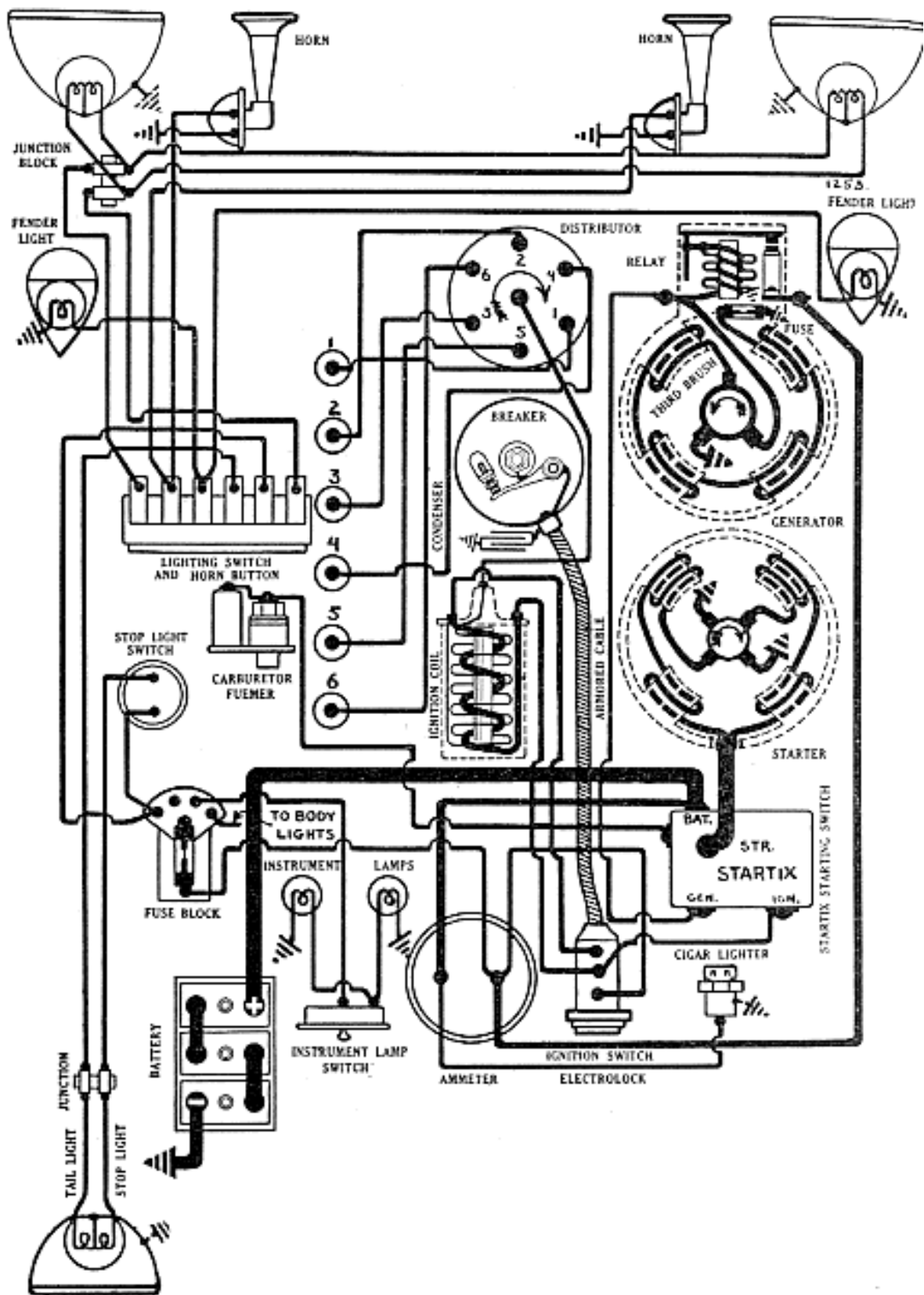


WILLYS KNIGHT

MODEL 66-D (1931-32), SERIAL NUMBERS 1001 UP
 STREAM-LINE MODEL 66-E (AFTER JUNE, 1932), SERIAL NOS. 7601 UP
 AUTO-LITE SYSTEM



CAR SERIAL NUMBER:—On plate on right frame member above front spring rear hanger and under driver's seat cushion.

