light is 6-8 volt, 15 cp. S.C. Mazda 87. Dash, tail, dome and corner lights are each 6-8 volt, 3 cp. S.C. Mazda 63.

FUSE:—Lighting fuse on block on dash is 20 ampere capacity.

AUBURN

MODEL 8-90 (1929), SERIAL NUMBERS 2,971,829 UP
MODEL 8-95 (1929-30)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—U.S.L. Type XY-13X-6A, 6 volt. The positive (+ terminal is grounded. Starting capacity (20 minute rate) is 90 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 17 hours. Battery is mounted under front seat on right side.

IGNITION:—Coil Model 528-C. Coil is mounted under the cowl. Ignition current is 4 amperes at 6 volts with engine running and 6 amperes at 6 volts with engine stopped.

Distributor Model 657-M & P. Breaker contact gap is .020 inch. Set contact gap by loosening lock screw on stationary contact mounting plate and turning eccentric adjusting screw until proper gap is secured with breaker arm on lobe of cam. Resurface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 18-21 ounces. Breaker has two sets of contacts on a four sided cam. Contacts open alternately at intervals of 45 degrees (equal to 90 degrees of crankshaft rotation). Contacts must be synchronized to secure this result for correct engine performance. See Timing. Distributor is semi-automatic. Maximum manual advance is 15 degrees. Maximum automatic advance is 15 degrees. The ignition switch is an Electrolock.

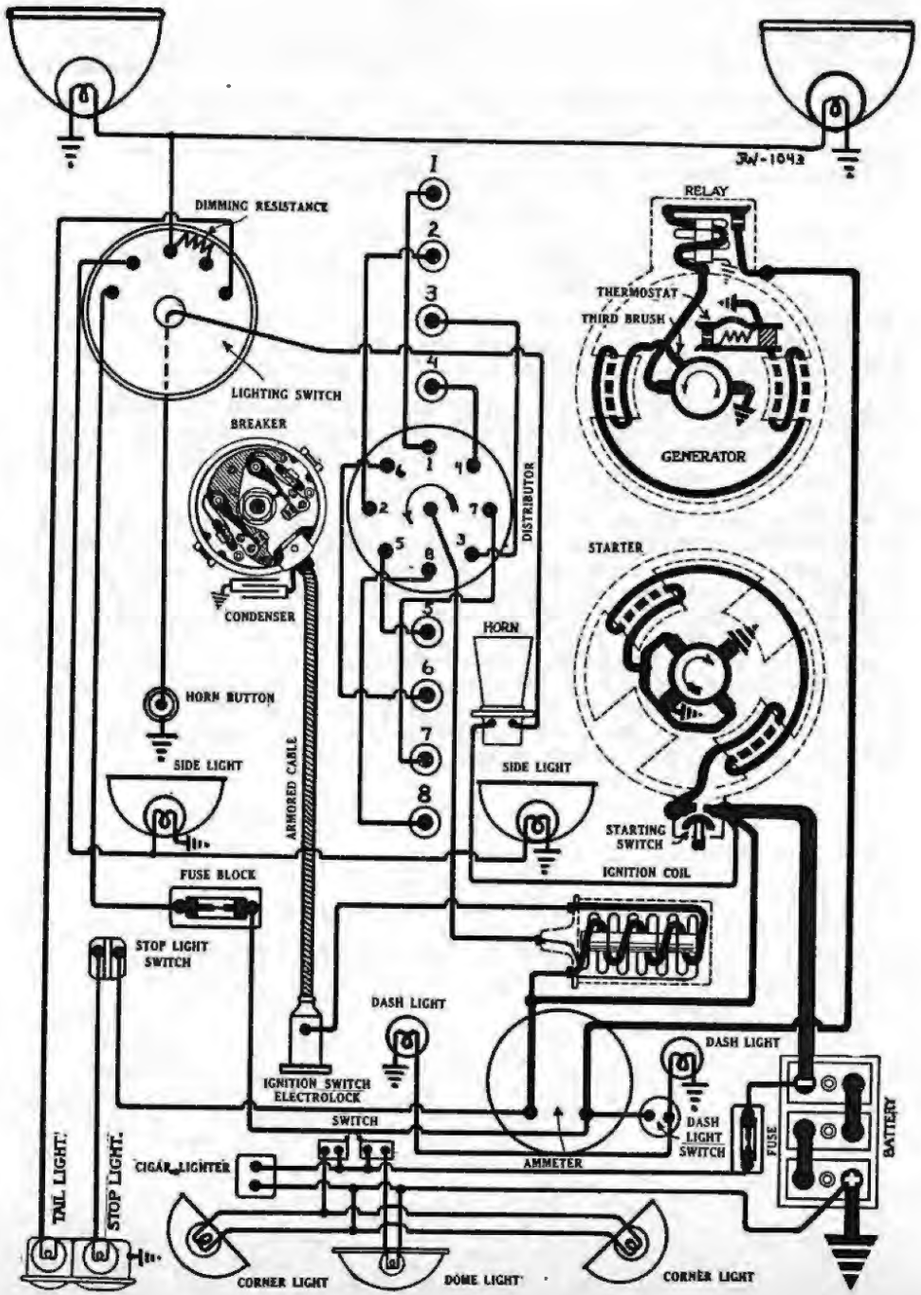
Mounting:—Distributor is mounted on the cylinder head. The Electrolock must be removed as a unit with the distributor. To remove distributor, disconnect Electrolock from dash, disconnect manual advance rod and remove distributor head with cables intact. Then remove set screw in side of shaft housing and pry up distributor until it can be lifted from place.

Oiling:—Fill the grease cup on the side of the shaft with medium grease and turn down one turn every month or each 1000 miles. Remove the head and rotor and saturate the wick oiler in the center of the shaft with light engine oil and put a small bit of vaseline on the face of the breaker cam every 1000 miles.

Timing:—Synchronization of Contacts. Synchronize contacts on a rotary spark gap or use special Delco-Remy tool, Part No. 820738, and follow complete directions in Equipment Section. Contacts can be synchronized without special equipment after distributor has been timed to the engine by cranking engine over exactly 90 degrees when piston No. 6 will reach firing position (6 degrees or 3 teeth on the flywheel past top dead center). If the second set of contacts are not beginning to open at this point, loosen the two lock screws on the movable sub-plate and turn the eccentric adjusting screw until the contacts begin to open. Tighten the lock screws and check the contact gap. If outside limits of .018-.024 inch, reset at .022 inch and repeat synchronization.

Timing Distributor to Engine:—Breaker contacts separate when the piston entering power stroke reaches a position 6 degrees or 3 teeth on the flywheel past top dead center with the spark control lever in the fully retarded position. To set timing, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed). Fully retard spark lever. Continue to crank engine until a point on the flywheel 3 teeth past the dead center mark '1-8DC' is opposite the indicator on the flywheel case. Then loosen advance arm clamp screw and rotate distributor until contacts begin to separate. Tighten the clamp screw and connect the terminal opposite the rotor to the spark plug in cylinder No. 1. Connect the remaining spark plugs in order 6-2-5-8-3-7-4 counter-clockwise around the distributor head.

Firing Order:—The firing order is 1-6-2-5-8-3-7-4.



AUBURN

MODEL 8-90 (1929), SERIAL NUMBERS 2,971,829 UP
MODEL 8-95 (1929-30)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

Spark Plugs:—Spark plugs are 7/8-18 S.A.E. Standard. Gaps are .030 inch.

VALVE TIMING:—INLET VALVES:—Head diameter, 1 17/32 inches. Stem diameter, .3425-341 inch. Stem length, 5¼ inches. Valve lift, 11/32 inch. Spring pressure, 47 pounds (valve closed). Tappet clearance, .006 inch (hot). Inlet valves open at top dead center and close 45 degrees after lower dead center on 1929 cars and open 5 degrees before top dead center and close 40 degrees after lower dead center on 1930 cars.

EXHAUST VALVES:—Head diameter, 1 13/32 inches. Stem diameter, .3425-341 inch. Stem length, 5¼ inches. Valve lift, 11/32 inch. Spring pressure, 47 pounds (valve closed). Tappet clearance, .008 inch (hot). Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center. The flywheel is marked '1-8DC' for inlet opening. Valve stem guides are removable. Oversize valves are made.

To Check Valve Timing. Turn engine over until piston No. 1 reaches top dead center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 inch. Crank engine over one complete revolution and stop when piston reaches top dead center with the dead center mark on the flywheel opposite the indicator on the housing. The No. 1 inlet valve should open at this point.

STARTER:—Model 716-C. Starter is connected to the engine through a Bendix drive. The direction of rotation is clockwise (armature shaft), viewed from the commutator end. Brush spring tension is 24-28 ounces. Starter cranks the engine at 90 R.P.M. drawing 150 amperes at 6 volts.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	3000	6	70
15 "	Lock	3.7	450

Mounting:—Starter is flange mounted at right of engine on forward side of flywheel housing. To remove starter, disconnect cable and remove flange mounting cap screws. Pull starter forward and lift from place.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles. Every six months remove the grease plug in the reduction gear case and pack gears with graphite grease.

GENERATOR:—Model 955-H. The direction of rotation is counter-clockwise, viewed from the commutator end. Generator current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 175°F. cutting the resistance across the thermostat contacts in series with the field and reducing the output approximately 40%. To adjust generator output, remove the commutator cover band and loosen the small round headed screw on the generator end plate. Then shift the third brush by hand in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. With standard car setting, maximum charging rate is 21 amperes (cold) reached at 1450 R.P.M.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.35-8.5	1450	9-12	7.35-7.65	1800-2000

Motoring, generator draws 5.5 amperes at 6 volts. Shunt field current is 4-6.1 amperes at 6 volts. Brush spring tension is 14-18 ounces.

Mounting:—Generator is mounted on special swinging bracket at right of engine and is belt driven from the crankshaft. The water pump is mounted directly on the rear of the generator and is driven by the generator shaft. To remove generator, first drain radiator and remove water pump hose connections. Then loosen adjustment clamp bolt and swing generator toward the engine. Slip off drive belt. Then remove two bolts mounting generator on bracket and lift generator from place.

Belt Adjustment:—To adjust belt tension, loosen bracket bolts and adjustment clamp bolt and swing generator away from the engine until the proper belt tension is secured. Tighten the bolts. Do not get too much belt tension or it will crowd the generator bearings.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler at each end of the generator every month or each 1000 miles.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay contacts close at 600 R.P.M. when the generator voltage reaches 6.75 volts and open with a discharge current of 0-2.5 amperes. Relay contacts separate .015-.025 inch. Air gap is .014 inch with contacts closed.

LIGHTING:—Soreng-Manegold Switch, Model 360-A. Switch is mounted at lower end of steering column. Dimming is by resistance mounted on switch. Headlights are 6-8 volt, 21 cp. S.C. Mazda 1129. Side lights are 6-8 volt, 3 cp. S.C. Mazda 63. Stop light is 6-8 volt, 15 cp. S.C. Mazda 87. Dash, dome, corner and tail lights are each 6-8 volt, 3 cp. S.C. Mazda 63.

NOTE:—Some cars in 1929 used a double filament 21-2 cp. bulb Mazda 1158 in the headlights.

FUSES:—Lighting fuse mounted on block on dash is 20 ampere capacity.

AUBURN

MODEL 120 (1929), SERIAL NUMBERS 2,950,502 UP
MODEL 125 (1929-30)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—U.S.L. Type XY-15X-6A, 6 volt. The positive (+) terminal is grounded. Starting capacity (20 minute rate) is 119 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 21 hours. Battery is mounted under front seat on right side.

IGNITION:—Coil Model 528-C. Coil is mounted under the cowl. Ignition current is 4 amperes at 6 volts with engine running and 6 amperes at 6 volts with engine stopped.

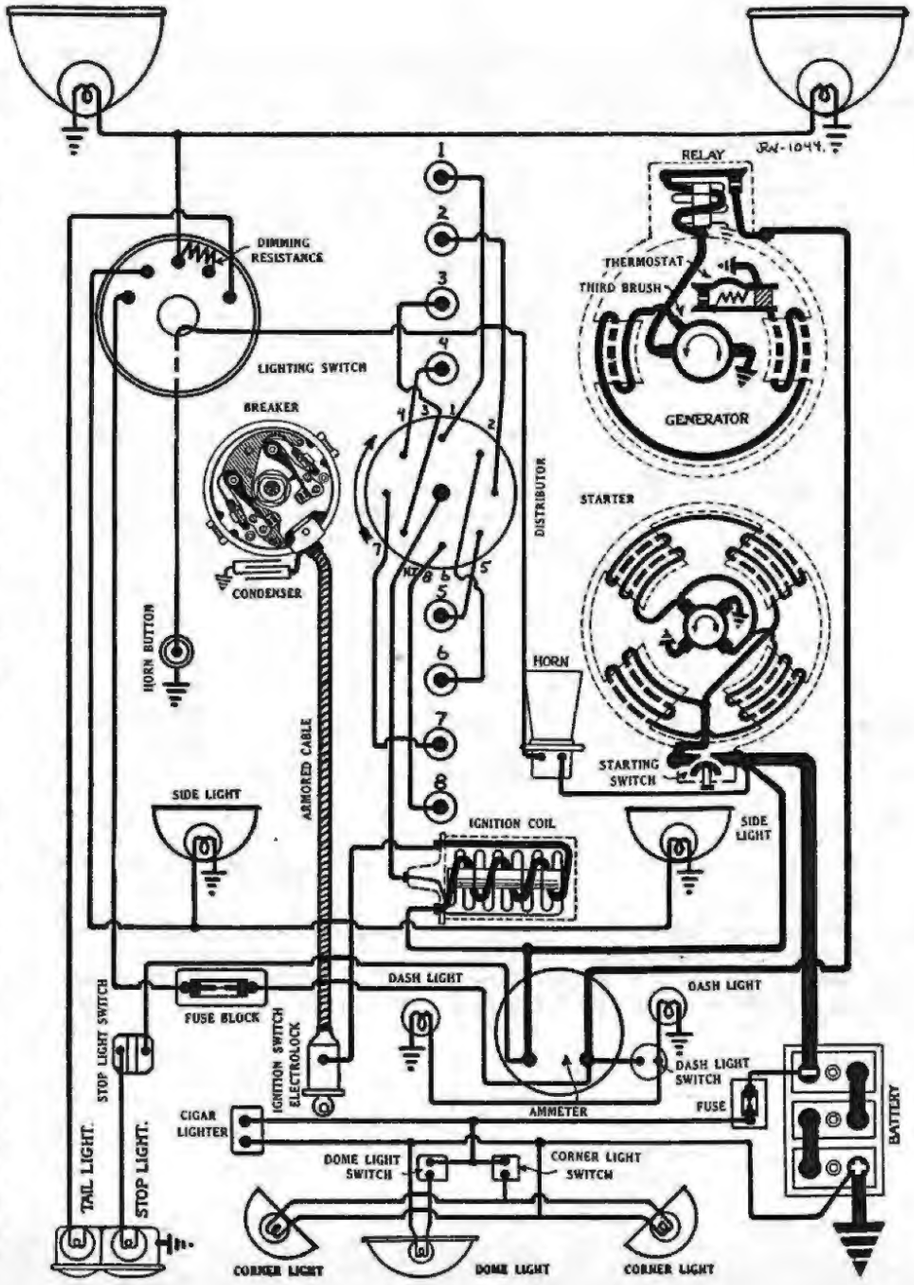
Distributor Model 657-L, N. Breaker contacts separate .022 inch. Set contact gap by loosening lock screw on stationary contact mounting plate and turning eccentric adjusting screw until correct gap is secured with breaker arm on lobe of cam. Resurface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 18-21 ounces. Breaker has two sets of contacts on a four sided cam. Contacts open alternately at intervals of 45 degrees (equal to 90 degrees of crankshaft rotation). Contacts must be synchronized to secure this result, for correct engine performance. See Timing. Distributor is semi-automatic. Maximum manual advance is 15 degrees. Maximum automatic advance is 18 degrees. The ignition switch is an Electrolock.

Mounting:—Distributor is mounted on the cylinder head and can be removed from the right side. The Electrolock must be removed as a unit with the distributor. To remove distributor, disconnect Electrolock at dash, disconnect manual advance rod and remove distributor head with cables intact. Then remove set screw in side of shaft housing and pry distributor up until it can be lifted from place.

Oiling:—Fill the grease cup on the side of the shaft with medium grease and turn down one turn every month or each 1000 miles. At the same time, remove the distributor head and rotor and saturate the wick oiler in the center of the shaft with light engine oil and put a small bit of vaseline on the face of the breaker cam.

Timing:—Synchronization of Contact. Synchronize contacts on a rotary spark gap or use special Delco-Remy tool, Part No. 820738, and follow complete directions in Equipment Section. Contacts can be synchronized without use of tool after distributor has been timed to the engine by cranking engine over exactly 90 degrees when piston No. 6 will reach firing position (3 teeth on the flywheel past top dead center with fully retarded spark). If the second set of contacts do not open at this point, loosen the two lock screws on the movable sub-plate and turn the eccentric adjusting screw until the contacts begin to open. Tighten the lock screws and check the contact gap. If outside limits of .018-.024 inch, reset at .022 inch and repeat synchronization.

Timing Distributor to Engine:—Breaker contacts begin to separate when the piston entering power stroke reaches a position 6 degrees or 3 teeth on the flywheel past top dead center with the spark lever fully retarded. To set timing, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed). Fully retard spark lever. Continue to crank engine until a point on the flywheel 3 teeth past the dead center mark '1-8DC' is opposite the indicator on the flywheel housing. Then loosen advance arm clamp screw and rotate distributor until one set of contacts begins to separate. Tighten the clamp screw and connect the terminal opposite the rotor to the spark plug in cylinder No. 1. Connect the remaining spark plugs as shown on the diagram.



AUBURN

MODEL 120 (1929), SERIAL NUMBERS 2,950,502 UP
MODEL 125 (1929-30)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

Firing Order:—The firing order is 1-6-2-5-8-3-7-4.

Spark Plugs:—Spark plugs are 7/8-18 S.A.E. Standard. Gaps are .030 inch.

VALVE TIMING:—INLET VALVES:—Head diameter, 1 5/8 inches. Stem diameter, .3425-.341 inch. Stem length, 4 7/8 inches. Valve lift, 11/32 inch. Spring pressure, 45.5 pounds (valve closed). Tappet clearance, .006 inch (hot). Inlet valves open 5 degrees before top dead center and close 45 degrees after lower dead center.

EXHAUST VALVES:—Head diameter, 1 15/32 inches. Stem diameter, .3425-.341 inch. Stem length, 4 7/8 inches. Valve lift, 11/32 inch. Spring pressure, 45.5 pounds (valve closed). Tappet clearance, .008 inch (hot). Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center. Valve stem guides are removable. Oversize valves are made.

To Check Valve Timing. Crank engine over until piston No. 1 reaches top dead center entering power stroke. Set tappet clearance of No. 1 inlet valve at .010 inch. Crank engine over one complete revolution and stop when piston is on top dead center with the dead center mark on the flywheel opposite the indicator on the housing. The No. 1 inlet valve should begin to open at this point.

STARTER:—Model 718-A. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, viewed from the commutator end. Brush spring tension is 24-28 ounces. Starter cranks the engine at 100 R.P.M. drawing 200 amperes at 6 volts.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Mounting:—Starter is flange mounted at right of engine on forward side of flywheel housing. To remove starter, disconnect cable and remove flange mounting cap screws. Then pull starter forward and lift from place.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles. The drive end bearing is oilless.

GENERATOR:—Model 955-J, K, 959-V. The direction of rotation is counter-clockwise, viewed from the commutator end. Current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 175°F. cutting the resistance across the thermostat contacts in series with the field and reducing the output approximately 40%. To adjust generator output, remove the commutator cover band and loosen the small round headed screw on the generator end plate. Then shift the third brush by hand in counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. With standard setting, maximum charging rate is 21 amperes (cold) at 8.5 volts reached at 1450 R.P.M.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.35-8.5	1450	9-12	7.35-7.65	1800-2000

Motoring, generator draws 5.5 amperes at 6 volts. Shunt field current is 4-6.1 amperes at 6 volts. Brush spring tension is 14-18 ounces.

Mounting:—Generator is flange mounted at right of engine on rear of timing chain case. To remove generator, disconnect lead and take off plate on front of chain case. Take out cap screws in generator flange, lift off drive chain and hang up in gear case with wire so that it can not slip off camshaft sprocket. Then pull generator to rear and lift from place.

Chain Adjustment. To take up timing chain, loosen the generator mounting screws and shift generator away from the engine until the chain begins to hum with the engine running. Then back off adjustment until chain runs noiselessly and tighten mounting screws.

Oiling:—Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every month or each 1000 miles.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay contacts close at 600 R.P.M. when the generator voltage reaches 6.75 volts and open with a discharge current of 0-2.5 amperes. Relay contacts separate .015-.025 inch. Air gap is .014 inch with contacts closed.

LIGHTING:—Soreng-Manegold Switch, Model 360-A. Switch is mounted at lower end of steering column. Dimming is by resistance on switch. Headlights are 6-8 volt, 21 cp. S.C. Mazda 1129. Side or cowl lights are 6-8 volt, 3 cp. S.C. Mazda 63. Stop light is 6-8 volt, 15 cp. S.C. Mazda 87. Dash, dome, corner and tail lights are each 6-8 volt, 3 cp. S. C. Mazda 63.

FUSES:—Lighting fuse on block on dash is 20 ampere capacity.

AUBURN

MODEL 8-98 (1931)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—U.S.L. Type XY-15X-6A, 6 volt. The positive (+) terminal is grounded. Starting capacity (20 minute rate) is 119 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 21 hours. Battery is mounted under the right front seat.

IGNITION:—Coil Model 528-C. Coil is mounted under the cowl. Ignition current is .6-3 amperes with engine idling and 4.6 amperes at 6 volts with engine stopped. The ignition switch is a Type 9-A Electrolock.

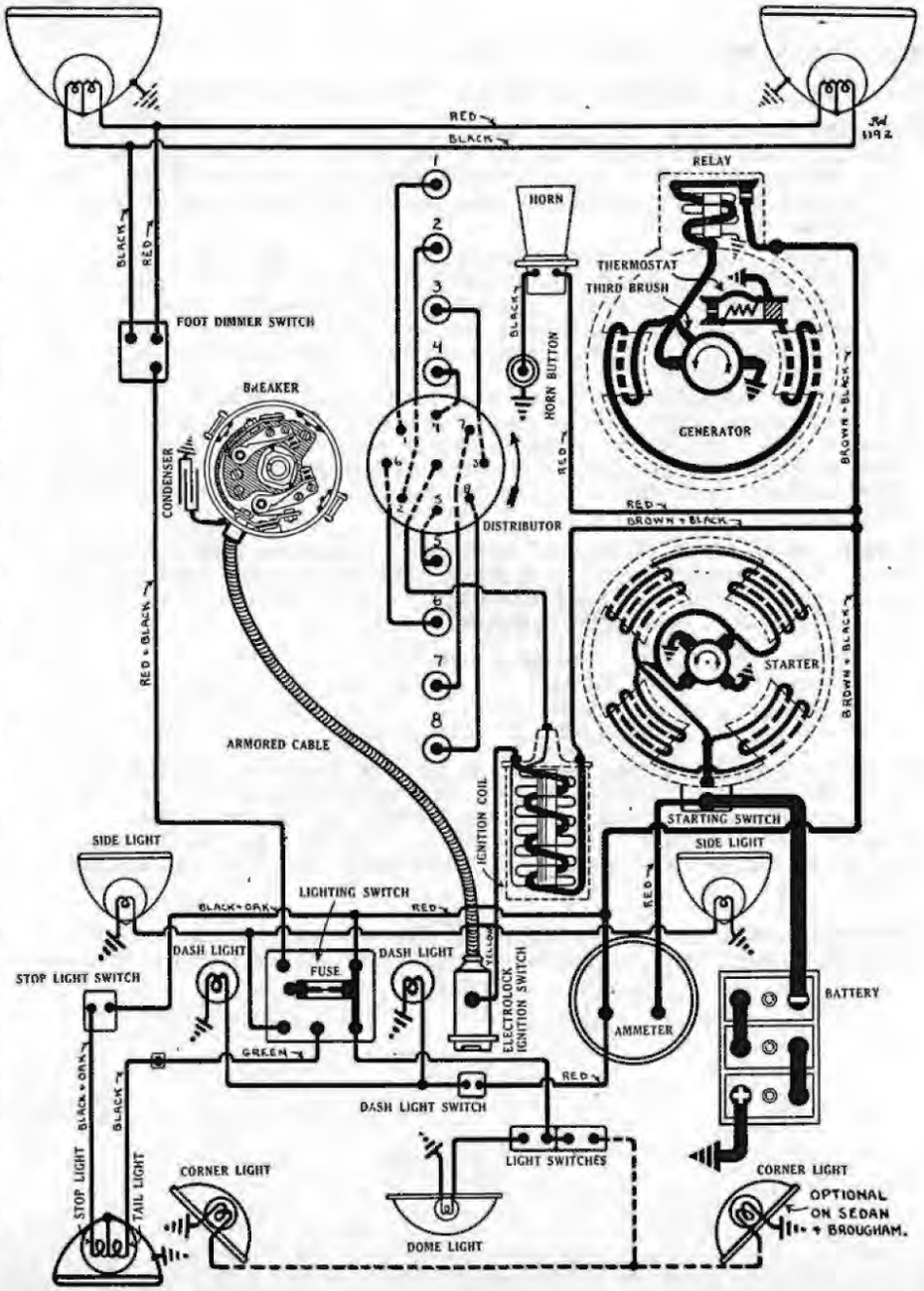
Distributor Model 660-Z. Breaker contacts separate .018-.025 inch. Set contact gap by loosening lock screw on stationary contact mounting plate (directly behind breaker arm) and turning eccentric adjusting screw until breaker gap is .022 inch with breaker arm on lobe of cam. Resurface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 18-21 ounces. Distributor is semi-automatic. Maximum manual advance is 15 degrees. Automatic advance begins at 400 R.P.M. of the engine. Maximum automatic advance is 25 degrees reached at 3200 R.P.M. of the engine. Breaker has two sets of contacts operating on a single four sided cam. Contacts open alternately at intervals of 45 degrees corresponding to the 90 degree firing interval of the engine. Contacts must be synchronized to secure this firing interval for satisfactory engine performance. See Timing.

