does not seat properly (or clean metering plug which was used in place of by-pass valve in early 1938). **Oil Pump Relief Valve**—Three different spring used. See Oil Pump Removal & Disassembly data above.

1939-48 MODELS

LOW OIL PRESSURE NOTE: Low oil pressure may be caused by fuel pump push rod bushing being worn through, permitting oil to escape from main oil channel. Replace bushing by driving old bushing out of cylinder block and driving new bushing in until top of bushing is ⅞" above face of casting. New bushings need not be reamed.

OIL PAN REMOVAL

1939-48 MODELS

OIL PAN REMOVAL: Drain crankcase. Disconnect drag link at steering gear pitman arm. Loosen clamp on exhaust cross pipe, disconnect cross pipe at left cylinder bank exhaust manifold, remove cross-pipe. Remove capscrews in ball cap at rear end of front radius rods, lower radius rods to provide additional clearance at pan (rods can be held down by inserting wooden block between ball connection at rear end and frame). Remove right and left splash pan mounting screws and move pans out of the way. Remove starter motor. Disconnect oil filter return line at oil pan. Take out oil pan capscrews and remove pan from beneath car. NOTE—Front end of car can be raised by means of hoist attached to bumper bars (not axle) for additional pan clearance at front end.

Installation Caution—Install new packing in groove at front end of oil pan and use new pan gasket. Packing should be soaked in engine oil for two hours before it is used.

1949-51 LINCOLN

►**OIL PAN REMOVAL (LINCOLN):** ***CAUTION—For access to oil pump and screen or for clean out, oil sump only can be removed. Oil sump secured by 4 lower capscrews on bell housing and 18 nuts to oil pan.***

Oil Pan Removal—Car manufacturer recommends following method be used:

1)—Drain oil, set #2 piston at top dead center (2nd cylinder right hand bank), turn wheels to extreme right, take off exhaust cross-over pipe (secure manifold heat valve with one nut).

2)—Remove steering idler arm bracket from right frame rail and pull down. Take off starter and oil dip stick tube.

3)—Remove oil sump (4 lower capscrews on bell housing and 18 nuts to oil pan). Take off oil pan baffle (clipped to oil pan). Disconnect filter return line on left side of pan.

4)—Remove 20 oil pan-to-block capscrews using ⅜" drive tools. Move outlet pipe to left after freeing bracket for access to front oil pan screws. Lower rear end of pan and slide out to rear.

1949-51 COSMOPOLITAN

OIL PAN REMOVAL (LINCOLN COSMOPOLITAN): Same as given for LINCOLN above except that front end of engine must be raised as follows:

1)—Drain radiator and remove lower radiator hoses.

2)—Turn fan so that wide angle between blades up.

3)—Remove fuel & vacuum pump from adapter.

4)—Take off 2 nuts from front engine mounts, raise front of engine 2¼-2⅜", block engine up by inserting blocks between brackets and engine mounts.

5)—When removing oil pan, pan should be turned so front oil seal will pass over left capscrew of front main bearing cap.

RADIATOR

1946-47-48 MODELS

RADIATOR REMOVAL: Drain cooling system. Disconnect and remove upper and lower radiator hoses. Remove two horizontal capscrews at bottom of radiator, lift radiator out.

COOLING SYSTEM

1949-51 LINCOLN & LINCOLN COSMOPOLITAN

►**PRODUCTION CHANGE FOR IMPROVED COOLING: New Cylinder Head Gasket No. 8EL-6051-D.** This gasket required for new water holes added during production, 4 holes in block (1 in upper corners of each bank) with matching holes in each cylinder head. This gasket furnished for service on all engines (can be used on early engines without the additional holes).

Drilling of Additional Water Passage Holes on Early Cylinder Blocks and Heads for Improved Circulation—Allowed by car manufacturer where overheating conditions cannot be corrected by regular methods. Use new gasket No. 8EL-6051-D as template, drill 5/16" additional holes as follows: 4 in cylinder block (1 in upper corner front and rear of each bank), 2 in each cylinder head (1 in upper corner front and rear).

►***CAUTION—Holes in cylinder block should not be drilled deeper than ⅝".***

tor. Loosen lockscrews on movable subplate, shift plate by turning eccentric adjusting screw until movable contacts begin to open, tighten lockscrews.

Synchronization (Other methods)—If distributor synchronized on rotary spark gap or other types of equipment, set movable contacts to open 33½° after stationary contacts. Firing intervals unequal 33½-26½-33½ distributor degrees.

CARBURETOR

CARBURETION:—Carburetor—Stromberg Model EE-22, 1.437" (1 7/16") dual downdraft type.

For complete data, refer to Carburetor Index.

Idle Adjustment—Warm up engine before adjusting. Manufacturer recommends use of vacuum gauge and adjustment of idle adjusting screws for highest steady vacuum. If vacuum gauge not used, adjust throttle stopscrew for 5-7 M.P.H. idling speed, cut out one bank of cylinders by disconnecting coil primary lead, adjust idling adjusting screw for carburetor barrel feeding the other bank by turning screw in until engine begins to miss and then out until engine fires smoothly. Reconnect coil, disconnect second coil and repeat adjustment for other idle adjusting screw. Idle engine for all 12 cylinders and readjust for correct 5-7 MPH idling speed.

Accelerating Pump Adjustment—Engage pump link in proper hole in throttle lever as follows:
Inner Hole—Minimum stroke—Summer setting.
Outer Hole—Maximum stroke—Winter setting.

CARB. EQUIPMENT

Air Cleaner: AC #1528347 (1937), #1528497 (Others), oil-wetted type.

Fuel Pump:—AC. Type I #1521218 Diaphragm type combination fuel-and-vacuum pump.

For complete data, refer to Carburetion Equip. Index.

Gasoline Gauge: King-Seeley Electric. K-S No. 6250, Lincoln No. K-13099D (dash unit), K-S No. 5850, Lincoln No. 70-9275 (tank unit).

For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—Exide, Type X-21-L. 6 volt, 21 plate, 147 ampere hour capacity (20 hour rate).

Starting Capacity—175 amperes for 20 minutes.

Zero Capacity—300 amperes for 6.1 minutes.

Grounded Terminal—Negative (—) terminal.

Location—On right side under front floor.

STARTER

Auto-Lite Model MAO-4003B (Std.), MAO-4004B (Exp.). Armature No. MAO-2006.
Drive—Outboard Bendix Type RB10FXXTD.
Cranking Engine—100 RPM, 150-200 amp., 5 volts.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-32 ozs. (new brushes).

Performance Data

Torque		R.P.M.	Volts	Amperes
0	ft. lbs.	2700 Min.	5.5	44 Max.
1.5	"	1360	5.5	100
5.7	"	740	5.0	200
11.1	"	500	4.5	300
16.8	"	320	4.0	400
22.3	"	180	3.5	500
34.0	"	Lock	3.0	715
48.5	"	Lock	4.0	975

Starting Switch:—Model SS-4004 (MAO-4003B), SS-4005 (MAO-4004B). Pushbutton R.B.M. No. 3225. Magnetic type switch mounted on starter and controlled by pushbutton on instrument panel.

For complete data, refer to Electrical Equipment Index.

Removal:—Starter flange mounted on right front face of flywheel housing. To remove, take out 3 flange mounting screws.

GENERATOR

Auto-Lite Model GBC-4103, Armature No. GBC-2035. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Use test meters to check output. Ground regulator by connecting short jumper between fuse cap on regulator and generator frame while making adjustment. Turn slotted screw on commutator endplate (upper hexagonal headed screw) clockwise to increase or counter-clockwise to decrease charging rate. Remove jumper wire.

IMPORTANT NOTE—Third brush stop is set to limit maximum possible output of generator to 24-25 amperes at 8.0 volts and is locked in this position (third brush cannot be shifted beyond this point).

Maximum Charging Rate—22 amperes (cold), 16 amperes (hot), 1300 R.P.M., 20-25 M.P.H.

Performance Data

Cold Regulator Contacts Closed			Hot Regulator Contacts Closed		
Amps.	Volts	R.P.M.	Amps.	Volts	R.P.M.
0	6.4	460	0	6.4	525
4	6.7	525	4	6.8	640
8	6.95	600	8	7.2	750
12	7.25	680	12	7.6	940
16	7.55	800	16	8.0	1500
22	8.0	1300			

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—22-27 ounces.
Field Current—2.47-2.73 amperes at 6.0 volts.
Field Fuse—5 ampere in cup on regulator.
Motoring Current—4.46-4.94 amperes at 6.0 volts.

Removal:—Generator flange mounted on right rear face of timing chain case. Water pump and oil temperature regulator mounted on commutator end of generator. To remove, drain radiator, disconnect hose couplings and oil leads, remove water pump (optional). Take out 3 capscrews in generator mounting flange, pull generator to rear to disengage drive coupling. Do not disturb intermediate plate carrying drive sprocket or timing chain automatic idler sprocket will require resetting.

REGULATOR

Auto-Lite Model TC-4305A. Two Charge Type. On generator. Consists of Cutout Relay and Two-Rate Charge Control Regulator in a single case.

For complete data, refer to Electrical Equipment Index.

Cutout Relay

Cuts In—6.5-7.25 volts, 10 M.P.H.
Cuts Out—.5-2.5 ampere discharge current.
Contact Gap—.025-.040".
Air Gap—.010-.030" with contacts closed.

Regulator.

Contacts Open—8.25-8.75 volts at 70°F. Unit is over-compensated for temperature (operating voltage lower when hot).
Contacts Close—1.2-1.4 volts below opening point.
Contact Gap—.005" minimum.
Air Gap—.045" with contacts closed.

LIGHTING

Headlamps—Hall, pre-focused type.
1937-40 Models. Upper and lower beams controlled by foot selector switch on toeboard.

Adjustment—Aim headlamps straight ahead with top of upper beam 37" (lamp bulb height) above floor at 25 feet. Adjusting screws located on reflector flange and lense must be removed. Make final check with lenses in place.

Beam Indicator—Located in light switch button Lighted whenever upper beams are lighted.

Switches (1937-40)
Lighting—R.B.M. No. 2400 ('37), 2430 ('38-39).
Foot Selector—R.B.M. No. 2450 ('37), 1092 ('38-39).
Instrument—Douglas, Lincoln No. 86-13740-B.
Stop Light—Gen'l. Ind., Lincoln K-10428-B.

MISC. ELECTRICAL

CIRCUIT BREAKER:—R.B.M. Model 1630. Consists of two vibrating and one lock-out circuit breaker in case on dash (see diagram for circuits controlled by each unit.

Performance—Begin to operate with load of 35-40 amperes, limiting load to 15 amperes maximum with dead short-circuit across terminals.

Contact Spring Tension—5 ounces minimum.

FUSES: Generator Field—5 ampere on regulator.

HORNS:—Sparton. Vibrator type twin horns. Operated by horn relay. Horn current 11-13 amperes each.

Horn Relay:—R.B.M. No. 100072-L.
Contacts Close—4 volts Maximum across windings
Current Draw—.4-.55 amperes at 6.0 volts.

ENGINE

ENGINE SPECIFICATIONS:—Own. 12 cylinder, 67° Vee, 'L' head type. Cylinder block for each bank cast enbloc and separate from crankcase.
Bore—3.125". **Stroke**—4.50".
Displacement—414 cubic inches.
Rated Horsepower—46.8 S.A.E.
Developed Horsepower—150 at 3400 R.P.M.
Compression Ratio—6.38-1 Std. aluminum head.
Compression Pressure—138 lbs. at 1000 R.P.M. or 105-110 lbs. at cranking speed of 100 R.P.M.
Vacuum Reading—18-20" steady reading with engine idling at 5-7 M.P.H.

PISTONS:—Lynite, aluminum alloy, T slot, Cam ground type with oxidized bearing surface (hard oxide formed on outer surface). Recondition engines to take finished replacement pistons. **Length**—3.87". **Weight**—12.5 ozs. (less rings, pin, locking screw). **Removal**—Pistons and rods removed from below. **Clearance**—.025" top, .002" bottom. See Fitting New Pistons.

Replacement Pistons:—Finished pistons furnished standard and .0025", .015", .030" oversize.

Fitting New Pistons: Use .002" feeler inserted between piston and wall on side opposite slot at right angles to pin bosses to check clearance. Pull required to withdraw feeler must be within 5-7 lbs.

Installing Pistons:—Slot toward left (viewed from drivers seat) for all pistons.

PISTON RINGS:—Two compression, two oil control rings per piston, all above pin. Lower ring groove drilled with oil drain holes.

CONTINUED ON NEXT PAGE

ENGINE HOOD & ENGINE REMOVAL:—Turn radiator ornament counter-clockwise to free latch, lift hood
Engine Removal:—Detach water hoses and heat indicator wire, take out radiator mounting screws, remove radiator (right and left grille sections can be removed if required). Disconnect all engine wires and controls, and fuel line. Disconnect exhaust pipe at manifolds. Disconnect transmission from engine, free engine mountings, lift engine out.

OIL PAN REMOVAL: *See Lincoln Shop Notes.*

MODEL IDENTIFICATION

SERIAL & ENGINE NUMBER:—Stamped on top of clutch housing and on left side of front frame cross-member.

TUNE-UP

COMPRESSION:—**Ratio**—6.7-1 Std. aluminum head.
Pressure—146 lbs. at 1000 R.P.M. Max. or 118 lbs. at cranking speed of 100 RPM.

VACUUM READING:—18-20" steady idling at 5 M.P.H.

FIRING ORDER: 1-4-9-8-5-2-11-10-3-6-7-12. See diagram for numbering and cable connections on caps.

SPARK PLUGS: Champion Type H-10. 14 mm. Metric.
Gaps—.030" Limits .028-.030"
NOTE—Use J-10 plugs for hot climate or high speed.

IGNITION: See Coil, Condenser, and Distributor.
Breaker Gap—.014-.016" **Cam Angle** 36.5° closed (each set operating independently.
Synchronization—Unequal alternate opening at 37½-22½-37½° (distr.) intervals.
Automatic Advance—8° max. at 950 RPM (Orig. H-12127 Distr.), 11-12° max. at 650 RPM (Repl. 16H-12127 Distr.). Distributor degrees & RPM.

IGNITION TIMING: See Ignition Timing.
Std. Setting—Special settings as follows:

	H-12127 Distr.	16H-12127 Distr.
Eng. H-45530 to 57738 ('38)	At TDC	2° ATDC
All Other Engines	4° BTDC	2° BTDC

No flywheel marks provided. See Ignition Timing for timing procedure and Vacuum Brake adjustment.

CARBURETION: See Carburetor & Carb. Equipment.
Idle Setting—Both idle screws ⅝-¾ turn open (Stromberg Carb.), ⅞ turn open (Chandler-Groves Carb.). Idle speed 5-7 MPH.
Float Level (Stromberg Carb.)—Fuel level 15/32" below top of float bowl.
Float Level (Chandler-Groves Carb.)—Fuel level 11/16" plus or minus 1/32" below top of bowl.
Accelerating Pump (Stromberg Carb.).—Inner Hole—Summer, Outer Hole—Winter.
Accelerating Pump (Chandler-Groves Carb.)—Center hole—Normal. Upper hole (Summer), Lower hole (Winter) for temperature extremes.
Fuel Pump Pressure: 3½ lbs. maximum.

VALVES: See Valve Timing.
Tappet Clearance None in service (hydraulic lifter)

IGNITION

IGNITION SWITCH: Oakes Steering Column & Ignition Lock Assembly. Ford No. 96H-3676-A (Std.). Ford No. 96H-3676-B (Custom).
Lock Cylinder—Ford No. 91A-3686-A with two keys.

COIL: Ford Part No. H-12024. Two coil unit assembled as part of Ignition Unit.
Ignition Current—Approx. 3.2 amperes idling, 4.2 stopped (per coil). Ignition primary circuit resistance 1.0-1.33 ohms.
Resistor Unit—One unit connected in each coil primary circuit (2 used). Mounted on Lighting Circuit Breaker assembly No. 86H-11624.

CONDENSER: Ford Part No. H-12300 (two used).
Capacity—.30-.34 microfarad.

DISTRIBUTOR: Ford No. H-12127 (Orig. Equip.), 16H- 12127 (Repl. Unit). Double breaker, 6 lobe cam, full automatic advance type with vacuum brake control. Same design as used on other Zephyr models (alternate contact opening, requires synchronization).
Firing Interval—Movable contacts open 37½° after fixed set. Unequal 37½° and 22½° intervals (corresponding to 75° and 45° of crankshaft rotation) caused by 75° included angle between banks.
Breaker Gap—.014-.016" Both sets. Use two step feeler gauge, .014" step 'go', .016" step 'no go'.
Cam Angle or Dwell—36.5° closed, 23.5° open (each set—operate independently).
Breaker Arm Spring Tension—20-24 ounces.
Rotation—Clockwise viewed from drive end.

No. H-12127
Distributor Automatic Advance Engine

Degrees	R.P.M.	Degrees	R.P.M.
Start	200	0	400
8	950	16	1900

NOTE—Limits are 7½-8½° (distributor).

No. 16H-12127

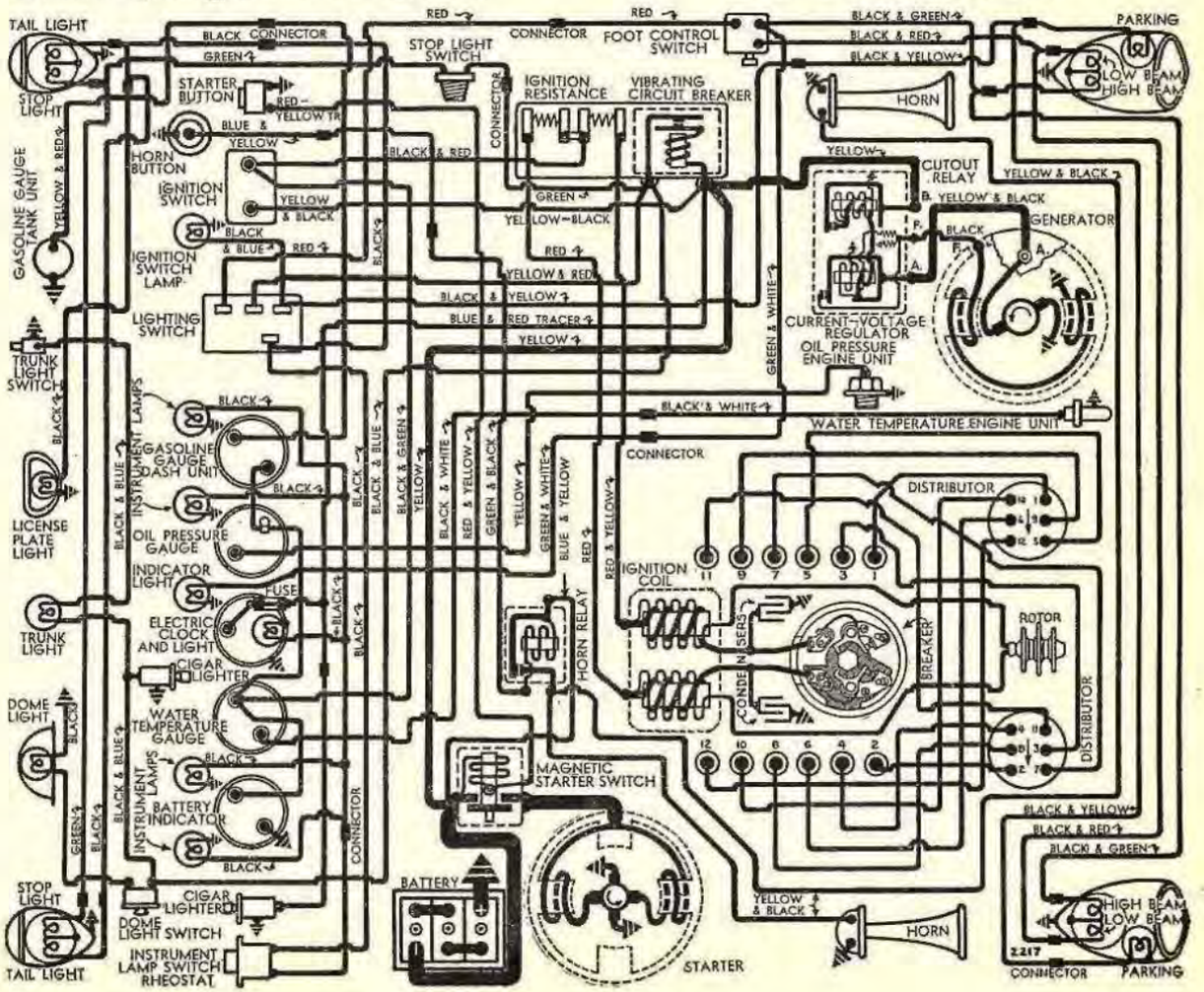
Start	200	0	400
11-12	650	22-24	1300

Distributor Removal:—Mounted on front of engine. Remove generator, disconnect vacuum line and primary leads, remove distributor cap, take out 3 capscrews in mounting flange.

IGNITION TIMING

IGNITION TIMING:—**Important Note**—Special setting for each type distributor and different setting for Engs. No. H-45530 to H-57738 (see below). See Vacuum Brake Setting also.

CONTINUED ON NEXT PAGE



ENGINE

CONTINUED FROM PRECEDING PAGE

each end. Connecting rod bronze bushed.
Pin Fit in Piston—.0003-.0009" clearance or light hand push fit with piston at 70°F.
Pin Fit in Rod Bushing—.0002-.0005" clearance (pin should pass through bushing slowly of own weight).
See Lincoln Shop Notes for Pin Fitting Directions.
Replacement Pins: *See Lincoln Shop Notes.*

CONNECTING ROD:—Weight 638 grams. Length 7.400".
Crankpin Journal Diameter—2.126".
Lower Bearing—Removable steel-backed, copper-lead lined bearing shells in each rod.
Clearance—.001-.0025". **Endplay** .014" (total).
Bearing Adjustment: None (no shims). Do not file caps. Replace bearings if less than .08375" thick.
Replacement Bearings: *See Lincoln Shop Notes.*
Installing Rods:—Assemble rods with marks on rod and cap together. Install in same numbered cylinder with marks pointing toward pan.

CRANKSHAFT:—4 Bearing. Integral counterweights. NOTE—Crankshafts furnished Std. and .020", .040" undersize.
Journal Diameters—2.401" (all bearings).
Bearing Type—Steel-backed, copper-lead lined.
Clearance—.001-.003".
Bearing Adjustment: None. Replace bearings.
End Thrust:—Taken by rear main bearing. Adjusted by replacing bearing. **Endplay**—.002-.006".
Replacement Bearings: *See Lincoln Shop Notes.*

CAMSHAFT:—Four bearing. Helical Gear Drive.
Bearing Diameters—1.797" (replace bearings if the diameter more than 1.802", replace camshaft if the journal diameter less than 1.7955").
Bearing Type—Steel-backed, babbit-lined bushings pressed in block. **Clearance**—.001-.002".
End thrust:—Taken by gear hub and coverplate. Adjusted by replacing coverplate. **Endplay** .004-.008"
Timing Gears:—Crankshaft gear cast-steel. Camshaft gear Bakelized Fabric.
Camshaft Setting:—Mesh marked crankshaft gear tooth with camshaft space between teeth marked by straight line (in line with mark on hub).

VALVES:—	Head Diameter	Stem Diameter	Length
All Valves	1.537"	.3105-.3115"	4.750-4.751"

	Seat Angle	Lift	Stem Clearance
Intake	45°	.292"	.0015-.0035"
Exhaust	45°	.292"	.0025-.0045"

NOTE—Service limit for valve stem diameter is .309" Intake, .3065" Exhaust. Valves interchangeable.
For Valve Servicing data, see Lincoln Shop Notes.
NOTE—Special seat inserts for exhaust valves.
Valve Guides: Split type retained by "C" washer and valve spring. NOTE—Replace both halves of all guides measuring less than .6665" (thickness of guide half and valve stem at top of guide with valve of .311" stem diameter in place in guide half).
Valve Lifters:—Barrel type with hydraulic tappet take-up (Wilcox-Rich Zero-lash type).
Diameter—.9995".
See Miscellaneous Section for complete data.
Valve Springs:—Free length 2.42".

	Spring Pressure	Length
Valve Closed	51-57 lbs.	2.13"
Valve Open	111-121 lbs.	1.84"

NOTE—Replace springs which do not test to 47-57 lbs. at 2⅛" or if paint coating has been removed.

VALVE TIMING

Tappet Clearance:—None in service (hydraulic lifter).
See Valve Lifter Servicing in Lincoln Shop Notes.
Valve Timing:—See Camshaft Setting above.
Int. Valves—Open 10.42° BTDC. Close 35.58° ALDC.
Exh. Valves—Open 50.92° BLDC. Close 8.08° ATDC.
To Check Valve Timing—No flywheel marks provided to check timing. If dead center position for any piston established on flywheel, intake valve for this cylinder should open approx. 3.24 flywheel teeth before this point with piston .0389" BTDC.

LUBRICATION

LUBRICATION:—Pressure system. Gear type oil pump mounted in crankcase. System changed to include oil-relief valve on oil pump, and channel for each row of hydraulic valve lifters in block (fed through metering hole from oil channel at rear of engine, excess oil flows to pressure regulator at front end).
Normal Oil Pressure—40-45 lbs. at 2000 R.P.M.
Oil Pump and Oil Pressure Regulator: *See Lincoln Shop Notes for complete data.*
Crankcase Capacity—5 quarts.
Oil Pressure Gauge:—King-Seeley Electric. Ford No.
Dash Unit—Ford No. 96H-9273.
Engine Unit—Ford No. 48-9278.
See Miscellaneous Section for complete data.

COOLING

Water Pump: Packless type, 2 used (1 for each bank)
See Water Pump Section for complete data.
Removal—Slack off drive belt, disconnect hose couplings, remove mounting screws in pump flange.
Thermostat:—In Upper radiator hose. NOTE—On first cars with thermostat at lower (engine) end of hose, reverse hose to provide additional clearance for drive belt **thermostat must be reversed in hose when this change made.** Later cars have thermostat at upper end.
Setting—Starts to open at 145°F. Fully open 180°F.
Temperature Gauge: King-Seeley Electric. Ford No.
Dash Unit—Ford No. 96H-10883.
Radiator Unit—99A-10884.
See Miscellaneous Section for complete data.
Water Capacity—30 quarts.
Drain Valves—One in left hand water outlet elbow, one at each front lower corner of engine block.

CLUTCH

CLUTCH:—**Long Model 10CF-CI.** Single plate, semi-centrifugal, dry disc type.
See Clutch Section for complete data.
Facings—Moulded type, chevron or spiral wound, 2 used. Inside Diam. 6". Outside Dia. 10". Thick. .140".
Adjustment:—Pedal free movement 1½-2". To adjust, loosen locknut and turn clevis on connector link.
Removal:—Slide transmission and rear axle to rear as a unit (see Transmission Removal below), take out mounting screws in clutch cover flange.

TRANSMISSION

TRANSMISSION:—Own Make. All helical gear, constant-mesh, synchro-mesh (second and high), sliding gear (Low and reverse) with new 'Blocker' type Synchronizer (for second and high).
See Transmission Section for complete data.
Removal:—Disconnect rear spring at center mounting on body, disconnect speedometer cable, brake cables, shock absorber links, take out mounting bolts in universal joint ball housing, slide axle assembly to rear. Remove side panel on shift lever housing, remove pin at lower end of shift lever, free lever from transmission. Support engine, take out rear engine mounting bolts, remove clutch housing mounting screws, pull transmission to rear.
NOTE—On cars before Eng. No. 47980 (without plate over rear bearing) use extreme care to prevent transmission mainshaft and rear main bearing pulling out of case when removing transmission which will allow synchronizer balls to drop out. Cars after 11/24/37 have bearing retained by plate

UNIVERSALS

UNIVERSAL JOINT:—Spicer. 1 used (at rear of transmission). *See Universals Section for complete data.*

REAR AXLE

REAR AXLE:—Own Make. New Hypoid Gear, 3/4 floating type with torque tube drive.
See Rear Axle Section for complete data.
Ratio—4.44-1 Std. **Backlash**—.002-.004".
Optional Axle:—Columbia Two-Speed type.
See Rear Axle Section for complete data.
Removal:—Disconnect shock absorber links, brake cables, rear spring at center connection on body, speedometer cable. Take out mounting bolts in universal joint ball housing, pull axle assembly back to free drive shaft at splined joint.
Axle Shaft Removal—Axle housing must be separated at pinion mounting and shafts removed from inner end (diff. side gear integral with shaft).

SHOCK ABSORBERS

SHOCK ABSORBERS:—Houde (Houdaille) No. BBLCE (front). BBCU (rear). Adjustable, hydraulic type.

FRONT SUSPENSION

Front Suspension:—Conventional 'I' beam section front axle with Reverse-Elliott ends and transverse spring. Axle positioned by radius rods.
Kingpin Inclination—4° crosswise.
Caster—5° Max., 3° Min. Caster must be alike within ½° for both wheels. Axle may be bent cold to correct caster if correct tools used (wedges and blocks to prevent crushing axle flange).
Camber—¾° Max., ¼° Min. Camber must be alike within ¼° both wheels. Correct as for Caster above.
Toe In—1/16-⅛". Adjust in usual manner by loosening tie rod clamp bolts and turning rod.
Steering Geometry (Toe out on turns)—Inner wheel turned 23°, outer 20°. Allowable variation ½°.

STEERING GEAR

Steering Gear: Gemmer Model 330. Worm-and-Roller
See Steering Gear Section for complete data.

BRAKES

Service (1939): Bendix Hydraulic, duo-servo, single anchor type without Eccentric Adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Wheel Cylinders ('39)—Dia. 1.125" (front), 1.00" (rear). Not interchangeable between wheels.
Drums—Diameter 12".
Lining—Molded (Primary or forward shoe), Woven (Secondary or rear shoe). Width 1.75". Thickness .21". Length per shoe 11.95".
Clearance—.010" at each end of each shoe.
Hand Brake: See Service Brakes above.

Note—On Ford Stroboscope, settings will be 2° BTDC (H-12127 Distr.), 1° BTDC (16H-12127 Distr.).

Timing & Synchronizing Note—Manufacturer recommends use of Stroboscope or V-126 Timing Fixture for both operations. See 1937 Lincoln-Zephyr article for all Timing Fixture data.

Timing (On Engine)—With #2 piston on top dead center (starting power stroke), loosen adjusting screw on right side of ignition unit housing, move screw down to bottom of slot, then move screw up slowly until left hand (fixed contacts) begin to open, note graduation on plate under screw head in line with reference mark on housing, move screw up one additional graduation (H-12127 Dist.), or up ½ graduation (16H-12127 Dist.) for correct timing

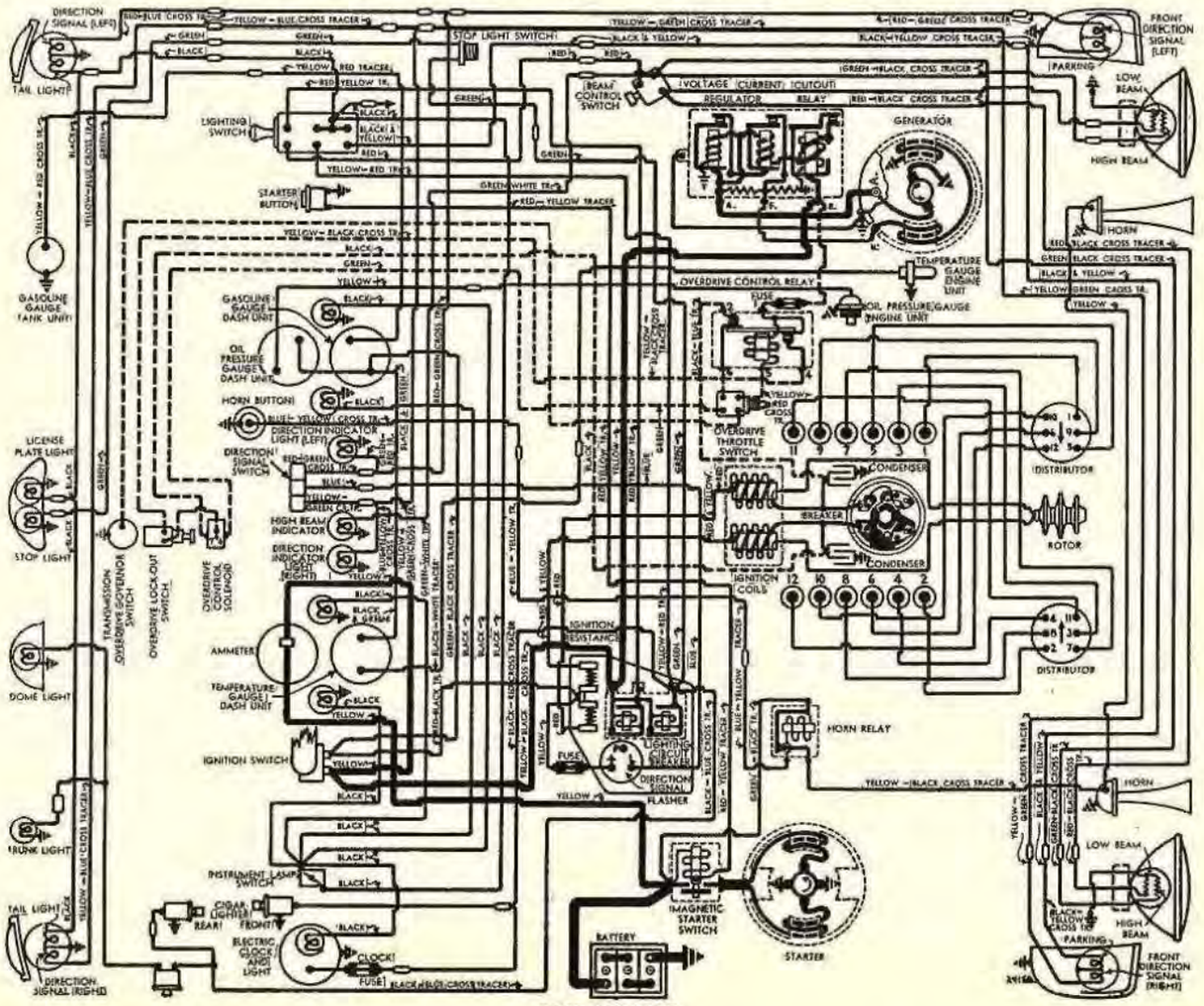
Synchronization (Movable Contacts)—No means provided for synchronization on engine (see note above). If Stroboscope, Timing Fixture, etc. used, set movable contacts to open exactly 37½° (distributor rotation) after fixed set. To adjust, remove timing adjusting screw and plate on side of housing, turn eccentric adjusting screw (visible in slot).

Vacuum Brake Setting:—Should be set for best performance with particular fuel and operating conditions. To adjust, loosen locknut and back off adjusting screw until engine pings when accelerated, then turn screw in just enough to eliminate this ping, tighten locknut. When adjusted on Stroboscope, brake should retard spark to peepsight (set at 0° advance) at speed of 950 RPM. (H-12127 Dist.), 650 RPM (16H-12127 Distr.) with no vacuum.

CARBURETOR

Holley (Chandler-Groves) Model AA-1, Ford No. 06H-9510 (1940-41), 16H-9510-B (1941) Std. on Zephyr Models (no Automatic Choke). Ford No. 16H-9505-A or 16H-9505-C Carburetor & Automatic Choke Assy. (Optl. on 1941 Zephyr, Std. on Contl. & Custom). 1" Dual (double barrel) downdraft types.

For complete data, refer to Carburetor Index.



1941 MODELS

Idle Adjustment—With engine warm, choke valve wide open and Fast Idle inoperative, set throttle lever stopscrew for 6 M.P.H. idle speed. Turn each idle adjusting screw (one for each barrel, adjust in succession) in until engine begins to miss, then out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Final setting should be approximately ⅞ turn out from the inner seated position. Reset for 6 MPH idle speed.

Float Level—Fuel level should be 19/32" plus or minus 1/32" (9/16-10/16") below top edge of bowl.

Accelerating Pump Adjustment—Three holes provided in throttle lever for pump link connection.
Inner (#1)—Min. stroke, Summer temperatures.
Center (#2)—Med. stroke, Winter temperatures.
Outer (#3)—Max. stroke, Extreme cold weather.
NOTE—Pump link locked in pump rod by snap lock.

Fast Idle:—Integral with carburetor. Operated by choke lever. No adjustment required.

CARB. EQUIPMENT

Automatic Choke (1941): Ford No. 16H-9850. Selectomatic type with automatic control when control button turned so that "A" is up, manual control when button turned so that "M" up. Automatic Choke is special Sisson type (connected to starter).

For complete data, refer to Carburetion Equip. Index.

Air Cleaner: Ford No. 06H-9600A (1940 Zephyr—with tube to manifold), 06H-9600E (1940-41 Zephyr, 1941 Custom), 06H-9600D (1940-41 Contl.) Oil-wetted type Std. Heavy duty Oil-bath type Optl. as follows: Ford No. 06H-9625A (1940 Zephyr), 16H-9625 (1941 Zephyr & Custom), 06H-9625C (1940-41 Contl.).

Gasoline Gauge:—King-Seeley Electric. Ford No.
Dash Unit—06H-9280A (1940 Zephyr), 06H-9280B (1940-41 Contl.), 16H-9280 (1941 Zephyr & Custom).
Tank Unit—01T-9275 (1940), 21C-9275A (1941).

For complete data, refer to Carburetion Equip. Index.

Fuel Pump:—AC Type R. #1523307. Ford No. 68-9350. AC Replacement Exchange Pump No. 541.

For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—**Ford No. 06H-10655-A.** 6 volt, 17 plate, 120 ampere hour capacity (20 hour rate).
Starting Capacity—150 amperes for 20 minutes.
Zero Capacity—300 amperes for 4.0 minutes.
Grounded Terminal—Positive (+) to cyl. head stud.
Location—On right side in engine compartment.
Dimensions—Length 10.6", Width 7.3", Height 9.2".

Battery Indicator:—King-Seeley. Voltmeter type. Ford No. 06H-10844-A (except Contl.), 06H-10844-B (Contl.). NOTE—This unit not used on 1941 models.

For complete data, refer to Electrical Equipment Index.

STARTER

STARTER:—**Ford No. 18-11002. Armature No. 18-11005.**
Drive—Inboard Bendix L11FX-10. Ford #B-11350.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—2 lbs. each.
Cranking Engine—100 RPM., 190-215 amperes.

Performance Data

Torque	R.P.M.	Volts	Amperes
4 ft. lbs.	1070	4.6	200
8 "	660	4.3	340
12 "	300	3.65	465
14 "	Lock	3.5	500

Starting Switch: R-B-M Model 5604, Ford No. 01A-11450 magnetic switch mounted on dash and controlled by pushbutton on instrument panel, R-B-M 3243, Ford No. 06H-11500A (1940 Zephyr—Std. Trim),

CONTINUED ON NEXT PAGE

ENGINE

CONTINUED FROM PRECEDING PAGE

End Thrust:—Taken by rear main bearing. To adjust, replace bearing. **Endplay**—.002-.006".

CAMSHAFT:—Four bearing. Helical gear drive.
NOTE—New bolted-on type Aluminum Alloy camshaft timing gear is used on these models.
Bearing Diameters—1.797" (replace bearings if the diameter more than 1.802", replace camshaft if the journal diameter less than 1.7955").
Bearing Type—Steel-backed, babbitt-lined bushings pressed in block. **Clearance**—.001-.002".
End Thrust:—Taken by gear hub and coverplate. Adjusted by replacing coverplate. **Endplay**—.005-.015"
Timing Gears: Cast-alloy iron (Crankshaft Gear), Aluminum alloy—bolted on type (Camshaft).
Backlash—.004" Max. *See Lincoln Special Shop Notes for Timing Gear servicing data.*
Camshaft Setting:—Mesh marked tooth of crankshaft gear with space marked by line on camshaft gear (this line must be in line with mark on hub).
NOTE—Capscrew holes in camshaft gear and shaft are unevenly spaced insuring correct gear position.

VALVES:—

	Head Diameter	Stem Diameter	Length
All Valves	1.537"	.3115"	4.750-4.751"

	Seat Angle	Lift	Stem Clearance
Intake	45°	.292"	.0015-.0035"
Exhaust	45°	.292"	.0025-.0045"

NOTE—Service limit for valve stem diameter is .309" Intake, .3065" Exhaust. Valves interchangeable.
For Valve Servicing data, see Lincoln Shop Notes.
NOTE—Valve Seat Inserts used for exhaust valves.
Valve Guides: Split type retained by "C" washer and valve spring. NOTE—Replace both halves of all guides measuring less than .6665" (thickness of guide half and valve stem at top of guide with valve of .311" stem diameter in place in guide half).
For Valve Guide Servicing data, see Lincoln Shop Notes.
Valve Lifters: Barrel type hydraulic tappet take-up (Wilcox-Rich Zero-Lash type or Johnson type).
Diameter—.9995".
See Miscellaneous Section for complete data.

Valve Springs:—	**Pressure**	**Length**
Valve Closed	51-57 lbs.	2.13"
Valve Open	111-121 lbs.	1.84"

NOTE—Replace springs which do not test to 47-57 lbs. at 2⅛" or if paint coating has been removed.

VALVE TIMING

Tappet Clearance:—None in service (hydraulic lifter).
See Valve Lifter Servicing in Lincoln Shop Notes.
Valve Timing:—See Camshaft Setting above.
Int. Valves—Open 10.42° BTDC. Close 35.58° ALDC.
Exh. Valves—Open 50.92° BLDC. Close 8.08° ATDC.
To Check Timing—No flywheel marks provided. If dead center position for any cylinder established on flywheel, intake valve for this cylinder should open approx. 3.24 teeth before this point with piston .0389" before top dead center.

LUBRICATION

LUBRICATION:—Pressure type with gear type oil pump
Normal Oil Pressure—40-45 lbs. at 2000 R.P.M.
Oil Pump and Oil Pressure Regulator: *See Lincoln Shop Notes for complete data.*
Oil Pressure Gauge:—King-Seeley Electric. Ford No.
Dash Unit—06H-9273A (1940 Zephyr), 16H-9273 (1941 Zephyr & Custom), 06H-9273B (1940-41 Contl.).
Engine Unit—48-9278 (All Models).
See Miscellaneous Section for complete data.
Crankcase Capacity:—5 qts.

COOLING

Water Capacity: 27 quarts (All Models).
Water Pump:—Packless type, 2 used (1 for each bank).
See Water Pump Section for complete data.
Thermostat:—In outlet hose for each bank (2 used).
Setting—Starts to open at 145°F. Fully open 180°F.
Temperature Gauge:—King-Seeley Electric. Ford No.
Dash Unit—06H-10883A (1940 Zephyr), 16H-10883 ('41 Zephyr & Custom), 06H-10883B (Continental).
Engine Unit—99A-10884 (All Models).
See Miscellaneous Section for complete data.

CLUTCH

Long Model 10CF-TI. Semi-centrifugal, single plate, dry disc type. *See Clutch Section for complete data.*
Facings—Woven type, 2 required. Inside Diameter 6". Outside Diameter 10". Thickness .140".
Adjustment:—Pedal free movement 1½-2". To adjust, loosen locknuts and turn clevis on connector link.
Removal:—Slide transmission and rear axle to rear as a unit to expose clutch (see Transmission Removal below), take out mounting screws in clutch cover.

TRANSMISSION

TRANSMISSION:—Own Model. All helical gear, constant-mesh, synchro-mesh (second & high), sliding gear (low & reverse) with steering col. shift.
See Transmission Section for complete data.
Transmission Control: Steering column shift Std.
See Transmission Section for complete data.
Removal:—Disconnect hand brake cable, hydraulic brake line at torque tube connection (bleed lines when re-connected), speedometer cable, shock absorber links. Disconnect rear spring at center frame connection. Take off universal joint ball housing bolts, slide axle assembly to rear. Disconnect shifter rods from levers at transmission. Support engine at rear, take out rear engine mounting bolts, remove clutch housing mounting screws, pull transmission

OVERDRIVE

Warner Type R10 (Optl. on 1941 Models). Electrical control type (with "kick-down" control). Used with Lincoln Transmission.
See Transmission Section for complete data.
Overdrive Solenoid—Ford No. 16H-6916.
Throttle 'Kick-down' Switch—Ford No. 16H-6918-A (Zephyr & Custom), 16H-6918-B (Continental). Adjust switch so that it closes when carburetor throttle valve is wide open.
Lock-Out Switch—Ford No. 16H-6917.
Governor Switch—Ford No. 16H-6919.
Control Relay—Ford No. 16H-6915.
Removal: Remove Overdrive Control Solenoid before removing Overdrive and Transmission from car. To remove solenoid, disconnect wires on solenoid terminals, take out mounting bolts, in solenoid flange, **turn solenoid approximately 60° right or left to disengage solenoid stem from pawl** (ball end of stem is flattened on two sides), pull solenoid out. Then remove Overdrive and Transmission (see data above).
►INSTALLATION CAUTION—Do not install Solenoid until Overdrive unit installed on transmission. To install solenoid, insert stem in adapter with ball end flats horizontal, make certain that short pilot on end of solenoid body enters counterbore in adapter casting, **turn solenoid approximately 60° to left to engage stem in pawl** and line up solenoid flange mounting holes. Check engagement of stem and pawl by attempting to pull solenoid out. Install bolts, connect leads **with solenoid terminals UP.**

UNIVERSALS

Spicer Model 2102-1. Needle bearing type. One used
See Universals Section for complete data.

REAR AXLE

REAR AXLE:—Own Model. ¾ floating, Hypoid Gear type with Torque Tube drive.
See Rear Axle Section for complete data.
Ratio—4.44-1. **Backlash**—.002-.004".
Optl. Axle:—Columbia Two-speed type.
See Rear Axle Section for complete data.
Removal:—Disconnect hand brake cable, hydraulic brake line at torque tube connection (bleed lines when re-connected), speedometer cable, shock absorber links. Disconnect rear spring at center frame connection, take out universal joint ball housing bolts, pull axle assembly to rear to free drive shaft
Axle Shaft Removal—*Refer to the Rear Axle Section Index for article on Lincoln (Zephyr) Rear Axle.*

SHOCK ABSORBERS

Houde (Houdaille) Type BBCM (1940 Front), BBCX (1940 Rear), BBCHN (1941 Front), BBCLZ (1941 Rear). Double acting, hydraulic. Ford Numbers:

	Right	Left
1940 Models—Front	06H-18045	06H-18046
1940 Models—Rear	06H-18080	06H-18081
1941 Models—Front	16H-18045	16H-18046
1941 Models—Rear	16H-18080	16H-18081

FRONT SUSPENSION

Front Suspension:—Conventional I-beam section axle with Reverse-Elliott ends and transverse spring. **Axle positioned by radius rods and anti-sway bar.**
Kingpin Inclination—4° crosswise.
Caster—3° Min., 5° Max. Must be equal for both wheels within ½°. No adjustment.
Camber—¼° Min., ¾° Max. Must be equal for both wheels within ¼°, right wheel must not exceed left.
Toe In—1/16". Set at 1-10 ratio to Camber. To adjust, loosen clamp bolts, turn tie rod.
Steering Geometry (Toe out on turns)—Inner wheel turned 23°, outer 20°. Allowable variation ½°.

STEERING GEAR

Gemmer Model 330. Worm-and-Roller type.
See Steering Gear Section for complete data.

BRAKES

BRAKES:—Service—Bendix Hydraulic, duo-servo, single anchor type without eccentric adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Wheel Cylinders—Diameter 1.125" (front), 1.00" (rear). Not interchangeable from one wheel to another. **Drums**—Diameter 12".
Lining—Molded (primary or forward shoe), Woven (secondary shoe). Width 1.75". Thickness .21", Length per shoe 11.95".
Clearance—.010" at each end of each shoe.
Hand Brake:—See Service Brakes above.

MISC. MECHANICAL

Power Operated Conv. Top: (1940) Vacuum Power type.
(1941) Auto-Lite Electric type.
See Miscellaneous Section for complete data.
Window Regulators (1941): Hydro-Electric type.
See Miscellaneous Section for complete data.

IGNITION TIMING

IGNITION TIMING:—See Vacuum Brake Setting below for correction dependent on fuel and operating conditions.

	Flywheel Degrees
All Engines (16H-12127 Distr.)	2° BTDC.

Timing—Manufacturer recommends use of Ford Laboratory Test Set (Heyer H1) with Distributor Stroboscope (Heyer H1-DFZ) and Stroboscope Attachment (Heyer H1-BRS). On Stroboscope, set Stroboscopic Disc at 37½°, set Timing Index at 1° before top dead center, set peepsight at Zero. Adjust distributor by loosening adjusting screw in slot on right hand side of housing, move screw down (to retard spark), up (to advance spark) in slot until stroboscopic disc light is in line with peepsight. Synchronize Movable Contacts (see below).

Timing (On the Car)—No flywheel marks provided. With distributor adjusted as described above (and movable contacts synchronized), this will give correct 2° BTDC. timing when installed on engine.

Synchronization (Movable Contacts)—No means provided for synchronization on engine. If Stroboscope, etc. used, set movable contacts to open exactly 37½° (distributor rotation) after fixed set. To adjust, remove adjusting screw and turning synchronizing screw visible in slot.

Vacuum Brake Setting—Should be adjusted to eliminate pinging when engine operated with load. To adjust, loosen locknut, back off adjusting screw until engine pings with load, then turn screw in just enough to eliminate ping, tighten locknut. When adjusted on Stroboscope, vacuum brake should retard spark to peep sight with peep sight set at 1° when distributor is driven at 650 RPM. with no vacuum to release brake.

CARBURETOR

Holley (Chandler-Groves)—Two models used: Ford No. 26H-9505-C (without Automatic Choke). Ford No. 26H-9505-D (cars with Automatic Choke). Dual (double barrel) downdraft type.
See Carburetor Section for complete data.

Idle Adjustment—With engine warm, choke valve wide open and Fast Idle inoperative, set throttle lever stopscrew for 6 MPH. idle speed. Turn each idle adjusting screw (one for each barrel. adjust in succession) in until engine begins to miss, then out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Final setting should be approximately ⅞ turn out from the inner seated position. Re-adjust throttle stopscrew for correct idling speed of 6 MPH. NOTE—If vacuum gauge used, set for highest steady gauge reading.

Liquamatic Drive Idle Speed Note—Set idle speed for cars with Liquamatic Drive at 350 RPM.

Accelerating Pump Setting—Three holes provided in the throttle lever for pump rod link connection. Adjust for seasonal requirements as follows:
#1 (Inner)—Min. stroke, Summer temperatures.
#2 (Center)—Med. stroke, Winter temperatures.
#3 (Outer)—Max. stroke, Extreme cold weather.

Float Level—Use Ford Gauge 9550-A to set the float level with 1/16" feeler between float and gauge (1.353" end 'Go', 1.322" end 'No Go') measuring from bottom of bowl cover to bottom of float (with 1/16" feeler between float and gauge). Fuel level in bowl should be 18/32-20/32".

Metering Jets—*See Holley (Chandler-Groves) Ford Jet Specification Table in Carburetor Section.*

Anti-Stall Device (Cars with Liquamatic Drive):—Ford No. 26H-9944. Vacuum operated throttle kicker.

Fast Idle (Cars without Automatic Choke):—Integral type. Operated by choke lever. No adjustment.

Automatic Choke:—Std. on Continental & Custom, Optl. Zephyr. *Refer to Carburetion Equipment Index. for Sisson Automatic Choke article for complete data.*

CARB. EQUIPMENT

Air Cleaner:—Ford No. 26H-9625-A (Zephyr & Custom), 26H-9625-B (Continental) oil bath type.

Fuel Pump:—AC Type R, #1537709. Ford No. 26H-9350. Diaphragm type. **Pressure**—1½-2¾ lbs.
For complete data, refer to Carburetion Equip. Index.

Gasoline Gauge:—King-Seeley Electric type. Ford No. 26H-9280 (dash unit), No. 21C-9275-A (tank unit).
For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—**Ford No. 06H-10655-A.** 6 volt, 17 plate, 120 ampere hour capacity (20 hour rate).

Starting Capacity—150 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.0 minutes.

Grounded Terminal—Positive (+) grounded to cylinder head stud of right hand bank.

Location—On right side in engine compartment.

Dimensions—Length 10.6". Width 7.3". Height 9.2".

STARTER

STARTER:—

Car Model	Ford Nos. Starter	Armature
Conv. Coupe (76)①	26H-11001-A	26H-11005-A
Conv. Coupe (76)②	26H-11001-B	
All Others①	18-11002	18-11005

①—Std. transmission. ②—With Liquamatic Drive.

Drive—With Std. Trans.: Inboard Bendix L11FX-10, Ford No. B-11350 (All exc. Conv. Coupe). Ford B&S Drive No. 91A-11350 (Conv. Coupe). **With Liquamatic Drive:** Barrel Type Bendix No. A-2100, Ford No. 09B-11350 (All Models).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—2 lbs. each.

Cranking Engine—100 RPM., 190-215 amperes.

Performance Data

Torque	R.P.M.	Volts	Amperes
4 ft. lbs.	1070	4.6	200
8 "	660	4.3	340
12 "	300	3.65	465
14 "	Lock	3.5	500

Starting Switch:—R-B-M Model 5604, Ford No. 01A-11450-A magnetic switch mounted on the dash and controlled by pushbutton on instrument panel Ford No. 26H-11500-A (Zephyr), 26H-11500-B (Others).

Removal:—Starter mounted on right front face of flywheel housing. To remove, take off pan at right of engine, free starter-to-oil pan support bracket, take out through-bolts on commutator end plate.

GENERATOR

GENERATOR:—**Ford No. 21A-10000. Armature No. 01A-10005.** Two brush (shunt) type with vibrating type voltage and current regulation. Ventilated by fan on drive pulley.

Charging Rate Adjustment.—None. See Regulator.

Maximum Charging Rate—Controlled by regulator and dependent on battery condition and load. To check generator output, disconnect generator field lead at generator, connect both generator terminals together (use short insulated wire). Use 'BRS' set or rheostat connected across battery terminals and apply load until voltage is exactly 6 volts. Connect ammeter in charging line, run engine, check output at 2 speeds given in performance table below. Restore original connections after completing test.

Do not operate generator in service with both terminals connected together. This eliminates all regulator action and will damage generator.

Performance Data

Amperes	Engine RPM.
Start	520
30	1060
30	2500

Rotation—Counter-clockwise at commutator end.

Field Current—2.1 amperes at 6.0 volts (field resistance 2.88 ohms at 70°F.).

Brush Spring Tension—Approximately 28 ozs.

Removal:—Generator mounted on bracket between cylinder banks at front of engine, driven in tandem with water pumps by Vee belt. To remove, loosen nut on bracket stud.

Belt Adjustment:—Loosen nut on bracket mounting stud, raise generator up until side movement on belt midway between generator and water pump pulleys is 1" (thumb and finger pressure).

REGULATOR

REGULATOR:—**Ford No. 11A-10505. Three-Unit type.** Consists of Cutout Relay, vibrating Voltage Regulator and vibrating Current Regulator (separate units) in single case on engine side of dash.
For complete data, refer to Electrical Equipment Index.

NOTE—Regulator case is grounded through separate ground wire extending from regulator to generator frame. This ground connection must be in place when regulator being operated or tested.

Cutout Relay

Cuts In—5.3-6.3 volts at operating temperature.
Cuts Out—8 ampere discharge current (maximum).

Voltage Regulator

Setting—6.9-7.2 volts at 70-80° F. See Ford Regulator article in the Electrical Equipment Section for voltages at other temperatures.

Checking & Adjusting—*Refer to Electrical Equipment Index for article on 'Ford Regulator—3-unit type'.*

Current Regulator

Setting—30-33 amperes hot (after engine run for 5 minutes).

Checking & Adjusting—See Voltage Regulator above.

CONTINUED ON NEXT PAGE

Oil Pump and Oil Pressure Regulator: *See Lincoln Shop Notes for complete data.*

Oil Pressure Gauge:—King-Seeley Electric. Ford No. 26H-9273 (dash unit), No. 48-9278 (engine unit). *See Miscellaneous Section for complete data.*

Crankcase Capacity:—5 qts.

COOLING

COOLING SYSTEM:—Capacity—27 quarts.

Water Pump:—Packless type, 2 used (1 for each bank). *See Water Pump Section for complete data.*
Removal—Slack off drive belt, disconnect hose couplings, take out mounting screws on pump.

Thermostat:—In outlet hose for each bank (2 used). **Setting**—Starts to open at 145°F. Fully open 180°F.

Temperature Gauge:—King-Seeley Electric. Ford No. 26H-10883 (dash unit), No. 99A-10884 (engine unit). *See Miscellaneous Section for complete data.*

CLUTCH

CLUTCH:—Long Model 10CF-TI. Semi-centrifugal single plate, dry disc type. *See Clutch Section for complete data.*
Liquamatic Drive Cars—These cars equipped with different type driven member. *See Clutch Section for complete data.*
Facings—Woven type, 2 required. Inside Diam. 6". Outside Diameter 10". Thickness .140".
Adjustment:—Pedal free movement 1½-2". To adjust, loosen locknuts and turn clevis on connector link.
Removal:—Slide transmission and rear axle to rear as a unit to expose clutch (see Transmission Removal below), take out mounting screws in clutch cover.

TRANSMISSION

STANDARD

TRANSMISSION (STD.):—Own Make. Constant-mesh, synchro-mesh (second and high), sliding gear (low and reverse). All helical gear type. *See Transmission Section for complete data.*

Transmission Control:—Mechanical steering col. shift. *See Transmission Section for complete data.*

Removal:—Disconnect hand brake cable, hydraulic brake line at torque tube connection (bleed lines when re-connected), speedometer cable, shock absorber links. Disconnect rear spring at center frame connection. Take off universal joint ball housing bolts, slide axle assembly to rear. Disconnect shifter rods from lever at transmission. Support engine at rear, take out rear engine mounting bolts, remove clutch housing mounting screws, pull transmission straight back.

TRANSMISSION

OPTIONAL EQUIPMENT

LIQUAMATIC DRIVE:—Consists of liquid coupling and Warner Model T94A-R10A 3 speed semi-automatic transmission (automatic shifting between 2nd & 3rd speeds) with overdrive. Optional equipment. *See Transmission Section for complete data.*

OVERDRIVE

Overdrive (Optl.):—Warner Type R10A overdrive with electrical solenoid control (no centrifugal pawls) and 'kick-down' feature. *See Transmission Section for complete data.*
Overdrive Solenoid—Ford No. 16H-6916.
Throttle 'Kick-down' Switch—Ford No. 16H-6918-A (Zephyr & Custom), 16H-6918-B (Continental). Adjust switch so that it closes when carburetor throttle valve is wide open.
Lock-out Switch—Ford No. 16H-6917. Mounted on Overdrive case.
Governor Switch—Ford No. 16H-6919.
Control Relay—Ford No. 26H-6915.

Removal: Remove Overdrive Control Solenoid before removing Overdrive and Transmission from car. To remove solenoid, disconnect wires on solenoid terminals, take out mounting bolts in solenoid flange, **turn solenoid approximately 60° right or left to disengage solenoid stem from pawl** (ball end of stem is flattened on two sides), pull solenoid. Then remove Overdrive and Transmission (see data above).

►INSTALLATION CAUTION—Do not install Solenoid until Overdrive Unit installed on transmission. To install solenoid, insert stem in adapter with ball end flats horizontal, make certain that short pilot on end of solenoid body enters counterbore in adapter, **turn solenoid approx. 60° to left to engage stem in pawl** and line up solenoid flange mounting holes. Check engagement of stem and pawl by attempting to pull solenoid out (solenoid should not be free and resistance of solenoid spring should be felt.) Install mounting bolts and connect leads at terminals.
CAUTION—Solenoid terminals must be "up."

UNIVERSALS

UNIVERSAL JOINT:—Spicer Model 2102-1. Needle bearing type. Single joint at rear of transmission. *See Universals Section for complete data.*

REAR AXLE

REAR AXLE:—Own Model. ¾ floating, Hypoid Gear type with Torque Tube drive. *See Rear Axle Section for complete data.*
Ratio—4.44-1. Backlash—.002-.004".

Removal:—Disconnect hand brake cable, hydraulic brake line at torque tube connection (bleed lines when re-connected), speedometer cable, shock absorber links. Disconnect rear spring at center frame connection. Take out universal joint ball housing bolts, pull axle assembly to free shaft at joint.
Axle Shaft Removal—*Refer to the Rear Axle Section Index for article on Lincoln Rear Axle for data.*

SHOCK ABSORBERS

SHOCK ABSORBERS:—Houde (Houdaille)—Types BBCHO (Front), BBCLY (Rear). Lincoln No. 26H-18045 (Right Front), 26H-18046 (Left Front), 26H-18080 (Right Rear), 26H-18081 (Left Rear). Double acting, hydraulic, adjustable type.

FRONT SUSPENSION

Front Suspension:—Conventional I-beam section axle with Reverse-Elliott ends and transverse spring. Axle held by radius rods and anti-sway strut rod.
Kingpin Inclination—4° crosswise.
Caster—3° Min., 5° Max. Must be equal for both wheels within ½°. No adjustment.
Camber—¼° Min., ¾° Max. Must be equal for both wheels within ¼°, right wheel must not exceed left.
Toe In—1/16". Set at 1-10 ratio to Camber. To adjust, loosen clamp bolts, turn tie rod.
Steering Geometry (Toe out on turns)—Inner wheel turned 23°, outer 20°. Allowable variation ½°.

STEERING GEAR

Gemmer Model 330. Worm-and-Roller type. *See Steering Gear Section for complete data.*

BRAKES

BRAKES:—Service—Bendix-Hydraulic, duo-servo, single anchor type without eccentric adjustment. Hand lever applies rear wheel service brakes. *See Brake Section for complete data.*
Wheel Cylinders—Diameter 1.125" (front), 1.00" (rear). Not interchangeable from one wheel to another. **Drums**—Diameter 12".
Lining—Molded (primary or forward shoe), Woven (secondary shoe). Width 1.75". Thickness .21", Length per shoe 11.95".
Clearance—.010" at each end of each shoe.
Hand Brake:—See Service Brakes above.

MISC. MECHANICAL

Power Operated Convertible Top: Auto-Lite Electric type. *See Miscellaneous Section for complete data.*
Window Regulators: Hydro-Electric type. *See Miscellaneous Section for complete data.*

Vacuum Brake: Consists of a spring-loaded, vacuum controlled brake piston which bears on edge of retard disc of breaker advance mechanism and acts as a "drag" to retard normal advance when engine is accelerated or operated under load. Piston is normally held out of engagement by manifold vacuum.

IGNITION TIMING

Std. Setting—All Engines.....2° BTDC. See Vacuum Brake Setting for service correction for operating conditions and octane rating of fuel used.

