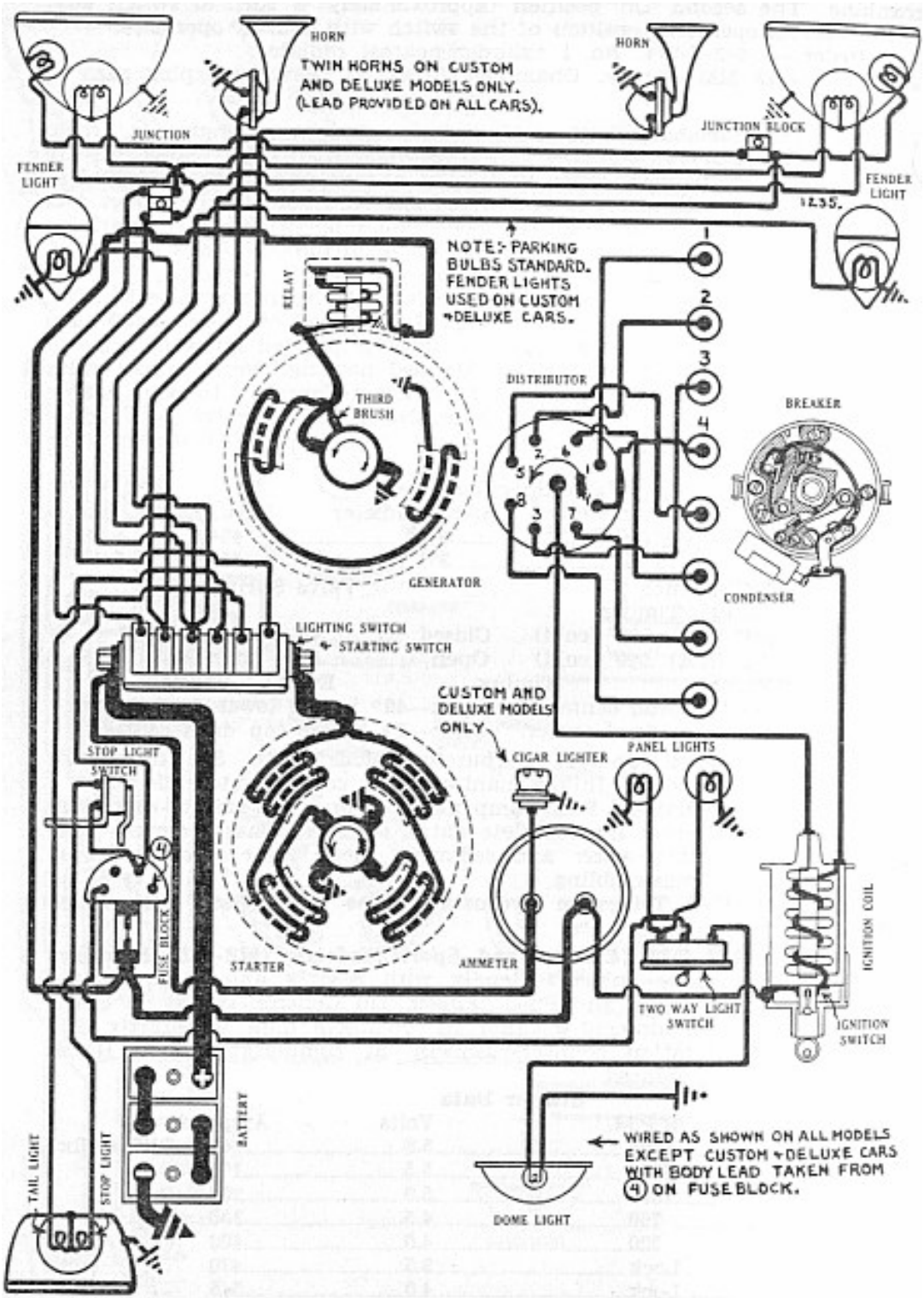
WILLYS OVERLAND EIGHT

EIGHT CYLINDER MODEL 8-88 (1932), SERIAL NUMBERS 1001 UP
STREAM LINE MODEL 8-88A—AFTER JUNE, 1932
AUTO-LITE SYSTEM



CAR SERIAL NUMBER:—Stamped on plate on right hand frame side rail above right front spring rear shackle and also under driver's seat.

ENGINE NUMBER:—Stamped on left side cylinder block opposite No. 1 cylinder.

BATTERY:—U.S.L., Type 3-HVX-7X-6A, 6 volt, 15 plate, 142 ampere hour capacity (5 ampere rate). Starting capacity 148.5 amperes for 20 minutes.

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

Mounting:—Mounted on left hand frame side rail under front floor boards.