Mounting:—Distributor is mounted on the cylinder head. The Electrolock must be removed as a unit with the distributor whenever the distributor is taken off the car. A complete description of the Electrolock and full directions on removing the Electrolock from the distributor will be found in the Equipment Section. To remove distributor, free Electrolock at dash, disconnect manual spark control and remove distributor head with cables intact. Then take out hold-down screw in advance arm and lift distributor from place.

Oiling:—Fill the grease cup on the side of the distributor shaft housing with medium cup grease and turn down one turn each month or every 1000 miles of operation. At the same time remove the distributor head and rotor and oil the wick oiler in the center of the shaft with light engine oil and put one drop of oil on the breaker arm pivot pins. Coat the breaker arm cam with a light film of vaseline.

Timing:—Synchronization of Contacts. Use special Delco-Remy tool, Part No. 1838182, and follow complete directions in Equipment Section to synchronize contacts. Contacts can be synchronized without special equipment after distributor has been timed to the engine by cranking engine over 90 degrees when piston No. 6 will reach firing position (3½ teeth on the flywheel before top dead center with manual spark control full advanced). Then loosen the lock screws on the movable sub-plate (on which the second set of contacts are mounted) and turn the eccentric adjusting screw until the contacts begin to open. Tighten the lock screws and check the contact gap with the breaker arm on the lobe of the cam. If outside limits of .018-.024 inch, reset at .022 inch and repeat synchronization. The first method of synchronization using special Delco-Remy tool is recommended.

Timing of Distributor to Engine. Breaker contacts begin to open when the piston entering power stroke reaches a position 13 degrees or 3½ teeth on the flywheel before top dead center with the manual spark control fully advanced. To set timing, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed). Fully



AUBURN

MODEL 8-98 (1931)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

advance the manual spark control and see that the distributor is rotated counter-clockwise as far as possible. Then turn engine over until piston reaches a position 13 degrees or 3½ teeth (measured on the flywheel) before top dead center. Loosen the advance arm clamp screw and rotate the distributor slightly until the first set of contacts (mounted directly on the breaker plate) begin to open. Tighten the the clamp screw and connect the spark plugs as shown on the diagram. The second set of contacts (mounted on the movable sub-plate) open 45 degrees after this point when piston No. 6 reaches firing position.

Firing Order:—The firing order is 1-6-2-5-8-3-7-4.

Spark Plugs:—Spark plugs are ⅞-18 S.A.E. Champion Type C-4. Gaps are .020-.025 inch.

VALVE TIMING:—INLET VALVES:—Head diameter, 1 7/16 inches. Stem diameter, .3410-.3425 inch. Stem length, 5¼ inches. Valve lift, 11/32 inch. Spring pressure, 46-51 pounds (valve closed—spring length, 2 3/16 inches) and 87-82 pounds (valve open—spring length, 1 27/32 inches). Tappet clearance, .006-.008 inch hot (operating) and .010 inch (for timing). Inlet valves open 5 degrees before top dead center and close 40 degrees after lower dead center.

EXHAUST VALVES:—Head diameter, 1 13/32 inches. Stem diameter, .3410-.3425 inch. Stem length, 5¼ inches. Valve lift, 11/32 inch. Spring pressure, 46-51 pounds (valve closed—spring length, 2 3/16 inches) and 87-92 pounds (valve open—spring length, 1 27/32 inches). Tappet clearance, .006-.008 inch hot (operating) and .010 inch (for timing). Exhaust valves open 50 degrees before lower dead center and close 10 degrees after top dead center. Valve stem guides are removable. Valves with oversize stems are made for replacement.

STARTER:—Model 722-F. Starter is connected to the engine through a set of reduction gears and an Outboard Bendix drive. The direction of rotation (armature shaft) is clockwise, viewed from the commutator end. Starter cranks the engine at 134 R.P.M. (normal speed) drawing 175 amperes. Brush spring tension is 24-28 ounces.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	2500	5	70
11 "	1200	5	175
22 "	Lock	3	600

Mounting:—Starter is flange mounted at the right of the engine on the forward face of the flywheel housing. To remove starter, disconnect cable and starting switch control and take out three flange mounting cap screws. Then pull starter forward to clear drive and lift from place.

Oiling:—Put 8 or 10 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles. The drive end bearings are fitted with oilless bushings. Every six months repack the reduction gears with graphite grease.

GENERATOR:—Model 955-H. The direction of rotation is counter-clockwise, viewed from the commutator end. Generator current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 165°F. cutting the resistance which is connected across the thermostat contacts in series with the shunt field and reducing the output approximately 40%. To adjust the generator output, remove the commutator cover band and loosen the small round headed lock screw on the end plate. Then shift the third brush by hand in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the lock screw after making the adjustment. With standard car setting, the maximum charging rate is 21 amperes (cold) at 8.5 volts reached at 1450 R.P.M. of the generator armature or 20 M.P.H.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
21	8.5	1450	12	7.5	2000

Motoring, generator draws 5.5 amperes at 6 volts. Shunt field current is 4-6.1 amperes at 6 volts. Brush spring tension is 14-18 ounces.

Mounting:—Generator is mounted on special swinging bracket at right of the engine and is belt driven from the crankshaft. The water pump is mounted directly on the commutator end of the generator and is driven by an extension of the armature shaft. To remove generator first drain radiator and remove water pump hose connections. Then loosen adjustment clamp bolt and swing generator toward engine. Slip off drive belt. Then remove two bolts forming generator bracket hinge and lift generator from place. The water pump can then be removed by taking out the capscrews which mount the pump on the generator end plate bosses.

Belt Adjustment. To adjust drive belt, loosen bracket bolts and adjustment clamp bolt and swing generator away from engine until proper belt tension is secured. The belt tension should be just sufficient to drive the generator and water pump without slipping.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler at each end of the generator every month or each 1000 miles of operation.

RELAY:—Model 265-B. Relay is mounted on the generator field frame. Relay contacts close at 600 R.P.M. (generator armature) or 8.3 M.P.H. when the generator voltage reaches 7-7.5 volts and open with a discharge current of 1-2.5 amperes. Relay contact gap is .015-.025 inch. Air gap is .014-.020 inch with contacts closed.

LIGHTING:—Soreng-Manegold Lighting Switch. Delco-Remy Dimmer Switch. Lighting switch is mounted on the instrument panel. Dimmer switch is mounted on the toeboard. Headlights are equipped with double filament bulbs. Head lights are 6-8 volt, 21-21 cp. D.C. Mazda 1110. Cowl lights instrument light are each 6-8 volt, 3 cp. S.C. Mazda 63. Dome light and side lights (optional on Sedan and Brougham) are each 6-8 volt, 6 cp. S.C. Mazda 81. Stop light and tail light are 6-8 volt, 21-2 cp. D.C. Mazda 1158. This is a double filament bulb and the tail light lead (black) must be connected to the 2 cp. filament.

Switches:—Lighting switch is Model 5670-A.

FUSES:—Lighting fuse mounted on back of lighting switch is 20 ampere capacity.

AMERICAN AUSTIN

BANTAM MODEL—PRODUCTION STARTED MAY 1, 1930
AUTO-LITE GENERATING, STARTING SYSTEM
AUTO-LITE IGNITION

BATTERY:—U.S.L., Type 3-CYX-4X-7A, 6 volt. The negative (—) terminal is grounded. Starting capacity (20 minute rate) is 60 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 12 hours. Battery is mounted in a recess in the cowl under the engine hood on the right side of the car.

IGNITION:—Coil Model IG-4065. Coil is mounted on the engine side of the dash. Ignition current is 3 amperes at 6.5 volts with engine running and 4 amperes at 6.4 volts with engine stopped. Ignition is controlled by the key in the combination switch on the instrument panel.

Distributor Model IGB-4034-A. Breaker contacts separate .018-.020 inch. Set contact gap by loosening lock nut on stationary contact mounting stud and turning up stud until gap is .022 inch ((new) or .020 inch (after 1000 miles) with the breaker arm on the lobe of the cam. Resurface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 16-20 ounces. Distributor is full automatic. Automatic advance begins at 600 R.P.M. of the engine. Maximum automatic advance is 22 degrees (flywheel) reached at 2800 R.P.M. of the engine.

Mounting:—Distributor is mounted on the commutator end of the generator at the front of the engine. To remove distributor, disconnect primary lead and remove distributor head with cables intact. Then take out hold-down screw in advance arm and lift distributor from place.

Oiling:—Put 4 or 5 drops of light engine oil in the oiler on the side of the distributor every 500 miles of operation. Every 1000 miles remove the distributor head and rotor and put one drop of oil on the breaker arm pivot pin and put a small bit of vaseline on the face of the breaker cam.

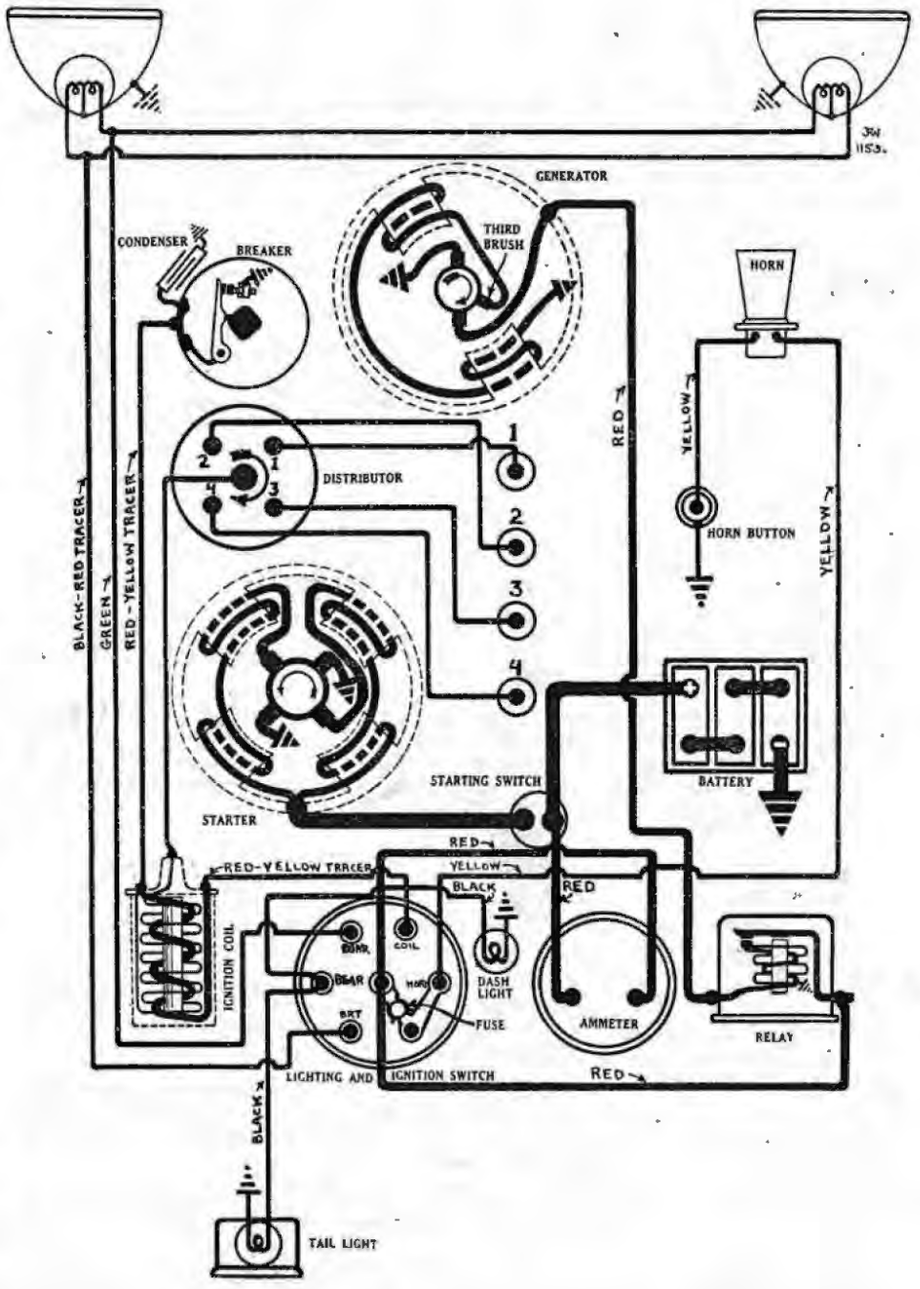
Timing:—Breaker contacts begin to open when the piston entering power stroke reaches a position .020 inch (actual piston travel) before top dead center. To set ignition, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed). Take out the spark plug in cylinder No. 1 and screw the special timing gauge in place in the spark plug port (see Equipment Section for full details of this gauge). Turn the engine over to top dead center and set gauge at zero. Then turn engine over until piston No. 1 is again coming up on compression and stop when gauge indicates piston is .020 inch before top dead center. Loosen advance arm clamp screw and rotate distributor until contacts begin to open. Tighten the clamp screw and connect the spark plugs as shown on the diagram. The firing position (.020 inch before top dead center) is approximately ¾ inch on the flywheel before the top dead center mark for cylinder No. 1.

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

Spark Plugs:—Spark plugs are 18 MM. Metric. Gaps are .025 inch.

VALVE TIMING:—INLET VALVES. Head diameter, 1 1/32 inches. Stem diameter, 9/32 inch. Stem length, 3⅛ inches. Valve lift, 5/32 inch. Spring pressure, 45 pounds. Tappet clearance, .002-.003 inch. Inlet valves open at top dead center and close 40 degrees after lower dead center.

EXHAUST VALVES. Head diameter, 1 1/32 inches. Stem diameter, 9/32 inch. Stem length, 3⅛ inches. Valve lift, 5/32 inch. Spring pressure, 45 pounds. Tappet clearance, .003-.004 inch. Exhaust valves open 45 degrees before lower dead center and close 15 degrees after top dead center. Valve stem guides are removable. Valves with ovrsize stems are not made.



AMERICAN AUSTIN

BANTAM MODEL—PRODUCTION STARTED MAY 1, 1930
AUTO-LITE GENERATING, STARTING SYSTEM
AUTO-LITE IGNITION

NOTE. The top dead center position of piston No. 1 is marked on the flywheel by the mark '#1&4 T.D.C.' This is the opening point for the inlet valve in cylinder No. 1.

STARTER:—Model MAK-4001. Starter is connected to the engine through a special inboard Bendix drive. The direction of rotation is counter-clockwise, viewed from the commutator end. Starter cranks the engine at 120 R.P.M. drawing 150 amperes at 3 volts. Brush spring tension is 27-43 ounces. When new brushes are fitted, spring tension should be 38-61 ounces. Starter switch is Model SW-4204 (first cars), superseded by Model SW-4001.

Starter Data

Torque	R.P.M.	Volts	Amperes
.3 lb. ft.	3350	5.5	100
1.3 "	1925	5.0	200
3.1 "	1060	4.5	300
4.8 "	235	4.0	400
7.0 "	Lock	4.0	520

Mounting:—Starter is flange mounted at the left of the engine on the forward face of the flywheel housing. To remove starter, disconnect cable and take out two flange mounting cap screws. Then pull starter forward to clear drive and lift from place.

Oiling:—Put 5 or 6 drops of light engine oil in the starter bearing oilers every 5000 miles of operation. Whenever the starter is dismantled the armature shaft splines should be oiled with heavy oil or graphite grease. The felt pad in the outer end of the commutator end bearing should be soaked in medium oil before being assembled.

GENERATOR:—Model GAS-4101. The direction of rotation is clockwise, viewed from the commutator end. Generator current regulation is by third brush shunt field. To adjust generator output, remove the commutator cover band and shift the third brush by prying on the brush mounting stud with a screwdriver. Shift the third brush in a clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. The third brush and brush mounting plate are held in position by friction between the mounting stud and the end plate. With standard car setting, the maximum charging rate is 14 amperes at 8 volts reached at 2000 R.P.M. or 28-30 miles per hour.

Generator Data

Amperes	Volts	R.P.M.
2	6.6	835
6	7.1	1000
10	7.25	1260
14	8.0	1925
12	7.75	2900

Shunt field current is 3.8-4.18 amperes at 6.0 volts. Motoring, generator draws 4.5-4.8 amperes at 6.0 volts. Brush spring tension is 15-20 ounces with new brushes.

Mounting:—Generator is flange mounted at the front of the engine and is driven by helical gears from the camshaft drive gear. The gear mesh is adjusted by shims under the generator mounting bracket and these shims must be carefully removed and replaced whenever the generator is taken off the car. The distributor is mounted on the commutator end of the generator. To remove generator, disconnect lead and all ignition wiring or remove distributor. Then take out three flange mounting bolts. Pull the generator to the left to disengage the drive gear and lift from place.

NOTE. An adjustment is provided to mesh the generator drive gear and this should be done whenever the generator has been taken off the car. With the engine running, the three screws and the nut on the stud which hold the generator mounting bracket on the crankcase should be loosened and the weight of the generator supported by hand at the commutator end until the gears assume the proper running position. The three screws and the nut should then be tightened.

Oiling:—The bearing at the drive end of the generator is packed with grease and is oiled from the gear case. It requires no attention in service but should be repacked whenever the generator is disassembled. The commutator end bearing is fitted with a grease cup cast in the end plate. This should be refilled with No. 3 Keystone grease every year or each 10,000 miles of operation.

RELAY:—Model CB-4008. Relay is mounted on the dash. Relay contacts close at 10 M.P.H. or 875 R.P.M. when the generator voltage reaches 7-7.5 volts with a charging current of approximately 2 amperes and open at 6-7 M.P.H. or 600-650 R.P.M. with a discharge current of .5-2.5 amperes. Relay contact gap is .025-.035 inch. Air gap is .010-.030 inch with contacts closed.

LIGHTING:—Briggs & Stratton Switch, Model 50518. Lighting switch is mounted on the instrument panel. Headlights are equipped with double filament bulbs. Headlight bulbs are 6-8 volt, 21-21 cp. D.C. Mazda 1110. Dash and tail lights are each 6-8 volt, 3 cp. S.C. Mazda 63.

FUSES:—Lighting fuse mounted on the back of the switch is 20 ampere capacity.

BARLEY

SIX (6-Y CONTINENTAL) (1922-23)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

BATTERY:—Prest-O-Lite, Type 611-SHK, 6 volt. Starting capacity is 110 amperes for 20 minutes. Lighting capacity is 5 amperes for 18.5 hours. The negative (—) terminal is grounded.

IGNITION:—Coil Model 2159. Distributor is mounted on generator. Breaker contacts separate .020-.025 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface with a fine, flat jeweler's file or on a medium hard oilstone. Automatic advance begins at 550 R.P.M. and reaches a maximum of 22-26° at 2400 R.P.M. Manual advance is 44°. The tension of the breaker arm spring should be 16-20 ounces.

Oiling:—Fill the oiler on the side of the distributor shaft with medium heavy grease every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks. Place a small bit of heavy grease on the face of the breaker cam and polish the rotor track with grease, removing all surplus, every 1000 miles.

Timing:—Breaker contacts begin to separate when piston No. 1 entering power stroke reaches top dead center with the spark control lever in the fully retarded position. At this point the flywheel marking 'UD' will be opposite the indicator on the flywheel housing. To set timing, loosen timing adjustment screw in center of cam and rotate the breaker cam until the contacts begin to separate. Then tighen the screw.

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

Spark Plugs:—Spark plug diameters are ⅞ inch. Gaps are .025 inch.

STARTER:—Model 240. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	6	50
12 "	Lock	2.75	....

Oiling:—Put 8 or 10 drops of light engine oil in the oiler on the commutator end of the starter every month or each 1000 miles if the car is driven more than 1000 miles in a month. Saturate the wick in the oiler at the end of the starter gear case once every year.

GENERATOR:—Model 241. The direction of rotation is counter-clockwise, looking at the commutator end. The third brush system is used for current regulation. To adjust the generator output, remove generator from engine and remove distributor drive housing from commutator end. Then loosen the three screws in the bearing retainer plate and shift the third brush. Shifting the brush in the direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. Tighten the screws after making the adjustment.

Generator Data

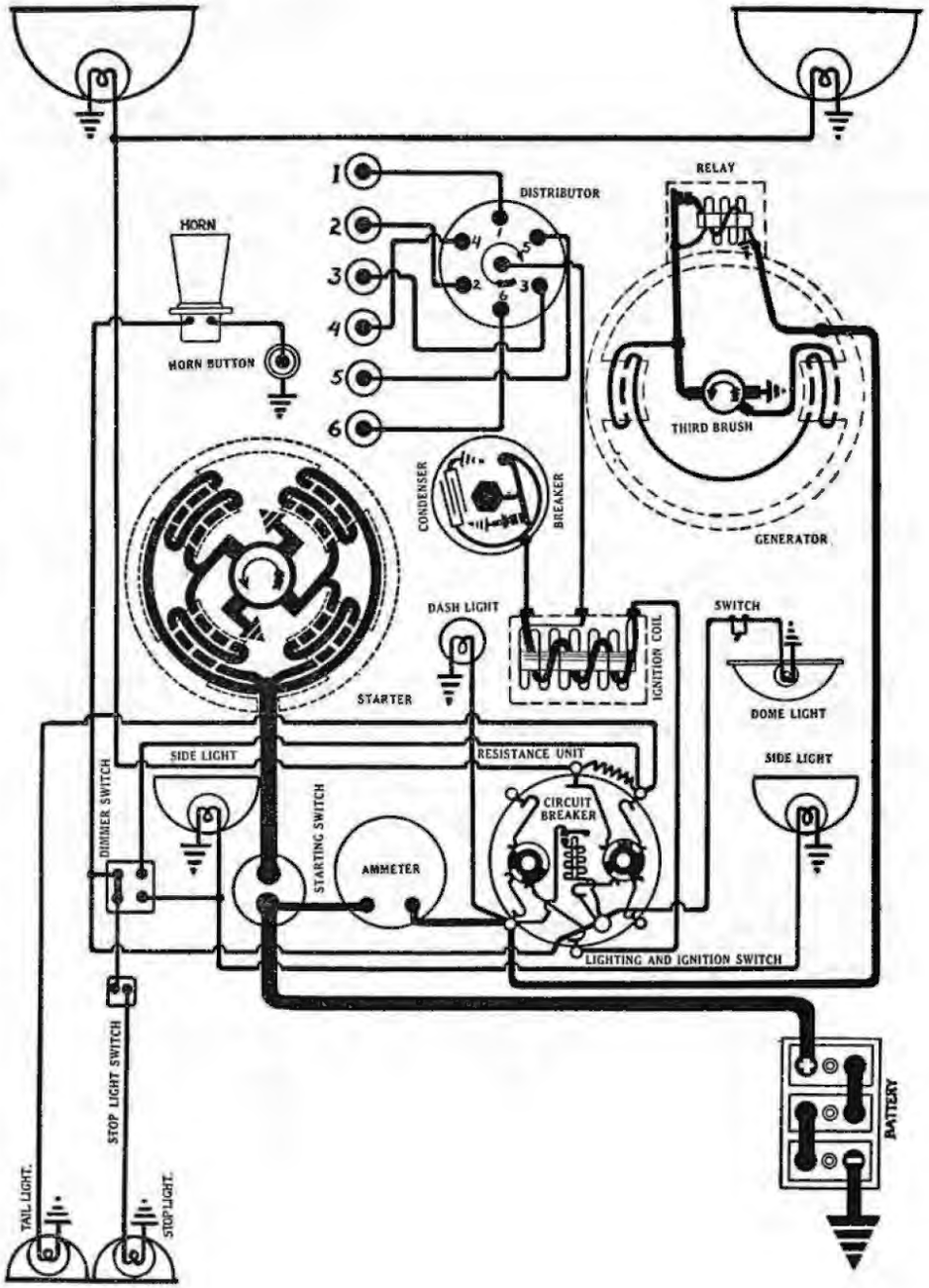
Amperes	R.P.M.
5	700
16-18	1600

Oiling:—Put 8 or 10 drops of light engine oil in the generator oiler every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY:—Relay is mounted on the generator. Contacts close when the voltage of the generator reaches 7-7.5 volts and open with a discharge current of 0-3 amperes. Relay contacts separate .045-.060 inch. Air gap between relay armature and coil core is .025-.035 inch.