Ignition Timing (Basic Setting)—Distributor can be set for correct ignition timing when off engine as follows: Place a small straight edge or scale against the tang on the drive end of the shaft (scale must be on **wide** side of shaft), rotate distributor in direction of rotation (clockwise) until the **trailing** edge of the scale is exactly 11/32" past the nearest edge of the mounting hole in the flange which is nearest the vacuum brake. If left hand (fixed) breaker contacts do not open at this point, loosen adjusting screw on side of distributor housing, move screw up (to advance timing), down (to retard timing) until contacts begin to open, tighten adjusting screw. Then check synchronization of movable contacts as follows:

Synchronization (Basic Setting)—Remove timing adjusting screw and plate on side of distributor for access to synchronizing screw (visible in adjusting screw slot). Place a scale on the wide side of the shaft and against the tang (as for timing above), rotate distributor shaft in direction of rotation (clockwise) until **leading** edge of scale is exactly 27/32" before the nearest edge of the mounting hole in the flange which is nearest the vacuum brake. If right hand (movable) contacts do not open at this point, turn synchronizing adjusting screw until contacts begin to open. Replace adjusting screw and plate, recheck timing of left hand (fixed) contacts as directed above.

Timing (On Engine)—No flywheel marks or other means provided to check or adjust ignition timing on the engine. If basic setting (timing & synchronizing of contacts) is correct as directed above, all necessary adjustments for operating conditions and octane rating of fuel being used can be made by means of Vacuum Brake Setting as follows:

Vacuum Brake Setting:—Should be set for best performance with particular fuel and operating conditions. To adjust, loosen locknut and back off adjusting screw until engine pings when accelerated, then turn screw in just enough to eliminate this ping, tighten the locknut.

CARBURETOR

Holley (Chandler-Groves) Ford No. 26H-9510-C. Dual (double barrel) downdraft with manual choke. ***See Carburetor Section for complete data.***

Idle Adjustment—With engine warm, choke valve wide open and Fast Idle inoperative, set throttle lever stopscrew for 6 M.P.H. idle speed. Turn each idle adjusting screw (one for each barrel, adjust in succession) in until engine begins to miss, then out until engine begins to roll, finally turn screw in until engine fires smoothly. Recheck idle speed.
NOTE—Set for highest reading on Vacuum Gauge.

Float Level—Use Gauge 9550-A to check float level. Invert air horn and float assembly, place gauge on face of bowl cover. Bottom of float should be 1.322-1.353" from face of cover (1.353" part of gauge "Go", 1.322" part of gauge "No Go"). Adjust by bending lip of float lever. Fuel level in bowl should be 11/16" plus or minus 1/32" below top edge of bowl.

Accelerating Pump Adjustment—Three holes provided in throttle lever for pump link connection.
Inner (#1)—Min. stroke, Summer temperatures.
Center (#2)—Medium stroke, Normal Temperature.
Outer (#3)—Max. stroke, Extreme cold weather.
NOTE—Pump link locked in pump rod by snap lock. Pull link shaft out of pump rod to disengage lock.

Metering Jets—***See Chandler-Groves (Ford) Jet Specification Table in Carburetor Section.***

Fast Idle:—Integral with carburetor. Operated by choke lever. No adjustment required.

CARB. EQUIPMENT

Air Cleaner: Ford No. 26H-9625-A (Lincoln), 26H-9625-B (Cont'l) Heavy duty Oil-bath type.

Servicing—Clean and re-fill (to level mark on case) with same grade engine oil used in crankcase at 3500 mile intervals (when crankcase drained) or more often if required. Wash filter element.
NOTE—Clean and re-oil filter element in oil filler cap (crankcase breather) every 1000 miles.

Gasoline Gauge: King-Seeley Electric. Ford Nos. **Dash Unit:** 5EH-9280A ('46 Lincoln), 5EH-9280B ('46 Continental), 5EH-9280C ('47 All). **Tank:** 21C-9275A.

Fuel Pump: AC Type R. No. 1537709, Ford No. 26H-9350A. Diaphragm type. ***See Carburetion Equipment Section for data.***

Pressure—3½ lbs. maximum (1½-3½ lbs.).

BATTERY

Ford Type 06H-10655-A. 6 Volt, 17 Plate, 120 Ampere Hour Capacity (20 hour rate).

Starting Capacity—150 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.0 minutes.

Grounded Terminal—Positive (+) grounded to cylinder head stud of right hand bank.

Location—On right side in engine compartment.

Dimensions—Length 10.6". Width 7.3". Height 9.2".

STARTER

Ford Model No. 18-11002 or Ford No. 5EH-11001.

Armature No.—Ford No. 18-11005 (for 18-11001).

Drive—Bendix No. A1472 (Ford No. B-11350) or Bendix No. A-2100 (June 1947, starting Ser. No. 7H-165897).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—2 lbs. each.

Cranking Engine—100 RPM., 190-215 amperes.

Performance Data

Torque	R.P.M.	Volts	Amperes
4 ft. lbs.	1070	4.6	200
8 "	660	4.3	340
12 "	300	3.65	465
14 "	Lock	3.5	500

Starting Switch: Ford No. 21A-11450. Magnetic switch mounted on the dash and is controlled by panel pushbutton switch Ford No. 5EH-11500.

Removal:—Starter mounted on right front face of flywheel housing. To remove, take off pan at right of engine, remove bolts on commutator endplate

GENERATOR

Ford Model No. 21A-10000. Armature No. 01A-10005A. Two brush (shunt) type with vibrating voltage and current regulation. Ventilated by fan

Charging Rate Adjustment.—None. See Regulator.

Maximum Charging Rate—Controlled by regulator and dependent on battery condition and load. To check generator output, disconnect generator field lead at generator, connect both generator terminals together (use short insulated wire). Use 'BRS' set or rheostat connected across battery terminals and apply load until voltage is exactly 6 volts. Connect ammeter in charging line, run engine, check output at 2 speeds given in performance table below. Restore original connections after completing test.

Do not operate generator in service with both terminals connected together. This eliminates all regulator action and will damage generator.

Amperes	Engine RPM.
Start	520
30	1060
30	2500

Rotation—Counter-clockwise at commutator end.

Field Current—2.1 amperes at 6.0 volts (field resistance 2.88 ohms at 70°F.).

Brush Spring Tension—Approximately 28 ozs.

Removal:—Generator mounted on bracket between cylinder banks at front of engine, driven in tandem with water pumps by Vee belt. To remove, loosen nut on bracket stud.

Belt Adjustment:—Loosen nut on bracket mounting stud, raise generator up until side movement on belt midway between generator and water pump pulley is ½" (thumb and finger pressure).

REGULATOR

Ford Model No. 01A-10505-C. Three Unit Type. Consists of Cutout Relay, vibrating Voltage Regulator and vibrating Current Regulator (separate units) in single case on engine side of dash. ***See Electrical Equipment Section for complete data.***

NOTE—Regulator case is grounded through braided wire 'pigtail' or separate ground wire extending from regulator to generator frame. Ground wire must be in place when generator operated.

Cutout Relay

Cuts In—5.8-6.3 volts at operating temperature.
Cuts Out—8 ampere discharge current (maximum).

Voltage Regulator

Setting—6.9-7.2 volts at 70-80° F. See Ford Regulator article in Electrical Equipment Section for voltages at other temperatures.

Checking & Adjusting—***Refer to Electrical Equipment Index for article on 'Ford Regulator—3-unit Type'***

Current Regulator

Setting—30-33 amperes hot (after 5 minutes run).

Checking&Adjusting—See Voltage Regulator above.

LIGHTING

Headlamps: Ford "Sealed Beam" type.

Controlled by Lighting Switch on instrument panel and Beam Selector Switch on toeboard. ***See Electrical Equipment Section for complete data.***

CONTINUED ON NEXT PAGE

Oil Pump: Gear type. In crankcase at rear of engine.
Oil Pump Servicing—*See Lincoln Shop Notes.*

Oil Filter: Replace cartridge at 5000 mile intervals (Ford No. 01A-18662-A1).

Oil Pressure Gauge: King-Seeley Electric. Ford Nos.
Dash Unit: 5EH-9273A ('46 Lincoln), 5EH-9273B('46 Continental), 5EH-9273C (All 1947).
Engine Unit—No. 48-9278 (All Models).
See Miscellaneous Section for complete data.

COOLING

Cooling System: Positive circulation with two water pumps at front of engine (pump for each bank), pressure system with relief valve in radiator cap.
Capacity—27 quarts.
Pressure Valve—In radiator filler cap. Opens at 3½-4½ lbs. Radiator Cap No. 26H-8100-B.

Water Pump: Packless type with ball bearing at pulley end (plain bushing at impeller). Two used.
See Water Pump Section for complete data.
Removal—Drain cooling system, loosen generator belt adjustment, remove belt. Disconnect and remove hose at water pump. Take out four capscrews mounting pump on cylinder block, lift pump out.
Belt Adjustment—*See Generator Belt Adjustment.*

Thermostat: In outlet hose for each bank (2 used).
Setting—Start to open at 150-155°F. Fully open at 175-180°F.

Temperature Gauge: King-Seeley Electric. Ford Nos.
Dash Unit: 5EH-10883A ('46 Lincoln), 5EH-10883B ('46 Continental), 5EH-10883C (All 1947).
Engine Unit—No. 99A-10884 (All Models).
See Miscellaneous Section for complete data.

CLUTCH

Long Model 10CF-TI, Ford No. 26H-7563. Semi-centrifugal, single plate, dry disc type.
See Clutch Section for complete data.
Facings—Woven asbestos composition. I. D. 6¾". O. D. 10". Thickness .125" (⅛").

Pedal Adjustment: Pedal free travel 1¼-2". To adjust, loosen locknuts and turn adjusting turnbuckle on connector rod between clutch throw-out lever and equalizer shaft lever. CAUTION—Opening in turnbuckle must be horizontal to prevent it binding on transmission case.

Removal: Remove transmission (see Transmission Removal below), block clutch release levers in disengaged position by inserting wedge between each lever and clutch cover. Take out six capscrews mounting clutch on flywheel, lift out assembly.

TRANSMISSION

Own Make No. 01A-7005 (Std.), 26H-7005-A (With Overdrive). All helical gear type, constant-mesh, synchro-mesh (Second & High), sliding gear (Low & Reverse).
See Transmission Section for complete data.

Transmission Control: Mechanical steering col. shift.
See Transmission Section for complete data.

Removal: Remove rear axle assembly (see Rear Axle Removal below). Disconnect Overdrive control and wires at solenoid, lockout switch and governor, remove solenoid as directed under Overdrive (cars with Overdrive Transmission only). Disconnect gearshift rods at transmission case levers, take out capscrew and washer mounting universal joint on transmission shaft, slide universal to rear and remove. Disconnect and remove clutch throw-out equalizer shaft. Remove nuts and flat washers on engine rear support bolts. Place support jack under rear end of engine (use wood block on jack), raise rear end of engine so that rear support clears mounting bolts. Take out eight capscrews mounting transmission on flywheel housing, pull transmission straight back and remove from car.

OVERDRIVE

Warner Model AS2-R10 (before Mar. 1, 1947), AS3-R10 (After Mar. 1, 1947). Optl. equipment, used with special Lincoln Transmission. Overdrive is solenoid operated with governor control and throttle operated "kick-down".
See Transmission Section for complete data.
Solenoid—Ford No. 16H-6916.
Control Relay—Ford No. 26H-6915-A.
Control Governor—Ford No. 16H-6919.
Throttle Kick-down Switch—Ford No. 16H-6918-A (Lincoln), 16H-6918-B (Continental).
Lock-out Switch—Ford No. 16H-6917.

Removal: Same as for Std. transmission (above) except for removal and installation of the solenoid.

►IMPORTANT SERVICE NOTE—Solenoid should be removed before transmission or overdrive removed from car (and installed after these units installed) and must be removed exactly as follows to avoid damage to unit: Disconnect wires at solenoid terminals, take out two mounting screws in base flange, **rotate solenoid approximately 60° to right** to disengage pawl rod from pawl (this will line up flats on end of rod with slot in pawl), withdraw solenoid and pawl rod assembly. To install solenoid, insert pawl rod in adapter with flats horizontal, make certain that short pilot on end of solenoid body enters counterbore in adapter casting, **rotate solenoid approximately 60° to left** to engage pawl rod in pawl and to line up solenoid flange mounting holes. Check engagement of pawl by attempting to pull solenoid out (solenoid should not come out and resistance of solenoid spring should be felt). Install solenoid mounting screws and connect wires.

UNIVERSALS

Spicer Model 2102-1X. Needle bearing type. Single universal in torque ball at rear of transmission.
See Universals Section for complete data.

REAR AXLE

Own Make. ¾ Floating, Hypoid Gear type with Torque Tube drive.
See Rear Axle Section for complete data.
Ratio—4.22-1 Std.
Backlash—.002-.004"

Removal: Raise rear end of car. Disconnect track bar. Disconnect rear spring (use spring spreader if available) by placing block under each rear spring eye and lowering car so that weight keeps spring extended, then remove spring shackle bolts and bars. Take out pin in hand brake equalizer and disconnect hand brake cable. Disconnect hand brake conduit retainer and hydraulic brake line at torque tube, disconnect shock absorber links. Remove front floor pan. Disconnect speedometer cable at torque tube. Take off nuts on four universal housing ball cap bolts, remove two bolts holding ball cap halves together, remove ball cap. Pull rear axle assembly straight back to disconnect torque tube from transmission, remove axle assembly from beneath car.
Axle Shaft Removal—*See Lincoln Rear Axle article in Rear Axle Section for complete data.*

SHOCK ABSORBERS

Houde (Houdaille). Double acting, hydraulic type.

	Houde Model	Right—Ford No.—Left
Front	BBCHO-6	5EH-18045.....5EH-18046
Rear	BBCLY-6	5EH-18080.....5EH-18081

Adjustment—Std. setting marked by line on face of lever hub (pointer should be aligned with this mark). Adjustment can be varied by turning pointer clockwise (for more control), or counter-clockwise (for less control) not more than **1 or 2 serrations at a time.** NOTE—Stops are provided to limit adjustment in either direction.

Refilling: Check at 5000 mile intervals and fill to level of filler plug hole. Use Ford No. M-4633-B fluid only (Houde L-1404) which is required for these new shock absorbers with **round top filler plug.**

FRONT SUSPENSION

Front Suspension:—Conventional I-beam section axle with Reverse-Elliott ends and transverse spring. Axle held by radius rods and anti-sway strut rod.
Kingpin Inclination—4° crosswise.
Caster—3° Min., 5° Max. Must be equal for both wheels within ½°. No adjustment.
Camber—¼° Min., ¾° Max. Must be equal for both wheels within ¼°, right wheel must not exceed left.
Toe In—1/16". Set at 1-10 ratio to Camber. To adjust, loosen clamp bolts, turn tie rod.
Steering Geometry—Outer wheel 20°, Inner 23° ± ½°

STEERING GEAR

Gemmer Model 330. Worm-and-Roller type.
See Steering Gear Section for complete data.

BRAKES

Service: Bendix Hydraulic, Duo-servo, Single Anchor type **without eccentric adjustment.** Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Wheel Cylinders—Diameter 1.125" (front), 1.00" (rear). Not interchangeable between wheels.
Drums—Composite Cast Iron type. Diameter 12".
Lining—Molded (primary or forward shoe), Woven (secondary shoe). Width 1.75". Thickness .21". Length per shoe 11.95".
Clearance—.010" at each end of each shoe (adjusting screw in each wheel backed off 14 notches or "clicks" from point where shoes drag on drum.
Hand Brake:—See Service Brakes above.

MISC. MECHANICAL

Power Operated Convertible Top: Auto-Lite Electric type.
See Miscellaneous Section for complete data.

Window Regulators: Hydro-Electric type.
See Miscellaneous Section for complete data.

Cam Angle—26-28½°.
Breaker Arm Spring Tension—17-20 ounces.
Rotation—Clockwise, viewed from above.

Advance Performance
►**With Distributor on Test Unit**

Distributor Degrees	Vacuum	R.P.M.
0°	0″	200
1½-2½°	0.8″	600
5-6°	2.0″	1000
9½-10½°	5.8″	2000

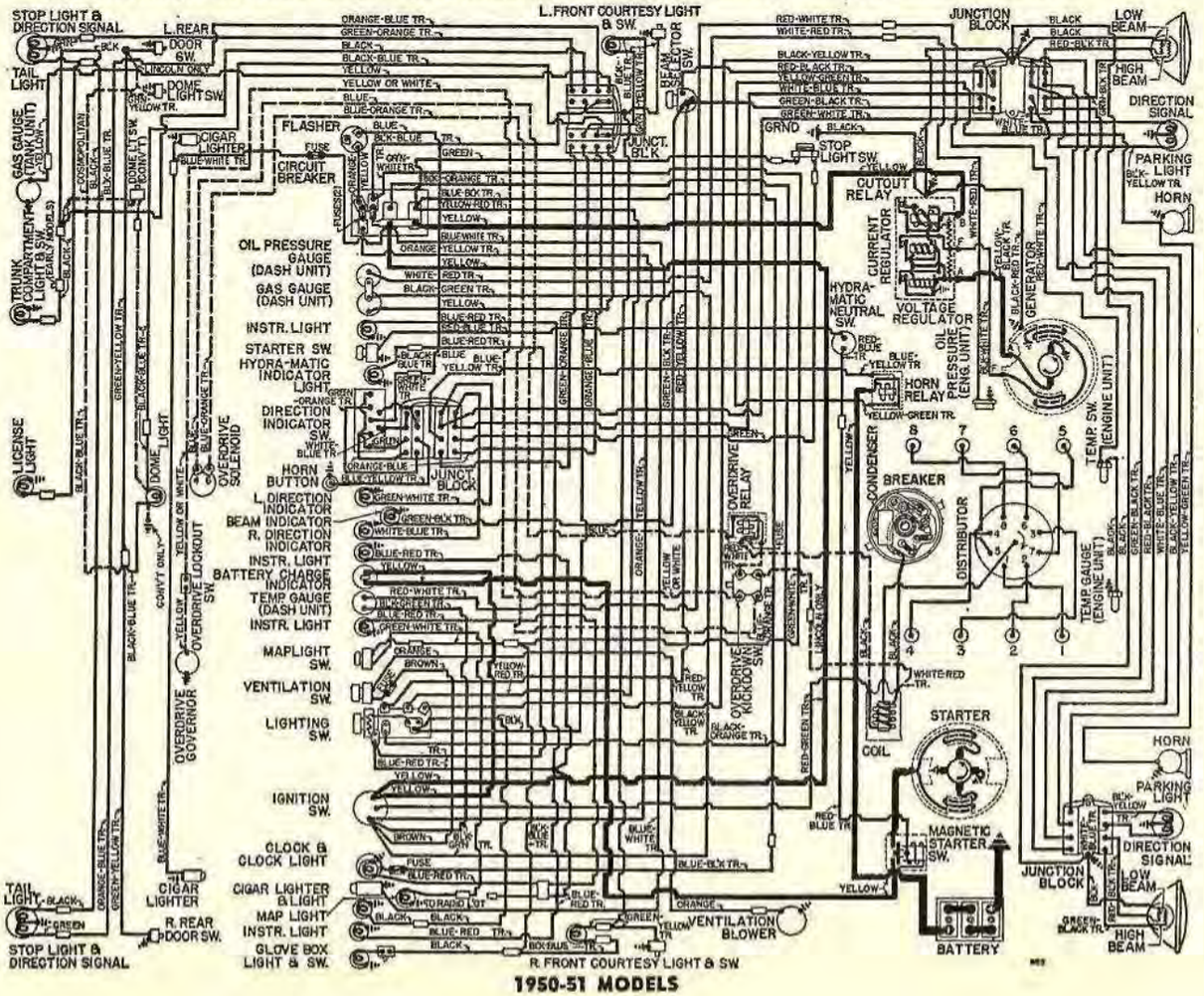
IGNITION TIMING

Std. Setting ..... **4° BTDC.**
Dampener Mark—"/" groove mark on edge of dampener with timing pin on front of engine.
Timing—With #1 piston at firing position and "/" groove mark on dampener aligned with timing pin on front of engine, loosen clamp screw in timing arm, rotate distributor until contacts begin to open, tighten clamp screw. Check spark plug connections (see diagram), see that rotor at #1 cap terminal.
Timing (with Neon Timing Light)—Mark timing pin and "/" groove mark on dampener with white chalk. Connect timing light to #1 spark plug. Idle engine below 550 RPM., adjust distributor (as directed above) until mark and timing pin aligned when light flashes.

CARBURETOR

1949 MODELS

Holley-Ford 8EL-9510—Dual downdraft with integral automatic choke.
See Carburetor Section for complete data.
►**New Float and Float Spring Change for Stabilizing Float Level**—*See 1949 Lincoln in Carburetor Section.*
Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*
Metering Jets—*See Holley-Ford Jet Specification Table in Carburetor Section.*
Hydra-Matic Throttle Adjustment: *See "Lincoln Hydra-Matic Drive" in Transmission Section.*



1950-51 MODELS

Fast Idle: Holley-Ford Carburetor type.
See Carburetion Equipment Section for complete data.
Automatic Choke: Holley-Ford Carburetor type.
See Carburetion Equipment Section for complete data.
Setting—Index mark on coil spring cover aligned with center mark on housing (maximum variation one division either side).

1950-51 MODELS

Holley-Ford 0EL-9510—Dual downdraft with separate automatic choke. Automatic choke unit located on intake manifold.
See Carburetor Section for complete data.
►*NEW "CLIP TYPE" FLOAT NEEDLE & SEAT ASSEMBLY*—Furnished for replacement.
Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*
Metering Jets—*See Holley-Ford Jet Specification Table in Carburetor Section.*
Hydra-Matic Throttle Adjustment: *See "Lincoln Hydra-Matic Drive" in Transmission Section.*
Fast Idle: Holley-Ford Carburetor type.
See Carburetion Equipment Section for complete data.
Automatic Choke: Holley-Ford Carburetor type.
Setting—Index mark on coil cover aligned with center mark on housing (maximum variation one division either side).
See Carburetion Equipment Section for complete data.

CARB. EQUIPMENT

Air Cleaner (Oil Bath): Lincoln No. 8EL-9600.
Fuel Pump (Fuel-&-Vacuum): Lincoln 8EL-9350-A.
Pressure—3½-4½ lbs.
►**Fuel Pump Filter Change**—Copper screen type changed to "Edge" type. Use "Edge" type when servicing pumps, Part No. 8EL-99360 Kit.
See Carburetion Equipment Section for complete data.
Gasoline Gauge: King-Seeley Electric.
Dash Unit—Lincoln No. (1949) 8EL-9280, (1950-51) OL-9280.
Tank Unit (Lincoln)—No. 99A-9275-B.
Tank Unit (Cosmopolitan)—Lincoln No. 21C-9275A.
See Carburetion Equipment Section for complete data.

BATTERY

Lincoln No. 06H-10655-A. 6 Volt, 17 Plate, 120 Ampere Hour Capacity (20 hour rate).
Starting Capacity—150 amperes for 20 minutes.
Grounded Terminal—Positive (+) terminal.
Location—On right side in engine compartment.

STARTER

Standard.....**Lincoln 7EH-11002-B. Arm. 18-11005**
Hydra-Matic.....**Lincoln 8EL-11002. Arm. 52-11005**
Drive—(7EH) B-11350, (8EL) 29B-11350.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—20-22 ounces.
Cranking Engine—100-180 RPM., 190-215 Amperes.

Performance Data

Torque	R.P.M.	Volts	Amperes
No Load①	4000-6000	5.8	45-60
15 ft. lbs.	Lock	3.5	600

①—Manufacturer recommends taking "No Load" readings by inserting 0-600 range ammeter in battery circuit at battery and operating starter while engine is idling.

CONTINUED ON NEXT PAGE

ENGINE

CONTINUED FROM PRECEDING PAGE

►**Crankshaft Interchangeability:** *See "Crankshaft & Main Bearings" in Lincoln Special Data.*

►**Flywheel Replacement, Special Dowels Necessary**—*See "Crankshaft & Main Bearings" in Lincoln Special Data.*

►*SLUDGE TRAPS—Crankpin throws equipped with sludge traps having removable plugs for cleaning.*

Main Journal Diameter—(1949-50) All bearings, 2.8735-2.8740", (1951) #1 & #2 2.8729-2.8740", #3 2.8724-2.8735". **Maximum Wear Limits**—Out-of-round .0015". Taper .001".

Clearance—#1 & #2 (1949-50) .0004-.0029", (1951) .0004-.0019". #3 (1949-50) .0009-.0034", (1951) .0009-.0024".

Bearings—Steel-backed, copper-lead alloy lined, replaceable shells. Upper and lower halves alike.

►*NOTE—Replace main bearings less than .0938" thick.*

Bearing Adjustment: None (no shims). Do not file caps. Replace bearings. Tang on bearing must engage groove in block and cap.

►*NOTE—Self-locking bearing cap bolts used.*

Replacement Bearings: Standard size and .002", .010", .020", .030", .040" Undersize.

End Thrust: Taken by rear main bearings. Adjust by replacing bearings if clearance excessive.

End Play—.004-.008". Worn limit .010".

CAMSHAFT: *CAUTION—Two types used and have different valve timing (see Valve Timing).*

Before Engine No. 9EL-43603 (1949)—Camshafts not marked.

Beginning Engine No. 9EL-43603—Camshaft No. 8EL-6251-B marked "P" on gear attaching flange at front end.

Camshaft Journal Diameter—(1949-50) 1.9265-1.9270", (1951) 1.9262-1.9267". Out-of-round limit .001". Undersize bearings available for reground shafts.

See "Connecting Rod & Bearings" in Lincoln Special Data.

►**Oversize Diameter Camshaft Bearings in some production engines**—*See "Camshaft" in Lincoln Special Data.*

Bearing Diameter—1.9285" (replace bearing if diameter greater than worn limit of 1.9315").

Replacement Bearings: Three sizes as follows:

1—Std. size on both inside and outside diameter.
2—Std. on I. D., .080" Oversize on O. D.
3—.015" Undersize on I. D., Std. on O. D. (must be finished reamed in assembly).

End Thrust: Thrust plate bolted on front of block.

Camshaft End Play—.004-.0065".

Timing Gears: Helical cast aluminum camshaft gear bolted on camshaft, cast alloy iron crankshaft gear.

Back Lash—.002-.003".

Oversize Timing Gears—Furnished in the following sizes: .006" & .012" oversize.

Camshaft Setting: Mesh marked tooth of crankshaft gear with space marked by line on camshaft gear.

VALVES:	Head Diameter	Stem Diameter	Length
Intake	1.800"	.3412-.3422"	5.7145"
Exhaust	1.484"	.340-.341"	5.7145"

	Seat Angle	Lift	Stem Clearance
Intake	45°	.350"	.0015-.003"①
Exhaust	45°	.350"	.002-.003"②

Wear Limit—①—.005", ②—.006".

Valve Seat Width—1/16-5/64". NOTE—If valve seat bearing line is at extreme outer edge of valve head or if seat width is under above specifications install oversize valve. *See "Valve System" in Lincoln Special Data.*

►*ROTATABLE VALVES USED IN 1951 ENGINES—See "Valve System" in Lincoln Special Data.*

►*CAUTION—Top of valve must not be more than .030" above top face of block for head clearance.*

Valve Guides: One piece type pressed in block. Inside diameter .3431-.3436". Length 2.66".

Guide Installation—Press in block from above with small diameter end down. Distance from top of valve seat to upper end of valve guide 1.30".

Valve Lifters: Mushroom type, hydraulic tappet take-up (Wilcox-Rich Zero-Lash type).

Body Diameter—.7177" (new), .7167" (wear limit).

Clearance in Block—.0003-.0018" (new), .003" (worn).

See Miscellaneous Section for complete data.

Initial Valve Clearance—*See "Valve System" in Lincoln Special Data.*

Valve Springs: Coated springs used.

Spring Pressure—62-68 lbs. (closed), 140-152 (open).

Spring Test—63-69 lbs. at 1.680". Free length 2.08".

VALVE TIMING

Tappet Clearance: None in service (Hydraulic lifters).

►**Valve Timing**—*CAUTION—Two Camshafts used and have different valve timing.*

►**Before Engine No. 9EL-43603**
(Camshaft not Marked)

Intake Valves—Open 14° BTDC. Close 60° ALDC.
Exhaust Valves—Open 62° BLDC. Close 16° ATDC.

►**After Engine No. 9EL-43603**
(Camshaft Stamped "P" on front end)

Intake Valves—Open 5° BTDC. Close 52° ALDC.
Exhaust Valves—Open 49° BLDC. Close 8° ATDC.
Valve Timing Check—*See "Valve System" in Lincoln Special Data.*

LUBRICATION

Engine Oiling System: Pressure to main bearings, connecting rod lower bearings, camshaft bearings, valve lifters (hydraulic type) and timing gears. Oil pump mounted in crankcase at rear of engine.

Crankcase Capacity—6 quarts.

Normal Oil Pressure—45-55 lbs. at 2000 RPM.

Oil Pressure Relief Valves: Two used as follows:

1—**Oil Pump Relief Valve**—In oil pump body and regulates pressure to 50 lbs. for engine lubrication. Spring Tension 12.4 lbs. at 2.175".
2—**Cylinder Block Oil Relief Valve**—At front end of valve chamber and regulates pressure to 15 lbs. for hydraulic valve lifters.

Oil Pump: Gear type. In crankcase at rear of engine.

►*NOTE—Removable sump attached to oil pan for access to oil pump and screen.*

Oil Filter: On left cylinder head. Replace cartridge every 5000 miles or more often if required.

Oil Filter Cartridge—Lincoln No. 8CM-6731A Kit.

Oil Pressure Gauge: King-Seeley Electric.

Dash Unit—Lincoln No. (1949) 8L-9273, (1950-51) OL-9273.

Engine Unit—Lincoln No. 41A-9278.

See Miscellaneous Section for complete data.

Crankcase Ventilation: Filter element in oil filler breather cap (inlet), and in upper end of outlet pipe at elbow connection just below generator on left side.

Servicing—Wash screen in cleaning fluid and wet with engine oil when dry at oil change period (2500 miles).

Outlet Pipe Air Filter Cartridge—Lincoln No. 8EL-6841.

COOLING

►**New Cylinder Head Gasket for improved cooling:** *See "Cooling System" in Lincoln Special Data.*

Cooling System: Pressure type with relief valve in filler cap and two belt-driven pumps (one for each bank) with re-circulating by-pass.

Capacity—34½ quarts.

Pressure Valve—In radiator filler cap. Lincoln No. 26H-8100-B (AC #846740). Opens at 3½-4 lbs.

Water Pumps: Two used. Centrifugal, belt-driven, packless type. Shaft mounted on sealed duplex ball bearing.

NOTE—Bottom bolt must be installed prior to installing water pump pulley.

See Water Pump Section for complete data.

Fan Belt Adjustment—Loosen fan mounting bracket bolts, raise fan up until side movement on belt midway between fan and crankshaft pulleys is ½".

Generator (& Water Pump) Belt Adjustment—*See GENERATOR.*

Thermostats: Two used (one in each cylinder head water outlet). Lincoln No. 8EL-8575-A (std.), B & C (optl.).

Setting (std.)—148-170° maximum.

Settings (Optl.)—158-180° (B), 178-200° (C), max.

Temperature Gauge: King-Seeley Electric.

Dash Unit—Lincoln No. (1949) 8L-10883, (1950-51) OL-10883.

Engine Unit—Lincoln No. 8A-10884 in left head.

Engine Switch—No. 8A-10990 in right hand head.

See Miscellaneous Section for complete data.

CLUTCH

Long Model 11CF-10½TI, Lincoln No. 8EL-7563. Semi-centrifugal, single plate, dry disc type.

See Clutch Section for complete data.

Facings—Moulded or Woven. Inside Diameter 7". Outside Diameter 10½". Thickness .125".

Pedal Adjustment: 1-1¼" free travel. Adjust by loosening locknut and turning adjusting screw on adjusting rod.

Removal: Remove transmission (see TRANSMISSION Removal below). Remove flywheel housing inspection cover. Remove transmission from flywheel housing, detach clutch release spring first, remove flywheel housing from engine plate and cylinder block. Take off clutch release bearing and hub. Prick punch flywheel and pressure plate so that these parts may be placed in original positions when reassembling. Use Tool 7563 to compress pressure plate. Take off 6 capscrews holding pressure plate assembly to flywheel.

TRANSMISSION

STANDARD

Warner Model AS1-T85B (Std.), AS2-T85B (with Overdrive). All helical gear type, constant-mesh,

CONTINUED ON NEXT PAGE

HOOD ASSEMBLY

1949-51 MODELS

HOOD ALIGNMENT: Fore-and-Aft Adjustment—3 hood hinge bracket-to-hood screws at each hinge. Loosen screws just enough to allow hinge to hold hood in place when raised. Lower hood, shift hood fore and aft until correctly positioned. Raise hood without disturbing alignment, tighten screws. Check hood safety catch action (bend catch if necessary).

Up-and-Down Adjustment—Loosen locknut on top of latch dowel. Turn dowel with screwdriver **down** if hood fits too tight, **up** if hood loose on dowel or too much clearance at lower edge of hood. Tighten locknut.

RADIATOR GRILLE REMOVAL: (1949-50)—Remove center grille ornament by taking out four bolts holding right and left hand grilles to center ornament. Remove capscrew holding center grille ornament to grille opening panel and take out sheet metal screws holding ornament to stone deflector. Disconnect parking lamp wire. Remove four sheet metal screws holding radiator grille extension (1950) to fender and opening panel. (Accessible from inside front wheel opening). Remove extension including lamp assembly. Remove sheet metal screw securing grille to grille opening and take out bolts securing grille to bracket. Remove bolts holding grille to center ornament.

(1951)—Center Grille Section Removal—Remove 8 bolts holding right and left hand grilles to center section and remove bolt holding center section to stone deflector. Push center grille backward and remove through opening between opening panel and radiator.

(1951) Right or Left Hand Grille Removal—Working from inside fender, remove two bolts holding grille to opening panel, and take out bolt holding grille to stone deflector bracket. Remove the lower bolts holding grille to center section.

TIGHTENING SPECIFICATIONS

1939-48 MODELS

	Ft.Lbs.	In.Lbs
Cyl. Hd. Nuts (All C.I. Hds.)	50-60	600-720
Cyl. Hd. Nuts (Al. Hds.)	35-40	420-480
Con. Rod Nuts (castellated)	35-40	420-480
Con. Rod Nuts (self-locking)	40-45	480-540
Main Bearing Nuts	75-80	900-960
Flywheel Capscrews	65-70	780-840

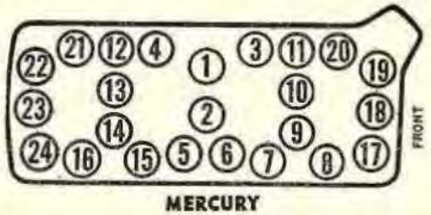
1949-51 MODELS

Cylinder Head Capscrews	65-70	780-840
Main Bearing Capscrews	80-90	960-1080
Connecting Rod Nuts	45-50	540-600
Flywheel to Crankshaft	75-85	900-1020
Engine Front Support	65-70	780-840
Eng. Rear Support to Trans.	55-60	660-720
Clutch Cover Mounting Screws	22-26	264-312
Flywheel Housing:	Ft Lbs.	In. Lbs.
To Cylinder Block	40-45	480-540
To lower Front Cover	15-18	180-216
Trans. to Flywheel Housing	30-35	360-420
Exten. (or OvDr.) to Trans.	40-45	480-540
Pitman Arm to Shaft	120-130	1440-1560
Steering Gear to Frame	30-35	360-420
Steering Idler Arm to Bracket	90-110	1080-1320
Idler Arm Bracket to Frame	40-45	480-540
Front Suspension:		
Upper Arm to Frame	75-80	900-960
Lower Arm to Frame	48-53	576-636
Upper Arm to Spindle	90-110	1080-1320
Lower Arm to Spindle	110-130	1320-1560
Front Brake Drum to Hub	13-15	156-180
Rear Brake Drum to Flange	12-17	144-204
Rear Shock Absorber	60-65	720-780
Rear Spring U-bolts	65-70	780-840
Rear Spring Shackles	35-40	420-480

CYLINDER HEAD

1949-51 MODELS

CYLINDER HEAD INSTALLATION: Use Torque Indicating Wrench to tighten cylinder head capscrews in correct sequence as shown in diagram. Tighten all screws to correct tension and recheck after engine has been run and thoroughly warmed up.



MERCURY

Tightening Torques—See Tightening (Torque Wrench) specifications.

1939-42 MODELS

REWORKING CYLINDER HEADS: Manufacturer recommends that all cylinder heads prior to 1942 (as listed below) be reworked for improved cooling. **These heads must be reworked for increased valve clearance when used with Replacement (1946 & Later) Cylinder Blocks.**

CYLINDER HEADS
(1939-42)

To Be Reworked Part No.	Replacement Not To Be Reworked Part No.
81A-6049-A & 6050-A	59A-6050-A (2 used).
81A-6049-B & 6050-B	①59A-6050-B (2 used).
81T-6049-A & 6050-A	①—Marked 59A-B.
99T-6049 & 6050	
29A-6049 & 6050	

Reworking of Cylinder Head for Improved Cooling: The water hole at center of top edge of the head between #4 & #5 valves should be increased to ¾" (from 7/16") and hole at center of head between #2 and #3 cylinder bores should be increased to ⅝"

Reworking of Cylinder Head for Valve Clearance: Use special Fixture, No. 6050-B-1, and Cutter, No. 6050-B-2, to enlarge combustion chamber as follows: Place cylinder head on dowels on one side of the fixture (with fixture clamped in vise) and secure head with bolt through fixture. Insert cutter through guide hole in fixture and cut away head material at edge of combustion chamber to the full depth of the chamber. Rework head at **each** valve in this manner (fixture has two holes so that one intake and one exhaust valve can be re-worked at each set-up of the fixture).

CAUTION—New design head gaskets must be used with these reworked heads.

See Cylinder Head Gasket Data below.

1946-48 MODELS

CYLINDER HEADS: Heads are new design as listed below. These heads are interchangeable (Right & Left) and have larger water passages and increased valve clearance required for use with the new "41A" and "59A" Cylinder blocks.

CAUTION—New design head gaskets must be used with these new type heads.

See Cylinder Head Gasekt data (following).

Part No.	Cylinder Heads	Used on
59A-6050-A (2 used)		90 & 100 HP.
59A-6050-B (2 used—Stmpd. 59A-B)		90 & 100 HP.

NOTE—Heads may be identified by part number prefix "41T" or "59A" cast on top surface.

1939-48 MODELS

CYLINDER HEAD GASKETS: New design gaskets (as listed below) have 5/16" round hole in place of large blunt cone shaped opening in center lower edge of gasket between #2 & #3 cylinder bores. When this gasket used with old design head (with smaller water passages), head must be reworked as directed in "Reworking Cylinder Head for Improved Cooling" above. ***Special gaskets must be used on 1945-48 engines (and earlier engine with new type "59A" Cylinder Blocks).***

ENGINE REMOVAL

1946-51 MODELS

ENGINE REMOVAL: For Engine Servicing—Drain cooling system and crankcase. Remove engine as follows:

1. Disconnect and remove radiator hoses and thermostats, remove radiator.
2. Disconnect cables and remove battery.
3. Remove engine hood by taking out capscrews in hood hinges and bolts in support arms at each side.
4. Disconnect all wires and cables at engine acces-

CONTINUED ON NEXT PAGE

CAMSHAFT PRODUCTION PARTS CHANGES

	Early Type	9CM-826 UP Type
Camshaft	8CM-6250	8CM-6250-B
Camshaft Gear	7RA-6256	8BA-6256-A
Crankshaft Gear	48-6306	8BA-6306
Oil Line Plug	8BA-6026	7HA-6026

NOTE—Beginning Vehicle #145,832 new fiber camshaft timing gears used. Part No. 8BA-6256-D (Std.), E (.006" oversize), F (.012" oversize).

Following modifications made for use of new REVERSE helix timing gears:

1)—Timing Gears. Reverse helical gears (L.H. teeth on camshaft gear, R.H. teeth on crankshaft gear).

2)—Camshaft. Oil hole in front bearing journal moved 1/16" (center of hole .440-.450" to rear of flange on shaft, was .507-.512" on early shafts). Inside diameter increased to 3/16" (was ⅛" on early shafts). Outer end of hole is at front of shaft on both types of camshafts.

NOTE—Beginning vehicle #145832 new fiber camshaft timing gear is used. Mercury Part No. 8BA-6256-D (Std.), E (.006" oversize), F (.012" oversize).

►**3)—Camshaft Front Bearing Position**—*CAUTION—Same bearing used but position in block different for each type camshaft. This is important to provide correct lubrication for front end of camshaft (alignment of upper oil hole in bearing with oil hole in camshaft front bearing journal). Bearing positioned as follows:*

Bearing Position for Late (8CM-6250-B) Camshaft—Installed with front edge flush with front face of block to align upper oil hole in bearing with relocated hole in camshaft front bearing journal (see No. 2 above).

Bearing Position for Early (8CM-6250) Camshaft—Installed with front edge 1/16" back from face of block for oil hole alignment.

4)—Cylinder Block Front Oil Line Plug. Solid plug in oil line (above camshaft). Early type plug equipped with oil hole for front end gear lubrication. With this new plug front end gears and thrust surfaces lubricated from front end of camshaft (oil fed from main oil line lead at front camshaft bearing into oil lead in shaft and out through front end of shaft).

VALVE SYSTEM

1939-51 MODELS

VALVE ASSEMBLY SERVICING: The complete valve assembly (valve, spring, and guide) should be removed and installed as a unit. Service these assemblies as follows:

Valve Assembly Removal:—Use special bar type lifter V-78 inserting the end of lifter through valve spring coils to engage flanged lower end of guides, pull guide down slightly, withdraw 'C' type guide retainer, lift valve assembly out of engine.

Valve Assembly Dismantling:—Use special bench fixture Part No. 6505-C. Fixture consists of special press by which valve spring can be compressed to free spring retainer (fixture has stop which prevents excessive valve spring compression).

Valve Grinding and Tappet Clearance Note:—To perform these operations with minimum amount of hand cranking, note which valves are fully open (first column in table below), grind or check valves listed on same line of table—then turn shaft until next 'valve open' point reached.

Valves Open	Valves to Grind
1. 4X & 1N	3X, 8N, 6N, 7X, 3N, 2X
2. 3X & 8N	1X, 7N, 5X, 2N, 4X, 1N
3. 1X & 7N	8X, 5N, 6X, 4N
OR	
1. 8X & 5N	1X, 7N, 6N, 7X, 3N, 2X
2. 6N & 7X	5X, 2N, 4X, 1N, 8X, 5N
3. 5X & 2N	6X, 4N, 3X, 8N

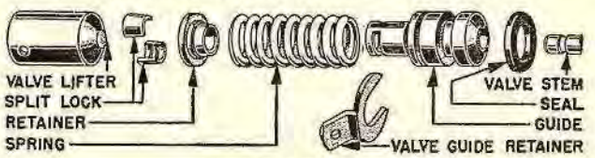
NOTE—'X' Exhaust Valve. 'N' Intake Valve.

Tappet Clearance Checking (1939-48): Check tappet clearance when re-installing valves. Turn camshaft until lifter is on heel of cam, make certain that valve assembly is seated in block ("C" washer engaging the valve guide), then check the tappet clearance between the end of the valve stem and the top surface of lifter with a feeler gauge. If clearance less than minimum, install a shorter valve or grind off end of valve stem, if clearance greater than maximum, install longer valve, or reface valve or valve seat to lower the valve in the block.

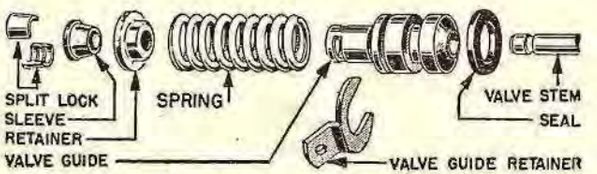
1951 MODELS

ROTATABLE VALVES: Used in 1951 engines. New two piece retainer and shorter valve spring used. Valve locks are same as previous types. Rotatable valves and parts can be installed in engines not so equipped by changing the spring, spring retainer, exhaust and intake valves, and installing the new retainer sleeve.

NOTE—Present valve gap setting is not changed with installation of new rotatable type parts.



CONVENTIONAL TYPE



ROTATABLE TYPE

1949-51 MODELS

►**VALVE GUIDE OIL SEALS:** Late type engines are equipped with rubber seals on intake valve guides. Use late type guides for replacement on all 1949 engines. Mercury Part numbers 8BA-6510-B (Guide) and 8BA-6571 (Seal).

VALVE TIMING CHECK: Remove valve cover (intake manifold) and right cylinder head. Crank engine over until intake valve #1 cylinder is opening. Line up pointer with timing mark on front dampener. Insert a piece of .020" stock between the exhaust valve (#1) stem and lifter. Crank the engine forward about 45°. Place contact point of dial indicator on head of #1 exhaust valve, and set dial to ZERO. Crank engine backward until timing marks are again lined up. If the valve timing is correct indicator will read .033" to .050". If the camshaft is one or more teeth out of time the dial readings will be considerably outside the limits given.

OIL PAN REMOVAL

1939-42 MODELS

OIL PAN REMOVAL: Drain cooling system, disconnect upper and lower radiator hoses, disconnect exhaust pipe and remove cross-over pipe, disconnect radius rods at rear end, push rear end of rods down and block in this position. Remove front engine support bolts, attach hoist and raise front end of engine. Remove oil pan screws and remove pan.

NOTE—Pan removal can be helped by removing starter motor and engine side pans, disconnecting steering tie rod and turning crankshaft so that #4 piston is at top dead center.

1946-48 MODELS

OIL PAN REMOVAL: Drain oil. Disconnect steering drag link at steering gear pitman arm. Loosen clamp on exhaust pipe at left manifold and remove cross-pipe. Take out capscrews in ball joint at rear end of front radius rods, lower rear end of rods and block down. Take out engine splash pan mounting screws and move pan to side out of way. Remove starter. Disconnect oil filter return line at oil pan connection, remove oil level indicator stick and tube. Take out oil pan screws and lower pan.

NOTE—Additional clearance can be secured by attaching hoist to front bumper bars and raising front end of car slightly.

1949-51 MODELS

OIL PAN REMOVAL: Car manufacturer recommends following method be used (pan can be removed without draining oil).

1)—Take off exhaust pipe cross-over (secure manifold heat valve with one nut).

2)—Remove steering idler arm bracket from right frame rail and pull down.

3)—Remove starter.

4)—Take off flywheel housing lower front cover (cover drops straight down after removing nuts and bolts). Remove oil dip stick tube from pan.

5)—Remove 16 oil pan-to-block capscrews using ⅜" drive tools. Lower rear end of pan and slide out to rear.

NOTE—Front end of engine does not have to be raised to remove pan.

OIL PUMP

1939-48 MODELS

OIL PUMP: Removal & Disassembly—To remove pump from engine, remove locking wire and take out mounting screw in pump mounting flange, pull pump down and out (NOTE—Pump body fits in re-

CONTINUED ON NEXT PAGE

FORD TRUCK NOTE:—All Mercury Engine data below applies to Ford Truck Models with '95' Engine as well as Mercury models.
clutch housing and on left frame member in front

MODEL IDENTIFICATION

SERIAL & ENGINE NUMBER:—Stamped on top of clutch housing and on left frame side member near generator.

TUNE-UP

COMPRESSION:—Ratio—6.3-1 Std. cast-iron head.

Pressure—145 lbs. at 2400 R.P.M. or 112 lbs. at cranking speed of 100 R.P.M.

VACUUM READING:—Steady 18-20" at 5-7 MPH.

FIRING ORDER: 1-5-4-8-6-3-7-2. See diagram for cylinder numbering and spark plug cable connections.

SPARK PLUGS: Champion Type H-10. 14 mm. Metric.

Gaps—.025"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.014-.016" Cam Angle 36° closed (both sets together with correct coil-loading lead).

Automatic Advance—8° max. at 950 RPM (78-12127 Distr.), 11° max. at 600 RPM (11A-12127 Distr.). Distributor degrees and RPM.

IGNITION TIMING: See Ignition Timing.

Std. Setting—4° BTDC. No flywheel marks provided. See Ignition Timing for method of timing ignition and Vacuum Brake adjustment.

CARBURETION: See Carburetor & Carb. Equipment.

Idle Setting—Both idle screws ⅝-⅞ turn open or set for highest steady vacuum gauge reading. Idle speed 5-7 MPH or 350 RPM.

Float Level—Fuel level 11/16" plus or minus 1/32" below top edge of float bowl.

Accelerating Pump—Inner (#1) hole—Summer, Center (#2) hole—Winter, Outer (#3) hole—Extreme Winter temperatures.

Fuel Pump Pressure: 3½ lbs. maximum.

VALVES: See Valve Timing.

Tappet Clearance—.010-.012" Intake, .014-.016" Exhaust. No adjustment provided.

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

Ignition Switch:—Oakes Steering Column & Ignition Lock Assy. No. 301941, Ford No. 99A-3676 (1939); 302142, Ford No. 09A-3676 (1940). Ignition Switch No. 301683 (1939), 302159 (1940).

Lock Cylinder—Hurd or Briggs & Stratton No. 8500, Ford No. 99A-3686 (with keys).

Key Series—FK000 to FK999. Groove—No. 17.

COIL: Ford Part No. 78-12036 or 81A-12036 (less Condenser). Mounted on ignition unit (part of ignition assembly).

Resistor Unit—Connected in coil primary circuit. Mounted on Circuit Breaker Assembly No. 01A-12250.

Ignition Current—4½-6 amperes (engine stopped). Ignition primary circuit resistance 1-1⅓ ohms.

CONDENSER: Ford Part No. 78-12300 (78-12036 Coil), 81A-12300 (81A-12036 Coil).

Capacity—.33-.36 microfarad.

DISTRIBUTOR: Ford Part No. 78-12127 (Orig. Equip). or 11A-12127 (Repl. Unit) less coil, caps, and plates. Double breaker, 8 lobe cam, full automatic advance type with Vacuum Brake Control (see Ignition Timing for adjustment). Both types alike except for automatic advance. Same design as used on Ford V8 models.

Breaker Gap—.014-.016" (both sets). Use special two step feeler—.014" step 'go', .016" step 'no go'.

Cam Angle—36° closed, 9° open. For both sets operating together with correct coil-loading lead.

Breaker Arm Spring Tension—20-24 ozs.

Rotation—Clockwise viewed from drive end.

No. 78-12127

Distributor Degrees	Automatic Advance R.P.M.	Engine Degrees	R.P.M.
Start	200	0	400
8	950	16	1900

NOTE—Limits are 7½-8½° (distributor).

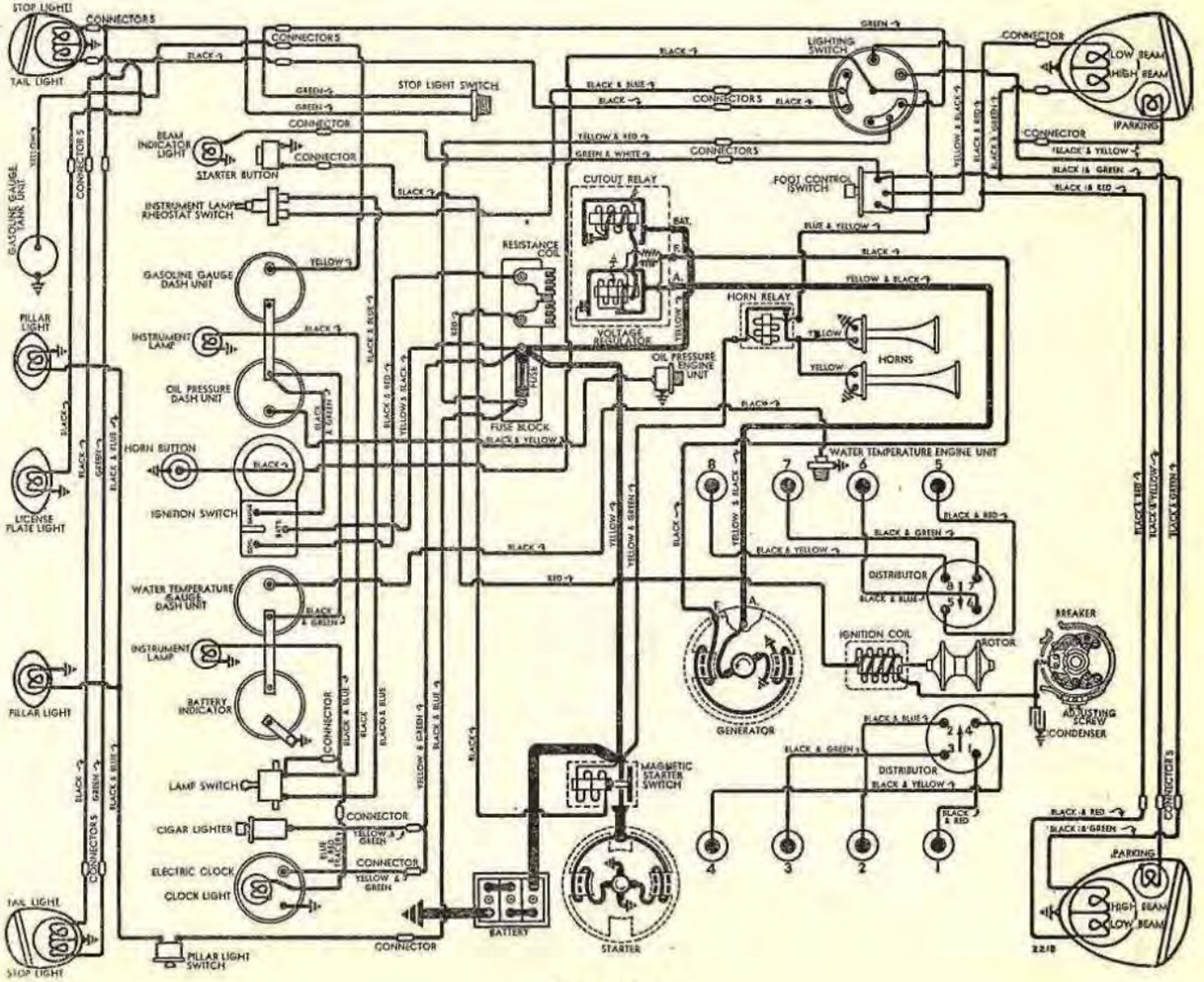
No. 11A-12127

Distributor Degrees	Automatic Advance R.P.M.	Engine Degrees	R.P.M.
Start	200	0	400
11	600	22	1200

NOTE—Limits are 10½-11½° (distributor).

Removal:—Ignition unit mounted on front of engine. To remove, disconnect vacuum line, take off caps, take out screws in mounting flange.

CONTINUED ON NEXT PAGE



1939 MODELS

STARTER

Ford Model No. 18-11002. Armature No. 18-11005.

Drive—Inboard Bendix No. L11FX-10. Ford No. B-11350 or Ford B&S Drive No. 91A-11350.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—2 lbs. each.

Cranking Engine—100 RPM., 190-215 amperes.

Performance Data

Torque	R.P.M.	Volts	Amperes
4 ft. lbs.	1070	4.6	200
8 "	660	4.3	340
12 "	300	3.65	465
14 "	Lock	3.5	500

Starting Switch:—R-B-M Model 5604. Ford No. 01A-11450A. Magnetic switch mounted on dash and controlled by pushbutton on instrument panel R-B-M No. 3239, Ford No. 09A-11500.

Removal:—Starter mounted on right front face of flywheel housing. To remove, take off pan at right of engine, free starter-to-oil pan support bracket, take out through-bolts on commutator end plate.

GENERATOR

STANDARD

Ford Model No. 91A-10000 (1939), 01A-10000A & 01A-10000B (1940). Two brush, shunt type with vibrating type voltage and current regulation. Ventilated by fan on drive pulley.

NOTE—01A-10000-A & B replaced by 21A-10000.

Armature—Ford No. 78-10005A (91A-10000), 01A-10005 (01A-10000A & 10000B).

Charging Rate Adjustment—No adjustment. See Regulator data below.

Maximum Charging Rate—Controlled by regulator and dependent on battery condition and load. To check generator output, disconnect generator field lead at generator, connect both generator terminals together (use short insulated wire). Use 'BRS' set or rheostat connected across battery terminals and apply load until voltage is exactly 6 volts. Connect ammeter in charging line, run engine at approximately 1000 RPM., check output at 3 speeds given in performance table below. Restore original connections after completing test. **Do not operate generator in service with both terminals connected together. This eliminates all regulator action and will damage generator.**

Performance Stds.

91A-10000

Amperes	Engine RPM.
Start	500
28	1250
28	2500

01A-10000-A		01A-10000-B	
Amperes	Eng. RPM.	Amperes	Eng. RPM.
Start	580	Start	520
32	1100	30	1060
32	2500	30	2500

Rotation—Counter-clockwise at commutator end.

Field Current—2.86 amperes at 6.0 volts (01A-10000-A), 2.08 amperes at 6.0 volts (01A-10000-B). **2.2 amperes at 6.0 volts (91A-10000). Field resistance** at 70°F is 2.1 ohms (01A-10000A), 2.88 ohms (01A-10000B), 2.7 ohms (91A-10000).

Brush Spring Tension—Approximately 28 ozs.

Removal:—Generator mounted on bracket between cylinder banks at front of engine and driven in tandem with water pumps by Vee belt. To remove, loosen nut on mounting bracket stud.

Belt Adjustment:—Loosen nut on bracket mounting stud, raise generator up until side movement on belt midway between generator and water pump pulleys is 1" (thumb and finger pressure).

GENERATOR

SPECIAL EQUIPMENT

SPECIAL GENERATORS:—Other Makes—*Refer to Electrical Equipment Index for 'Special Generator' article for complete data on special Generators and Regulators which may be used on these models.*

REGULATOR

Ford No. 91A-10505A (91A-10000 Gen.), 01A-10505A (01A-10000A & 10000B Gen.). Cutout Relay and vibrating type voltage-regulator in case mounted on engine dash. NOTE—Regulator mounted on rubber cushions (separate ground wire attached to case).

REPLACEMENT NOTE—This 2-unit regulator superseded by new 3-unit type No. 01-A-10505C.

Cutout Relay

Cuts In—5.8-6.3 volts at operating temperature.

Cuts Out—5.5 amperes max. (Cold 60°), 1.7 amperes (Hot 180°)—*see Regulator article in Electrical Equipment Section for specifications at other temperatures.*

Voltage-Current Regulator

Voltage Setting—6.9-7.2 volts at 70-80°F.

Current Setting—30-33 amperes.

Regulator Checking & Adjustment—*See Ford Regulator article in Electrical Equipment Section for complete testing data.* Not adjustable (case sealed).

LIGHTING

Headlamps—Ford (Corcoran-Brown) Two-Lite, Prefocused type (1939), Ford Sealed Beam type (1940). Upper and lower beams controlled by Beam Selector switch on toeboard.

Headlamp Adjustment—With upper beams lighted, aim each headlamp straight ahead so that beam centered on vertical line directly ahead of lamp upper edge of beam at lamp center height (1939), hot spot centered on horizontal line 3" below lamp center height (1940) at distance of 25 feet.

Beam Indicator—Red jewel on instrument panel in upper left hand corner (1939), directly above speedometer (1940). Lighted with Upper Beams "on".

Switches—1939

Lighting—R-B-M. Ford No. 91-A-11653-B (switch and wiring assembly), 81-A-11657 (body and contact assembly).

Beam Selector—R-B-M. Ford No. 81-A-13532.

Instrument—Ford No. 99A-13740.

Stop Light—Ford No. 91A-13480.

Switches—1940

Lighting—R-B-M Model 6425. Ford No. 01A-11652. Switch mounted on instrument panel with separate Beam Selector Switch on toeboard. Light Switch Knob & Insert Ford No. 09A-11661-B.

Beam Selector—R-B-M Model 2480. Ford No. 81A-13532 (Switch only), No. 01A-11653-A (with Wiring).

Instrument—Ford No. 09A-13740-A.

Stop Light—Ford No. 11A-13480.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps (1939)	32-32	2330
Headlamps (1940)		Sealed Beam
Parking	1.5	55
Instrmt., Beam Ind.	1	51
Stop & Tail	21-3	1158
Pillar	3	63
License Plate	3	63

MISC. ELECTRICAL

LIGHTING CIRCUIT BREAKER (1939): Ford No. 91A-12250 (Circuit Breaker) or No. 40-12250 (Fuse Block). Mounted on rear of dash under cowl with Ignition Resistor as an assembly. Vibrating type circuit breaker serviced by No. 01-A-12250 (1940 type).

Fuse Capacity—20 amps. (for 40-12250 Fuse Block).

LIGHTING CIRCUIT BREAKER (1940): R-B-M 6700, Ford No. 01A-12250. Combined with Ignition Resistor on block on dash under cowl. Combination thermostatic and wound-coil type. Contacts open at 50 amperes and vibrate to control current.

HORNS:—Air Electric type dual horns. **Ford No. 91A-13832** (high note), 91A-13833 (low note).

Horn Current—24-28 amperes (total).

Horn Relay:—R-B-M Model 4700, Ford No. 91A-13842.

Contact Closing Voltage—3.5-4.5 volts.

Current Draw—Approximately ¾ ampere.

ENGINE

ENGINE SPECIFICATIONS:—Own 95. 8 Cylinder, 90° Vee, L head. Both banks & crankcase cast enbloc.

Bore—3.187". **Stroke**—3.75".

Rated Horsepower—32.5. **Displacement**—239 cu. ins.

Developed Horsepower—95 at 3600 RPM.

Compression Ratio—6.30-1 (Pass. Cars, Ford Comm.), 5.9-1 (Ford Trucks). Cast-iron heads.

Compression & Vacuum Reading—*See Tune-up data.*

OIL PAN & ENGINE REMOVAL—*See Mercury Special Data.*

TIGHTENING TORQUES & CYLINDER HEAD: *See Mercury Special Data.*

►**Reworking Head For Improved Cooling**—*See Mercury Special Data.*

CYLINDER SLEEVES:—Hardened, dry type cylinder sleeves used on engines marked 'HS' on cylinder block above upper front corner of left cylinder head. *See Mercury Special Data.*

PISTONS:—Steel alloy, light weight, cam ground type (Mercury), Aluminum alloy, T-slot type (Ford Trucks). Recondition engine for finished replacement pistons.

Weight—Without rings or pin, 358-362 grams (Mercury), 364-368 grams (Ford Truck).

Removal—Pistons and rods removed from above.

Clearance—See Fitting New Pistons.

Replacement Pistons: Std., .0025", .005", .015", .020", .030", .040".

