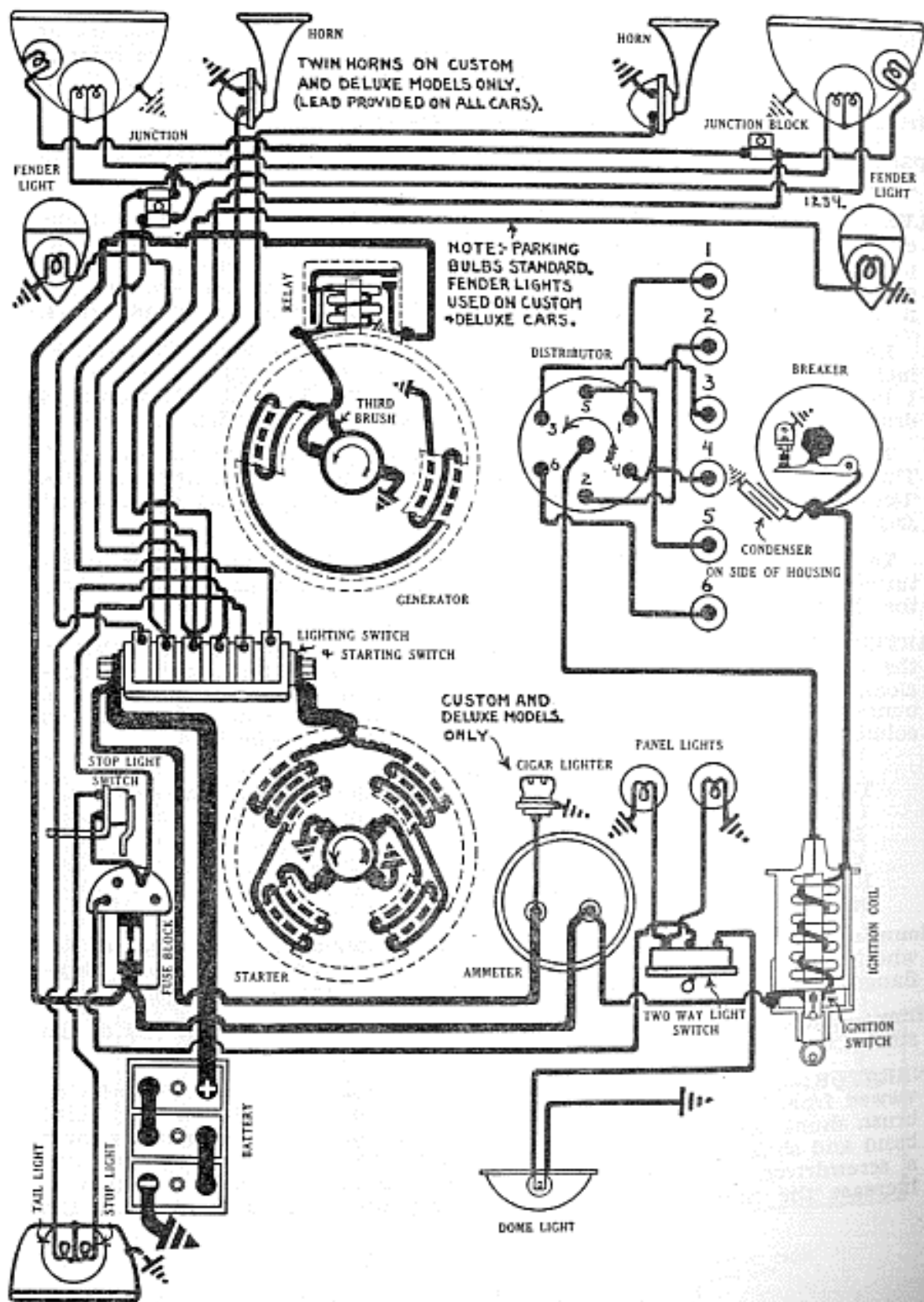


# WILLYS OVERLAND SIX

SIX CYLINDER MODEL 6-90 (1932), SERIAL NUMBERS 1001 UP

STREAM LINE MODEL 6-90A—AFTER JUNE, 1932

AUTO-LITE SYSTEM



**CAR SERIAL NUMBER:**—Stamped on plate on left hand frame side rail in front of left front spring rear shackle and on plate under driver's seat cushion. First serial number of this model—14201.

**ENGINE NUMBER:**—Stamped on left hand upper front of engine block.

**ENGINE:**—Six cylinder, 'L' head type,  $3\frac{1}{4} \times 3\frac{3}{8}$ " bore and stroke, 193 cubic inch displacement, rated at 25.35 H.P., develops 65 H.P. at 3400 R.P.M. Standard compression ratio—5.26-1.

**BATTERY:**—U.S.L., Type XY-13X-7A, 6 volt, 13 plate, 87.5 ampere hour capacity (5 ampere rate). Starting capacity 102 amperes for 20 minutes.

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

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

**Dimensions:**—Width,  $7\frac{1}{4}$ ". Length, 9". Height,  $8\frac{5}{8}$ ".

**IGNITION:**—Coil Model IG-4305 (Std.), IG-4602 (Clsd. Cars), IG-4502 (Sport Rdstr.), IG-4501 (Std. Rdstr.). IG-4035, 4501, 4502 are coil lock types mounted on back of instrument board (switch in base). IG-4602 mounted on dash and connected to special Mitchelllock by armored cable (see Electrical Equipment Section for Mitchelllock data).