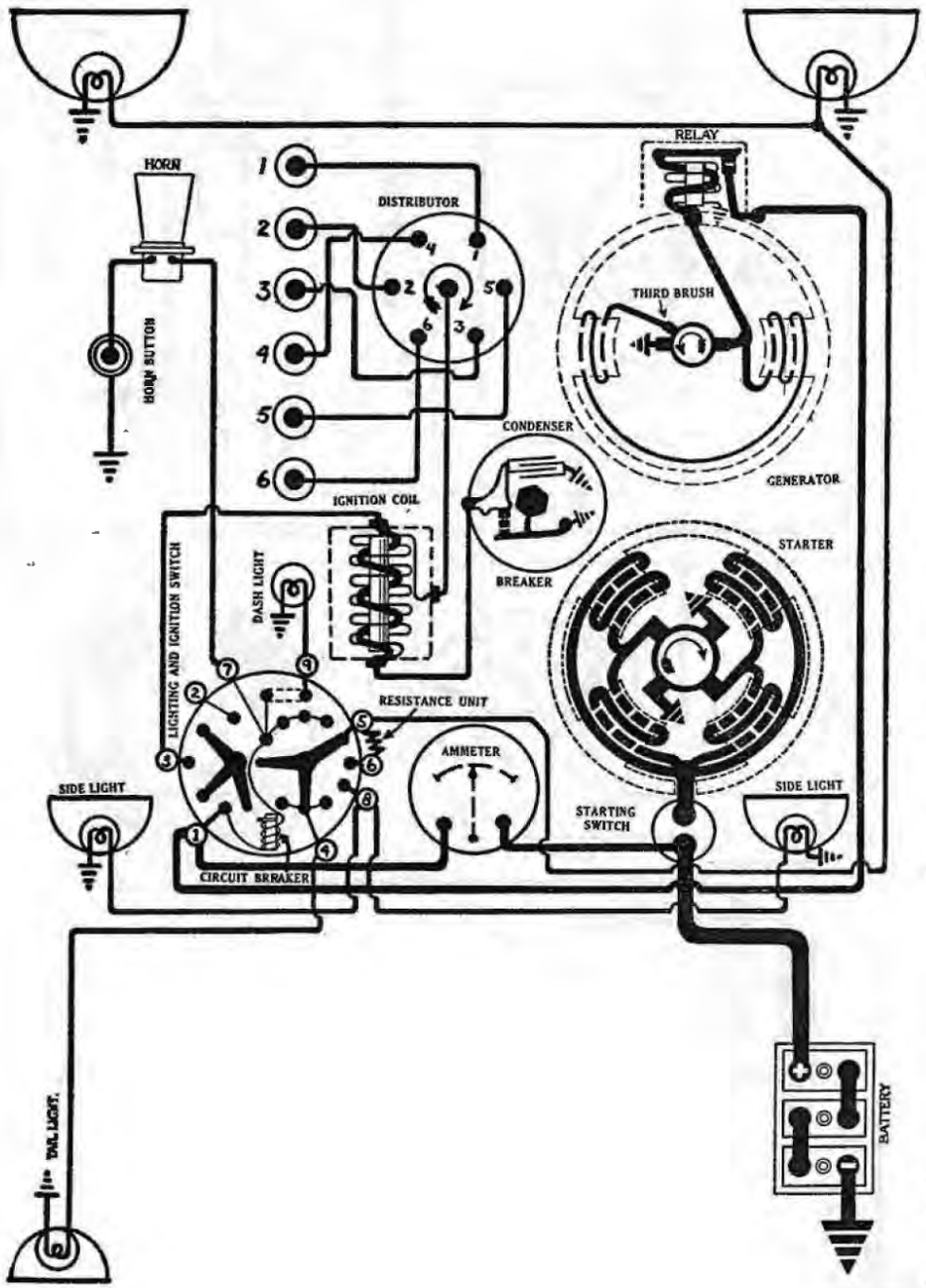
LIGHTING:—Switch Model 1172. Head and stop lamps are each 6-8 volt, 21 cp. S.C. Side and tail lamps are 6-8 volt, 2 cp. D.C. Dash and tonneau lamps are 6-8 volt, 2 cp. S.C.

CIRCUIT BREAKER:—A vibrating circuit breaker is mounted on the back of the switch. A current of 25-30 amperes causes this device to operate. While vibrating the current is 10-15 amperes.



BARLEY

SIX (6-Y CONTINENTAL) (1923-24)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION



BATTERY:—Prest-O-Lite, Type 611 SHK, 6 volt. Starting capacity is 110 amperes for 20 minutes. Lighting capacity is 5 amperes for 18.5 hours. The negative (—) terminal is grounded.

IGNITION:—Coil Model 2178. Distributor is mounted on generator. Breaker contacts separate .020-.025 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface with a fine, flat jeweler's file, or on a medium hard oilstone. Automatic advance begins at 550 R.P.M. and reaches a maximum of 17-21° at 2000 R.P.M. Manual advance is 30°. The tension of the breaker arm spring should be 13-16 ounces.

Oiling:—Put eight or ten drops of light engine oil in the oiler on the side of the distributor housing every two weeks or each 500 miles. Remove the plug in the distributor gear housing and fill with medium heavy grease twice each year. Place a small bit of heavy grease on the face of the distributor cam every 1000 miles.

Timing:—Breaker contacts begin to separate when Piston No. 1 entering power stroke reaches top dead center with the spark control lever in the fully retarded position. At this point the flywheel marking 'UD' will be opposite the indicator on the flywheel housing. To set timing, loosen advance lever clamp screw and turn the distributor cup until breaker contacts begin to separate. Then tighten the clamp screw. Make certain that the rotor button is under the segment connected with the spark plug in cylinder No. 1.

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

Spark Plugs:—Spark plug diameters are ⅞ inch. Gaps are .025 inch.

STARTER:—Model 208. Starter is connected to the engine through a Bendix drive. The direction of rotation is clockwise, looking at the commutator end. Starter brush tension is 2¼-2¾ pounds each.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	6	36
27 "	Lock	2.75	....

Oiling:—Put 8 or 10 drops of light engine oil in each of the starter bearing oilers every month or each 1000 miles. Satnrate the wick in the oiler at the end of the Bendix gear case with light oil once each year. Remove the plug on the reduction gear housing, and refill with medium heavy grease twice each year.

GENERATOR:—Model 257. The direction of rotation is counter-clockwise, looking at the commutator end. The third brush system is used for current regulation. To adjust the charging rate, loosen the generator cover band and shift the third brush mounting plate by means of the handle on the plate. In shifting the third brush in direction of armature rotation, increases the charging rate, and the opposite direction decreases the charging rate. The mounting is held in any desired position by friction clamp washers. The generator brush tension should be 1½-1¾ pounds each.

Generator Data

Amperes	R.P.M.
5	700
16-18	1500

Oiling:—Put 8 or 10 drops of light engine oil in the generator oiler at commutator end of generator every two weeks or each 500 miles.

RELAY:—Relay is mounted on the generator. Relay contacts close when the voltage of the generator reaches 6.75-7.5 volts and open with a discharge current of 0-3 amperes. Relay contacts separate .025-.035 inch. Air gap between relay armature and coil core is .015-.025 inch.

LIGHTING:—Switch Model 1244. Head and stop lamps are each 6-8 volt, 21 c.p. S.C. Side and tail lamps are 6-8 volt, 2 cp. D.C. Dash and tonneau lamps are 6-8 volt, 2 cp. S.C.

CIRCUIT BREAKER:—A vibrating circuit breaker is mounted on the back of the switch. A current of 25-30 amperes causes this device to operate. While vibrating the current is 10-15 amperes.

BAY STATE

MODELS 1 AND 2 (1923-24-25)

DELCO GENERATING, STARTING AND LIGHTING SYSTEM

DELCO IGNITION

BATTERY.—Exide, Type 3-XC-15-1, 6 volts, 105 ampere-hour capacity. The starting capacity is 114 amperes for 20 minutes. The lighting capacity is 5 amperes for 20 hours. The negative (—) terminal is grounded.

IGNITION.—Coil Model No. 2178. Distributor Model No. 5256. The breaker contacts separate .020 inch. They are made of tungsten. If the condition of the contact points affects the ignition, remove and resurface on a medium hard oilstone.

Oiling.—Put 8 or 10 drops of light engine oil into distributor oiler every two weeks. If the car is driven more than 500 miles in two weeks, this care must be given every 500 miles.

Timing.—Breaker contacts begin to separate when piston No. 1 is at top dead center, on compression stroke, indicated on flywheel by marks "UD," spark control lever and breaker assembly fully retarded.

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

Spark Plugs.—The spark plug diameters are 7/8 inch, gaps are .027 inch.

STARTER: — Model No. 181. The direction of rotation is clockwise, looking at the commutator end. The starter is connected to the engine through a Bendix drive. Cranking engine, starter takes 125-200 amperes at 5 volts.

Starter Test Data

Torque	R.P.M.	Amperes	Volts
0 lb. ft.	4000	36	6
27 "	Lock.	450.500	2.75

The pressure of the starter brushes on the commutator should be 2¼-2¾ pounds each.

Oiling.—Put 8 or 10 drops of light engine oil into each starter oiler every month. If the car is driven more than 1000 miles in a month, this care must be given every 1000 miles. Saturate the wick in the oiler at the end of the Bendix gear case with light engine oil once each year. Every six months remove the plug in the reduction gear case and inject medium heavy cup grease.

GENERATOR.—Model No. 258. The direction of rotation is counter-clockwise, looking at commutator end. The third brush system is used for current regulation. To adjust charging rate, remove the cover band and shift the third brush mounting plate by means of an extension handle on the third brush. The plate is held in any position desired by means of friction clamp washers. The maximum charging rate is 16 amperes, reached at 1600 R.P.M.

Generator Test Data

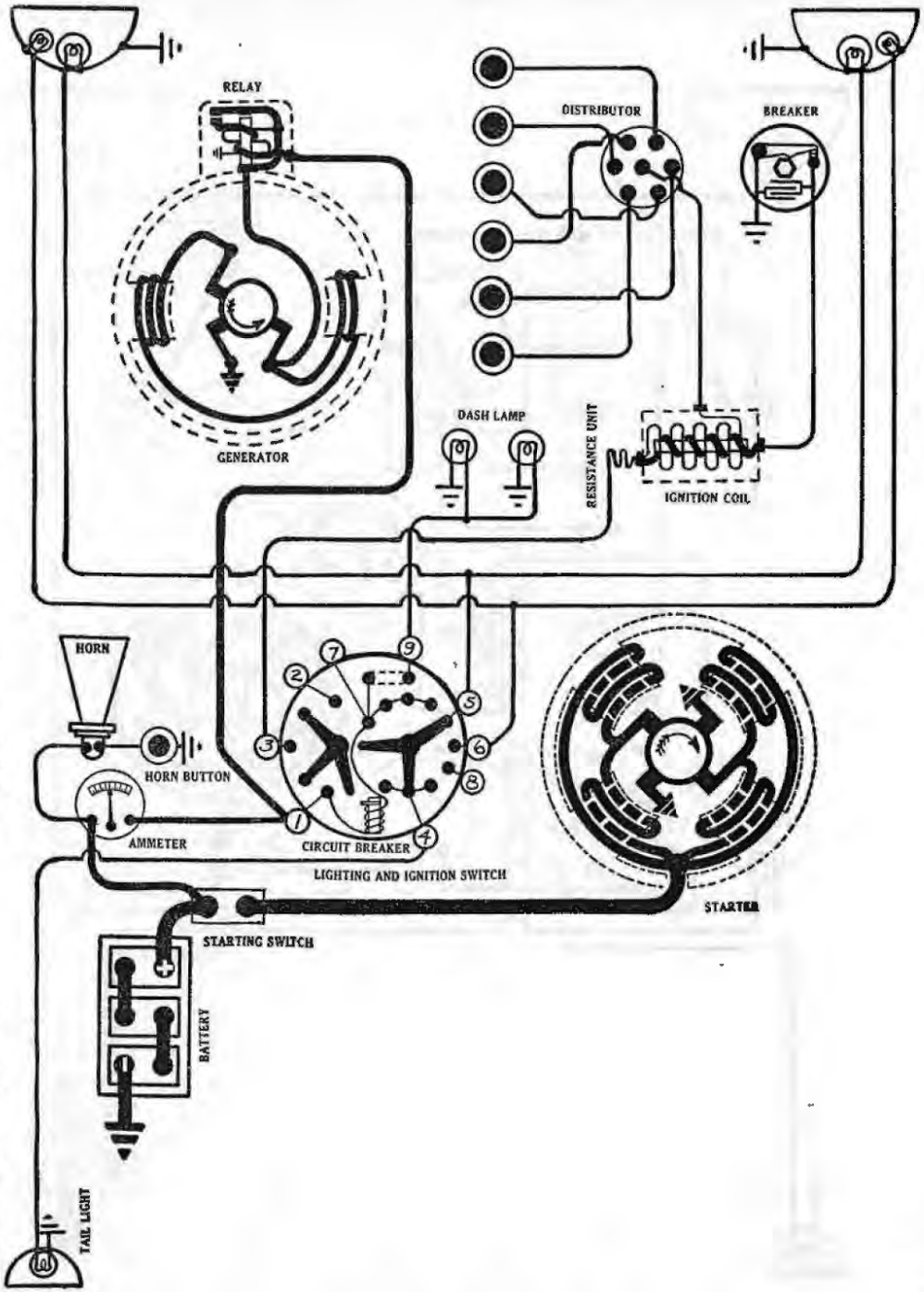
Amperes	R.P.M.
4	800
8	1000
14-16 (Max.)	1600
15	2000

Oiling.—Put 8 or 10 drops of light engine oil into each generator oiler every two weeks. If the car is driven more than 500 miles in two weeks, this care must be given every 500 miles.

RELAY.—Relay closes at 8-10 M.P.H. or at 6.75-7.5 volts, and opens with a current discharge of 0-3 amperes. The contact gap is .025-.035 inch, and the air gap between the relay armature and coil core is .010-.015 inch, contacts fully closed.

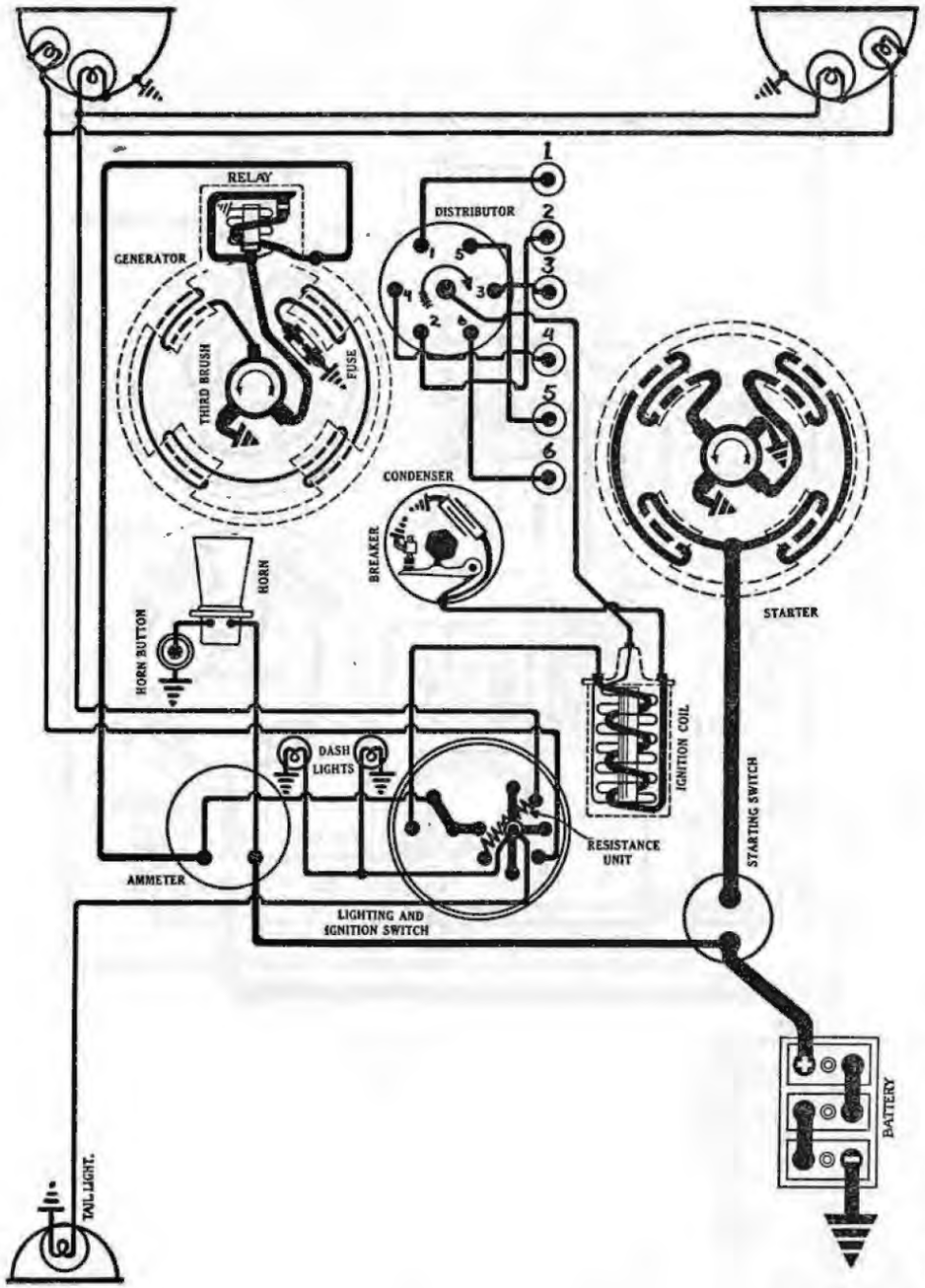
LIGHTING: — Combination Switch Model No. 1246. Head lamps are 6-8 volt, 21 cp. S. C. Dome lamp is 6-8 volt, 2 cp. D. C. Dimmer, cowl and tail lamps are each 6-8 volt, 2 cp. S.C. On 1923 cars dash and tail lights are connected in series and are 3-4 vot, 2 cp.

CIRCUIT BREAKER.—A circuit breaker is used in the place of fuses. Circuit breaker will operate with a current flow of 25-30 amperes, and will continue to function with a current flow of not more than 15 amperes.



BAY STATE

MODELS 1 AND 2 (1925-26)
AMERICAN BOSCH GENERATING, STARTING AND LIGHTING SYSTEM
AMERICAN BOSCH IGNITION



BATTERY:—Exide, Type 3-XC-15-1. Starting capacity is 114 amperes for 20 minutes. Lighting capacity is 5 amperes for 20 hours. The negative (—) terminal is grounded.

IGNITION:—Coil Model TC-30. Distributor Model T-6210. Breaker contacts separate .018-.020 inch. Resurface contacts with a fine, flat jeweler's file or on a medium hard oilstone.

Oiling:—Fill the oiler on the side of the distributor housing with light engine oil every month or each 1000 miles if the car is driven more than 1000 miles in a month. Place a small bit of cup grease on the face of the breaker cam under the fiber bumper of the contact arm and put one drop of oil on the breaker arm pivot pin.

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 ⅞ inch. Gaps are .025 inch.

STARTER:—Model 942. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 1¾-2 pounds each.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	5000	6	50
9 "	Lock	4	350

Oiling:—Starter bearings are oilless. They require no attention.

GENERATOR:—Model 1047. 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, insert the special Bosch key wrench in the hole in the generator end plate and shift the third brush mounting plate by turning the key. The third brush plate can be turned by hand after removing the commutator cover band. Shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate.

Generator Data

Cold Test		Hot Test	
Amperes	R.P.M.	Amperes	R.P.M.
0	500	0	600
7	800	4	800
12	1200	8.5	1200
13.5	1600	10	1600
12.8	2000	9.5	2000
9	3000	6.5	3000

Motoring freely, generator draws 6 amperes at 6 volts. Shunt field current is 3.4 amperes at 6 volts. Generator brush tension should be 1¼ pounds each.

Oiling:—Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY:—Relay is mounted on the generator. Relay contacts close at 500 R.P.M. when the voltage of the generator reaches 6.5-7.5 volts and open with a discharge current of 0-2 amperes. Relay contacts separate .030 inch. Air gap between relay armature and coil core is .010 inch, contacts closed.

LIGHTING:—Switch Model S-106. Head lamps are 6-8 volt, 21 cp. S.C. Dome lamp is 6-8 volt, 4 cp. S.C. Dash, side and tail lamps are each 6-8 volt, 2 cp. S.C.

FUSES:—Generator field fuse is 5 amperes.

BAY STATE

MODEL 3 (1925-26)
AMERICAN BOSCH GENERATING, STARTING AND LIGHTING SYSTEM
AMERICAN BOSCH IGNITION

BATTERY:—Exide, Type 3-XC-15-1, 6 volt. Starting capacity is 114 amperes for 20 minutes. Lighting capacity is 5 amperes for 20 hours. The negative (—) terminal is grounded.

IGNITION:—Coil Model TC-30. Distributor Model T-8202. Breaker contacts separate .018-.020 inch. Resurface contacts with a fine, flat jeweler's file or on a medium hard oilstone.

Oiling:—Fill the oiler on the side of the distributor housing with light engine oil every month or each 1000 miles if the car is driven more than 1000 miles in a month. Put a small bit of heavy grease on the face of the breaker cam under the fiber bumper and put one drop of light oil on the breaker arm pivot pin every month.

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

Firing Order:—The firing order is 1-6-2-5-8-3-7-4.

Spark Plugs:—Spark plug diameters are ⅞ inch. **Gaps are** .025 inch.

STARTER:—Model 942. Starter is connected to the engine through a Bendix drive. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 1¾-2 pounds each.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft	5000	6	50
9 "	Lock	4	350

Oiling:—Starter bearings are oilless. They require no attention.

GENERATOR:—Model 1262. 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, remove the commutator cover band and shift the third brush mounting plate by hand. Move the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.75	550	0	6.5	625
7	7.	700	2.5	6.5	700
12	7.6	850	8	7.5	900
17	8.	1300	13	8.	1300
12.6	8.	2000	11	8.	2000
9.5	7.6	2800	9	7.	2800

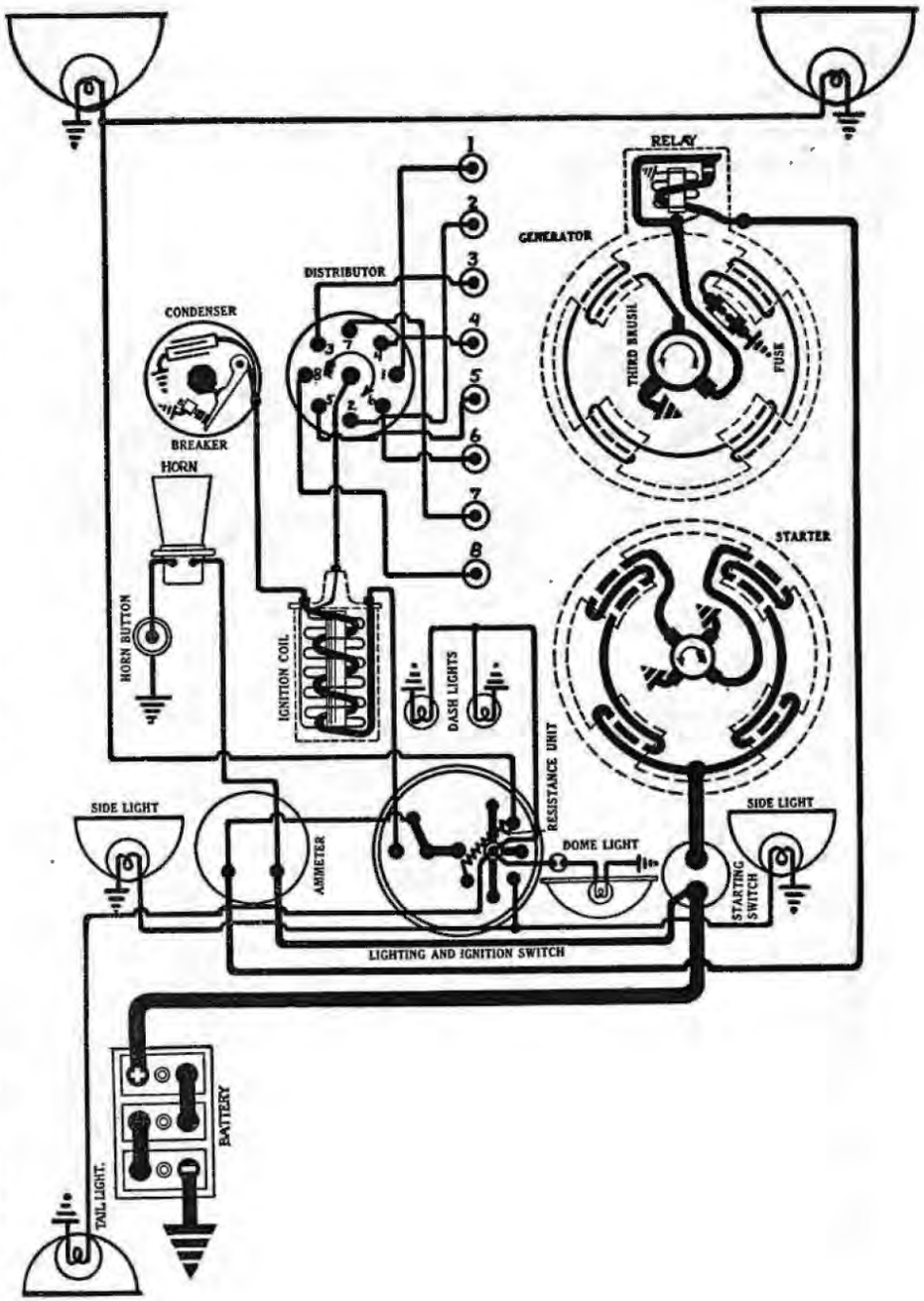
Motoring freely, generator draws 6 amperes at 6 volts. Shunt field current is 6.6 amperes at 6 volts. Generator brush tension should be 1¾-2¾ pounds each.

Oiling:—Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every month or each 1000 miles if the car is driven more than 1000 miles in a month.