Fitting New Pistons: Use .50" wide feeler stock of correct thickness (see Table below) inserted between piston and cylinder wall at right angles to

CONTINUED ON NEXT PAGE

UNIVERSALS

UNIVERSAL JOINT:—Spicer 6454-SF ('39), 202-6 ('40). Steel bushing type. 1 joint to rear of transmission.

See Universals Section for complete data.

REAR AXLE

REAR AXLE—Own make. ¾ floating, Spiral Bevel gear type with Torque Tube drive.

See Rear Axle Section for complete data.

Ratio—3.54-1 Std., 3.78-1 Optl.

Backlash—.010" max.

Optional Axle:—Columbia Two-speed type.

See Rear Axle Section for complete data.

Removal:—Disconnect rear shock absorbers, hand brake cables, hydraulic brake line (at torque tube connection—bleed lines when re-connected), speedometer cable, shock absorber links. Disconnect rear spring at center frame connection. Take out universal joint ball housing screws, pull axle assembly to rear to disengage drive shaft at splined joint.

Axle Shaft Removal—*See Mercury Rear Axle article in Rear Axle Section.*

SHOCK ABSORBERS

SHOCK ABSORBERS:—Houde (Houdaille). Front—BBDK (1939), BBDM (1940). Rear—BBDW (1939), BBCX (1940). Double acting, hydraulic, adjustable.

FRONT SUSPENSION

Front Suspension:—Conventional 'I' beam section front axle with Reverse Elliott ends and transverse spring. Axle positioned by radius rods.

Kingpin Inclination—8° crosswise.

Caster—9° Max., 4½° Min. Must be equal within ½°. Axle may be bent cold to correct caster if proper tools (to prevent axle damage) are used.

Camber—1° Max., ¼° Min. Must be equal within ¼°, right wheel must not exceed left. Adjust in same manner as for caster (see caster data above).

Toe In—1/16". Set at 1-10 ratio to Camber. Adjust by loosening clamp bolts and turning tie rod.

Steering Geometry (Toe Out on Turns)—Outer wheel turned 20°, Inner wheel 23⅓°. No adjustment.

STEERING GEAR

Steering Gear: Gemmer Model 305. Worm-and-Roller type with "push-pull" adjustments.

See Steering Gear Section for complete data.

BRAKES

BRAKES:—Service. Lockheed hydraulic, double anchor type. Hand lever applies rear service brakes.

See Brake Section for complete data.

Drum—Cast iron. Diameter 12".

Wheel Cylinders—Stepped type as follows: Front Wheel....1.25"-1.00". Rear Wheel....1.125"-1.00".

Lining—Woven (forward shoes), Molded (rear shoes). Width 1.75". Thickness .20". Length per shoe 13.18" (forward shoes), 10.1" (rear shoes).

Clearance—Least possible amount without drag.

Hand Brake:—See Service Brakes above.

MISC. MECHANICAL

1940 Power Operated Conv. Top: Vacuum Power type.

See Miscellaneous Section for complete data.

directly off end of camshaft. Double breaker, 8 lobe cam, full automatic advance type with Vacuum Brake control (breaker design unchanged).
Breaker Gap—.014-.016" (both sets). Use special two step feeler—.014" step 'go', .016" step 'no go'.
Cam Angle or Dwell—Approx. 36° closed, 9° open. Set dwell at 80% (limits 78-80% at 2000 RPM.) on Ford Test Set. For both sets operating together with correct coil-loading lead.
Breaker Arm Spring Tension—20-24 ounces.
Rotation—Clockwise viewed from drive end (counter-clockwise viewed from front of car).

No. 21A-12127

Distributor Degrees	Automatic Advance R.P.M.	Degrees	Engine R.P.M.
Start	200	0	400
11	600	22	1200

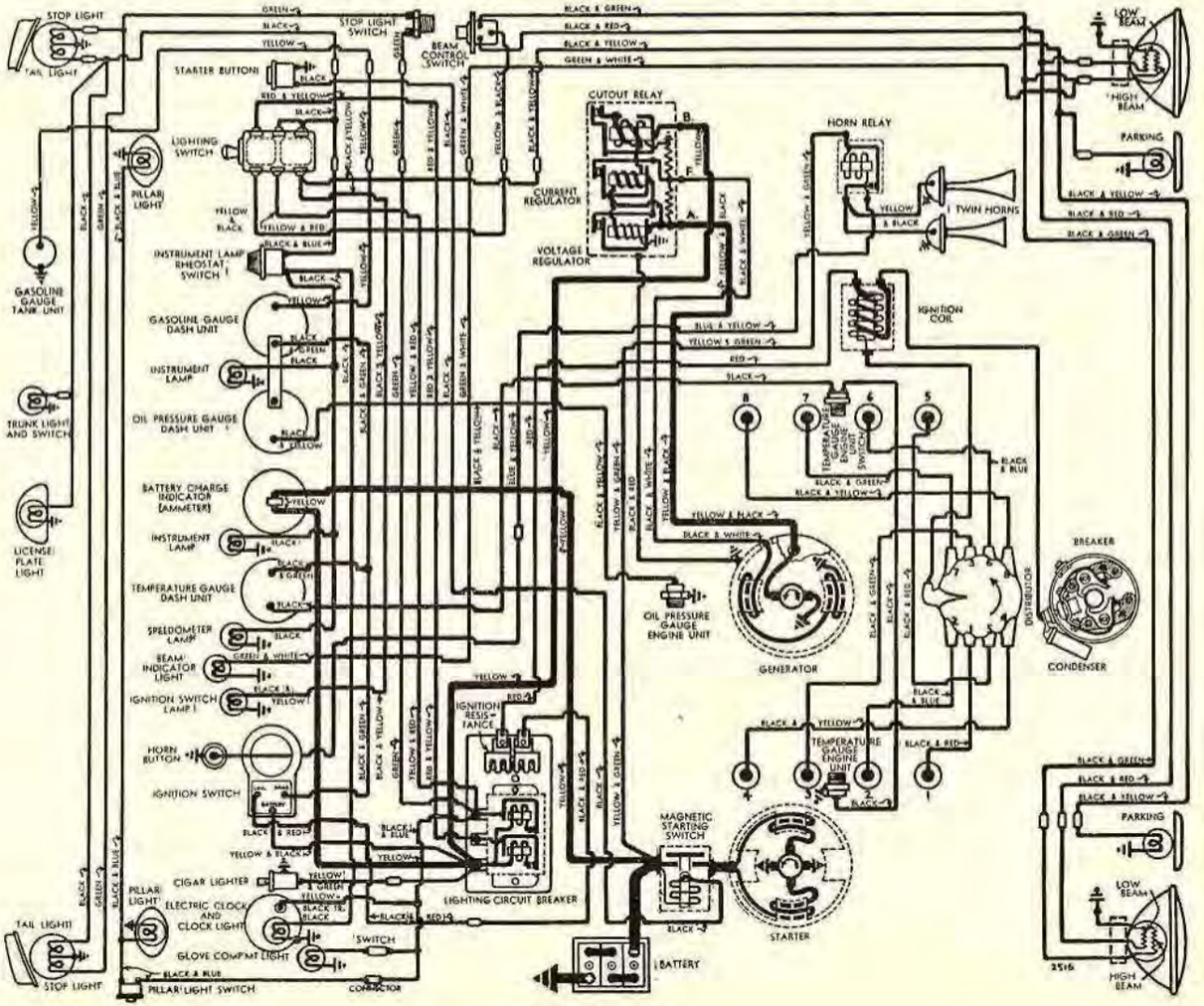
NOTE—Limits are 10½-11½° (distributor degrees).
Removal:—Distributor mounted on front of engine. To remove, disconnect primary lead, remove distributor cap, take out mounting screws in distributor flange, lift unit out.

IGNITION TIMING

IGNITION TIMING:—See Vacuum Brake Setting for final adjustment dependent on operating conditions.

	Flywheel Degrees	Piston Position
All V8 Engines	4° BTDC	.0058" BTDC.

Timing—Manufacturer recommends use of Ford Laboratory Test Set (Heyer H1) with Distributor Stroboscope (Heyer H1-DFZ). On Stroboscope set timing index at 2° before top dead center, set peepsight at Zero, adjust distributor by loosening adjusting screw in slot on left side of housing and moving screw up (to retard spark), down (to advance spark) in slot until Stroboscopic disc light is in line with peepsight, tighten adjusting screw.
Timing (On Engine)—No flywheel marks provided and timing should be set with piston on top dead center. With #1 piston on top dead center entering power stroke, loosen timing adjusting screw on left hand side of ignition unit housing, place screw in retard position at lower end of slot, move screw slowly up until timing contacts begin to open, note graduation on plate under screw head which is in line with reference mark on housing, move screw up exactly one additional graduation, tighten screw. NOTE—Dead center position can be determined by inserting gauge rod in cylinder or by measuring to tops of #2 and #3 pistons (should be equal).
Vacuum Brake Setting—Should be adjusted to eliminate pinging when engine operated with load. To adjust, loosen locknut, back off adjusting screw until engine pings with load, then turn screw in just enough to eliminate ping, tighten locknut. When adjusted on the stroboscope, vacuum brake should retard spark to peep sight with peep sight set at 2° when distributor is driven at 950 RPM. (78-12127), 650 RPM. (11A-12127 & 21A-12127) with no vacuum to release brake.



1942 MODELS

Holley (Chandler-Groves) Model AA-1, Ford No. 91A-9510A (1941), 21A-9510A (1942—and replacement for 1941 type). Dual, downdraft type.
NOTE—New 1942 carburetor has bowl vent at rear and must be used with new type higher fan (bowl vent location prevents fuel fluctuations in bowl from cooling air fan blast).
For complete data, refer to Carburetor Index.
Idle Adjustment—With engine warm, choke valve wide open, and Fast Idle inoperative, set throttle lever stopscrew for 5-7 MPH. idling speed, turn each idle adjusting screw (one for each barrel, adjust in succession) in until engine begins to miss, then out until engine begins to roll, finally turn screw in until engine fires smoothly. Final setting should be approximately ⅝-¾ turn of screw from inner seated position. Readjust stopscrew for correct idling speed of 5-7 MPH. NOTE—Vacuum gauge recommended (set for highest steady reading).
Liquamatic Drive Idle Speed Note—Set idle speed for cars with Liquamatic Drive at 350 RPM.
Accelerating Pump Setting—Three holes provided in the throttle lever for pump rod link connection. Adjust for seasonal requirements as follows:
#1 (Inner) Hole—Summer or Hot weather.
#2 (Center) Hole—Average fuel and weather.
#3 (Outer) Hole—Extremely Cold weather.
Float Level—Use 9550-A gauge to set the float level (1.353" end 'Go', 1.332" end 'No Go') measuring from underside of bowl cover to bottom of float (with cover and float assembly inverted). Fuel level in bowl should be 11/16" plus or minus 1/32".
Metering Jets—*See Holley Chandler-Groves (Ford) Jet Specification Table in Carburetor Section.*

CARB. EQUIPMENT

Air Cleaner:—Ford No. 19A-9600-A oil-wetted type standard. Heavy duty oil-bath type optional.
Fast Idle:—Integral with carburetor. Operated by choke valve lever. No adjustment required.
Fuel Pump:—AC 'R' No. 1537383—Exchange No. 541, Ford No. 11A-9350 diaphragm type fuel pump.
For complete data, refer to Carburetion Equip. Index.
Pressure—1½-2¾ lbs.
Gasoline Gauge: King-Seeley Electric. Ford Nos.
Dash Unit—19A-9280 (1941), 29A-9280 (1942).

CONTINUED ON NEXT PAGE

ENGINE

CONTINUED FROM PRECEDING PAGE

Floating type (locking ring in piston at each end).
Pin Fit in Piston—.0001-.0002" clearance (aluminum pistons), .0003-.0009" clearance (steel pistons) or light hand push fit with piston at 70°F.
Pin Fit in Rod Bushing—.0002-.0005" clearance (pin should pass through bushing slowly of own weight).
Replacement Pins: Std., .002" Oversize, .002" Undersize, .001" Undersize.

CONNECTING ROD:—Length 7.000". Weight 488 grams.
Crankpin Journal Diameter—2.139" (connecting rod diameter on crankpin—2.360").
Bearing Type—Steel-backed, special-alloy lined. Bearing floats in both rods (side-by-side mounting) with bearing surface on both inner and outer face.
Bearing Dimensions—Length 1.747". Thick. .1095".
Clearance—.0015-.0035" (see Bearing Adjustment).
Sideplay—.003-.007" (bearing endplay), .006-.014" (side clearance for both rods).
Bearing Adjustment: None (no shims). Do not file bearing caps. Replace bearings if less than .1085" thick, replace or hone rods for oversize bearings if worn more than .0015" over original size of 2.3597-2.3603". CAUTION—Both rods must be same size.
Replacement Bearings: Std., .003", .010", .015", .020". Also furnished Oversize on O.D. for oversize rods.
Installing Rods:—Marks on rods and caps must be together and installed in same numbered cylinder with marks pointing down toward oil pan.

CRANKSHAFT:—3 bearing. Integral counterweights.
NOTE—1942 engines equipped with new crankshaft (used in conjunction with new wide land pistons).
MAIN BEARING NOTE—Some cylinder blocks have been manufactured with main bearing bore .015" Oversize. These blocks can be identified by mark 'ERP' stamped on oil pan gasket flange at left front corner of block.
CAUTION—All bearings installed in these engines must be special "O.D. .015"" Oversize type.
Journal Diameters—2.499" (all bearings).
Bearing Type—Steel-backed, special-alloy lined.
Clearance—.001-.003".
Bearing Adjustment:—None (no shims). Do not file.
End Thrust:—Taken by rear main bearing. Adjust by replacing bearing. **Endplay**—.002-.006".
Replacement Bearings: Std., .005", .010", .015", .022", .030".

CAMSHAFT:—Three bearing. Helical gear drive.
Bearing Diameters—1.797" all bearings. Replace camshaft if worn to less than 1.7955" diameter.
Bearings—Steel-backed, babbitt-lined bushings.
Clearance—.002".
End Thrust:—Taken by gear hub and cover plate. Adjusted by replacing coverplate. **Endplay**—.005-.015".
Timing Gears:—Cast alloy iron (crankshaft), Bakelized Fabric or Alum. bolted on shaft (camshaft).
Backlash—.004" maximum. *See Mercury Special Data.*
Camshaft Setting:—Mesh '0' marked tooth of crankshaft gear with '/' marked space on camshaft gear (this mark must be in line with mark on hub).

VALVES:—	**Head Diameter**	**Stem Diameter**	**Length**
All Valves	1.537"	.3115"	4.750-4.751"
	Seat Angle	**Lift**	**Stem Clearance**
All Valves	45°	.292"	.0015-.0035"

NOTE—Service limit for valve stem diameter is .309" Intake, .3065" Exhaust. Valves interchangeable. *See Mercury Special Data.*
NOTE—Seat inserts on all valves ('41), exhaust ('42).
Valve Guides:—Split type retained by 'C' washer and valve spring. NOTE—Replace both halves of all guides measuring less than .6665" (thickness of guide half and valve stem at top of guide with valve of .311" stem diameter in place in guide). *See Mercury Special Data.*
Valve Lifters:—Barrel type in reamed holes in block. **Diameter**—.9995". Replace if worn to less than .998" in diameter or length less than 1.710" after any necessary resurfacing of ends (cast type can be resurfaced on both ends, pressed steel on bottom only). **Clearance**—.0005-.0015". Lifter should slip into hole in block of own weight.

Valve Springs:	**Pressure**	**Length**
Valve Closed	37-40 lbs.	2.13"
Valve Open	76-80 lbs.	1.84"

NOTE—Minimum spring tension 30 lbs. at 2.125".

VALVE TIMING

Tappet Clearance:—.010-.012" Intake, .014-.016" Exh.
Valve Timing:—See Camshaft Setting above.
Intake Valves—Open at TDC. Close 44° ALDC.
Exhaust Valves—Open 48° BLDC. Close 6° ATDC.
To Check Valve Timing—No flywheel marks provided. Intake valve opens with piston at TDC.

LUBRICATION

LUBRICATION:—Pressure. Gear type oil pump mounted in crankcase at rear of engine.
Normal Oil Pressure:—30 lbs. at 2000 R.P.M.
Oil Pump and Oil Pressure Regulator: *See "Oil Pump" in Mercury Special Data.*
Oil Pressure Gauge:—King-Seeley Electric. Ford No.
Dash Unit—19A-9273 (1941), 29A-9273 (1942).
Engine Unit—48-9278 (All Models).
See Miscellaneous Section for complete data.
Crankcase Capacity:—5 quarts.

COOLING

COOLING SYSTEM:—Capacity 25½ qt. ('41), 22 qt. ('42).
Water Pump:—Packless type, 2 used (1 for each bank). *See Water Pump Section for complete data.*
Thermostat:—In each cylinder head outlet (2 used). **Setting**—Starts to open at 145°F. Fully open 180°.
Temperature Gauge:—King-Seeley Electric. Ford No.
Dash Unit—19A-10883 (1941), 29A-10883 (1942).
Engine Unit—99A-10884 (All Models).
See Miscellaneous Section for complete data.
NOTE—Accessory Temperature Gauge Switch (for Other Bank) No. 01A-10990. Kit No. 11A-18381.

CLUTCH

CLUTCH:—Long Model 10CF-TI (Std.), 9CF-CS (with Liquamatic Drive). Semi-centrifugal, single plate, dry disc type. *See Clutch Section for complete data.*
Facings Woven, 2 used. I.D. 6¾", O.D. 10". Thick ⅛".
Adjustment:—Pedal free movement must be 1.0-1.25". To adjust, remove pin at throw-out shaft lever end of connecting link, turn clevis on link rod.
Removal:—Slide rear axle and transmission to rear as a unit to expose clutch (see Transmission Removal below), take out mounting screws in cover.

TRANSMISSION

STANDARD

TRANSMISSION (STD.):—Own Make. Constant-mesh, synchro-mesh (second and high), sliding gear (low and reverse). All helical gear type.
See Transmission Section for complete data.
Transmission Control:—Mechanical steering col. shift.
See Transmission Section for complete data.
Removal:—Disconnect gear shifter rods at levers on transmission case. Disconnect rear shock absorbers, hand brake cables, hydraulic brake line at torque tube connection (bleed lines when re-connected), speedometer cable. Disconnect rear spring at center frame connection. Take out universal joint ball housing screws, slide rear axle assembly back to disengage drive shaft at splined joint. Support engine at rear, take out rear engine mounting bolts, and clutch housing screws. Remove transmission.

TRANSMISSION

OPTIONAL

LIQUAMATIC DRIVE (29A):—Consists of fluid coupling & 3 speed automatic transmission (automatic shifting between 2nd & 3rd speeds). Optl. equipment.
See Transmission Section for complete data.

UNIVERSALS

UNIVERSAL JOINT:—Spicer 202-6 Steel bushing type.
See Universals Section for complete data.

REAR AXLE

REAR AXLE: Own Make. ¾ floating, Spiral Bevel Gear Torque Tube drive. *See Rear Axle Section for data.*
Ratio—3.54-1 Std., 3.78-1 & 4.11-1 Optl.
Backlash—.010" maximum.
Removal:—Disconnect rear shock absorbers, hand brake cables, hydraulic brake line (at torque tube connection—bleed lines when re-connected), speedometer cable, shock absorber links. Disconnect rear spring at center frame connection. Take out universal joint ball housing screws, pull axle assembly to rear to disengage drive shaft at splined joint.
Axle Shaft Removal—*See Mercury Rear Axle article*

SHOCK ABSORBERS

Houde. Double acting, hydraulic, adjustable type.

	Houde Model	**Right—Ford No.—Left**	
Front '41	BBCN	11A-18045A	11A-18046A
Front '42	BBCN	21A-18045	21A-18046
Rear	BBCZ	11A-18080A	11A-18081A

FRONT SUSPENSION

Front Suspension:—Conventional 'I' beam section front axle with Reverse Elliott ends and transverse spring. Axle positioned by radius rods.
Kingpin Inclination—8° crosswise.
Caster—9° Max., 4½° Min. Must be equal within ½°.
Camber—1° Max., ¼° Min. Must be equal within ¼° and the right wheel must not exceed the left. Axle may be bent cold to adjust caster & camber if proper tools (to prevent axle flange damage) used.
Toe In—1/16". Set at 1-10 ratio to Camber.
Steering Geometry—Inner wheel 23⅓°. Outer 20°.

STEERING GEAR

Steering Gear: Gemmer Model 305. Worm-and-Roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

BRAKES:—Service. Lockheed hydraulic, double anchor type. Hand lever applies rear service brakes.
See Brake Section for complete data.
Drum—Cast iron. Diameter 12".
Wheel Cylinders—Stepped type as follows:
Front Wheel....1.25"-1.00". Rear Wheel....1.125"-1.00".
Lining—Woven (all shoes). Width 1.75". Thickness .20". Length per shoe 13.18" (forward), 10.1" (rear).
Clearance—Least possible amount without drag.
Hand Brake:—See Service Brakes above.

MISC. MECHANICAL

Power Operated Convertible Top: Auto-Lite Electric type. *See Miscellaneous Section for complete data.*

retard disc of breaker advance mechanism and acts as a "drag" to retard normal advance when engine is accelerated or operated under load. Piston is normally held out of engagement by manifold vacuum.

Removal: Distributor mounted on front of engine. To remove, disconnect coil primary lead, unsnap ball clip and remove terminal housing and conduit assembly, remove distributor rotor. Take out two capscrews mounting distributor on engine, remove distributor and gasket. NOTE—Vacuum connection (for Vacuum Brake operation) is through hole in face of mounting flange.

IGNITION TIMING

Std. Setting—See Vacuum Brake Setting for service correction for operating conditions.

	Flywheel Degrees	Piston Position
All Engines	4° BTDC	.0058" BTDC.

Ignition Timing (Basic Setting)—Distributor can be timed for correct ignition timing when off engine as follows: Place a small straight edge or scale against tang on drive end of distributor shaft (scale must be on wide side of shaft), rotate distributor in direction of rotation (clockwise) until trailing edge of scale is exactly ⅜" past the nearest edge of the small mounting hole (left hand hole—nearest vacuum brake) on the mounting flange. If left hand (timing) contacts do not begin to open at this point, loosen adjusting screw on side of distributor housing, move screw down (to advance spark), up (to retard spark), in slot until contacts begin to open, tighten adjusting screw. This setting will provide correct 4° BTDC. ignition timing when distributor installed on engine.

NOTE—Timing is controlled by opening of **left hand breaker contacts** only (right hand contacts "load" coil and open and close earlier than the left hand contacts).

Timing (On the Engine)—No flywheel marks provided. With basic timing of distributor properly set (above), ignition timing will be correct when distributor installed on engine and all necessary adjustments for operating conditions and octane rating of fuel being used can be made by means of the Vacuum Brake adjustment as follows:

Vacuum Brake Setting:—Should be adjusted to eliminate pinging when engine operated with load. To adjust, loosen locknut, back off adjusting screw until engine pings with load, turn screw in just enough to eliminate ping.

CARBURETOR

Holley (Chandler-Groves) Ford No. 59A-9510-A. Dual (double barrel), downdraft type with manual choke control.

See Carburetor Section for complete data.

Idle Adjustment—With engine warm, choke valve wide open, and Fast Idle inoperative, set throttle lever stopscrew for 500 RPM. idling speed, turn each idle adjusting screw (one for each barrel, adjust in succession) in until engine begins to miss, then out until engine begins to roll, finally turn screw in until engine fires smoothly. Final setting should be approximately ⅝-¾ turn of screw from inner seated position. Readjust stopscrew for correct idling speed. NOTE—Idling speed can be estimated by marking spot on fan belt and setting speed for 25 revolutions of the belt in 10 seconds.

NOTE—Vacuum gauge recommended for idling adjustment. Set for highest steady gauge reading.

Float Level—Use 9550-A gauge to set float level (1.353" end "Go", 1.322" end "No Go") measuring from underside of bowl cover to bottom of float with cover and float assembly inverted. Fuel level in bowl should be 11/16" plus or minus 1/32".

Accelerating Pump Setting—Three holes provided for pump link connection as follows:
Inner (#1)—Min. stroke, Summer Temperatures.
Center (#2)—Medium Stroke, Normal temperature.
Outer (#3)—Max. stroke, Extreme Cold Weather.
NOTE—Link locked in pump rod by snap-lock. Pull link shaft out of pump rod to disengage this lock.

Metering Jets—*Refer to Carburetor Index for Chandler-Groves (Ford) Carburetor Jet Specification Table.*

Fast Idle: Integral with carburetor. Operated by Choke Valve lever. No adjustment required.

CARB. EQUIPMENT

Air Cleaner: Ford No. 91A-9600-A. Oil-bath type.
Servicing—Clean and refill (to level mark on case) with same grade engine oil used in crankcase at 3500 mile intervals (when crankcase drained) or more often if required. Clean filter element by washing in cleaning fluid.
NOTE—Clean and re-oil filter element in oil filler cap (crankcase breather) every 1000 miles.

Fuel Pump: AC. Type R, Ford No. 11A-9350. Diaphragm type. Exchange Pump AC No. 541 ('46), 571 ('47).
See Carburetion Equipment Section for data.
Pressure—3½ lbs. maximum (1½-3½ lbs.).

Gasoline Gauge: King-Seeley Electric. Ford Nos.
Dash Unit—No. 59A-9280 ('46), No. 6M-9280 ('47).
Tank Unit—No. 99A-9275-B.
See Carburetion Equipment Section for data.

BATTERY

Ford Type No. 01A-10655-A. 6 Volt, 17 Plate, 120 Ampere Hour Capacity (20 hour rate).
Starting Capacity—150 amperes for 20 minutes.
Zero Capacity—300 amperes for 4.0 minutes.
Grounded Terminal—Positive (+) grounded to dash.
Engine Ground—Strap connector between right rear cylinder head and dash.
Dimensions—Length 10.56". Width 7.28". Height 8.25".
Location—On right side in engine compartment.

STARTER

Ford Model No. 18-11002. Armature No. 18-11005
Drive—Inboard Bendix Drive No. A1472, Ford No. B-11350.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—2 lbs. each.
Cranking Engine—100 RPM., 190-215 amperes.

Performance Data

Torque	R.P.M.	Volts	Amperes
4 ft. lbs.	1070	4.6	200
8 "	660	4.3	340
12 "	300	3.65	465
14 "	Lock	3.5	500

Starting Switch: Ford No. 21A-11450 Magnetic Switch mounted on the dash and controlled by pushbutton switch on instrument panel, Ford No. 19A-11500.

Removal:—Starter mounted on right front face of flywheel housing. To remove, take off pan at right of engine, free starter-to-oil pan support bracket, take out through-bolts on commutator end plate.

GENERATOR

Ford Model No. 21A-10000. Armature No. 01A-10005A. Two brush (shunt) type with vibrating type voltage and current regulation. Ventilated by fan on drive pulley.
Charging Rate Adjustment—No adjustment. See Regulator data below.
Maximum Charging Rate—Controlled by regulator and dependent on battery condition and load. To check generator output, disconnect generator field lead at generator, connect both generator terminals together (use short insulated wire). Use 'BRS' set or rheostat connected across battery terminals and apply load until voltage is exactly 6 volts. Connect ammeter in charging line, run engine, check output at 2 speeds given in performance table below. Restore original connections after completing test. **Do not operate generator in service with both terminals connected together. This eliminates all regulator action and will damage generator.**

Performance Data

Amperes	Engine RPM.
Start	520
30	1060
30	2500

Rotation—Counter-clockwise at commutator end.
Field Current—2.1 amperes at 6.0 volts (field resistance 2.88 ohms at 70°F.).
Brush Spring Tension—Approximately 28 ozs.

Removal:—Generator mounted on bracket between cylinder banks at front of engine, driven in tandem with water pumps by Vee belt. To remove, loosen nut on bracket stud.

Belt Adjustment:—Loosen nut on bracket mounting stud, raise generator up until side movement on belt midway between generator and water pump pulley is ½" (thumb and finger pressure).

REGULATOR

Ford Model No. 01A-10505-C. Three-Unit Type. Consists of Cutout Relay, vibrating Voltage Regulator and vibrating Current Regulator (separate units) in single case on engine side of dash.
See Electrical Equipment Section for complete data.
NOTE—Regulator case is grounded through braided wire 'pigtail' or separate ground wire extending from regulator to generator frame. This ground connection must be in place when regulator being operated or tested (disturbed by removal of regulator cover).

Cutout Relay

Cuts In—5.8-6.3 volts at operating temperature.
Cuts Out—8 ampere discharge current (maximum).

Voltage Regulator

Setting—6.9-7.2 volts at 70-80° F. See Ford Regulator article in Electrical Equipment Section for voltages at other temperatures.
Checking and Adjusting—*Refer to Electrical Equipment Index for article on 'Ford Regulator—3-unit Type' for complete instructions.*

Current Regulator

Setting—30-33 amperes hot (after generator has been operating for 5 minutes).
Checking & Adjusting—See Voltage Regulator (above).

CONTINUED ON NEXT PAGE

ENGINE

CONTINUED FROM PRECEDING PAGE

Clearance—.0005-.0015". Lifter should slip into hole in block of own weight.

Valve Springs: Replace springs if pressure less than 30 lbs. when compressed to 2.125".

	Spring Pressure	Length
Valve Closed	37-40 lbs.	2.13"
Valve Open	76-80 lbs.	1.84"

VALVE TIMING

Tappet Clearance: .010-.012" Intake, .014-.016" Exhaust, Cold. No adjustment.

Valve Timing: See Camshaft Setting above.

Intake Valves—Open AT TDC. Close 44° ALDC.

Exhaust Valves—Open 48° BLDC. Close 6° ATDC.

Valve Timing Check—No flywheel marks or other means provided to check timing. #1 intake valve should open with #1 piston on top dead center entering the intake stroke.

LUBRICATION

Engine Oiling System: Pressure to main bearings, connecting rod lower bearings, camshaft bearings, and timing gears. Oil pump mounted in crankcase at rear of engine.

Crankcase Capacity—5 quarts.

Normal Oil Pressure—30 lbs. at 2000 RPM.

Oil Pressure Regulator—Located under plug above front camshaft bearing (under manifold) and on oil pump housing (some models). Not adjustable. NOTE—Check relief valve tension spring whenever engine overhauled. Replace the cylinder block relief valve spring if tension not within limits of 43-50 ozs. at 1.380" (engines without oil pump relief valve), or 78-80 ozs. at 1.380" (engines with oil pump relief valve). Replace oil pump relief valve spring tension not within 78-87 ozs. at 1.380".

Oil Pump: Gear type. In crankcase at rear of engine.

►NOTE—This new type pump, No. 41A-6600-A (for engines without oil pan baffles), has oil pressure regulator (relief valve) in pump body.

See Mercury Special Data.

Oil Filter: Replace cartridge at 5000 mile intervals (Ford No. 01A-18662-A Unit).

Oil Pressure Gauge: King-Seeley Electric. Ford Nos.

Dash Unit—No. 59A-9273 ('46), No. 6M-9273 ('47).

Engine Unit—No. 41A-9278 (80 lbs. type).

See Miscellaneous Section for complete data.

COOLING

Cooling System: Positive circulation with two water pumps at front of engine (pump for each bank).

Capacity—22 quarts.

Pressure Valve—In radiator filler cap. Opens at 3½-4½ lbs.

Water Pump: Packless, centrifugal type (2 used). Mounted on front of engine (pump housing integral with front engine mounting).

See Water Pump Section for complete data.

Removal—Drain cooling system, place support jack under engine (use wood block on jack to avoid damaging pan), remove bolt from front engine support, raise engine until no weight rests on front support. Loosen generator mounting bolt, remove drive belt. Disconnect and remove hose at pump. Remove four capscrews mounting pump on engine, lift pump out. CAUTION—One mounting screw located within water pump inlet connection (accessible with hose removed).

Belt Adjustment—*See Generator Belt Adjustment.*

Thermostat: In each cylinder head water outlet (two used). Start to open at 150-155°F. Fully open at 175-180°F.

Temperature Gauge: King-Seeley Electric Ford Nos.

Dash Unit—No. 59A-10883 ('46), No. 6M-10883 ('47).

Engine Unit—No. 01A-10990 (Temperature Gauge Switch—in left hand cylinder head), No. 99A-10884 (regular Engine Unit—in right cylinder head).

See Miscellaneous Section for complete data.

CLUTCH

Long Model 10CF-TI, Ford No. 19A-7563. Single plate, semi-centrifugal, dry disc type.

See Clutch Section for complete data.

Facings—Woven asbestos composition. I.D. 6¾". O.D. 10". Thickness ⅛".

Pedal Adjustment: Pedal free travel 1-1¼". To adjust, disconnect clevis at equalizer (throw-out) shaft end of pedal connector rod, turn clevis on rod.

Removal: Remove Transmission (see Transmission Removal below), install wooden wedges between each release lever and cover to hold the clutch in released position, take out six capscrews mounting cover assembly on flywheel, lift out cover assembly

TRANSMISSION

Own Make. Three-speed, all-helical gear type. Constant-mesh, synchro-mesh (Second & High), sliding gear (Low & Reverse).

See Transmission Section for complete data.

Transmission Control: Remote control type with gearshift lever on steering column.

See Transmission Section for complete data.

Removal: Remove Rear Axle (see Rear Axle Removal below), remove capscrews mounting front seat track on floor, move front seat back for necessary room. Take out mounting screws in front floor pan spacer, remove spacer. Disconnect gearshift connecting rods at transmission case, disconnect and remove equalizer (clutch release) shaft. Remove capscrew and washer on end of transmission shaft (in universal joint), remove universal joint. Remove nuts and washers on engine rear support bolts. Support engine by placing jack (use wood block on jack) under rear end and raise engine sufficiently so that rear support clears mounting bolts (NOTE—remove nuts holding lower half of engine rear support assembly and remove the assembly). Take out eight capscrews mounting transmission case on flywheel housing, pull transmission straight back

UNIVERSALS

Spicer Model 202-6X, Ford No. B-7090. Steel bushing type. Single joint in torque ball at transmission.

See Universals Section for complete data.

REAR AXLE

Own Make. ¾ Floating, Spiral Bevel Gear type with Torque Tube Drive.

See Rear Axle Section for complete data.

Ratio—3.54-1 Std., 3.78-1 & 4.11-1 Optl.

Backlash—.012" maximum.

Removal: Raise rear end of car. Disconnect track bar. Disconnect rear spring (use spring spreader if available) by placing block under each rear spring eye and lowering car so that weight keeps spring extended and then removing spring shackle bolts and bars. Take out pin in hand brake equalizer and disconnect hand brake cable. Disconnect hydraulic brake line at torque tube and rear shock absorber links at each wheel. Disconnect accelerator pedal, remove pedal pads, floor mat, beam control switch (take out two mounting screws), and floor pan. Disconnect speedometer cable at torque tube. Remove nuts on four universal joint ball housing bolts and two bolts holding ball cap halves together, remove ball cap. Pull rear axle back to disconnect torque tube from transmission and remove from beneath car.

SHOCK ABSORBERS

Houde. Double acting, hydraulic, adjustable type.

Houde Model	Right — Ford No. — Left
Front.....BBCN-3	51A-18045 ..... 51A-18046
Rear①.....BBCZ-3	51A-18080A 51A-18081A
Rear②.....BBCZ-3	51A-18080B 51A-18081B

①—Except Sedan Delivery and Station Wagon.

②—Sedan Delivery & Station Wagon only.

Adjustment: Standard setting marked by line on face of lever hub (pointer should be aligned with this mark). Adjustment can be varied by turning pointer clockwise (for more control) or counter-clockwise (for less control) not more than 1 or 2 serrations at a time. NOTE—Stops are provided to limit adjustment in either direction.

Refilling: Check every 5000 miles, fill to level of the filler plug hole. Use Ford No. M-4633-B fluid only (Houde L-1404) required for these new shock absorbers (identified by round top filler plug).

FRONT SUSPENSION

Front Axle: Conventional "I" beam section type with Reverse-Elliott ends and transverse spring. Axle positioned by radius rods.

Kingpin Inclination—8° crosswise.

Caster—3°. Axle may be bent cold for minor corrections providing correct tools used to prevent crushing of axle flange.

Camber—¾°. Adjust as for Caster (above).

Toe In—1/16". Adjust in usual manner by changing length of tie rod.

STEERING GEAR

Gemmer design (Model 305), Ford Make. Worm-&-Roller type with push-pull adjustments.

See Steering Gear Section for complete data.

BRAKES

Service: Lockheed Hydraulic, self-centering, double anchor type. Hand lever applies rear wheel brakes.

►**These brakes do not have anchor pin adjustments.**

See Brake Section for complete data.

Drums—Composite iron and steel. Diameter 12".

Clearance—Least possible amount without drag.

Lining—Width 1.75". Thickness .187". Length per shoe 13.12" (forward shoes), 10.08" (rear shoes).

Hand Brakes: See Service Brakes (above).

MISC. MECHANICAL

Power Operated Convertible Top: 2 types as follows:

1—Convertible—Auto-Lite electric type.

2—Sportsman Convertible—Hydro-Lectric type.

See Miscellaneous Section for complete data.

Power Window Regulators (Sportsman Convertible): Hydro-Lectric type.

See Miscellaneous Section for complete data.

IGNITION TIMING

Std. Setting ..... **2° BTDC.**

►*IGNITION TIMING NOTE*—Improved performance can be obtained by advancing timing 4° (total advance will be 6° indicated on dampener). Paint ¼" wide stripe on ADVANCE side of timing mark to indicate new setting. (Edge of line indicates 6° point).

Crankshaft Pulley Mark—Small circular button on rim of pulley. Timing pin above pulley on right side.

Timing—With #1 piston at firing position and timing mark on pulley aligned with timing pin on front of engine, loosen hold down screw on distributor, rotate distributor until contacts begin to open, tighten hold down screw. Check spark plug connections (see diagram), see that rotor at #1 in cap.

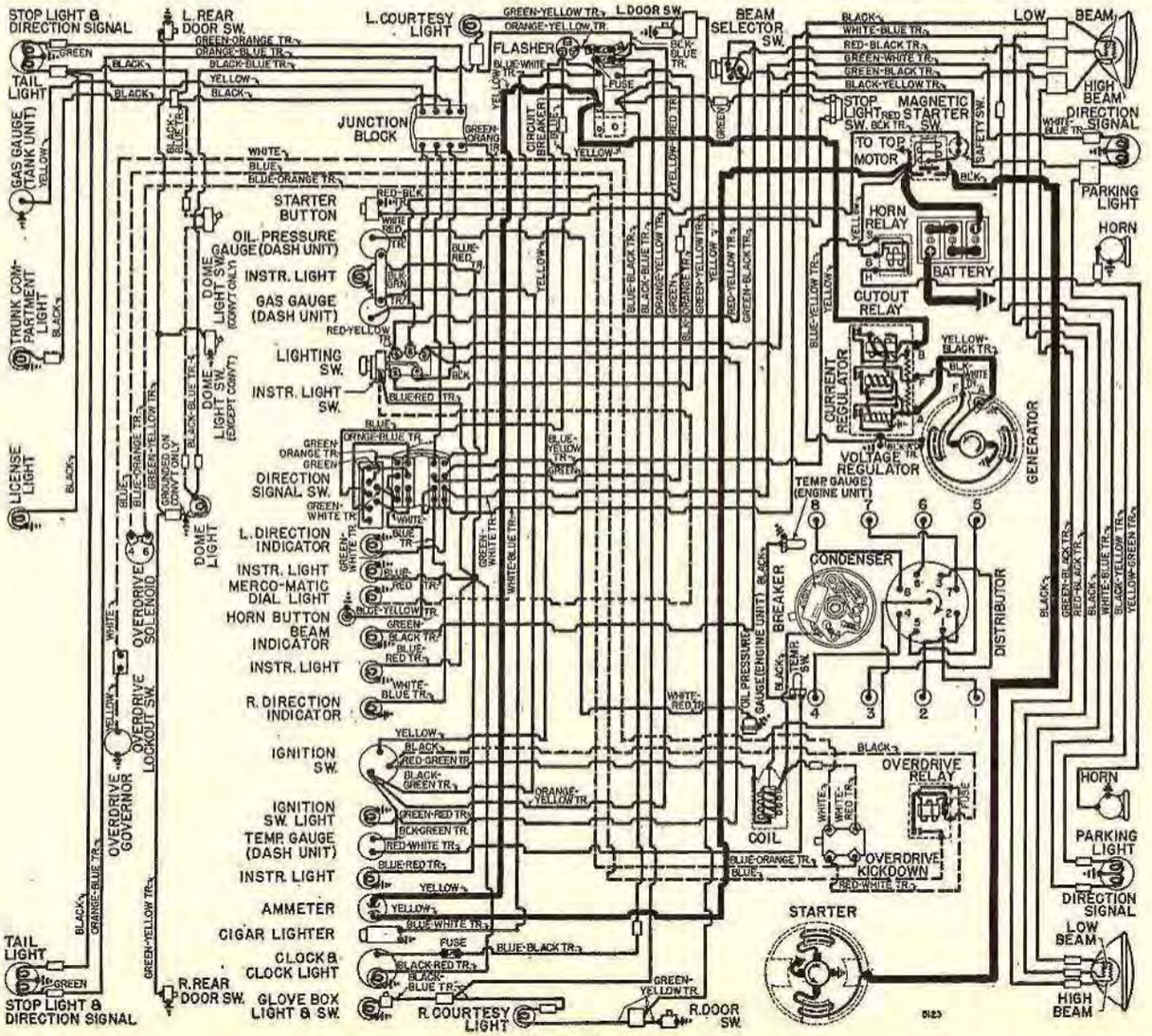
►**Timing (with Neon Timing Light)**—*CAUTION—Vacuum line must be disconnected to avoid vacuum advance operating.* Connect timing light to #1 spark plug. Idle engine and adjust distributor (as directed above) until mark aligned with timing pin.

CARBURETOR

Holley-Ford dual concentric (double barrel) downdraft with automatic choke.

1949-Early 1950 Std. Trans.....**8CM-9510-G, H, J**
1950-1951 Std. Trans.....**1CM-9510-G,H,J**
1950 (Early) Merc-O-Matic.....**1CM-9510-K,L,M**
1950-1951 Merc-O-Matic ①**1CM-9510-N,P,R**
①Automatic choke mounted on intake manifold.

See Carburetor Section for complete data.



1950-51 MODELS

►*ADAPTING LATE TYPE (Stamped 8-49 & Later) CARBURETOR TO EARLIER MODELS—See Carburetor Section for complete data.*

►*NEW "CLIP TYPE" FLOAT NEEDLE & SEAT ASSEMBLY*—furnished for replacement.

Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*

Metering Jets—*See Holley-Ford Jet Specification Table in Carburetor Section.*

Fast Idle: Holley-Ford Carburetor type.
See Carburetion Equipment Section for complete data.

Automatic Choke: Holley-Ford Carburetor type.

►*AUTOMATIC CHOKE PRODUCTION CHANGE*—Automatic choke moved to position on intake manifold on late 1950 & 1951 Merc-O-Matic cars.
See Carburetion Equipment Section for complete data.

Setting—Index mark on coil cover aligned with center mark on housing (maximum variation one division either side).

CARB. EQUIPMENT

Air Cleaner (Oil Bath): Mercury No. (1949) 8CM-9600-A1. (1950-51) 8CM-9600-A5.

►*CAUTION: Oil Bath Air Cleaners stamped "HH" on underside should be serviced with ½ pint of engine oil only. Disregard level mark or 1 pint specifications.*

Fuel Pump (std.): Mercury No. 7RA-9350-C.

►**Fuel Filter Change to "Edge" type**—*See Lincoln Mercury Dual Concentric Carburetor in Carburetor Section.*

Optl. (Fuel-&-Vacuum)—Mercury 8CM-9350-A, C. **Pressure**—3½-4½ lbs. (both types).
See Carburetion Equipment Section for complete data.

Gasoline Gauge: King-Seeley Electric.
Dash Unit—Mercury No. (1949) 8M-9280. (1950-51) OM-9280.
Tank Unit (exc. Sta. Wgn.)—Mercury 99A-9275-B.
Tank Unit (Sta. Wagon)—Mercury No. 01A-9275-A.
See Carburetion Equipment Section for complete data.

BATTERY

Mercury No. 8M-10655-A. 6 volt, 17 plate, 100 A. H. Zero Capacity—300 amperes for 3.3 minutes. **Five** Second Voltage—4.2 volts.
Grounded Terminal—Positive (+) terminal.
Location—On left side in engine compartment.
Dimensions—L. 10 9/16". W. 7¼". H. 8 1/16".

STARTER

Mercury No. (Std. Trans.) 7RA-11002. Armature No. 18-11005. **(Merc-O-Matic Trans.) 1CM-11002.** Armature No. 1CM-11005-A.
Drive—Mercury No. (Std. Trans.) B-11350. (Merc-O-Matic) 1CM-11350-B.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—20-22 ounces.
Cranking Engine—100-180 RPM., 190-215 amperes.

Performance Data

Torque	R.P.M.	Volts	Amperes
No Load①	4000-6000	5.8	45-60
15 ft. lbs.	Lock	3.5	600

①—Manufacturer recommends taking "No Load" reading by inserting 0-600 range ammeter in battery circuit at battery and operating starter while engine is idling.

CONTINUED ON NEXT PAGE

ENGINE

CONTINUED FROM PRECEDING PAGE

mum wear limit out of round .0015", Taper .001".

►**Lower Bearing**—*Locked in (not floating type as used on earlier engines)*, steel-backed, copper-lead alloy lined, replaceable shells. Upper and lower halves interchangeable.

Clearance—.0005-.003" (new), .005" (worn limit).

Side Play—(2 rods) .006-.020". Worn Limit .022".

►*NOTE—Replace bearing shells less than .0745" thick.*

Bearing Adjustment—None. Replace bearings.

►**CONNECTING ROD INSTALLATION**—*See "Connecting Rod & Bearings" in Mercury Special Data.*

Replacement Bearings: Standard size and .002", .010", .020", .030", .040" Undersize.

CRANKSHAFT: 3 bearing, 6 integral counterweights.

►*SLUDGE TRAPS—Crankpin throws equipped with sludge traps having removable plugs for cleaning.*

Journal Diameters—2.498-2.499" (all main journals).

Wear Limits: .0015" Out-of-round, .001" Taper.

Bearings—Steel-backed, copper-lead alloy lined, replaceable shells. Upper and lower halves alike.

Clearance—.001-.0026".

►*NOTE—Replace main bearing shells when less than .0835" thick.*

Bearing Adjustment—None. Replace bearings.

Replacement Bearings: Standard size and .002", .010", .020", .030" Undersize. Rear mains also furnished .015" Oversize length for taking up excessive end play.

End Thrust: Taken by rear main bearing. Adjust by replacing bearing if endplay excessive.

Endplay—.002-.006" (new), .008" (worn).

CAMSHAFT: *CAUTION—Different Camshafts used in 1950 & 1951.* Three bearing. Helical gear drive. Distributor drive gear pressed on front end of shaft, oil pump drive gear on rear end.

►*CAMSHAFT PRODUCTION CHANGE VEHICLE NO. 9CM-826 UP (1949)—Change to REVERSE helix timing gears. See Mercury Special Data.*

Camshaft Journal Diameter—1.7965-1.797".

Bearing Diameter—1.7985" (replace bearing if diameter greater than worn limit of 1.8015").

Replacement Bearings: Standard size and .010", .015" Undersize. Undersize bearings require finish reaming.

End Thrust: Taken by front end of camshaft and thrust surface on inner face of front cover. Adjust by replacing front cover. **End Play**—.007-.016".

Timing Gears: L.H. helical. Fiber camshaft gear.

Replacement Camshaft Gears—Standard, .006" & .012" Oversize.

Camshaft Setting: Mesh marked tooth of crankshaft gear with marked space on camshaft gear.

VALVES:	Head Diam.	Stem Diam.	Length
Intake	1.515"	.342"	4.8175"
Exhaust	1.515"	.3405-.3415"	4.8175"

Seat Angle—45°

Lift—(1950) .338". (1951) .333".

Stem Clearance—**Intake** .0006-.0026".

Exhaust—.0011-.0031".

►*ROTATABLE VALVES USED IN 1951 ENGINES—See "Valve System" in Mercury Special Data.*

►*REPLACEMENT VALVES—Exhaust valves furnished for replacement to be used for ALL VALVES.*

Valve Seat Inserts—Used on all valves.

Valve Seat Width—1/16-5/64".

Valve Guides: One piece type positioned and retained by "C" washer. Inside diameter .344". Outside diameter 1.031". Distance from top of valve seat to upper end of guide 1.116".

Valve Guide Bushing—Rubber seal used around outer diameter of intake valve guide bushings.

Valve Lifters: Barrel type operating in guide holes in cylinder block.

Diameter—.9992" (replace if worn to less than .9977"). Length limit after resurfacing end 1.728".

Clearance—.0007-.0016" (new), .003" (worn limit).

Valve Springs: Coated springs used.

Spring Test—37-40 lbs. at 2.125". Free length 2.41".

VALVE TIMING

VALVE TAPPET CLEARANCE: *CAUTION—Different camshafts used in 1950 & 1951. Valve tappet clearances are different.*

1949-50—**Intake** .010"-.012". **Exhaust** .014"-.016".

1951—**Intake** .013"-.015". **Exhaust** .017"-.019".

Valve Timing: See Camshaft Setting above.

1949-50

Intake Valves—Open 10° BTDC. Close 50° ALDC.

Exhaust Valves—Open 50° BLDC. Close 10° ATDC.

1951

Intake Valves—Open 5° BTDC. Close 51° ALDC.

Exhaust Valves—Open 47° BLDC. Close 9° ATDC.

Valve Timing Check—*See "Valve System" in Mercury Special Data.*

LUBRICATION

Engine Oiling System: Pressure to main bearings, connecting rod lower bearings, camshaft bearings, timing gears and distributor drive gear. Piston pins and valve lifters lubricated by splash. Oil pump mounted in crankcase at rear of engine.

Crankcase Capacity—5 quarts (refill).

Normal Oil Pressure—55 lbs. at 2000 RPM.

Oil Pressure Relief Valve: In oil pump body. Not adjustable.

Spring Tension—12 lbs. at 1.14".

NOTE—Cylinder block oil relief valve not used.

Oil Pump: Gear type. In rear of crankcase.

Oil Filter: On left cylinder head. Replace cartridge each 5000 miles or more often if required.

Oil Filter Cartridge—Mercury No. 8CM-18662.

Oil Pressure Gauge: King-Seeley Electric.

Dash Unit—Mercury No. (1949) 8M-9273. (1950-51) OM-9273.

Engine Unit—Mercury No. 41A-9278.

See Miscellaneous Section for complete data.

Crankcase Ventilation: Filter element in oil filler breather cap (inlet), and in outlet pipe below fan. **Servicing**—Wash screen in cleaning fluid and wet with engine oil when dry at oil change period (2500 miles).

Outlet Pipe Air Filter Cartridge—Mercury No. 8CM-6841.

COOLING

Cooling System: Pressure type with relief valve in filler cap and two belt-driven pumps (one for each bank) with re-circulating by-pass.

Capacity—22.25 quarts.

Pressure Valve—In radiator filler cap. Mercury No. 26H-8100-B (AC #846740). Opens at 3½-4 lbs.

Water Pumps: Two used. Centrifugal, belt driven packless type. Shaft mounted on pre-packed ball bearings. Require no lubrication service.

NOTE—Bottom bolt must be installed prior to installing water pump pulley.

See Water Pump Section for complete data.

Fan Belt Adjustment—Loosen 2 fan mounting bracket bolt nuts, raise fan up until side movement of belt midway between fan and crankshaft pulleys is ½".

Generator (& Water Pump) Belt Adjustment—*See GENERATOR.*

Thermostats: Two used (one in each cylinder head water outlet). Mercury No. 8RT-8575-A.

Setting—Starts to open 148-153°F. Fully open 168-173°F.

Temperature Gauge: King-Seeley Electric.

Dash Unit—Mercury No. (1949) 8M-10883. (1950-51) OM-10883.

Engine Unit—Mercury No. 8A-10990 (switch in right bank), No. 8A-10884 (reg. unit left bank).

See Miscellaneous Section for complete data.

CLUTCH

Borg & Beck Model 10A7 Mercury No. (1949) 8CM-7563-A. (1951) 8CM-7563-B, C. Single plate. Dry disc type with Borglite driven member.

Cover Number—988 stamped on cover.

See Clutch Section for complete data.

Facings—Moulded. Inside diameter 6¾". Outside diameter 10". Thickness .125".

Pedal Adjustment: 1-1¼" free travel. Adjust by loosening locknut and turning adjusting screw on adjusting rod.

Removal: Remove transmission (see TRANSMISSION Removal below). Remove flywheel housing. Prick punch flywheel and pressure plate so that these parts may be placed in original positions when reassembling. Compress pressure plate assembly with Tool 7563 and remove capscrews. Take off clutch assembly.

TRANSMISSION

Own Make. 3-speed, all helical gear type. Constant-mesh, synchro-mesh (Second & High), sliding gear (Low & Reverse).

See Transmission Section for complete data.

Transmission Control: Steering column mounted shift.

See Transmission Section for complete data.

Removal: Disconnect rear universal, slide propeller shaft out of transmission. Disconnect clutch, transmission and speedometer linkage. Support rear of engine and disconnect rear engine mounting from frame. Take out eight transmission-to-flywheel housing capscrews and remove transmission.

OVERDRIVE

Warner Model (1949-50) AS1-R10C, (Early 1951) AS1-R10E, (Late 1951) AS4-R10E. (NOTE—AS4-R10E is not equipped with "Lock-out Switch"). Overdrive is solenoid operated type (no centrifugal pawls) with governor control and throttle operated Kick-down Switch.

See Transmission Section for complete data.

►*LOCKOUT SWITCH NOTE—In the event of lockout switch faulure, it is only necessary to by-pass switch by connecting the two wires together. Leave switch in place or install a plate over transmission opening.*

CONTINUED ON NEXT PAGE

HOOD ASSEMBLY

1940 MODELS

HOOD LOCK: Engine hood hinged at cowl and lifts from forward end. To raise hood, turn latch handle located on lower edge of radiator grille at center and release safety catch (under hood) at upper edge of grille.

1941-48 MODELS

HOOD LOCK: Alligator type hood hinged at cowl. Hood lock button located on left side under instrument panel. Removable hood side panels used.

FRONT END SHEET METAL

1940 MODELS

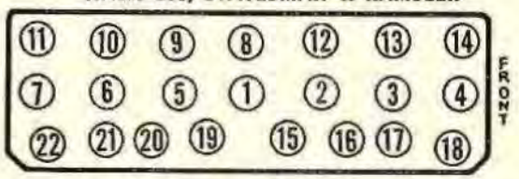
FRONT END ASSEMBLY REMOVAL: Radiator core, grille and front fenders can be removed as an assembly for work on front of engine, if necessary, by loosening fenders, core, and side shields.

CYLINDER HEAD

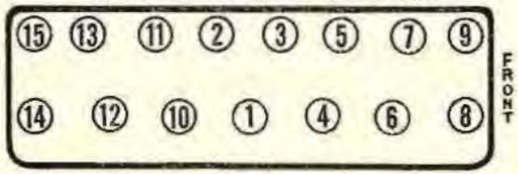
1951 & EARLIER MODELS

INSTALLING CYLINDER HEAD: Use a Torque Indicating Wrench to tighten cylinder head stud nuts, tighten in correct sequence as shown in the diagrams. Cast Iron heads sould be tightened cold and rechecked after the engine has been run and thoroughly warmed up.

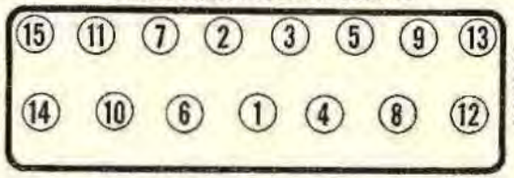
NASH 600, STATESMAN & RAMBLER



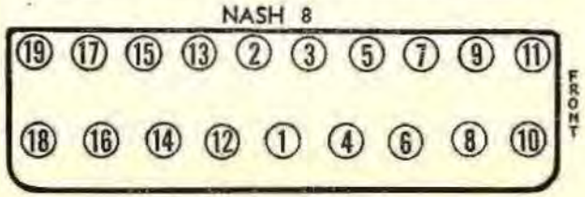
NASH AMB. 6 (1949 & EARLIER)



NASH AMBASSADOR 1950-51



NASH 8



Cylinder Head Gasket—Always use new gasket. Coat gasket with very light application of Perfect Seal Gasket Paste to insure tight seal between head and block.

Tightening Torque—See Tightening (Torque Wrench) Specifications below.

1939-41 MODELS

REPLACEMENT CYLINDER HEADS FOR OLDER CAR MODELS: Cylinder heads as used on later cars are furnished for replacement on some earlier car models (with special attaching parts) as follows:

Series 39, 4020 (1939-40): Use Service Assembly Part No. 3123400-A (includes 4760 Cylinder head and attaching parts).

Series 39, 4080 (1939-40): Use 4280 Cylinder Head and gasket and **install Washer WA-1035 under each rocker arm shaft stud spacer** to maintain original angular movement of valve push rods.

TIGHTENING SPECIFICATIONS

1942-51 MODELS

	Ft.Lbs.	In.Lbs.
Cylinder Head Stud Nuts:		
Ambassador (Dry)	65-70	780-840
Ambassador (Oiled)	60-65	720-780
Others (Dry)	60-65	720-780
Others (Oiled)	57-60	684-720
Main Bearing Capscrews (6's)	66-70	792-840
Main Bearing Capscrews (8's)	70-73	840-876
Con Rod Bolt Nuts:		
Ambassador	50-55	600-660
Others	27-30	324-360
Spark Plugs (14mm.)	30	360

1941 MODELS

	Ft. Lbs.	In. Lbs.
Cylinder Head Stud Nuts:		
'600' 4140—Dry	61-64	732-768
'600' 4140—Oiled	57-60	684-720
4160 & 4180—Dry	65-70	780-840
4160 & 4180—Oiled	60-65	720-780
Main Bearing Capscrews (Sixes)	66-70	792-840
Main Bearing Capscrews (Eight)	73-75	876-920
Connecting Rod Bolt Nuts ('600')	27-30	324-360
Connect. Rod Bolt Nuts (4160,80)	50-55	600-660
Tappet Screw '600'	4 1/6	50 min.

1940 & EARLIER MODELS

Cylinder Head Bolts	60-64	720-768
Main Bearing Capscrews (Sixes)	65-70	780-840
Main Bearing Capscrews (Eight)	70-75	840-900
Connecting Rod Bolts	50-55	600-660

ENGINE REMOVAL

1946-48 MODELS

ENGINE REMOVAL: Remove hood. Drain cooling system, remove radiator and hose connections from engine. Disconnect fuel line at fuel pump, and exhaust pipe at manifold flange. Disconnect throttle controls and remove linkage from engine. Disconnect oil pressure and temperature gauge lines at engine units. Disconnect wiring at ignition coil and generator. Remove crankcase ventilator. Take out front and rear engine mounting bolts. Disconnect clutch linkage (under car), disconnect transmission (see Transmission Removal on car model page for complete instructions). Lift engine out of car using care not to damage engine accessories.

1950-51 RAMBLER

ENGINE REMOVAL: Engine is removed from below car. Place car on lift or place two high jacks under body sills just behind the rear engine support cross-member. Remove hood top and radiator core. Disconnect fuel line at fuel pump, and remove fuel line to carburetor. Disconnect wires at generator and oil and heat indicator engine units. Disconnect throttle linkage. Remove exhaust manifold and fasten out of the way against the side panel. Disconnect steering cross tie rod, shift rods at transmission, clutch linkage to clutch beam, speedometer cable (and Overdrive wiring if used). Place lifting fixture to head studs and lift engine just enough to support it. Remove four bolts holding front cross-member to side sills. Remove rear engine diagonal mounting braces and the four bolts holding the rear engine support cross-member to body sills. Engine will now be supported by the lifting device. Lower the engine slightly and move forward enough to slide the front universal off the transmission. Engine can now be lowered and removed from beneath the car.

ENGINE MOUNTINGS

1941-48 "600" MODELS

Front Engine Mounting: Consist of shackles insulated with rubber bushings (upper end attached to engine support plate by bushing welded to support, lower end attached to bracket bolted to front frame cross-member) with rubber bumper between frame bracket and bushing to limit movement of shackle mounting.

Installation & Adjustment—Tighten retaining nuts on shackle studs securely. NOTE—Studs provided with shoulders to limit compression of rubber bushings.

Rear Engine Mounting: Consists of rubber and steel support cushion (upper and lower channel sections with live rubber cushion vulcanized to both parts) bolted to transmission case (upper channel), and to body frame cross-member (lower channel). Oil shield is installed on top of support to protect support cushion. Clutch housing is also insulated from engine block (see Clutch Housing Insulator).

Installation—See that oil seal installed with depressed edge forward (to clear transmission case), tighten mounting bolts securely.

Clutch Housing Insulator: Consists of a live rubber pad installed between clutch housing and engine block (upper) and additional pad between engine block and adapter plate (lower). Upper mounting studs (3) provided with limiting sleeves to prevent excessive compression of the rubber pad. Tighten stud nuts securely and lock with palnuts. NOTE—No bolt used in hole on right hand side of housing just above dowel bolt (omitted to permit proper functioning of insulators).

1941-47 AMBASSADOR MODELS

REPLACEMENT (1948 TYPE) ENGINE NOTE: ***When installing 1948 engines in these models, see Replacement Engine Mounting data (following original mounting data).***

Front Engine Mounting (Original Type): Consists of rubber cushion in retainer mounted on frame cross-member by four studs and nuts. Cushion has steel insert (for engine support capscrew) and loose rub-

CONTINUED ON NEXT PAGE

3rd Letter—Crankpin Journal Size.

Size Identification—Letters indicate following:
'A'—Standard size (bore or bearing sizes).
'B'—.010" Undersize (main or con rod bearings).
'C'—.010" Oversize (bore size with .010" OS Pistons).
NOTE—.010" Undersize bearings fitted to .010" Undersize main bearing and crankpin journals. .010" Oversize pistons fitted to .010" oversize bores.

CONNECTING ROD & BEARINGS

1940-51 MODELS

CONNECTING ROD: Bearing Removal & Installation. Removable bearing shells used. To remove bearings, take off bearing caps, remove bearings from rod and cap. Fit bearings as directed below. When installing bearings, oil hole in upper half should register with oil spit hole in rod. Tongue on each bearing should engage groove in rod and cap.

Replacement Bearings—Finished bearings furnished standard and .002", .010" undersize.