ENGINE NUMBER:—On plate on left side of crankcase.

BATTERY:—U.S.L., Type 3-HVX-8X-6A ('31), HW-17A ('32), 6 volt, 17 plate, 166 ampere hour capacity (5 ampere rate). Starting capacity 170 amperes for 20 minutes.

Grounded Terminal:—Negative (—) terminal grounded to frame.

Mounting:—On left hand side of frame under front floor boards.

Dimensions:—Width, 7 $\frac{1}{8}$ ". Length, 13 $\frac{7}{16}$ ". Height, 9 $\frac{1}{8}$ ".

IGNITION:—Coil Model IG-4202, 4303 (66-D) IG-4602 or North East No. 22636 (66-E). Lock coil type mounted on back of instrument board with switch in base (except North East coil mounted on side of engine block, and IG-4602 used with special Mitchellock Model 16-S).

Ignition Current:—2 amperes at 6 volts (engine running), 4 amperes at 6 volts (engine stopped).

Ignition Switch:—Electrolock Type 5-B (N. E. distributor—see Equip. Section for complete data). Switch is assembled as unit with distributor and must be taken off the car whenever distributor is removed. No provision is made to turn ignition on with Startix being inoperative and it will be necessary to disconnect lead on 'IGN' terminal of Startix case to avoid automatic cranking when ignition is turned on to check timing.

Distributor North-East Type 10877 or Auto-Life Model IGC-4052. Single breaker, 6 lobe cam, semi-automatic advance type.

Manual Advance:—20 degrees (engine) maximum.

Breaker Gap:—Set contact gap at .020 inch.

Breaker Arm Spring Tension:—16-20 ounces.

Cam Angles—(IGC-4052). Closed 41°. Open 19° (distributor degrees).

Automatic Advance—Type 10877

Degrees	Distributor	R.P.M.	Degrees	Engine	R.P.M.
Start	200	2	.....	400
12	1000	24	.....	2000

Automatic Advance—Model IGC-4052

Start	.....	200	0	.....	400
3	.....	610	6	.....	1220
6	.....	1050	12	.....	2100
9	.....	1480	18	.....	2960
10.5	.....	1700	21	.....	3400

Mounting:—Distributor is mounted on top of oil pump housing at right of engine. To remove distributor, take out hold-down screw in advance arm and lift distributor from place.

Timing:—Breaker contacts begin to open when the piston entering power stroke reaches a position .112 inch (actual piston travel) or 16 degrees (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. This can be determined by taking out No. 1 spark plug and turning the engine over until the air compressed in the cylinder is felt escaping through the spark plug port. Fully advance the manual spark control (push the spark button all the way in toward the dash) and see that the distributor is turned counter-clockwise as far as possible. Turn engine over until the ignition mark on the flywheel, 'IGN', which is 16 degrees before the top dead center mark 'T.C.' is directly opposite the

indicator in the inspection hole in the flywheel housing. Take up all backlash in distributor gears by turning distributor shaft counter-clockwise. Then loosen advance arm clamp screw and rotate distributor until contacts begin to open. Tighten the clamp screw and connect spark plugs as shown on the diagram.

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

Spark Plugs:— $\frac{7}{8}$ -18 S.A.E. Champion Type C-4. Gaps are .020 inch.

VALVE TIMING:—The Willys-Knight engine is of the sleeve valve type. To time sleeve valves with eccentric shaft sprocket removed, remove pipe plug in exhaust manifold directly opposite No. 1 exhaust port and scrape carbon from edges of sleeve ports so that closing of ports can be checked. Remove inspection hole cover in flywheel housing and turn engine over until piston No. 1 reaches top dead center with the flywheel mark 'T.C.' directly opposite the indicator. Remove the spark plug in cylinder No. 1 and place a test lamp in the spark plug port so that the light can be seen through the exhaust port. Then turn eccentric shaft in direction of rotation until the upper edge of the port in the outer sleeve just passes the lower edge of the port in the cylinder block when the light will be cut off. Assemble eccentric shaft sprocket and timing chain, being careful not to disturb relative positions of eccentric shaft and crankshaft.