RELAY:—Relay is mounted on top of the generator. Relay closes at 500 R.P.M. when the voltage of the generator reaches 6.5-7 volts and opens at 400 R.P.M. with a discharge current of 1-3 amperes. Contacts separate .015 inch. Air gap between relay armature and coil core is .010 inch, contacts closed.

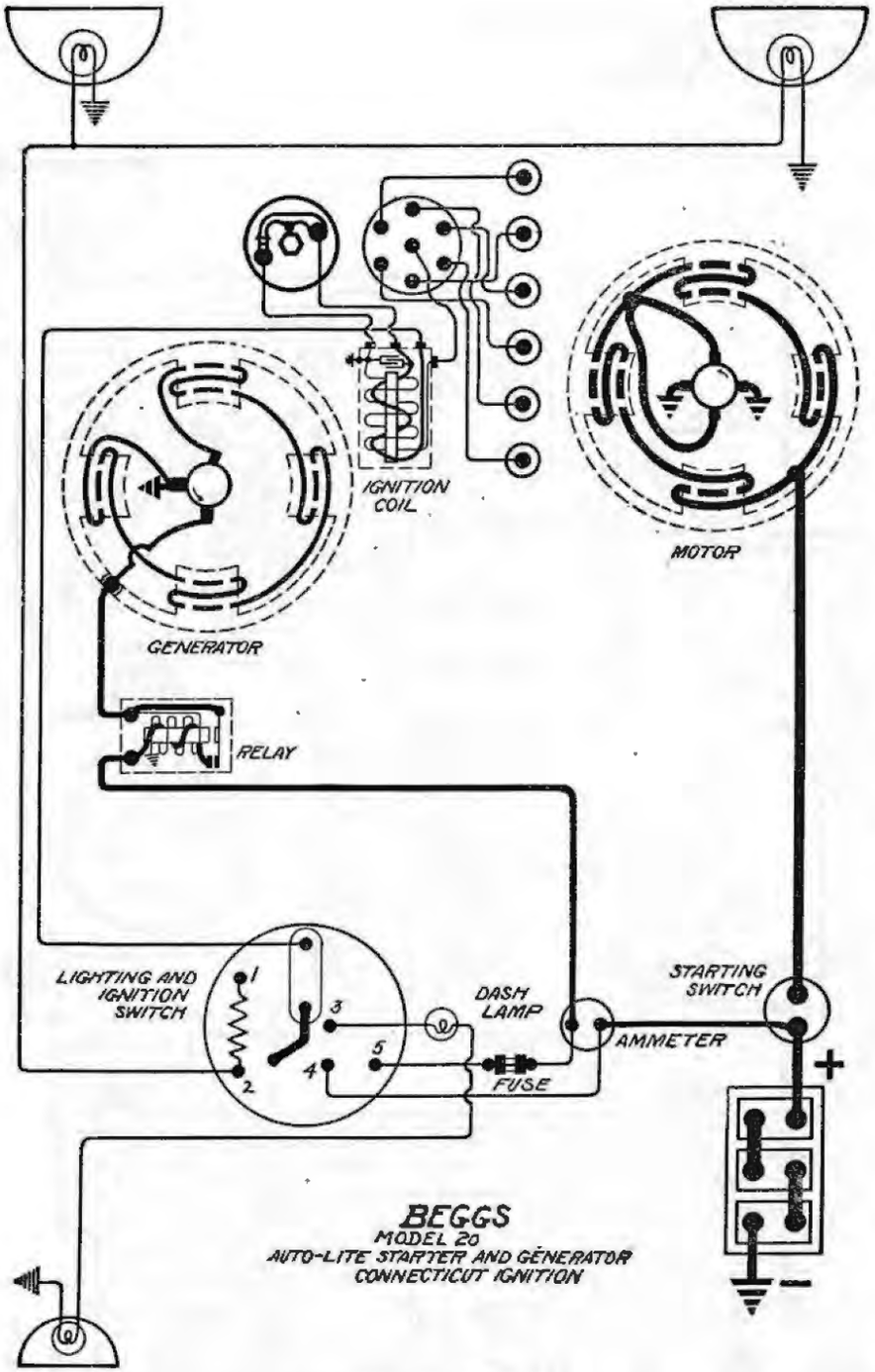
LIGHTING:—Switch Model S-106. Head lamps are 6-8 volt, 21 cp. S.C. Dome lamp is 6-8 volt, 4 cp. S.C. Side, dash and tail lamps are each 6-8 volt, 2 cp. S.C.

FUSES:—Generator field fuse is 7.5 ampere capacity.



BEGGS

MODEL 20 (1920-21-22-23-24-25)
AUTO-LITE GENERATING, STARTING AND LIGHTING SYSTEM
CONNECTICUT IGNITION



BATTERY:—Exide, Type 3-XC-13-1. 6 volt, 90 ampere hour. The starting capacity is 98 amperes for 20 minutes. The lighting capacity is 5 amperes for 16.8 hours. The negative (—) terminal is grounded.

IGNITION.—Breaker contacts separate .023 inch. They are made of tungsten. When the condition of the contacts affects the ignition, renew the inner breaker mechanism. For temporary service, resurface with fine emery cloth.

OILING.—Refill the cup under the breaker head with pure vaseline and turn down every month. If the car is driven more than 1000 miles in a month, this must be done every 1000 miles.

TIMING.—Breaker contacts begin to separate when the piston entering power stroke is on top dead center, 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 are .030 inch.

STARTER:—Model MH-1025. Starter is connected to the engine by means of a Bendix drive. The direction of rotation is counter clockwise, looking at the commutator end.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	4000	6.	40-60
1.3 "	1500	5.5	100
5 "	800	5.	200
9 "	400	4.5	300
17.5 "	Lock	4.	600

OILING.—Put 5 or 6 drops of light engine oil in each of the starter oilers every month.

GENERATOR.—Model GJ. Generator current regulation is by the third brush system.

Generator Data.

Cold Test. (25°C)			Hot Test (75°C)		
Amperes.	Volts.	R.P.M.	Amperes.	Volts.	R.P.M.
2	6.25	575	2	6.95	700
6	6.4	700	6	7.1	875
10	6.55	900	10	7.25	1200
14	6.7	1250	12	7.35	1650
15.5	6.8	1700	12	7.35	1850

Maximum charging rate is reached at 20-25 miles per hour or 1600-1700 R.P.M. of the armature.

OILING.—Put 4 or 5 drops of light engine oil in each of generator bearing oilers every two weeks. If the car is driven more than 500 miles in two weeks, the oiling must be done every 500 miles.

RELAY.—Relay closes at 6-9 miles per hour or 550-600 R.P.M. of the armature and opens at 4-7 miles per hour or 500-550 R.P.M. of the armature. Charging current is 1-3 amperes at closing, and discharge current .5 to 1.5 amperes at opening of relay contacts. Clean relay contacts by drawing unglazed paper between them.

LAMPS.—Head lamps are 6-8 volt, 21 cp. Dash and tail lamps are 3-4 volt, 2 cp.

FUSES:—Lighting fuse is 10 amperes capacity.

BLACKHAWK

BLACKHAWK SIX SERIES L (1929-30), SERIAL NUMBERS 16,001 UP
PRODUCTION STARTED DECEMBER 4, 1928
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—Prest-O-Lite, Type 615-J, 6 volt. The negative (—) terminal is grounded. Starting capacity (20 minute rate) is 120 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 20 hours. Battery is mounted under the left front seat.

IGNITION:—Coil Model 527-A or 528-C. Coils are mounted under the hood on the right side. Ignition current is 10 amperes at 6 volts with engine stopped and 6 amperes at 6 volts with engine running. Ignition switch is Delco-Remy Dual-lock, Model 426-J or K.

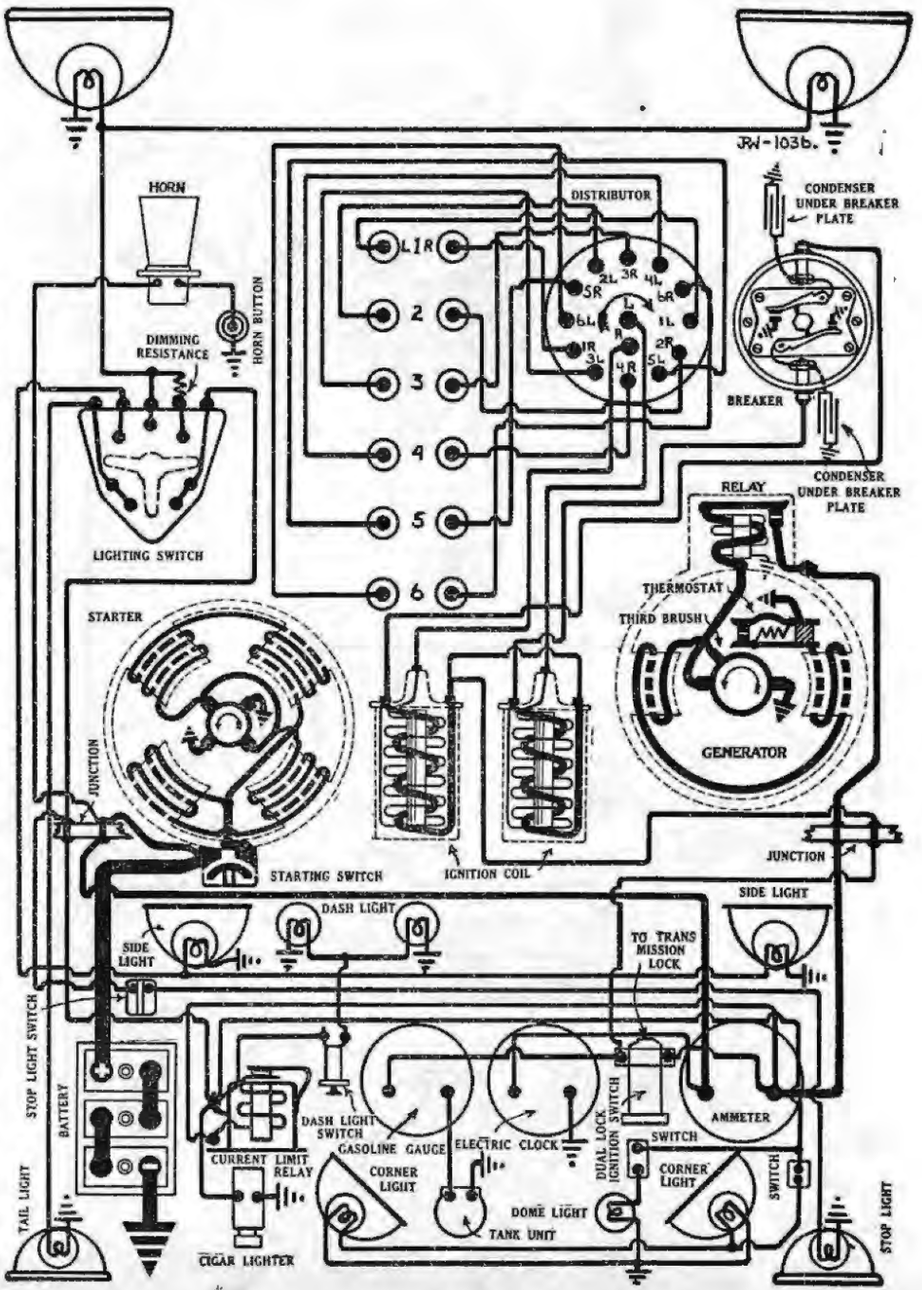
Distributor Model 4043. Breaker contacts separate .017 inch. Set contact gap by loosening lock nut on stationary contact mounting stud and turning up stud until correct gap is obtained with breaker arm on lobe of cam. Resurface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 17-21 ounces. Distributor is semi-automatic. Maximum manual advance is 38 degrees (engine). Automatic advance begins at 400 R.P.M. (engine). Maximum automatic advance is 22 degrees reached at 2600 R.P.M. There are two sets of contacts on a six sided cam. Contacts open simultaneously and each set of contacts controls one coil and fires one set of spark plugs. The electrical circuit of each coil is entirely separate except that one distributor is used. Contacts must be synchronized for correct performance. See Timing.

Mounting:—Distributor is mounted on accessory bracket at right of engine. To remove distributor, disconnect manual advance rod and primary leads and remove distributor head with cables intact. Then remove manual advance stop screw and lift distributor from plaee.

Oiling:—Put 8 or 10 drops of light engine oil in the oiler on the side of the distributor every 750 miles. Every 1000 miles remove the distributor head and rotor and put a small amount of vaseline on the face of the breaker cam and oil the breaker arm pivot pins with light engine oil.

Timing:—Synchronization of Contacts:—Contacts must be synchronized so that they open at the same instant firing both spark plugs in each cylinder simultaneously. Connect a six volt lamp in each primary circuit. Turn ignition on and crank engine over slowly. The lamps will go out as each set of contacts open. If both lamps go out at the same instant the contacts are synchronized. If they do not, loosen the four lock screws on the breaker plate and shift the plate causing one set of contacts to open earlier or later until synchronization is effected. Then tighten lock screws and check contact gap with breaker arm on lobe of cam. If outside limits of .015-.020 inch, reset at .017 inch and repeat synchronization.

Timing Distributor to Engine:—Breaker contacts begin to open when the piston entering power stroke reaches a position 15 degrees before top dead center with the spark lever in the fully advanced position. To set timing, crank engine over until piston No. 1 enters compression stroke (the upstroke with both valves closed). Fully retard spark lever and continue to crank engine until piston reaches top dead center when the flywheel mark 'Top C 1 & 6' will be in the center of the inspection hole in the upper flywheel case. Then advance spark lever exactly 6/10 of the total range with the ignition turned on. At this point the ammeter should drop from an indicated discharge of 10 amperes to '0'. If it drops in two stages of 5 amperes each it indicates that the contacts are not synchronized. If the ammeter reading does not drop at this point, loosen the lock screw in the center of the breaker cam and carefully rotate cam until contacts open. Tighten the lock screw and connect the segment opposite the rotor segment connected



BLACKHAWK

BLACKHAWK SIX SERIES L (1929-30), SERIAL NUMBERS 16,001 UP
PRODUCTION STARTED DECEMBER 4, 1928
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

to the terminal in the center of the distributor head to right hand spark plug in cylinder No. 1. Connect the remaining spark plugs as shown on the diagram.

Firing Order:—The firing order is 1-5-3-6-2-4. Spark plugs are connected 1R-6L-5R-2L-3R-4L-6R-1L-2R-5L-4R-3L clockwise around the distributor head. Spark plugs are right (R) and left (L) in the cylinder head as viewed from the driver's seat and No. 1 cylinder is nearest the radiator.

Spark Plugs:—Spark plugs are 18 MM. Metric Standard. Gaps are .022 inch.

VALVE TIMING:—Specifications:—Head diameter, 1 21/32 inches. Stem diameter, ⅜ inch. Stem length, 6 11/32 inches (top of seat to end of stem). Valve lift, 11/32 inch. Spring pressure, 102 pounds with valve open (spring length, 2 5/64 inches) and 56 pounds with valve closed (spring length, 2 27/64 inches). Tappet clearance or lash between valve cap and cam, .028 inch. Valve stem guides are removable. Oversize valves are not made.

Valve Timing:—Inlet valves open 7 degrees after top dead center and close 47 degrees after lower dead center. Exhaust valves open 49 degrees before lower dead center and close 7 degrees after top dead center.

To Set Valve Timing:—Cam shaft sprocket should be taken off cam shaft and automatic adjusting sprocket must be off engine. Crank engine over until piston No. 1 reaches a position 7 degrees past top dead center when the flywheel mark 'EX.CL.1&6 IN.OP1&6' will be in the exact center of the inspection hole in the upper flywheel housing. Then turn cam shaft until the heel of the first cam at the front of the engine is directly above No. 1 valve (exhaust valve in cylinder No. 1). Set lash or clearance between valve cap and cam at .028 inch (this is very important). Then turn cam shaft in direction of rotation (clockwise) until the valve has opened and just closed. This may be determined by inserting pin in hole in valve cap and oscillating valve. The added drag when the valve seats will be perceptible. Then mesh cam shaft sprocket in upper chain and rotate sprocket counter-clockwise to take up all the slack in the driving side of the chain. Line up holes in sprocket and cam shaft flange by slipping chain one tooth at a time on the transfer sprocket. Insert four cap screws mounting sprocket on cam shaft. Mesh automatic adjusting sprocket in chain and insert eccentric adjusting hub. Wind up spiral spring one and one half turns to provide proper chain tension and insert spring tongue in nearest slot. Assemble plain washer on sprocket shaft and insert cotter.

STARTER:—Model 726-C. Starter is connected to the engine through a clutch and manual pinion shift connected to the starting switch. The direction of rotation is counter-clockwise, viewed from the commutator end. Brush spring tension is 24-28 ounces.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15 "	Lock	3.15	570

Mounting:—Starter is flange mounted at left of engine on forward side of flywheel housing. To remove starter, disconnect cable and starting pedal linkage and remove three flange mounting cap screws. Then pull starter forward and lift from place.

Oiling:—Put 8 or 10 drops of light engine oil in the oiler on the commutator end of the starter every 750 miles. The drive end bearing is oilless.

GENERATOR:—Model 949-H. The direction of rotation is counter-clockwise, viewed from the commutator end. Generator current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 165°F. cutting the resistance across the thermostat contacts in series with the shunt field and reducing the output approximately 40%. To adjust generator output, remove the commutator cover band and loosen the small round headed screw on the generator endplate. Then shift the third brush by hand in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. With standard car setting, the maximum charging rate is 12 amperes (hot) at 7.6 volts reached at 2000 R.P.M. or 32 M.P.H.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
19-21	8.35-8.5	1450	9-12	7.35-7.65	1800-2000

Shunt field current is 4-6.1 amperes at 6 volts. Brush spring tension is 14-18 ounces.

Mounting:—Generator is flange mounted at right of engine on rear of accessory bracket. To remove generator, disconnect water pump drive coupling and generator lead and remove three flange mounting cap screws. Then pull generator to rear and lift from place.

Oiling:—Put 8 or 10 drops of light engine oil in the oiler at each end of the generator every 750 miles.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay contacts close at 575 R.P.M. or 8 M.P.H. when the generator voltage reaches 7-7.5 volts and open with a discharge current of 0-2.5 amperes. Contacts separate .015-.020 inch. Air gap is .014-.021 inch with contacts closed.

LIGHTING:—Delco-Remy Switch Model 486-G. Lighting switch is mounted at lower end of steering column. Headlights are dimmed by resistance on switch. Headlights are 6-8 volt, 32 cp. S.C. Mazda 1133. Cowl lights are 6-8 volt, 3 cp. S.C. Mazda 63. Stop light is 6-8 volt, 15 cp. S.C. Mazda 87. Dash and tail lights are each 6-8 volt, 3 cp. S.C. Mazda 63.

CURRENT LIMIT RELAY:—Model 410-C. This device is a vibrating circuit breaker mounted on the dash and connected in the lighting circuits. It begins to vibrate when the current flow reaches 20-30 amperes and continues limiting the current to 2-15 amperes. Contacts separate .012-.030 inch. Air gap is .019-.025 inch with contacts closed.

BLACKHAWK

BLACKHAWK EIGHT SERIES L (1929-30), SERIAL NUMBERS 28,001 UP
PRODUCTION STARTED DECEMBER 4, 1928
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—Prest-O-Lite, Type 615-J, 6 volt. The negative (—) terminal is grounded. Starting capacity (20 minute rate) is 120 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 20 hours. Battery is mounted under the left front seat.

IGNITION:—Coil Model 528-C. Coil is mounted on the dash. Ignition current is 6 amperes at 6 volts with engine running and 10 amperes at 6 volts with engine stopped. Ignition switch is Delco-Remy Dual-lock, Model 426-J or K.

Distributor Model 658-U. Breaker contacts separate .022 inch. Set contact gap by loosening lockscrew on stationary contact mounting plate and turning eccentric adjusting screw until correct gap is secured with breaker arm on lobe of cam. Resurface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 18-21 ounces. Distributor is semi-automatic. Maximum manual advance is 22 degrees (engine). Automatic advance begins at 600 R.P.M. (engine). Maximum automatic advance is 20 degrees reached at 3200 R.P.M. Breaker has two sets of contacts on a four sided cam. Contacts open alternately at intervals of 45 degrees corresponding to 90 degrees of crankshaft rotation. This is the correct firing interval and contacts must be synchronized for correct performance. See Timing.

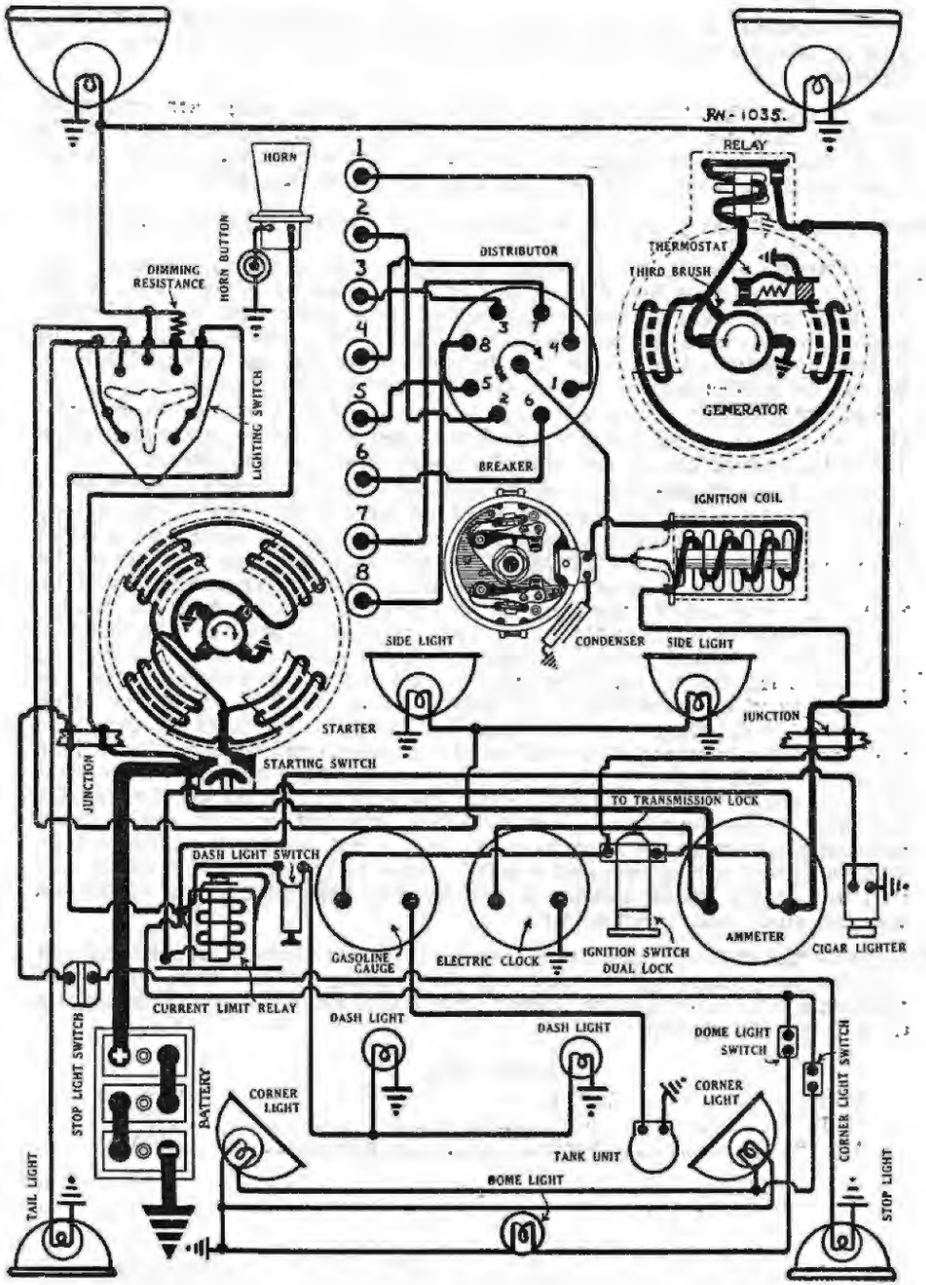
Mounting:—Distributor is mounted on rear of generator at right of engine. To remove distributor, disconnect primary lead and manual advance rod and remove distributor head with cables intact. Then take out manual advance stop screw and lift distributor from place.

Oiling:—Fill the grease cup on the side of the shaft with medium cup grease and turn down one half turn every 1000 miles. At the same time remove the distributor head and rotor and saturate the wick oiler in the center of the shaft with light engine oil and put a small amount of vaseline on the face of the breaker cam.

Timing:—Synchronization of Contacts. To synchronize contacts, use Delco-Remy tool, Part No. 820738, and follow directions in Equipment Section. Contacts can be synchronized without tool after distributor has been timed to engine by cranking engine over 90 degrees from firing position of piston No. 1 when piston No. 6 will reach a position 10 degrees after top dead center. The second set of contacts should separate at this point. If they do not, loosen the two lock screws on the breaker plate and turn the eccentric adjusting screw until contacts begin to open. Tighten the lock screws and check the contact opening with the breaker arm on the lobe of the cam. If breaker gap is outside limits of .018-.024 inch, reset at .022 inch and repeat synchronization.

Timing Distributor to Engine:—Breaker contacts begin to separate when the piston entering power stroke reaches a position 10 degrees after top dead center with the spark control lever in the fully retarded position. To set timing, crank engine over until piston No. 1 enters compression stroke (the upstroke with both valves closed). Then fully retard spark control lever and continue to crank engine until piston reaches a position 10 degrees after top dead center. Loosen advance arm clamp screw and rotate distributor until contacts begin to open. Tighten the clamp screw and connect the segment opposite the rotor to the spark plug in cylinder No. 1. Connect the remaining spark plugs in order 6-2-5-8-3-7-4 clockwise around the distributor head.