Fitting Bearings—To check bearing clearance, insert short piece of .002" feeler stock, ½" wide, lengthwise to crankpin between bearing and crankshaft, tighten cap. Bearing fit correct when a definite drag is felt when rotating the crankshaft. (CAUTION—Do not rotate crankshaft more than 1" in either direction). If no drag felt, replace bearings with proper size (see Replacement Bearings above) until bearing fit correct. Do not shim bearings or file bearing caps.

CRANKSHAFT & MAIN BEARINGS

1940-51 MODELS

MAIN BEARING REMOVAL & INSTALLING: Upper bearing halve may be 'rotated' out by inserting pin in oil hole in crankshaft and turning shaft in the direction of locating tongue on bearing. Bearings can be installed by reversing removal procedure

Replacement Bearings—Finished bearings which require no reaming or scraping are furnished standard size and .002", .010" undersize.

Fitting Bearings—To check bearing clearance, insert short piece of .002" feeler stock, ½" wide, lengthwise to crank pin between bearing and crankshaft, tighten cap. Bearing fit correct when a definite drag is felt when rotating crankshaft (CAUTION—Do not rotate crankshaft more than 1" in either direction). If no drag felt, replace bearings with proper undersize (as listed above) until bearing fit correct. Do not shim bearings or file caps.
NOTE—If filing of caps necessary, car manufacturer recommends that this be done carefully without removing too much metal.

1940-51 MODELS

REPLACEMENT MAIN BEARING CAPS: In extreme emergencies, replacement main bearing caps can be installed if fitted as directed below. Bearing caps are line-bored in production and original bearing caps should be retained if possible.

Replacement Main Bearing Caps—On 6 cyl. engines replace caps as follows: Align bore in cap with bore in crankcase by filing sides of cap (caps fit in recess in block). To assure correct alignment, cap retaining screws should be tightened, then backed off slightly and crankshaft rotated allowing cap to be properly positioned, tighten retaining screws to 66-70 ft. lbs. tension with tension wrench.

Replacement Main Bearing Caps—On 8 cylinder, Install caps on engine, tighten retaining screws, back off screws slightly, line up dowel holes in cap and crankcase (original caps doweled in place when bearings line-bored) to align bore in cap with bore in crankcase, tighten screws to 70-73 ft. lbs.

1940-51 MODELS

CRANKSHAFT REAR OIL SEALS: Install new seals with rear main bearing cap off (and crankshaft out of engine when replacing upper half) as follows:

Rear Main Oil Seal ("600", Statesman & Rambler)—Packing in groove in block and cap behind oil slinger on crankshaft. Cap sealed with rubber plugs in groove on each side where cap fitted in recess in block. Use Tool J-1610 to install packing in groove in block and cap. Place packing in groove (with bearing shell removed) place small diameter of tool over packing, hit end of tool with lead hammer to seat packing, cut ends of packing flush with bearing cap seat, remove tool. Repeat operation for groove in block. Install rubber seal plugs on each side of bearing cap (where angle seal used, make certain that seal also seated in horizontal groove in block).

Rear Main Oil Seal (Amb. Six 1948-51)—Steel backed, synthetic rubber seal. Install upper half in block, lower half in bearing cap, making certain that seal fits snugly over edge of rear bearing oil return groove. See that surface on crankshaft to rear of oil slinger (on which seal bears) is clean and smooth. Install rubber seal key strips on either side of bearing cap three strips overlap bearing cap and seal sides and mating surfaces of bearing cap in crankcase).

Rear Main Bearing Oil Seal (Ambassador 6, 1940-47)—Reverse threaded oil slinger formed on crankshaft rotates in line with cored groove in block and cap. No seal installed in this groove. Groove in cap provided with two 13/32" diameter oil return holes. Cap sealed with straight grain pine wood seal plugs installed in groove on each side of cap where cap fitted in recess in block. With bearing cap off, check clearance between oil slinger threads and bore in block and cap. Clearance must be .006-.008" uniformly around shaft to provide eccentric oil thread. If clearance too small, file crankshaft thread (CAUTION—Do not alter bore in block and cap for clearance adjustment). Clean seal plug grooves in cap to provide flat and smooth surfaces. After bearing cap installed, place gasket compound on inner end of plug, tap plug carefully in place in groove on each side of cap, cut off ends of plugs flush.

Rear Main Bearing Oil Seal (Ambassador 8, 1940-42)—Reverse threads cut on the crankshaft behind oil slinger. Slinger turns in line with cored groove in block and cap. No seal installed in this groove. Groove in cap provided with oil return holes. Clearance between threads (behind oil slinger) and bore in block (behind oil slinger groove) should be .006-.008". Check with cap off engine. If clearance too small file threads on crankshaft. Cap sealed to oil pan with cork gasket. Rear edge of cap sealed to flywheel housing pan by an additional cork gasket.

Crankshaft Sprocket Installation:—Sprocket should be heated for installation on crankshaft. When reassembling timing chain make certain that sprocket marks are adjacent and in line with a straightedge across the crankshaft and camshaft centers.
NOTE—Sprocket should be heated to 212° F. (temperature of boiling water).

1941-49 "600" MODELS
1950-51 STATESMAN & RAMBLER

CRANKSHAFT END THRUST PLATE: Crankshaft end thrust taken by flanged edges of front bearing. A steel thrust plate is assembled between rear face of timing chain sprocket and flanged face of front bearing. Plate keyed to shaft by Woodruff key which also secures sprocket on shaft. When plate installed, chamfered edge on inner diameter should face toward the rear for tight fit against bearing journal.

Adjustment—If endplay not correct with all parts correctly assembled, replace front main bearings or thrust plate.

1941-51 MODELS

CRANKSHAFT FRONT OIL SEAL: "600" & Amb. 6. A felt seal is fitted in the timing chain cover which bears against vibration dampener hub. Seal seat in cover has inner edge turned up to form a shedder on inside of cover. An oil slinger is assembled behind vibration dampener hub which extends over outer edge of oil shedder. Use Tool J-1430 installed on end of crankshaft when tightening timing chain cover screws to align seal properly. NOTE—On '600' Model a cork seal and rubber seal ring is assembled behind vibration dampener to seal front end of crankshaft. See Vibration Dampener below for data.

Model 4180—Oil threads formed on rear of vibration dampener hub with an oil slinger assembled behind hub. A steel-bushing is assembled in opening in timing chain cover. Use Tool J-1430 installed on end of crankshaft when tightening timing chain cover screws to align steel bushing properly.

VIBRATION DAMPENER

1940 MODELS

VIBRATION DAMPENER: Rubber cushioned vibration dampener mounted on forward end of crankshaft. Dampener is drilled for lubrication. Car manufacturer recommends that 2 brass filler plugs in outside diameter of dampener flywheel be removed and filled with light engine oil at 3000 mile intervals.

1941-51 MODELS

VIBRATION DAMPENER: "600" & Amb. Six. Non-adjustable, rubber-cushioned vibration dampener mounted on forward end of crankshaft. Outer flywheel secured to dampener hub by rubber-cushioned bolts. On '600' Model, a cork seal and rubber seal ring installed between front end of crankshaft and hub retainer. Hub assembly installed as follows: Lock hub on shaft with woodruff key, install large lockwasher with notches on inner edge, cork seal, rubber seal ring and hub retainer in recess in hub, install hex head lock screw with helical lockwasher under it in screw hole in end of crankshaft and tighten screw securely. On Amb. Six

CONTINUED ON NEXT PAGE

end of pump shaft. Install pump in reverse order of disassembly and removal instructions (above).
CAUTION—Maintain a tight connection between inlet flange and pump body.

LATE 1947 MODELS

►**OIL PUMP PRODUCTION CHANGE:** New larger capacity, higher-pressure pumps used beginning with late 1947 cars as follows: "600" Series 40—Serial No. K-182791, Eng. No. KE-34134 Up; Amb. Series 60—Serial No. R-457798, Eng. No. RE-20512 Up.

►***CAUTION—Pump parts not interchangeable (parts furnished for both early and later type pumps).***

Pump Identification—Pumps can be distinguished by length of pump gears as follows: First Type—1¼", Later Type—1⅜". Later type pump also has shaft undercut to provide for the greater oil delivery flow.

CLUTCH NOTES

1946-51 STATESMAN

STARTING SERIAL NO. N4-125727

1949-51 AMBASSADOR

CLUTCH LINKAGE: Linkage consists of a beam lever, with a support mounted at one end in a hook plate on engine (later models use a flexible link) and the other end held in position by a fulcrum plate and guide fastened to a steering gear housing boss bolt which also bolts steering gear to frame. The outer end of the beam lever connects to the clutch pedal with a rod, and the inner end connected by rod to the release bearing fork arm. Both rods are adjustable. Only the latter rod must be used when making clutch pedal free play adjustments. The fulcrum plate guide centers the beam support. If the beam support is not centered it will climb out of the hook and cause chattering. The beam is held in position by the beam anchor spring, and the pedal return spring.

►***CAUTION—Do not disturb the length of the pedal to beam rod (All Models).***

Beam Fulcrum Plate Adjustment (to centralize beam) 1946-48 Models—Install spacing washers as required, between the steering gear boss and the fulcrum plate on bolt so that the beam support is centered on the support points. See that pull of beam anchor spring is parallel to beam anchor plate.

Clutch Linkage Adjustment 1949-50 Models—Pedal free play adjustment is made by lengthening or shortening the beam to release bearing fork arm rod. Do not disturb the pedal to beam rod setting. In the event it is necessary to adjust the pedal to beam rod the adjustment is made so that the outer end of the beam lever projects (1/2" on "Statesman" and 5/16" on "Ambassador") from the beam, toward the rear, with the clutch pedal against the floorboard. No provision is made for adjustment of this rod on the 1950 "Rambler" (solid rod used).

"RAPPING" CORRECTION

1951 RAMBLER

(EARLY 1951 PRODUCTION CARS)—In some cases, insufficient clearance may exist between the transmission at the drain plug boss and the rear engine support crossmember. This may result in a metallic rapping noise when driving over rough roads and may be diagnosed as a front suspension noise. Correct by lowering front crossmember, thereby raising rear end of transmission and providing sufficient clearance.

NOTE—Slotted holes in front crossmember will permit lowering the member.

Synchronization (Timing Movable Contacts)—Without disturbing position of distributor or crankshaft, loosen lockscrews on movable sub-plate (carrying second set of contacts), shift plate by prying with screwdriver in notch on edge of plate until this set of contacts begin to open, tighten sub-plate lockscrews.

Synchronization (Other Methods)—Set contacts to open simultaneously at regular 60° (dist.) intervals.

CARBURETOR

CARBURETION:—**Carburetor**—Carter Model WA-1, Type 435-S. (#253 cast on face of flange). Single barrel, 1¼" downdraft type with Carter Climatic Control.

For complete data, refer to Carburetor Index.

Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*

Fast Idle:—Carter Cam type.

For complete data, refer to Carburetion Equip. Index.

Setting—Turn throttle stopscrew until it just seats on cam (fast idle cam held in normal idle position). With throttle lever closed, pull cam back until stopscrew against first stop of fast idle cam. Check clearance between inside wall of air horn and lower edge of choke valve (Gauge T109-83). Should be ½".

Automatic Choke:—Carter Climatic Control. Built-in carburetor.

For complete data, refer to Carburetion Equip. Index.

Setting—Set coil housing one notch rich for average driving and climatic conditions.

CARB. EQUIPMENT

Air Cleaner:—AC. #1529112 oil-wetted type std. #1529115 heavy duty oil-bath type optional.

Fuel Pump:—AC. Type W #1523642 diaphragm type std. Type AD #1523643 combination fuel-and-vacuum pump optl. or on cars with Cruising Gear.

For complete data, refer to Carburetion Equip. Index.

Gasoline Gauge:—King-Seeley Electric type. K-S No. 7265 (dash unit), No. 6732 (tank unit).

For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—**U.S.L. Type HTL-1-15. 6 volt, 15 plate, 105** ampere hour capacity (20 hour rate).

Starting Capacity—133 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.8 minutes.

Grounded Terminal—Positive (+) terminal grounded to frame and to transmission (1 cable).

Dimensions—Length & Height 9 1/16". Width 7⅛".

Location—Under right front seat.

STARTER

Auto-Lite Model MAB-4076. Armature MAB-2057.
Drive—Inboard Bendix Type LCD11FX-10.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—42-53 ozs. (new brushes).
Cranking Engine—160 RPM., 150-160 amps., 5.2 v.

Performance Data

Torque		R.P.M.	Volts	Amperes
0	ft. lbs.	3700	5.5	60
.6	"	1910	5.5	100
3.4	"	1100	5.0	200
6.6	"	695	4.5	300
10.15	"	420	4.0	400
15.8	"	Lock	3.0	582
22.5	"	Lock	4.0	775

Removal:—Starter flange mounted on left front face of flywheel housing. To remove, take out flange mounting screws.

Starting Switch:—A-L Model SW-4005. Mounted on left side of engine below clutch pedal. Operated by depressing clutch pedal fully. No adjustment required.

GENERATOR

THIRD-BRUSH TYPES

Auto-Lite Model GDS-4802A. Armature No. GDF-2097. Third brush control type with external vibrating voltage regulation. Ventilated by fan on drive pulley.

Maximum Charging Rate—35 amperes (cold), 27.5 amperes (hot), at 8.0 volts, 24 M.P.H. Actual charging rate controlled by Voltage Regulator and dependent on battery condition.

Charging Rate Adjustment—Maximum output controlled by third brush. Do not adjust third brush for output greater than shown in table below (with field terminal grounded to render regulator inoperative). See Regulator Section (following).

NOTE—Third brush setting 1 bar minus 1 mica strip (minimum), 1 bar (maximum) from insulated main brush.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	920	0	6.4	960
4	6.6	1050	4	6.65	1120
8	6.8	1175	8	6.9	1280
12	7.0	1300	12	7.1	1430
16	7.2	1450	16	7.45	1640
20	7.4	1600	20	7.6	1900
24	7.6	1820	24	7.8	2320
28	7.8	2075	27.5	8.0	3200
33	8.0	2900			

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—53 ozs. max. (new brushes).
Field Current—1.65-1.82 amperes at 6.0 volts.
Motoring Current—5.10-5.45 amperes at 6.0 volts.

Removal:—Generator cradle mounted at left side of engine with fan belt drive. Water pump driven by generator shaft extension. To remove, disconnect water pump, loosen fan belt, remove generator clamp band and lift generator off.

Belt Adjustment:—Adjust whenever belt deflection is more than 1½" (when pressed lightly midway between generator and fan pulleys). To adjust, loosen two capscrews on fan bracket, lift fan up (one screw hole slotted) until belt deflection is approximately 1", tighten screws.

GENERATOR

TWO-BRUSH TYPES

Auto-Lite Model GCO-4802-C. Armature Number GCO-2031F. Shunt (two brush) type with external vibrating voltage and current regulation. *See Electrical Equipment Section.*

REGULATOR

FOR THIRD-BRUSH GENERATOR

Auto-Lite Model VRD-4010A. Voltage Type (used with GDS-4802A Generator). Consists of cutout relay and vibrating voltage regulator in a single case mounted on frame in engine compartment.

For complete data, refer to Electrical Equipment Index.

NOTE—Regulator cover sealed. Serviced on exchange basis if seals not broken.

Cutout Relay

Cuts In—6.4-7.0 volts Cold, 9 M.P.H.

Cuts Out—.5-3.0 amperes discharge current.

Contact Gap—.015" minimum.

Air Gap—.034-.038" Contacts open—measure at hinge end of core.

Voltage Regulator

Setting—7.3-7.6 volts at 70°F.

To Check (without breaking seals)—Connect ammeter in charging line at regulator 'B' terminal, voltmeter between 'B' and 'GD' terminals. Operate generator at speed equivalent to 30 M.P.H., charging battery, until voltage is steady. Voltage reading ing should be 7.3-7.6 volts (Cold—70°F), 7.1-7.4 volts (Hot—140°F).

To Adjust (with cover removed)—Change regulator armature spring tension by bending lower spring hanger. See Electrical Equipment Section for complete directions.

Contact Gap—.010-.020" (armature against stop pin).
Air Gap—.0595-.0625" with contacts just opening.

REGULATOR

FOR TWO-BRUSH GENERATOR

Auto-Lite Model VRB-4010-A. Voltage-Current Type (Used with GCO-4802C Generator. *See Electrical Equipment Section.*

LIGHTING

LIGHTING:—**Headlamps**—Corcoran-Brown, pre-focused type. Country driving and City beams controlled by selector switch on toeboard. City beam deflected slightly to right (special 2331 bulb).

Headlamp Adjustment—With car 25' from screen and Country Driving (upper beams) lighted, aim headlamps straight ahead with top of beam at lamp center height. Adjusting screws located under headlight door to left of lens. Upper screw controls horizontal movement, lower screw vertical movement.

Beam Indicator—Red dot above speedometer dial. Lighted when Country Driving (upper beams) in use.

Switches

Lighting—Douglas.
Beam Selector—Douglas.
Instrument—Douglas.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Park, Dash, License	3	63
Indicator	1	51
Stop-Tail	21-3	1158
Dome	6	81

MISC. ELECTRICAL

FUSES:—**Lighting**—20 ampere capacity fuse on lighting switch.

Accessory—20 ampere capacity fuse on fuse block on lighting switch. Protect stop light and gasoline gauge circuits.

HORNS:—**Auto-Lite.** Model HH-4003 (low pitch), HH-4004 (high pitch). Vibrator type, blended tone horns operated by relay.

Horn Relay:—R.B.M. Model 4755.

Contacts Close—3.5-4.5 volts.

Current Draw—¾ ampere.

CONTINUED ON NEXT PAGE

NOTE:—Engine hood hinged at cowl and lifts from forward end. Hood latch handle located at lower edge of radiator grille (safety catch at top of grille).

MODEL IDENTIFICATION

SERIAL NUMBER:—First number B-89000. Stamped on plate on right frame side rail under hood.

ENGINE NUMBER:—Stamped on boss on right front upper corner of engine block (see Note for numbering change).

Engine No. Change Note—Beginning with Serial No. B-103201, engine numbering changed so that number is 500 less than serial number on same car (Serial No. B-103201, Engine No. B-102701).

TUNE-UP

COMPRESSION:—Ratio—6.0-1 std. No optl. ratios.

Pressure—110 lbs. at 350 R.P.M. or approximately 100 lbs. at cranking speed of 125 R.P.M. Pressure must be equal for all cylinders within 10 lbs.

VACUUM READING:—18-20" steady reading with engine idling at 7-8 M.P.H.

FIRING ORDER: 1-6-2-5-8-3-7-4. See wiring diagram for spark plug cable connections in distr. cap.

SPARK PLUGS: AC No. 45. 14 mm. Metric.
Gaps—Set at .025".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.017". **Cam Angle**—28° Closed.

Synchronization—Set movable contacts to open simultaneously with stationary contacts.

Automatic Advance—12° max. at 1100 RPM (distr.).

IGNITION TIMING: See Ignition Timing.

Std. Setting—9° BTDC. Vibration dampener mark 'IGN' (.725" before 'DC' mark) aligned with pointer on chain case cover at front of engine. Both sets of contacts should open simultaneously.

CARBURETION: See Carburetor & Carb. Equipment.

Idle Setting—Idle screws ¼-1 turn open. Idle speed 7-8 MPH.

Float Level—3/16" from top of float to machined surface of cover (remove gasket, invert to check).

Accelerating Pump—Lower Hole (Summer), upper (Winter).

Fuel Pump Pressure: 3½ lbs. maximum.

VALVES: See Valve Timing.

Tappet Clearance—.008" Int., (.015" for high speed operation), .015" Exh. Set with engine warm and idling.

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

Ignition Switch:—Oakes Steering Column and Ignition Lock No. 301955. Ignition Switch No. 301538.

Ignition Lock—Briggs & Stratton No. 80207 (Lock cylinder). Key Series—5 digits. Groove—#1.

COIL: Two Used, Auto-Lite CE-4402-A. Service Coil CE-4404. Coils mounted on right side of engine.

Ignition Current—2 amps. idling, 4 stopped.

CONDENSER: Auto-Lite Part No. IG-2671. Two used.

Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite IGK-4102. Twin ign. double breaker, 8 lobe cam, full automatic advance type. Contacts open simultaneously to fire both spark plugs in each cylinder at the same instant and must be synchronized (See Timing).

Breaker Gap—Set at .017" (alike for both sets).

Cam Angle or Dwell—28° Closed. 17° Open. For each set of contacts (operate independently).

Breaker Arm Spring Tension—18-20 ounces.

Rotation—Clockwise viewed from the top.

Automatic Advance

Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine R.P.M.
Start	275	0	550
2	335	4	670
4	400	8	800
6	570	12	1140
8	745	16	1490
10	925	20	1850
12	1100	24	2200

Removal:—Distributor mounted on right hand side of crankcase. To remove, take out hold-down screw in advance arm.

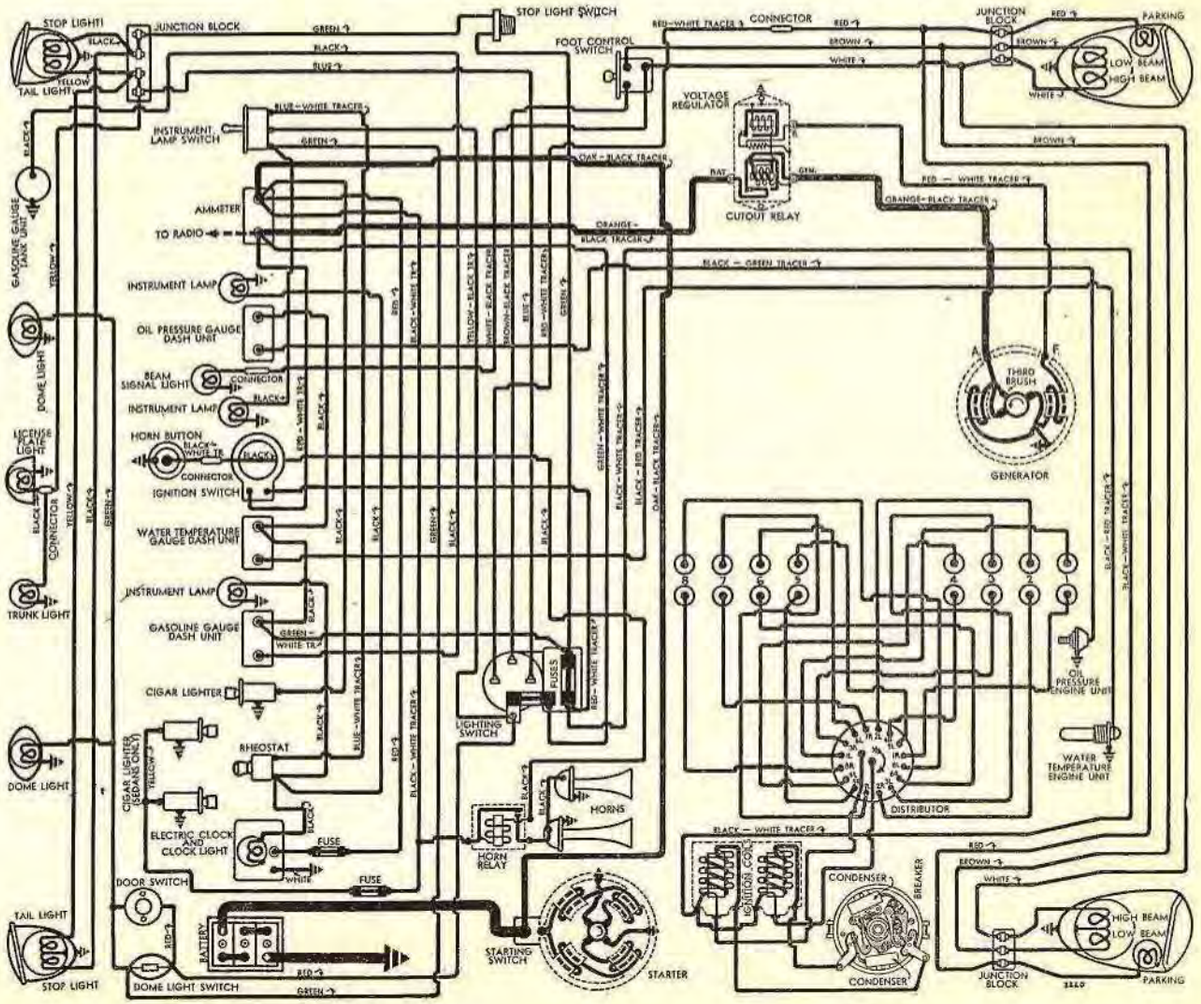
IGNITION TIMING

IGNITION TIMING:—Setting for all engines as follows:

Flywheel Degrees	Piston Position
9° BTDC	.0325" BTDC

Timing (Stationary Contacts)—With #1 piston on compression, turn engine over until piston is 9° or .0325" before top dead center, stop when 'IGN' mark on vibration dampener at front of engine lines up with pointer on chain case cover (this mark is 9° or .725" before top dead center mark 'DC'). Loosen advance arm clamp bolt, rotate distributor until stationary contacts (mounted directly on breaker plate) begin to open, tighten clamp bolt, then synchronize movable contacts.

CONTINUED ON NEXT PAGE



ENGINE

CONTINUED FROM PRECEDING PAGE

PISTONS:—Nelson-Bohnalite, aluminum alloy, Invar strut, tin plated, split skirt type. See Engine Code Note above for original bore and piston sizes.
Weight—16 ounces. **Length**—3 11/16".
Removal—Pistons and rods remove from below.
Clearance—Top .018-.022". Skirt .001-.002".
Replacement Pistons:—Std. & .001", .002", .003", .005", .010", .012", .015", .020" O.S. Semi-finished .050" O.S.
Fitting New Pistons:—Insert .002" feeler between piston and cylinder wall on side opposite slot. Pull to withdraw feeler should be 10 lbs.
Installing Pistons:—Pin offset to camshaft side of engine. Trademark (within piston) to front.

PISTON RINGS:—Two compression rings, two oil control rings per piston, all above pin.

Ring	Width	End Gap	Wall Thickness
Compression	.1235-.124"	.010-.015"	.130"
Oil Cont. (#3)	.1235-.1240"	.010-.018"	.140"
Oil Cont. (#4)	.1860-.1865"	.010-.018"	.140"

Replacement Rings:—Furnished .010", .020" oversize.

PISTON PIN:—**Diameter**—.8745-.8748". **Length**—2.564-2.576". Floating type. Retained by locking rings. Pin hole in piston offset toward camshaft.
Pin Fit in Piston—Light push fit (piston @ 200°F.)
Pin Fit in Rod Bushing—Select fit to .0001" or light push fit at normal temperature.
Replacement Pins:—Furn. .001", .002", .005" oversize.

CONNECTING ROD:—**Length**—8¾". **Weight**—34 ozs.
Upper Bearing (Piston Pin Bushing)—Bronze.
Crankpin Journal Diameters—2.000". *See Engine Code Note in Nash Special Data for original sizes.*
Lower Bearing—Removable steel-backed, babbitt-lined type. No shims. See Engine Code Note (above) for original bearing sizes.
Clearance—.0015-.0025". **Sideplay**—.008-.012".
Bearing Adjustment:—None (no shims). Replace bearings. Do not file rods or caps.
Replacement Bearings:—Furnished .010" undersize.

CRANKSHAFT:—Nine bearing type.
Journal Diameters—2.479" (2 31/64"). *See Engine Code Note in Nash Special Data for original sizes.*
Bearing Type—Interchangeable steel-backed, babbitt-lined. No shims. See Engine Code Note (above) for original bearing sizes. **Clearance**—.002".
Bearing Adjustment:—None (no shims). Replace bearings. Do not file caps. Upper halves can be 'rotated' out without removing crankshaft by using pin in oil hole in shaft, turn shaft.
Replacement Bearings:—Furnished .010" undersize.
End Thrust:—At #5 bearing. **Endplay**—.004".

CAMSHAFT:—Non-adjustable double-roller chain drive.
Timing Chain:—Diamond. Width 9/16". Pitch ⅜". Length 62 links or 23¼".
Camshaft Setting:—Sprockets marked. Mesh chain with sprocket marks adjacent and in line with a straightedge across the shaft centers.

VALVES:	Head Diameter	Stem Diameter	Length
Intake	1 21/32"	.3715-.3725"	5½"
Exhaust	1 15/32"	.3715-.3725"	5½"

	Seat Angle	Lift	Stem Clearance
All Valves	45°	11/32"	.002-.004"

Valve Guides:—Press fit in head.
Valve Springs:—Double springs on all valves. Spring free length 1 21/32" (inner), 2" (outer).

	Inner Spring		Outer Spring	
	Pressure	Length	Pressure	Length
Closed	19-23 lbs.	1 3/8"	35½-40½ lbs.	1 11/16"
Open	48-54 lbs.	1 1/32"	92-98 lbs.	1 11/32"

VALVE TIMING

Tappet Clearance:—.008" Int., (.015" for high speed operation), .015" Exh. Set with engine warm and idling.
Valve Timing:—See Camshaft Setting above.
Intake Valves—Open 20° BTDC. Close 74° ALDC.
Exhaust Valves—Open 45° BLDC. Close 10° ATDC.
Valve Timing Check—With regular running tappet clearance of .015", Exhaust valve should close with piston 10° or .0400" after top dead center.

LUBRICATION

LUBRICATION:—Gear type pump in crankcase.
Normal Oil Pressure:—30 lbs. at 20 M.P.H.
Oil Pressure Relief Valve:—On oil pump cover. Opens at 30 lbs. Screw adjustment.
Oil Pressure Gauge:—King-Seeley Electric. K-S No. 7270 (dash unit), 6125 (engine unit).
See Miscellaneous Section for complete data.
Crankcase Capacity:—7 qts. (dry or refill).

COOLING

COOLING SYSTEM:—**Capacity**—17 quarts.
Water Pump:—Centrifugal, adjustable packing type. Driven by generator extension shaft.
See Water Pump Section for complete data.
Removal—Drain radiator, disconnect hose and drive coupling, take out mounting screws in pump flange.
Thermostat:—Dole. In water outlet on cyl. head.
Setting—Starts to open at 160°F.
Temperature Gauge:—King-Seeley Electric. K-S No. 7275 (dash unit), 7000 (engine unit).
See Miscellaneous Section for complete data.
NOTE—Gauge reads '212' with ignition 'Off'.

CLUTCH

CLUTCH:—**Borg & Beck Model 10A7.** #919 stamped on cover. Single plate, dry disc type.
See Clutch Section for complete data.
Facings—Woven, 2 required. Inside Diam. 6". Outside Diam. 10". Thickness .125".
Adjustment:—Pedal free movement ½-1¼". (loosen transverse bolt in link below pedal shaft, position pedal in slot). Pedal toeboard clearance ⅜". Check Starting Switch adjustment (below) and 'No-Rol' (if car so equipped).
Starting Switch Adjustment—Starting switch lever should have ⅛" free movement. Adjust by turning lever stopscrew on side of switch case. Switch should close just after clutch is completely disengaged. Adjust by loosening two clampscrews attaching switch cable to lever on right end of clutch throw-out shaft, move clamp toward shaft for later starter engagement, out for earlier.
Removal:—Remove transmission (see below), clutch housing underpan, clutch cover mounting bolts (release tension evenly), lower assembly out.

TRANSMISSION

TRANSMISSION:—**Own Make.** Constant-mesh (all speeds), synchro-mesh (second & high), all helical gear.
See Transmission Section for complete data.
Transmission Control:—Mechanical type steering column mounted gear shift, optional.
See Transmission Section for complete data.
Removal:—Disconnect driveshaft. Disconnect shift linkage (cars with steering column shift). Remove transmission mounting stud nuts and lift out.

OVERDRIVE

Cruising Gear (Overdrive):—Warner design type R6 standard. In separate case at rear of transmission.
See Transmission Section for complete data.

UNIVERSALS

UNIVERSAL JOINTS:—Mechanics. Type 3C. Roller bearing type. 2 used.
See Universals Section for complete data.

REAR AXLE

REAR AXLE:—**Own Make.** Semi-floating, hypoid gear type with Hotchkiss drive (spiral bevel on Coupe).
See Rear Axle Section for complete data.
Ratio—4.1-1 standard
Backlash—.005-.007". Screw Adjustment.
Removal:—Block up rear of car, remove wheel and drum assemblies, axle shafts, disconnect brake lines and cables, shock absorbers, drive shaft at rear universal. Free axle from springs by disconnecting spring bolts, withdraw axle.
Axle Shaft Removal—Remove wheel and drum, take out retainer mounting bolt nuts, remove retainer, oil seal, brake backing plate, bearing adjusting shims. Pull shaft and bearing out.
Wheel Bearing Adjustment—Shims at flanged end of housing. To adjust, remove brake backing plate, add or remove shims. **Endplay**—.004-.006".

SHOCK ABSORBERS

SHOCK ABSORBERS:—**Delco** 1112-M (front), 1117-DD (rear). Direct acting, hydraulic type.

FRONT SUSPENSION

Front Suspension:—Conventional 'I' beam front axle with Reverse-Elliott ends and semi-elliptic springs.
Kingpin Inclination—7° crosswise.
Camber—½-1½° and equal at both wheels.
Caster—1½°. Shim adjustment. Install shims (furnished in 1½° and 3° angles) between spring and spring pad on axle.
Toe In—0-1/16". Adjust by loosening clamp bolt at right end of tie rod and turning tie rod.
Steering Shock Eliminator—Consists of spring and rubber bumper bracket at rear of left front spring. Adjust lower nut to give ⅛" clearance between upper rubber cushion and frame. Adjust spring cushion (ahead of spring rear shackle) to 1/16" clearance between cushion and spring.

STEERING GEAR

Steering Gear: Gemmer Model 335 Worm-and-Roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

BRAKES:—**Service.** Bendix hydraulic, duo-servo, single anchor type with eccentric adjustment. Hand lever applies rear service brakes.
See Brake Section for complete data.
Drums—Cast-iron. Diameter 11 1/16".
Lining—Moulded. Width 2¼". Thickness 7/32". Length per wheel 24".
Clearance—.010" at heel and toe of each shoe.
Braking Power—53% front wheels, 47% rear.
Hand Brake:—See Service Brakes.
No-Rol: Optional equipment.
See Brake Section for complete data.

CARBURETOR

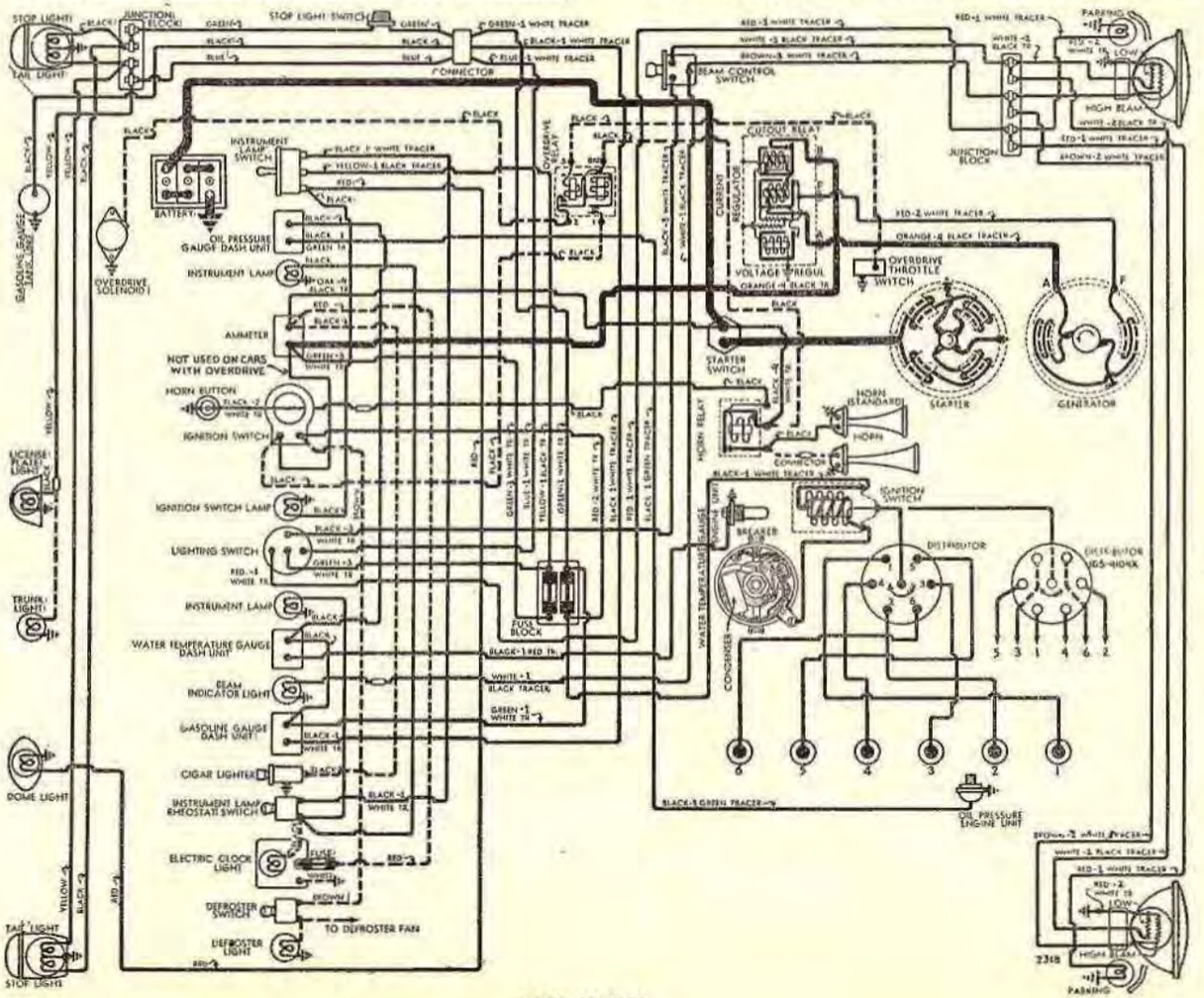
CARBURETION: (1939)—Stromberg Model EE-1; **(1940)**—Carter Type WDO Model 458-S (#295 cast on face of flange). 1" dual downdraft types.
1940—New Air horn, Climatic Control assembly, and Thermostatic Coil & Housing assembly should be installed on first cars to correct warming up complaints.
For complete data, refer to Carburetor Index.
Settings (Idle Setting, Float Level, and Accelerating Pump): ***See Tune-Up data.***
Fast Idle (Carter): Integral type (built-in carb.).
For complete data, refer to Carburetion Equip. Index.
Fast Idle Setting (Carter)—Adjust fast idle screw for .026" throttle opening with choke valve closed.
Automatic Choke:—Carter Climatic Control.
For complete data, refer to Carburetion Equip. Index.
Choke Setting—1 Notch Rich (with first 170B64S Thermostatic Coil & Housing Assembly), centered (with later 170K64S Thermostatic Coil & Housing

CARB. EQUIPMENT

Air Cleaner (1939): AC #1528643 (with #1529117 silencer adapter) used on early cars, #1529111 later cars, oil-wetted type std. #1529114 heavy duty oil-bath type opti.
(1940)—AC #1529419 oil-wetted type std.
Fuel Pump:—AC Type W #1523640 diaphragm type Standard. Type AD #1523641 combination fuel-and-vacuum pump opti. or used with Overdrive.
For complete data, refer to Carburetion Equip. Index.
Gasoline Gauge:—King-Seeley Electric type. K-S No. 7070 (1939 Special), 7265 (1939 Deluxe), 7680 (1940) Tank Units; No. 6732 (1939), 7780 (1940) Tank Units.
For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—USL Type RN-15 or Auto-Lite Type PN-15. 6 volt, 15 plate, 95 AH. capacity (20 hr. rate).
Starting Capacity—117 amperes for 20 minutes.
Grounded Terminal—Positive (+) grounded to transmission. Separate ground strap from transmission to frame.
Location—Under front seat.



1940 MODEL

Auto-Lite Model MAB-4076. Armature MAB-2057.
Drive—Inboard Bendix Type LCD11FX-10.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—42-53 ozs. (new brushes).

Performance Data

Torque		R.P.M.	Volts	Amperes
0	ft. lbs.	3700	5.5	60
3.4	" "	1100	5.0	200
10.15	" "	420	4.0	400
15.8	" "	Lock	3.0	582

Removal:—Starter flange mounted on left front face of flywheel housing. To remove, take out flange mounting screws.
Starting Switch:—A-L #SW-4005. Mounted on body floor below clutch pedal. Operated by depressing clutch pedal fully. No adjustment required.

GENERATOR

1939 SPECIAL MODELS

Auto-Lite Model GCM-4825A. Armature GCJ-2097.
Third brush control type with Cutout Relay Charging Rate Adjustment—Make tests at generator. Remove commutator cover band, shift third brush counter-clockwise to increase, clockwise to decrease charging rate. Do not exceed maximum charging rate as given below. Third brush held in position by friction.
NOTE—Standard setting of third brush is 2⅜-2⅝ commutator bars from nearest main brush.
Maximum Charging Rate—21 amperes (cold), 18 amperes (hot), 8.0 volts, 2650 R.P.M. or 24 M.P.H.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	775	0	6.4	830
8	7.0	1075	8	7.1	1190
16	7.6	1420	16	7.8	1970
22	8.0	2650	18	8.0	2700

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—53 ozs. max. (new brushes).
Amperes Field Current—3.50-3.89 at 6.0 volts.
Motoring Current—5.75-6.25 amperes at 6.0 volts.
Field Fuse—5 ampere capacity (under cover on generator frame).
Removal and Belt Adjustment:—Same as for Deluxe generator following.

GENERATOR

1939 DELUXE MODELS

Auto-Lite Model GDS-4802A. Armature GDF-2097.
Third brush control type with external Voltage Regulator mounted on car frame. NOTE—This generator optional equipment on Special Models.
Maximum Charging Rate—35 amperes (cold), 27.5 amperes (hot), at 8.0 volts, 24 M.P.H. Actual charging rate controlled by Voltage Regulator and dependent on battery condition.
Charging Rate Adjustment—Maximum output controlled by third brush. Do not adjust third brush for output greater than shown in table below (with field terminal grounded to render regulator inoperative). See Regulator Section (following).
NOTE—Third brush setting 1 bar minus 1 mica strip (minimum), 1 bar (maximum) from insulated main brush.

CONTINUED ON NEXT PAGE

ENGINE

CONTINUED FROM PRECEDING PAGE

End Thrust:—Taken by front bearing. Replace bearing to take up excessive endplay.
Endplay—.003" (new), .005" Max. (worn).
Timing Chain:—Whitney No. 49205 or Diamond. Pitch ⅜". Width 9/16". Length 60 links or 22½".
Camshaft Setting:—Sprockets marked. Mesh chain with sprocket marks adjacent and in line with a straightedge across the shaft centers.

VALVES:—	Head Diameter	Stem Diameter	Length
Intake	1 21/32"	.3407"	5 55/64"
Exhaust	1 17/32"	.3407"	5 55/64"

	Seat Angle	Lift	Stem Clearance
All Valves	45°	5/16"	.002-.004"

Valve Guides:—Press fit in block. Press guides in place 1¼" (intake), ¾" (exhaust) below top of block. Ream to correct clearance. Replacement guides furnished .002" undersize.
Valve Springs:—Free length 2½".

	Spring Pressure	Spring Length
Valve Closed	70 lbs	2"
Valve Open	115 lbs	1 11/16"

Valve Lifters:—Mushroom type. Lifter guide holes reamed in block. Remove from below (camshaft out).

VALVE TIMING

Tappet Clearance:—.015" all valves—engine warm and idling. NOTE—For high speed driving .018" max. setting may be used. Remove right front fender shield for access to valve covers.
Valve Timing:—See Camshaft Setting above.
Intake Valves—Open 21½° BTDC. Close 71° ALDC.
Exhaust Valves—Open 71° BLDC. Close 36½° ATDC.
Valve Timing Check—With regular tappet clearance of .015", Intake valve should open with piston 21½° or .1891" BTDC., and Exhaust valve close with piston 36½° or .5118" ATDC.

LUBRICATION

LUBRICATION:—Pressure system (gear type oil pump in crankcase).
Normal Oil Pressure:—30 lbs. at 20 MPH.
Oil Pressure Relief Valve:—On oil pump cover. Opens at 30 lbs. Turn adjusting screw in to increase.
Oil Pressure Gauge:—King-Seeley Electric. K-S No. 7270 (1939 Deluxe), 7070 (1939 Special), 7665 (1940) Dash Units; 6125 (Engine Unit—All Models).
See Miscellaneous Section for complete data.
Crankcase Capacity:—6 qts. (dry or refill).

COOLING

Capacity (1939): 20 qts., (1940) 18 qts. (19 with heater).
Water Pump:—Centrifugal, adjustable packing type.
See Water Pump Section for complete data.
Removal—Drain radiator, disconnect hose and drive coupling, take out mounting screws in pump flange.
Thermostat:—Dole. In water outlet on cyl. head.
Setting—Starts to open at 160° F.
7275 (1939 Deluxe), 7295 (1939 Special), 7670 (1940) Dash Units; 7000 (Engine Units—All Models). NOTE—Gauge inoperative with ignition Off (reads '212').
See Miscellaneous Section for complete data.

CLUTCH

CLUTCH: Borg & Beck Model 9A6 (1939-40), 9A7 ('40). Single plate, dry disc type.
Production Change—9A6 (#932) used on first cars, 9A7 (#937 & #951 with 'Borglite' driven member) used after Dec. 15, 1939. Assembly No. stamped on cover.
See Clutch Section for complete data.
Facings—Spiral wound molded woven, 2 used. Inside Diam. 5⅝" (932), 6" (951). Outside Diam. 9¼". Thickness .125". NOTE—Install plate with mark 'flywheel side' forward (damper toward trans).
Pedal Adjustment:—Free travel ½-1" (adjusting nuts on lower end of pedal connector link). Check NoRol
Removal:—Remove transmission (see below). Disconnect clutch pedal linkage. Support engine at rear, disconnect rear engine mountings. Remove clutch housing and pan. Punch mark flywheel, cover, and pressure plate (re-assemble to these marks). Take out mounting screws in cover flange.

TRANSMISSION

TRANSMISSION:—Own Make. All helical gear, constant-mesh (all speeds), synchro-mesh (second & high).
See Transmission Section for complete data.
Transmission Control:—Steering col. mechanical shift. Optional on 1939 Models.
See Transmission Section for complete data.
Removal:—Disconnect shift rods, speedometer cable, overdrive control and wires (if used), and driveshaft. Remove two upper mounting studs and install pilot studs (to support transmission and avoid bending clutch plate). Remove remaining mounting stud nuts, remove transmission from below. NOTE—Do not remove inspection hole cover in floor.

OVERDRIVE

Cruising Gear (Overdrive): Warner Model R6. Optl.
NOTE—1940 Models have electrical 'kick-down' control.
See Transmission Section for complete data.
Overdrive Solenoid—Delco-Remy Model 1118004.
Throttle Switch—Adjust switch to close with throttle wide open and carburetor throttle shaft pulley spring just starting to compress.
Control Relay—Delco-Remy Model 1116798.

UNIVERSALS

UNIVERSAL JOINTS:—Mechanics Type 2C. Roller bearing type. 2 used.
See Universals Section for complete data.

REAR AXLE

Own Make—Semi-floating, hypoid gear type with Hotchkiss drive (spiral bevel on 1939 Coupe).
See Rear Axle Section for complete data.
Ratio—4.1-1 Std., 4 4/9-1 Optl.
Backlash—.005-.007". Shim adjustment.
Removal:—Hoist rear of car, remove axle shafts (see below). Free axle from springs by disconnecting U-bolts and rear shackles and withdraw from car.
Axle Shaft Removal:—Remove wheel and drum. Disconnect brake line and cable. Remove backing plate mounting bolt nuts, oil seal retainer, brake backing plate, bearing adjusting shims and withdraw shaft and bearing (do not drag shaft on oil seal).
Wheel Bearing Adjustment—Shims at flanged end of housing. To adjust, remove backing plate, add or remove shims (equally at both ends of axle).
Endplay—.003-.006".

SHOCK ABSORBERS

Delco. Front—1112-N (1939 Special), Q ('39 Deluxe), 1947-C, D (1940). Rear—1117-DD (1939), 1006-DD, 1006-EE (1940 Heavy Springs). Direct acting, hydraulic types.

FRONT SUSPENSION

1939 MODELS

Front Suspension:—Conventional 'I' beam front axle with Reverse-Elliott ends and semi-elliptic springs.
Kingpin Inclination—7° crosswise.
Camber—½-1½° and equal for both wheels.
Caster—1½°. Shim adjustment. Install shims (furnished in 1½° and 3° angles) between spring and spring pad on axle.
Toe In—0-1/16". Adjust by loosening clamp bolt at right end of tie rod and turning tie rod.
Steering Shock Eliminator—Consists of spring and rubber bumper bracket at rear of left front spring. Adjust lower nut to give ⅛" clearance between upper rubber cushion and frame. Adjust spring cushion (ahead of spring rear shackle) to 1/16" clearance between cushion and spring.

FRONT SUSPENSION

1940 MODELS

Front Suspension:—Independent, linked parallelogram type with coil springs.
See Front Suspension Section for complete data.
IMPORTANT—Insert 2" blocks (Tool J886) between upper support arm and frame flange (at each side) to level frame when checking specifications.
Kingpin Inclination—4½° crosswise.
Caster—0° to Negative ½°. Adjustable.
Camber—Pos. ¼° to Pos. ¾°. Adjustable.
Toe In—1/32-3/32". Adjust tie rod tube for each wheel equally.
Steering Geometry—Inner wheel 21½°, Outer 20°.

STEERING GEAR

Steering Gear: Gemmer Model Number 305. Worm-and-Roller type with 'push-pull' adjustment. New type steering linkage with idler arm on right frame side member. *See Steering Gear Section for data.*

BRAKES

1939 MODELS

BRAKES:—**Service**—Lockheed hydraulic, double anchor type. Hand lever applies rear service brakes.
See Brake Section for complete data.
Drums—Cast-iron. Diameter 10 1/16".
Lining—Moulded. Width 2". Thickness 7/32". Length per wheel 21".
Clearance—.010" at heel and toe of each shoe.
Braking Power—53% front wheels, 47% rear.
Hand Brake:—See Service Brakes.
No-Rol: Optional equipment.
See Brake Section for complete data.

BRAKES

1940 MODELS

BRAKES:—**Service.** Bendix hydraulic, duo-servo, single anchor type without eccentric adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Drums—Cast-iron. Diameter—10".
Lining—Moulded. Width 2". Thickness 3/16". Length per wheel 22".
Clearance—.015" at each end of secondary shoe with primary shoe forced out against drum.
Braking Power—53% front wheels, 47% rear.
Hand Brake:—See Service Brakes above.
NoRol: Optl. *See Brake Section for complete data.*

Synchronization—Use Nash Timing Light SE-569 (consists of two lights—one for each set of contacts) connected between each primary terminal and ground. Turn on ignition, turn engine over until fixed points just open (light for stationary contacts on). If both lights go on, synchronization correct. If not, loosen 3 lockscrews on movable subplate, shift plate by prying with screwdriver in notch on edge of plate until this set of contacts begin to open (both lights on), tighten sub-plate lockscrews, and set Ignition Timing as directed above. If other methods used, set contacts to open simultaneously at 60° (distributor) intervals.
Torquematic Spark Control Check—Distributor must be free in bracket and cable pulleys positioned to prevent cable interference with engine. Advance spring and cable take-up spring must be properly located and spring resistance centralized. Car manufacturer recommends use of Nash Synchro Light SE-417 to check torquematic retard by means of dead center mark on vibration dampener.

CARBURETOR

CARBURETION:—**Carburetor**—Carter Type WA-1, Model 435-S (#253 cast on face of flange). Single barrel, 1¼" downdraft type.
For complete data, refer to Carburetor Index.
Settings (Idle Setting, Float Level, and Accelerating Pump): ***See Tune-Up data.***
Fast Idle:—Integral type (built-in carburetor).
For complete data, refer to Carburetion Equip. Index.
Fast Idle Setting—Part of Climatic Control. Adjust by bending connecting link offset for ⅝" choke valve opening with stopscrew against (not on) first step of fast idle cam.
Automatic Choke:—Carter Climatic Control.
For complete data, refer to Carburetion Equip. Index.
Setting—Set coil housing 1 Notch Rich.

CARB. EQUIPMENT

Air Cleaner:—AC #1529112 oil-wetted type std.
Fuel Pump:—AC Type W #1523642 diaphragm type std. Type AD #1523643 combination fuel-and-vacuum pump optional.
For complete data, refer to Carburetion Equip. Index.
Gasoline Gauge:—King-Seeley Electric type. K-S No. 7680 (dash unit), No. 7780 (tank unit).
For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—**USL Type HTL-1-15 or Auto-Lite Type CTL-1-15.** 6 volt, 15 plate, 105 ampere hour capacity
Starting Capacity—133 amperes for 20 minutes.
Grounded Terminal—Positive (+) grounded to transmission. Separate ground strap from transmission to frame.
Location—Under front seat.

STARTER

Auto-Lite Model MAB-4076. Armature MAB-2057.
Drive—Inboard Bendix Type LCD11FX-10.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—42-53 ozs. (new brushes).
Cranking Engine—160 RPM, 150-160 amps., 5.2 v.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	3700	5.5	60
3.4 " "	1100	5.0	200
10.15 " "	420	4.0	400
15.8 " "	Lock	3.0	582

Removal:—Starter flange mounted on left front face of flywheel housing. To remove, take out flange mounting screws.
Starting Switch:—A-L #SW-4005. Mounted on body floor below clutch pedal. Operated by depressing clutch pedal fully. No adjustment required.

GENERATOR

Auto-Lite Model GDZ-4803A. Armature No. GDZ-2079-F. Two brush type with current-voltage control.
Charging Rate Adjustment—None. See Regulator.
Maximum Charging Rate—35 amperes (hot or cold), 8.0 volts, 1900 RPM (generator) and above with load or discharged battery (Current Regulator setting). Actual charging rate controlled by Voltage Regulator and dependent on battery condition.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	925	0	6.4	1000
8	6.75	1140	8	6.75	1235
16	7.15	1370	16	7.15	1460
24	7.5	1590	24	7.5	1730
28	7.7	1710	28	7.7	1900
35	8.0	1900	35	8.0	2250

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—53 ozs. max. (new brushes).
Field Current—1.60-1.78 amperes at 6.0 volts.
Motoring Current—4.16-4.60 amperes at 6.0 volts.
Removal:—Generator cradle mounted at left side of engine with fan belt drive. Water pump driven by generator shaft extension. To remove, disconnect water pump, loosen fan belt, remove generator clamp band and lift generator off.
Belt Adjustment:—Adjust whenever belt deflection is over 1½" (when pressed lightly midway between generator and fan pulleys). To adjust, loosen two capscrews on fan bracket, lift fan up (one screw hole slotted) for 1" belt deflection, tighten screws.

REGULATOR

Auto-Lite Model VRP-4004A. Current-Voltage Type. Mounted in single case on dash.
For complete data, refer to Electrical Equipment Index.
NOTE—Regulator case cover is sealed. Serviced on exchange basis if seals not broken.

Cutout Relay

Cuts In—6.4-6.6 volts.
Cuts Out—4.1-4.8 volts (approx. 4-6 amps. disch.).
Contact Gap—.015" minimum.
Air Gap—.031" min., .034" max. with contacts open. Measure at hinge end of core.

Voltage Regulator

Setting—7.2-7.5 volts at 70° F.
To Check (without breaking seals)—Connect ammeter in charging line at regulator 'B' terminal, voltmeter between 'B' terminal and ground. Operate generator at speed equivalent to 30 MPH, charging battery until voltage is steady. Voltage reading should be 7.2-7.5 volts at 70° F. See Electrical Equipment Section for voltages at other temperatures.
To Adjust (with cover removed)—Change regulator armature spring tension by bending lower spring hanger slightly. ***See Electrical Equipment Section.***
Contact Gap—.012" Min. (armature against stop pin).
Air Gap—.048-.052" with contacts just opening.

Current Regulator

Setting—34-36 amperes (marked '35' on cover).
To Check (without breaking seals)—Connect test meters as for Voltage check (above). Operate generator at 30 MPH, charging battery, add load (use bank of headlamp bulbs, or turn on car lights and accessories and discharge battery) so that generator charges at peak rate and Current Regulator operates. Charging current should not exceed 34-36 amperes. If more than slight excess noted, regulator is defective.
Adjustment & Contact Gap—Same as for Voltage Regulator (above).
Air Gap—.034-.038" (before No. 5U-000001), .048-.052" (after above No.) with contacts just opening.

LIGHTING

LIGHTING:—**Headlamps**—General Electric 'Sealed Beam'.
For complete data, refer to Electrical Equipment Index.
Headlamp Adjustment—Aim upper beam for each lamp straight ahead with center of hot spot 3" below lamp center height.
Beam Indicator—Red light on speedometer face. Lighted whenever Country (upper) beam in use.

Switches

Lighting—Douglas No. 5754.
Beam Selector—Douglas No. 5733.
Instrument—Douglas No. 5653.

MISC. ELECTRICAL

FUSES:—**Lighting**—30 ampere (SFE type) mounted on fuse block on back of instrument panel toward left.
Accessory—30 ampere (SFE type) on fuse block.
HORNS:—**Delco-Remy.** No. 1999565 (low note), No. 1999566 (high note). Vibrator type, blended tone, operated by horn relay.

Type	Current (at 6 volts)	Air Gap
1999565 (Low Note)	19-21 amperes	.047-.052"
1999566 (High Note)	18-20 amperes	.039-.044"

Horn Relay:—Delco-Remy Model 1116775.
Contact Gap—.020". **Air Gap**—.015" (closed).
Contacts Close—2.75-4.0 volts.

ENGINE

ENGINE CODE NOTE (ORIGINAL BORE & BEARING SIZES): ***See Nash Shop Notes for complete data.***
ENGINE SPECIFICATIONS:—6 cylinder, valve-in-head, Twin Ignition type. NOTE—'Iso-thermal' fuel intake system used (intake manifold cast in cylinder head—water cooled for temperature control).
Bore—3⅜". **Stroke**—4⅜".
Displacement—234.8 cu. ins. **Rated HP**—27.34.
Developed Horsepower—105 at 3400 RPM.
Compression Ratio—6.0-1 cast-iron head.
Compression & Vacuum Reading—***See Tune-Up data.***
►**Later type Replacement Cylinder Heads:** ***See "Cylinder Head" in Nash Shop Notes.***
PISTONS:—Nelson-Bohnalite, aluminum alloy, Invar strut, tin plated, split skirt type.
Original Bore Size:—***See Engine Code Note in Nash Shop Notes for complete data.***
Weight—19¼ ozs. (stripped). **Length**—3⅞".
Removal—Pistons and rods removed from above.
Clearance—Top .027-.030". Skirt .001-.002".
Replacement Pistons:—***See Nash Shop Notes for data.***
Fitting New Pistons:—Insert .002" feeler between piston and cylinder wall on side opposite slot. Pull to withdraw feeler should be 10 lbs.
Installing Pistons:—Pin offset toward camshaft. Slot toward left (trademark within piston toward front).

CONTINUED ON NEXT PAGE

NOTE:—Engine hood hinged at cowl and lifts from forward end. Hood latch handle located at lower edge of radiator grille (safety catch at top of grille).

MODEL IDENTIFICATION

SERIAL NUMBER:—First number B-106300. Stamped on plate on right frame side rail under hood.
SERVICE SERIAL NUMBER:—First number N8-13500. On 'Caution Plate' on left front door hinge post.
ENGINE NUMBER:—First number B-105800. On engine block on right side at front. NOTE—Engine Number is 500 less than Serial Number on same car.

TUNE-UP

COMPRESSION:—**Ratio**—6.0-1 std. cast-iron head.
Pressure—110 lbs. at 350 RPM or approx. 100 lbs. at cranking speed of 160 RPM.
VACUUM READING:—Steady 18-20" idling at 7-8 MPH.
FIRING ORDER: 1-6-2-5-8-3-7-4. See wiring diagram for spark plug cable connections in distr. cap.
SPARK PLUGS: AC No. 45. 14 mm. Metric.
Gaps—Set at .025".
IGNITION: See Coil, Condenser, and Distributor.
Breaker Gap—.017". **Cam Angle**—28° closed.
Synchronization—Set movable contacts to open simultaneously with stationary contacts.
Automatic Advance—12° max. at 1100 RPM (distr.).
IGNITION TIMING: See Ignition Timing.
Std. Setting—9° BTDC. Vibration dampener mark 'IGN' (.725" before 'DC' mark) aligned with pointer on chain case cover at front of engine. Both sets of contacts should open simultaneously. CAUTION—Torquematic Spark Control (see DISTRIBUTOR following for description) cable must be disconnected at dash before setting Ignition Timing.
CARBURETION: See Carburetor & Carb. Equipment.
Idle Setting—Idle screws ½-1½ turns open. Idle speed 7-8 MPH.
Float Level—3/16" from top of float to gasket seat on cover with needle valve seated (invert to check).
Accelerating Pump—Lower hole (Summer), upper (Winter).
Fuel Pump Pressure: 3½ lbs. maximum.
VALVES: See Valve Timing.
Tappet Clearance:—.015" all valves—engine warm and idling. NOTE—For high speed driving, .018" maximum tappet clearance may be used.
STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

Ignition Switch:—Oakes Steering Column and Ignition Lock No. 302076. Ignition Switch No. 301538.
Ignition Lock—Briggs & Stratton. B & S No. 80207. Key Series—5 digits. Groove—No. 1.
COIL: Two Used, Auto-Lite CE-4025-A. Mounted on right side of engine.
Ignition Current—2 amps. Idling, 4 Stopped.
CONDENSER: Auto-Lite Part No. IG-2671. Two used.
Capacity—.20-.25 microfarad.
DISTRIBUTOR: Auto-Lite IGK-4102. Twin Ign. double breaker, 8 lobe cam, full automatic advance type with Torquematic Spark Control. Contacts open simultaneously to fire both spark plugs in each cylinder at the same instant and must be synchronized (see Ignition Timing).
Breaker Gap—Set at .017" (alike for both sets).
Cam Angle or Dwell—28° closed, 17° open (distr.). For each set of contacts (operate independently).
Breaker Arm Spring Tension—17-20 ounces.
Rotation—Clockwise viewed from above.