Intake Ports	Timing—1931	Exhaust Ports
Open—5° after top dead center.		Open—50° before lower dead center.
Close—46° after lower dead center.		Close—At top dead center.

Timing—1932		
Open—10° before top dead center.		Open—45° before lower dead center.
Close—36° after lower dead center.		Close—At top dead center.

STARTER:—Model MAB-4018, MAB-4036 R.H.D. Starter drives engine through a Bendix drive. The direction of rotation is clockwise, viewed from the commutator end. Brush spring tension is 44-56 ounces. The starting switch is mounted at the lower end of the steering column and is operated by pulling up on the knob on the steering wheel.

Starter Data

Torque	R.P.M.	Volts	Amperes
.6 lb. ft.....	1910.....	5.5.....	100
3.4 ".....	1100.....	5.0.....	200
6.6 ".....	695.....	4.5.....	300
10.15 ".....	420.....	4.0.....	400
24 ".....	Lock.....	4.0.....	725

Mounting:—Starter is sleeve mounted at the right of the transmission on the rear face of the flywheel housing. To remove starter, disconnect cable and take out two dowel screws in flywheel housing directly above starter sleeve. Then pull starter to the rear to clear drive and lift from place.

GENERATOR:—Model GAG-4130, 4134. Direction of rotation is counter-clockwise at commutator end. Third brush regulation. With standard car setting,

maximum charging rate is 17 amperes at 8 volts (cold) reached at 1500 R.P.M.

Charging Rate Adjustment. Take off commutator cover band, shift third brush by prying on brush mounting stud, counter-clockwise to increase, or clockwise to decrease charging rate. Third brush mounting plate is held in position by friction.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0.....	6.4	550	0.....	6.4	640
4.....	6.7	660	4.....	6.9	800
8.....	7.0	760	8.....	7.3	980
12.....	7.4	900	10.....	7.6	1110
16.....	7.8	1120	12.....	7.8	1280
19.....	8.0	1500	14.2.....	8.0	1680
13.....	7.4	2400	11.5.....	7.7	2400

Brush Spring Tension:—22-27 ounces on each brush.

Field Current:—4.08-4.52 amperes at 6.0 volts across field terminals.

Field Fuse:—7½ ampere capacity fuse mounted on brush ring.

Motoring:—4.18-4.62 amperes at 6.0 volts.

Mounting:—Generator is cradle mounted at the right of the engine and is driven through a flexible coupling from the chain case. To remove generator, disconnect lead and drive coupling. Then loosen mounting strap and slide generator from place.

RELAY:—Model CB-4014, 4021. Mounted on the generator field frame. Relay contacts close at 575 R.P.M. when the voltage of the generator reaches 7-7.5 volts and open with a discharge current of .5-2.5 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:—**Finger Tip Control Switch, Model A-805.** Switch is mounted at the lower end of the steering column and is controlled by a button on the steering wheel. The starting switch, lighting switch and horn button are all incorporated in the single unit. Dimmer system 'depressed beam' double filament headlight bulbs controlled by lighting switch. See Equipment Section for complete article on Finger Tip Control.

Lamp Sizes

Position	Voltage	Candlepower	Base	Mazda No.
Headlights	6-8.....	21-21.....	D.C.....	1110
Fender lights	6-8.....	3	S.C.....	63
Dash lights	6-8.....	3	S.C.....	63
Stop and tail light	6-8.....	21-2	D.C.....	1158
Dome and corner lights.....	6-8.....	3	S.C.....	63

FUSES:—Generator field fuse is 7.5 ampere capacity. Lighting fuse mounted on fuse block on lower left front side of dash is 20 ampere capacity.