Firing Order:—The firing order is 1-6-2-5-8-3-7-4.



BLACKHAWK

BLACKHAWK EIGHT SERIES L (1929-30), SERIAL NUMBERS 28,001 UP
PRODUCTION STARTED DECEMBER 4, 1928
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

Spark Plugs:—Spark plugs are 18 MM. Metric Standard. Gaps are .022 inch.

VALVE TIMING:—INLET VALVES:—Head diameter, 1½ inches. Stem diameter, 21/64 inch. Stem length, 5 57/64 inches. Valve lift, 5/16 inch. Spring pressure, 62 pounds with valve closed (spring length, 2¼ inches) and 103 pounds with valve open (spring length, 1 15/16 inches). Tappet clearance, .007 inch. Inlet valves open 8 degrees after top dead center and close 40 degrees after lower dead center.

EXHAUST VALVES:—Head diameter, 1⅜ inches. Stem diameter, 21/64 inch. Stem length, 5 57/64 inches. Valve lift, 5/16 inch. Spring pressure, 62 pounds with valve closed (spring length, 2¼ inches) and 103 pounds with valve open (spring length, 1 15/16 inches). Exhaust valves open 40 degrees before lower dead center and close 8 degrees after top dead center. Valve stem guides are removable. Oversize valves are made. Set tappet clearance at .012 inch when setting valve timing.

To Check Valve Timing. Turn engine over until piston No. 1 reaches top dead center entering power stroke. Set tappet clearance of No. 1 inlet and exhaust valve at .012 inch. Turn engine over one complete revolution and stop with the piston 8 degrees after top dead center when the flywheel mark 'EX.CL.1-8' is opposite the indicator on the housing. The No. 1 inlet valve should open and exhaust valve close at this point.

STARTER:—Model 724-J. Starter is connected to the engine through an outboard Bendix drive. The direction of rotation is clockwise, viewed from the commutator end. Brush spring tension is 24-28 ounces. Starting switch is Model 405-C.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	3500	5	70
22 "	Lock	3	600

Mounting:—Starter is flange mounted at left of engine on forward side of flywheel housing. To remove starter, disconnect cable and remove three flange mounting cap screws. Then pull starter forward and lift from place.

Oiling:—Put 8 or 10 drops of light engine oil in the oiler at each end of the armature shaft every 1000 miles. Every six months remove the grease plug in the reduction gear case and repack gears with graphite grease.

GENERATOR:—Model 944-N, P. Direction of rotation is counter-clockwise, viewed from the commutator end. Generator current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 165°F. cutting the resistance across the thermostat contacts in series with the shunt field and reducing the output approximately 40%. To adjust generator, loosen the small round headed screw on the generator end plate and remove the commutator cover band. Then shift the third brush by hand in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. With standard car setting the maximum charging rate is 9-12 amperes (hot) at 7.65 volts reached at 1500 R.P.M. or 32 M.P.H.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
18-20	8.3-8.5	1300	9-12	7.35-7.65	1300-1500

Shunt field current is 4-6.1 amperes at 6 volts. Brush spring tension is 14-18 ounces.

Mounting:—Generator is flange mounted at right of engine on rear of timing chain case. To remove generator, disconnect all ignition wiring or remove distributor. Take off inspection cover on front face of chain case and remove nut on generator shaft. Then take out the flange mounting screws and pull generator to the rear. Tie up the timing chain and do not crank engine with generator out.

Chain Adjustment. To adjust timing chain, loosen the generator mounting screws and shift the generator away from the engine until the chain begins to hum with the engine running. Back off the adjustment until the chain runs noiselessly and tighten the mounting screws.

Oiling:—Put 8 or 10 drops of light engine oil in the oiler at each end of the generator every 1000 miles.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay contacts close at 500 R.P.M. or 8 M.P.H. when the voltage of the generator reaches 7-7.5 volts and open with a discharge current of 0-2.5 amperes. Contacts separate .015-.020 inch. Air gap is .014-.021 inch with contacts closed.

LIGHTING:—Delco-Remy Switch Model 486-G. Lighting switch is mounted at lower end of steering column. Headlights are dimmed by resistance on switch. Headlights are 6-8 volt, 32 cp. S.C. Mazda 1133. Cowl lights are 6-8 volt, 3 cp. S.C. Mazda 63. Stop light is 6-8 volt, 15 cp. S.C. Mazda 87. Dash and tail lights are each 6-8 volt, 3 cp. S.C. Mazda 63.

CURRENT LIMIT RELAY:—Model 410-C. This device is a vibrating circuit breaker mounted on the dash and connected in the lighting circuits. It begins to vibrate when the current flow reaches 20-30 amperes and continues limiting the current to 2-15 amperes. Contact gap is .012-.030 inch. Air gap is .019-.025 inch with contacts closed.

BREWSTER

1920 TO 1926

U. S. L. GENERATNG, STARTING AND LIGHTING SYSTEM

BERLING IGNITION

1920-22

BATTERY.—U. S. L., Type HDN-611-C, 12 volt, 93 ampere-hour. The negative (—) terminal is grounded.

IGNITION.—Magneto breaker contacts separate .016 to .020 inch. When the condition of the contacts affects the ignition, resurface with a fine, flat jeweler's file or worn No. 00 sandpaper.

TIMING.—Breaker contacts begin to separate when piston entering power stroke is on top dead center, spark control lever and breaker assembly in the fully retarded position.

MODEL 02 (1924-25)

BATTERY:—Exide, Type 6-XX-13-1. 12 volt, 90 ampere hour. The starting capacity is 185 amperes for 20 minutes. The negative (—) terminal is grounded.

IGNITION:—Model ZR-4. Breaker contacts separate .016-.020 inch. When the condition of the contacts affects the ignition, resurface with a fine, flat jeweler's file or worn No. 00 sandpaper.

OILING.—Put 10 drops of light engine oil in each of the magneto oil cups every month. Put a small amount of vaseline on the cam and on the rubbing surfaces of the fiber lever, applying with a toothpick. If the car is driven more than 1000 miles in a month, these attentions must be given every 1000 miles.

TIMING:—Breaker contacts begin to separate when piston entering power stroke is 5 millimeters before top dead center with the spark control lever and breaker assembly in the fully retarded position.

FIRING ORDER.—The firing order is 1, 3, 4, 2.

SPARK PLUGS:—Spark plugs are ⅞ inch in diameter. Gaps should be .020 inch.

STARTER-GENERATOR.—Model E-207. Armature is fastened to the engine crankshaft, taking the place of the flywheel. When operating as a starter, the unit cranks the engine at 175 R.P.M., taking 185 amperes.

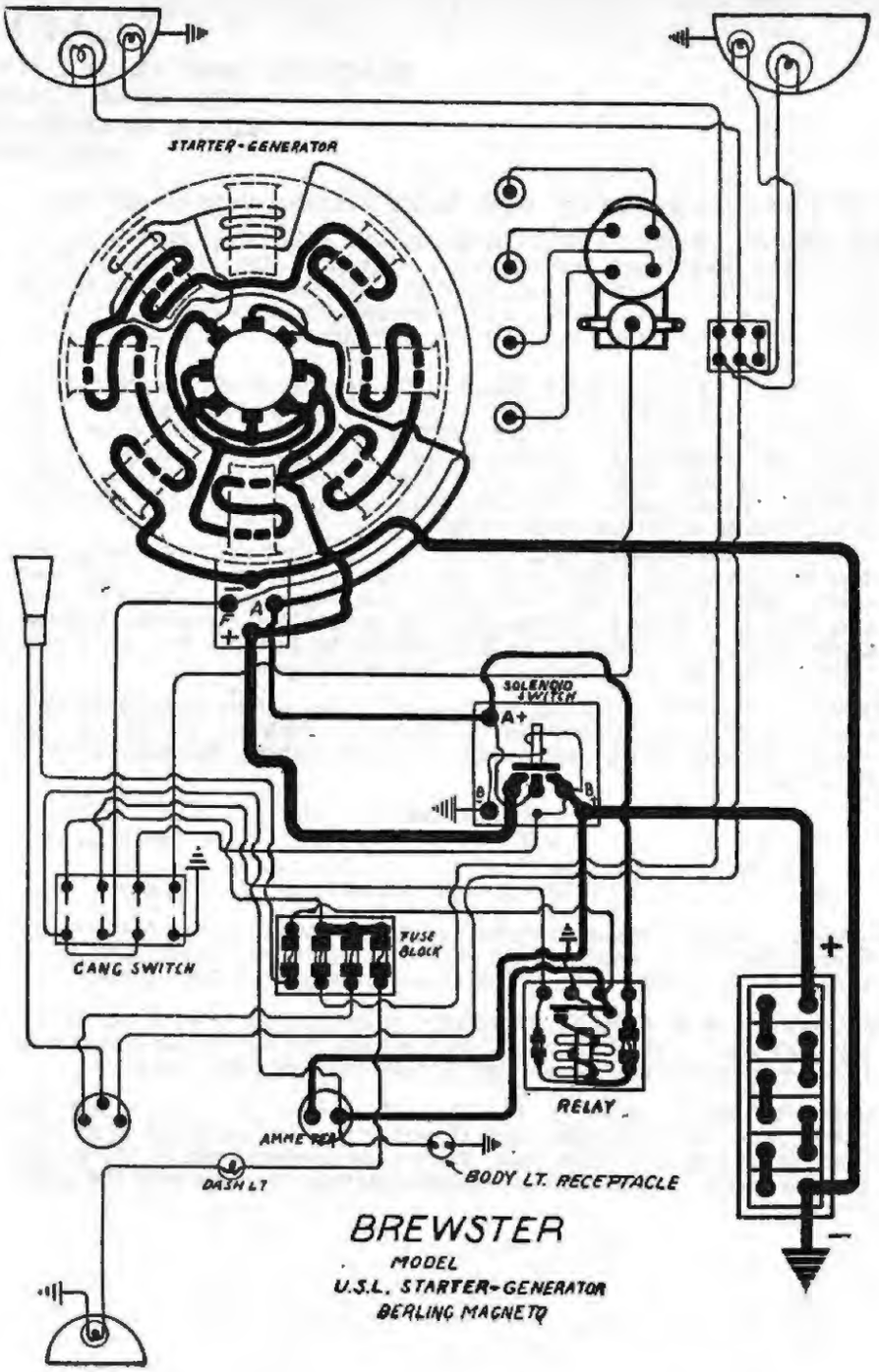
GENERATOR.—Generator current regulation is by third brush and compensating field. Maximum current output is 12 amperes at 500 R.P.M. of the armature or 18 miles per hour. Pressure of brushes on the commutator is 1¾ pounds.

OILING.—Starter-generator requires no oiling.

RELAY.—Relay closes at 11 miles per hour or 350 R.P.M. of the armature, and opens at 9 miles per hour or 250 R.P.M. of the armature. Clean relay contacts by drawing unglazed paper between them. If badly burned or pitted, resurface with well worn No. 00 sandpaper. Remove all grit. Adjust before again putting into service.

LAMPS.—Head lamps are 12-16 volt, 36 cp. Dimmer lamps are 12-16 volt, 4 cp. Dash and tail lamps are 6-8 volt, 2 cp.

FUSES:—Lighting fuses are 20 ampere. Large fuse in relay box is 30 ampere. Small field fuse is 6 ampere capacity.



BUICK

MODEL 21-SIX (1921) AND 22 SIX (1922)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

BATTERY:—(21SIX) Willard, Type SJWH-4 (22-SIX) Exide, Type 3-XC-15-1 6 volt, 100 ampere hour. The negative (—) terminal is grounded. The starting capacity is 98 amperes for 20 minutes. Lighting capacity is 5 amperes for 17 hours.

IGNITION:—Coil Model 2159. Distributor Part No. 17037. Breaker contacts separate .020-.025 inch. Set contact gap by loosening lock nnt on stationary contact mounting stud and turning up stud. Resnrface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 16-20 ounces. Distributor is semi-automatic. Maximum manual advance is 27½-32½ degrees (engine). Automatic advance begins at 580 R.P.M. of the engine. Maximum automatic advance is 16-20 degrees reached at 1333 R.P.M.

Oiling:—Apply a small amount of vaseline on the breaker cam each 1000 miles. See also starter-generator oiling.

Timing:—Breaker contacts begin to separate when the seven degree mark on the flywheel (which is approximately one inch after top dead center) is at the indicator spark control lever and distributor drive shaft in the fully retarded position.

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

Spark Plugs:—Diameters ⅞ inch. Gaps are .030 inch.

STARTER-GENERATOR:—No. 184. Starter and generator are combined into one unit. Depressing the starting pedal meshes the reduction gears, opens the generator circuit, and allows the motor brush to come in contact with the commutator, closing the starter circuit and cranking the engine. When the pedal is released, a spring reverses these operations. Direction of rotation is colckwise, looking at commutator end. Brush spring tension should be 2¼-2¾ pounds each.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	6	75
8 "	Lock	3.1	—

Regulation and Output.—Generator current regulation is by the third brush system.

Generator Data. Motor-Generator No. 184

Amperes	Cold Test R.P.M.	Amperes	Hot Test R.P.M.
Neutral	500	Neutral	520
8.0- 9.5	825	7.5- 8.5	825
12.5-16.0	1500	12.0-15.0	1500
11.0-14.5	1800	11.5-14.5	1800

To adjust the charging rate, loosen the two screws on the bottom of generator frame and move the slotted plate which carries the third brush holder to the left (looking at commutator end) to increase charging rate, and to the right to decrease it.

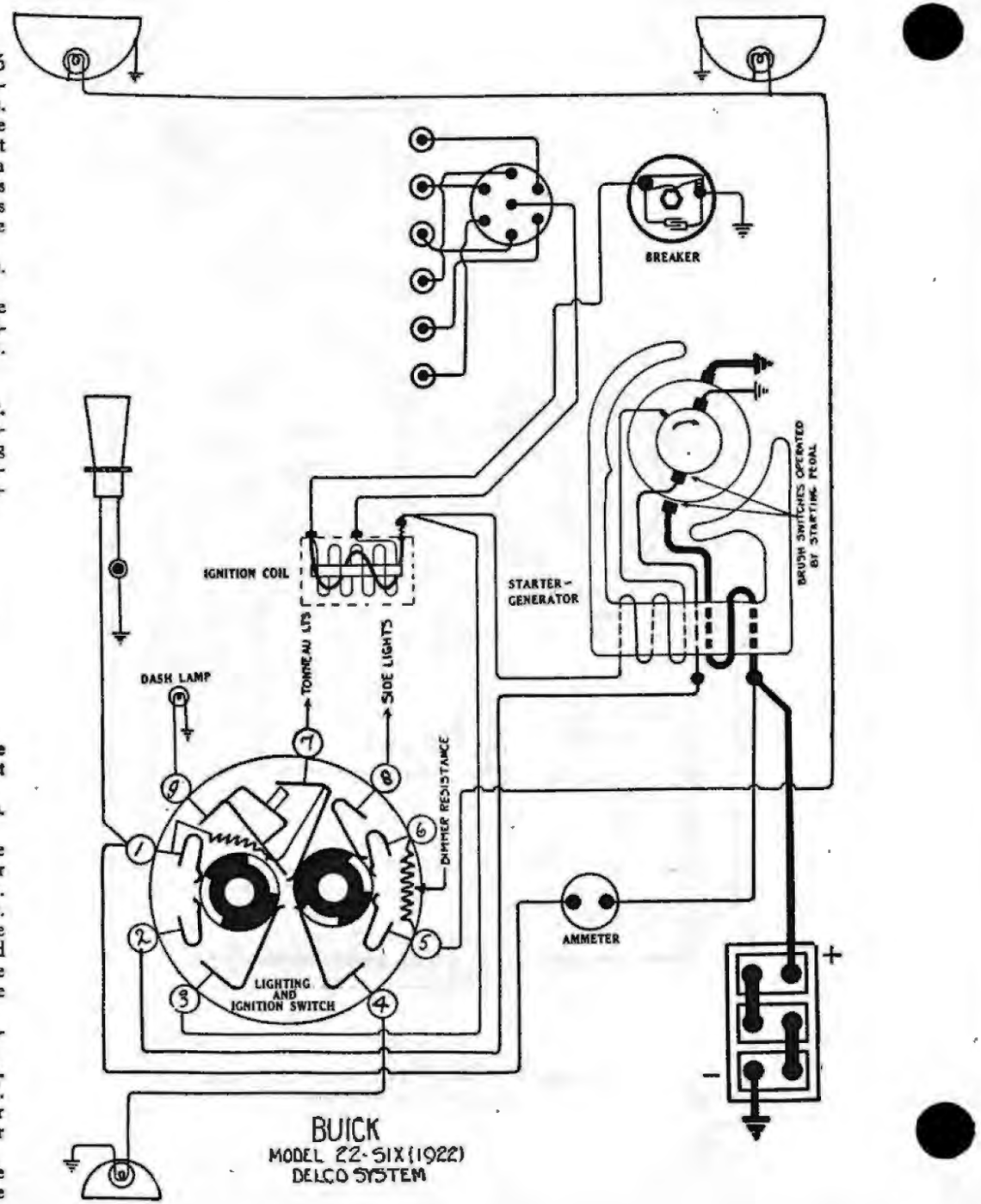
Motoring freely with over-running clutch, taking a current of 5.5 amperes, 6 volts. Field current is 2.5 amperes.

Oiling:—Put 4 or 5 drops of light engine oil in oiler provided for lnbricating the rear armature shaft bearing every two weeks. Remove the front end cover over the commutators and put 3 or 4 drops of light engine oil in the exposed oil hole. Put 4 or 5 drops of light engine oil in the upper distributor shaft bearing oiler. If the car is driven more than 500 miles in two weeks, these attentions must be given every 500 miles. Refill the starting gear grease cup with soft cup grease and turn down two turns every month. Every six months, remove the plate on the side of the distributor honsing and refill with soft cup grease to a level just above the manual advance ring.

RELAY:—There is no relay. The circuit between the generator and the battery is controlled by the ignition switch.

LIGHTING:—Delco Combination Switch, Model 1159 (1921), 1222 or 1228 (1922). Switch is mounted on the instrument panel. Headlights are 6-8 volt, 21 cp. S.C. Dash, tail, dome and side lights are each 6-8 volt, 2 cp. On the 21-six dimmer lights connected to No. 6 terminal on the switch are used instead of the dimmer resistance. Dimmer lights are 6-8 volt, 5 cp.

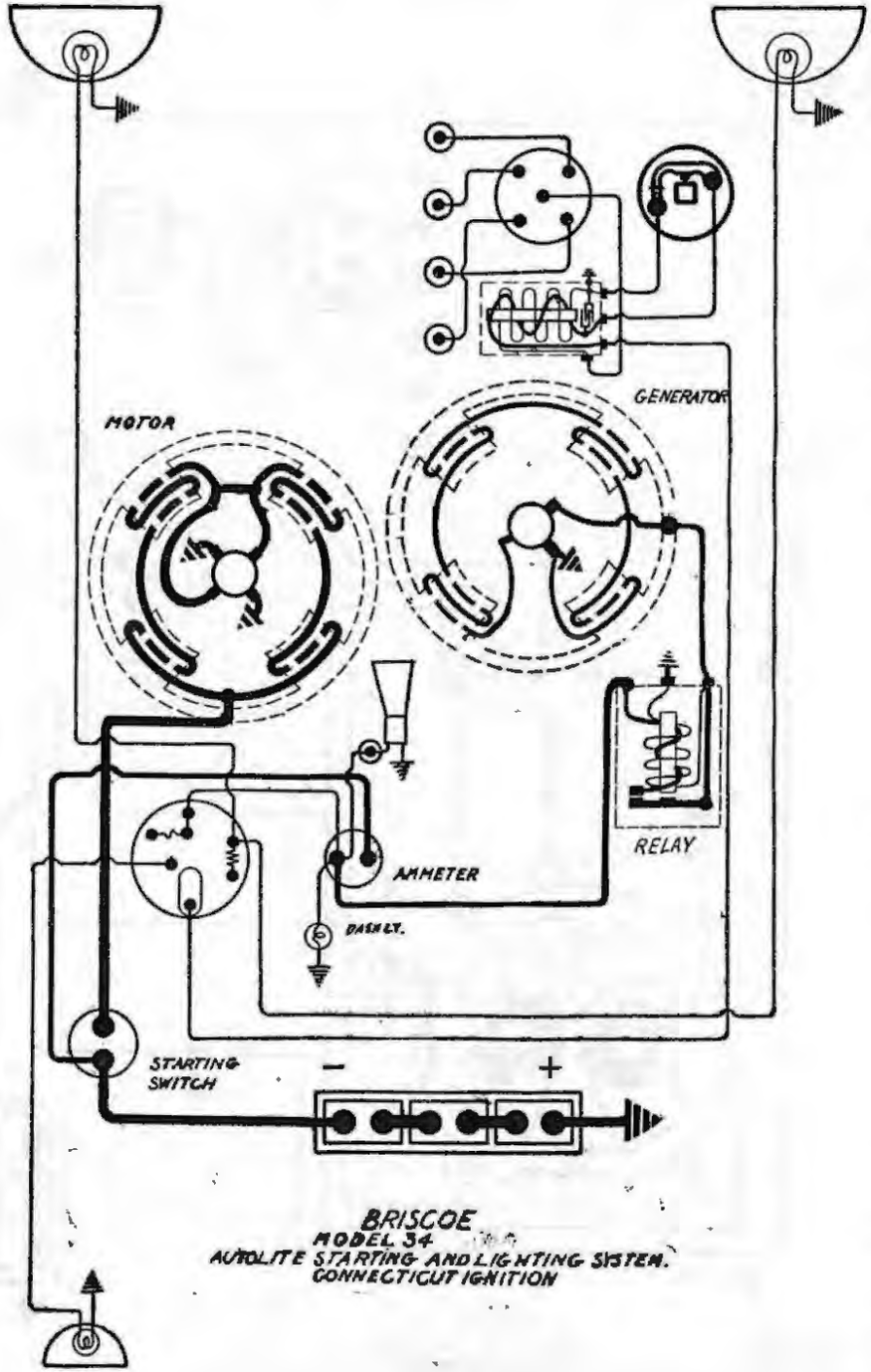
CIRCUIT BREAKER:—A vibrating circuit breaker is mounted on the back of the switch. It is connected in the lighting circuits. Circuit breaker begins to vibrate when the current reaches 25-30 amperes and continues limiting the current to 10-15 amperes.



BRISCOE

MODEL 4-34 (1920-21-22)

AUTO-LITE GENERATING, STARTING AND LIGHTING SYSTEM
CONNECTICUT IGNITION



BATTERY.—Presi-O-Lite, Type 613-WHN-2, 6 volt, 80 ampere-hour. The positive (+) terminal is grounded.

IGNITION.—Connecticut, Model 16, clockwise rotation. Breaker contacts separate .020 inch. They are made of tungsten. When the condition of the contacts affects the ignition, renew the inner breaker mechanism. For temporary service, resurface contacts with fine emery cloth.

OILING.—Refill the cup under the breaker head with pure vaseline and turn down every month. If the 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.

TIMING.—Breaker contacts begin to separate when the top dead center mark on the flywheel is 1½ 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 are .025 inch.

STARTER.—Model MG-1013. Starter is connected to the engine through a Bendix drive. Running free at 4000 R.P.M., taking 40-60 amperes, 6 volts. Cranking the engine at 125 R.P.M., taking 150 amperes, 5 volts. Lock torque, 13 pound-feet, taking 450 amperes, 3-4 volts.

Starter Data

Torque	R.P.M.	Amperes
2 lb. ft.	1280	135
4 lb. ft.	900	210
6 lb. ft.	600	275
8 lb. ft.	400	335
10 lb. ft.	180	390
13 lb. ft.	Lock	450

OILING.—Put 4 or 5 drops of light engine oil in each of the starter bearing oilers every month.

GENERATOR.—Model GJ-1013. Generator current regulation is by third brush system. Maximum output is 12-16 amperes, reached at 1700 R.P.M. of the armature or 22 miles per hour.

Cold Test		Hot Test		Generator Data	
Amperes		R.P.M.	Amperes		R.P.M.
0		500	0		460
8		750	6		840
12		960	9		1050
16		1400	12		1360
16.5		1700	12.7		1700
12		3400	10		3400

Above readings are obtained with generator charging a battery of 1.300 solution.

Oiling.—Repack timer drive housing with arctic cup grease once every season. If car is driven over 5000 miles in one season, this care must be given to every 5000 miles.

RELAY.—Relay closes at 9 miles per hour or 580 R.P.M. of armature and opens at 7 miles per hour or 360 R.P.M. of armature. Relay contacts separate .030 to .045 inch. Clean relay contacts by drawing unglazed paper between them. If badly burned or pitted, resurface with well worn No. 00 sandpaper. Remove all grit. Adjust before again putting into service.

LAMPS.—Head lamps are 6-8 volt, 21 cp. Dash lamp is 6-8 volt, 2 cp. Tail lamp is 6-8 volt, 2 cp.

FUSES.—Fuses are 20 ampere.

BUICK

MODEL 21-SIX (1921) AND 22 SIX (1922)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

BATTERY:—(21SIX) Willard, Type SJWH-4 (22-SIX) Exide, Type 3-XC-15-1 6 volt, 100 ampere hour. The negative (—) terminal is grounded. The starting capacity is 98 amperes for 20 minutes. Lighting capacity is 5 amperes for 17 hours.