Distr. Degrees	Distr. R.P.M.	Automatic Advance Degrees	Eng. R.P.M.
Start	275	0	550
4	400	8	800
6	575	12	1150
9	840	18	1680
12	1100	24	2200

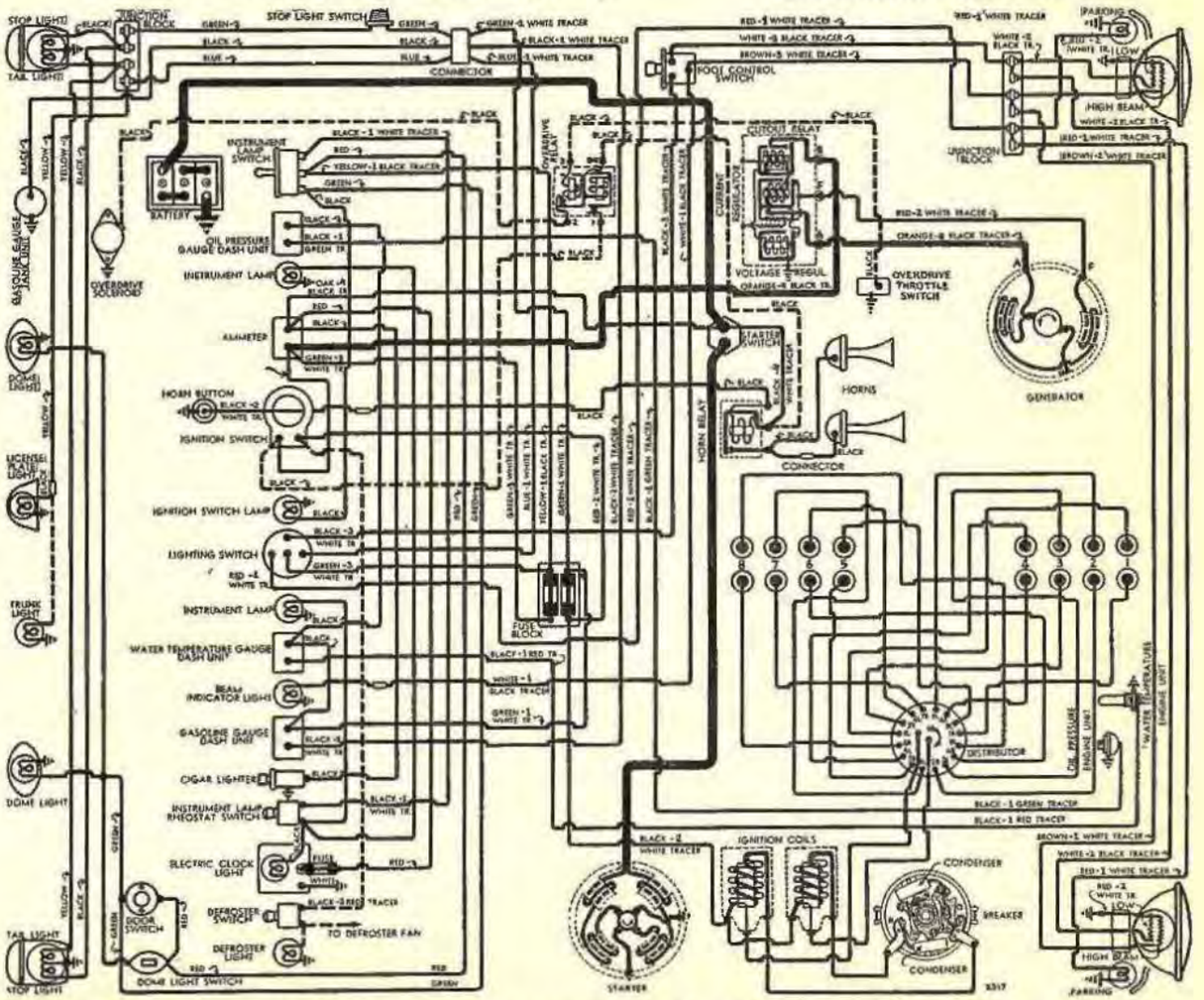
Torquematic Spark Control—Consists of cable anchored at dash and connected to distributor body by a travel limiting spring. Retards distributor through engine movement caused by torque action. Maximum retard 2½° (engine movement in excess of 2½° taken up by travel limiting spring).
Removal:—Mounted on right side of engine. To remove, take out hold-down screw in advance arm, disconnect torquematic control, lift distributor off.

IGNITION TIMING

Flywheel Degrees	Piston Position
9° BTDC	.0325" BTDC

To Set Timing—Car manufacturer recommends use of Nash Timing Light SE-569. Synchronize breaker points (see Synchronization following). With Timing Light connected as for Synchronization (see below), slacken torquematic cable by loosening locknuts on anchor bracket at dash. With #1 piston on compression, turn engine over until piston is 9° or .0325" BTDC, stop when 'IGN' mark on vibration dampener lines up with pointer on chain case cover (this mark is 9° or .725" before top dead center mark 'DC'). Loosen advance arm clamp bolt, rotate distributor until points just break (lights go on) with stop-pin (hold-down bolt and nut) in advance position in slot in advance arm, tighten clamp bolt. Adjust cable locknuts at anchor bracket on dash to leave torquematic cable without slack or tension and stop-pin in advance position in slot.

CONTINUED ON NEXT PAGE



NOTE—On cars with Overdrive, line from ammeter to ignition switch (marked by arrow) not used.

ENGINE

CONTINUED FROM PRECEDING PAGE

PISTON RINGS:—Two compression, two oil control rings per piston, all above pin. Oil ring grooves drilled for oil drain holes.

Ring	Width	End Gap	Side Clearance
Compr. #1	.124"	.010-.020"	.002-.0025"
Compr. #2	.124"	.010-.020"	.0015-.003"
Oil Contr. #3	.1240"	.010-.018"	.0015-.0025"
Oil Contr. #4	.1865"	.010-.018"	.001-.0025"

Replacement Rings:—*See Nash Shop Notes for data.*

PISTON PIN:—**Diameter—.8747". Length—2.574".** Floating type. Pin retained by locking ring at each end. Pin hole in piston offset to camshaft.
Pin Fit in Piston—Light push fit (piston at 200°F.).
Pin Fit in Rod Bushing—Select fit to .0001" or light push fit at normal temperature.
Replacement Pins:—.001", .003", .005" oversize.

CONNECTING ROD:—**Length—8¾". Weight—34 ozs.**
Upper Bearing (Piston Pin Bushing)—Bronze.
Crankpin Journal Diameters—2.000". *See Engine Code Note in Nash Special Data for original sizes.*
Lower Bearing—Removable steel-backed, babbitt-lined type. No shims.
Clearance—.0015-.0025". Sideplay—.008-.012".
Bearing Adjustment:—None (no shims). Replace bearings. Do not file rods or caps. Tangs on bearing shells should be installed on opposite sides of rod.
Replacement Bearings:—.002", .010" undersize.
Installing Rods:—Oil split hole toward camshaft.

CRANKSHAFT:—9 bearing. No counterweights.
See Nash Shop Notes for vibration dampener data.
Journal Diameters—2.479" (2 31/64"). *See Engine Code Note in Nash Special Data for original sizes.*
Bearings—Interchangeable steel-backed, babbitt-lined type. No shims. **Clearance—.002".**
Bearing Adjustment:—None (no shims). *See Nash Shop Notes for removing, installing and fitting bearings.*
Replacement Bearings:—.002", .010" Undersize.
End Thrust:—Center (#5) bearing. Replace bearing to take up excessive endplay. **Endplay—.004".**

CAMSHAFT:—Non-adjustable double-roller chain drive.
See Nash Shop Notes for camshaft removal.
Bearings—Steel-backed, babbitt bushings.
Bearing Clearance—.002".
End Thrust:—Taken by front bearing. Replace bearing to take up excessive endplay.
Endplay—.003" (new), .005" Max. (worn).
Timing Chain:—Diamond. Width 9/16". Pitch ⅜". Length 62 links or 23¼".
Camshaft Setting:—Sprockets marked. Mesh chain with sprocket marks adjacent and in line with a straightedge across the shaft centers.

VALVES:—	Head Diameter	Stem Diameter	Length
Intake	1 21/32"	.3725"	5½"
Exhaust	1 15/32"	.3725"	5½"

	Seat angle	Lift	Side Clearance
All Valves	45°	11/32"	.002-.004"

Valve Guides:—Press fit. Press in head to shoulder on guide and ream for correct clearance. Replacement guides furnished .002" undersize.
Valve Springs:—Double springs on all valves.
Free Length—1 21/32" (inner), 2" (outer).

	Inner Spring Pressure	Inner Spring Length	Outer Spring Pressure	Outer Spring Length
Closed	21 lbs.	1⅜"	38 lbs.	1 11/16"
Open	51 lbs.	1 1/32"	95 lbs.	1 11/32"

Valve Lifters:—Mushroom type. Lifter guide holes reamed in block. Remove from below (camshaft out).

VALVE TIMING

Tappet Clearance:—.015" all valves—engine warm and idling.
Valve Timing:—See Camshaft Setting above.
Intake Valves—Open 20° BTDC. Close 74° ALDC.
Exhaust Valves—Open 45° BLDC. Close 10° ATDC.
Valve Timing Check—With regular tappet clearance of .015" Exhaust valve should close with piston 10° or .0400" after top dead center.

LUBRICATION

LUBRICATION:—Pressure system (gear type oil pump in crankcase). NOTE—Slot in pump shaft should be assembled across engine when pump installed.
Normal Oil Pressure:—30 lbs. at 20 MPH.
Oil Pressure Relief Valve:—On oil pump cover. Opens at 30 lbs. Turn adjusting screw in to increase.
Oil Pressure Gauge:—King-Seeley Electric. K-S No. 7665 (dash unit), 6125 (engine unit).
See Miscellaneous Section for complete data.
Crankcase Capacity:—7 qts. (dry or refill).

COOLING

COOLING SYSTEM:—**Capacity. 17 qts.** (add 1 qt. for heater).
Water Pump:—Centrifugal, adjustable packing type.
See Water Pump Section for complete data.
Thermostat:—Dole. In water outlet on cyl. head.
Setting—Starts to open at 160° F.
Temperature Gauge:—King-Seeley Electric. K-S No. 7670 (dash unit), 7000 (engine unit). NOTE—Gauge inoperative with ignition Off (reads '212').
See Miscellaneous Section for complete data.

CLUTCH

CLUTCH:—**Borg & Beck Model 10A7.** Single plate, dry disc type. See Production Change following.
►**Production Change**—Clutch assembly changed from #919 (same as 1939) to #949 (with 'Borglite' driven member) after Feb. 1, 1940. Assembly No. stamped on cover.
See Clutch Section for complete data.
Facings—Spiral wound molded woven, 2 used. Inside Diam. 6" (919), 6½" (949). Outside Diam. 10". Thickness .125". NOTE—Install plate with mark 'flywheel side' forward (damper toward trans).
Pedal Adjustment:—Free travel ½-1" (adjusting nuts on lower end of pedal connector link). Check NoRol
Removal:—Remove transmission (see below). Disconnect clutch pedal linkage. Support engine at rear, disconnect rear engine mountings. Remove clutch housing and pan. Punch mark flywheel, cover, and pressure plate (re-assemble to these marks). Take out mounting screws in cover flange.

TRANSMISSION

TRANSMISSION:—**Own Make.** All helical gear, constant-mesh (all speeds), synchro-mesh (second & high) with remote type steering column shift.
See Transmission Section for complete data.
Transmission Control:—Steering col. mechanical shift.
See Transmission Section for complete data.
Removal:—Disconnect shift rods, speedometer cable, overdrive control and wires (if used), and driveshaft. Remove two upper mounting studs and install pilot studs (to support transmission and avoid bending clutch plate). Remove remaining mounting stud nuts, remove transmission from below.

OVERDRIVE

Cruising Gear (Overdrive):—Warner Model AS12-R6 with electrical 'kick-down' control optl.
See Transmission Section for complete data.
Overdrive Solenoid—Delco-Remy Model 1118004.
Throttle Switch—Adjust switch to close with throttle wide open and carburetor throttle shaft pulley spring just starting to compress.
Control Relay—Delco-Remy Model 1116798.

UNIVERSALS

Mechanics Type 3C—Roller bearing type. 2 used.
See Universals Section for complete data.

REAR AXLE

REAR AXLE:—**Own Make.** Semi-floating, hypoid gear type with Hotchkiss drive.
See Rear Axle Section for complete data.
Ratio—4.1-1 Std., 4 4/9-1 Optl.
Backlash—.005-.007". Shim adjustment.
Removal:—Hoist rear of car, remove axle shafts (see below). Free axle from springs by disconnecting U-bolts and rear shackles and withdraw from car.
Axle Shaft Removal:—Remove wheel and drum. Disconnect brake line and cable. Remove backing plate mounting bolt nuts, oil seal retainer, brake backing plate, bearing adjusting shims and withdraw shaft and bearing (do not drag shaft on oil seal).
Wheel Bearing Adjustment—Shims at flanged end of housing. To adjust, remove backing plate, add or remove shims (equally at both ends of axle).
Endplay—.003-.006".

SHOCK ABSORBERS

SHOCK ABSORBERS:—**Delco. Front**—Model 1947-C, D. **Rear**—Model 1006-DD, 1006-EE (heavy springs), 1723-N, P (heavy springs—Export). Double acting, hydraulic. Direct acting on rear (except 1723).

FRONT SUSPENSION

Front Suspension:—Independent, linked parallelogram type with coil springs.
See Front Suspension Section for complete data.
IMPORTANT—Insert 2" blocks (Tool J886) between upper support arm and frame flange (at each side) to level frame when checking specifications.
Kingpin Inclination—4½° crosswise.
Caster—0° to Negative ½°. Adjustable.
Camber—Pos. ¼° to Pos. ¾°. Adjustable.
Toe In—1/32-3/32". Adjust tie rod tubes equally.
Steering Geometry—Inner wheel 21½°, Outer 20°.

STEERING GEAR

Steering Gear: Gemmer Model Number 335. Worm-and-Roller type with 'push-pull' adjustment.
See Steering Gear Section for complete data.

BRAKES

BRAKES:—**Service.** Bendix hydraulic, duo-servo, single anchor type with eccentric adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Drums—Cast-iron. Diameter 11 1/16".
Lining—Moulded. Width 2¼". Thickness 3/16". Length per wheel 24".
Clearance—.010" at heel and toe of each shoe.
Braking Power—53% front wheels, 47% rear.
Hand Brakes:—See Service Brakes above.
No-Rol: Optional. *See Brake Section for complete data.*

IGNITION TIMING

IGNITION TIMING:—Flywheel Degrees Piston Position
All Engines ..... At TDC ..... .000" TDC.
Timing Note—Vacuum advance must be latched out by aligning holes in advance arm and hold-down plate and inserting ⅛" pin through these holes while timing is being set.
To Set Timing—Turn engine over until #1 piston reaches top dead center on compression stroke with 'IGN/DC' mark on vibration dampener in line with pointer on chain case cover. Latch out vacuum control (see note above), loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor at #1 segment in distributor cap, check Octane Selector setting.
Octane Selector Setting—Should be set for slight ping when accelerating with wide open throttle at speeds between 10-15 MPH. To adjust, loosen hold-down screw, rotate distributor one graduation at a time counter-clockwise (if ping too severe), clockwise (if no ping noted) until correct performance secured.

CARBURETOR

CARBURETION:—Carburetor—Carter (B & B) Model 513-S, 1¼" downdraft type with manual choke control.
For complete data, refer to Carburetor Index.
Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*
Metering Jet—*See Carter (B&B) Jet Table in Carburetor Section for complete data.*
Fast Idle:—No adjustment provided (linked to choke valve so throttle opened to fast idle position when choke valve closed).

CARB. EQUIPMENT

Air Cleaner:—AC No. 1542037 oil-wetted type Std.
Fuel Pump:—AC Type W (Std.), Type AJ Fuel-&-Vacuum Pump (Cars with Overdrive). Pump Exchange Part No. 532.
For complete data, refer to Carburetion Equip. Index.
Pressure—3½ lbs. ('W'), 4 lbs. ('AJ').
Gasoline Gauge:—Auto-Lite Electric type. No. NG-9645D (Dash Unit), No. NG-9637T (Tank Unit).
For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—Auto-Lite CTL-1-13. 6 volt, 13 plate, 90 Ampere Hour capacity (20 hour rate).
Zero Capacity—300 amperes for 3.0 minutes.
Grounded Terminal—Positive (+) terminal to body.
Engine Ground—Separate strap connector to body.
Location—Under left front seat.

STARTER

STARTER:—Delco-Remy 1109451. Armature No. 1882547.
Drive—Inboard Barrel Type Bendix No. A-2033.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ozs. each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	6000	5.7	60
11.5 "	Lock	3.3	540

Removal:—Starter flange mounted on left front face of flywheel housing. To remove, take out flange mounting screws.
Starting Switch:—Mounted on toeboard and operated by clutch pedal when clutch fully disengaged.

GENERATOR

GENERATOR:—Delco-Remy 1102684. Armature 1882588. Two brush type with Current-Voltage control.
Charging Rate Adjustment—None. See Regulator.
Maximum Charging Rate—32-34 amperes, 8 volts, not. Actual charging rate controlled by voltage regulator and dependent on battery condition.

Performance Data

	Amperes	Volts	R.P.M.
Cold	30①	8.0	1750

①Not maximum output. See Current Regulator.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—25 ozs. each.
Field Current—1.75-1.9 amperes at 6.0 volts.
Removal:—Generator cradle mounted at left side of engine with fan belt drive (water pump driven by extension of generator shaft). To remove, disconnect water pump, loosen fan belt, remove generator clamp band, lift generator out.
Belt Adjustment:—Adjust whenever belt deflection exceeds 1½" (light pressure midway between fan and generator pulley). To adjust, loosen fan mounting bracket capscrews, raise fan (pivots on one screw, other screw hole slotted) until belt deflection is ¾", tighten screws.

REGULATOR

REGULATOR:—Delco-Remy 1118202. Single Core Type. Vibrating Current & Voltage Regulator on dash.
For complete data, refer to Electrical Equipment Index.
CAUTION—Check generator for grounded field coils and leads before changing regulator settings to correct High Charging Rate or High Voltage.

Cutout Relay

Cuts In—6.2-6.7 volts hot.
Cuts Out—0-4.0 ampere discharge current.
Contact Gap—.020" (same for both sets).
Air Gap—.020" (with contacts just closed).

Voltage Regulator

Setting—7.2-7.4 volts hot (operating temperature).
To Check—Connect ammeter in charging line at regulator 'BAT' terminal, voltmeter between this terminal and ground. Operate generator at 2800 RPM., adjust charging rate to 8-10 amperes (use variable rheostat or AVR set). With regulator hot (150°F.), decrease generator speed until cutout relay contacts open, then increase speed to 2800 RPM. and check hot voltage setting (above).
To Adjust—Change regulator armature spring tension slightly by bending hanger at lower end of one spring only. If further adjustment required, see Single Core Regulator article in Electrical Equipment Section for other (2nd.) spring adjustment.
Air Gap—.070" between center of core and armature with contacts just closing (press down on armature to open contacts, release pressure, check gap at point where contacts just close).

Current Regulator

Setting—34-36 amperes hot (at operating temp.).
To Check—Remove regulator cover, connect short jumper between Voltage Regulator frame and upper contact support bracket (to short out Voltage Regulator), connect ammeter in charging line at regulater 'BAT' terminal, turn on car lights and accessories. Operate generator and increase speed until output remains constant. With regulator hot (150°F), current reading should agree with setting (above).
To Adjust—Same as for Voltage Regulator (above).
Air Gap—.080" (check same as Voltage Regulator).

LIGHTING

LIGHTING:—Headlamps—Hall 'Sealed Beam' type.
For complete data, refer to Electrical Equipment Index.
Headlamp Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height).
Beam Indicator—In center of speedometer dial. Lighted when Country (upper) beams in use.

Switches

Lighting—Douglas. Nash No. 3107032.
Beam Selector—Douglas.
Instrument—Douglas.

MISC. ELECTRICAL

FUSES:—Lighting—30 ampere. On fuse block on left hand front face of dash.
Accessory—30 ampere. On fuse block.
HORNS:—Delco-Remy. No. 1999917 (Spec. 4145, 7), No. 1999565 (Deluxe 4142, 3, 8), No. 1999565 Low Note & 1999566 High Note Twin Horns (Deluxe Torpedo 4140). Deluxe Single Horn & Torpedo Deluxe Twin Horns operated by horn relay.

Type	Current (at 6 volts)	Air Gap
1999565 (Low Note)	19-21 amperes	.047-.052"
1999566 (High Note)	18-20 amperes	.039-.044"

Horn Relay:—Delco-Remy No. 1116775.
Contact Gap—.025". **Air Gap**—.015" (closed).
Contacts Close—2.75-4.0 volts.

ENGINE

OIL PAN REMOVAL AND ENGINE CODE NOTE DATA (ORIGINAL BORE & BEARING SIZES): *Refer to Nash Shop Notes for complete instructions.*
ENGINE SPECIFICATIONS:—6 cylinder, 'L' head type. Cylinders cast Enbloc with intake manifold cast in block (Iso-thermal fuel intake system).
Bore—3⅛". **Stroke**—3¾".
Displacement—172.6 cu. ins. **Rated HP**—23.44.
Developed Horsepower—75 at 3600 RPM.
Compression Ratio—6.7-1 Std. (cast-iron head).
Compression Pressure—120 lbs. at 350 RPM.
Vacuum Reading—18-20" idling at 6 MPH.
PISTONS:—Aluminum alloy, Autothermic, cam-ground, tin-plated type. **Length**—3⅜".
Original Bore Sizes:—*See Engine Code Note in Nash Shop Notes for data.*
Removal—Pistons and rods removed from above.
Clearance—See Fitting New Pistons.
Replacement Pistons:—Furnished std. and .001", .002", .003", .005", 010", .012", .015", .020", .040" oversize.
Fitting New Pistons:—Use .002" oiled feeler ½" wide between piston and wall at right angles to pin hole on side opposite slot. Pull to withdraw feeler must be within 12-18 lbs. with piston at room temperature.
Installing Pistons:—Slot to left side (trademark on piston toward the front).
PISTON RINGS:—Two compression, one oil ring per piston, all above pin. Oil ring groove drilled for oil drain.

Ring	Width	End Gap	Side Clearance
Compr.	.093"	.010-.015"	.002-.004"
Oil Contr.	.1865"	.010-.015"	.003-.004"

Replacement Rings & Installation Data:—*See Nash Shop Notes for complete data.*
PISTON PIN:—Diameter—.8120". **Length**—2.609".
Floating type, retained by locking ring at each end.
Pin Fit in Piston—Light push fit (piston at 200° F.).
Pin Fit in Rod Bushing—Select fit for .0001" clearance or light push fit at normal temperature.
Replacement Pins:—Standard, .001, .003" oversize.

CONTINUED ON NEXT PAGE

MODEL IDENTIFICATION

SERIAL NUMBER:—First number R-353001. Stamped on plate on right frame side member under hood.

SERVICE SERIAL NUMBER:—First number N6-45001. On 'Caution Plate' on left front door hinge post.

ENGINE NUMBER:—First number R-353001. Stamped on right side of engine block at front.

TUNE-UP

COMPRESSION:—**Ratio**—6.3-1 std. cast-iron head. **Pressure**—125 lbs. at cranking speed of 350 RPM.

VACUUM READING:—Steady 18-20" idling at 7-8 MPH.

FIRING ORDER:—1-5-3-6-2-4. See diagram for spark plug cable connections on distributor cap. **NOTE**—Rotation now clockwise (reversed from previous models).

SPARK PLUGS:—AC No. 45. 14 MM. Metric. **Gaps**—.025".

IGNITION: See Coil, Condenser, and Distributor. Breaker Gap—.020". **Cam Angle** 35° Closed. **Synchronization**—Set movable contacts to open simultaneously with stationary contacts. **Automatic Advance**—11½° max. at 875 RPM (distr.).

IGNITION TIMING: See Ignition Timing. Std. Setting—6° BTDC. Vibration dampener mark 'IGN' (23/64" before 'DC' mark) aligned with pointer on chain case cover at front of engine. Both sets of contacts should open simultaneously. CAUTION—Torquematic Spark Control (see DISTRIBUTOR following for description) cable must be disconnected at dash before setting Ignition Timing.

CARBURETION: See Carburetor & Carb. Equipment. Idle Setting—Idle screw ¾-1½ turns open. Idle speed 7-8 MPH. **Float Level**—⅜" from projection on cover to top of soldered seam at front end of float with needle valve seated (invert to check). **Accelerating Pump**—Lower Hole (Normal setting).

Fuel Pump Pressure: 3½ lbs. maximum.

VALVES: See Valve Timing. Tappet Clearance:—.015" all valves (see Adjustment Note following) with engine hot and idling (may be set .018" max. for sustained high speed driving). ADJUSTMENT NOTE—Due to redesigned cylinder head and increased angle of engine, a new oil plug (in drilled passage in cylinder head between lead from oil filter and lead to rocker arm shafts) is used and must be removed if valves adjusted with engine running (cutting off oil supply to rocker arm shafts). IMPORTANT—Replace plug after adjusting valves to provide proper lubrication for overhead mechanism after cover installed (if plug not replaced overhead valve mechanism will not be lubricated, oil will be by-passed in head).

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

Ignition Switch:—Oakes Steering Column and Ignition Lock No. 302382. Ignition Switch No. 302440. **Ignition Lock**—Briggs & Stratton, B & S No. 85347. **Key Series**—5 digits. **Groove**—No. 1.

COIL: Two Used, Auto-Lite CE-4025-A. Mounted on right side of engine. **Ignition Current**—2 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IG-2671. Two used. Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite IGE-4024. Twin Ignition double breaker, 6 lobe cam, full automatic advance with Torquematic Spark Control. Contacts open simultaneously to fire both spark plugs in each cylinder at the same instant and must be synchronized (see Ignition Timing). NOTE—Distributor rotation reversed from previous models).

Breaker Gap—Set at .020".

Cam Angle or Dwell—35° closed, 25° open (distr.). For each set of contacts (operate independently).

Breaker Arm Spring Tension—17-20 ounces.

Rotation—Clockwise viewed from above. NOTE—Rotation reversed from previous models.

Automatic Advance

Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine R.P.M.
Start	275	0	550
3	370	6	740
7	500	14	1000
9	665	18	1330
11.5	875	23	1750

Torquematic Spark Control—Consists of cable anchored at dash and connected to distributor body by a travel limiting spring. Retards distributor through engine movement caused by torque action. Maximum retard 2½° (engine movement in excess of 2½° taken up by travel limiting spring). See Ignition Timing for setting.

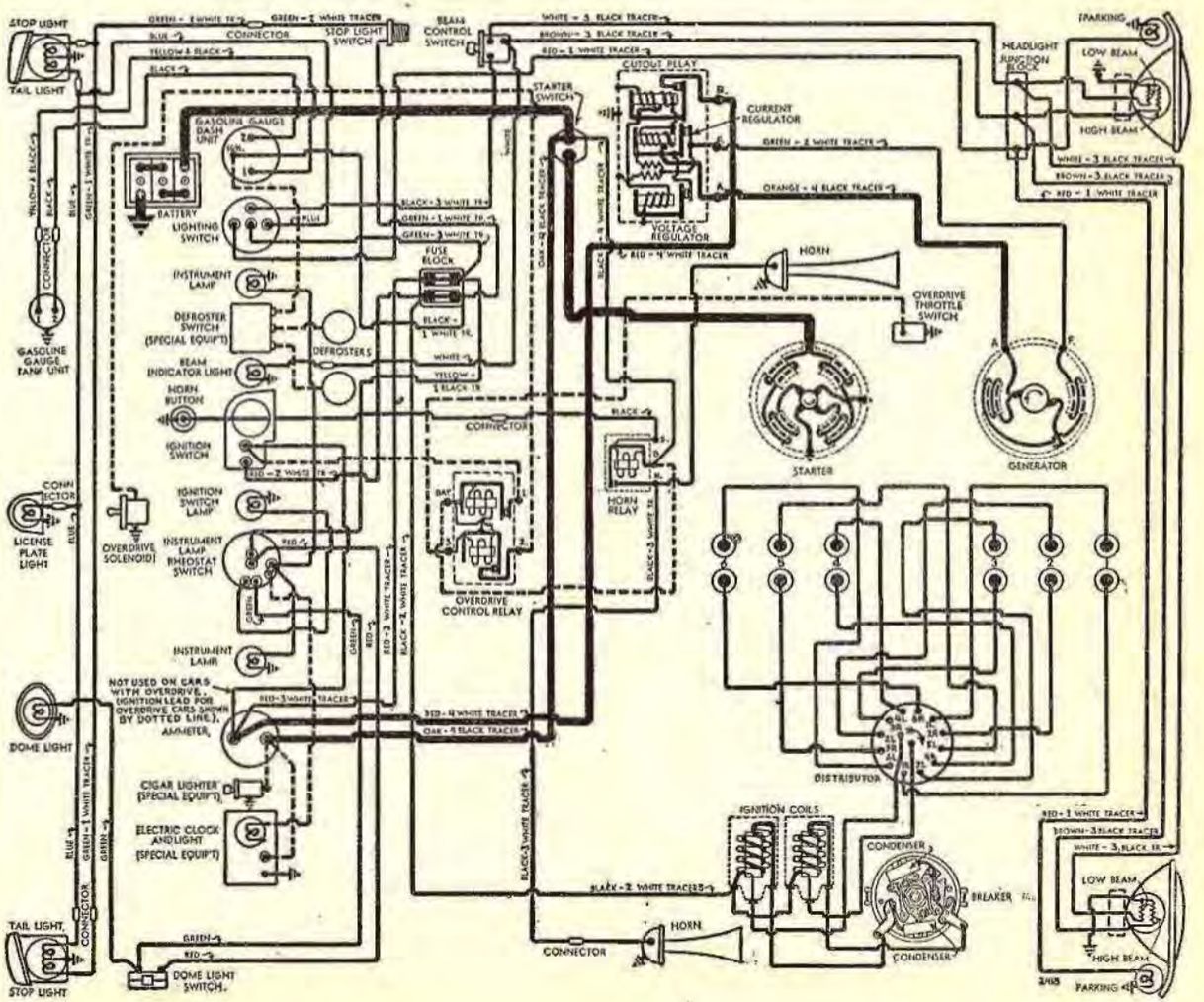
Removal:—Mounted on right side of engine. To remove, take out hold-down screw in advance arm, disconnect torquematic control, lift distributor off.

IGNITION TIMING

Flywheel Degrees	Piston Position
6° BTDC	.0150" BTDC

To Set Timing—Car manufacturer recommends use of Nash Timing Light SE-569. Synchronize breaker points (see Synchronization following). With Timing Light connected as for Synchronization (see below), slacken torquematic cable by loosening locknuts on anchor bracket at dash. With #1 piston on compression, turn engine over until piston is 6° or

CONTINUED ON NEXT PAGE



ENGINE

CONTINUED FROM PRECEDING PAGE

PISTON RINGS:—Two compression, two oil control rings per piston, all above pin. Oil ring grooves drilled for oil drainage.

Ring	Width	End Gap	Side Clearance
Compr.	.124"	.010-.015"	.002-.004"
Oil Contr.	.155"	.010-.015"	.002-.004"

Replacement Rings:—*See Nash Shop Notes for data.*

PISTON PIN:—**Diameter**—.8745". **Length**—2.804". Floating type, retained by locking ring at each end. Pin hole in piston offset toward camshaft.
Pin Fit in Piston—Light push fit (piston at 200° F.).
Pin Fit in Rod Bushing—Select pin for .0001" clearance or light push fit at normal temperature.

Replacement Pins:—Standard, .001" .003" oversize.

CONNECTING ROD:—**Length**—8¾". **Weight**—36¼ ozs.
Upper Bearing (Piston Pin Bushing)—Bronze.
Crankpin Journal Diameters—2.000". *See Engine Code Note in Nash Special Data for original sizes.*
Lower Bearing—Removable, steel-backed babbitt.
Clearance—.0015-.0025". **Sideplay**—.008-.012".

Bearing Adjustment:—None (no shims). Replace bearings. Do not file rods or bearing caps. *See Nash Shop Notes for instructions and 'Palnut' data.*

Replacement Bearings:—Std. & .002", .010" undersize.

Installing Rods:—Mark rods and bearing caps before removal and install in same position. Oil hole in lower end of rod must be toward right of engine.

CRANKSHAFT:—7 bearing, counterweighted type. *See Nash Shop Notes for Vibration Dampener data.*
Journal Diameters—2.479" (2 31/64"). *See Engine Code Note in Nash Special Data for original sizes.*
Bearings—Removable steel-backed, babbitt type.
Clearance—.002-.003".

Bearing Adjustment:—None (no shims). Replace bearings. *See Nash Shop Notes for bearing installation and fitting, replacement main bearing caps, and rear main bearing oil seal data.*

Replacement Bearings:—Std. & .002", .010" undersize.

End Thrust:—Taken by center bearing. Replace bearing to take up excessive endplay. **Endplay** .004-.006".

CAMSHAFT:—Non-adjustable roller-chain drive. *See Nash Shop Notes for Camshaft Removal directions.*
Bearing Type—Steel-backed, babbitt bushings.
Clearance—.002".

End Thrust:—Taken by front bearing.
Endplay—.004-.006".

Timing Chain:—Whitney No. 49205 roller chain. Width 9/16". Pitch ⅜". Length 22½" or 60 links.

Camshaft Setting:—Mesh chain with camshaft and crankshaft sprockets turned so that marked tooth on each gear is 45° past (to right—as viewed facing front of engine) top vertical position. With sprockets in this position there should be 9½ links between tooth marks.

VALVES:—	Head Diameter	Stem Diameter	Length
Intake	1¾"	.3725"	5 17/32"
Exhaust	1 19/32"	.3725"	5 17/32"

	Seat Angle	Lift	Stem Clearance
All Valves	45°	11/32"	.002-.004"

Valve Guides:—Press fit in head (positioned by shoulder on guide). Ream new guides for clearance.

Valve Springs:—Double springs used on all valves. Free length 1 21/32" (inner), 2" (outer spring).

	Inner Spring		Outer Spring	
	Pressure	Length	Pressure	Length
Valve Closed	21 lbs.	1 3/8"	38 lbs.	1 11/16"
Valve Open	51 lbs.	1 1/32"	95 lbs.	1 11/32"

Valve Lifters:—Mushroom type. Lifter guide holes in block. Remove from below with camshaft out.

VALVE TIMING

Tappet Clearance:—.015" all valves, engine hot and idling (.018" max. may be used for sustained high speed driving. CAUTION—Oil plug in drilled passage in cylinder head (between oil filter pipe and lead to rocker arm shaft) must be removed to cut off oil to rocker arm shafts when valves adjusted with engine running. IMPORTANT—Plug must be replaced after adjustment completed (oil is bypassed in head with plug out and valve mechanism will not be oiled).

Valve Timing:—See Camshaft Setting above.
Intake Valves—Open 11.6° ATDC. Close 34.6° ALDC.
Exhaust Valves—Open 49.3° BLDC. Close 5° ATDC.
To Check Valve Timing—With .015" tappet clearance, #1 intake valve opens 11.6° ATDC. with 'DC' mark on vibration dampener at front of engine 23/32" after the indicator on the chain case cover. Exhaust valve closes with piston 5° or .0104" ATDC.

LUBRICATION

LUBRICATION:—Pressure system with gear type oil pump in crankcase (pump driven by separate gear from camshaft with oil delivery up along drive shaft to oil gallery in engine block).

Normal Oil Pressure:—25-30 lbs. at 25 MPH (warm oil).

Oil Pressure Regulator:—On oil pump cover. Opens at 30 lbs. Not adjustable.

Crankcase Capacity:—6 quarts.

COOLING

COOLING SYSTEM:—**Capacity** 17 qts. (18 with heater).

Water Pump:—Centrifugal, adjustable packing type. *See Water Pump Section for complete data.*

Thermostat:—Fulton or Dole. In cyl. head outlet.
Setting—Starts to open at 160°F.

Temperature Gauge:—Auto-Lite (Motometer) Vapor Tension type. Auto-Lite No. H-9644. *See Miscellaneous Section for complete data.*

CLUTCH

CLUTCH:—**Borg & Beck Model 10A7. Assembly No. 950.** Single plate, dry disc type. *See Clutch Section for complete data.*
Facings—Moulded-woven type, 2 used. Inside Diam. 7". Outside Diam. 10". Thickness ⅛".

Pedal Adjustment & Over-center Spring Setting:—Pedal free travel ½-1". Adjusted in same manner as on the Nash 8 (see next page for instructions). CAUTION—Over-center spring setting must be checked whenever clutch pedal is adjusted.

Removal:—Remove Transmission (see below). Disconnect clutch pedal linkage, support engine at rear and free rear engine mountings, remove clutch housing and pan. Punchmark flywheel, clutch cover and pressure plate (reassemble to same marks), remove clutch mounting screws and clutch.

TRANSMISSION

TRANSMISSION:—**Own Make.** New design, all helical gear, constant-mesh, synchro-mesh (second & high), sliding gear (low & reverse). *See Transmission Section for complete data.*

Transmission Control:—Mech. steering column shift. *See Transmission Section for complete data.*

Removal:—Disconnect shift rods, speedometer cable, overdrive control cable & wires (if used), and driveshaft. Remove two right transmission mounting studs and install pilot studs (to support transmission during removal), remove other mounting stud nuts, pull transmission straight back and remove

OVERDRIVE

Overdrive (Cruising Gear):—Warner Model AS1-R7C, Type R7C with electrical 'kick-down' control. *See Transmission Section for complete data.*
Overdrive Solenoid—Delco-Remy Model 1118004.
Throttle Switch—Adjust switch position on mounting bracket so that contacts close with throttle valve wide open and spring on carburetor throttle valve pulley just starting to compress.
Control Relay—Delco-Remy Model 1116798.

UNIVERSALS

Mechanics Type 2CR—Roller bearing type. 2 used. *See Universals Section for complete data.*

REAR AXLE

REAR AXLE:—**Own Make.** Semi-floating, hypoid gear type with Hotchkiss drive. *See Rear Axle Section for complete data.*
Ratio—4.1-1 Std., 4.4-1 with Overdrive.
Backlash—.005-.007". Shim adjustment.

Removal:—Hoist rear end of car, disconnect shock absorbers, remove axle shafts (see below), free axle from springs by disconnecting U bolts and rear shackles, withdraw axle assembly from beneath car.

Axle Shaft Removal:—Remove wheel and drum, disconnect brake line and cable, remove backing plate mounting bolt nuts, oil seal retainer, backing plate, and bearing adjusting shims. Withdraw shaft and bearing, using care not to drag shaft on oil seal.

Wheel Bearing Adjustment—Shims located between backing plate and flanged end of housing. To adjust, remove wheel and backing plate (above), add or remove shims for endplay. **Endplay** .003-.006".

SHOCK ABSORBERS

SHOCK ABSORBERS:—**Delco Model 1016-E (front), 1023-BB (rear).** Direct acting, hydraulic type.

FRONT SUSPENSION

Front Suspension:—Independent, linked parallelogram type with coil springs. *See Front Suspension Section for complete data.*
Kingpin Inclination—4½° crosswise.
Caster—0° to ½° Neg. Adjustable.
Camber—Pos. ¼° to ½°. Adjustable.
Toe In—1/32-3/32" measured 10" up from floor.
Steering Geometry—Inner wheel 21° + ¾°, outer 20°

STEERING GEAR

Steering Gear: Gemmer Model 305 Worm-and-Roller type with "push-pull" adjustments. *See Steering Gear Section for complete data.*

BRAKES

BRAKES:—**Service**—Bendix hydraulic, duo-servo, single anchor type, without Eccentric Adjustment. Hand lever applies rear wheel service brakes. *See Brake Section for complete data.*
Drums—Cast iron. Diameter 10".
Lining—Moulded type. Width 2." Thickness 3/16". Length 22" per wheel.
Clearance—.015" at each end of secondary shoes with primary shoes forced out against drum.
Braking Power—53% front, 47% rear wheels.

Hand Brakes:—See Service Brake above.

and ground. Turn on ignition, turn engine over until fixed points just open (light for stationary contacts on). If both lights go on, synchronization correct. If not, loosen 3 lockscrews on movable subplate, shift plate by prying with screwdriver in notch on edge of plate until this set of contacts begin to open (both lights on), tighten sub-plate lockscrews, and set Ignition Timing as directed above. If other methods used, set contacts to open simultaneously at 45° (distributor) intervals.

Torquematic Spark Control Check—Distributor must be free in bracket and cable pulleys positioned to prevent cable interference with engine. Advance spring and cable take-up spring must be properly located and spring resistance centralized. Car manufacturer recommends use of Nash Synchro Light SE-417 to check torquematic retard by means of dead center mark on vibration dampener.

CARBURETOR

CARBURETION:—Carburetor—Carter Type WDO, Model 511-S (#360 cast on face of flange), 1" dual downdraft type.
For complete data, refer to Carburetor Index.

Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*
Metering Rods & Jets—*See Carter Jet Table in Carburetor Section for complete data.*

Fast Idle:—Integral type (built-in carburetor).
For complete data, refer to Carburetion Equip. Index.
Setting—Adjust fast idle screw for .015" throttle opening with choke valve closed.

Automatic Choke:—Carter Climatic Control.
For complete data, refer to Carburetion Equip. Index.
Setting—Centered (at index mark). This setting supersedes original 1 Notch Rich setting.

CARB. EQUIPMENT

Air Cleaner:—AC # 1529113 oil-wetted type standard.

Fuel Pump:—AC Type W (Std.), Type AD Fuel-&-Vacuum Pump (Cars with Overdrive). Pump Exchange Part No. 534.
For complete data, refer to Carburetion Equip. Index.

Gasoline Gauge:—Auto-Lite electric. No. NG-9645D (dash unit), No. NG-9637T (tank unit).
For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—Auto-Lite Type CTL-2-17. 6 volt, 17 plate, 120 ampere hour capacity (20 hour rate).
Starting Capacity—152 amperes for 20 minutes.
Grounded Terminal—Positive (+) grounded to body. Separate body to engine ground strap used.
Location—Under front seat.

STARTER

STARTER:—Auto-Lite MAB-4104, Armature MAB-2057.
Drive—Inboard Bendix Type LCD11FX-10.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—42-53 ozs. (new brushes).
Cranking Engine—160 RPM, 150-160 amps., 5.2 v.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	3700	5.5	60
3.4 " "	1100	5.0	200
10.15 " "	420	4.0	400
15.8 " "	Lock	3.0	582

Removal:—Starter flange mounted on right front face of flywheel housing. To remove, disconnect battery cable, take out flange mounting screws.

Starting Switch:—A-L #SW-4012. Mounted on body floor below clutch pedal. Operated by depressing clutch pedal fully. No adjustment required.

GENERATOR

GENERATOR:—Auto-Lite GDZ-4803B, Armature GDZ-2079F. Two brush type with current-voltage control.
Charging Rate Adjustment—None. See Regulator.
Maximum Charging Rate—35 amperes (hot or cold), 8.0 volts, 1900 RPM (generator) and above with load or discharged battery (Current Regulator setting). Actual charging rate controlled by Voltage Regulator and dependent on battery condition.

Performance Data

Cold Amperes	Cold Volts	Cold R.P.M.	Hot Amperes	Hot Volts	Hot R.P.M.
0	6.4	925	0	6.4	1000
4	6.6	1035	4	6.6	1120
8	6.75	1140	8	6.75	1235
12	6.95	1250	12	6.95	1350
16	7.15	1370	16	7.15	1460
20	7.3	1480	20	7.3	1590
24	7.5	1590	24	7.5	1730
28	7.7	1710	28	7.7	1900
32	7.9	1820	32	7.9	2090
35	8.0	1900	35	8.0	2250

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—53 ozs. max. (new brushes).
Field Current—1.60-1.78 amperes at 6.0 volts.
Motoring Current—4.16-4.60 amperes at 6.0 volts.

Removal:—Generator cradle mounted at left side of engine with fan belt drive. Water pump driven by generator shaft extension. To remove, disconnect water pump, loosen fan belt, remove generator clamp band and lift generator off.

Belt Adjustment:—Adjust whenever belt deflection is over 1½" (when pressed lightly midway between generator and fan pulleys). To adjust, loosen two capscrews on fan bracket, lift fan up (one screw hole slotted) for ¾" belt deflection, tighten screws.

REGULATOR

REGULATOR:—Auto-Lite VRP-4004F or 4004F-1. Current Voltage Type. On left side of engine dash.
For complete data, refer to Electrical Equipment Index.
NOTE—Regulator case cover sealed. Serviced on exchange basis if seals not broken (to remove cover).

Cutout Relay

Cuts In—6.4-6.6 volts.
Cuts Out—4.1-4.8 volts (approx. 4-6 amps. disch.).
Contact Gap—.015" minimum.
Air Gap—.031-.034" with contacts open (check at hinge end of core).

Voltage Regulator

Setting—7.2-7.5 volts at 70° F. See Electrical Equipment Section for settings at other temperatures.
To Check (without breaking seals)—Connect ammeter in charging line at regulator 'B' terminal (use short heavy leads), voltmeter between 'B' terminal and ground. Operate generator at speed equivalent to 30 MPH., charging fully charged battery, until voltage is steady. Voltage reading should agree with setting given above.
To Adjust (with cover removed)—Change regulator armature spring tension by bending lower spring hanger slightly. See Electrical Equipment Section.
Contact Gap—.012" min. (armature against stop pin).
Air Gap—.048-.052" with contacts just opening.

Current Regulator

Setting—34-36 amperes (marked '35' on the cover).
To Check (without breaking seals)—Connect test meters as for voltage check (above). Operate generator at speed equivalent to 30 MPH. charging battery, turn on car lights and accessories or connect load (bank of headlamp bulbs etc.) between ammeter and battery so that generator charges at peak rate and Current Regulator operates. Current reading should agree with setting given above. If more than slight excess noted, regulator is defective.
To Adjust (with cover removed)—Same as for Voltage Regulator (above).
Contact Gap & Air Gap—Same as Voltage Regulator.

LIGHTING

LIGHTING: Headlamps—Hall "Sealed Beam" type. *See "1941 Nash "600" for data.*

MISC. ELECTRICAL

FUSES:—Lighting—30 ampere. On fuse block mounted on left hand side of engine dash.
Accessory—30 ampere. On fuse block.

HORNS:—Delco-Remy. No. 1999565 (left horn—low note), No. 1999566 (right horn—high note). Vibrator type, blended tone, operated by horn relay.

Type	Current (at 6 volts)	Air Gap
1999565 (Low Note)	19-21 amperes	.047-.052"
1999566 (High Note)	18-20 amperes	.039-.044"

Horn Relay:—Delco-Remy Model 1116775.
Contact Gap—.025". **Air Gap**—.015" (closed).
Contacts Close—2.75-4.0 volts.

ENGINE

ENGINE CODE NOTE (ORIGINAL BORE & BEARING SIZES): *See Nash Shop Notes for complete data.*

ENGINE SPECIFICATIONS:—8 cylinder, valve-in-head, Twin Ignition type with Iso-thermal fuel intake system (intake manifold cast in cylinder head—water jacketed for temperature control).
Bore—3⅛". **Stroke**—4¼".
Displacement—260.8 cu. ins. **Rated HP**—31.25.
Developed Horsepower—115 at 3400 RPM.
Compression Ratio—6.3-1 Std. cast iron head.
Compression & Vacuum Reading—*See Tune-Up.*

►**Later type Replacement Cylinder Heads:** *See "Cylinder Head" in Nash Shop Notes.*

PISTONS:—Nelson Bohnalite, aluminum alloy, Invar strut, tin-plated, split skirt type.
Weight—16 ozs. (stripped). **Length**—3 11/16".
Removal—Pistons and rods removed from below.
Clearance—See Fitting New Pistons.
Original Bore Sizes:—*See Engine Code Note in Nash Shop Notes for data.*
Replacement Pistons:—Furnished std. and .001", .002", .003", .005", 010", .012", .015", .020", .040" oversize.
Fitting New Pistons:—Use .0025" dry (not oiled) feeler between piston and wall on side opposite slot at right angles to pin hole. Pull to withdraw feeler 8-15 lbs. with piston at room temperature.
Installing Pistons:—Pin offet toward camshaft. Slot toward left (trademark in piston toward front).

PISTON RINGS:—Two compression, two oil control rings per piston, all above pin. Oil ring grooves drilled for oil drainage.

Ring	Width	End Gap	Side Clearance
Compr. (both)	.124"	.010-.015"	.002-.004"
Oil Cont. (Upper)	.124"	.010-.015"	.002-.004"
Oil Cont. (Lower)	.1865"	.010-.015"	.002-.004"

Replacement Rings:—*See Nash Shop Notes for data.*

CONTINUED ON NEXT PAGE

OIL PAN REMOVAL, AND ENGINE CODE NOTE DATA (ORIGINAL BORE & BEARING SIZES): *Refer to Nash Shop Notes for complete instructions.*

MODEL IDENTIFICATION

SERIAL NUMBER:—First No. K-56001. On plate on right side of cowl under engine hood.
Service Serial No. Note—Stamped on plate on left front door hinge pillar. First No. N4-55501.

ENGINE NUMBER:—Stamped on left side of engine block at front end. First No. same as Serial No.

TUNE-UP

COMPRESSION:—Ratio 6.87-1 cast-iron head standard.
Pressure—120 lbs. at 350 RPM. cranking speed.

VACUUM READING:—Steady 18-20" idling at 6 MPH.

FIRING ORDER:—1-5-3-6-2-4. See diagram.

SPARK PLUGS:—Auto-Lite AN-7. 14 MM. Metric.
Gaps—.025".

IGNITION: See Coil, Condenser, and Distributor.
Breaker Gap—.020". **Cam Angle**—35° Closed.
Automatic Advance—10° max. at 1200 RPM (distr.).
Vacuum Advance—8½° (Distr.) with 14-17" vacuum.

IGNITION TIMING: See Ignition Timing.
Std. Setting—TDC. 'IGN/DC' vibration dampener mark aligned with pointer at front of engine.
CAUTION—Latch out vacuum advance when setting Ign. Timing (See IGNITION TIMING following).

CARBURETION: See Carburetor & Carb. Equipment.
Idle Setting—Idle screw ½-1¼ turns open. Idle speed 6 MPH.
Float Level—Top of float (not soldered seam) 5/64" below top edge of bowl with valve seated.
Accelerating Pump—Center Hole normal setting.
Fuel Pump Pressure: 3½ lbs. (4 lbs. fuel & vacuum).

VALVES: See Valve Timing.
Tappet Clearance:—.015" all valves with engine Hot.
NOTE—May be set at .018" max. for sustained high speed driving. Self-locking tappet screws used.

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

Ignition Switch:—Delco-Remy No. 1116335. Connected to ignition coil by armored cable.
Ignition Lock—Briggs & Stratton No. 45792.
Key Series—N-1201 to N-1449. Groove—No. 15.

COIL: Delco-Remy 1115028 (Domestic), 1115030 (Exp.). Mounted on engine side of dash.
Ignition Current—2 amperes idling, 5 stopped.

CONDENSER: Delco-Remy Part No. 1869705.
Capacity—.18-.25 microfarad.

DISTRIBUTOR: Delco-Remy 1110512. Single breaker, 6 lobe cam, full automatic advance type with separate vacuum spark control and Octane Selector adjustment.
Breaker Gap—.020". Limits .018-.024".
Cam Angle or Dwell—35° closed, 25° open.
Breaker Arm Spring Tension—17-21 ozs.
Rotation—Counter-clockwise viewed from above.

Distr. Degrees	Automatic Advance R.P.M.	Eng. Degrees	R.P.M.
Start	400	2	800
10	1200	20	2400

Vacuum Spark Control No. 1116029. Mounted on distributor mounting plate and linked to advance arm. Provides additional advance at speeds above idling except when engine accelerated or operated with wide open throttle when spark retarded by return spring within unit.

Plunger Travel—23/64" (total).

Distr. Degrees	Vacuum Advance Eng. Degrees	Vacuum (" of HG)
Start	0°	3-5"
8½°	17°	14-17"

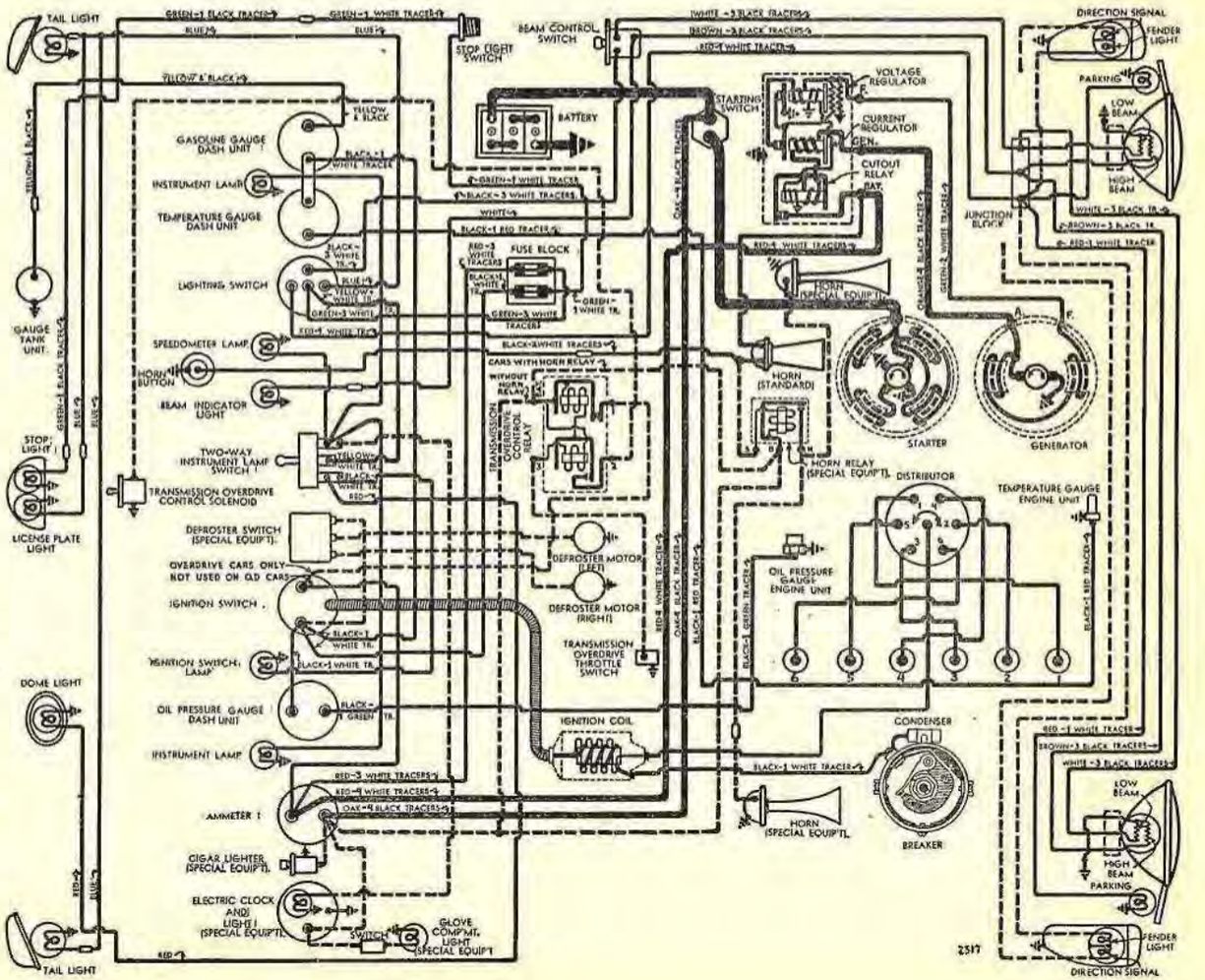
Removal:—Distributor mounted on left side of engine and driven by inclined shaft. To remove, loosen advance arm clamp bolt or disconnect vacuum line and take out hold down screw in advance arm.
Installation Note—When installing distributor, crank engine to firing position for #1 cylinder (piston at TDC), see that oil pump drive gear meshed so that slot in shaft points across engine with wide half of shaft toward front (slot is offset), turn rotor to #1 segment in distributor cap, install distributor and check timing.

IGNITION TIMING

IGNITION TIMING:—Flywheel Degrees Piston Position
All Engines ..... At TDC ..... .000" TDC.

Timing Note—Vacuum advance must be latched out by aligning holes in advance arm and hold-down plate and inserting ⅛" pin through these holes while timing is being set.
To Set Timing—Turn engine over until #1 piston reaches top dead center on compression stroke with 'IGN/DC' mark on vibration dampener in line with pointer on chain case cover. Latch out vacuum control (see note above), loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor at #1 segment in distributor cap, check Octane Selector setting.
Octane Selector Setting—Should be set for slight ping when accelerating with wide open throttle at speeds between 10-15 MPH. To adjust, loosen hold-down screw, rotate distributor one graduation at a time counter-clockwise (if ping too severe), clockwise (if no ping noted) until correct performance secured.

CONTINUED ON NEXT PAGE



ENGINE

CONTINUED FROM PRECEDING PAGE

CRANKSHAFT:—Four bearing, counterweighted type. *See Nash Shop Notes for Vibration Dampener data.*

Journal Diameters—2.479" (2 31/64"). *See Engine Code Note in Nash Special Data for original sizes.*

Bearings—Removable steel-backed babbitt type.

Clearance—.002".

Bearing Adjustment:—None (no shims). Replace bearings. *Refer to Nash Shop Notes for bearing installation and fitting, replacement main bearing caps, and rear main bearing oil seal data.*

Replacement Bearings:—Std., .002", .010" undersize.

End Thrust:—Taken by No. 1 (front) bearing. *See Nash Shop Notes for thrust plate and oil seal data.*

Endplay—.004-.006".

CAMSHAFT:—4 bearing. Non-adjustable chain drive. *See Nash Shop Notes for Camshaft Removal data.*

Bearing Type—Steel-backed, babbitt bushings.

Clearance—.002".

End Thrust:—Thrust plate assembled on front face of engine block. **Endplay**—.004-.006".

Timing Chain:—Whitney No. 49205, Type 35D-60. Duplex type roller chain. Pitch ⅜". Length 60 links.

Camshaft Setting:—Mesh chain with camshaft and crankshaft sprockets turned so that marked tooth on each gear is 45° past (to right—as viewed facing front of engine) top vertical position. With sprockets in this position there should be 9½ links or 19 pins between tooth marks.

VALVES:—	Head Diameter	Stem Diameter	Length
Intake	1 11/32"	.3412"	4¾"
Exhaust	1 9/32"	.3412"	4¾"

	Seat Angle	Lift	Stem Clearance
All Valves	45°	5/16"	.002-.003"

Valve Guides:—Press fit in block (press in place 1" below top of block, ream for valve stem clearance).

Valve Springs:—	Pressure	Length
Valve Open	83 lbs.	1 7/16"

NOTE—Install springs with closed coils at top.

Valve Lifters:—Mushroom type operating in reamed holes in block. Lifters must be removed from below. *See Nash Shop Notes for Camshaft Removal data.*

VALVE TIMING

Tappet Clearance:—.015" all valves, engine hot and idling (.018" max. may be used for sustained high speed driving). *Refer to Nash Shop Notes for Self-locking type tappet adjusting screw data.*

Valve Timing:—See Camshaft Setting above.

Intake Valves—Open 19° BTDC. Close 63° ALDC.

Exhaust Valves—Open 59° BLDC. Close 23° ATDC.

To Check Valve Timing—With .015" tappet clearance, #1 intake valve opens 19° BTDC with 'DC' mark on vibration dampener at front of engine 1 3/16" ahead of pointer on chain case cover. No. 1 exhaust valve closes 23° ATDC. with 'DC' mark 1 15/16" past the pointer.

LUBRICATION

LUBRICATION:—Pressure system. Gear type oil pump on right side of crankcase (driven by inclined shaft).

Normal Oil Pressure:—35 lbs. at 20 MPH.

Oil Pressure Regulator:—Under plug on left side of crankcase behind pump. Opens at 25 lbs. Non-adj.

Oil Pressure Gauge:—King-Seeley Electric. K-S Nos. 40161 (Dash Unit), No. 6125 (Engine Unit). *See Miscellaneous Section for complete data.*

Crankcase Capacity:—5 quarts.

COOLING

COOLING SYSTEM:—Capacity 14 qts. (15 with heater).

Water Pump:—Centrifugal, adjustable packing type. *See Water Pump Section for complete data.*

Thermostat:—Fulton or Dole. In cyl. head outlet.

Setting—Starts to open at 160°F.

Temperature Gauge:—King-Seeley Electric. K-S Nos. 40154 (Dash Unit), No. 7000 (Engine Unit). *See Miscellaneous Section for complete data.*

CLUTCH

CLUTCH:—**Borg & Beck Model 8A7.** Assembly No. 959. or No. 925. Single plate, dry disc type. *See Clutch Section for complete data.*

Facings—Molded metallic type, 2 required. Inside Diam. 5⅜". Outside Diam. 8". Thickness ⅛".

Pedal Adjustment—¾" min. pedal free travel. Adjust by loosening locknut and turning adjusting nut on connector link at clutch fork.

CAUTION—Adjusting clevis on rod linking idler lever and pedal is pedal adjustment. Turn clevis so that inner idler lever is slightly ahead of perpendicular with pedal against floor board.

Removal:—Remove transmission (see below), disconnect clutch pedal linkage, remove clutch housing and pan, punchmark flywheel, clutch cover and pressure plate (reassemble to same marks), take out clutch fork and mounting screws in cover flange. Remove clutch assembly.

TRANSMISSION

TRANSMISSION:—**Warner Model AS3-T84G (std.), AS4-T84G (with Overdrive).** All helical gear, constant-mesh, synchro-mesh (second & high), sliding gear (low and reverse). *See Transmission Section for complete data.*

Transmission Control:—Mech. steering column shift. *See Transmission Section for complete data.*

Removal:—Remove Rear Axle (see below), disconnect shift rods, speedometer cable, and Overdrive control wires and cable (if used). Support engine at rear, free rear engine mounting, take out transmission mounting bolts, pull transmission straight back and remove from below.

OVERDRIVE

Overdrive (Cruising Gear):—Warner Type R7C with electrical 'kick-down' control Optl. *See Transmission Section for complete data.*

Overdrive Solenoid—Delco-Remy Model 1118004.

Throttle Switch—Adjust switch position on mounting bracket so that contacts close with throttle valve wide open and spring on carburetor throttle valve pulley just starting to compress.

Control Relay—Delco-Remy Model 1116798.

UNIVERSALS

UNIVERSAL JOINT:—**Mechanics No. 1½R.** Needle bearing type, 1 used (in torque tube at rear of transmission). Tapered coil spring is installed ahead of joint to properly locate joint on drive shaft. NOTE—Universal is slip fit on transmission end and slight press fit on propeller shaft. *See Universals Section for complete data.*

REAR AXLE

REAR AXLE:—**Own Make.** Semi-floating, hypoid gear type with Torque Tube Drive. *See Rear Axle Section for complete data.*

Ratio—4.1-1 Std. 4.4-1 with Overdrive.

Backlash—.005-.007". Shim adjustment.