Dimensions:—Width, 7 7/16". Length, 11¾". Height, 9¾".

IGNITION:—Coil Model IG-4305, 4501 (8-88), IG-4602 (8-88A). IG-4305 and IG-4501 are coil lock types mounted on back of instrument board with switch in base of coil. IG-4602 mounted on dash and connected to special Mitchellock by armored cable. See Electrical Equipment Section for Mitchellock data.

Ignition Current:—1-3 amperes at 6 volts (engine running), 3-4.5 amperes at 6 volts with engine stopped.

Ignition Switch—Type 16-S Mitchellock integral with coil. Switch has two 'On' positions. First on position (⅛ turn from 'Off' or vertical) does not connect Startix and should be used for timing. Second 'On' position (approximately ¼ turn to right) is regular running position with Startix operative.

Distributor Model IGH-4013. Two-breaker arm, 4-lobe cam, semi-automatic advance type. Distributor is retarded by pulling out spark control button for hand cranking and operation at low speeds or heavy pulling. Pushing in button advances distributor 20° (engine). Breaker contacts open alternately at 45° intervals corresponding to 90° firing interval of engine. Contacts must be synchronized (see Ignition Timing).

Breaker Gap:—Set contact gap at .018". Hold within limits of .018-.020".

Breaker Arm Spring Tension:—16-22 ounces (measured at tip of breaker arm with spring scale centered and at right angles to arm).

Cam Angles—Closed 32°. Open 13° (distributor) when synchronized.

Automatic Advance

Degrees	Distributor	R.P.M.	Degrees	Engine	R.P.M.
Start		200	0		400
3		600	6		1200
6		1015	12		2030
9		1430	18		2860
11		1700	22		3400

Mounting:—Mounted at left center of crankcase and driven by inclined shaft from crankshaft. To remove, disconnect primary lead, disconnect manual spark control, take off distributor cap, take out hold-down screw in advance arm, lift distributor out.

Oiling:—250 Miles. Put 6 drops SAE. No. 20 engine oil in oiler on side of shaft. Take off distributor cap and rotor, oil wick oiler in center of shaft. Put one drop oil on breaker arm pivot pins.

5000 Miles. Apply thin film vaseline to face of breaker cam.

IGNITION TIMING:—Standard Setting—6° (flywheel) or .0136" (piston travel) before top dead center with manual spark control advanced.

To Set Ignition Timing. Take off cover plate on inspection hole in right front face of flywheel housing, advance manual spark control (push button in toward dash) with No. 1 piston on compression, turn engine over by hand until flywheel mark 'IGN./' (which is 6° before top dead center mark '1&8.TC./I.O.') registers with pointed end of inspection cover plate screw. Loosen advance arm clamp bolt, rotate distributor until first set of breaker contacts (mounted directly on breaker plate) begin to open, tighten clamp bolt. If ignition is turned on to check opening of contacts on Custom models equipped with Startix, use first 'On' position of switch (key turned approximately ⅛ turn to right) to avoid automatic cranking. See that rotor is directly opposite No. 1 terminal in distributor cap (see diagram) and connect spark plugs as indicated. Then synchronize contacts.

Synchronization of Contacts. No flywheel marks provided to synchronize contacts on engine. It will be necessary to use a rotary spark gap or special Auto-Lite synchronizing tool. See Equipment Section for complete data on synchronization. If timing gause is used, shift gauge to No. 6 cylinder and repeat timing. Do not loosen clamp bolt but loosen lock screws on movable sub-plate (carrying second set of contacts), shift plate until contacts begin to open, tighten lock screws.

Firing Order:—1-6-2-5-8-3-7-4. No. 1 cylinder nearest radiator.

Spark Plugs:—18 MM. Metric. Champion Type #8. Set gaps at .027 inch.

VALVE TIMING:—Camshaft Setting. Camshaft at right of engine and driven from crankshaft by two-sprocket non-adjustable chain drive. Sprockets are marked. Mesh chain so that marks are adjacent and in line with straight-edge across shaft centers. With correct setting, mark on rim of camshaft sprocket should be in line with mark on edge of front engine support with piston No. 1 on top dead center and flywheel mark '1&8.T.C./I.O.' registering with pointer in inspection hole.

To Check Valve Timing. Set tappet clearance No. 1 intake and exhaust valves at .010" cold. With No. 8 piston on compression turn engine over until piston reaches top dead center with flywheel mark '1&3.T.C./I.O' at indicator. No. 1 intake valve should open at this point. Turn engine over 4° until flywheel mark 'E.C/' registers with pointer. No. 1 exhaust valve should close. Reset tappet clearance at .006" (intake), .008" (exhaust) with engine warm.