**Ignition Current:**— $1\frac{1}{2}$  amperes at 6 volts (engine running), 3.4-5 amperes at 6 volts (engine stopped).

**Distributor Model IGB-4032.** Single breaker arm, 6 lobe cam, semi-automatic advance type. Manual advance controlled by button on dash. Distributor is retarded by pulling out button for hand cranking or heavy pulling. Pushing button in toward dash advances distributor  $20^\circ$  (engine).

**Breaker Gap:**—Set contact 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 on arm and at right angles to breaker arm).

**Cam Angles:**—Closed  $34^\circ$ . Open  $26^\circ$  (distributor degrees).

#### Automatic Advance

Degrees	Distributor	R.P.M.	Degrees	Engine	R.P.M.
Start	.....	300	0	.....	600
3	.....	640	6	.....	1280
6	.....	1010	12	.....	2040
9	.....	1350	18	.....	2700
11	.....	1600	22	.....	3200

**Mounting:**—Distributor mounted at left center of engine and driven by an inclined shaft from the camshaft. To remove, disconnect primary lead, disconnect manual spark control, take off distributor cap, take out hold-down screw in advance arm, lift out.

**Oiling:**—250 Miles. Put 6 drops SAE #20 engine oil in oiler on side of shaft. Take off distributor cap and rotor, put 6 drops oil in wick oiler in center of shaft.

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

**IGNITION TIMING:**—Standard Setting—top dead center with manual control advanced.

**To Set Ignition Timing:**—Take off cover plate over inspection hole in left hand front face of flywheel housing, advance manual spark control (push button in toward dash), see that distributor is rotated clockwise to end of advance arm slot. With No. 1 piston on compression turn engine over until piston reaches top dead center with flywheel mark '1-6 CYL./IGN.TC' directly opposite indicator on housing, loosen advance arm clam bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor is opposite No. 1 terminal in distributor cap (see diagram), connect spark plugs as indicated.

**Note on Cars with Startix:**—The Electrolock ignition switch used on all cars with Startix automatic starting switch has two 'On' positions. The first 'On' position (approximately  $\frac{1}{8}$  turn from the vertical 'Off' position) turns on ignition and gasoline gauge circuit but does not connect Startix. This switch position should be used in checking ignition to avoid automatic

cranking. The second 'On' position (approximately  $\frac{1}{4}$  turn of switch key) is the normal operating position of the switch with Startix operative.

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

**Spark Plugs:**—18 MM. Metric. Champion Type C-7. Set spark plug gaps at .027".

**VALVE TIMING:**—Camshaft Setting:—Camshaft at right of engine is driven from crankshaft by two-sprocket non-adjustable chain drive. Sprockets are marked. Mesh chain with sprockets turned so that punch marks are adjacent and in line with straightedge 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 'IGN.TC./CYL.1-6' at indicator.

**To Check Valve Timing:**—Set tappet clearance No. 1 intake valve at .008", No. 1 exhaust valve at .009" (cold). With No. 6 piston on compression turn engine over until flywheel mark 'IO/' is opposite pointed screw on edge of inspection hole in left front face of flywheel housing. No. 1 intake valve should begin to open at this point. Turn engine over  $5^\circ$  to point where flywheel mark 'EC./' registers with pointer. No. 1 exhaust valve should close at this point. Reset tappet clearance at .004" (intake), .006" (exhaust) with engine hot.

### Valve Specifications

Valve	Head Diameter	Stem Diameter	Seat Angle	Lift
Intake	1 5/8"	.372"	45°	5/16"
Exhaust	1 15/32"	.371"	45°	5/16"

### Tappet Clearance

#### Operating Timing

Intake	.004" (hot) .008" (cold)	Closed	46 pounds—2 1/4"
Exhaust	.005" (hot) .009" (cold)	Open	85 1/2 pounds—1 15/16"

### Valve Springs

#### Intake Valve

#### Timing

#### Exhaust Valves

Open	7° before top dead center.	Open	49° before lower dead center.
Close	39° after lower dead center.	Close	2° before top dead center.

**CARBURETION:**—Tillotson Updraft Carburetor, Model J1B. 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 for complete data). Remove glass sediment bowl when necessary, empty water and sediment, clean filter screen (located above bowl) before reassembling.

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

**STARTER:**—Model MZ-4030 (Custom and Sport Models), (MZ-4024 Standard Models). Starter 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 switches. Rotation counter-clockwise at commutator end. Brush spring tension 44-56 ounces.

### Starter Data

Torque	R.P.M.	Volts	Amperes
0 lb. ft.	4902	5.5	47 (with Bendix)
.65 "	2500	5.5	100
2.55 "	1325	5.0	200
4.95 "	750	4.5	300
7.65 "	220	4.0	400
10.1 "	Lock	3.5	470
12.25 "	Lock	4.0	545

**Mounting:**—Flange mounted on left hand front face of flywheel housing. To

remove, disconnect cable, take out 3 flange mounting screws, 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 Startix terminal). 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.