IGNITION:—Coil Model 2159. Distributor Part No. 17037. Breaker contacts separate .020-.025 inch. Set contact gap by loosening lock nnt on stationary contact mounting stud and turning up stud. Resnrface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 16-20 ounces. Distributor is semi-automatic. Maximum manual advance is 27½-32½ degrees (engine). Automatic advance begins at 580 R.P.M. of the engine. Maximum automatic advance is 16-20 degrees reached at 1333 R.P.M.

Oiling:—Apply a small amount of vaseline on the breaker cam each 1000 miles. See also starter-generator oiling.

Timing:—Breaker contacts begin to separate when the seven degree mark on the flywheel (which is approximately one inch after top dead center) is at the indicator spark control lever and distributor drive shaft in the fully retarded position.

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

Spark Plugs:—Diameters ⅞ inch. Gaps are .030 inch.

STARTER-GENERATOR:—No. 184. Starter and generator are combined into one unit. Depressing the starting pedal meshes the reduction gears, opens the generator circuit, and allows the motor brush to come in contact with the commutator, closing the starter circuit and cranking the engine. When the pedal is released, a spring reverses these operations. Direction of rotation is colckwise, looking at commutator end. Brush spring tension should be 2¼-2¾ pounds each.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	6	75
8 "	Lock	3.1	—

Regulation and Output.—Generator current regulation is by the third brush system.

Generator Data. Motor-Generator No. 184

Amperes	Cold Test R.P.M.	Amperes	Hot Test R.P.M.
Neutral	500	Neutral	520
8.0- 9.5	825	7.5- 8.5	825
12.5-16.0	1500	12.0-15.0	1500
11.0-14.5	1800	11.5-14.5	1800

To adjust the charging rate, loosen the two screws on the bottom of generator frame and move the slotted plate which carries the third brush holder to the left (looking at commutator end) to increase charging rate, and to the right to decrease it.

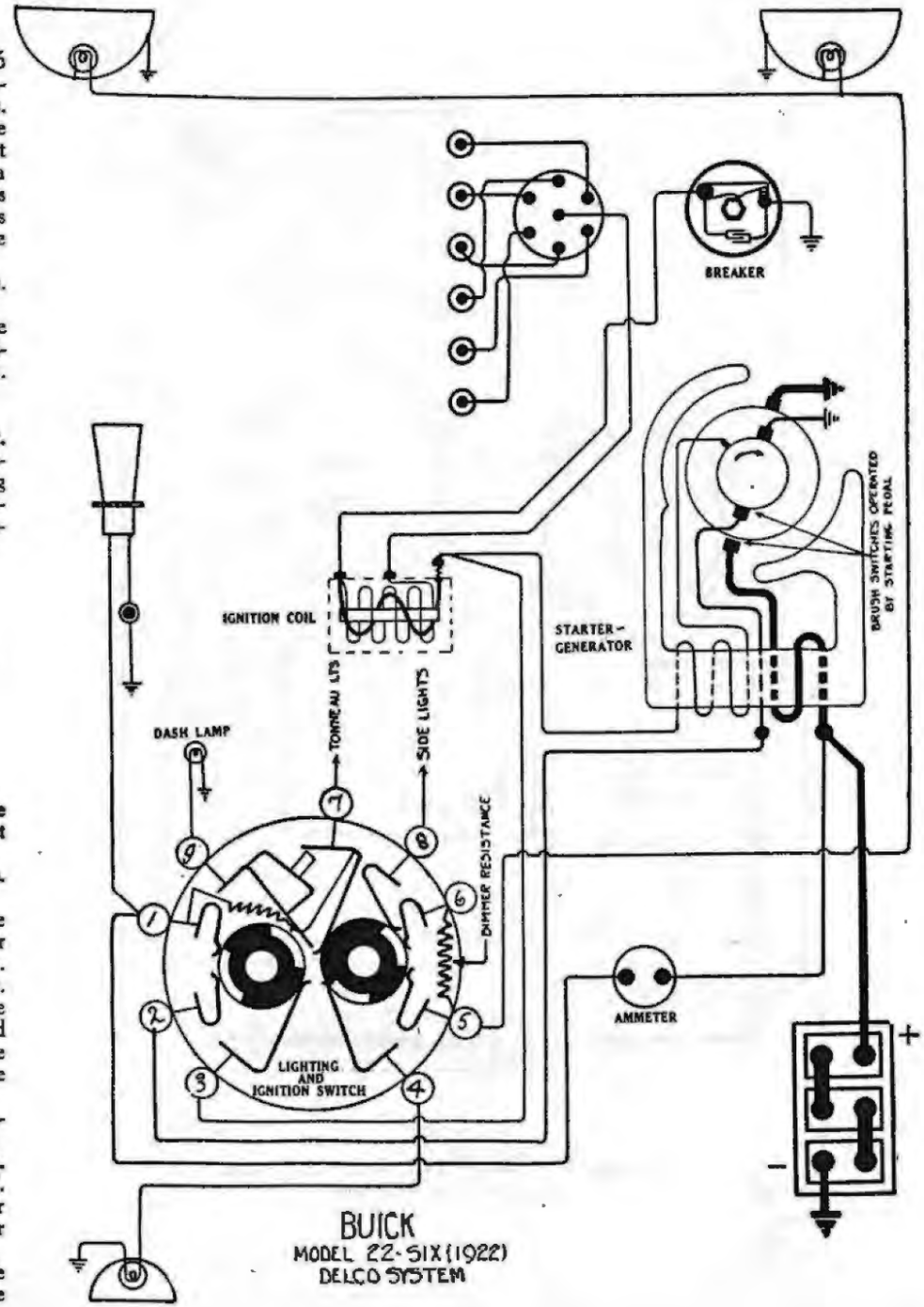
Motoring freely with over-running clutch, taking a current of 5.5 amperes, 6 volts. Field current is 2.5 amperes.

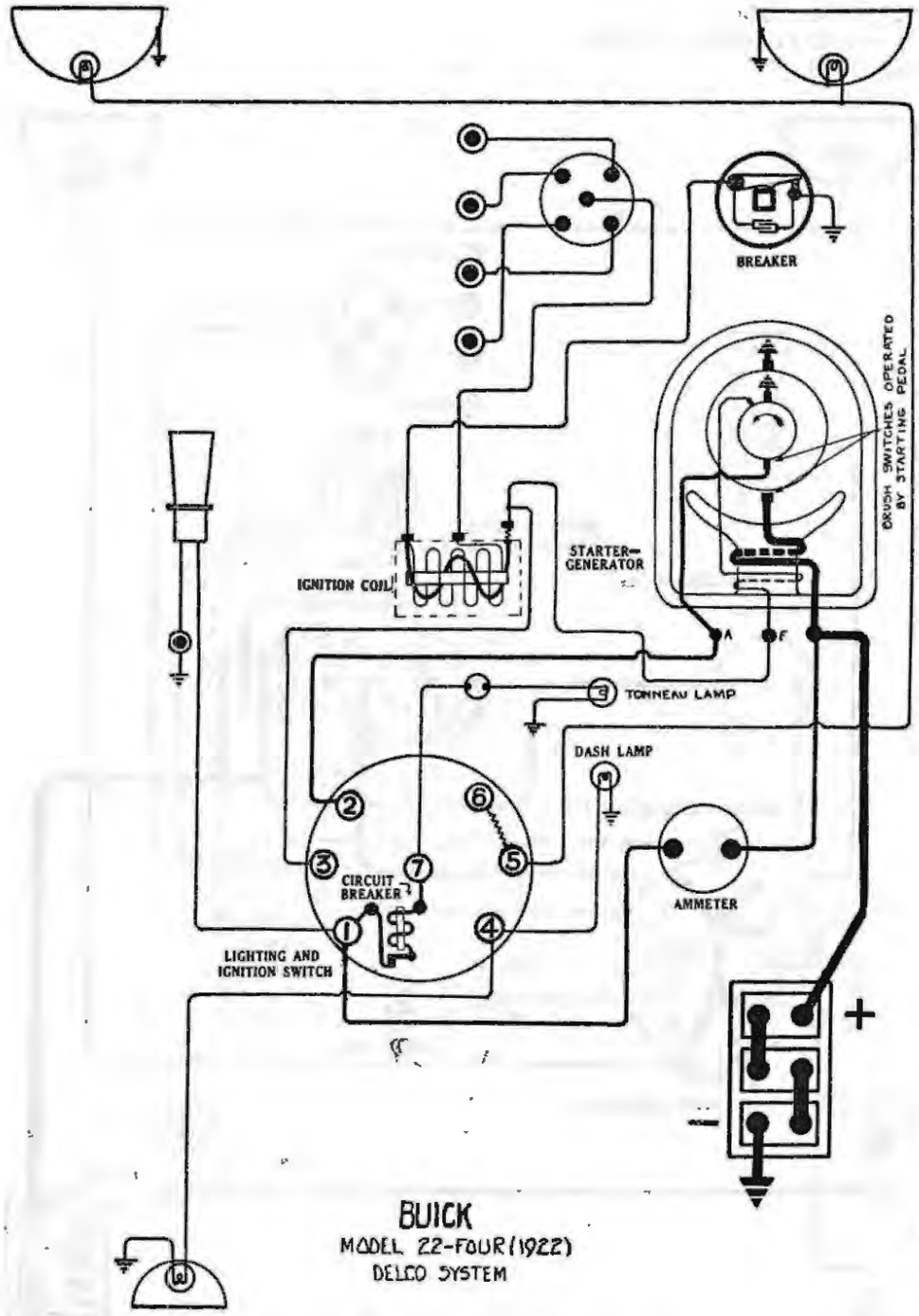
Oiling:—Put 4 or 5 drops of light engine oil in oiler provided for lnbricating the rear armature shaft bearing every two weeks. Remove the front end cover over the commutators and put 3 or 4 drops of light engine oil in the exposed oil hole. Put 4 or 5 drops of light engine oil in the upper distributor shaft bearing oiler. If the car is driven more than 500 miles in two weeks, these attentions must be given every 500 miles. Refill the starting gear grease cup with soft cup grease and turn down two turns every month. Every six months, remove the plate on the side of the distributor honsing and refill with soft cup grease to a level just above the manual advance ring.

RELAY:—There is no relay. The circuit between the generator and the battery is controlled by the ignition switch.

LIGHTING:—Delco Combination Switch, Model 1159 (1921), 1222 or 1228 (1922). Switch is mounted on the instrument panel. Headlights are 6-8 volt, 21 cp. S.C. Dash, tail, dome and side lights are each 6-8 volt, 2 cp. On the 21-six dimmer lights connected to No. 6 terminal on the switch are used instead of the dimmer resistance. Dimmer lights are 6-8 volt, 5 cp.

CIRCUIT BREAKER:—A vibrating circuit breaker is mounted on the back of the switch. It is connected in the lighting circuits. Circuit breaker begins to vibrate when the current reaches 25-30 amperes and continues limiting the current to 10-15 amperes.





BUICK

MODEL 22-FOUR (1922)

DELCO GENERATING, STARTING AND LIGHTING SYSTEM

DELCO IGNITION

BATTERY:—Exide, Type 3-XC-13-1. 6 volt, 84 ampere hour. The negative (—) terminal is grounded.

IGNITION:—Coil Model 2159. Distributor Part No. 17004. Breaker contacts separate .020-.025 inch. Set contact gap by loosening lock nut on stationary contact mounting stud and turning up stud. Resurface contacts when necessary with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 13-16 ounces. Distributor is semi-automatic. Maximum manual advance is 31 degrees (engine). Automatic advance begins at 580 R.P.M. of the engine. Maximum automatic advance is 20-24 degrees reached at 2200 R.P.M.

Oiling:—See motor-generator oiling.

Timing:—Breaker contacts begin to separate when the seven-degree mark on the flywheel (which is approximately one inch after top dead center) is at the indicator, spark control lever and distributor assembly in fully retarded position.

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

Spark Plugs:—Diameter, 7/8 inch. Spark gaps are .030 inch.

STARTER-GENERATOR:—Models Nos. 231, 236. Starter and generator are built in one unit, but are electrically separate. Depressing the starting pedal meshes the reduction gears, opens the generator circuit, and allows the motor brush to come in contact with the commutator, closing the starter circuit and cranking the engine. When the pedal is released a spring reverses these operations. Brush spring tension should be 4½-5 pounds on the upper starter brush and 2¼-2¾ pounds on the lower brush. The direction of rotation is counter-clockwise, viewed from the commutator end.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	4000	5.5	90
6 "	Lock	3.5	450

GENERATOR:—Generator current regulation is by the third brush system. The maximum charging rate should not exceed 18 amperes, hot adjustment, under any circumstances. To adjust the charging rate loosen clamp screw on third brush carrier (to right of bearing, looking at commutator end). Move carrier to left to increase charging rate, and to the right to decrease the charging rate. Tighten the clamp screw after position adjustment.

Generator Data

Amperes	R.P.M.	M.P.H.
8-9	825	------
0	600	------
Max. 14-16	1500	20
12-15	1800	------

Motoring freely the starter-generator draws 5-6 amperes at 6 volts. Shunt field current is 1.5-2 amperes at 6 volts. Brnsh spring tension is 1½-1¾ pounds.

Oiling:—Put 4 or 5 drops of light engine oil in oiler provided for lubricating the rear armature shaft bearing every two weeks. Remove the front end cover over the commutator and put 3 or 4 drops of light engine oil in the exposed hole. Put 4 or 5 drops of light engine oil in the upper distributor shaft bearing oiler. If the car is driven more than 500 miles in two weeks, these attentions must be given every 500 miles. Refill starting gear case cup with soft cup grease and turn down two turns every month. Every six months, remove the plate on the side of the distributor housing and refill with soft cup grease to a level just above the manual advance ring.

RELAY:—There is no relay. The circuit between the generator and the battery is controlled by the ignition switch.

LIGHTING:—Delco Combination Switch, Model 1214. Switch is mounted on the instrument panel. Headlights are 6-8 volt, 21 cp. Dash and tail lights are each 6-8 volt, 2 cp. Dome light is 6-8 volt, 5 cp. Headlights are dimmed by resistance on the switch.

CIRCUIT BREAKER:—A circuit breaker mounted on the back of the switch takes the place of fuses. A current of 25-30 amperes causes this device to operate. While vibrating the current is 10-15 amperes.

BUICK

MODEL 23-4 (1923) 24-4 (1924)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

BATTERY.—Exide, Type 3-XC-13-1, 6 volt, 84 ampere-hour. **The negative (—) terminal is grounded.**

IGNITION:—Coil Model 2159 (1923), 2176 (1924). Distributor Part No. 17004. Breaker contacts separate .020-.025 inch. Set contact gap by loosening lock nut on stationary contact mounting stud and turning up stud. Resurface contacts with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 13-16 ounces. Distributor is semi-automatic. Maximum manual advance is 31 degrees (engine). Automatic advance begins at 580 R.P.M. of the engine. Maximum automatic advance is 20-24 degrees reached at 2200 R.P.M.

Mounting:—Distributor is mounted on the forward end of the starter-generator at the right of the engine. To remove distribntor, disconnect primary lead and manual spark control rod and remove distributor head with cables intact. Then take out hold-down screw in advance lever and lift distributor from place.

Oiling.—See motor-generator oiling.

Timing:—Breaker contacts begin to open when the piston entering power stroke reaches a position seven degrees past top dead center (measured on the flywheel) with the manual spark control in the fully retarded position, To set timing, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed). Fully retard manual spark control and remove cover over timing inspection hole on the forward edge of the flywheel honsing at the left of the engine. Turn engine over until the seven degree mark '7 Deg.' (which is about one inch past the top dead center mark '¼') is directly opposite the indicator notch on the housing. Then remove the knurled plng at the lower end of the distributor housing and loosen the timing adjustment screw at the hottom of the shaft. Turn the distributor shaft until the breaker contacts begin to open with the rotor under No. 1 segment in the distributor head. Tighten the adjustment screw and replace the plug.

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

Spark Plugs.—Diameter, ⅞ inch. Spark gaps are .030 inch.

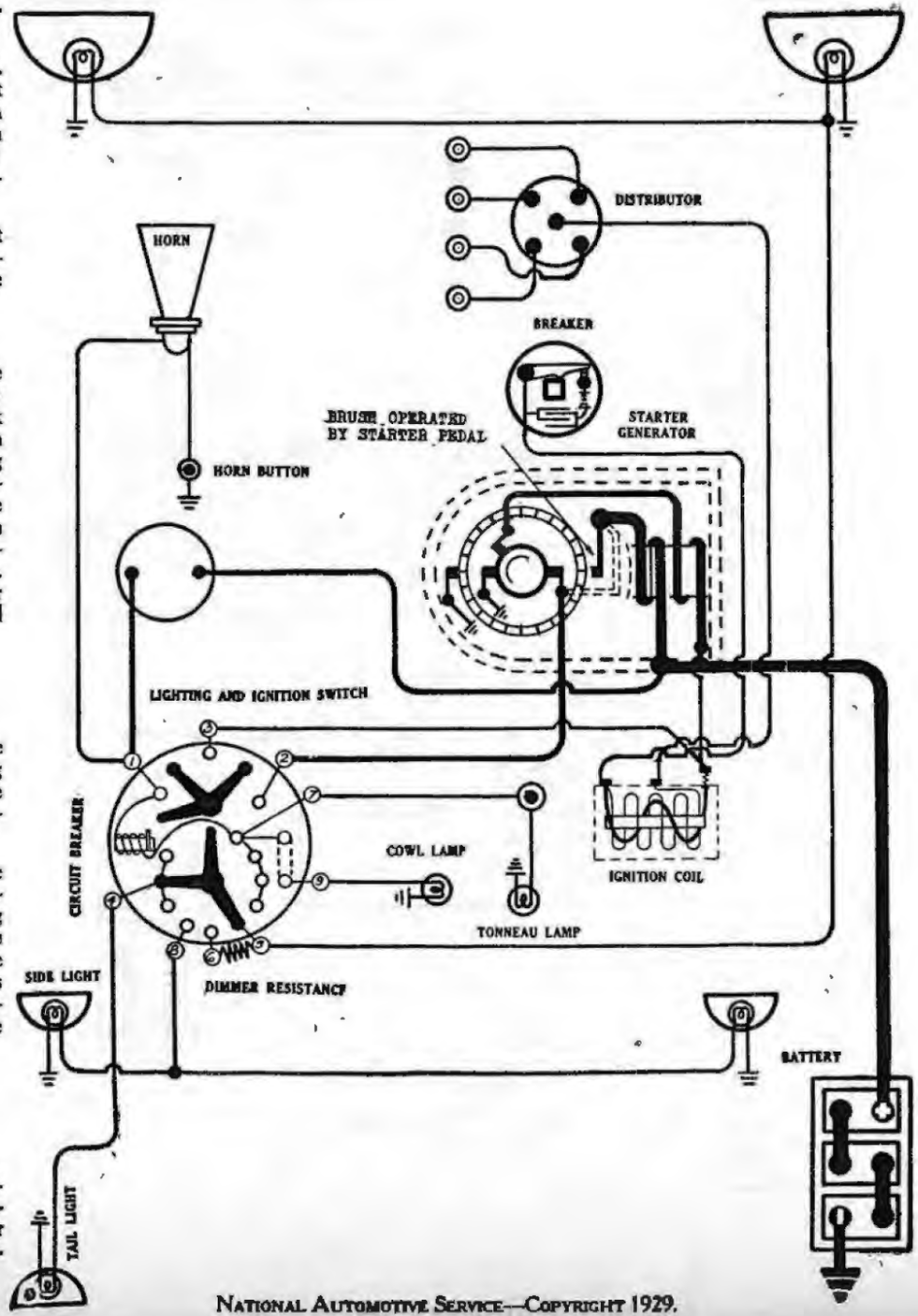
VALVE TIMING:—The camshaft is driven by a spiral gear from the crankshaft at the forward end of the engine. The gears are marked and in setting the valve timing the gears should be meshed so that the punch mark on the two gears should come together when lined up with a straightedge laid across the two shaft centers. Tappet clearance should be .010 inch (hot).

STARTER-GENERATOR:—Model 251. Starter and generator are built as a single unit bnt are electrically separate. When the ignition switch is turned on the generator circuit is completed and the generator runs as a motor to assist in meshing the starter drive gears. Depressing the starting pedal meshes the starter drive gears, opens the generator circuit and closes the starting circnit by allowing the upper starter brush to come in contact with the commutator. When the pedal is released a spring reverses these operations. The direction of rotatiou is counterclockwise, viewed from the commutator end. Brush spring tension should be 4½-5 pounds on the upper brush and 2¼-2¾ pounds on the lower brush.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	6	70
6 "	Lock	3	450

GENERATOR.—Generator current regulation is by the third brush system. **The maximum charging rate should not exceed 18 amperes, hot adjustment, under any circumstances.** To adjust the charging rate loosen clamp screw on third brush carrier (to right of bearing, looking at commutator end). Move carrier to left to in-



BUICK

MODEL 23-4 (1923), 24-4 (1924)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

crease charging rate, and to the right to decrease the charging rate. Tighten the clamp screw after position adjustment.

Test Data

Amperes	R.P.M.	M.P.H.
8-9	825	—
0	600	—
Max. 14-16	1500	20
12-15	1800	—

Motoring freely generator draws 5-6 amperes at 6 volts. Shunt field current is 1.5-2 amperes at 6 volts. Brush spring tension is 1½-1¾ pounds.

Mounting:—Starter-generator is mounted at the right of the engine. It is driven through an overrunning clutch at the forward end and by an extension of the water pump shaft when operating as a generator and drives through an overrunning clutch and a set of reduction gears to the flywheel when operating as a starter. To remove starter-generator, first disconnect all ignition wiring or remove distributor. Then disconnect starter and generator cables. Remove pin in pump coupling and drive coupling forward on the water pump drive shaft. Remove large mounting screws at bottom of unit. Pull starter-generator forward to clear starter drive pinion and lift from place.

Oiling.—Put 4 or 5 drops of light engine oil in oiler provided for lubricating the rear armature shaft bearing every two weeks. Remove the front end cover over the commutator and put 3 or 4 drops of light engine oil in the exposed oil hole. Put 4 or 5 drops of light engine oil in the upper distributor shaft bearing oiler. If the car is driven more than 500 miles in two weeks, these attentions must be given every 500 miles. Refill starting gear grease cup with soft cup grease and turn down two turns every month. Every six months, remove the plate on the side of the distributor housing and refill with soft cup grease to a level just above the manual advance ring.

RELAY.—There is no relay. The circuit between the generator and the battery is controlled by the ignition switch. The overrunning clutch at the driving end allows generator to operate as a motor when battery's pressure is above that of generator. If engine is killed when stopping, the noise made by the clutch serves to attract the operator's attention to open the ignition switch. The opening and closing of the generator-battery circuit by the operator takes the place of the relay.

LIGHTING:—Delco Combination Switch, Models 1234, 1249. Switch is mounted on the instrument panel. Headlights are 6-8 volt, 21 cp. Dash and tail lights are each 6-8 volt, 2 cp. Dome light is 6-8 volt, 5 cp. Headlights are dimmed by a resistance on the switch.

CIRCUIT BREAKER:—A vibrating circuit breaker mounted on the back of the switch is connected in the lighting circuits. It begins to operate when the current reaches 25-30 amperes and continues limiting the current to 10-15 amperes.

BUICK

MODEL 23-6 (1923), 24-6 (1924)
MASTER SIX (1925)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

BATTERY.—Exide, Type 3-XC-15-1, 6 volt, 100 ampere-hour. The negative (—) terminal is grounded. The starting capacity is 114 amperes for 20 minutes. The lighting capacity is 5 amperes for 20 hours.

IGNITION.—Ignition Coil No. 2176. Distributor is integral with motor-generator. Breaker contacts separate .020 to .025 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface with a fine, flat jeweler's file or on a medium hard oilstone. The tension of the breaker arm spring is 13-16 ounces. The automatic advance starts at 580 R.P.M. and reaches a maximum of 16-20° at 1333 R.P.M. The total automatic and manual advance is 51°

Mounting:—Distributor is mounted on the forward end of the starter-generator at the right of the engine. To remove distributor, disconnect primary lead and manual advance rod and remove distributor head with cables intact. Then take out hold-down screw in advance lever and lift distributor from place.

Oiling.—Apply a small amount of grease on the distributor track two or three times during the first 2000 miles. After this it will be necessary to keep the glazed surface wiped with a clean cloth. Apply a small amount of vaseline on the breaker cam each 1000 miles. See also starter-generator oiling.