Valve Specifications

Valve	Head Diameter	Stem Diameter	Seat Angle	Lift
Intake	1 17/32"	.372"	45°	21/64"
Exhaust	1 15/32"	.371"	45°	21/64"

Tappet Clearance			Valve Springs
	Operating	Timing	
Intake	.006" (hot)	.010" (cold)	92-100 pounds—1 15/16"
Exhaust	.008" (hot)	.010" (cold)	

Intake Valves	Timing	Exhaust Valves
Open—At top dead center		Open—34° before lower dead center.
Close—38° after lower dead center.		Close—4° after top dead center.

CARBURETION:—Tillotson Updraft Carburetor, Model W5D. See Carburetor Section for complete data. Intake manifold heat control automatic.

Fuel Pump:—A.C. Mechanical Fuel Pump mounted on right side of crankcase (see Carburetion Section). Remove glass sediment bowl when necessary empty water and sediment, clean filter screen (located directly above bowl) before reassembling.

Gasoline Gauge:—K-S Telegauge hydrostatic type (see Carburetion Section).

STARTER:—**Model MAB-4035, 4048.** Drive—Inboard Bendix with Startix automatic starting switch on Custom models and Pines 'Finger Tip Control' switch on Standard models. See Equipment Section for complete data on Startix and Pines 'Finger Tip Control' switches. Rotation counter-clockwise at commutator end. Brush spring tension 44-56 ounces.

Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	4020	5.5	46
0.6 "	1910	5.5	100
3.4 "	1100	5.0	200
6.6 "	695	4.5	300
10.15 "	420	4.0	400
17.0 "	Lock	3.0	525
24.0 "	Lock	4.0	720

Mounting:—Flange mounted on left hand front face of flywheel housing. To remove, disconnect cable, take out 3 flange mounting bolts, pull starter forward to clear Bendix, lift out.

Oiling:—**500 Miles.** Put 6 drops SAE. No. 20 engine oil in oiler at each end.

GENERATOR:—Model GAL-4331. Third brush regulation. Rotation counter-clockwise at commutator end. Maximum charging rate (standard setting) is 17.2 amperes (cold) at 8.0 volts reached at 1900 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. Brush held in position by friction.

Generator Data

Cold Test			Hot Test		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.3	600	0	6.4	700
4	6.7	740	4	6.9	900
8	7.1	900	8	7.4	1150
12	7.4	1120	10	7.7	1340
17	8.0	1900	12.4	8.0	2150
12	7.4	3200	9.5	7.7	3200

Brush Spring Tension:—8-13 ounces on each brush.

Field Current:—4.08-4.52 amperes at 6 volts across field terminals.

Motoring:—4.27-4.73 amperes at 6.0 volts.

Mounting:—Pivot mounting on bracket at left front of engine with fan belt drive. To remove, disconnect lead, loosen adjustment clamp bolt, swing generator toward engine and slip off drive belt, take out bolt forming bracket hinge, lift generator out.

Belt Adjustment:—Loosen adjustment clamp bolt and mounting bolt, pull generator away from engine until fan can just be turned with belt held stationary, tighten adjustment bolt and mounting bolt before slacking off on generator.

Oiling:—250 Miles. Put 6 drops SAE. No. 20 engine oil in oiler at each end. **1000 Miles.** Remove grease cup under bearing retainer on commutator end, clean out old grease, fill cup with vaseline, dip wick in oil and replace.

RELAY:—Model CB-4014, 4021 (With terminal for Startix). Mounted on generator field frame. Relay contacts close at 675 R.P.M. with generator voltage of 7-7.5 volts and charging current of approximately 2 amperes and open with discharge current of .5-2.5 amperes.

Contact Gap:—.025-.035 inch. **Air Gap:**—.010-.030 inch (contacts closed).

LIGHTING:—Pines Switch, Model A-805 (Standard Models), 6700 (Custom and Sport Models). Lighting switch 'Finger Tip Control' type mounted at lower end of steering column and controlled by knob on steering wheel. Type A-805 on Standard models includes starting switch. Type 6700 on Custom models is used with Startix and does not include starting switch. See Equipment Section for complete data. Lighting system 'depressed beam' dimming with standard double filament headlight bulbs.

Lamp Sizes

Position	Voltage	Candlepower	Base	Mazda No.
Headlights	6-8	21-21	D.C.	1110
Parking Lights	6-8	3	S.C.	63
Instrument Lights	6-8	3	S.C.	63
Stop and Tail Lights	6-8	21-2	D.C.	1158

Custom and Sport models have parking lights mounted on fenders. Standard models have parking bulbs in headlights. Stop and tail light has special double filament bulb and tail light lead must be connected to 2 cp. filament.

FUSES:—One 20-ampere capacity fuse mounted on left front of dash.