Removal:—Raise rear end of car and support car at body frame (not frame flange) or at bumper brackets. Disconnect brake cables at equalizer and remove brake tube connections. Disconnect stabilizer bar and rear spring and shock absorber mounting brackets from axle (allow springs and shock absorbers to hang from body—do not bend shock absorber rod or bayonet). Disconnect torque tube by removing nuts on forward ends of trunnion bracket mounting studs, move tube and axle back to clear studs, pry universal joint off drive shaft, pull axle assembly out from car. *Refer to Rear Axle Section for "1942 Nash '600' Axle" article for data on Trunnion Bracket installation and adjustment, and shaft bearing data.*

Axle Shaft Removal: Remove wheel and drum, disconnect brake line and cable, remove backing plate mounting bolt nuts, oil seal retainer, backing plate, and bearing adjusting shims. Withdraw shaft and bearing, using care not to drag shaft on oil seal.

Wheel Bearing Adjustment—Shims located between backing plate and flanged end of housing. To adjust, remove wheel and backing plate (above), add or remove shims for endplay. **Endplay** .002-.004".

Rear Suspension:—Coil spring type. *See Rear Axle Section for complete data.*

SHOCK ABSORBERS

SHOCK ABSORBERS:—**Delco Model 1026-N (front), 1022-BB (rear—4D Sedans), 1022-Z (rear—others).** Direct acting, hydraulic types.

FRONT SUSPENSION

Front Suspension:—Enclosed type with knuckle support and coil spring on kingpin mounted on frame cross-member. *See Front Suspension Section for complete data.*

Kingpin Inclination—5½° crosswise.

Caster—0° plus or minus ¼°. Adjustable.

Camber—0° to ½° Positive. Adjustable.

Toe In—0-1/16" measured 10" up from floor. Adjust by turning tube at outer end of each tie rod equally. CAUTION—Tie rod clamp bolts must be down toward ground when adjustment completed to avoid interference with body when wheel raised.

Steering Geometry (Toe Out on Turns)—Inner wheel turned 21° plus ½°, Outer wheel 20°.

STEERING GEAR

Steering Gear: Gemmer Model 250 Worm-and-Roller. *See Steering Gear Section for complete data.*

BRAKES

BRAKES:—Service. Lockheed hydraulic, double anchor type. Hand lever applies rear wheel service brakes. *See Brake Section for complete data.*

Drums—Cast Iron. Diameter 9".

Lining—Molded. Width 1¾". 3/16" thick. Length 20½".

Clearance—.008" toe, .004" heel, for each shoe.

Hand Brake:—See Service brakes above.

CARBURETOR

CARBURETION:—Carburetor. Carter Type WA-1, Model 464-S (#290 cast on face of flange). Single barrel, 1¼" downdraft type with Carter Climatic Control.
For complete data, refer to Carburetor Index.

Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*
Metering Rods & Jets—*Refer to Carburetor Index for Carter Downdraft Carburetor Jet Specification Table.*

Fast Idle:—Integral type (built-in carburetor).
For complete data, refer to Carburetion Equip. Index.
Setting—⅜" clearance between choke valve and air horn (gauge T109-85) with throttle stopscrew against (not on) first step of fast idle cam. Adjust by bending fast idle link offset (Tool T109-41).

Automatic Choke:—Carter Climatic Control.
For complete data, refer to Carburetion Equip. Index.
Setting—Coil housing centered (at index mark).

CARB. EQUIPMENT

Air Cleaner:—AC #1529112 oil-wetted type standard. #1529115 heavy duty oil-bath type optional. Use Replacement Filter Element Assembly: Type #2 (for #1529112), #1542245 (for #1529115).

Fuel Pump:—AC 'W' No. 1537389—Exchange No. 533 diaphragm type fuel pump standard. 'AD' #1535390 fuel-and-vacuum pump optional (std. on cars with Cruising Gear).
For complete data, refer to Carburetion Equip. Index.
Pressure—3½ lbs. maximum (Type 'W').

Gasoline Gauge:—King-Seeley Electric type. K-S No. 40152 (dash unit), 40170 (tank unit).
For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—Auto-Lite CTL-1-15. 6 volt, 15 plate, 105 ampere hour capacity (20 hour rate).
Starting Capacity—133 amperes for 20 minutes.
Grounded Terminal—Positive (+) terminal grounded to body. A separate ground strap is used from the body to the engine.
Location—On right side under front seat.

STARTER

STARTER:—Auto-Lite MAB-4076. Armature MAB-2057.
Drive—Inboard Bendix Type LCD11FX-10.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—42-53 ozs. (new brushes).
Cranking Engine—160 RPM, 150-160 amps., 5.2 v.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	3700	5.5	60
3.4 "	1100	5.0	200
10.15 "	420	4.0	400
15.8 "	Lock	3.0	582

Removal:—Starter flange mounted on left front face of flywheel housing. To remove, take out flange mounting screws.

Starting Switch:—A-L #SW-4012. Mounted on body floor below clutch pedal. Operated by depressing clutch pedal fully. No adjustment required.

GENERATOR

GENERATOR:—Auto-Lite GDZ-4806A. Armature GDZ-2079F. 2 brush type with Current-Voltage control.
Charging Rate Adjustment—None. See Regulator.
Maximum Charging Rate—35 amperes (hot or cold), 8.0 volts, 1900 RPM (generator) and above with load or discharged battery (Current Regulator setting). Actual charging rate controlled by Voltage Regulator and dependent on battery condition.

Performance Data	Cold		Hot	
0	6.4	925	6.4	1000
8	6.75	1140	6.75	1235
16	7.15	1370	7.15	1460
24	7.5	1590	7.5	1730
28	7.7	1710	7.7	1900
35	8.0	1900	8.0	2250

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—53 ozs. max. (new brushes).
Field Current—1.60-1.78 amperes at 6.0 volts.
Motoring Current—4.16-4.60 amperes at 6.0 volts.

Removal:—Generator cradle mounted at left side of engine with fan belt drive. Water pump driven by generator shaft extension. To remove, disconnect water pump, loosen fan belt, remove generator clamp band and lift generator off.

Belt Adjustment:—Adjust whenever belt deflection is over 1½" (when pressed lightly midway between generator and fan pulleys). To adjust, loosen two capscrews on fan bracket, lift fan up (one screw hole slotted) for ¾" belt deflection, tighten screws.

REGULATOR

REGULATOR:—Auto-Lite VRP-4004F-1. Current-Voltage type. Consists of Cutout Relay, vibrating Voltage Regulator, and vibrating Current Regulator in a single case mounted on left side of dash in engine compartment.
For complete data, refer to Electrical Equipment Index.
NOTE—Regulator case cover is sealed. Serviced on exchange basis if seals not broken (to remove cover).

Cutout Relay

Cuts In—6.4-6.6 volts.
Cuts Out—4.1-4.8 volts (approx. 4-6 amps. disch.).
Contact Gap—.015" minimum.
Air Gap—.031-.034" with contacts open (check at hinge end of core).

Voltage Regulator

Setting—7.2-7.5 volts at 70°F. See Electrical Equipment Section for settings at other temperatures.
To Check (without breaking seals)—Connect ammeter in charging line at regulator 'B' terminal (use short heavy leads), voltmeter between 'B' terminal and ground. Operate generator at speed equivalent to 30 MPH., charging fully charged battery, until voltage is steady. Voltage reading should agree with setting given above.
To Adjust (with cover removed)—Change regulator armature spring tension by bending lower spring hanger slightly. See Electrical Equipment Section.
Contact Gap—.012" min. (armature against stop pin).
Air Gap—.048-.052" with contacts just opening.

Current Regulator

Setting—34-36 amperes (marked '35' on the cover).
To Check (without breaking seals)—Connect test meters as for voltage check (above). Operate generator at speed equivalent to 30 MPH. charging battery, turn on car lights and accessories or connect load (bank of headlamp bulbs, etc.) between ammeter and battery so that generator charges at peak rate and Current Regulator operates. Current reading should agree with setting given above. If more than slight excess noted, regulator is defective.
To Adjust (with cover removed)—Same as for Volt-Regulator (above).
Contact Gap & Air Gap—Same as Voltage Regulator.

LIGHTING

LIGHTING:—Headlamps—Hall 'Sealed Beam' type.
For complete data, refer to Electrical Equipment Index.
Headlamp Adjustment—Aim upper beam of each headlamp straight ahead with hot spot centered 3" below lamp center height.
Beam Indicator—Red dot in lower portion of speedometer. Lighted whenever Country (upper) beam in use.

Switches

Lighting—Douglas.
Beam Selector—Douglas.
Instrument—Douglas.

MISC. ELECTRICAL

FUSES:—Lighting—30 ampere. On fuse block mounted on left hand side of engine dash.
Accessory—30 ampere. On fuse block.

HORNS:—Delco-Remy Klaxon. Model 1999565 (left horn—low note), Model 1999560 (right horn—high note). Vibrator type, blended tone, operated by horn relay.

Type	Current (at 6 volts)	Air Gap
1999565 (Low Note)	19-21 amperes	.047-.052"
1999566 (High Note)	18-20 amperes	.039-.044"

Horn Relay:—Delco-Remy Model 1116775.
Contact Gap:—.025".
Air Gap—.015" (closed).
Contacts Open—2.75-4.0 volts.

ENGINE

ENGINE CODE NOTE (ORIGINAL BORE, PISTON, & BEARING SIZES):—*See Nash Shop Notes for data.*

ENGINE SPECIFICATIONS:—6 cylinder, valve-in-head type with Iso-thermal fuel intake system (intake manifold cast in cylinder head—water jacketed for temperature control).
Bore—3⅜". **Stroke**—4⅜".
Displacement—234.8 cubic ins. **Rated HP**—27.34.
Developed Horsepower—105 at 3400 RPM.
Compression Ratio—6.5-1 cast-iron head.
Compression Pressure—125 lbs. at 350 RPM.
Vacuum Reading—Steady 18-20" idling at 7 MPH.

PISTONS:—Tin-plated, cam-ground, lightweight type.
Removal—Pistons and rods removed from above.
Clearance—.0003-.0009". See Fitting New Pistons.

Original Bore & Piston Sizes:—*See Engine Code Note in Nash Shop Notes for sizes and markings.*

Replacement Pistons:—Furnished std. and .001", .002", .003", .005", .010", .012", .015", .020", .040" oversize.

Fitting New Pistons:—Fit piston by feel. Piston should hold own weight in normal running position ⅓ down in cylinder but should be free when worked by hand (piston and bore must be clean and free from oil when checking fit).

Installing Pistons:—Pin offset 1/16" toward camshaft.

PISTON RINGS:—#1 Compr. (inner edge tapered at top), #2 Compr. (outer edge tapers out at bottom with plain expander installed behind ring), #3 and #4 oil (slotted type with ventilated expander behind ring), all above pin. Drilled oil drain holes in oil ring grooves.

Ring	Width	End Gap	Side Clearance
Compr.	.124"	.010-.015"	.002-.004"
Oil Contr.	.155"	.010-.015"	.002-.004"

Replacement Rings:—*See Nash Shop Notes for data.*

CONTINUED ON NEXT PAGE

MODEL IDENTIFICATION

SERIAL NUMBER:—First No. B-114001. Stamped on plate on right frame siderail under engine hood. Service Serial Number—First number N8-21001. On Caution Plate on left front door hinge pillar post.

ENGINE NUMBER:—Stamped on right side of engine block at front end. First No. same as Serial No.

TUNE-UP

COMPRESSION:—Ratio—6.6-1 cast-iron head. Pressure—125 lbs. at 350 RPM. cranking speed.

VACUUM READING:—Steady 18-20" idling at 7 MPH.

FIRING ORDER:—1-6-2-5-8-3-7-4. See diagram.

SPARK PLUGS:—AC No. 45. 14 MM. Metric type. Gaps—.025".

NOTE—Eight spark plugs only are used (not Twin Ignition type).

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.017". Cam Angle—27° Closed.

Automatic Advance—12½°max.at 1900 RPM(distr.).

Vacuum Advance—6° (distr.) with 17½" vacuum.

IGNITION TIMING: See Ignition Timing.

Std. Setting—7° BTDC. Vibration dampener mark 'IGN' aligned with pointer on chain case cover.

CARBURETION: See Carburetor & Carb. Equipment.

Idle Setting—Idle screws ¼-1¼ turns open. Idle speed 7 MPH.

Float Level—3/16" from top of float to machined surface of cover (remove gasket, invert to check).

Accelerating Pump—Lower hole (Summer), upper (Winter).

Fuel Pump Pressure: 3½ lbs. maximum.

VALVES: See Valve Timing.

Tappet Clearance:—.015" for all valves with engine hot and idling (may be set .018" max. for sustained high speed driving).

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

IGNITION SWITCH: Auto-Lite Lock Switch and Cable Assembly No. CE-2260BGS.

Ignition Lock—Briggs & Stratton. B & S No. 45792.

Key Series—N1201 to N1449. Groove—No. 15.

COIL: Auto-Lite CE-4662. Service winding (less switch & cable) CE-3224JS. On engine dash.

NOTE—One coil only used (not Twin Ignition type).

Ignition Current—2 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IG-2671G. One used. Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite IGT-4202. Single breaker, 8 lobe cam, full automatic advance with auxiliary vacuum spark control. NOTE—No synchronization required (not Twin Ignition system).

Breaker Plate Identification—Maximum vacuum advance limited by slot and marked by number (#6) on breaker plate.

Breaker Gap—Set at .017".

Cam Angle or Dwell—27° closed, 18° open (distr. °).

Breaker Arm Spring Tension—17-20 ounces.

Rotation—Clockwise viewed from the top.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	250	0	500
2	310	4	620
5	400	10	800
9	1200	18	2400
12.5	1900	25	2800

Vacuum Spark Control—Integral type (on distributor, linked directly to breaker plate). Provides additional advance at speeds above idling except when engine accelerated or operated with wide open throttle (spark retarded by return spring in unit).

Vacuum Advance

Distr. Degrees	Eng. Degrees	Vacuum (" of HG)
Start	0°	14"
1°	2°	14⅝"
3°	6°	15¾"
5°	10°	16⅞"
6°	12°	17½"

Removal:—Mounted on right side of engine. To remove, disconnect vacum line, take out mounting screw, lift distributor assembly off engine.

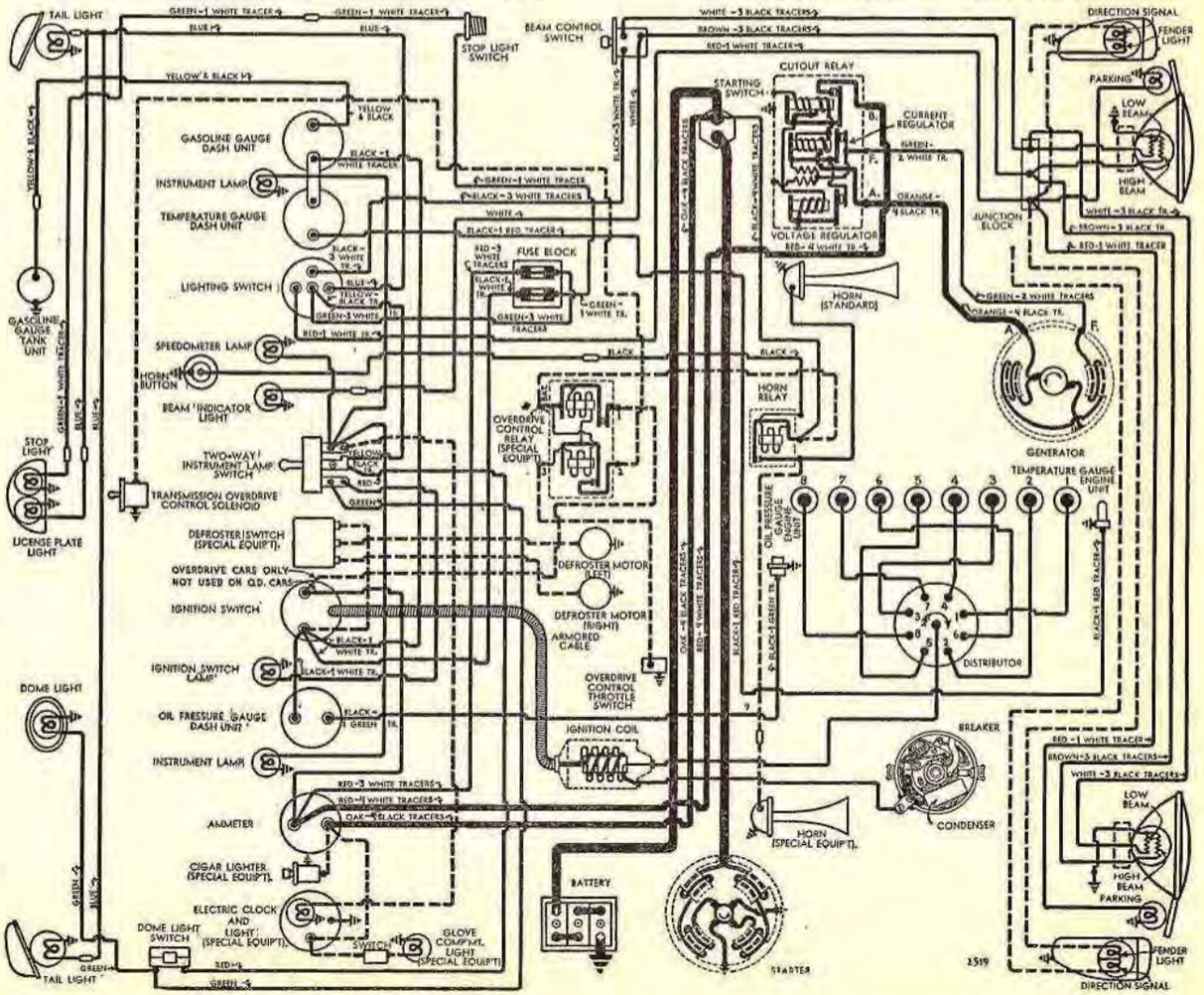
Installation Note—When installing distributor, crank engine to firing position for #1 cylinder (piston 7° BTDC—'IGN' mark on vibration dampener in line with pointer on timing chain case cover), see that oil pump and distributor drive gear meshed with camshaft gear so that oil pump drive pin (at lower end of distributor drive shaft) is crossways of the engine.

IGNITION TIMING

Flywheel Degrees	Piston Position
7° BTDC.	.0197" BTDC.

To Set Timing—With #1 piston on compression, turn engine over until piston is 7° or .0197" before top dead center, stop when 'IGN' mark on vibration dampener (front flywheel) lines up with pointer on timing chain cover. Loosen advance arm clamp bolt, rotate distributor until points just break, tighten clamp bolt.

CONTINUED ON NEXT PAGE



ENGINE

CONTINUED FROM PRECEDING PAGE

PISTON PIN:—Diameter—.8747". Length—2.574". Floating type, retained by locking ring at each end. Pin hole in piston offset toward camshaft.
Pin Fit in Piston—Light push fit (piston at 200°F.).
Pin Fit in Rod Bushing—Select pin for .0001" clearance or light push fit at normal temperature.

Replacement Pins:—Standard, .001", .003" oversize.

CONNECTING ROD:—Length—8¾". Weight—34 ozs.
Upper Bearing (Piston Pin Bushing)—Bronze.
Crankpin Journal Diameters—2.000". *See Engine Code Note in Nash Special Data for original sizes.*
Lower Bearing—Removable, steel-backed babbitt.
Clearance—.0015-.0025". **Sideplay**—.008-.012".

Bearing Adjustment:—None (no shims). Replace bearings. Do not file rods or bearing caps. *Refer to Nash Shop Notes for instructions and 'Palnut' data.*

Replacement Bearings:—Std. & .002", .010" undersize.

Installing Rods:—Mark rods and bearing caps before removal and install in same position. Oil hole in lower end of rod must be toward right of engine.

CRANKSHAFT:—Nine bearing. No counterweights. *See Nash Shop Notes for Vibration Dampener data.*
Journal Diameters—2.479" (2 31/64"). *See Engine Code Note in Nash Special Data for original sizes.*
Bearings—Removable steel-backed, babbitt type.
Clearance—.002-.003".

Bearing Adjustment:—None (no shims). Replace bearings. *Refer to Nash Shop Notes for bearing installation and fitting, replacement main bearing caps, and rear main bearing oil seal data.*

Replacement Bearings:—Std. & .002", .010" undersize.

End Thrust:—Taken by center bearing. Replace bearing to take up excessive endplay. **Endplay** .004-.006".

CAMSHAFT:—Non-adjustable roller chain drive.
See Nash Shop Notes for Camshaft Removal data.
Bearing Type—Steel-backed, babbitt bushings.
Clearance—.002".

End Thrust:—Taken by front bearing.
Endplay—.004-.006".

Timing Chain:—Diamond double roller type. Width 9/16". Pitch ⅜". Length 23¼" or 62 links.

Camshaft Setting:—Mesh chain with camshaft and crankshaft sprockets turned so that marked tooth on each gear is 45° past (to right—as viewed facing front of engine) top vertical position. With sprockets in this position there should be 10 links or 20 pins between tooth marks.

VALVES:—	Head Diameter	Stem Diameter	Length
Intake	1 21/32"	.3725"	5½"
Exhaust	1 15/32"	.3725"	5½"

	Seat Angle	Lift	Stem Clearance
All Valves	45°	11/32"	.002-.004"

Valve Guides:—Press fit in head (positioned by shoulder on guide). Ream new guides for clearance.

Valve Springs:—Double springs used on all valves. Free length 1 21/32" (inner), 2" (outer spring).

	Inner Spring		Outer Spring	
	Pressure	Length	Pressure	Length
Valve Closed	21 lbs.	1 3/8"	38 lbs.	1 11/16"
Valve Open	51 lbs.	1 1/32"	95 lbs.	1 11/32"

Valve Lifters:—Mushroom type. Lifter guide holes in block. Remove from below with camshaft out.

VALVE TIMING

Tappet Clearance:—.015" all valves, engine hot and idling (may be increased to .018" max. for continuous high speed driving).

Valve Timing:—See Camshaft Setting above.
Intake Valves—Open 10½° BTDC. Close 63½° ALDC.
Exhaust Valves—Open 69½° BLDC. Close 35½° ATDC.
To Check Valve Timing—With .015" tappet clearance, #1 intake valve opens 10½° BTDC with 'DC' mark on vibration dampener at front of engine 7/16" ahead of pointer on chain case cover.

LUBRICATION

LUBRICATION:—Pressure system. Gear type oil pump in crankcase.

Normal Oil Pressure:—20 lbs. at 20 MPH.

Oil Pressure Regulator:—On oil pump cover. Opens at 30 lbs. Not adjustable.

Oil Pressure Gauge:—King-Seeley Electric. K-S No. 40161 (Dash Unit), No. 6125 (Engine Unit).
See Miscellaneous Section for complete data.

Crankcase Capacity:—7 quarts.

COOLING

COOLING SYSTEM:—Capacity 16 qts. (17 with heater).

Water Pump:—Centrifugal, adjustable packing type.
See Water Pump Section for complete data.

Thermostat:—Fulton or Dole. In cyl. head outlet.
Setting—Starts to open at 160° F.

Temperature Gauge:—King Seeley Electric. K-S No. 40154 (Dash Unit), No. 7000 (Engine Unit).
See Miscellaneous Section for complete data.

CLUTCH

CLUTCH:—Borg & Beck Model 10A7. Assembly No. 950 stamped on cover. Single plate, dry disc type.
See Clutch Section for complete data.
Facings—Spiral-woven type, 2 used. Inside Diameter 7". Outside Diameter 10". Thickness ⅛".
Pedal Adjustment—Pedal travel must be ½". To adjust, install Aligning Pin J-1390 in end of helper spring lever (right end of clutch release shaft), loosen helper spring lever screw on end of clutch release shaft. Loosen locknut and adjust nut on clutch release shaft end of pedal connector link for correct ½" pedal free travel. Use pipe wrench or pliers to turn clutch release shaft to rear to take up all play, see that aligning pin in helper spring lever is against pivot bracket at rear of engine, tighten helper spring lever screw securely.
CAUTION—Pedal adjustment must be made exactly as outlined above to insure correct pedal travel and helper spring operation.

Removal:—Remove transmission (see below). Disconnect clutch pedal linkage, support engine at rear and free rear engine mountings, remove clutch housing and pan. Punchmark flywheel, clutch cover and pressure plate (reassemble to same marks), remove clutch mounting screws, take out clutch.

TRANSMISSION

TRANSMISSION:—Own Make. All helical gear, constant-mesh, synchro-mesh (second & high), sliding gear (low & reverse) with remote shift.
See Transmission Section for complete data.

Transmission Control:—Mechanical steering col. shift.
See Transmission Section for complete data.

Removal:—Disconnect shift rods, speedometer cable, overdrive control cable & wires (if used), and front universal. Remove 2 right transmission mounting screws and install pilot studs (to support transmission during removal), remove remaining mounting screws, pull transmission straight back and remove.

OVERDRIVE

Overdrive (Cruising Gear):—Warner Model AS1-R7C, Type R7C with electrical 'kick-down' control.
See Transmission Section for complete data.
Overdrive Solenoid—Delco-Remy Model 1118004.
Throttle Switch Setting—Adjust switch position on mounting bracket so that contacts just close with throttle wide open when spring on carburetor throttle shaft pulley begins to compress.
Control Relay—Delco-Remy Model 1116798.

UNIVERSALS

UNIVERSAL JOINTS:—Mechanics Type 2CR. Roller bearing type. 2 used.
See Universals Section for complete data.

REAR AXLE

REAR AXLE:—Own Make. Semi-floating, hypoid gear type with Hotchkiss drive.
See Rear Axle Section for complete data.
Ratio—4.1-1 Standard, 4.4-1 with Overdrive.
Backlash—.005-.007". Shim adjustment.

Removal:—Hoist rear end of car, disconnect brake cables at rear clevises. Remove brake tubes. Disconnect rear universal. Remove rear spring U-bolts and withdraw axle from car.

Axle Shaft Removal:—Remove wheel and drum, disconnect brake line and cable, remove backing plate mounting bolt nuts, oil seal retainer, backing plate, and bearing adjusting shims. Withdraw shaft and bearing, using care not to drag shaft on oil seal.
Wheel Bearing Adjustment—Shims located between backing plate and flanged end of housing. To adjust, remove wheel and backing plate (above), add or remove shims for endplay. **Endplay** .002-.004".

SHOCK ABSORBERS

SHOCK ABSORBERS:—Delco Model 1016-E (front), 1023-BB (rear). Direct acting, hydraulic type.

FRONT SUSPENSION

Front Suspension:—Independent, linked parallelogram type with coil springs.
See Front Suspension Section for complete data.
Kingpin Inclination—4½° crosswise.
Caster—0° to ½° Negative. 'C' washer adjustment.
Camber—Pos. ¼° to ½°. 'C' washer adjustment.
Toe In—1/32-3/32" measured 10" up from floor.
Steering Geometry (Toe out on turns)—Inner wheel turned 21° plus ¾°, outer wheel exactly 20°.

STEERING GEAR

Steering Gear: Gemmer Model 335 Worm-and-Roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

BRAKES:—Service—Bendix hydraulic, duo-servo, single anchor type, without Eccentric Adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Drums—Cast iron. Diameter 10".
Lining—Moulded type. Width 2". Thickness 3/16". Length 22" per wheel.
Clearance—.015" at each end of secondary (rear) shoes with primary shoes forced out against drum.

Hand Brakes:—See Service Brakes above.

Automatic Advance (Auto-Lite IGW-4184, A)

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	275	0	550
2	330	4	660
4.5	400	9	800
8	940	16	1880
11	1400	22	2800

Automatic Advance (Auto-Lite IGC-4512)

Degrees Distr.	R.P.M.	Degrees Eng.	R.P.M.
Start	300	0	600
1	325	2	650
4	410	8	820
10	1290	20	2580
11	1450	22	2900

Octane Selector—Hold-down plate marked with scale for timing variation dependent on fuel regularly used.

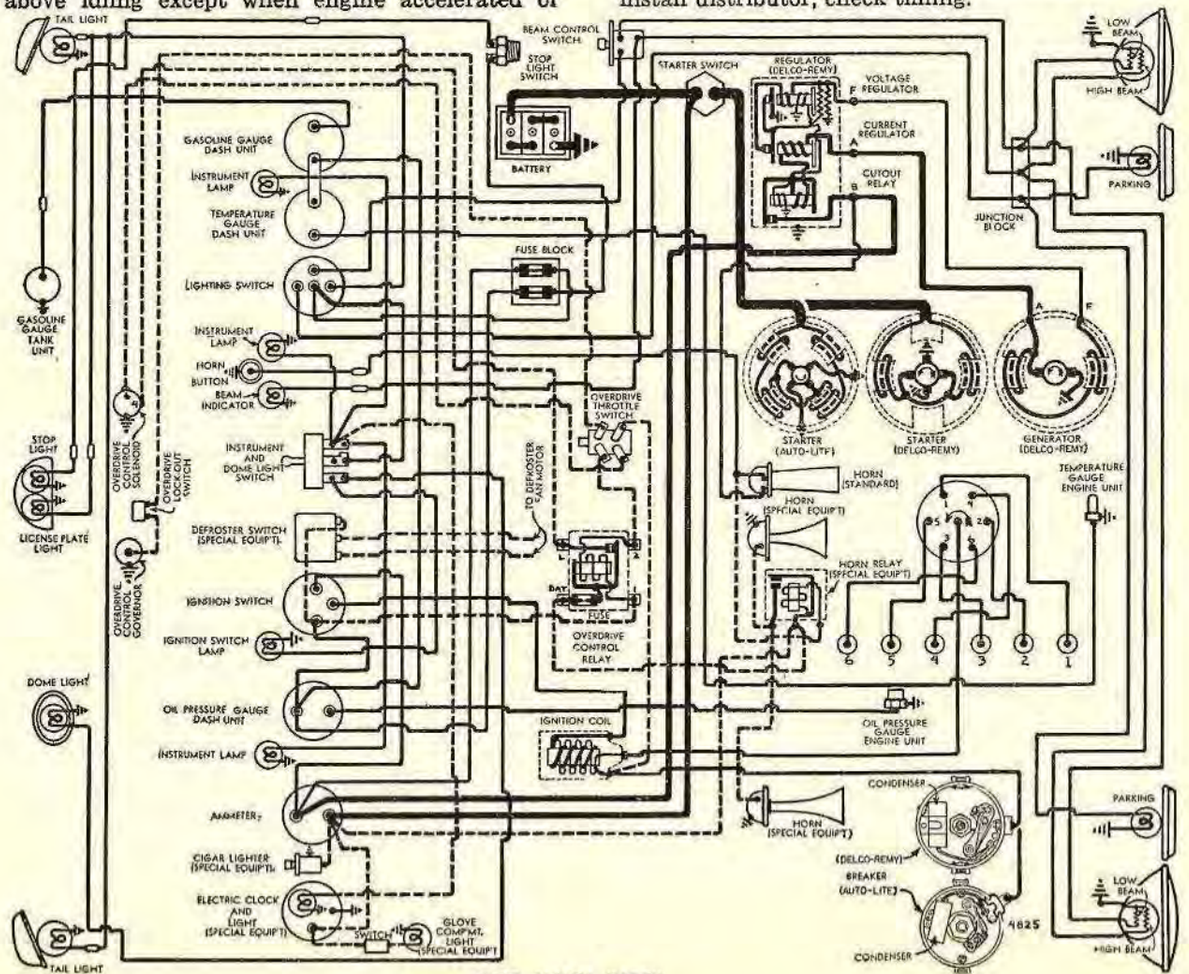
Vacuum Spark Control: A-L No. VC-4015. Separate unit mounted on hold-down plate and linked to advance arm. Provides additional advance at speeds above idling except when engine accelerated or operated with wide open throttle when spark retarded by spring within unit.

Vacuum Advance (Auto-Lite)

Distr. Degrees	Eng. Degrees	Vacuum (" of HG)
Start	0°	4"
2°	4°	6⅛"
4.5°	9°	9"
6°	12°	12"
7.5°	15°	15"

Distributor Removal: On left side of engine. To remove, disconnect vacuum line, take out hold-down screw, lift distributor off.

Installation Note—When installing distributor, crank engine to firing position for #1 cylinder (piston at TDC), see that oil pump drive gear meshed with shaft tongue on **1946-47 in vertical** or straight-across-engine position, or on **1948 two teeth forward** of vertical position, and on all engines wide half of shaft should be toward rear (offset shaft), turn distributor to #1 segment in distributor cap, install distributor, check timing.



1948 NASH "600"

IGNITION TIMING

Std. Setting ..... At TDC.

NOTE—Car manufacturer recommends using Synchroscope or Timing Light to set Ignition Timing.

Timing (Using Synchroscope)—Loosen distributor hold-down screw, center octane selector scale, tighten screw. Fill in "IGN/DC" mark on vibration dampener with chalk. Clip synchroscope to #1 spark plug, direct light on vibration dampener at timing case cover pointer. Idle engine at 400-500 RPM., loosen advance arm clamp bolt, rotate distributor until "IGN/DC" vibration dampener mark aligned with pointer, tighten clamp bolt, check Octane Selector Setting given below.

Timing (Using Timing Light)—Connect timing light, adjust distributor as directed above. Crank engine by placing in high gear and moving car ahead slowly.

Octane Selector Setting—Loosen hold-down screw in distributor, adjust scale so that slight ping secured when accelerating with wide open throttle at 10-15 MPH.

CARBURETOR

Carter WA1, No. 611S (1946-47), 662S (Early 1948), 662SA (Late 1948). 1¼" Single Barrel downdraft type with Carter Climatic Control.
See Carburetor Section for complete data.

Settings (Idle Setting, Float Level, and Accelerating Pump Setting): ***See Tune-Up data.***
Metering Rods & Jets—*See Carter Jet Table in the Carburetor Section.*

Fast Idle: Carter Single Barrel Carburetor type.
See Carburetion Equipment Section for complete data.
Setting—⅝" clearance between choke valve and air horn (Gauge T109-85) with throttle valve closed and stopscrew against (not on) first step of fast idle cam. Adjust by bending connector link at lower offset (Tool T109-41).

Automatic Choke: Carter Climatic Control (Single Barrel Carburetor).
See Carburetion Equipment Section for complete data.

►**Setting—*CAUTION—Two settings used.***
(611S, 662S) 2 points Lean, (662SA) Centered.

CARB. EQUIPMENT

Air Cleaner: AC No. 1542037 Oil-wetted type (Std.), Filter Element AC #1. Oil-bath Cleaner Optl.
Servicing Oil-wetted type)—Wash filter element and re-oil with heavy engine oil every 2000 miles.
Servicing (Oil-bath type)—Wash filter element, clean out and refill oil reservoir with 1 pint SAE No. 50 engine oil (summer), No. 20 (winter) every 5000 miles.

Fuel Pump (Std.): AC Type W, No. 1537398.
(Optl. & Overdrive Cars)—AC Type AJ, No. 1537406 combination fuel-and-vacuum pump.
Replacement Pumps—AC 532 (for W), 7406 (for AJ).
►***CAUTION—Install pumps with rocker arm ABOVE (W), or UNDER (AJ) eccentric on camshaft.***
See Carburetion Equipment Section for complete data.
Pressure—3½ lbs. max. ("W"), 4 lbs. ("AJ").

Gasoline Gauge: King-Seeley electric type. K-S Nos. 40152 (dash unit), 40170 (tank unit).
See Carburetion Equipment Section for complete data.

CONTINUED ON NEXT PAGE

ENGINE

ENGINE SPECIFICATIONS: 6 cylinder, "L" head type. Cylinders cast Enbloc with intake manifold cast in block (Iso-thermal fuel intake system).

Bore—3⅛". Stroke—3¾".

Displacement—172.6 cu. ins. Rated H.P.—23.44.

Developed Horsepower—82 at 3800 RPM.

Compression Ratio—7.0-1 Std. cast iron head. 7.5-1 ratio optional.

Compression & Vacuum Reading—*See Tune-up data.*

ORIGINAL BORE & BEARING SIZES: ***See "Original Bore & Pistons" and "Original Bearing Sizes" in Nash Shop Notes.***

TIGHTENING TORQUES: ***See Nash Shop Notes.***

CYLINDER HEAD INSTALLATION: ***See Nash Shop Notes***

ENGINE REMOVAL (For Servicing): ***See Nash Shop Notes.***

PISTONS: Aluminum alloy, split skirt, strut, oval, tin-plated type. **Length—3⅜".**

NOTE—Cylinder out-of-round limits .003" (in service), .0005" (when reconditioned). Taper limits .009" (in service).

Clearance—.001-.002". See Fitting New Pistons.

NOTE—Piston out-of-round and taper limits .004" in service.

Removal—Pistons and rods removed from above.

Fitting New Pistons: Do not use feeler gauge. New pistons should hold own weight approximately ⅓ down from top of bore but must be free enough to work up and down by hand (bore clean and free from oil).

Replacement Pistons: Furnished std. and .001", .002". .003", .005", .010", .012", .015", .020", .040" oversize.

Installing Pistons: Piston slot toward left side (opposite side from oil squirt hole in rod).

PISTON RINGS: 2 compression, 1 oil ring per piston, all above pin. Drilled oil drain holes in oil ring groove.

Ring	Width	End Gap	Side Clearance
Compression	.0932"	.010-.015"	.002-.004"
Oil Control	.1862"	.010-.015"	.002-.004"

PISTON PIN: Diameter .812". Length 2.632". Floating type with lock ring at each end.

Pin Fit in Piston—Palm push fit with piston heated (heat piston in boiling water).

Pin Fit in Rod Bushing—Light thumb push fit at room temperature.

Replacement Pins: Standard, .001", .003" oversize.

CONNECTING ROD: Length—6¾". Weight—24 ozs.

NOTE—Pin hole in rod bronze bushed.

Crankpin Journal Diameter—1.875". ***See "Original Bearing Sizes" in Nash Shop Notes.***

Lower Bearing—Removable steel-backed, babbitt lined type. No shims.

Clearance—.0015-.002". Sideplay—.006-012".

Bearing Adjustment: None. Replace bearings. ***See "Connecting Rods & Bearings" in Nash Shop Notes.***

NOTE—Tangs on bearing shells must engage slots in rod and cap. Palnuts used on rod bolt nuts.

Replacement Bearings: Std., .002", .010" Undersize.

Installing Rods: Oil squirt hole in lower end of rod toward right (camshaft side) of engine.

NOTE—Rods and bearing caps should be marked before removal and replaced in same cylinder and in same relative positions.

CRANKSHAFT: Four bearing, counterweighted type with vibration dampener mounted on front end.

Vibration Dampener Servicing—*See Nash Shop Notes.*

Journal Diameters—2.479" (2 31/64"). ***See Engine Code Note in Nash Special Data for original sizes.***

►**Bearings—*CAUTION—Bearings changed, two types used as follows:***

Before Serial No. K-196901, Eng. No. KE-55001. Replaceable precision, steel-backed, thin babbitt lined. No shims. Used with first type oil pump.

Beginning Serial No. K-196901, Eng. No. KE-55001. Bearings have 360° oil groove. Used with later type larger-capacity, higher-pressure oil pump.

CAUTION—These 360° oil groove bearings used only when new larger capacity oil pump used. See Oil Pump.

Clearance—.002".

Bearing Adjustment: None (no shims). Replace bearings. ***See "Crankshaft & Main Bearings" in Nash Shop Notes.***

Replacement Bearings: Standard, .002", .010" undersize.

Crankshaft Oil Seal: ***See "Crankshaft & Main Bearings" in Nash Shop Notes.***

End Thrust: Taken by front (#1) bearing (thrust plate on shaft ahead of flanged bearing).

Endplay Adjustment—*See "Crankshaft & Main Bearings" in Nash Shop Notes.*

Endplay—.006-.008".

CAMSHAFT: 4 bearing. Non-adjustable chain drive.

Camshaft Removal—*See Nash Shop Notes.*

Bearings—Steel-backed, babbitted bushings.

Clearance—.002".

End Thrust: Thrust plate assembled on front face of engine between #1 bearing and camshaft sprocket. Endplay controlled by position of timing chain sprocket (press fit on shaft).

Endplay—.004-.006".

CAUTION—Thrust plate has long oil groove on rear face which provides valve tappet lubrication from #1 camshaft bearing. Short groove on front face of plate lubricates timing chain and sprockets.

Timing Chain: Non-adjustable type. Width 9/16". Pitch ⅜". Length 22½" or 60 links.

Camshaft Setting: Mesh chain with camshaft and crankshaft sprockets turned so that marked tooth on each gear is 45° past (to right—as viewed facing front of engine) top vertical position. With sprockets in this position there should be 9½ links or 19 pins between tooth marks.

VALVES:	Head Diameter	Stem Diameter	Length
Intake	1 15/32"	.3412"	4 25/32"
Exhaust	1 9/32"	.3412"	4 25/32"

	Seat Angle	Lift	Stem Clearance
All Valves	45°	5/16"	.002-.003"

NOTE—Valve face angle 44°.

Valve Guides: Top of guides 27/32" below top face of block. Press guides in place and ream for correct stem clearance.

Valve Springs: Install springs with closed-coil end up against cylinder block and seated in counterbore in block. Spring free length 2 3/32".

►***CAUTION—Excessive wear of valve stems and guides will result if springs not properly seated in counterbore.***

	Spring Pressure	Length
Valve Closed	37-41 lbs.	1 3/4"
Valve Open	80-86 lbs.	1 7/16"

Valve Lifters: Mushroom type operating in reamed holes in block. Lifters removed from below with camshaft out of engine. ***See "Camshaft & Bearings" in Nash Shop Notes for Camshaft Removal.***

VALVE TIMING

Tappet Clearance: .015" Hot, running clearance. Tappet adjusting screws self-locking (no locknuts). NOTE—Replace lifter and adjusting screw assembly if torque required to turn screw less than 50 in. lbs.

Valve Timing: See Camshaft Setting above.

Intake Valves—Open 6° BTDC. Close 50° ALDC.

Exhaust Valves—Open 46° BLDC. Close 10° ATDC.

Valve Timing Check—With tappet clearance set at .019", #1 exhaust valve should close with piston 10° after top dead center and "DC" mark on vibration dampener ⅝" past pointer on timing chain cover. Reset tappet clearance at .015" Hot.

LUBRICATION

Engine Oiling System: Pressure to main, connecting rod, and camshaft bearings, piston pins, valve tappets, and timing chain. Oil pump mounted on right side of crankcase.

Crankcase Capacity—5 quarts.

Normal Oil Pressure—30 lbs. at 20 MPH.

Oil Pressure Regulator—Spring-loaded release valve under plug to rear of oil pump on lower edge of crankcase. Non-adjustable. Opens at 30 lbs. (first type spring—before Eng. No. KE-18015), 50-58 lbs. (later type spring—after Eng. No. KE-18015).

►**Oil Pump:** ***CAUTION—Pump changed, two types used:***

Oil Pump (Before Serial No. K-182791, Eng. No. KE-34134)—Gear type with gears 1¼" long. Pump parts not interchangeable with later type.

Oil Pump (Beginning Serial No. K-182791, Eng. No. KE-34134)—Gear type with longer 1⅜" gears. Has increased volume and pressure. Parts not interchangeable with first type pump.

►***CAUTION—This larger capacity pump must be used when new 360° oil groove main bearings used (see Crankshaft Bearings).***

Oil Pump Installation—*See Distributor Removal Installation Note for correct meshing of oil pump gears.*

Oil Filter: Optional. Replace cartridge at 8000 mile intervals or more often if necessary.

Oil Pressure Gauge: King-Seeley Electric. K-S Nos. 40161 (dash unit), No. 40790 (engine unit).

See Miscellaneous Section for complete data.

CONTINUED ON NEXT PAGE

►**1948 ELECTRICAL EQUIPMENT NOTE:** Both Auto-Lite and Delco-Remy electrical units are used.

HOOD LOCK: Alligator hood. To raise hood, pull out on lock button under left side of instrument panel, reach under front edge of hood and release safety catch, raise hood.

MODEL IDENTIFICATION

SERIAL NUMBER: On plate attached to top right frame side rail to rear of front shock absorber.
1946 Numbers—R-393101 Up.
1947 Numbers—R-429201 Up.
1948 Numbers—R-468501 Up.

Service Serial Number (4660 only): N6-86001 Up. On plate on left front door hinge pillar post.

ENGINE NUMBER: Stamped on pad on right side of engine block at upper front corner.

TUNE-UP

COMPRESSION PRESSURE: 125 lbs. at 350 RPM. for Std. 7.02-1 Head.

VACUUM READING: Steady 18-20" idling at 7 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUG GAPS: .025".
Plug Type—AC No. 45. 14 mm. Metric type.

IGNITION: *See Coil, Condenser, and Distributor.*
Breaker Gap—.020" Limits .018-.022" (Auto-Lite), .018-.024" (Delco-Remy).
Cam Angle or Dwell (A-L)—38° Closed, 22° Open.
Cam Angle or Dwell (D-R)—35° Closed, 25° Open.
Breaker Arm Spring Tension—17-20 ozs. (Auto-Lite), 17-21 ozs. (Delco-Remy).
Automatic & Vacuum Advance—*See Distributor.*

IGNITION TIMING: 4° BTDC ('46), TDC ('47-48).
Timing Procedure—*See Ignition Timing.*
Timing Mark—"IGN" ('46), "IGN/DC" ('47-48) dampener mark in line with pointer on timing chain cover.

CARBURETION: *See Carburetor & Carb. Equipment.*
Idle Setting—Set idle adjusting screw ½-1½ turns open. Adjust for smooth idle. Idle speed 7 MPH.
Float Level—⅜" from top of projection on underside of bowl cover to top of seam on free end of float (invert bowl cover and float to check level).
Accelerating Pump—Inner Hole (med. stroke) Normal, Lower hole (max.) winter, Upper (min.) Summer.

Fuel Pump Pressure: 3½ lbs. maximum.

VALVE TAPPET CLEARANCE: .015" Int., .018" Exh. Hot.
Valve Timing Check—*See Valve Timing.*

►*CAUTION—Valve timing changed during 1946 production. See Valve Timing.*

STARTING: *See Battery, Starter, Generator, Regulator.*

IGNITION
DELCO-REMY

IGNITION SWITCH: Delco-Remy No. 1116460. No armored cable.
Ignition Lock—Briggs & Stratton No. 85853.
Key Series—5 digits. **Groove**—No. 1.

COIL: Delco-Remy No. 1115380. Mounted on engine.
Ignition Current—2 amperes idling, 5 stopped.

CONDENSER: Delco-Remy Part No. 1869704.
Capacity—.18-.25 microfarad.

DISTRIBUTOR: Delco-Remy No. 1110216. Full automatic advance type with auxiliary vacuum spark control.
Breaker Gap—.020". Limits .018-.024".
Cam Angle—35° Closed, 25° Open.
Breaker Arm Spring Tension—17-21 ozs.
Rotation—Clockwise viewed from above.

Automatic Advance (Delco-Remy)

Degress	Distr.	R.P.M.	Degress	Eng.	R.P.M.
Start		300	2		600
8		650	16		1300
15		1350	30		2700

Vacuum Spark Control: Delco-Remy (integral type). Linked directly to breaker plate. Provides additional advance at speeds above idling except when engine accelerated or operated with wide open throttle when spark retarded by return spring within unit. Total plunger travel 7/64".

Vacuum Advance (Delco-Remy)

Distr. Degrees	Eng. Degrees	Vacuum (" of HG)
Start	0°	4-6"
6°	12°	14-16"

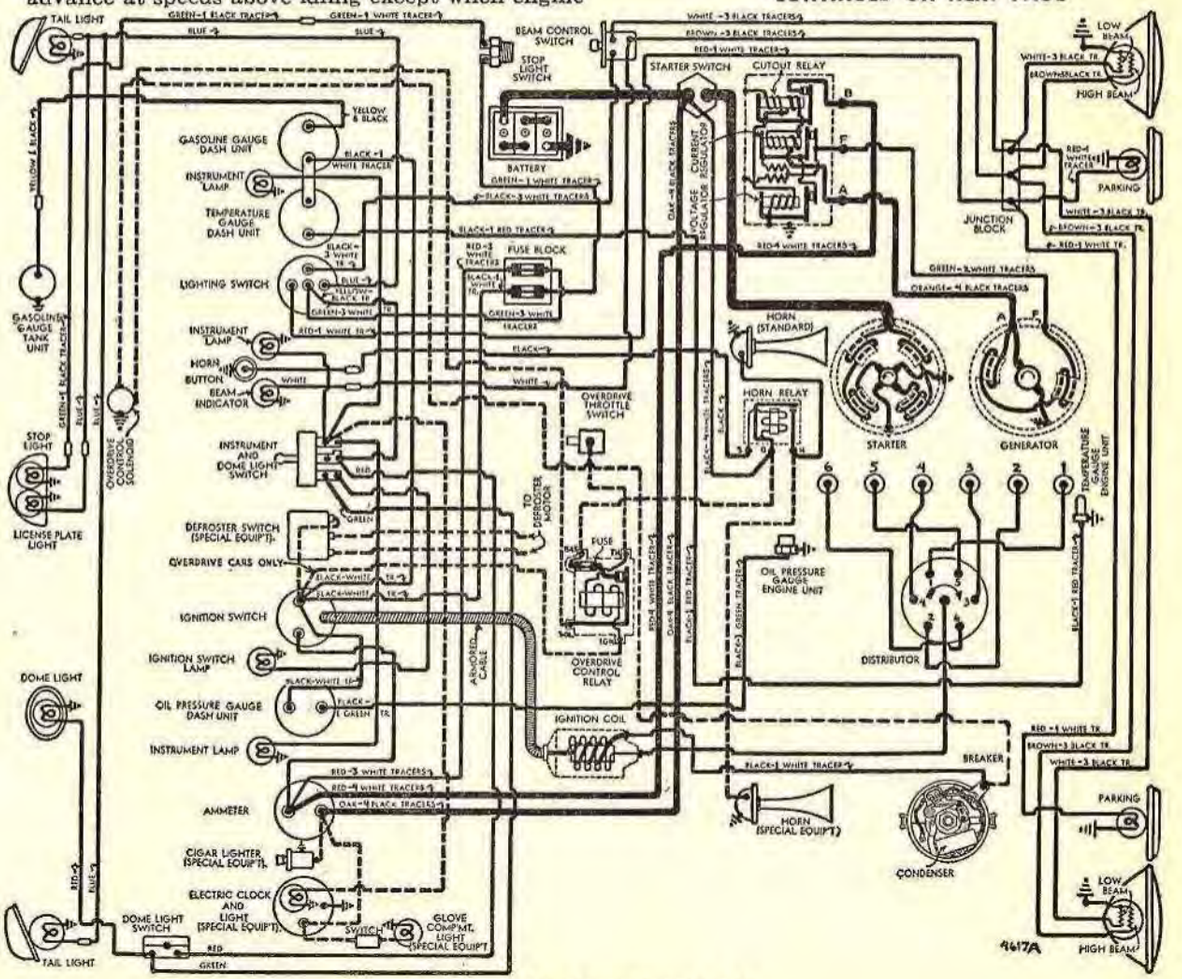
Distributor Removal: *See Auto-Lite Distr. (following).*

IGNITION
AUTO-LITE

IGNITION SWITCH: Mitchellock Type 24-B, No. E-10231. Connected to coil by armored cable.

COIL: 1946-47 Auto-Lite CE-4662. Service Coil (less switch & cable) CE-3224JS. On dash.

CONTINUED ON NEXT PAGE



1946-47 NASH AMBASSADOR SIX
►R7 OVERDRIVE CIRCUIT WITH AUTO-LITE CONTROLS SHOWN ABOVE
►FOR R7 OVERDRIVE WITH DELCO-REMY CONTROLS, SEE 1942 DIAGRAM
►FOR R10 GOVERNOR CONTROLLED OVERDRIVE, SEE 1948 DIAGRAM

BATTERY

Auto-Lite Type 1H-105 (old CT-1-15). 6 volt, 15 Plate, 105 Ampere Hour Capacity (20 hour rate).
Starting Capacity—133 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.5 minutes. Five second voltage—4.2 volts.
Dimensions—L. 9 1/16". W. 7 1/16". H. 9 1/16".
Grounded Terminal—Positive (+) to body floor to rear of battery. Separate engine to frame ground.
Location—Right side under front seat.

STARTER
DELCO-REMY

Delco-Remy No. 1107949, Armature No. 1911763.
Drive—Inboard Bendix No. A-1584.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ozs.

Performance Data (Delco-Remy)

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	6000	5.0	60
16 "	Lock	3.0	600

Starting Switch: Delco-Remy No. 1996478. Mounted on toeboard, actuated by fully depressing clutch pedal.
Removal: *See Auto-Lite Starter (following).*

STARTER
AUTO-LITE

4660, 4760.....**Auto-Lite MAB-4076. Arm. MAB-2057**
4860.....**Auto-Lite MCL-6008. Arm. MCH-2038**
Drive—Inboard Bendix No. A-1660.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—42-53 ozs. (new brushes).
Cranking Engine—160 RPM, 150-160 amps., 5.2 v.

Performance Data (Auto-Lite MAB-4076)

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	3700	5.5	60
0.6 "	1910	5.5	100
3.4 "	1100	5.0	200
6.6 "	695	4.5	300
10.15 "	420	4.0	400
15.8 "	Lock	3.0	582
22.5 "	Lock	4.0	775

Performance Data (Auto-Lite MCL-6008)

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5300	5.5	65
8 "	Lock	2.0	410

Removal: Flange mounted on left front face of flywheel housing. To remove, disconnect cable, take out flange mounting screws.
Starting Switch: Auto-Lite No. SW-4012. Mounted on toeboard and operated by fully depressing clutch pedal.

GENERATOR
DELCO-REMY

Delco-Remy Model 1102702. Armature No. 1911454.
Two-brush with voltage and current regulation.
Maximum Charging Rate—30 amperes, 8.0 volts.
Charging Rate Adjustment—None (see Regulator).

Performance Data (Delco-Remy)

	Amperes	Volts	R.P.M.
Cold	30①	8.0	1750

①—Not maximum output. See Current Regulator.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—25 ounces.
Field Current—1.75-1.9 amperes at 6.0 volts.
Removal & Belt Adjustment: *See Auto-Lite Generator (following).*

GENERATOR
AUTO-LITE

Auto-Lite Model GDZ-4806A. Armature GDZ-2079F. Two brush (shunt) type with voltage and current regulation. Ventilated.
Maximum Charging Rate—35 amperes, 8.0 volts, 1900 RPM.
Charging Rate Adjustment—None (see Regulator).

Performance Data (Auto-Lite)

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	925	0	6.4	1000
5	6.65	1060	5	6.65	1150
10	6.85	1200	10	6.85	1290
15	7.05	1340	15	7.05	1430
20	7.3	1480	20	7.3	1590
25	7.55	1620	25	7.55	1750
30	7.8	1760	30	7.8	1980
35①	8.0	1900	35	8.0	2250

①—Current regulator setting. See Regulator data.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—35-53 ozs. (new brushes).
Field Current—1.60-1.78 amperes at 6.0 volts.
Motoring Current—4.16-4.60 amperes at 6.0 volts.
Removal: Generator cradle mounted at left side of engine with fan belt drive (water pump driven by flexible coupling from generator). To remove, disconnect water pump, loosen fan belt, remove generator clamp band, lift out generator.
Belt Adjustment: Adjust whenever belt deflection exceeds ½" either way between the fan and generator shaft pulleys. To adjust, loosen fan mounting bracket screws (pivots on one screw, other screw hole slotted), raise fan, tighten screws. Belt misalignment can be corrected by installing shims behind fan bracket.

REGULATOR
DELCO-REMY

Delco-Remy Model 1118202. Single Core Type. Voltage and current regulator on left sill brace under hood.
See Electrical Equipment Section for complete data.
CAUTION—Check generator for grounded field coils and leads before changing regulator settings to correct High Charging Rate or High Voltage.

Cutout Relay
Cuts In—6.2-6.7 volts hot (operating temperature).
Cuts Out—0-4.0 amperes discharge current.
Contact Gap—.020" (same for both sets).
Air Gap—.020" (with contacts just closed).

Voltage Regulator
Setting—7.2-7.4 volts Hot (operating temperature). Regulator over-compensated for temperature. Check with cover in place and at operating temp.
Checking & Adjustment—*See Electrical Equipment Section.*
Air Gap—.070" between center of core and armature with contacts just closing.

Current Regulator
Setting—34-36 amps hot (operating temperature).
Checking & Adjustment—*See Electrical Equipment Section.*
Air Gap—.080" between center of core and armature with contacts just closing.

REGULATOR
AUTO-LITE

Auto-Lite Model VRP-4004-F. Vibrating type voltage and current regulators (with cutout relay) in case on left body sill brace under hood.
See Electrical Equipment Section for complete data.
NOTE—Regulator cover sealed. Warranty void if seals broken.

Cutout Relay
Cuts In—6.4-7.0 volts (set to 6.4-6.6 volts).
Cuts Out—4.1-4.8 volts (approx. 4-6 amps. disch.).
Contact Gap—.015" minimum.
Air Gap—.031-.034" with contacts open (check at hinge end of core).

Voltage Regulator
Setting—7.2-7.5 volts at 70°F. See Electrical Equipment Section for settings at other temperatures.
Checking (without breaking seal) & Adjustment—*See Electrical Equipment Section.*
Contact Gap—.012" min. (armature against stop pin).
Air Gap—.048-.052" with contacts just opening.

Current Regulator
Setting—34-36 amperes (marked '35' on the cover).
Checking (without breaking seal) & Adjustment—*See Electrical Equipment Section.*
Contact Gap—.012" min. (armature against stop pin).
Air Gap—.048-.052" with contacts just opening.

LIGHTING

Headlamps: Hall "Sealed Beam" type. Upper and lower beams controlled by beam selector switch on toeboard.
See Electrical Equipment Section for complete data.
Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25 ft.).
Beam Indicator—Red jewel above speedometer dial. Lighted when upper (country beam) in use.

Switches
Lighting—Douglas.
Beam Selector—Douglas.
Instrument—Douglas.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	Sealed Beam	4030
Parking, Speedometer	1½	55
Dash Instruments	1	51
Stop	21	1129
Rear License, Tail	3	63
Dome	6	81

MISC. ELECTRICAL

FUSES: Lighting—30 ampere. On fuse block on left body sill brace under hood.
Accessory—30 ampere. On fuse block.
Overdrive (Auto-Lite Relays only)—20 ampere.

HORNS: Auto-Lite. Model HT-4009 (low note), HT-4010 (high note). Twin horns operated by relay.
NOTE—Single horn with relay standard.
Horn Current—14-16 amperes (each).

CONTINUED ON NEXT PAGE

►**Oil Pump:** *CAUTION—Pump changed—two types used.*

Oil Pump (Before Serial No. R-457798, Eng. No. RE-20512)—Gear type with gears 1¼" long. Pump parts not interchangeable with later type.

Oil Pump (Beginning Serial No. R-457798, Eng. No. RE-20512)—Gear type with longer 1⅜" gears and undercut shaft to provide additional oil flow. Parts not interchangeable with first type pump.

►*CAUTION—This larger capacity pump must be used when new 360° oil groove main bearings used (see Crankshaft Bearings).*

Oil Pump Servicing—*See Nash Shop Notes.*

Cylinder Cover Vent: Vent located on front of cover just behind water outlet elbow to allow escape of vapors inside cover. Turn to open position at all times, especially winter, except for hot dusty driving.

Oil Filter: Replace cartridge at 8000 mile intervals or more often if necessary.

Oil Pressure Gauge: King-Seeley Electric. K-S Nos. 40161 (dash unit), No. 40790 (engine unit).
See Miscellaneous Section for complete data.

COOLING

Cooling System: Pressure type with pressure valve in filler cap, and positive circulation with water pump on left side of engine with thermostat control.

Capacity—17 quarts (18 with heater).

Pressure Valve—AC 850501 (Filler Cap). Opens at 4 lbs.

Water Pump: Centrifugal, adjustable packing type with oiler for bearing lubrication. Driven by flexible coupling from generator.
See Water Pump Section for complete data.

Removal—Drain cooling system, disconnect pump drive coupling (remove rear bolt), disconnect inlet hose, remove pump mounting capscrews.

Belt Adjustment—*See Generator Belt Adjustment.*

Thermostat: Fulton. In water outlet on cylinder head.

Setting—Starts to open at 157-162°F. and should be fully open 20° above starting point.

Temperature Gauge: King-Seeley Electric. K-S Nos. 40154 (dash unit), No. 41085 (engine unit).
See Miscellaneous Section for complete data.

CLUTCH

Borg & Beck Model 10A7. Assembly No. 950 stamped on cover. Single plate, dry disc type.
See Clutch Section for complete data.

Facings—Woven type, 2 used. Inside Diameter 7". Outside Diameter 10". Thickness ⅛".

Adjustment: Pedal free travel setting must be ½". To adjust, install Aligning Pin J-1390 in end of helper spring lever (right end of clutch release shaft), loosen helper spring lever screw on end of clutch release shaft. Loosen locknut and adjust nut on clutch release shaft end of pedal connector link for correct ½" pedal free travel. Use pipe wrench or pliers to turn clutch release shaft to rear to take up all play, see that aligning pin in helper spring lever is against pivot bracket at rear of engine, tighten helper spring lever screw securely.

CAUTION—Pedal adjustment must be made exactly as outlined above to insure correct pedal travel and helper spring operation.

Removal:—Remove transmission (see below). Disconnect clutch pedal linkage, support engine at rear and free rear engine mounting, remove clutch housing and pan. Punchmark flywheel, clutch cover and pressure plate (reassemble to same marks), remove clutch mounting screws, take out clutch.

TRANSMISSION

Own Make. Constant-mesh, synchro-mesh (second & high), sliding gear (low & reverse), all helical gear.
See Transmission Section for complete data.

►**1947 Transmission Shifter Shaft & Fork Change and 1946-47 Replacement Shifter Shaft & Fork Assemblies**—*See 1946-47 Nash Ambassador Six in Transmission Section.*

Transmission Control: Mechanical steering col. shift.
See Transmission Section for complete data.

Removal:—Disconnect shift rods, speedometer cable, and front universal. Remove 2 upper transmission mounting screws and install pilot studs (to support transmission during removal), remove remaining mounting screws, pull transmission straight back and remove.

OVERDRIVE

►4660 TO SERVICE SERIAL NO. N6-95333 "R7" WITH DELCO-REMY RELAY & SOLENOID

Warner Type R7C (Warner No. AS1-R7C) with Delco-Remy Relay and Solenoid. Centrifugal pawl type with throttle controlled "kick-down". Optl. equipment.

►**Delco-Remy Solenoid has one-terminal only.**
See Transmission Section for complete data.

Overdrive Solenoid—Delco-Remy No. 1118004.

Overdrive Relay—Delco-Remy No. 1116798.

Removal: Same as for R10 type below.