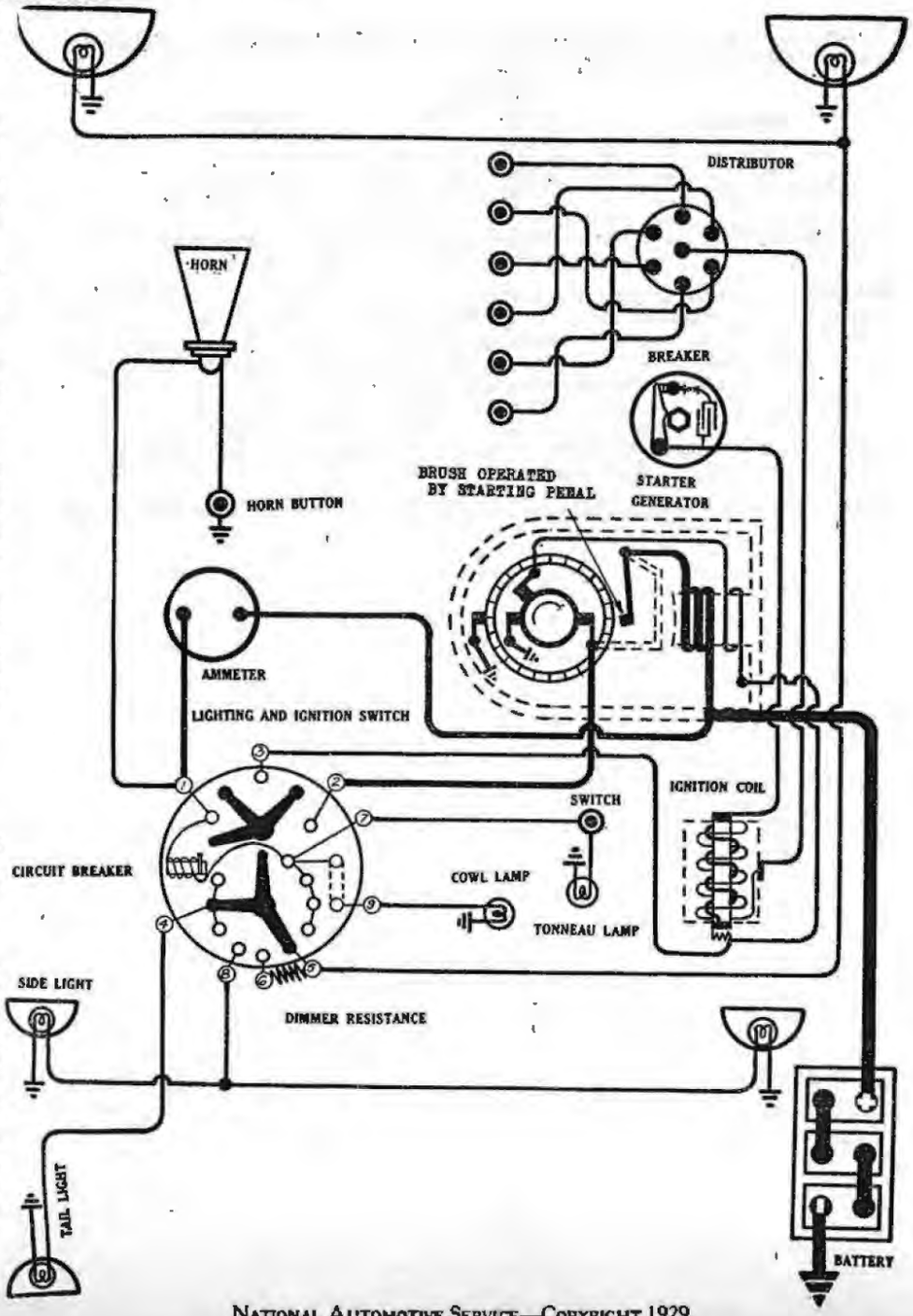
Timing:—Breaker contacts begin to open when the piston entering power stroke reaches a position 7 degrees past top dead center (measured on the flywheel) with the mannal spark control in the fully retarded position. To set timing, crank engine over until piston No. 1 enters compression stroke (the up stroke with both valves closed). Fully retard the manual spark control and remove the cover over the timing inspection hole in the flywheel housing at the left of the engine. Turn engine over until the seven degree mark '7 Degree' on the flywheel (which is about one inch past the top dead center mark '1/6') is directly opposite the indicator line on the housing. Then remove the knurled plug at the lower end of the distributor shaft housing and loosen the timing adjustment screw at the bottom of of the shaft. Rotate the distributor sbaft until the contacts begin to open with the rotor directly under No. 1 segment in the distributor head. Tighten the adjustment screw and replace the plug.

Firing Order.—The firing order is 1.4.2.6.3.5.

Spark Plugs.—Diameter ⅞ inch. Spark gaps are .030 inch.

VALVE TIMING:—The camshaft is driven by a spiral gear from the crankshaft at the forward end of the engine. The gears are marked by a punch mark and should be meshed so that the two marks come together when the gears are turned so that a line drawn between the two shaft centers passes through the marks. Tappet clearance should be .010 inch (hot).

STARTER-GENERATOR:—Model 249 (1923), 268 (1924-25). Starter and generator are combined in a single unit but are electrically separate. The unit is driven through an overrunning clutch at the forward end from an extension of the water pump shaft when operating as a generator and drives through another overrunning clutch and reduction gears to the flywheel when operating as a starter. Turning on the ignition completes the generator circuit, allowing the generator to motor slowly which assists in meshing the starter gears. Depressing the starting pedal meshes the gears, opens the generating circuit and allows the upper starter brush to come in contact with the commntator, completing the starting circuit. When the pedal is released a spring reverses these operations. The direction of rotation is counter-clockwise, viewed from the commutator end. Starter brnsh spring pressure should be 4½-5 pounds on the upper brush and 2¼-2¾ pounds on the lower brush.



BUICK

MODEL 23-6 (1923), 24-6 (1924)
MASTER SIX (1925)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	6	75
8 "	Lock	3.1	—

GENERATOR:—Generator current regulation is by third brush system. The charging rate is adjusted by shifting the third brush.

Generator Test Data

Amperes	R.P.M.	M.P.H.
0	600	7- 8
8-9	825	____
Max. 14-16	1600	20-25
12-15	1800	____

To adjust charging rate, remove end cover and loosen the third brush adjusting screw one or two turns. Then shift the third brush in the direction of armature rotation to increase the charging rate and in the opposite direction to decrease it. After making the adjustment tighten the adjusting screw. Generator motoring freely with overrunning clutch takes a current of 5.5 amperes at 6 volts. Field current is 2.5 amperes. The pressure of the generator brushes on the commutator should be 1½ to 1¾ pounds each.

Mounting:—Starter-generator is mounted at the right of the engine. To remove starter-generator, first disconnect all ignition wiring or remove distributor. Then disconnect all starter and generator cables. Remove motor clutch cover plate. Move generator end plate forward on pump shaft. Take out three mounting screws at bottom of unit. Lift pinion end of unit, slide forward and lift from place.

Oiling.—Put 4 or 5 drops of light engine oil in oiler provided for lubricating the rear armature shaft bearing every two weeks. Remove the front end cover over the commutators and put 3 or 4 drops of light engine oil in the exposed oil hole. Put 4 or 5 drops of light engine oil in the upper distributor shaft bearing oiler. If the car is driven more 500 miles in two weeks, these attentions must be given every 500 miles. Refill the starting gear grease cup with soft cup grease and turn down two turns every month. Every six months, remove the plate on the side of the distributor housing and refill with soft cup grease to a level just above the manual advance ring.

RELAY.—There is no relay. The circuit between the generator and the battery is controlled by the ignition switch. The overrunning clutch at the driving end allows generator to operate as a motor when battery's pressure is above that of generator. If engine is killed when stopping, the noise made by the clutch serves to attract the operator's attention to open the ignition switch.

LIGHTING:—Delco Combination Switch, Models 1232, 1233, 1252, 1253. Switch is mounted on the instrument panel. Headlights are 6-8 volt, 21 cp. S.C. Dash, tail and side lights are each 6-8 volt, 2 cp. Dome light is 6-8 volt, 5 cp. Headlights are dimmed by a resistance on the switch.

CIRCUIT BREAKER:—A vibrating circuit breaker is mounted on the back of the switch. It is connected in the lighting circuits. Circuit breaker begins to vibrate when the current reaches 25-30 amperes and continues limiting the current to 10-15 amperes.

BUICK

STANDARD SIX (1925)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM.
DELCO IGNITION.

BATTERY:—Exide, Type 3-XC-13-1, 6 volt, 90 ampere hour. The starting capacity is 98 amperes for 20 minutes. The lighting capacity is 5 amperes for 16.8 hours. The negative (—) terminal is grounded.

IGNITION:—Coil Model No. 2176. The distributor is mounted on the motor-generator. Breaker contacts separate .020 to .025 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface with a fine, flat jeweler's file or on a medium hard oilstone. The tension of the contact arm spring should be 13-16 ounces. The automatic advance starts at 580 R.P.M. and reaches a maximum of 14-18° at 1800 R. P. M. The total automatic and manual advance is 41°.

Mounting:—Distributor is mounted at rear of motor-generator on right of engine. To remove distributor remove head with cables attached. Then disconnect primary lead and manual advance rod. Remove advance lever hold-down screw and lift distributor from place.

Oiling:—Put a small bit of medium heavy cup grease on the face of the breaker cam and wipe out the distributor head with a small amount of grease, removing all excess and polishing the rotor track with a soft clean cloth, every 1000 miles. See also motor-generator oiling.

Timing:—Breaker contacts begin to separate when Piston No. 1 entering power stroke reaches a position at which the 7 degree mark on the flywheel is opposite the mark on the flywheel housing. The 7 degree mark is approximately one inch past the dead center mark 1-6 on the flywheel. To set ignition timing, crank engine over until piston No. 1 enters compression stroke. This is the upstroke with both valves closed. Fully retard spark lever and continue to crank engine over until the 7 degree mark on the flywheel is opposite the indicator on the flywheel case. Then loosen the knurled plug at the lower end of the distributor shaft and loosen the timing adjustment screw visible after the plug is removed. Then rotate the cam until the contacts begin to separate. Tighten the adjustment screw and replace the plug. Make certain that the segment opposite the rotor is connected to the spark plug in cylinder No. 1.

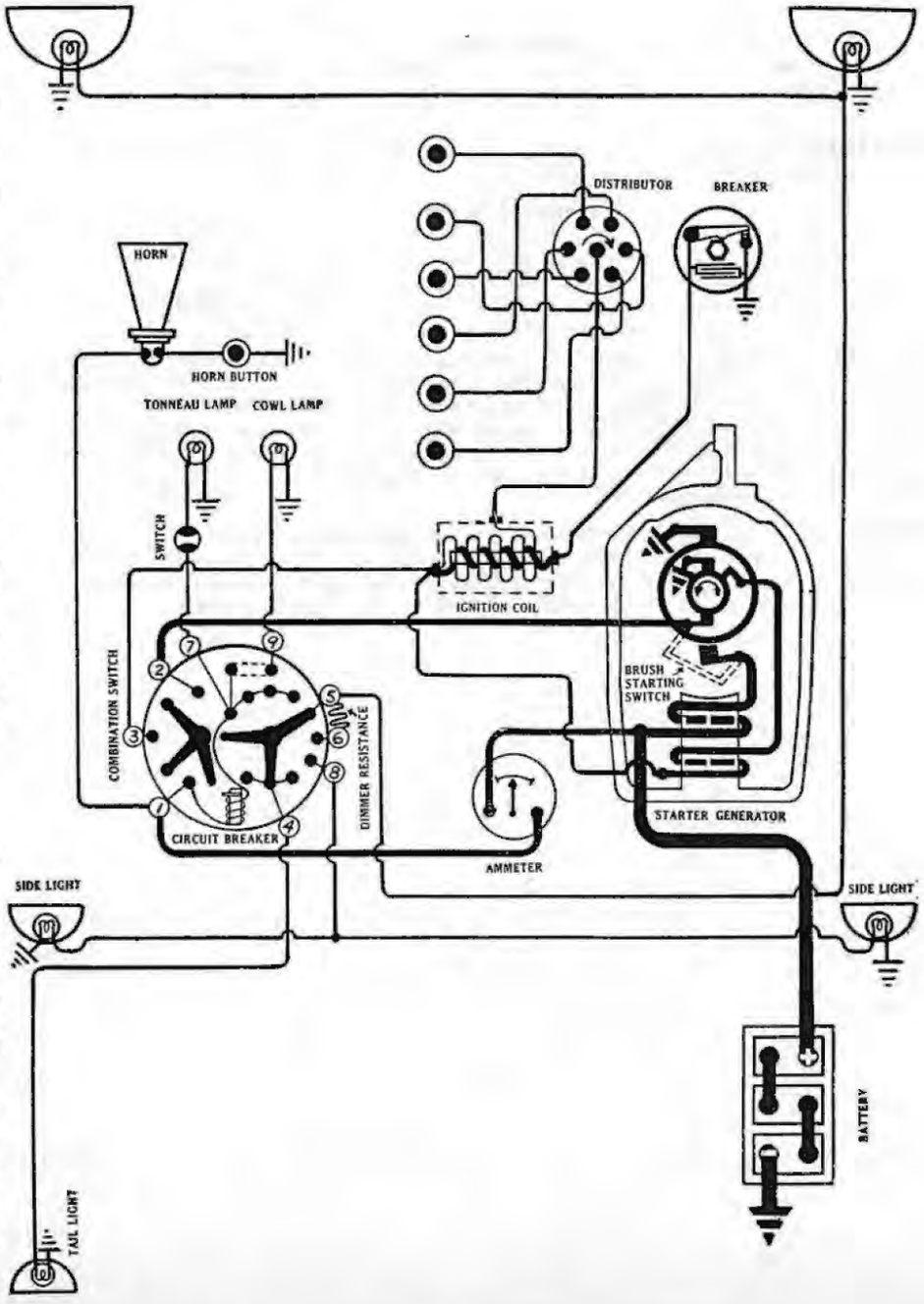
Firing Order:—The firing order is 1-4-2-6-3-5.

Spark Plugs:—Spark plug diameters are 7/8 inch. Gaps are .020-.025 inch.

VALVE TIMING:—Specifications. Head diameter, 1 7/16 inches. Stem diameter, 3/8 inch. Stem length, 3 1/8 inches. Spring pressure, 90 pounds (valve open). Tappet clearance, .006-.008 inch (hot).

Valve Timing. Inlet valves open 50 degrees before top dead center and close 68 degrees 24 minutes after lower dead center. Exhaust valves open 76 degrees 50 minutes before lower dead center and close 32 degrees 10 minutes after top dead center. The camshaft is driven by spiral gear from the crankshaft at the forward end of the crankshaft. In setting the valve timing, mesh the gears so that the punch marks on the camshaft gear and crankshaft gear coincide when both marks line up with a straightedge laid across the shaft centers.

STARTER:—Motor-generator Model 283. The starter is connected to the engine through a set of reduction gears and a mechanically operated pinion shift. Closing the ignition switch completes the generator circuit and allows the machine to motor, assisting the meshing of the pinion. An over-running clutch permits this rotation When the starter pedal is depressed, it opens the generator circuit, meshes the starter pinion and completes the motor circuit allowing the machine to crank the engine. When the pedal is released, a spring reverses these operations. A second over-running clutch prevents the engine driving the motor-generator through the starter gears. The direction of rotation is counter-clockwise, looking at the commutator end.



BUICK

STANDARD SIX (1925)
DELCO GENERATING, STARTING AND LIGHTING SYSTEM
DELCO IGNITION

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Running Free	6	70
6 " "	Lock.	3	—

The brush pressure should be 5-6 pounds on the upper starter brush and 2¼ to 2¾ pounds on thte lower brush.

GENERATOR:—Generator current regulation is by the third brush system. The average output required is 15 amperes. To adjust the charging rate remove the generator end cover and loosen the third brush plate adjusting screw one or two turns. Then shift the third brush in the direction of rotation (counter-clockwise) to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the adjusting screw after making the adjustment.

Generator Data.

Amperes.	R.P.M.
6.5	825
20.	1500

The pressure of the generator brushes on the commutator should be 1¾ pounds each.

Mounting:—Motor-generator is mounted by special bracket at right of engine. To remove motor-generator disconnect manual advance rod and remove distributor head. Remove cover, disconnect all leads and tape to prevent short circuits. Remove pump shaft coupling pin and drive coupling forward. Remove hold-down screws in mounting bracket, pull unit forward to free starter pinion and lift unit from place.

Oiling:—Put 8 or 10 drops of light engine oil in the bearing oiler at each end of the generator every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks. Give the Zerk connections on the distributor housing and the starter gear housing a charge of lubricant every 500 miles. Once each year dissassemble, clean and repack the starter aud generator clutches with vaseline.

RELAY:—No relay is used. The circuit between the battery and generator is controlled by the ignition switch. The over-running clutch allows the generator to operate as a motor when the voltage of the battery is higher than that of the generator. If the ignition switch is left in the 'on' position with the motor stopped, the noise made by the over-runniug clutch warns the operator to open the switch.

LIGHTING:—Combination switch No. 1234. Head lamps are each 6-8 volt, 21 cp. Dash dome, tonneau and tail lamps are each 6-8 volt, 3 cp. Side lamps are also 6-8 volt, 3 cp.

CIRCUIT BREAKER:—A vibrating circuit breaker mounted on the back of the switch takes the place of fuses. A current of 25-30 amperes causes this device to operate. While vibrating the current is 10-15 amperes.

BUICK

STANDARD SIX AND MASTER SIX (1926-27)
DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM
DELCO-REMY IGNITION

BATTERY.—Exide, 3-XC-13-1, 6 volt. Starting capacity is 98 amperes for 20 minutes. Lighting capacity is 5 amperes for 16.8 hours. The negative (—) terminal is grounded **Exide, Type 3-XC-15-1,** 6 volt. Starting capacity is 114 amperes for 20 minutes. Lighting capacity is 5 amperes for 20 hours. The negative (—) terminal is grounded. Battery is located on right side under floor boards.

IGNITION.—Coil Model 2188. Distributor Model 17046. Breaker contacts separate .015-.0225 inch. They are made of tungsten. When the condition of the contacts affects the ignition, remove and resurface on a medium hard oilstone or with a fine, flat jeweler's file. The distributor has both manual and automatic advance. Automatic advance begins at 400 R.P.M. of engine and reaches a maximum of 18° (engine) at 2200 R.P.M. Manual advance is 24° (engine). The breaker arm spring tension is 16-20 ounces.

Mounting.—Distributor is mounted on the rear of the generator at the right of the engine. To remove, disconnect manual advance rod and remove manual advance stop screw. Then lift distributor from its mounting.

Oiling.—A Zerk oiler is located on the side of the distributor shaft housing. Give this a charge from the pressure gun every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

Timing.—Breaker contacts begin to separate when piston No. 1 on compression stroke reaches a position at which the 17° mark on the flywheel is opposite the indicator on the flywheel case. This is 17° before top dead center. The manual advance lever must be in the fully advanced position. To set timing remove the plug at the bottom of the distributor shaft housing and loosen the timing adjustment screw. Then rotate the breaker cam until the contacts begin to separate. Tighten the screw after making the adjustment.

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

Spark Plugs.—Spark plug diameters are 7/8 inch. Gaps are .020 inch.

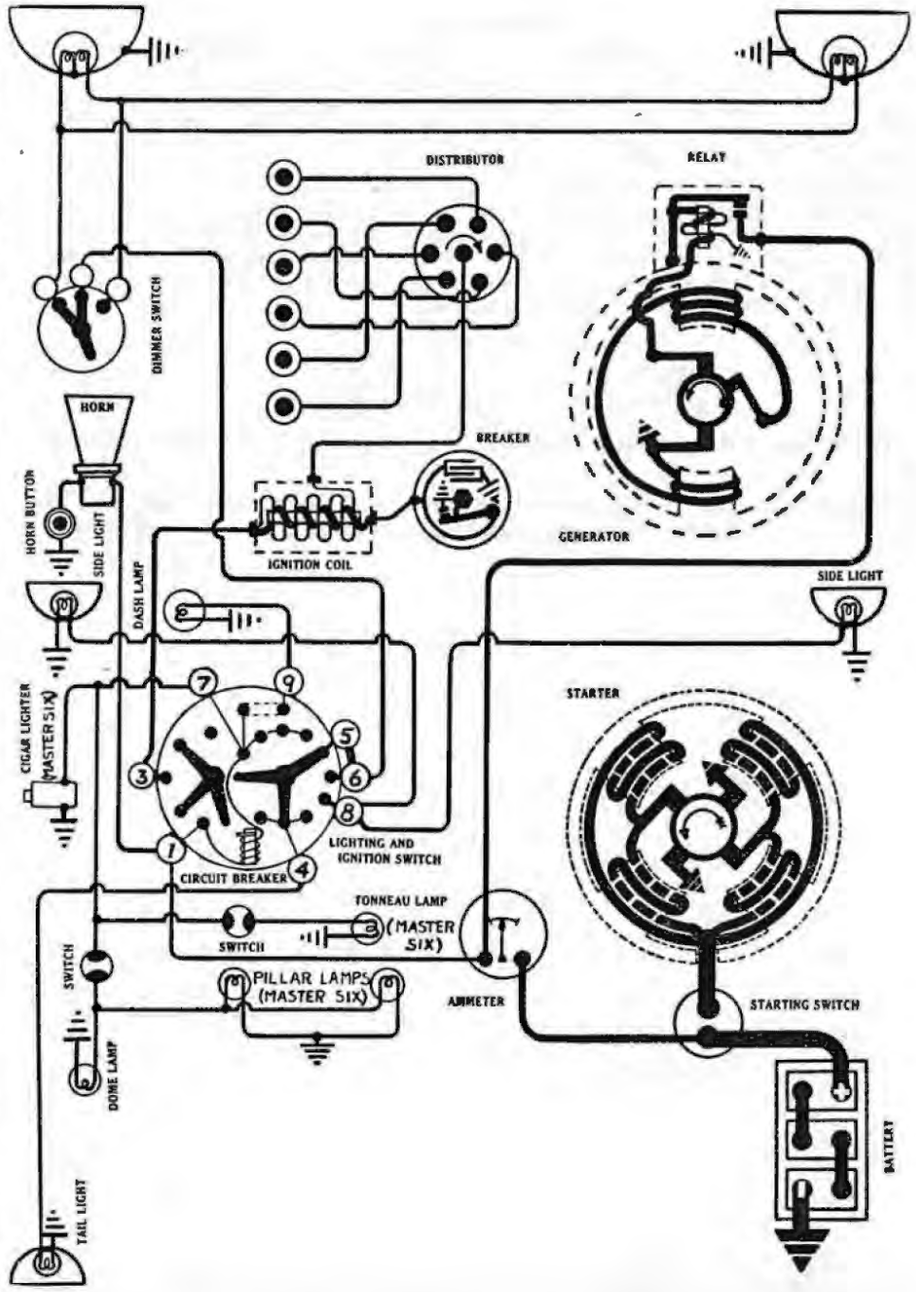
VALVE TIMING:—INLET VALVES. Head diameter, 1 7/8 inches; stem diameter, 3/8 inch; stem length, 6 1/8 inches; tappet clearance, .008 inch (hot); valve lift, 21/64 inch; intake opens at 25° 50 minutes before top dead center and closes 81° 23 minutes past lower dead center.

EXHAUST VALVES.—Head diameter, 1 5/8 inches; stem diameter, 3/8 inch; stem length, 6 1/8 inches; tappet clearance, .008 inch (hot); spring pressure, 56 to 68 pounds (valve closed); valve lift, 5/16 inch; exhaust opens at 101° 36 minutes before lower dead center and closes 45° past top dead center. Stem guides are removable. Oversize valve stems are made.

NOTE.—On 114 1/2 inch wheel base model, head diameter is 1 7/16 inches; and stem length is 5 5/8 inches.

To Set Valve Timing. Camshaft is gear driven at the forward end of the engine. To set valve timing, mesh the gears so that the punch mark on the gear is meshed with the space on the other gear, which is also marked with a punch mark.

STARTER.—Model 316. Starter is connected to the engine through a mechanically operated pinion shift incorporated in the starting switch and an overrunning clutch which prevents the engine driving the starter. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush tension should be 2 1/4-2 1/2 pounds each.



BUICK

STANDARD AND MASTER SIX (1926-27)
DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM
DELCO-REMY IGNITION

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	4000	6.0	60
1.5 "	1800	4.9	150
2.5 "	1400	4.7	200
5 "	825	4	300
11.5 "	Lock	2.75	500

Mounting.—Starter is mounted at right of engine by flange mounting. To remove starter, disconnect pedal return spring and pedal rod and remove three flange mounting screws. Then slide starter forward and lift from place.

Oiling.—Starter bearings are self oiling. They require no attention.

GENERATOR.—Model 317. The direction of rotation is counter-clockwise, looking at the commutator end. Current regulation is by the third brush system. To adjust the outpnt, remove the generator cover band and shift the third brush by means of the handle on the third brush mounting plate. Moving the third brnsh in the direction of armature rotation increases the charging rate and in the opposite direction decreases the charging rate. The mounting plate is held in any desired position by friction clamp washers. The maximum charging rate of 18 amperes is reached at 1450 R.P.M. of the generator or 25 M.P.H.

Generator Data

Cold Test (75° F.)			Hot Test (170° F.)		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
4	6.8	700			
7	7.1	750			
10	7.4	940	13	7.6	2000
18-20	8.3	1450			
8		3000			

Motoring freely at 300 R.P.M. generator draws 4.5-5 amperes at 6 volts. Shunt field current is 3 amperes at 6 volts. Generator brush tension should be 1¼-1¾ pounds each.

Mounting.—Generator is mounted at right of engine. To remove generator, drain radiator, disconnect pump coupling and remove water pump. Then remove three flange mounting screws and slide generator to rear.

Oiling.—Put 8 or 10 drops of light engine oil in the oiler on the commutator end of the generator every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks. The drive end is oiled by splash from the timing gear case.

RELAY.—Model 5766. Relay is mounted on the generator. Relay contacts close at 600 R.P.M. of the generator at 8 M.P.H. with a generator voltage of 7.5 volts and open at 580 R.P.M. or 6 M.P.H. with a discharge current of 0-2 amperes. Charging current at closing of contacts is 1-2 amperes. Relay contacts separate .012 inch. Air gap between relay armature and coil core is .009-.010 inch, contacts closed.

LIGHTING.—Head lamps are each 6-8 volt, 21 cp. They are double filament, the second filament being used for dimming and controlled by a dimmer switch on the steering column. Dash and side lamps are 6-8 volt, 3 cp. S.C. Tail lamp is 6-8 volt, 3 cp. D.C.

Switches.—Dimmer switch is Model 1290. Combination switch on Standard Six is Model 1288. Combination switch on the Master Six is Model 1289.

