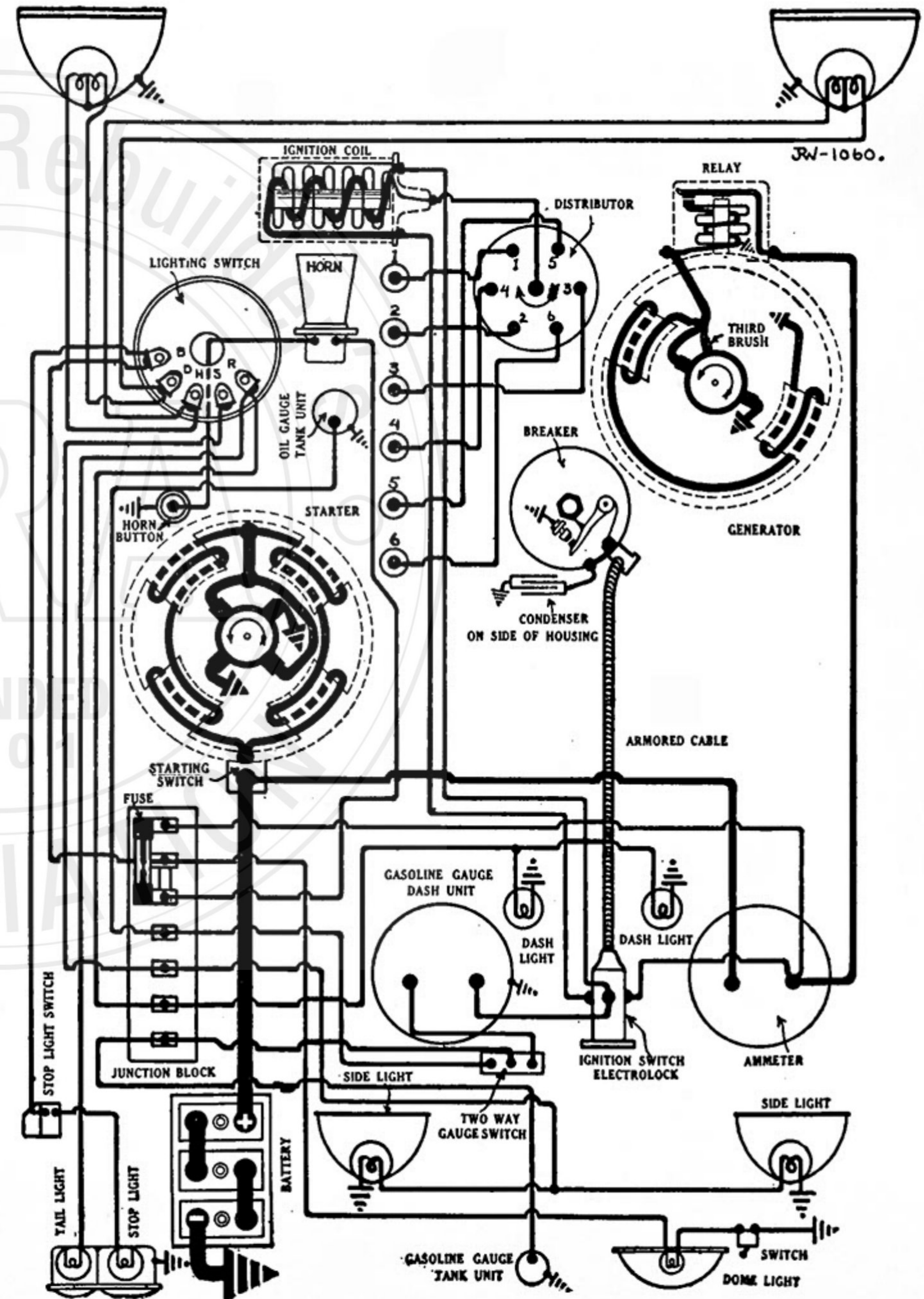


**CHALLENGER MODEL (1929) SERIAL NUMBERS 928658 UP
PRODUCTION STARTED JANUARY 1, 1929
AUTO-LITE GENERATING, STARTING SYSTEM
AUTO-LITE IGNITION**

Timing:—Inlet valves open 7 degrees after top dead center with the piston 1/64 inch down on inlet stroke. Tappet clearance must be .006 inch.



ESSEX

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PRODUCTION STARTED JANUARY 1, 1929
AUTO-LITE GENERATING, STARTING SYSTEM
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STARTER:—Model MZ-4012. Starter is connected to the engine through an in-board Bendix drive. The direction of rotation is counter-clockwise, viewed from the commutator end. Brush spring tension is 2½ pounds.

Starter Data			
Torque	R.P.M.	Volts	Amperes
0 lb. ft.	Free	6	50
1.5 "	1800	5.2	150
2.5 "	1325	5.0	200
5.0 "	740	4.5	300
7.6 "	220	4.0	400
12.2 "	Lock	4.0	550

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

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

GENERATOR:—Model GAM-4101. The direction of rotation is counter-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 tapping on the mounting stud with a screwdriver. Shift the third brush in a counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. The brush is held in position by friction between the mounting stud and the end plate. With standard car setting, the maximum charging rate is 15 amperes at 8 volts reached at 1350 R.P.M. or 25 miles per hour.

Generator Data		
Amperes	Volts	R.P.M.
0	6.5	620
2	6.9	710
5	7.1	830
10	7.8	1090
14	7.9	1490
15	8.0	1900

Motoring, generator draws 5.5 amperes at 6 volts. Shunt field current is 6.5 amperes at 6 volts. Brush spring tension is 1¼-1½ pounds.

Mounting:—Generator is cradle mounted at right of engine. To remove generator, disconnect generator lead and drive coupling and loosen mounting clamp band. Lift generator from place.

Oiling:—Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles of operation.

RELAY:—Model CB-4015. Relay is mounted on the generator end plate. Relay closes at 550 R.P.M. 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 contact gap is .025-.035 inch. Air gap is .010-.030 inch with contacts closed.

LIGHTING:—Clum Switch Model 10717. Lighting switch is mounted at base of steering column. Double filament headlights using a second 21 cp. filament instead of dimmers are standard equipment. Headlights are 6-8 volt, 21-21 cp. D.C. Mazda 1110. Stop light is 6-8 volt, 15 cp. S.C. Mazda 87. Side, dash and tail lights are each 6-8 volt, 3 cp. S.C. Mazda 63.

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