►4660 SERVICE SER. NO. N6-95333 TO 120026 "R7" WITH AUTO-LITE RELAY & SOLENOID

Warner Type R7C (Warner No. AS1-R7C) with Auto-Lite Relay and Solenoid. Centrifugal pawl type with throttle controlled "kick-down". Optl. equip.

►**Auto-Lite Solenoid has two terminals.**
See Transmission Section for complete data.

Overdrive Solenoid—Auto-Lite No. SSB-4002.

Overdrive Relay—Auto-Lite No. HRT-4001.

Fuse—20 ampere. On O. D. Relay under hood.

Removal: Same as for R10 type below.

►STARTING 4660 SERVICE SERIAL NO. N6-120026 "R10" GOVERNOR CONTROLLED OVERDRIVE

Warner Type R10B (Warner Number AS2-R10B) Governor controlled. Electric solenoid operation and throttle controlled "kick-down". Optl. equipment.
See Transmission Section for complete data.

Overdrive Solenoid—Nash No. 3123433, Warner Part No. 3AR10B-62.

Control Governor—Auto-Lite Model TGE-4001.

Control Relay—Auto-Lite Model HRT-4101.

Throttle Kickdown Switch—Nash No. 3122959.

Lockout Switch—Nash No. 3123432.

Fuse—20 ampere. On Control Relay under hood.

Removal: Same as for Std. Transmission (above) except that overdrive control cable and wires must first be removed. Then remove overdrive as a unit with transmission.

UNIVERSALS

Mechanics Type 2CR. Roller bearing type, 2 used.
See Universals Section for complete data.

REAR AXLE

Own Make. Semi-floating, hypoid gear type with Hotchkiss drive.
See Rear Axle Section for complete data.

Ratio—4.1-1 Standard. 4.4-1 with Overdrive.

Backlash—.004-.006". Shim adjustment.

Removal:—Hoist rear end of car, disconnect brake cables at rear clevises. Remove brake tubes. Disconnect rear universal. Remove rear spring U-bolts and withdraw axle from car.

Axle Shaft Removal—Remove wheel & drum, disconnect brake line and cable, remove backing plate mounting bolt nuts, oil seal retainer, backing plate, and bearing adjusting shims. Withdraw shaft and bearing, using care not to drag shaft on oil seal.

Wheel Bearing Adjustment—Shims located between backing plate and flanged end of housing. To adjust, remove wheel and backing plate (above), add or remove shims for endplay. **Endplay** .002-.004".

SHOCK ABSORBERS

Monroe Model K-11431 (Front), K-11432 (Rear). Direct acting, hydraulic type.
NOTE—Shock absorbers are sealed (non-refillable).

FRONT SUSPENSION

Front Suspension: Independent, linked parallelogram type with coil springs and direct acting shock absorbers.
See Front Suspension Section for complete data.

Kingpin Inclination—4½°.

Caster—0° to Negative ½°. "C" washer adjustment.

Camber—Pos. ¼° to ¾°. "C" washer adjustment.

Toe In—1/16-3/16".

STEERING GEAR

Gemmer Model 305. Worm-and-roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

Service Brakes: Bendix hydraulic, duo-servo, single anchor type without Eccentric Adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Drums—Cast-iron. Diameter 10".
Lining—Moulded type. Width 2". Thickness 3/16". Length 22" per wheel.
Clearance—.015" at each end of secondary (rear) shoes with primary shoes forced out against drum.

Hand Brakes: See Service Brake data above.

Adjustment—With hand lever set two notches 'on', loosen two clamp bolts at wheel cable equalizer under car, remove all cable slack, tighten clamp bolts. See that wheels free of drag with lever 'off'.

Fast Idle: Carter Single Barrel Carburetor type.
See Carburetion Equipment Section for complete data.
Setting—⅝" clearance between choke valve and air horn (Gauge T109-85) with throttle valve closed and stopscrew against (not on) first step of fast idle cam. Adjust by bending connector link at lower offset (Tool T109-41).

Automatic Choke: Carter Climatic Control (Single Barrel Carburetor).
See Carburetion Equipment Section for complete data.
Setting—2 points rich.

CARB. EQUIPMENT

Air Cleaner: AC No. 1542037 Oil-wetted type, Filter Element AC #1. AC No. 1544558 Oil-bath type, Filter Element AC #21.

Fuel Pump (Std.): AC Type W, 1537398 or 1539413.
(Optl. & Overdrive Cars)—AC Type AJ, No. 1537406 combination fuel-and-vacuum pump.
Replacement Pumps—AC 532 (for W), 7406 (for AJ).
►*CAUTION—Install pumps with rocker arm ABOVE (W), or UNDER (AJ) eccentric on camshaft.*
See Carburetion Equipment Section for complete data.
Pressure—3-4½ lbs. (5 lbs. maximum).

Gasoline Gauge: Auto-Lite electric type.
Dash Unit—Auto-Lite No. 11578-A.
Tank Unit—Auto-Lite No. 11529-A.
See Carburetion Equipment Section for complete data.

BATTERY

Auto-Lite Type CT-1-13—6 volt, 13 plate, 90 Ampere Hour Capacity (20 hour rate).
Starting Capacity—114 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.0 minutes. Five second voltage—4.10 volts.
Grounded Terminal—Positive (+) grounded to wheelhouse (engine grounded at same point).
Location—Under hood at left side of engine.

STARTER

Delco-Remy 1109451 (RHD 1109458). Arm. 1882547.
Drive—Barrel type Bendix Drive No. A-2033.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ounces.

Performance Data

Torque		R.P.M.	Volts	Amperes
0	ft. lbs.	6000	5.7	60
11.5	"	Lock	3.3	540

Starting Switch: Delco-Remy No. 1996476. Mounted on toeboard, actuated by fully depressing clutch pedal.

Removal: Flange mounted on left front face of flywheel housing. To remove, work from above under hood, disconnect shift rods at shift levers, disconnect starter cable, take out mounting screws.

GENERATOR

Delco-Remy Model 1102702 or 1102712. Armature No. 1911454 (for 1102702).
Two-brush with voltage and current regulation.
Maximum Charging Rate—30 amperes, 8.0 volts.
Charging Rate Adjustment—None (see Regulator).

Performance Data

	Amperes	Volts	R.P.M.
Cold	30①	8.0	1750

①—Not maximum output. See Current Regulator.

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—25 ounces.
Field Current—1.75-1.9 amperes at 6.0 volts.

Removal: Generator cradle mounted at left side of engine with fan belt drive (water pump driven by flexible coupling from generator). To remove, disconnect water pump, loosen fan belt, remove generator clamp band, lift out generator.

Belt Adjustment: Adjust whenever belt deflection exceeds ½" either way between the fan and generator shaft pulleys. To adjust, loosen fan mounting bracket screws (pivots on one screw, other screw hole slotted), raise fan, tighten screws. Belt misalignment can be corrected by installing shims behind fan bracket.

REGULATOR

Delco-Remy 1118302. Voltage & Current Regulator.
►*NEW "1118300 SERIES"* regulators have screw adjustment for settings and single regulator springs.
See Electrical Equipment Section for complete data.
CAUTION—Check generator for grounded field coils and leads before changing regulator settings to correct High Charging Rate or High Voltage.

Cutout Relay

Cuts In—5.9-6.8 volts hot (set to 6.4 volts hot).
Contact Gap—.020" (same for both sets).
Air Gap—.020" (with contacts just closed).

Voltage Regulator

Setting—7.0-7.7 volts hot (set to 7.4 volts hot). Regulator is over-compensated for temperature. Should be checked with cover in place and hot.
Air Gap—.075" with armature pressed down to point where contacts are just touching.
Checking & Adjustment—*See Elec. Equip. Section.*

Current Regulator

Setting—32-40 amperes hot (set to 36 hot).
Air Gap—.075" with armature pressed down to point where contacts are just touching.
Checking & Adjustment—*See Elec. Equip. Section.*

LIGHTING

Headlamps: Hall "Sealed Beam". Upper and lower beams controlled by selector switch on toeboard.
See Electrical Equipment Section for complete data.
Beam Indicator—Red jewel located on right side of instrument cluster face.

Switches

Lighting—Rotary type on steering column.
Beam Selector—Nash No. 3104105.

MISC. ELECTRICAL

GENERATOR CHARGE INDICATOR: Indicator light in instrument cluster. Lights when ignition turned on, should go out when generator begins to charge.

CIRCUIT BREAKERS: Two used, side-by-side mounting (30 amp. CB to front) on left body sill brace under hood.
15 or 20 Amp. CB—Protects Stop Light Switch, Heater and Defroster Switch, and Direction Signal Flasher.
30 Ampere CB. Protects Dome Light, Pillar Light, Courtesy Light, and Main Lighting Switches.

FUSES: Electric Clock. 3 ampere in clock feed.
Overdrive—20 Amp. On overdrive relay on left body sill brace under hood.

HORNS: Auto-Lite. Model HW-4013 or HW-4025 (low note), HW-4014 or HW-4026 (high note). Twin horns.
Horn Current—15 amps. at 6.2 volts.

Horn Relay: Auto-Lite Model HRC-4001.
Contact Gap—.026".
Air Gap—.016-.020" with contacts closed but not sealed. .015-.018" air gap between armature leg and yoke with armature sealed to core.
Contacts Close—1.5-3.0 volts. Armature seals to core at 4.0 volts maximum.
Contacts Open .5 volts minimum (open from seal).

ENGINE

ENGINE SPECIFICATIONS: 6 cylinder, "L" head type. Cylinder cast Enbloc with intake manifold cast in block (Iso-thermal fuel intake system).
Bore—3⅛". *See "Original Bore & Pistons" in Nash Special Data.*
Stroke—3¾".
Displacement—172.6 cu. in.
Rated Horsepower—23.44.
Developed Horsepower—82 at 3800 R.P.M.
Compression Ratio—7.0-1 Std. cast iron head.
Compression & Vacuum Reading—*See Tune-up.*

CYLINDER HEAD & TIGHTENING TORQUES—*See Nash Special Data.*

OIL PAN REMOVAL: Raise front of engine for access to front pan bolt just below generator.

PISTONS: Aluminum alloy, Cam Ground, Tin Plated, strut type with solid skirt. **Length**—3⅜".
Weight—13½ ozs. stripped.
Removal—Pistons and rods removed from above.
Clearance—.001-.002". See Fitting New Pistons.
NOTE—Cylinder out-of-round and taper limits .004"

Original Piston & Bore Sizes: *See Nash Special Data.*

Fitting New Pistons: With all parts clean and dry, fit pistons so that piston will support its own weight in any portion of cylinder. If feeler gauge used, insert .002" x ½" feeler at right angles to pin bosses, pull to withdraw feeler must be 12-18 lbs.

Replacement Pistons: Furnished std. and .001", .002", .003", .005", .010", .012", .015", .020", .040" oversize.

Piston Installation: Pin hole in piston offset 1/16" from center-line. Install piston with heavy side away from camshaft (pin offset toward camshaft).

PISTON RINGS: 2 compression, 2 slotted oil rings (expander behind lower oil ring), per piston all above pin. Oil ring grooves drilled with oil drain holes.

Ring	Width	End Gap	Side Clearance
Compression	3/3)"①	.015±.005"	.002-.004"
Oil Control	5/32"②	.015±.005"	.002-.004"

①—.0930" ± .0005". ②—.15475" ± .00025".
Installing Rings—Stepped inner edge of both compression rings must be UP.

PISTON PIN: Diameter—.8593-.8595". **Length**—2¾". Locked in rod.
Pin Fit in Piston—Thumb press fit or .0003" max. loose fit at room temperature (70°F.).

Replacement Pins: Standard & .001", .003" oversize.

CONNECTING ROD: Length—6⅝" (6.623-6.627").
Weight—25 ozs.

CONTINUED ON NEXT PAGE

►*CAUTION*—When connecting propeller shaft coupling to pinion shaft, coupling nut must be tightened to 300 ft. lbs. to prevent loosening in service.

See Nash Rear Axle in the Rear Axle Section for Propellor Shaft Data.

REAR AXLE

Own Make. Semi-floating, hypoid gear type with Torque Tube Drive.
See Rear Axle Section for complete data.

Ratio (without Overdrive)—4.4-1 (35:8) std.

Ratio (with Overdrive)—4.9-1 (39:8) std.

Backlash—.004-.006". Shim adjustment.

Removal: Jack up and support rear end of body. Disconnect rear brake cable at equalizer, torque tube at rear transmission, brake hose and shock absorbers at axle end (allow shocks and brake hose to hang from body). Roll axle assembly out from under car. ***For Torque Tube Trunnion Bracket Adjustment, see Nash Rear Axle in Rear Axle Section.***

Axle Shaft Removal—Remove wheel, pull drum (use hub puller J-1644). Disconnect brake line and cable. Remove backing plate mounting bolts nuts, take off oil seal retainer, backing plate, and wheel bearing adjusting shims (check thickness of shims, replace same amount when re-assembling). Withdraw axle shaft using Puller J-2498, do not drag shaft on inner oil seal.

Wheel Bearing Adjustment—Shims located between backing plate and flanged end of housing. To adjust, remove wheel and backing plate (above), add or remove shims for endplay. **Endplay**—.002-.004".

Rear Suspension: Coil spring type with conventional rear axle.
See Rear Axle Section for complete data.

SHOCK ABSORBERS

Delco or Monroe. Direct acting, Hydraulic.

FRONT SUSPENSION

Front Suspension: New design, parallelogram type with coil springs and direct acting shock absorbers. NOTE—Entire assembly mounted on box-section pressed steel cross-member attached to frame and body through 4 rubber-bushed bolts.
See Front Suspension Section for complete data.

Kingpin Inclination—8½° crosswise.

Caster—0° desired. Limits 0° to Pos. ½°. Shim adjustment ("C" washers) between upper control arm inner pivot and frame bracket.

Camber—0° desired. Limits Neg. ¼° to Pos. ¼°. Shim adjustment as for Caster (above).

Toe In—1/8-3/16". Loosen clamps at both ends of adjustable tubes in each tie rod. Turn tubes equally.

Steering Geometry—Inner wheel 23½° + ½° — 0°. Outer wheel 20°.

STEERING GEAR

Gemmer Model 305. Worm-and-roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

Service Brakes: Bendix (Lockheed) Hydraulic, self-centering (floating shoe) type. Hand lever applies rear wheel service brakes.
NOTE—No anchor pin adjustment on these brakes.
See Brake Section for complete data.

Wheel Cylinders—Diam.: Front wheels 1", Rear ⅞".

Drums—Cast-iron. Diameter 9".

►***Lining—CAUTION—Different width and length used on each shoe in each wheel as follows:***

Brake Shoe	Width	Length	Thickness
Forward (Primary)	2"	10"	3/16"
Rear (Secondary)	1 3/4"	7½"	3/16"

Lining is molded type.

Clearance—All shoes just free of drag with brakes centralized (by hard brake application and releasing pedal). Eccentric adjustment for each shoe.

Braking Power—57.6% front wheels, 43.4% rear.

Hand Brake: See Service Brakes (above).

MISC. MECHANICAL

Windshield Wiper: Cable Operated—vacuum type.
See Miscellaneous Section for complete data.

Automatic Choke: Carter Climatic Control (Single Barrel Carburetor).
See Carburetion Equipment Section for complete data.
Setting—Centered (coil housing at index).

CARB. EQUIPMENT

Air Cleaner: AC No. 1544443 Oil-wetted type (Std.), Filter Element #3. Oil-bath Cleaner AC No. 1544393, Element #7-S.
Servicing (Oil-wetted type)—Wash filter element and re-oil with heavy engine oil every 2000 miles.
Servicing (Oil-bath type)—Wash filter element, clean out and refill oil reservoir with 1 pint SAE No. 50 engine oil (summer), No. 20 (winter) every 5000 miles.

Fuel Pump: (Std.): AC Type W, No. 1537389 or No. 1539412.
(Optl. & Overdrive Cars)—AC Type AJ, No. 1539216 combination fuel-and-vacuum pump.
Replacement Pump—AC 533 (for W), 585 (for AD).
►*CAUTION—Install pumps with rocker arm ABOVE (W), or UNDER (AJ) eccentric on camshaft.*
See Carburetion Equipment Section for complete data.
Pressure—3-4½ lbs. (5 lbs. maximum).

Gasoline Gauge: Auto-Lite electric type.
Dash Unit—Auto-Lite No. 11578-A.
Tank Unit—Auto-Lite No. 11529-A.
See Carburetion Equipment Section for complete data.

BATTERY

Auto-Lite Type CT-1-15—6 volt, 15 plate, 105 Ampere Hour Capacity (20 hour rate).
Starting Capacity—133 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.5 minutes. Five second voltage—4.2 volts.
Grounded Terminal—Positive (+) grounded to wheelhouse (engine grounded at same point).
Location—Left side of engine compartment under hood.

STARTER

Standard.....**Delco-Remy 1107950.** Arm. 1911832
RHD Cars.....**Delco-Remy 1107959.** Arm. 1911832
Drive (1107950 & 959)—Bendix No. A-2033.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ozs.

Performance Data—1107950 & 959

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5500	5.7	65
16 "	Lock	3.0	600

Starting Switch (Std.): Delco-Remy No. 1996478. On toeboard, actuated by fully depressing clutch pedal.

GENERATOR

Delco-Remy Model No. 1102702.
Armature No. 1911454 (for 1102702).
Two-brush with voltage and current regulation.
Maximum Charging Rate—30 amperes, 8.0 volts.
Charging Rate Adjustment—None (see Regulator).

Performance Data

	Amperes	Volts	R.P.M.
Cold	30①	8.0	1750

①—Not maximum output. See Current Regulator.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—25 ounces.
Field Current—1.75-1.9 amperes at 6.0 volts.

Removal: Generator cradle mounted at left side of engine with fan belt drive (water pump driven by flexible coupling from generator). To remove, disconnect water pump, loosen fan belt, remove generator clamp band, lift out generator.

Belt Adjustment: Adjust whenever belt deflection exceeds ½" either way between the fan and generator shaft pulleys. To adjust, loosen fan mounting bracket screws (pivots on one screw, other screw hole slotted), raise fan, tighten screws. Belt misalignment can be corrected by installing shims behind fan bracket.

REGULATOR

Delco-Remy 1118302. Voltage & Current Regulator.
►*NEW "1118300 SERIES"* regulators have screw adjustment for settings and single regulator springs.
See Electrical Equipment Section for complete data.
CAUTION—Check generator for grounded field coils and leads before changing regulator settings to correct High Charging Rate or High Voltage.

Cutout Relay
Cuts In—5.9-6.8 volts hot (set to 6.4 volts hot).
Contact Gap—.020" (same for both sets).
Air Gap—.020" (with contacts just closed).

Voltage Regulator
Setting—7.0-7.7 volts hot (set to 7.4 volts hot). Regulator is over-compensated for temperature. Should be checked with cover in place and hot.
Air Gap—.075" with armature pressed down to point where contacts are just touching.
Checking & Adjustment—*See Electrical Equipment Section.*

Current Regulator
Setting—32-40 amperes hot (set to 36 hot).
Air Gap—.075" with armature pressed down to point where contacts are just touching.
Checking & Adjustment—*See Electrical Equipment Section.*

LIGHTING

Headlamps: Hall "Sealed Beam" type. Upper and lower beams controlled by selector switch on floor.
See Electrical Equipment Section for complete data.
Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25 ft.).
Beam Indicator—Red jewel located on right side of instrument cluster face.

Switches
Lighting—Rotary type on steering column.
Beam Selector—Nash No. 3104105.

MISC. ELECTRICAL

GENERATOR CHARGE INDICATOR: Indicator light in instrument cluster. Lights when ignition turned on should go out when generator begins to charge.

CIRCUIT BREAKERS: Two used, side-by-side mounting (30 Amp. CB to front) on left body sill brace under hood.
15 or 20 Amp. CB—Protects Stop Light Switch, Heater and Defroster Switch, and Direction Signal.
30 Ampere CB. Protects Dome Light, Pillar Light, Courtesy Light Switch, and Main Lighting Switch.

FUSES: Electric Clock. 3 ampere in clock feed.
Overdrive—20 Amp. On overdrive relay on left body sill brace under hood.

HORNS: Auto-Lite. Model HW-4013 or HW-4025 (low note), HW-4014 or HW-4026 (high note). Twin horns.
Horn Current—15 amps. at 6.2 volts.

Horn Relay: Auto-Lite Model HRC-4001.
Contact Gap—.026".
Air Gap—.016-.020" with contacts closed but not sealed. .015-.018" air gap between armature leg and yoke with armature sealed to core.
Contacts Close—1.5-3.0 volts. Armature seals to core at 4.0 volts maximum.
Contacts Open—.5 volts minimum (open from seal).

ENGINE

ENGINE SPECIFICATIONS: 6 cylinder, valve-in-head type. Cylinders cast Enbloc with intake manifold cast in block. (Iso-thermal fuel intake system).
Bore—3⅜". *See "Original Bore & Pistons" in Nash Special Data.*
Stroke—4⅜". **Displacement**—234.8 cu. ins.
Rated Horsepower—27.34.
Developed Horsepower—112 at 3400 RPM.
Compression Ratio—7.02-1 cast iron head.
Compression & Vacuum Reading—*See Tune-Up.*

CYLINDER HEAD & TIGHTENING TORQUES: *See Nash Special Data.*

OIL PAN REMOVAL: Raise front of engine approx. 3" for access to front pan bolts and to provide clearance at #1 and #2 crank throws.

PISTONS: Aluminum alloy, Cam Ground, Tin plated, strut type with split skirt. **Length**—3⅞".
Weight—12½ ozs. (stripped).
Clearance—.001-.002". See Fitting New Pistons.
NOTE—Cylinder out-of-round and taper limits .004".
Removal—Pistons and rods removed from above.

Original Piston & Bore Sizes: *See Nash Special Data.*

Fitting New Pistons: With all parts clean and dry, fit pistons so that piston will support its own weight in any portion of cylinder. If feeler gauge used, insert .002" x ½" feeler at right angles to pin bosses on side opposite slot, pull to withdraw feeler must be 12-18 lbs.

Replacement Pistons: Furnished std. and .001", .002", .003", .005", .010", .012", .015", .020, .040" oversize.

Installing Pistons: Piston slot toward left side (opposite side from oil squirt hole in rod).

PISTON RINGS: 2 compression, 2 slotted oil rings per piston, all above pin. Drilled oil drain holes in oil ring grooves. Expander behind lower oil ring.

Ring	Width	End Gap	Side Clearance
Comp.	.0930±.0005"	.015±.005"	.002-.004"
Oil Control	.15475"	.015±.005"	.002-.004"

Installing Rings—Top compression ring inner groove up, lower compr. ring outer groove down.

PISTON PIN: Diameter—.8746". **Length**—2.824".
Floating type, with lock ring at each end.
NOTE—Pin hole in piston offset toward camshaft.
Pin Fit in Piston—Palm push fit with piston heated (heat piston in boiling water).
Pin Fit in Rod Bushing—Light thumb push fit at room temperature.

Replacement Pins: Standard & .001", .003" oversize.

CONNECTING ROD: Length—8¾". **Weight**—36¼ ozs.
Crankpin Journal Diameter—2.000-2.001". *See "Original Bearing Sizes" in Nash Special Data.*
Lower Bearing—Removable steel-backed, babbitt lined type. No shims.
Clearance—.001-.002". **Sideplay**—.008-.014".

CONTINUED ON NEXT PAGE

See Rear Axle Section for complete data.

Ratio—4.1-1 (41:10) Std., 4.4-1 (40:9) with O.D.

Backlash—.004-.006". Shim adjustment.

Removal: Raise and support rear end of car. Disconnect rear brake cable at center equalizer. Disconnect torque tube at rear of transmission. Disconnect brake hose and shock absorbers at the axle end, (will hang from the body). Roll axle free from car.

Axle Shaft Removal—Remove wheel, pull drum (use hub puller J-1644). Disconnect brake line and cable. Remove backing plate mounting bolts nuts, take off oil seal retainer, backing plate, and wheel bearing adjusting shims (check thickness of shims, replace same amount when re-assembling). Withdraw axle shaft using Puller J-2498, do not drag on inner seal.

Wheel Bearing Adjustment—Shims located between backing plate and flanged end of housing. To adjust, remove wheel and backing plate (above), add or remove shims for endplay. **Endplay**—.002-.004".

SHOCK ABSORBERS

Delco or Monroe—Direct acting, hydraulic type.

FRONT SUSPENSION

Front Suspension: Independent, linked parallelogram type with coil springs and direct acting shocks.
See Front Suspension Section for complete data.
Kingpin Inclination—8½° crosswise.
Caster—0° desired. Limits 0° to Pos. ½°. Shim adjustment ("C" washers) at upper control arms.
Camber—0° desired. Limits Neg. ¼° to Pos. ¼°. Shim adjustment as for Caster (above).
Toe-In—1/8-3/16". Loosen clamps at both ends of adjustable tubes in each tie rod. Turn tubes equally.
Steering Geometry—Inner wheel 23° plus ½°, minus 0°. Outer wheel 20°.

STEERING GEAR

Gemmer Model 305—Worm-and-roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

Service Brakes: Bendix hydraulic, duo-servo, single anchor type without Eccentric Adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Drums—Cast-iron. Diameter 10".
Lining—Molded type. Width 2". Thickness 3/16". Length 22" per wheel.
Clearance—.015" at each end of secondary (rear) shoes with primary shoes forced out against drums.
Braking Power—53% front wheels, 47% rear.

Hand Brakes: See Service Brake data (above).

MISC. MECHANICAL

Windshield Wiper: Cable Operated—vacuum type.
See Miscellaneous Section for complete data.

IGNITION TIMING

Std. Setting.....At TDC.

NOTE—Car manufacturer recommends using Neon Timing Light to set Ignition Timing.

Timing (Using Neon Timing Light)—Align ⅛" holes in clamp arm and distributor support and insert pin. Loosen distributor hold-down screw and center octane selector scale, tighten screw. Clip Neon Timing Light to #1 spark plug, direct light at vibration dampener at timing chain cover pointer. Idle engine at 450-500 RPM., loosen clamp arm bolt, rotate distributor until "/" mark on dampener aligned with pointer, tighten clamp bolt, remove ⅛" pin in support. Check Octane Selector Setting.

Octane Selector Setting—Loosen hold-down screw in distributor, adjust at scale for slight ping accelerating 10-15 MPH. with wide open throttle.

CARBURETOR

EARLY 1950 CARTER WA-1

Carter 694S. (Early 1950) 1¼" Single Barrel downdraft with Climatic Control.

See Carburetor Section for complete data.

Settings (Idle Setting, Float Level, and Accelerating Pump Setting): ***See Tune-Up data.***

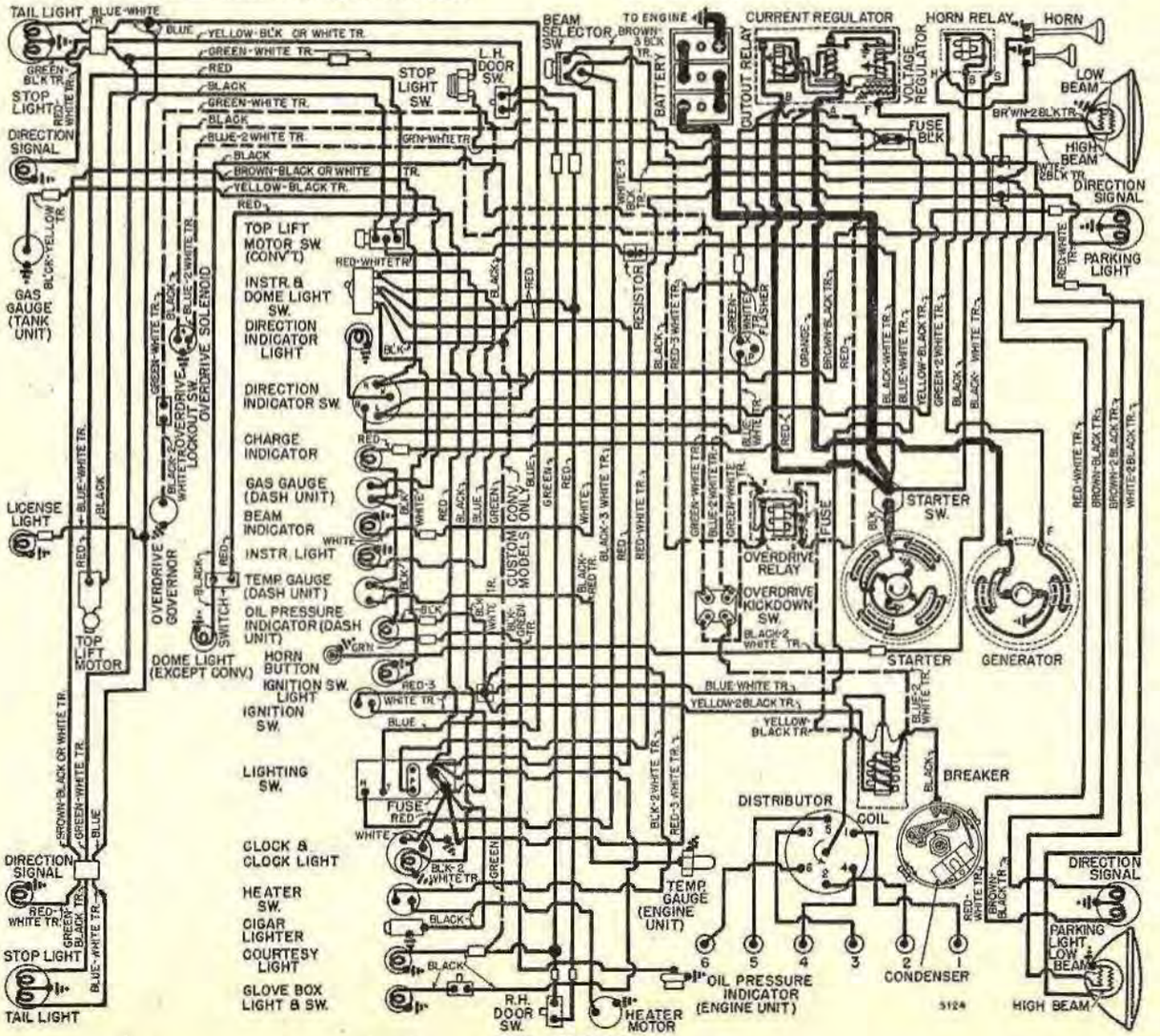
Metering Rods & Jets—***See Carter Jet Table in the Carburetor Section.***

Fast Idle: Carter Single Barrel Carburetor type.

See Carburetion Equipment Section for complete data.

Setting—⅝" clearance between choke valve and air horn (Gauge T109-85) with throttle valve closed and stopscrew against (not on) first step of fast idle cam (bend connector link at lower offset).

Automatic Choke: Carter Climatic Control (Single Barrel Carburetor).



See Carburetion Equipment Section for complete data.

Setting—2 points rich.

1950-51 CARTER YF

Carter 757S, SA, SB (Late 1950 & Early 1951). Carter 876S, SA (Late 1951). 1¼" Single barrel downdraft with Climatic Control.

See Carburetor Section for complete data.

Settings (Idle Setting, Float Level, and Accelerating Pump): ***See Tune-Up data.***

►***CARBURETOR RECOMMENDED CHANGE FOR SMOOTHER ENGINE PERFORMANCE—See Carburetor Section for complete data.***

Metering Rods & Jets—***See Carter Jet Table in the Carburetor Section for complete data.***

Fast Idle: .054" between throttle valve and bore of carburetor (side opposite port). Remove thermostatic coil housing and baffle plate. Crack throttle valve and hold choke valve fully closed, then close throttle. Fast idle cam will revolve to fast idle position. With choke valve held tightly closed, and slight tension on throttle lever, check throttle opening. Adjust by bending connector link at lower bend.

See Carburetion Equipment Section for complete data.

Automatic Choke: Carter Climatic Control (Single Barrel Carburetor).

Setting—(757S, SA, SB) Centered on index. (876S, SA) Set 1 point lean.

See Carburetion Equipment Section for complete data.

CARB. EQUIPMENT

Air Cleaner: Oil-wetted (Std.), oil-bath (Optl.).

Servicing (Oil-wetted type)—Wash filter element and re-oil with heavy engine oil every 2000 miles.

Servicing (Oil-bath type)—Wash filter element, clean out and refill oil reservoir with 1 pint SAE 50 oil (summer), 20 (winter) every 5000 miles.

Fuel Pump: Carter No. M-774-S. Diaphragm type, Std.

Opt'l (with Overdrive) No. M-797-S.

Pressure—4-5¼ lbs. at 1800 RPM.

See Carburetion Equipment Section for complete data.

Gasoline Gauge: King-Seeley Electric type.

Dash Unit—KS No. 42751 (Std., Red Dial). No. 42951 (Custom, Alum. Dial).

Tank Unit—KS No. 42760.

See Carburetion Equipment Section for complete data.

BATTERY

Auto-Lite Type IH-90D—6 volt, 13 plate, 90 Ampere Hour capacity (20 hour rate).

Starting Capacity—114 amperes for 20 minutes.

Grounded Terminal—Positive (+) grounded to wheelhouse (engine grounded at same point).

Location—Left side in engine compt. under hood.

STARTER

Delco-Remy No. (1950) 1109459, (1951) 1109463.

Armature—Delco-Remy No. 1915056 (for 1109459), 1917887 (for 1109463).

Drive—Delco-Remy No. 1915041 (for 1109459), 1917888 (for 1109463).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	6000	5.7	60
11.5 "	Lock	3.3	540

Starting Switch: Delco-Remy No. 1996476. Mounted on toeboard, actuated by fully depressing clutch pedal.

Removal: Flange mounted on left front face of flywheel housing. To remove, work from above under

CONTINUED ON NEXT PAGE

after top dead center and "DC" mark on vibration dampener 5/8" past pointer on timing chain cover. Reset tappet clearance at .015" Hot.

LUBRICATION

Engine Oiling System: Pressure to main, connecting rod, and camshaft bearings, valve tappets, and timing chain.
Crankcase Capacity—5 quarts.
Normal Oil Pressure—50 lbs. at 35 MPH.
Oil Pressure Regulator—Spring-loaded release valve under plug to rear of oil pump on lower edge of crankcase. Non-adjustable. Opens at 50-58 lbs.
Oil Pump: Gear type. Mounted externally on right side of crankcase.
Oil Filter: Optional. Replace cartridge every 8000 miles, or oftener if necessary.
Oil Pressure Gauge: King-Seeley Electric type.
Dash Unit—Warning indicator light used. Light goes on when ignition switch is turned on, and goes out when oil pressure exceeds 13 pounds.
Engine Unit—King-Seeley No. 47100.
See Miscellaneous Section for complete data.

COOLING

Cooling System: Pressure type with pressure valve and vacuum valve (relief valves) in filler cap, and positive circulation with water pump.
Capacity—12 quarts (13 quarts with heater).
Pressure Valve—AC #850501 Cap. Opens 4½ lbs.
►*PRESSURE VALVE CHANGE NOTE*—Effective at car serial No. D-41833, a 7 lb. pressure radiator cap entered production.
Water Pump: New sealed-in, non-adjustable seal assembly. Grease fitting for bushing lubrication. Centrifugal pump driven from generator shaft.
See Water Pump Section for complete data.
Belt Adjustment—*See Generator Belt Adjustment.*
Removal—Drain cooling system, disconnect pump drive coupling (remove rear bolt), disconnect inlet hose, remove two pump mounting capscrews.
Thermostat: Dole. In cylinder head water outlet.
Setting—Starts to open 162-168°F. and should be fully open 20° above opening point.
Temperature Gauge: King-Seeley Electric type.
Dash Unit—KS No. 42735 (Std. Red dial).
No. 42953 (Custom Alum. dial).
Engine Unit—KS No. 42550.
See Miscellaneous Section for complete data.

CLUTCH

Borg & Beck Model 8A7—Single plate, dry disc type.
See Clutch Section for complete data.
Facings—Woven (flywheel side). Molded (pressure plate side). I.D. 5⅜". O.D. 8". Thickness ⅛".
Adjustment: Pedal free travel ½-¾". Adjust by loosening locknut and turning adjusting nut on connector link at clutch fork.
►*CAUTION—Do not disturb adjustment of clutch beam lever-to-pedal rod.*
Removal: Remove transmission (see below), disconnect clutch pedal linkage, remove clutch housing and pan, punchmark flywheel, clutch cover and pressure plate (reassemble to same marks), take out clutch fork and mounting screws in cover flange.

TRANSMISSION

Warner AS35-T96 (Std.), AS36-T96 (Optl.—with Overdrive). Constant-mesh, synchro-mesh, all helical gear type.
See Transmission Section for complete data.
Transmission Control: Mech. steering column shift.
See Transmission Section for complete data.
Removal: Move rear axle back (see Universals for procedure) to slip front universal joint off transmission. Disconnect shift levers and speedometer cable, remove two upper transmission to bell housing bolts, and install special guide bolts in their place. Remove lower bolts, slide transmission out.

OVERDRIVE

Warner R10 Type (part of AS36-T96 Transmission). New centered ring gear type. Governor controlled with electrical solenoid operation and throttle operated kick-down switch.
See Transmission Section for complete data.
Overdrive Fuse—30 ampere on overdrive relay.
Removal: Remove as a unit with transmission after disconnecting control cable and all wiring on overdrive case. See Transmission Removal (above).

UNIVERSALS

Mechanics or Saginaw. Needle bearing, cross type. Front joint slips on transmission mainshaft.
See Universal Section for complete data.
Lubrication—Pre-packed. Service every 15000 miles.
Propeller Shaft: Open drive line with front and rear universal joints.
►*FRONT UNIVERSAL JOINT SPLINED FLANGE CAUTION*—Two types used in production. SHORT TYPE (3 13/16" from centerline of universal joint bore to end of flange) for cars **WITH OVERDRIVE.** LONG TYPE (4 7/32" from centerline of universal joint to end of flange) for cars **WITHOUT OVERDRIVE.**
Removal—Support rear of car at body side sills and rear axle at the housing. Loosen propeller shaft coupling nut by turning nut clockwise (facing rear of car) with Tool J-4486 (Shaft holding and Coupling wrenches). Disconnect rear shocks at axle tube, parking brake cable at adjusting yoke, and disconnect rear brake hose clip from body floor pan. Remove rear spring front bracket mounting nuts and lower the rear axle (continue to support body). Push rear axle assembly to rear; sliding propeller shaft yoke off transmission main shaft splines. Remove propeller shaft from pinion shaft by tapping with a soft hammer.
Installation—Install propeller shaft (coupling) onto pinion shaft until center of "U" joint is 4 3/16" from front face of rear axle housing. Push axle assembly to rear and slide front "U" joint onto transmission main shaft. Move the propeller shaft forward until front universal joint "bottoms" on the transmission main shaft; MARK THE YOKE AT THE TRANSMISSION REAR OIL SEAL; THEN ADJUST THE PROPELLER SHAFT SO THE MARK IS 5/32" TO THE REAR OF THE OIL SEAL. Loosen rear spring front eye bolt and tilt front bracket so rear holes are aligned with bolts in floor pan. Raise axle assembly, aligning rear spring front bracket with mounting bolts and secure the mounting nuts. TIGHTEN THE COUPLING NUT TO 300 FOOT POUNDS TORQUE with the use of tool J-4486 and 3' extensions applied to wrench handles. Reinstall brake clip. Connect rear shock absorbers.

REAR AXLE

Own Make. Semi-floating, hypoid gear type with Hotchkiss Drive.
See Rear Axle Section for complete data.
Ratio—(Std.) 3.8-1 (9-34), (Overdrive) 4.4-1 (8-35), (Optional ratio with overdrive) 4.1-1 (9-37). (Sta. Wgn.) 4.4-1 (8-35).
Backlash—.004-.006". Shim adjustment.
Removal: Raise and support rear end of body. Remove rear wheels, axle shaft nuts, and rear hub and drums. Disconnect parking brake cables at rear wheels, brake hose and shock absorbers. Remove rear spring clips and rear spring front eye brackets. Move axle to rear which will pull the front universal off the transmission mainshaft spline. Rear axle and propeller shaft now removed as an assy.
Axle Shaft Removal & Wheel Bearing Adjustment: See "1950-51 Nash Statesman" data.
Endplay—.002-.004".

SHOCK ABSORBERS

Delco. Direct acting, hydraulic type.

FRONT SUSPENSION

Front Suspension: New design, parallelogram type with coil springs and direct acting shock absorbers.
►*"RAPPING" SOUND FROM FRONT END—See "Rapping Correction" in Nash Special Data.*
►*FRONT SUSPENSION BRACE NOTE—Effective with car serial No. D-66777, a front suspension brace entered production. This brace can be installed on all previous models.*
See Front Suspension Section for complete data.
Kingpin Inclination—8½° crosswise.
Caster—Pos. ¾° to 1¼° (1° preferred).
Camber—Pos. ¼° to ¾° (½° preferred).
Toe-In—⅛" to ¼". ¼" preferred.

STEERING GEAR

Gemmer Model 305. Worm-and-roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

Service Brakes: Bendix (Lockheed) Hydraulic, self-centering (floating shoe) type. Hand lever applies rear wheel service brakes.
NOTE—No anchor pin adjustment on these brakes.
See Brake Section for complete data.
Wheel Cylinders—Front wheels 1", Rear 13/16".
Drums—Cast iron. Diameter 8".
Lining—Molded. **Lining Thickness** 3/16" (all).
►*Lining—CAUTION—Different width and length used on each shoe in each wheel as follows:*

Lining Width	Frt. Wheel	Rear Wheel
Primary Shoe	1¾"	1¼"
Secondary Shoe	1½"	1"

Clearance—All shoes just free of drag with brakes centralized (by hard brake application and releasing pedal). Eccentric adjustment for each shoe.
Braking Power—60.2% front wheels, 39.8% rear.
Hand Brake: See Service Brakes (above).

MISC. MECHANICAL

CONVERTIBLE TOP CONTROL: Electric. Cable operated with electric motor operating winding drum behind rear seat.
See Miscellaneous Section for complete data.
WINDSHIELD WIPER: Vacuum type, cable operated.
See Miscellaneous Section for complete data.

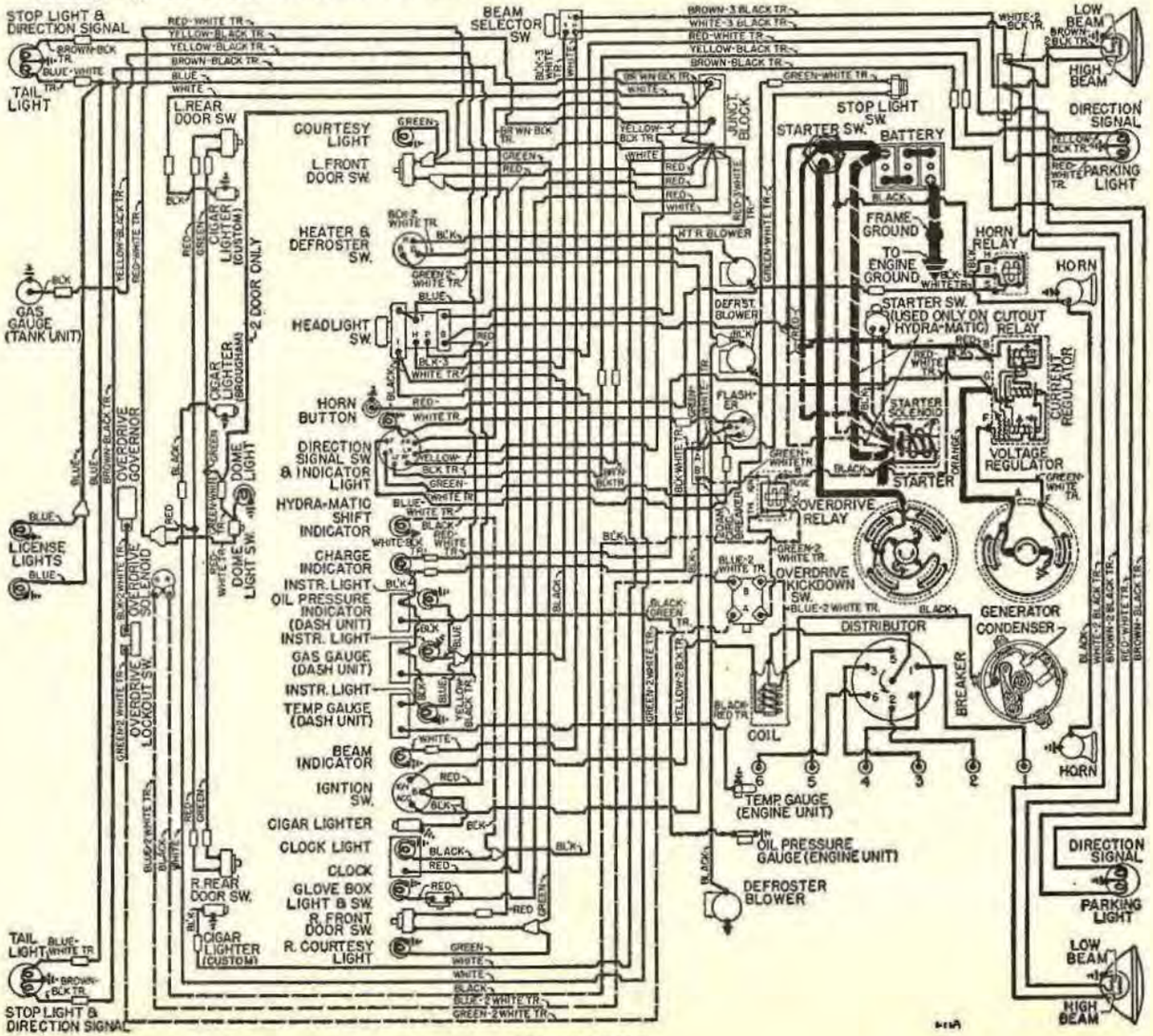
CARBURETOR

EARLY 1950 CARTER WA-1

Carter No. (1950 Early Cars) 694S, (1950 Late Cars) 780S. 1¼" Downdraft type with Climatic Control.
Casting No. on Flange (694S)—298, (780S)—779.
See Carburetor Section for complete data.
Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*
►**694S Accelerating Pump Setting Change**—To improve acceleration performance. *See "Carter WA-1" in Carburetor Section.*
Metering Rods & Jets—*See Carter Jet Table in the Carburetor Section.*
Fast Idle: Carter Single Barrel Carburetor type.
Setting—⅝" clearance between choke valve and air horn (Gauge T109-85) with throttle valve closed and stopscrew against (not on) first step of fast idle cam. Adjust by bending connector link.
See Carburetion Equipment Section for complete data.
Automatic Choke: Carter Climatic Control (Single Barrel Carburetor).
See Carburetion Equipment Section for complete data.
Setting—(694S) 2 points rich; (780S) Centered *(This setting supersedes previous setting of 2 points rich.)*

1950-51 CARTER YF

Carter No. (Early 1951) 824S, SA, SB. (Late 1951) 877S, SA. 1¼" Single barrel downdraft type with Climatic Control.
See Carburetor Section for complete data.



1951 MODELS

Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up Data.*
►*CARBURETOR RECOMMENDED CHANGE FOR SMOOTHER ENGINE PERFORMANCE—See Carburetor Section for complete data.*
Metering Rods & Jets—*See Carter Jet Table in the Carburetor Section.*
Fast Idle: .054" between throttle valve and bore of carburetor (side opposite port). Remove thermostatic coil housing and baffle plate, adjust by bending connector link at lower bend.
See Carburetion Equipment Section for complete data.
Automatic Choke: Carter Climatic Control (Single Barrel Carburetor).
Setting—(824S, SA, SB) Centered on index. (877S, SA) Set 1 point lean.
See Carburetion Equipment Section for complete data.

CARB. EQUIPMENT

Air Cleaner: Oil Wetted type (std.), Oil Bath type (optional).
Fuel Pump: (1950) Carter No. M797S or AC type W, No. 1537398 or 1539413.
(Optl. & Overdrive Cars)—AC Type AJ, No. 1537406 combination fuel-and-vacuum pump.
Replacement Pumps—AC 532 (for W), 7406 (for AJ).
Fuel Pump: (1951) Carter No. M797S, (Hydra-Matic & Overdrive cars). AC No. 1539413 (Std. Trans. cars).
►*CAUTION—Install pumps with rocker arm ABOVE (W), or UNDER (AJ) eccentric on camshaft.*
Pressure—3-4½ lbs. (5 lbs. maximum).
See Carburetion Equipment Section for complete data.
Gasoline Gauge: Auto-Lite electric type.
Dash Unit—Auto-Lite (1950) 11982A, (1951) 12268A.
Tank Unit—Auto-Lite (1950) 11529A, (1951) 12203A.
See Carburetion Equipment Section for complete data.

BATTERY

Auto-Lite Type CT-1-13—6 volt, 13 plate, 90 Ampere Hour capacity (20 hour rate).
Grounded Terminal—Positive (+) grounded to wheelhouse (engine grounded at same point).
Location—Under hood at left side of engine.

STARTER

Delco-Remy No. (1950) 1109451 or 1109459, (1951) 1109463 (Std. Trans.), 1109465 (Hydra-Matic).
Armature—Delco-Remy No. 1882547 (for 1109451), 1915056 (for 1109459), 1917887 (for 1109463), 1917946 (for 1109465).
Drive—(1950) Barrel type Bendix Drive No. A 2033
Drive—(1951) Delco-Remy Automatic type. No. 1917888 (Std. Trans.), No. 1917948 (Hydra-Matic).
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ounces.

Performance Data

Torque		R.P.M.	Volts	Amperes
0	ft. lbs.	6000	5.7	60
11.5	"	Lock	3.3	540

Starting Switch: (Std. Trans.) Delco-Remy No. 1996478. Mounted on toeboard, actuated by fully depressing clutch pedal.
Starting Switch: (Hydra-Matic Trans.) Delco-Remy No. 1465. Magnetic type. Control switch (Delco-Remy No. 1996044) mounted on steering column and controlled by Hydra-Matic selector lever. Operative by lifting the lever in "N" position.

CONTINUED ON NEXT PAGE

VALVE TIMING

Tappet Clearance: .015" Hot, running clearance.
NOTE—Tappet adjusting screws are self-locking.

Valve Timing: See Camshaft Setting above.
Intake Valves—Open 6° BTDC. Close 50° ALDC.
Exhaust Valves—Open 46° BLDC. Close 10° ATDC.
Valve Timing Check—With tappet clearance set at .019", #1 exhaust valve should close with piston 10° after top dead center and "DC" mark on vibration dampener ⅝" past pointer on timing chain cover. Reset tappet clearance at .015" Hot.

LUBRICATION

Engine Oiling System: Pressure to main, connecting rod, and camshaft bearings, valve tappets, and timing chain.
Crankcase Capacity—5 quarts.
Normal Oil Pressure—50 lbs. at 30 MPH.
Oil Pressure Regulator—Spring-loaded release valve under plug to rear of oil pump on lower edge of crankcase. Non-adjustable. Opens at 50-58 lbs.

OIL PAN REMOVAL—*See Nash Special Data.*

Oil Pump: Gear type pump mounted on right side of engine, driven by inclined shaft.

Oil Filter: Optional. Replace cartridge at 8000 mile intervals or more often if necessary.

Oil Pressure Gauge: Auto-Lite Electric.
Dash Unit—Auto-Lite No. (1950) 11981A, (1951) 12267A. Auto-Lite Magnetic type.
Engine Unit—Auto-Lite No. 11527-A.
See Miscellaneous Section for complete data.

COOLING

Cooling System: Pressure type with pressure valve and vacuum valve (relief valves) in filler cap, and positive circulation with water pump.
Capacity—14 quarts (15 quarts with heater).
Pressure Valve—AC #850501 Filler Cap. Opens 4 lbs.
►*PRESSURE VALVE CHANGE NOTE*—Effective at car serial No. K-48207, a 7 lb. pressure radiator cap entered production.

Water Pump: New sealed-in, non-adjustable seal assembly. Grease fitting for bushing lubrication. Centrifugal pump driven by flexible coupling from generator.
See Water Pump Section for complete data.
Belt Adjustment—*See Generator Belt Adjustment.*
Removal—Drain cooling system, disconnect pump drive coupling (remove rear bolt), disconnect inlet hose, remove two pump mounting capscrews.

Thermostat: Dole. In cylinder head water outlet.
Setting—Starts to open 162-168°F. and should be fully open 20° above opening point.

Temperature Gauge: Auto-Lite Electric.
Dash Unit—Auto-Lite No. (1950) 11983A, (1951) 12269A. Auto-Lite Magnetic type.
Engine Unit—Auto-Lite No. 11528-A.
See Miscellaneous Section for complete data.

CLUTCH

Borg & Beck Model 8A7—(Std. & O.D. Trans. Cars). Single plate dry disc type.
Identification Note—Cover stamped "987".
See Clutch Section for complete data.
Facings—Woven. 2 used. I.D. 5⅜". O.D. 8". Thickness ⅛".

Adjustment: Pedal free travel ½-¾". Adjust by loosening locknut and turning adjusting nut on connector link at clutch fork.

►*CAUTION—Do not disturb adjustment of clutch beam lever-to-pedal rod.*

Removal: Remove transmission (see below), disconnect clutch pedal linkage, remove clutch housing and pan, punchmark flywheel, clutch cover and pressure plate (reassemble to same marks), take out clutch fork and mounting screws in cover flange. Remove clutch assembly.

TRANSMISSION

Own Make. Constant-mesh, synchro-mesh (second & high), sliding gear (low & reverse), all helical gear.
See Transmission Section for complete data.

Transmission Control: Mech. steering column shift.
See Transmission Section for complete data.

Removal: Remove Rear Axle (see REAR AXLE below), disconnect transmission shift rods at levers on left side of case and speedometer cable. Support engine at rear, free rear engine mounting, take out transmission upper mounting bolts, install special guide bolts in these holes, remove lower mounting bolts, slide transmission back on guide bolts, remove from below.

OVERDRIVE

Warner Type AS8-R10B—With centered ring gear. Optional (with Nash Transmission). Governor controlled type with electric solenoid operation and throttle operated kick-down switch.
See Transmission Section for complete data.
Overdrive Solenoid—Delco-Remy No. 1118132.
Governor—Warner No. AR10B-72E.
Control Relay—Auto-Lite No. HRT-4101.
Overdrive Fuse—30 ampere. On BAT terminal of overdrive relay (on left body sill under hood).

Removal: Remove as a unit with transmission after disconnecting control cable and all wiring on overdrive case. See Transmission Removal (above).

HYDRA-MATIC TRANSMISSION

See Nash Ambassador for Nash Hydra-Matic Data.

UNIVERSALS

Mechanics 1½CR or Saginaw. One used (in torque tube adapter at rear of transmission). Tapered coil spring is installed ahead of joint to properly locate joint on driveshaft. NOTE—Universal is slip fit on transmission end, slight press fit on driveshaft.
See Universals Section for complete data.

Propeller Shaft (Std. & Overdrive Cars): Steel shaft with pre-lubricated, rubber mounted center bearing installed in torque tube. Shaft splined at both ends, universal light press fit on forward end, coupling at rear end is a tight press fit.

Propeller Shaft (Hydra-Matic Drive): One piece tubular steel shaft with one universal at forward end and companion flange at rear. No center bearing.
►*CAUTION*—When connecting propeller shaft coupling to pinion shaft, coupling nut must be tightened to 300 ft. lbs. to prevent loosening in service.
See Nash Rear Axle in the Rear Axle Section for Propellor Shaft Data.

REAR AXLE

Own Make. Semi-floating, hypoid gear type with Torque Tube Drive.
See Rear Axle Section for complete data.
Ratio—(Std.) 4.4-1 (8-35). (Overdrive) 4.9-1 (8-39). (Hydra-Matic) 3.8-1 (9-34).
Backlash—.004-.006". Shim adjustment.

Removal: Jack up and support rear end of body. Disconnect rear brake cable at equalizer, torque tube at rear of transmission, brake hose and shock absorbers at axle end (allow shocks and brake hose to hang from body). Roll axle assembly out from under car. *For Torque Tube Trunnion Bracket Adjustment, see Nash Rear Axle in Rear Axle Section.*
Axle Shaft Removal—Remove wheel, pull drum (use hub puller J-1644). Disconnect brake line and cable. Remove backing plate mounting bolts nuts, take off oil seal retainer, backing plate, and wheel bearing adjusting shims. Withdraw axle shaft using Puller J-2498, do not drag shaft on inner oil seal.

Wheel Bearing Adjustment—Shims located between backing plate and flanged end of housing. To adjust, remove wheel and backing plate (above), add or remove shims for endplay. **Endplay**—.002-.004".

Rear Suspension: Coil spring type with conventional rear axle. *See Rear Axle Section for complete data.*

SHOCK ABSORBERS

Delco or Monroe. Direct acting, Hydraulic.

FRONT SUSPENSION

Front Suspension: Independent, parallelogram type. with coil springs and direct acting shock absorbers.
NOTE—Entire assembly mounted on box-section pressed steel cross-member attached to frame and body through 4 rubber-bushed bolts.
See Front Suspension Section for complete data.
Kingpin Inclination—8½° crosswise.
Caster—0° desired. Limits 0° to Pos. ½°. Shim adjustment ("C" washers) between upper control arm inner pivot and frame bracket.
Camber—0° desired. Limits Neg. ¼° to Pos. ¼°. Shim adjustment as for Caster (above).
Toe-In—1/16" to 3/16". Loosen clamp at both ends of adjustable tubes in each tie rod. Turn tubes
Steering Geometry—Inner wheel 23½° + ½° — 0°. Outer wheel 20°.

STEERING GEAR

Gemmer Model 305. Worm-and-roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

Service Brakes: Bendix (Lockheed) Hydraulic, self-centering (floating shoe) type. Hand lever applies rear wheel service brakes.
NOTE—No anchor pin adjustment on these brakes.
See Brake Section for complete data.
Wheel Cylinders—Diam.: Front wheels 1", Rear ⅞".
Drums—Cast-iron, Diameter 9".
►*Lining—CAUTION—Different width and length used on each shoe in each wheel as follows:*

Brake Shoe	Width	Length	Thickness
Forward (Primary)	2"	10"	3/16"
Rear (Secondary)	1 3/4"	7½"	3/16"

Lining is moulded type.
Clearance—.015" heel and toe. Eccentric adjustment for each shoe.
Braking Power—57.6% front wheels, 43.4% rear.

Hand Brake: See Service Brakes (above).

MISC. MECHANICAL

Windshield Wiper: Cable Operated—vacuum type.
See Miscellaneous Section for complete data.

CARB. EQUIPMENT

Air Cleaner: AC No. 1544443 Oil-wetted type (Std.), Filter Element #3. Oil-bath Cleaner AC No. 1544393, Element #7-S.

Fuel Pump: (Std.) AC Type W, No. 1537389 or 1539412, Carter No. M-816-S.
(Optional, Overdrive & Hydra-Matic Cars) AC Type AJ, No. 1539216 or Carter No. M-798-S.

►***CAUTION—Install pumps with rocker arm ABOVE (W), or UNDER (AJ) eccentric on camshaft.***
See Carburetion Equipment Section for complete data.

Pressure—3-4½ lbs. (5 lbs. maximum).

Gasoline Gauge: Auto-Lite electric type.
Dash Unit—Auto-Lite No. (1950) 11982A, (1951) 12268A.
Tank Unit—Auto-Lite No. (1950) 11529A, (1951) 12203A.
See Carburetion Equipment Section for complete data.

BATTERY

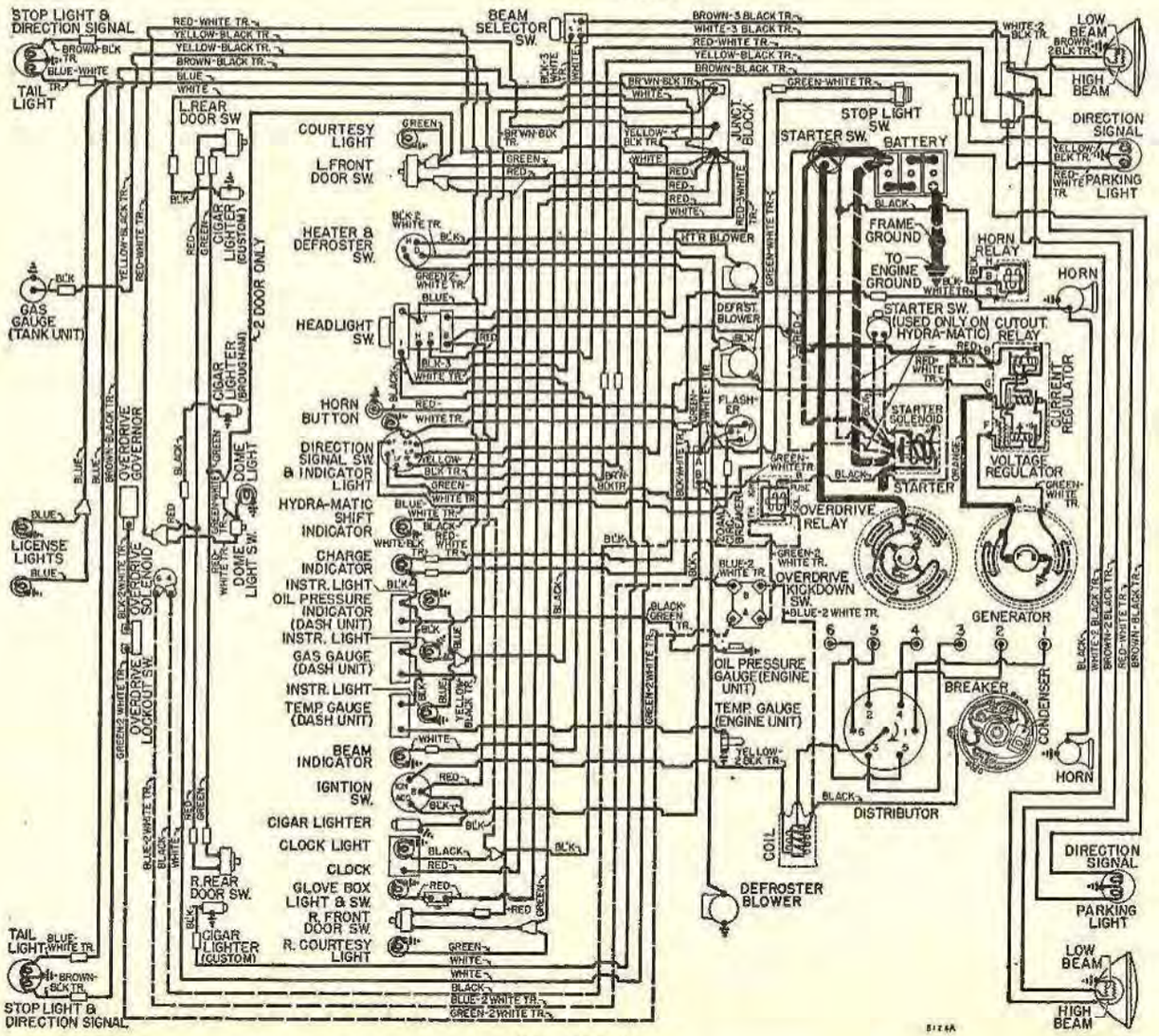
Auto-Lite Type CT-1-15—6 volt, 15 plate, 105 Ampere Hour Capacity (20 hour rate).