CIRCUIT BREAKER.—A vibrating circuit breaker is mounted on the back of the switch. A current of 25-30 amperes causes this device to operate. While vibrating the current is 10-15 amperes.

BUICK

SERIES 115 AND SERIES 120-128 (Late 1927)
DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—Exide (Series 115). Type 3-XC-13-1G, 6 volt, 80 ampere hour. Starting capacity is 98 amperes for 20 minutes. Lighting capacity is 5 amperes for 16.6 hours. **(Series 120-128) Type 3-XC-15-1G,** 6 volt, 100 ampere hour. Starting capacity is 114 amperes for 20 minutes. Lighting capacity is 5 amperes for 20 hours. The negative (—) terminal is grounded. Battery is mounted under front floor boards on right hand frame member.

IGNITION:—Coil Model 2188. Distributor Model No. 4019. Breaker contacts separate .015-.0225 inch. They are made of tungsten. Resurface contacts with a fine flat contact file or on a medium hard oilstone. Distributor is semi-automatic. Manual advance is 24° (flywheel). Automatic advance begins at 400 R.P.M. and reaches a maximum of 19° (flywheel) at 2200 R.P.M. (crankshaft). Breaker arm spring tension is 16-20 ounces.

Mounting:—Distributor is mounted on the rear of the generator. To remove distributor, disconnect primary lead and manual advance rod. Then remove distributor head with high tension cables intact. Remove manual advance stop screw and lift distributor from place.

Oiling:—Give the Zerk oiler on the side of the distributor housing one charge from the pressnre gnn every two weeks or each 500 miles. Put a small amount of vaseline on the face of the breaker cam every month.

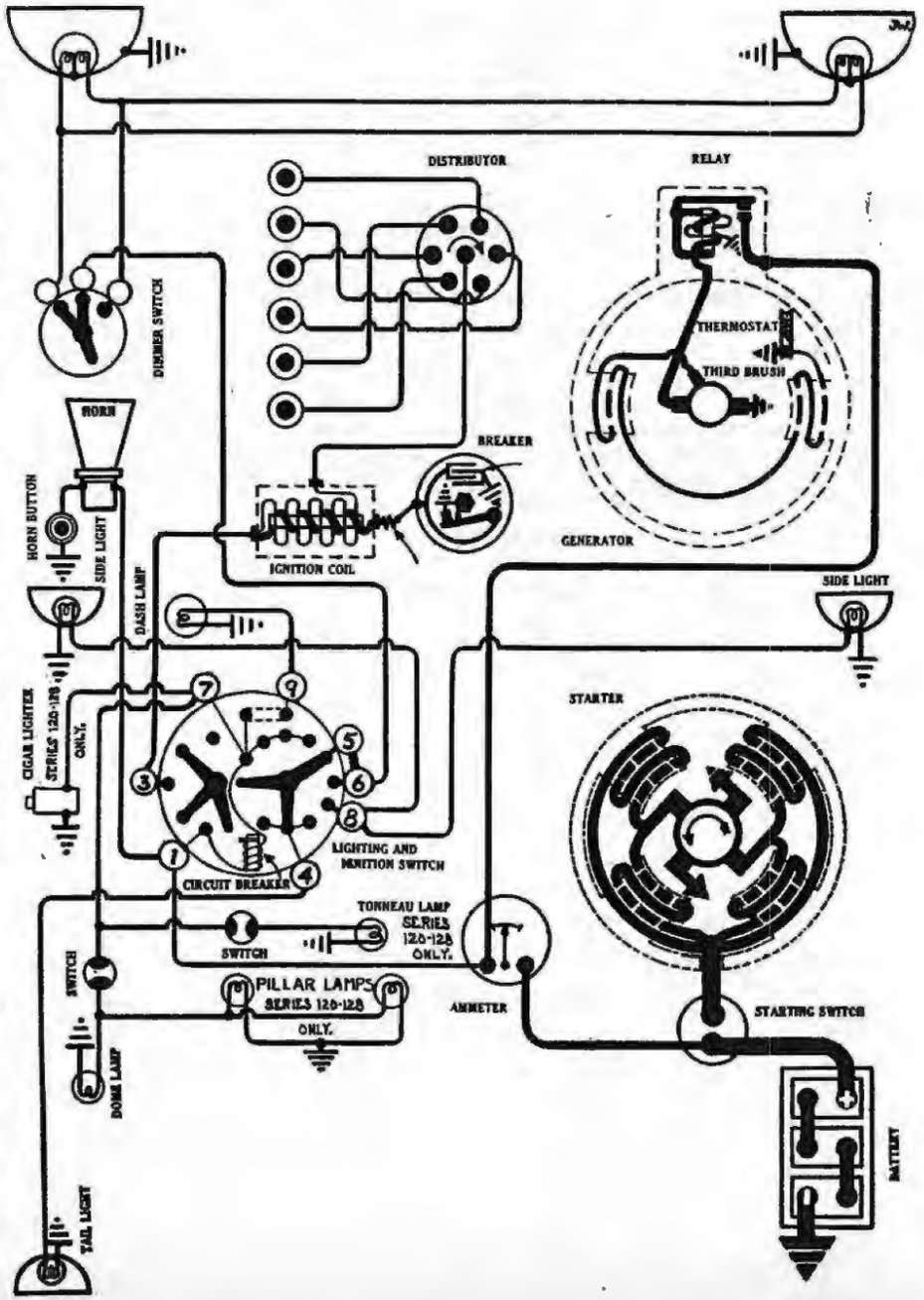
Timing:—(Series 115-120-128). Breaker contacts begin to separate when the piston entering power stroke reaches a position 17° before top dead center with the spark control lever in the fully advanced position. To set timing, crank engine until piston No. 1 enters compression stroke (the upstroke with both valves closed). Fully advance the spark control lever and continue to crank engine until the 17° mark on the flywheel is opposite the indicator in the flywheel case. If breaker contacts do not separate at this point, remove the plug at the bottom of the distributor shaft housing and loosen the timing adjustment screw. Then rotate the breaker cam until the contacts begin to separate. Tighten the screw and replace the plug. There is also a 7° mark on the flywheel so that engine can be timed with spark retarded. With manual spark control lever fully retarded the breaker contacts begin to separate when the 7° mark is opposite the indicator on the inspection hole edge. Timing may be set by either mark but it must be remembered that the spark control lever must be fully advanced when contacts separate at the 17° mark and fully retarded when contacts separate at the 7° mark. This will give an identical setting.

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

Spark Plugs:—Spark plugs are 7/8-18 S.A.E. Gaps are .025 inch.

VALVE TIMING (Series 115):—INLET VALVES. Head diameter, 1 7/16 inches; stem diameter, 3/8 inch; valve lift, 21/64 inch; spring pressure, 47-53 pounds closed and 96-105 pounds open; tappet clearance, .008 inch (hot). Inlet valves open 25° 50′ before top dead center and close 81° 10′ after lower dead center.
EXHAUST VALVES:—Head diameter, 1 7/16 inches; stem diameter, 3/8 inch; valve lift, 5/16 inch; spring pressure, 47-53 pounds closed and 96-105 pounds open; tappet clearance, .008 inch (hot). Exhaust valves open 101° 50′ before lower dead center and close 45° 50′ after top dead center. Valve stem guides are removable. Oversize valve stems are not made.

(Series 120-128). INLET VALVES:—Head diameter, 1 7/8 inches; stem diameter, 3/8 inch; valve lift, 21/64 inch; spring pressure, 41-55 pounds closed and 118-134 pounds open; tappet clearance, .008 inch (hot). Inlet valves open 25° 50′ before top dead center and close 81° 10′ after lower dead center.
EXHAUST VALVES:—Head diameter, 1 5/8 inches; stem diameter, 3/8 inch;



BUICK

SERIES 115 AND SERIES 120-128 (Late 1927)
DELCO-REMY GENERATING, STARTING AND LIGHTING SYSTEM
DELCO-REMY IGNITION

valve lift, 5/16 inch; spring pressure, 41-55 pounds closed and 118-134 pounds open; tappet clearance, .008 inch (hot). Exhaust valves open 101° 50′ before lower dead center and close 45° after top dead center.

To Set Valve Timing. Camshaft is gear driven from the crankshaft at the forward end of the engine. Mesh the gears so that the two punch marks on the gears are together. One tooth on one gear is marked and the space between the teeth on the other gear is similarly marked.

STARTER:—Model 316. Starter is connected to the engine through a manual pinion shift incorporating a roller clutch and connected to the starting switch. The direction of rotation is counter-clockwise, looking at commutator end. Starter brush tension is 2¼-2½ pounds. Starter cranks the engine drawing 175-200 amperes at 5 volts. Starter switch is Model 1952.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	4000	6.0	60
2 "	1750	5.5	175
5 "	775	4.1	300
11.5 "	Lock	2.75	500

Mounting:—Starter is flange mounted at right of engine on forward side of flywheel case. To remove starter, disconnect pedal return spring, pedal rod and starter cable. Then remove three flange mounting cap screws and slide starter forward from place.

Oiling:—Starter bearings are oilless. They require no attention.

GENERATOR:—Model 940-D. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by third brush shunt field combined with a thermostat. Thermostat contacts open at 160°F. cutting a resistance in the shunt field circuit and reducing the output approximately 40%. To adjust generator output, loosen the small round headed screw on the commutator end plate and shift the third brush. Shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. Tighten the screw after making the adjustment. The maximum charging rate is 18-20 amperes (cold) reached at 1450 R.P.M. or approximately 25 M.P.H.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
18-20	8.5	1450	9-12	7.5	2000

Generator motoring draws 5.5-6 amperes at 6 volts. Shunt field current is 5 amperes at 6 volts directly across field terminals. Brush spring tension is 22-26 ounces.

Mounting:—Generator is flange mounted at right of engine. To remove generator, disconnect generator lead and ignition leads or remove distributor. Then drain radiator, disconnect pump coupling, remove pump monnting studs and remove water pump. Then remove three flange mounting cap screws and lift generator from place.

Oiling:—Put 8 or 10 drops of light engine oil in the commutator end oiler every two weeks or each 500 miles. The drive end bearing is oiled by splash from the timing gear case.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay closes when the voltage of the generator reaches 7-7.5 volts and opens with a discharge current of 0-2.5 amperes. Contacts separate .015-.025 inch. Air gap between relay armature and coil core is .014-.020 inch, contacts closed.

LIGHTING:—Delco Switch Model 1288 (Series 115) 1289 (Series 120) and 1312 (Series 128). Dimmer Switch Model 1290. Head lamps are 6-8 volt, 21 cp. double filament using second 21 cp. filament for dimming. This is controlled by dimmer switch monnted on the steering column. Dash and side lamps are 6-8 volt, 3 cp. S.C. Tail lamp is 6-8 volt, 3 cp. S.C.

CIRCUIT BREAKER:—Model 5773. Circuit breaker is mounted on the back of the switch. It cuts in at 25-30 amperes limiting the current to 10-15 amperes.

BUICK

MODEL 114½ (1928) SERIAL NUMBERS 1,888,911 UP
MODEL 120 (1928) SERIAL NUMBERS 1,911,026 UP
MODEL 128 (1928) SERIAL NUMBERS 1,921.026 UP
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—(Model 114½) Exide, Type 3-XC-13-IG, 6 volt, 13 plates. Starting capacity (20 minute rate) is 98 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 16.6 hours.

(Models 120, 128) Exide, Type 3-XC-15-IG, 6 volt, 15 plates. Starting capacity (20 minute rate) is 114 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 20 hours. The negative (—) terminal is grounded. Battery is mounted under the front floor boards on the right frame member.

IGNITION:—Coil Model 2188. Coil is mounted on the generator at the right of engine. Ignition current is 4 amperes at 6 volts with engine stopped and 2 amperes at 6 volts with engine running. A ballast resistor is connected in series with the primary at one terminal of the coil.

Distributor Model 640-A. Breaker contacts separate .018-.024 inch with breaker arm on lobe of cam. Set contact opening by loosening lock screw on stationary contact mounting plate and turning eccentric adjusting screw. Resurface contacts with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 17-21 ounces. Distributor is semi-automatic. Maximum manual advance is 24 degrees (engine). Automatic advance begins at 400 R.P.M. of engine. Maximum automatic advance is 19 degrees reached at 2400 R.P.M.

Mounting:—Distributor is mounted on rear of generator at right of engine. To remove distributor, disconnect primary lead and remove distributor head with cables intact. Disconnect manual advance rod and remove stop screw in advance arm. Lift distributor from place.

Oiling:—Distributor shaft is oiled from the gear case. Oil gears with Zerk gun through connection on side of gear compartment every 500 miles. Remove the distributor head and rotor and put 4 or 5 drops of light oil in the wick oiler in the center of the shaft and put a small amount of vaseline on the face of the breaker cam every 2000 miles.

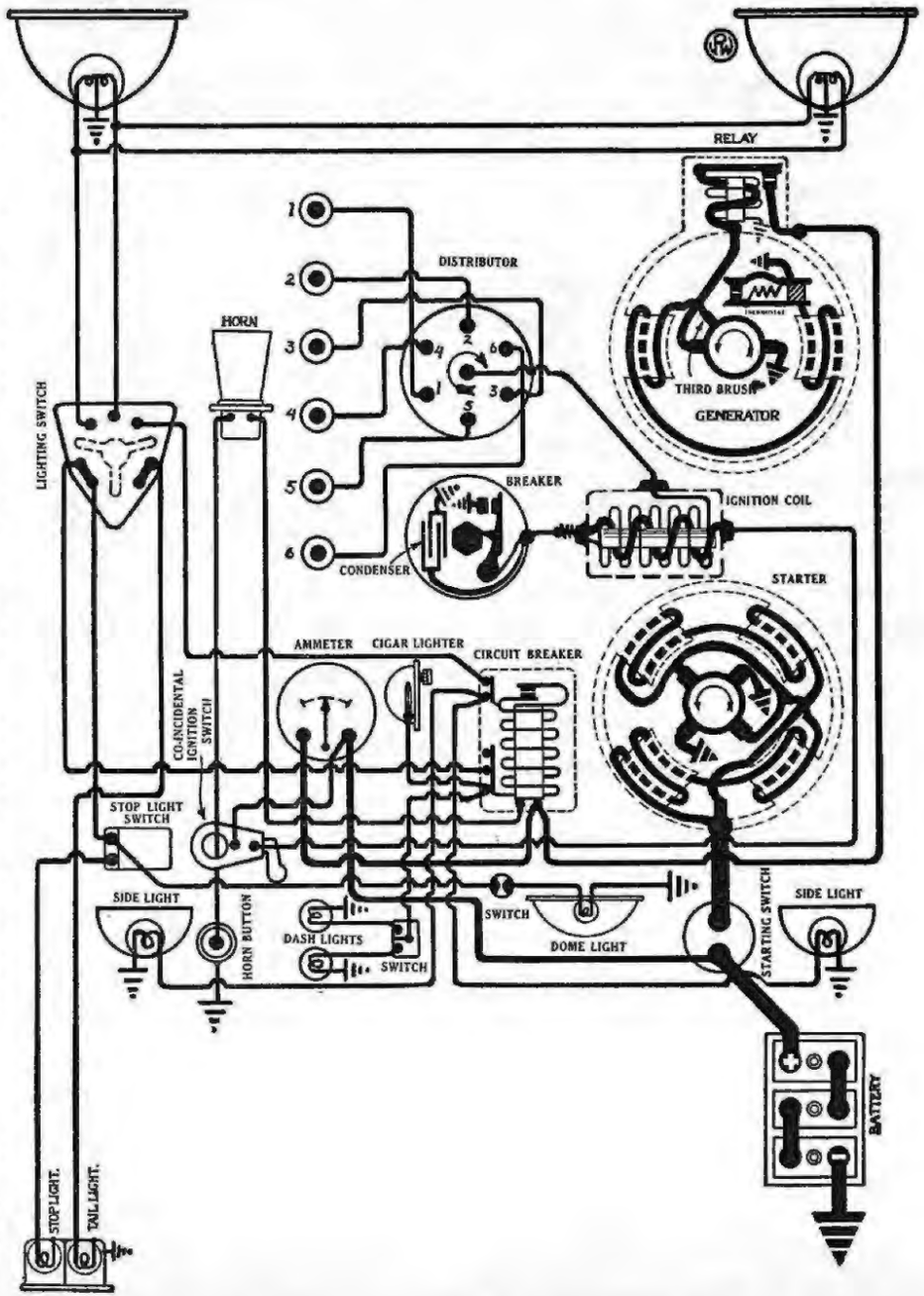
Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches a position 17 degrees before top dead center (on the flywheel) with the manual advance lever fully advanced. To set timing, crank engine until piston No. 1 enters compression stroke (the upstroke with both valves closed). Fully advance spark lever. Remove cover over peephole in crankcase over flywheel on right of engine and continue to crank engine until the flywheel mark 'ADV 17°' is directly opposite the line on the edge of the hole. The rotor must be opposite the segment connected to the spark plug in cylinder No. 1 (see diagram). If it is not, remove manual advance stop screw and lift distributor to disengage gears. Then rotate rotor and shaft until rotor is directly opposite proper segment, remesh gears and replace stop screw. Then loosen advance arm clamp screw and rotate distributor housing until contacts begin to separate. Connect the segment opposite the rotor to spark plug in cylinder No. 1 and connect remaining plugs in order 4-2-6-3-5 clockwise around the distributor head.

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

Spark Plugs:—Spark plugs are ⅞-18 S.A.E. Standard. Gaps are .025 inch.

VALVE TIMING:—(Series 114½). Specifications:—Head diameter, 1 7/16 inches; stem diameter, ⅜ inch; valve lift, 21/64 inch; spring pressure, 53 pounds (valve closed). Tappet clearance, .008 inch (hot).

Timing:—Inlet valves open at top dead center and close 54 degrees after lower dead center. Exhaust valves open 62 degrees before lower dead center and close 25 degrees after top dead center. Valve stem guides are removable. Oversize valve stems are not made.



BUICK

MODEL 114½ (1928) SERIAL NUMBERS 1,888,911 UP
MODEL 120 (1928) SERIAL NUMBERS 1,911,026 UP
MODEL 128 (1928) SERIAL NUMBERS 1,921,026 UP
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

(Series 120 and 128). INLET VALVES:—Head diameter, 1⅞ inches; stem diameter, ⅜ inch; valve lift, 21/64 inch. Spring pressure, 55 pounds (valves closed). Tappet clearance, .008 inch (hot). Inlet valves open at top dead center and close 54 degrees after lower dead center.

EXHAUST VALVES:—Head diameter, 1⅝ inches; stem diameter, ⅜ inch; valve lift, 21/64 inch. Spring pressure, 55 pounds (valve closed). Tappet clearance, .008 inch (hot). Exhaust valves open 62 degrees before lower dead center and close 25 degrees after top dead center. Valve stem guides are removable. Oversize valve stems are not made.

To Set Valve Timing. Camshaft is gear driven from the crankshaft at the forward end of the engine. Mesh the gears so that the two punch marks on the gears are together. One tooth on one of the gears is marked and the space between the gear teeth on the other gear is similarly marked.

STARTER:—Model 725-A. Starter is connected to the engine through a manually operated pinion shift interconnected with the starting switch and a Delco clutch. The direction of rotation is counter-clockwise, looking at the commutator end. Starter brush spring tension is 24-28 ounces.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	6000	5	65
15.5 "	Lock	3	600

Mounting:—Starter is flange mounted at right of engine on forward side of flywheel housing. To remove starter, disconnect pedal rod and cable and remove 3 flange mounting cap screws. Then slide starter forward and lift from place.

Oiling:—Put 4 or 5 drops of light oil in the commutator end oiler every 1000 miles. The drive end bearings are oilless.

GENERATOR:—Model 940-F. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by third brush shunt field and thermostat. Thermostat contacts open at 165°F. cutting the resistance across the thermostat contacts in series with the shunt field and reducing the output approximately 40%. To adjust generator output, remove commutator cover band and loosen the small round headed screw on the end plate. Then shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite diirection to decrease the charging rate. Tighten the screw after making the adjustment. With standard car setting, maximum charging rate is 18-20 amperes (cold) reached at 1450 R.P.M. or approximately 25 miles per hour.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
18-20	8.5	1450	9-12	7.5	2000

Motoring generator draws 5.5-6 amperes at 6 volts. Shunt field current is 5 amperes at 6 volts directly across field terminals. Brush spring tension is 22-26 ounces.

Mounting:—Generator is flange mounted at right of engine on rear of timing gear case. To remove generator, disconnect all ignition wires and controls or remove distributor. Then disconnect generator lead and water pump coupling. Drain radiator, remove pump mounting studs and remove water pump. Then remove three flange mounting cap screws. Pull generator to rear and lift from place.

Oiling:—Put 8 or 10 drops of light oil in the oiler on the commutator end of the generator every 500 miles. The drive end bearing is oiled by splash from the timing gear case.

RELAY:—Model 265-B. Relay is mounted on the generator. Relay contacts close at approximately 8 M.P.H. when the generator voltage reaches 6.75-7.5 volts and open with a discharge current of 0-2.5 amperes. Charging current at closing of contacts must not exceed 3 amperes. Relay contacts separate .015-.025 inch. Air gap is .014-.021 inch with contacts closed.

LIGHTING:—Head lights are 6-8 volt, 21-21 cp. (double filament-double contact base using second 21 cp. filament instead of dimming) Mazda No. 1110. Stop light is 6-8 volt, 15 cp. S.C. Mazda No. 87. Side (parking), tonneau and tail lights are each 6-8 volt, 3 cp. S.C. Mazda No. 63. Dome light is 6-8 volt, 6 cp. S.C. Mazda No. 81. Dash light (direct lighting) is 6-8 volt, 3 cp. S.C. Mazda No. 63. Dash light (indirect lighting) is 6-8 volt, 6 cp. S.C. Mazda No. 81.

Switches:—Lighting switch is Delco-Remy Model 484-A. It is mounted on the lower end of the steering column. Stop and backing light combination switch is Delco-Remy Model 466-B. Dash light switch is Model 1322.

CIRCUIT BREAKER:—Delco-Remy Model 410-A. A vibrating circuit breaker is mounted on the back of the dash. It begins to operate with a current of 25-30 amperes and continues to vibrate limiting the current to 10-15 amperes until the short circuit is repaired.

BUICK

MODELS 116, 121 AND 129 (1929)
DELCO-REMY GENERATING, STARTING SYSTEM
DELCO-REMY IGNITION

BATTERY:—Exide (Model 116), Type 3-MXV-13-1, 6 volt, 13 plates. The negative (—) terminal is grounded. Starting capacity (20 minute rate) is 114 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 20 hours.

(Models 121 and 129), Type 3-MVX-15-1, 6 volt, 15 plates. The negative (—) terminal is grounded. Starting capacity (20 minute rate) is 133 amperes for 20 minutes. Lighting capacity (5 ampere rate) is 5 amperes for 24 hours.

IGNITION:—Coil Model 528-H. Distributor Model 640-J. Breaker contacts separate .018-.024 inch with breaker arm on lobe of cam. Resurface contacts with a fine flat contact file or on a medium hard oilstone. Breaker arm spring tension is 17-21 ounces. Distributor is semi-automatic. Manual advance is 24 degrees (engine). Automatic advance begins at 500 R.P.M. Maximum automatic advance is 26 degrees reached at 2400 R.P.M. (engine).

Mounting:—Coil is mounted on the engine case in front of generator. Distributor is mounted in a well on the commutator end of the generator. To remove distributor, disconnect primary lead and manual advance rod. Remove head with high tension cables intact. Remove advance arm stop screw and lift distributor from place.

Oiling:—Distributor shaft is oiled from the gear case. Oil gears with Zerk gun through connection on side of gear compartment every 500 miles. Remove the distributor head and rotor and put 4 or 5 drops of light oil in the wick oiler in the center of the shaft and put a small bit of vaseline on the face of the breaker cam every 2000 miles.

Timing:—Breaker contacts begin to separate when the piston entering power stroke reaches a position 15 degrees (Model 116) and 17 degrees (Models 121 and 129) before top dead center (measured on the flywheel) with the manual advance lever fully advanced. To set timing, crank engine over until piston No. 1 enters compression stroke. This is the up stroke with both valves closed. Fully advance spark lever. Remove cover over peephole in crankcase over flywheel, on right side of engine, and continue to crank engine until the flywheel mark is directly opposite the line on the edge of the hole. The rotor must be opposite the segment connected to the spark plug in cylinder No. 1 (see diagram). If it is not, remove manual advance stop screw and lift distributor to disengage gears. Then rotate rotor and shaft until rotor is directly opposite proper segment, remesh gears and replace stop screw. Then loosen the advance arm clamp screw and rotate distributor housing until contacts begin to separate. Connect the segment opposite the rotor to spark plug in cylinder No. 1 and connect remaining plugs in order 4-2-6-3-5 clockwise around the distributor head.

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

Spark Plugs:—Spark plugs are A.C. Metric. Gaps are .025 inch.

VALVE TIMING:—INLET VALVES:—Model 116.) Head diameter is 1 9/16 inches; stem diameter is ⅜ inch. Tappet clearance is .008 inch (hot). Valve lift is 21/64 inch. Spring pressure is 44-56 pounds closed and 125-141 pounds open. Inlet valves open at 2 degrees after top dead center and close at 42 degrees after lower dead center.

EXHAUST VALVES:—Head diameter is 1 9/16 inches; stem diameter is ⅜ inch. Tappet clearance is .008 inch (hot). Valve lift is 21/64 inch. Spring pressure is 44-56 pounds closed and 125-141 pounds open. Exhaust valves open at 50 degrees before lower dead center and close at 20 degrees after top dead center.