Starting Capacity—133 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.5 minutes. Five second voltage—4.2 volts.

Grounded Terminal—Positive (+) grounded to wheelhouse (engine grounded at same point).

Location—Left side of engine compartment under hood.



1951 MODELS

STARTER

Standard.....**Delco-Remy 1107950. Arm. 1911832**
Hydra-Matic.....**Delco-Remy 1107965. Arm. 1867897**
Drive (1107950 & 959)—Bendix No. A-2033.
Drive (1107965)—Delco-Remy No. 1873789. Overrunning clutch with solenoid pinion shift.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ozs.

Performance Data—1107950 & 959

Torque		R.P.M.	Volts	Amperes
0	ft. lbs.	5500	5.7	65
16	"	Lock	3.0	600

Performance Data—1107965

0	ft. lbs.	5500	5.7	80①
14	"	Lock	3.0	600

①—Includes current draw of starter switch.

Starting Switch (Std.): Delco-Remy No. 1996478. On toeboard, actuated by fully depressing clutch pedal.

Starting Switch (Hydra-Matic): Delco-Remy Solenoid No. 1118136 (no relay) used mounted on starter. Control Switch (Delco-Remy No. 1996044) mounted on steering column and controlled by Hydra-Matic selector lever. Operative only with lever in "N."

►***CAUTION***—Overrunning clutch pinion clearance must be adjusted whenever solenoid removed from starter.
See Electrical Equipment Section for complete data.

Starter Switch Adjustment—*See Nash Hydra-Matic Drive in Transmission Section.*

GENERATOR

1950—Delco-Remy No. 1102712 or 1102730. Armature No. 1913597.
1951—Delco-Remy No. (Std.) 1102730, (Optional) 1102748. Armature No. 1913597 (for 1102730), 1917175 (for 1102748).
Two-brush with voltage and current regulation.
Maximum Charging Rate—30 amperes, 8.0 volts.
Charging Rate Adjustment—None (see Regulator).

Performance Data (Gen. Nos. 1102712 & 1102730)

	Amperes	Volts	R.P.M.
Cold	30①	8.0	1750

Performance Data (Gen. No. 1102748)

	Amperes	Volts	R.P.M.
Cold	40	8.0	1950

①—Not maximum output. See Current Regulator.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—28 ozs.
Field Current—1.75-1.9 amperes (for 1102712 & 1102730). **1.90-2.05 amperes** (for 1102748). All at 6.0 volts.

Belt Adjustment: Adjust belt so that 25 lbs. pressure midway between fan and generator shaft pulley will deflect belt ½". To adjust, loosen fan mounting bracket screws, raise fan, tighten screws. Belt misalignment corrected by shims back of fan bracket.

REGULATOR

Delco-Remy No. 1118302 (for 1102712 & 1102730), **No. 1118382** (for 1102748. Voltage and Current Regulator.

►***"1118300 SERIES"*** regulators have screw adjustment for settings and single regulator springs.
See Electrical Equipment Section for complete data.

CONTINUED ON NEXT PAGE

LUBRICATION

Engine Oiling System: Pressure to main, connecting rod, and camshaft bearings, piston pins, and timing chain.
Crankcase Capacity—6 quarts.
Normal Oil Pressure—50 lbs. at 30 MPH.
Oil Pressure Regulator—Located in body of pump. Not adjustable. Opens at 50-58 lbs.
Oil Pump: Gear type in crankcase mounted on center main bearing cap.
See "Oil Pump" in Nash Special Data.
Cylinder Cover Vent: Vent located on front of cover just behind water outlet elbow to allow escape of vapors inside cover. Turn to open position at all times, especially winter, except for hot dusty driving.
Oil Filter: Replace cartridge at 8000 mile intervals or more often if necessary.
Oil Pressure Gauge: Auto-Lite Electric.
Dash Unit—Auto-Lite No. (1950) 11981A, (1951) 12267A.
Engine Unit—Auto-Lite No. 11527-A.
See Miscellaneous Section for complete data.

COOLING

Cooling System: Pressure type with pressure valve and vacuum valve (relief valves) in filler cap, and positive circulation with water pump.
Capacity—17 quarts (18 quarts heater).
Pressure Valve—AC 850501 (Filler Cap). Opens at 4 lbs.
►*PRESSURE VALVE CHANGE NOTE*—Effective at car serial No. R-633937, a 7 lb. pressure radiator cap entered production.
Water Pump: New sealed-in, non-adjustable type.
See Water Pump Section for complete data.
Removal—Drain cooling system, disconnect pump drive coupling (remove rear bolt), disconnect inlet hose, remove pump mounting capscrews.
Belt Adjustment: *See Generator Belt Adjustment.*
Thermostat: Dole. In water outlet on cylinder head.
Setting—Starts to open at 162-168°F. and should be fully open 20° above starting point.
Temperature Gauge: Auto-Lite Electric.
Dash Unit—Auto-Lite No. (1950) 11983A, (1951) 12269A.
Engine Unit—Auto-Lite No. 11528-A.
See Miscellaneous Section for complete data.

CLUTCH

Borg & Beck Model 10A7—Assembly No. 950 stamped on cover. Single plate, dry disc type.
See Clutch Section for complete data.
Facings—Woven type, 2 used. Inside Diameter 7". Outside Diameter 10". Thickness ⅛".
Adjustment: Pedal free travel ½-¾". Adjust by loosening locknut and turning adjusting nut on connector link at clutch fork.
►*CAUTION—Do not disturb adjustment of clutch beam lever-to-pedal rod.*
Removal: Remove transmission (see below), disconnect clutch pedal linkage, remove clutch housing and pan, punchmark flywheel, clutch cover and pressure plate (reassemble to same marks), take out clutch fork and mounting screws in cover flange.

TRANSMISSION

Warner Model (Std. Without Overdrive) AS25-T86E. (Optional With Overdrive Early 1950) AS26-T86E, (Optional With Overdrive Late 1950 & 1951) AS46-T86E. Constant mesh, synchro-mesh (Second & High), sliding gear (Low & Reverse).
See Transmission Section for complete data.
Transmission Control: Mechanical steering col. shift.
See Transmission Section for complete data.
Removal: Remove Rear Axle (see REAR AXLE below), disconnect transmission shift rods at levers on left side of case and speedometer cable. Support engine at rear, free rear engine mounting, take out transmission upper mounting bolts, install special guide bolts in these holes, remove lower mounting bolts, slide transmission back, remove from below.

OVERDRIVE

Warner Type R10 (part of AS26-T86E & AS46-T86E Transmission). Optl. Governor controlled type with electrical solenoid operation and throttle operated kick-down switch. Overdrive in AS46-T86E assembly is new "centered ring gear" type.
See Transmission Section for complete data.
Overdrive Solenoid—Delco-Remy No. 1118132.
Governor—Auto-Lite No. TGE-4005.
Control Relay—Auto-Lite No. HRT-4101.
Overdrive Fuse—20 ampere. On BAT terminal of overdrive relay (on left body sill under hood).
Removal: Remove as a unit with transmission after disconnecting control cable and all wiring on overdrive case. See Transmission Removal (above).

HYDRA-MATIC DRIVE

OPTIONAL EQUIPMENT

Description—Four-speed planetary type automatic transmission and fluid coupling.
►*1951 MODELS HAVE HYDRAULICALLY OPERATED "CONE TYPE CLUTCH" REVERSE MECHANISM.*
See Transmission Section for complete data including Testing & Trouble Shooting.
Lubrication—Check fluid level every 1000 miles. Add fluid, as required, to maintain level at "F" mark on dip stick. Drain and refill every 25,000 miles. Use Hydra-Matic Fluid (Automatic Transmission Fluid Type "A") as furnished in containers marked with approval symbol "AQ-ATF".
Capacity—Approx. 11 qts. (refilling after draining). **12 qts.** (when transmission disassembled).
Checking Fluid Level—Set hand brake, place selector lever in "N" position, start engine and idle for a minimum of two minutes after transmission has reached operating temperature. Roll back front floor mat on right side, remove inspection cover in floor pan, clean all dirt and lint from floor and around oil level indicator on left side of transmission case. Place selector lever in "D" position and idle engine with lever in this position while checking fluid level. Fluid level should be at "F" mark on dip stick, add fluid to bring level up to "F" mark.
►*CAUTION—Do not fill above "F" mark on dip stick.*
Draining & Refilling—*See "Hydra-Matic Drive" in Transmission Section.*
Hydra-Matic Linkage Adjustment—*See "Nash Hydra-Matic Drive" in Transmission Section.*
Removal: *See "Nash Hydra-Matic Drive" in Transmission Section.*

UNIVERSALS

Mechanics or Saginaw—Roller bearing type, 1 used.
See Universals Section for complete data.
Propeller Shaft: (Synchro-mesh Trans.) One piece steel shaft with pre-lubricated, rubber mounted center bearing installed in torque tube.
(1950 Hydra-Matic Drive) Two shafts used. Front shaft is tubular and is splined to rear solid steel shaft which is supported in the center with a pre-lubricated, rubber mounted bearing installed in the torque tube.
(1951 Hydra-Matic Drive) One piece shaft.
See Nash Rear Axle in the Rear Axle Section for Propeller Shaft Data.

REAR AXLE

Own Make. Semi-floating, hypoid gear type with torque tube drive.
See Rear Axle Section for complete data.
Ratio—(Std.) 4.4-1 (9-40), (Overdrive) 4.1-1 (10-41), (Hydra-Matic) 3.5-1 (11-39).
Backlash—.004-.006". Shim adjustment.
Removal: Raise and support rear end of car. Disconnect rear brake cable at center equalizer. Disconnect torque tube at rear of transmission. Disconnect brake hose and shock absorbers at the axle end, (will hang from the body). Roll axle free from car.
Axle Shaft Removal—Remove wheel, pull drum (use hub puller J-1644). Disconnect brake line and cable. Remove backing plate mounting bolts nuts, take off oil seal retainer, backing plate, and wheel bearing adjusting shims (check thickness of shims, replace same amount when re-assembling). Withdraw axle shaft using Puller J-2498, do not drag on inner seal.
Wheel Bearing Adjustment—Shims located between backing plate and flanged end of housing. To adjust, remove wheel and backing plate (above), add or remove shims for endplay. **Endplay**—.002-.004".

SHOCK ABSORBERS

Delco or Monroe—Direct acting, hydraulic type.

FRONT SUSPENSION

Front Suspension: Independent, linked parallelogram type with coil springs and direct acting shocks.
See Front Suspension for complete data.
Kingpin Inclination—8½° crosswise.
Caster—0° desired. Limits 0° to Pos. ½°. Shim adjustment ("C" washers) at upper control arms.
Camber—0° desired. Limits Neg. ¼° to Pos. ¼°. Shim adjustment as for Caster (above).
Toe-In—1/16" to 3/16". Loosen clamp at both ends of adjustable tubes in each tie rod. Turn tubes equally.
Steering Geometry—Inner wheel 23° plus ½°, minus 0°. Outer wheel 20°.

STEERING GEAR

Gemmer Model 305—Worm-and-roller type with "push-pull" adjustments.
See Steering Gear Section for complete data.

BRAKES

Service Brakes: Bendix hydraulic, duo-servo, single anchor type without Eccentric Adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.
Drums—Cast-iron. Diameter 10".
Lining—Moulded type. Width 2". Thickness 3/16". Length 22" per wheel.
Clearance—.015" heel and toe. Eccentric adjustment for each shoe.
Braking Power—53% front wheels, 47% rear.
Hand Brakes: See Service Brake data (above).

MISC. MECHANICAL

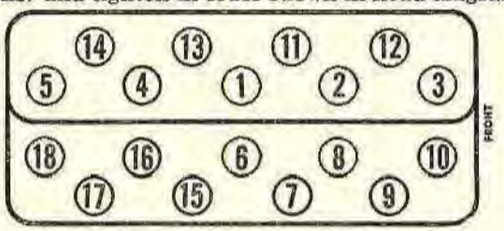
Windshield Wiper: Cable Operated—vacuum type.
See Miscellaneous Section for complete data.

Remove air cleaner, generator, and spark plug wire retainers (name plates on valve covers). Disconnect wires at spark plugs, throttle linkage, and spark plug wire and air cleaner supports from cyl. heads. Take off distributor cap, lift off cap, high tension wire assembly and supports off engine as an assembly. Remove carburetor fuel and vacuum lines, external water by-pass (tube around lower end of oil filler pipe), valve covers, intake manifold with coil and carburetor attached. Disconnect exhaust pipe from exhaust manifold. Remove rocker arm shaft assembly, push rods. Remove cylinder head with exhaust manifold by taking out 14 cylinder head bolts.

CYLINDER HEAD INSTALLATION: Reverse removal instructions given above and note following:

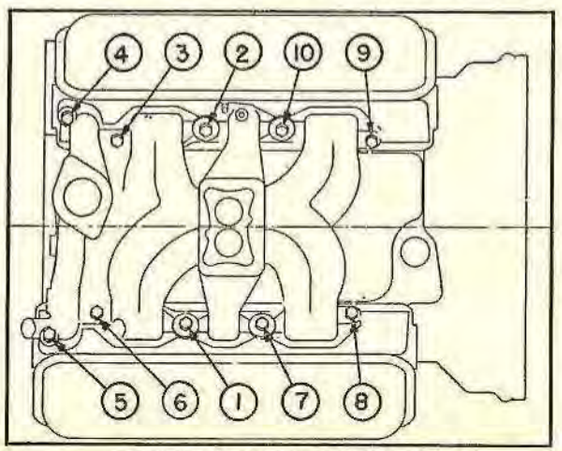
Gaskets. Use all new gaskets. Use POB No. 3 sealer and coat both sides of head and intake gaskets. Cement cover gaskets to valve covers. ***Install head gaskets with crimped side UP.***

Cylinder Head Bolts. 7/16" bolts used as follows: Four 6" bolts at rocker arm supports. Ten 4½" bolts through center of head. Four 2½" bolts at bottom. Use a Torque Wrench (see Tightening Specifications) and tighten in order shown in head diagram.



OLDSMOBILE ROCKET V8

Intake Manifold. ***CAUTION—Manifold must be centered between cylinder heads.*** Dip threads of six manifold bolts (two ⅜" x 1⅞" at front, and four ⅜" x 1½" at sides) in POB No. 3 sealer. Use large flat washers under manifold nuts, small flat washers on bolts. Use a Torque Wrench (see Tightening Specifications) and tighten in order shown below.

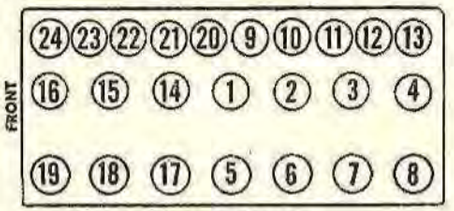


ROCKET V8 INTAKE MANIFOLD

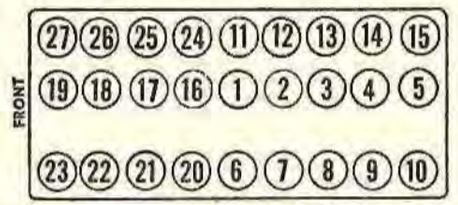
ALL 1950 & EARLIER (EXCEPT ROCKET V8)

CYLINDER HEAD SERVICING: Steel-asbestos cylinder head gasket used. **This gasket cannot be reused.** When installing new gasket, coat both sides with thin coat of P.O.B. Perfect Gasket Seal at room temperature (approx. 70°F.). Edges at cylinder bore holes must be wiped clean of all sealer. To prevent leakage, a plain washer is used under bolt heads.
1941-47 Note. Install gasket with 3/16" flange next to cyl. block (flange on upper side 3/32" wide).
1939-41 8 cyl. Engine Note—Install new neoprene grommet in pump by-pass hole on front of head.

INSTALLING CYLINDER HEAD: Use a Torque Indicating Wrench to tighten cylinder head capscrews, tighten in correct sequence as shown in the diagram. Cast Iron heads should be tightened cold and rechecked after engine has been run sufficiently to bring all parts to normal operating temperature.



OLDSMOBILE SIX



OLDSMOBILE 8 (1948 & EARLIER)

Tightening Torque—See Tightening (Torque Wrench) Specifications below.

TIGHTENING SPECIFICATIONS

1949-51 MODELS

	Ft. Lbs.	In. Lbs.
Con. Rod Nuts (self-locking)	45-50	540-600
Crankshaft Front End Bolt	130-140	1560-1680
Cylinder Head Capscrews	60-70	720-840
Exh. & Int. Manifold Nuts (V8)	22-26	264-312
Exh. to Int. Manifold Bolts (6)	22-26	264-312
Flywheel to Crankshaft (6)	55-60	660-720
Flywheel to Crankshaft (V8)	65-70	780-840
Flywheel Housing to Block	50-55	600-660
Front Cover to Block (V8)	30-35	360-420
Front Plate to Block (6)	22-26	264-312
Main Bearing Capscrews (Rear)	140	1680
" " " (All Others)	100	1200
Oil Pan Capscrews	9-11	108-132
Oil Pump to Block (6)	30-35	360-420
Oil Pump to Bearing Cap (V8)	11-14	132-168
Rocker Shaft Sup. to Block (V8)	18-22	216-264
Spark Plugs (14 MM.)	28-35	336-420
Torus Cover (H-M) to Flywheel	30-35	360-420
Transmission to Housing	60-70	720-840

1941-48 MODELS

	Ft. Lbs.	In. Lbs.
Spark Plugs (14 MM. Type)	28-35	336-420
Cylinder Head Capscrews	60-70	720-840
Main Bearing Bolts:		
All (except Rear)	100	1200
Rear Only	140	1680
Connect. Rod Nuts (slotted lock)	50-55	600-660
Piston Pin Lockscrews	9-11	108-132
Flywheel to Crankshaft Bolts	55-60	660-720
" " " (Hydra-Matic)	60	720
Front Engine Mounting to Frame	25-30	300-360
Rear Eng. Mtg. to Clutch Hous'g	45-50	540-600
Exh. to Int. Manifold Bolts	22-26	264-312
Manifold to Block Nuts	11-14	132-168
Crankshaft Front End Bolt	130-140	1560-1680
Clutch Cover Mounting Bolts	22-26	264-312
Transmission to Housing	60-70	720-840

1940 & PREVIOUS MODELS

Cylinder Head Capscrews	60-70	....	720-840
Piston Pin Lockscrews	9-11	....	108-132
Main Bearing Bolts:			
#2 and #3	120	....	1440
#1 and #4 (#5 on Eight)	140	....	1680
Spark Plugs (14 MM. Type)	28-35	....	336-420
Con Rod Nuts (regular type)	30-35	....	360-420
" " " (self-locking type)	50-55	....	600-660

ENGINE FRONT COVER

1949-51 ROCKET V8 ENGINE

ENGINE FRONT COVER REMOVAL: Drain cooling system. Disconnect lower radiator hose and heater hose from front cover, external water by-pass (tube at base of oil filler pipe), and generator link at generator. Remove oil pan (see Oil Pan Removal). Take out two front motor mount-to-frame bolts. Use Tool Set BT-29 and support engine with motor mount clear of frame front cross-member. Remove radiator core and shroud, fan blades and pulleys, lower pulley and harmonic balancer, and fuel-&-vacuum pump. Take out front cover attaching screws (five 1¾" screws on outside of cover, two 4" screws through water pump housing—one each side at center, use 9/16" wrench).

1949-51 ROCKET V8 ENGINE

ENGINE FRONT COVER INSTALLATION: Reverse removal data given above and seal as follows: Use new front cover gasket and cement to cover with V.G. 1000 cement. Apply Fiske lubriplate to fuel pump mounting pad and to front oil seal. Coat threads of cover screws and water by-pass fittings with POB No. 3 sealer.

PISTON PINS

1937-48 MODELS

FOR ALUMINUM PISTONS

PISTON PINS:—Servicing—Standard size pins only furnished for service. Pin bosses in pistons electrolited and must not be reamed. Replacement pistons (standard and oversize) furnished with pins fitted.

Removal:—To remove pin, take out lockscrew, place

CONTINUED ON NEXT PAGE

Spring-loaded button should not be assembled to camshaft on 1941 engines (see above). 1941 timing chain cover equipped with camshaft thrust plate so that this cover may be used in service for earlier cars. Thrust plate does not function on 1941 engines.

1949-51 ROCKET V8 ENGINE

CAMSHAFT REMOVAL: Drain radiator. Remove radiator hoses, heater hoses, air cleaner, fuel and vacuum lines, distributor, throttle linkage from carburetor, fan, fan pulleys, fan belts, generator, generator belt, generator bracket, spark plug wire support, external water by-pass tube, valve covers, rocker arm assembly, push rods, intake manifold, cylinder block cover, valve lifters (keep clean and in order for re-installation in same position), upper radiator baffle, radiator core, harmonic balancer and pulley as an assembly, fuel pump, exhaust pipe cross-over, steering idler arm, oil pan, front engine mounting (use Tool Set BT-29 to support engine), engine front cover, fuel pump eccentric, timing chain and sprocket, thrust plate, and camshaft.

►*CAUTION*—Withdraw camshaft carefully to prevent bearing damage as follows: Slide camshaft through each bearing while slowly rotating shaft, hold shaft at front end and guide it from the rear.

VALVE SYSTEM

1949-51 ROCKET V8 ENGINE

VALVE LIFTER REMOVAL: Remove intake manifold, cylinder block cover, valve covers, rocker arm shaft assemblies, push rods, and valve lifters.

►*CAUTION*—Valve lifters must be re-installed in same bores from which removed.

ROCKER ARM SHAFT ASSEMBLIES: Identical hollow steel tube shafts (ends plugged) are used. Four removable supports for each shaft, one support doweled to shaft for oil feed (at oil line from #2 camshaft bearing on left side, from #4 camshaft bearing on right side). Three springs used to position center rocker arms against supports. End rocker arms retained by wave washer, flat washer, and cotter key.

Rocker Arm Shaft Disassembly: With assembly off engine, remove cotter key and washers from end of shaft. Remove rocker arms, supports (except doweled support which should not be removed from shaft), and springs.

►***CAUTION—Rocker arms should be stored so that they can be reassembled in their original position.***

Rocker Arm Shaft Reassembly: Assemble supports in proper position as to doweled support (oil supply). Push rod end of rocker arms must be on same side as large cylinder head bolt hole in each support.

OIL PUMP

1939-47 MODELS

OIL PUMP: Gear type pump. Six and Eight pump identical except for gear faces which are ¼" wider on Eight. When assembling pump gear on shaft, press shaft on gear flush with outer end of gear (Six), with gear extending ¼" beyond end of shaft (Eight—Use Tool J-954 which properly positions gear on shaft). Pump drive gear must be assembled with Feeler Gauge J-954-1 between inner face of gear hub and pump body to give proper end clearance for pump shaft. Use new pump body gasket.

Installation—Set engine in firing position for #1 cylinder with rotor opposite #1 segment in distributor cap. Note position of distributor shaft tongue for proper oil pump drive gear mesh, then raise distributor and mesh pump drive gear with camshaft gear. Replace distributor in position and reset ignition timing.

1949-50 SIX CYLINDER

OIL PUMP: Disassembly. With pump off engine, use an arbor press and Tool J-959 and press drive gear off shaft and take out woodruff key. Disassemble pump, take off cover, oil pump gears and shaft.

Assembling Pump. With pump gear on flat surface and woodruff key in place on shaft, press shaft through gear until flush with outer end of gear. Put idler gear on stub shaft in pump body, slide pump shaft and gear assembly into place in pump housing. Place woodruff key on upper end of shaft and press pump drive gear on shaft with Tool J-954-1 between inner face of gear hub and pump body (gives proper end clearance of pump shaft assembly). Install piston, relief spring and nut in pump cover, bolt cover to body. Use new gaskets between pump cover and body, and between pump body and cylinder block.

Installation. Set engine in firing position for #1 cylinder with rotor opposite #1 segment in distributor cap. Note position of distributor shaft tongue for proper oil pump drive gear mesh, then raise distributor and mesh pump drive gear with camshaft gear. Replace distributor in position and reset ignition timing.

OIL PAN REMOVAL

1942-47 MODELS
1948 DYNAMIC MODELS

OIL PAN REMOVAL: Oil pan can be removed as follows: Disconnect idler arm support from frame dropping steering relay rod assembly. On 8 cylinder only, remove flywheel lower pan. For access to bolts at front end of pan, unhook splash guard fasteners and work through openings in front frame cross-member. Third bolt from front on each side requires use of end wrench to clear front suspension cross-member. Remove right and left filler plates (rotate left plate out). With all pan bolts removed, turn crankshaft to place counterweights up out of the way, take off pan.

Installation—Use new gaskets and allow them to dry before installing so as to prevent gasket moving when pan installed on engine.

1949-50 SIX CYLINDER

OIL PAN REMOVAL: Disconnect steering idler arm from frame and drop steering relay assembly. Drain radiator, disconnect radiator hoses. Remove two front engine mounting-to-frame bolts, raise engine approx. ¾". For access to pan bolts at front end, unhook fasteners on splash guard between cross-member and radiator baffle and work through openings in cross-member. Front bolts on each side of pan must be removed with an end wrench. With pan bolts removed, rotate crankshaft to place counterweights up for clearance, remove oil pan.

Installation—Use new gasket coated with cement. Allow cement to dry for easier installation.

1949-51 ROCKET V8 ENGINE

OIL PAN REMOVAL: Remove starter and exhaust cross-over pipe. Disconnect idler arm from frame and drop steering relay rod. Remove oil pan cap-screws and withdraw pan.

RADIATOR

1942-48 MODELS

RADIATOR CORE REMOVAL: To remove radiator core, raise hood, drain cooling system, detach upper and lower radiator hoses, take out four radiator core-to-core support bolts at each side, lift out core (rotate fan as required).

1949-50 SIX CYLINDER

RADIATOR CORE REMOVAL: Drain radiator, disconnect radiator hoses and hood latch cable. Take off upper radiator baffle. At each side, remove one shroud-to-core self-tapping screw and four core-to-core support self-tapping screws. Lift core out (rotate fan as required).

1949-51 ROCKET V8 ENGINE

RADIATOR CORE REMOVAL: Drain radiator, disconnect radiator hoses. Remove radiator upper baffle, radiator shroud and lift core out.

COOLING SYSTEM

1946-47 EIGHT CYL. MODELS

RADIATOR SHROUD #555107 FOR 1946-47 EIGHT CYLINDER: This assembly used on 1948 Eight Cylinder Series 68 and 78 to maintain proper water temperatures for high altitude and extremely high outside temperatures. This shroud can be installed on 1946-47 Eight Cylinder Series 68, 78, and 98.

Radiator Shroud Installation on 1946-47 Eight Cylinder Series 68, 78, and 98—Drain radiator just enough to permit disconnecting upper end of top hose. Remove radiator baffle cover and take off hood latch as an assembly. Remove radiator baffle. Disconnect radiator support from radiator by taking out 1 bolt and 3 screws on each side. Free wiring harness from clips at upper radiator tank. Loosen upper end of top radiator hose. Pull radiator forward just enough to slide shroud in place between core and support. Re-assemble all parts and fill radiator.

CLUTCH NOTES

1939-51 MODELS

CLUTCH RELEASE BEARING WITH LUBRICATION FITTING:—Production Change on 1940 Models—Beginning with '40 Eng. No. G-190392 (6 Cyl.), L-365742 (8 Cyl.), new type release bearing which has pressure gun fitting used so that bearing can be lubricated in service. Fitting extends down at angle toward left side and is accessible by removing lower clutch cover pan. Lubricate at 5000 mile intervals for extreme service (taxi, etc.) using petrolatum (or white or amber vaseline). CAUTION—Bearing wear will be increased if other than recommended lubricant used. Fill bearing using a small high pressure hand gun until petrolatum appears at small vent hole at top of bearing.

arm clamp bolt, rotate distributor until contacts begin to open (use timing light connected between ignition terminal and ground and turn on ignition, light will go on as contacts open), tighten clamp bolt. Check Octane Selector setting.

Octane Selector—Should be set for slight ping when accelerating engine with wide open throttle at speeds below 15 MPH. To adjust, loosen distributor hold-down screw, rotate distributor clockwise toward 'Adv' end of scale (if no ping noted), counter-clockwise toward 'Ret' end of scale (if ping too severe). Check performance after making adjustment.

CARBURETOR

CARBURETION:—Carburetor—Carter Model WA-1 Type 426-S (Std.), 425-S (With Self-shifting Transmission). 1¼", single barrel, downdraft type.

For complete data, refer to Carburetor Index.

Important—Cars with Self-shifting Transmission—Transmission throttle control lever setting must be checked and adjusted whenever carburetor throttle linkage disconnected or disturbed. *See Oldsmobile Self-Shifting Transmission article in the Transmission Section.*

Settings (Idle Setting, Float Level, and Accelerating Pump): *See Tune-Up data.*

Fast Idle:—Integral type. Built-in carburetor.

For complete data, refer to Carburetion Equip. Index.

Setting—Bend fast idle link so that choke valve opening is 5/8" with throttle valve closed and stop-screw turned in to contact lowest step of fast idle cam (cam revolved so stopscrew against but not on first step of cam).

Accelerator Linkage Adjustment:—Must be set for correct 'throttle-cracking' action for starting. To adjust, disconnect starter cable (to prevent cranking), fully depress starting switch pedal, loosen locknut on eccentric pin on starter shift lever, use offset screwdriver and adjust pin to give .030" clearance between throttle stopscrew and fast idle cam (cam in fast idle position), tighten locknut.

Automatic Choke:—Carter Climatic Control.

For complete data, refer to Carburetion Equip. Index.

Setting—Notch on thermostatic coil housing should be two notches Rich (clockwise) from reference mark on housing.

CARB. EQUIPMENT

Air Cleaner:—AC #1528602 oil-wetted type Std., #1528970 heavy duty oil-bath type Optl.

Fuel Pump:—AC Type AH #1523844 Std., Type AJ #1523825 combination fuel-and-vacuum type Optl.

For complete data, refer to Carburetion Equip. Index.

Gasoline Gauge:—AC Electric type. #1515358 (dash unit), #1515492 (tank unit).

For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—Delco Model 15E-1. 6 volt, 15 plate, 100 ampere hour capacity (20 hour rate).

Starting Capacity—115 amperes for 20 minutes.

Grounded Terminal—Negative (—) terminal.

Location—Left side under engine hood.

STARTER

Delco-Remy Model 1107007. Armature No. 1867897.

Drive—Manual pinion shift and overrunning clutch.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces.

Cranking Engine—125-135 amperes, 5 volts (summer).

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 "	Lock	3.37	525

Removal:—Flange mounted on left front face of flywheel housing. To remove take out flange mounting screws.

Starting Switch:—No. 820052. Mounted on starter. Operated by pedal-operated pinion shift lever.

GENERATOR

STANDARD

Delco-Remy Model 1100009. Armature No. 1866789. Fixed third brush control with external vibrating voltage regulator. Ventilated by fan on drive pulley.

Charging Rate Adjustment—See Regulator data below.

NOTE—Third brush fixed in place for maximum output and should not be disturbed.

Maximum Charging Rate—As given in table below. To check charging rate, connect test ammeter in charging line at regulator 'BAT' terminal, voltmeter between 'BAT' terminal and ground, ground 'F' terminal to eliminate regulator action.

Performance Data

	Amperes	Volts	R.P.M.
Cold	26-30	8.0	3400
Hot	25-28	8.0	3600

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—25 ozs. (main), 17 ozs. (third brush).

Field Current—2.3-2.6 amperes at 6.0 volts.

Removal:—Pivot mounted at left front of engine. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Swing generator out until belt deflection midway between generator and fan pulley is ¾" with light pressure.

GENERATOR

SPECIAL EQUIPMENT

Delco-Remy Model 934-F (for City Police Cars), 1102657 (State Police). Used with Double Core Type Voltage and Current Regulators 5599 (934-F), 5872 (1102657). *Refer to 1938 Oldsmobile Eight L-38 pages for complete data on these Generators and Regulators.*

Other Types—Models 1105851 or 1105856 (State Police). Used with new type Single Core Voltage & Current Regulator. *Refer to 1940 Oldsmobile Eight pages for data on these Generators and Regulators.*

REGULATOR

Delco-Remy Model 5858. "Double Core" Voltage Regulator (No 'IGN' Terminal). Cutout Relay and vibrating type Voltage Regulator in case on engine side of dash.

For complete data, refer to Electrical Equipment Index.

Cutout Relay

Cuts In—6.3-6.9 volts, 825 R.P.M. (generator).

Cuts Out—0-4.0 amperes discharge current.

Contact Gap—.020". **Air Gap**—.020" (closed).

Voltage Regulator

Setting—7.5-7.9 volts (70°F), 7.4-7.6 volts (150°). Regulator over-compensated for temperature and must be checked at these points.

Adjustment—Connect ammeter in charging line at regulator 'BAT' terminal, voltmeter between 'BAT' terminal and ground. Operate generator at 2800-3000 R.P.M., adjust charging current to 8-10 amperes (use variable rheostat or AVR set), adjust regulator by bending spring hanger at lower end of armature spring slightly for setting shown above.

CAUTION—Regulator cover must be in place when tests made. Do not operate generator on open-circuit.

Contact Gap—.020". **Contact Spring Tension**—3.5 ozs.

Air Gap—.063" between armature and center of core with armature down so fibre bumper just touches stop, .010". between fibre bumper and stop with armature up.

LIGHTING

LIGHTING: *See "1939 Oldsmobile Eight" for data.*

MISC. ELECTRICAL

THERMOSTATIC RELAY & HORNS: *See "1939 Oldsmobile Eight" for data.*

ENGINE

F-39 '60' & G-39 '70' ENGINE NOTE:—Some parts on these engines are not identical and must not be interchanged (though similar in appearance), other parts are identical for both engines as follows:

Identical Parts:—Following parts same for F and G engines: Cylinder Blocks, Flywheel, Main Bearings, Pistons, Timing Chain and Sprockets, Valve Springs, Valve Guides, Valve Lifters, Oil Pump, Water Pump, Water Thermostat, and Carburetor.

Dissimilar Parts:—Following parts are not identical and must not be interchanged:

Cylinder Head—Marked by numeral cast in head: '216'—F-39, '230'—G-39 (early G-39 heads unmarked). Heads must not be interchanged.

Crankshaft—Marked by letter cast on largest counterweight: 'F'—F-39, 'G'—G-39. Throw greater on G-39.

Camshaft—Letter 'F' cast in shaft near GM trademark for F-39 camshaft only. G-39 shaft longer and unmarked.

Connecting Rod—Round Boss in center of rod I-beam section on F-39 rod only. G-39 connecting rod ⅛" shorter and unmarked (serviced by 'L' rods).

OIL PAN REMOVAL: *See Oldsmobile Shop Notes.*

ENGINE SPECIFICATIONS:—6 cylinder, 'L' head.

Bore—3 7/16". **Stroke**—3⅞" (F-60), 4⅛" (G-70).

Displacement—216 cu. ins. (F-60), 229.7 (G-70).

Rated Horsepower—28.4

Developed Horsepower—90 (F-60 Std. Hd), 85 (F-60 LC), 95 (G-70 Std.), 90 (G-70 LC) at 3400 RPM.

Compression Ratio—6.2-1 (Std. F-60), 6.1-1 (Std. G-70), 5.67-1 (Optl. F-60), 5.61-1 (Optl. G-70).

See Oldsmobile Shop Notes for Cylinder Head Servicing.

Vacuum Reading—*See Tune-Up data.*

PISTONS:—Aluminum alloy, 'T' slot, cam ground type with hard oxide bearing surface.

Weight—17.75 ozs. (stripped). **Length**—4 1/32".

Removal—Pistons and rods removed from above.

Clearance—Top .026". Skirt .0013-.0018".

Replacement Pistons:—Finished pistons (pins fitted) .003", .005", .010", .015", .030" oversize (Std. Weight).

Fitting New Pistons:—Insert .002"x½" feeler between piston and cylinder wall on valve side with piston (pin out) inverted and 'T' slot on opposite side from feeler. Pull to withdraw feeler must be 4-11 lbs. (at 70° F., low lbs. pull below 70°, high above 70°).

Installing Pistons:—Mark 'V-S' on head toward valves (slot away from valves). Pin hole offset 3/32" to left.

CONTINUED ON NEXT PAGE

FRONT END SHEET METAL ASSEMBLY REMOVAL:—*See Oldsmobile Special Data for complete data.*

MODEL IDENTIFICATION

SERIAL NUMBER:—For each plant as follows: L-228201 Up (Lansing, Mich.), CL-189001 to CL-195000 (South Gate, Calif.), LL-199001 to LL-212000 (Linden, N.J.). On left hand frame side member under hood.

ENGINE NUMBER:—First number L-316001 (cars with Self-shifting transmission have prefix 'LA' instead of 'L'). Stamped on boss on left side of cylinder block behind water pump.

TUNE-UP

COMPRESSION:—Ratio—6.2-1 Std., 5.8-1 Optl. **Pressure**—152 lbs. (Std Hd.), 125 lbs. (Optl. LC. Hd.) at 1000 R.P.M. or approximately 104-114 lbs. at cranking speed for Std. head.

VACUUM READING:—Steady 17" min. at 6 MPH, idling

FIRING ORDER: 1-6-2-5-8-3-7-4. See diagram.

SPARK PLUGS: AC Type 45. 14 mm. Metric. **Gaps**—.030".

IGNITION: See Coil, Condenser, and Distributor. Breaker Gap—.015". **Cam Angle**—31° Closed. **Automatic Advance**—15° max. at 2000 RPM (distr.). **Vacuum Advance**—7½° (distr.) with 14-17"vacuum.

IGNITION TIMING: See Ignition Timing. Std. Setting—2° BTDC. Flywheel mark (steel ball) aligned with insp. hole pointer (left side housing). CAUTION—Time #6 cylinder on this engine.

CARBURETION: See Carburetor & Carb. Equipment. Idle Setting—Set idle screws ½-1¼ turns open. Idle speed 6 MPH (or 3rd gear Self-Shift. Trans.). **Float Level**—⅜" from top of float to cover with needle valve seated. **Accelerating Pump**—Not adjustable. **Fuel Pump Pressure:** 4 lbs. maximum.

MANIFOLD HEAT CONTROL:—Automatic thermostatic coil type. See that valve operates freely. When installing thermostatic coil, wind coil up 160° or slightly less than ½ revolution at 70°F.

VALVES: See Valve Timing. Tappet Clearance .008" Intake, .011" Exhaust, hot.

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

Ignition Switch:—Delco-Remy No. 1116267. Connected to coil by armored cable. **Ignition Lock**—Briggs & Stratton No. 45792. Key Series—8000 to 9499. Groove—No. 15.

COIL: Delco-Remy Model 1115129. On dash. Ignition Current—2.0 amperes idling, 4.5 stopped.

CONDENSER: Delco-Remy No. 1869704. Capacity—.18-.25 microfarad.

DISTRIBUTOR: Delco-Remy 1110803. Single breaker, 8 lobe cam, full automatic advance with auxiliary vacuum spark control and Octane Selector. **Breaker Gap**—.015", Limits .0125-.0175". **Cam Angle or Dwell**—31° closed, 14° open (distr.). **Breaker Arm Spring Tension**—22 ounces. **Rotation**—Counter-clockwise viewed from the top.

Distr. Degrees	Automatic Advance R.P.M.	Degrees	Eng. R.P.M.
Start	300	2.5	600
3.5	500	7	1000
15	2000	30	4000

Vacuum Spark Control Model 681-R—Integral type (mounted on distributor cup, linked to breaker plate). Provides additional advance at speeds above idling except when engine accelerated or operated with wide open throttle when spark retarded by return spring in unit. Plunger travel 11/64" total.

Distr. Degrees	Vacuum Advance Eng. Degrees	Vacuum (" of HG).
Start	0	5-7"
7.5	15	14-17"

Octane Selector—Adjustment at distributor. Permits 10° advance or retard from center '0' position. See Ignition Timing for adjustment directions.

Removal:—Distributor mounted on left side of engine. To remove, disconnect vacuum line, take out hold-down screw in advance arm.

IGNITION TIMING

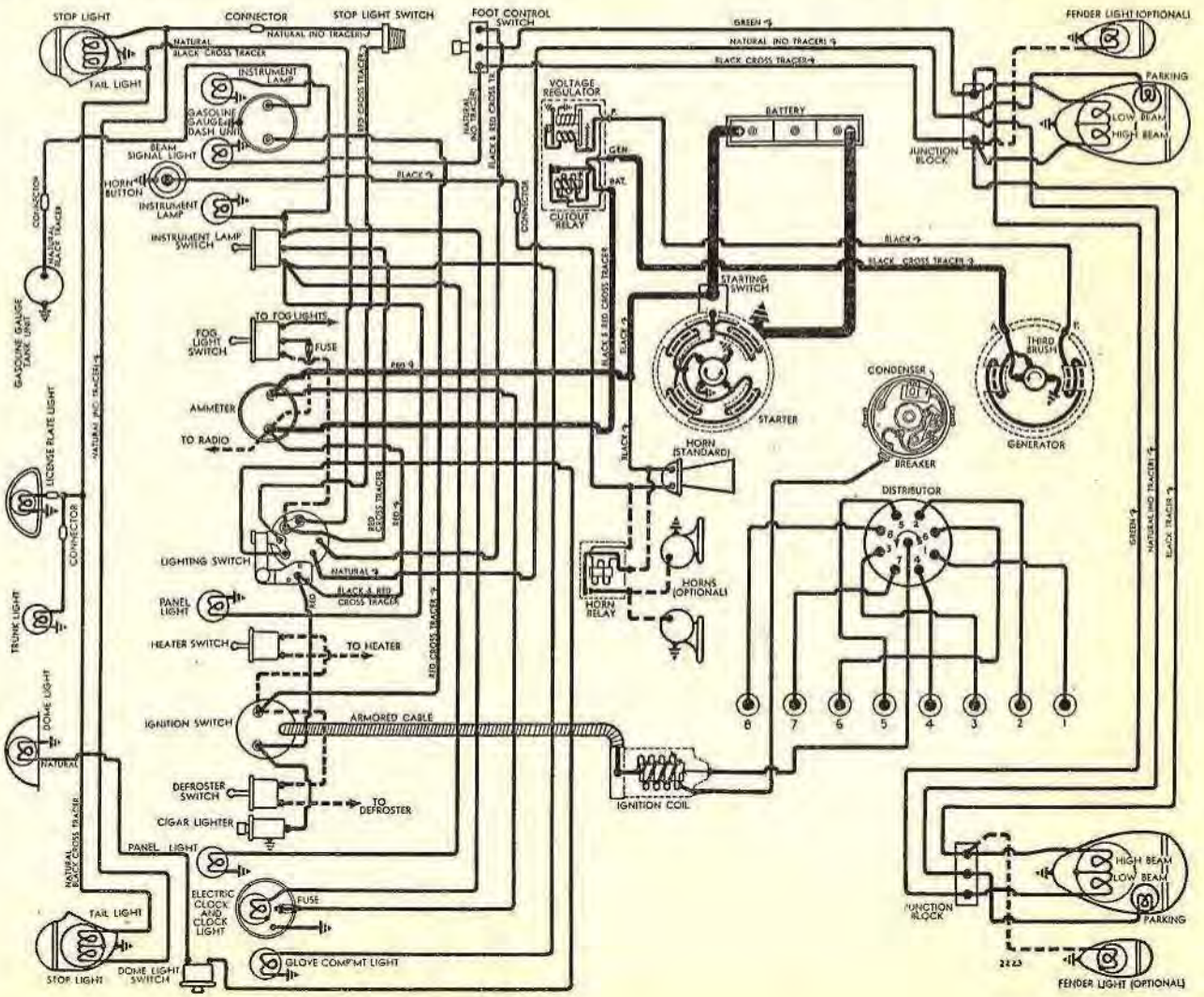
	Flywheel Degrees	Piston Position
All Engines	2° BTDC	.002" BTDC

NOTE—Flywheel timing mark (steel ball insert) is for #6 cylinder (#1 cylinder not used or marked).

Timing (Using Synchroscope)—This method recommended by manufacturer. Clip synchroscope lead to #6 spark plug, direct light on flywheel through inspection hole in left front face of flywheel housing beside starter. Idle engine, loosen hold-down screw, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until timing mark (steel ball insert in flywheel) appears in line with pointer in inspection hole, tighten clamp bolt. Check Octane Selector setting.

Timing (Without Synchroscope)—Turn engine over to firing position for #6 piston with steel ball insert in flywheel in line with pointer in inspection hole in left front face of flywheel housing. Loosen hold-down screw in advance arm, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until contacts begin to open (using timing light connected between ignition terminal and ground and turn on ignition, light will go on as contacts open), tighten clamp bolt. Check Octane Selector setting.

CONTINUED ON NEXT PAGE



ENGINE

CONTINUED FROM PRECEDING PAGE

PISTON RINGS:—2 compression (tapered. O.D. .001" larger at bottom), 2 oil control rings per piston, all above pin.

NOTE—Install comp. rings with mark TOP to top.

Ring	Width	End Gap	Side Clearance
Compr.	.0925-.0935"	.009-.014"	.001-.003"
Oil	.1860-.1865"	.009-.014"	.001-.0025"

Replacement Rings:—.010", .020", .030" oversize.

PISTON PIN:—**Diameter**—.8554-.8557". **Length 2 31/32".** Pin locked in 1 piston boss by lockscrew. **Free end** slotted (allows boss to slide on pin). Bosses plated. **Pin Fit in Piston**—.0001" loose to .0002" tight in plain boss end, .0002-.0005" tight in lock boss end. **Pin Fit in Rod Bushing**—Clearance .0003-.0006". **Fitting Pins**—*See Oldsmobile Shop Notes.*

CONNECTING ROD:—**Length 7 13/16". Weight 28.0 ozs.**

Crankpin Journal Diameter—2.123-2.124".

Lower Bearing—Removable steel-backed, babbitt.

Clearance—.0005-.0025". **Sideplay**—.0055-.0105".

Bearing Adjustment:—None. Replace bearings.

Installing Rods:—Oil spit hole in lower bearing upper half to valves. Grooves in rod and cap bolt boss on part number side must be matched. Ground bolts used (tighten to 30-35 ft. lbs. with J-1264 torque wrench).

CRANKSHAFT:—5 bearing. 8 integral counterweights. **Journal Diameters**—#1, 2.478-2.479"; #2, 2.5405-2.5415"; #3, 2.603-2.604"; #4, 2.6655-2.6665"; #5, 2.6855-2.6865".

Bearings—Removable steel-backed, babbitt-lined. Upper and lower halves interchangeable.

Clearance—.001-.003" (#1, 2, 3, 4), .0005-.002" (#5).

Bearing Adjustment:—None (no shims). Replace bearings. Do not file caps. Tighten bolts to 135-145 ft. lbs. with J-1264 torque wrench. **Endplay**—.004-.008". *See Oldsmobile Shop Notes for main bearing removal, end thrust and oil seal data.*

CAMSHAFT:—5 bearing. Non-adjustable chain drive. **Journal Diameters**—#1, 2.0600-2.0595"; #2, 1.9975-1.9970"; #3, 1.9350-1.9345"; #4, 1.8725-1.8720"; #5, 1.8100-1.8095".

Bearings—Bronze bushings. **Clearance .0015-.0035".**

End Thrust:—Spring-loaded steel plunger in front of camshaft bearing against steel plate on chain cover.

Timing Chain:—Link-Belt #365. Width 1". Pitch .500". Length 47 links or 23½". *See Oldsmobile Shop Notes for front end sheet metal assembly removal.*

Camshaft Setting:—Mesh chain with sprocket marks adjacent and in line with a straightedge across the shaft centers (or use Gauge HM-408-0).

VALVES:—	Head Diameter	Stem Diameter	Length
Intake	1 9/16"	.3415-.3425"	5 51/64"
Exhaust	1 27/64"	.3410-.3418"	5 51/64"

	Seat Angle	Lift	Stem Clearance
Intake	30°	.286"	.00175-.00375"
Exhaust	45°	.313"	.00245-.00425"

Valve Guides:—Length 3 7/32" (¼" shorter at top over '38. May be used on '37 and '38 models). Press guides in so top end ⅞" below top of block (Tool J-1042). Ream to .34425-.34525".

Valve Springs:—Free length 2⅝". Damper used in top of each spring.

	Spring Pressure	Length
Valve Closed	50½ lbs.	2 1/4"
Valve Open	95½ lbs.	1 15/16"

Valve Lifters:—Mushroom type. Body Diam. .6235-.6240". Serviced by installing lifters furnished .001", .0015", .002", .005", .010" O.S. **Clearance .0003-.0007".**

NOTE—Lifter holes have bearing-ized finish. Fit lifters without reaming hole wherever possible.

VALVE TIMING

Tappet Clearance:—.008" Intake, .011" Exh. hot.

Valve Timing:—See Camshaft Setting above.

Intake Valves—Open at TDC. Close 35° ALDC.

Exhaust Valves—Open 45° BLDC. Close 10° ATDC. These figures correct with tappet clearance of .0124" Intake and .0155" Exhaust.

Valve Timing Check—Set tappet clearance #1 intake valve at .0124". This valve should open with piston on top dead center (.000") when flywheel mark 'TDC/' (NOT steel ball insert) lines up with pointed end of the inspection hole cover screw in left front face of flywheel housing.

LUBRICATION

LUBRICATION:—Pressure (gear type oil pump on right of engine). *See Oldsmobile Shop Notes for pump data.*

Normal Oil Pressure:—28-33 lbs.

Oil Pressure Regulator:—On pump. Opens at 27 lbs. Non-adjustable type.

Crankcase Capacity:—6 quarts.

COOLING

COOLING SYSTEM:—**Capacity**—24 quarts.

Water Pump:—Packless, sealed bearing type. *See Water Pump Section for complete data.*

Thermostat:—Harrison. In cylinder head outlet. **Setting**—Starts to open 152° F. Fully open 173° F.

Temperature Gauge:—AC #1510796, 1510830 RHD. *See Miscellaneous Section for complete data.*

CLUTCH

CLUTCH:—**Borg & Beck Model 10A7.** Cover Assembly No. 897 (up to Eng. No. 318499), #927 (after Eng. No. 318499). Single plate, dry disc type. *See Clutch Section for complete data.*

Facings—Moulded-woven, 2 required. Inside Diameter 6" (897), 7" (927), Outside Diameter 10" (all), Thickness .125" (all). *See Oldsmobile Shop Notes for data on late 1940 type Clutch Release Bearing with Lubrication Fitting.*

Adjustment:—Pedal free movement 1-1½" (adjusting clevis and locknut on link at clutch fork).

NOTE—Arm on auxiliary shaft has 2 holes for pedal push rod link. Use front hole only.

Removal:—Remove transmission (see data below) mark clutch and flywheel, take out six mounting screws in cover flange. NOTE—Install two mounting screws with long shank in second hole on each side of locating dowel when installing clutch.

TRANSMISSION

TRANSMISSION:—**Own make.** All helical gear, constant-mesh, synchro-mesh (second & high), sliding gear (low & reverse) with new remote shift control. *See Transmission Section for complete data.*

Transmission Control:—Oldsmobile 'Handi-shift' type. *See Transmission Section for complete data.*

Removal:—Disconnect lower control rod at transmission and selector cable from cable anchor bracket, unscrew cable from shaft, remove selector shaft lever (with helper springs) and speedometer cable. Remove propeller shaft (disconnect rear U-joint pull shaft out), remove clutch housing underpan & reinforcing plate for access to 2 lower transmission mounting bolts & nuts, remove 2 mtg. screws at top.

SELF-SHIFTING TRANSMISSION

SELF-SHIFTING TRANSMISSION:—Optional. *See Transmission Section for complete data.*

UNIVERSALS

UNIVERSAL JOINTS:—**Mechanics Type 2C.** Roller bearing type. 2 used (3 with Self-Shift Trans.). *See Universals Section for complete data.*

Propeller Shaft Center Bearing:—On cars with Self-Shift transmission.

REAR AXLE

REAR AXLE:—**Own make.** Semi-floating, hypoid gear type with torque taken through 2 support arms. *See Rear Axle Section for complete data.*

Ratio—4.3-1 Std. 3.636-1 Self-Shift Tr. 4.55-1 Mt.

Backlash—.004-.008". Screw adjustment.

Removal:—Disconnect drive shaft at rear universal, (do not disengage spline joint at transmission), remove axle shafts (see below), remove capscrews on carrier flange, pull carrier assembly out.

Axle Shaft Removal—Hoist rear of car, remove wheel, brake drum and 4 nuts securing backing plate, remove static collector, and loosen bearing retainer (avoid shifting backing plate so as not to damage brake line). Pull shaft (Puller J-942). Do not drag shaft on seal. Secure backing plate with one nut. **Wheel Bearing Adjustment**—None.

Rear Suspension:—Coil springs with 2 support arms. *See Rear Axle Section for complete data.*

SHOCK ABSORBERS

SHOCK ABSORBERS:—**Delco.** Front—Model 1947-C (right), 1947-D (left). Rear—1751-U (right), 1751-T (left). Double acting, hydraulic type.

FRONT SUSPENSION

Front Suspension:—Independent, linked parallelogram type with coil springs. *See Front Suspension Section for complete data.*

Kingpin Inclination—4°51'10".

Caster—0-¾° reverse.

Camber—⅛-1°. Adjustable.

Toe In—⅛-3/16". Adjust each tie rod.

Steering Geometry (Toe-out on Turns)—Inner wheel turned 23° plus or minus ½°. Outer wheel 20°.

STEERING GEAR

Steering Gear: Saginaw Worm-and-Roller type with steering linkage with idler arm on right frame rail. *See Steering Gear Section for complete data.*

BRAKES

BRAKES:—**Service.** Bendix hydraulic, duo-servo, single anchor type with eccentric adjustment. Hand lever applies rear service brakes. *See Brake Section for complete data.*

Drums—Cast-iron. Diameter 12".

NOTE—Drum turn down limit .030" cut.

Lining—Primary—molded. Secondary—woven and compressed. Width 1¾". Thickness 3/16". Length—Primary 8 27/32" (front), 10 3/32" (rear); Secondary 12 61/64" (all).

Clearance—.010. at heel and toe of each shoe.

Hand Brake:—See Service Brakes above.

Timing (Using Synchroscope)—This method recommended by manufacturer. Clip synchroscope lead to #1 spark plug, direct light on flywheel through inspection hole in left front face of flywheel housing beside starter. Idle engine, loosen hold-down screw, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until timing mark (steel ball insert in flywheel) appears in line with pointer in inspection hole, tighten clamp bolt. Check Octane Selector setting.

Timing (Without Synchroscope)—Turn engine over to firing position for #1 piston with steel ball insert in flywheel in line with pointer in inspection hole in left front face of flywheel housing. Loosen hold-down screw in advance arm, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until contacts begin to open (use timing light connected between ignition terminal and ground and turn on ignition, light will go on as contacts open), tighten clamp bolt. Check Octane Selector setting.

Octane Selector Setting—Set for slight ping when accelerating engine with wide open throttle at speeds below 15 MPH. To adjust, loosen distributor hold-down screw, rotate distributor clockwise toward 'Adv.' end of scale (if no ping noted), counter-clockwise toward 'Ret' end of scale (if ping too severe). Check performance after making adjustment.

CARBURETOR

CARBURETION:—Carburetor—Carter Type WA-1, Models 466-S (Std.), 467-S (with Hydra-matic drive). 1¼" single barrel, downdraft type. #194 cast on face of flange.

For complete data, refer to Carburetor Index.

Hydra-matic Drive Car Note—Throttle linkage must be adjusted for correct transmission performance.

See Hydra-Matic Transmission article in Transmission Section for Throttle Linkage Adjustment procedure.

Idle Adjustment—With engine warm and running at slow idle speed (choke valve wide open, fast idle inoperative), set throttle stopscrew for 6 MPH idle speed (high gear—Conv. Trans.), 375 Engine R.P.M. Hydra-matic drive). Adjust idle adjusting screw until engine fires smoothly (½-1½ turns open—turn screw in for leaner mixture). Readjust idle speed.

Accelerator Pump Setting—Pump arm (under dust cover) has three holes for pump connector link engagement. Set as follows:

Lower (med. stroke)—Normal setting.
Inner (short stroke)—Hot temperature or premium fuels.
Outer (max. stroke)—Cold temperature or low-test fuels.

Float Level—⅜" from projection on cover to top of soldered seam at front end of float with needle valve seated (invert to check).

Fast Idle:—Integral type (built-in carburetor).

For complete data, refer to Carburetion Equip. Index.

Fast Idle Setting—Part of Climatic Control. Adjust by bending connecting link offset for ⅝" choke valve opening with stopscrew against (not on) first step of fast idle cam.

Accelerator Linkage Adjustment:—Must be set for correct 'throttle cracking' action for starting. To adjust, disconnect starter cable (to prevent cranking), fully depress starter switch pedal, loosen eccentric pin locknut, adjust pin to give .030" clearance between throttle stopscrew and high point of fast idle cam, tighten locknut.

Automatic Choke:—Carter Climatic Control.

For complete data, refer to Carburetion Equip. Index.

Choke Setting—Set coil housing 2 notches rich (466-S), center on index mark (467-S). Choke setting may be varied 2 notches.

CARB. EQUIPMENT

Air Cleaner:—AC #1528602 oil wetted type std.

Fuel Pump:—AC Type AJ #1537094 diaphragm type combination fuel-and-vacuum pump.

For complete data, refer to Carburetion Equip. Index.

Gasoline Gauge:—AC Electric type. #1515372 (dash unit), #1516206 (tank unit).

For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—Delco Model 15E-1 or 15E-2. 6 volt, 15 plate, 100 ampere hour capacity (20 hour rate).

Starting Capacity—120 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.5 minutes. Five second voltage—4.25 volts.

Dimensions—Length 19 5/16". Width 4". Height 9".

Grounded Terminal—Negative (—) grounded to starter motor housing.

Location—On left side under hood.

Police Battery:—Delco Model 19E-1. 6 volt. 19 plate, 130 ampere hour capacity (20 hour rate).

Starting Capacity—150 amperes for 20 minutes.

Zero Capacity—300 amperes for 5.3 minutes. Five second voltage—4.55 volts.

All other data as given above for 15E-1.

STARTER

Delco-Remy Model 1107007 (Std.), 1107034 (Cars with Hydra-matic Drive), 1107019 (RHD. Cars).
NOTE—Model 1107034 starter has provision for Hydra-matic Drive Interlock mounting. ***See Oldsmobile Hydra-matic Drive article in Transmission Section for Starter Interlock Adjustment.***
Armature Number—1867897 (1107007 & 1107034), 810601 (1107019 RHD. starter).
See Electrical Equipment Section for recommended correction for burning of starter commutators.
Drive—Overrunning clutch (manual shift on 1107-007 & 1107034), Solenoid pinion shift (1107019).
Rotation—Counter-clockwise at commutator end.
Cranking Engine—125-135 amperes, 5 volts at 100 RPM (summer temperatures) for 1107007.
Brush Spring Tension—24-28 ounces.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 "	Lock	3.37	525

Removal:—Mounted on left front face of flywheel housing. To remove, take out mounting screws.
Starting Switch (1107007 & 1107034):—No. 820052. Mounted on starter and operated by starting pedal.
Starting Switch (1107019):—Solenoid Switch type 1546 operated by pushbutton switch 1996008.
For complete data, refer to Electrical Equipment Index.

GENERATOR

Delco-Remy Model 1102664. Armature No. 1879002. (Std.), 1106403 (City Police), 1105851 or 1105856 (State Police). Two brush (shunt) type with voltage and current regulation.
Charging Rate Adjustment—No adjustment at generator. Charging rate controlled by Voltage Regulator and maximum output by Current Regulator.
See Regulator data following.
Maximum Charging Rate—33 amperes min. (hot or cold), 8.0 volts, 2400 RPM or approx. 20 MPH and above with load or discharged battery (Current Regulator setting). Actual charging rate controlled by Voltage Regulator and dependent on battery condition.

Performance Data Cold

	*Amperes	Volts	R.P.M.
1102664	30	8.0	1750
1106403	35	8.0	1040
1105851, 6	40	8.0	1850

*—Not maximum output—See Current Regulator.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—25 ounces each.
Field Current—1.75-1.9 amperes (1102664), 1.77-2.0 amperes (1106403), 1.62-1.82 amperes (1105851, 6) at 6.0 volts.

Removal:—Pivot mounted at left front of engine. To remove, take out clamp and pivot bolts.
Belt Adjustment:—Swing generator out until belt deflection midway between generator and fan pulley is ¾" with light pressure on belt.

REGULATOR

Delco-Remy Model 1118201 (for 1102664 Generator), 1118229 (1106403 Gen.), 1118237 (1105851,6 Gen.). Single Core Type. Vibrating type voltage and current regulators in single case with Cutout Relay.
CAUTION—Check generator for grounded fields before changing regulator settings.
For complete data, refer to Electrical Equipment Index.

Cutout Relay

Cuts In—6.2-6.7 volts (hot), 600 Gen. RPM.
Cuts Out—0-4.0 amperes discharge current.
Contact Gap—.020" (same for both sides).
Air Gap—.020" (with points just closed).

Voltage Regulator

Setting—7.2-7.4 volts hot (1118201), 7.0-7.2 volts hot (1118229 & 1118237) at operating temperature
To Check—Connect ammeter in charging line at 'BAT' regulator terminal, voltmeter between 'BAT' terminal and ground. Operate generator at approx. 3000 RPM, adjust charging rate to 8-10 amperes (use variable rheostat or 'AVR' set). With regulator hot, retard generator speed until cut-out relay points open, then increase speed to approx. 3000 RPM and check hot voltage setting (above) with cover in place.
To Adjust—Change regulator armature spring tension slightly by bending lower spring hanger for **light (left) spring (or one spring if both alike) only.** If further adjustment required, see Single Core Regulator article in Electrical Equipment Section for Heavy (or other spring) adjustment.
Air Gap—.070" between center of core and armature with contacts just closed.

CONTINUED ON NEXT PAGE

between clutch housing and underpan used on first 6488 cars. Must be removed to take out clutch.
Facings—Spiral wound (spirally grooved) molded woven, 2 used. Inside Diam. 6". O.D. 9¼". ⅛" thick.

Pedal Adjustment:—Free travel 1-1½" (adjusting clevis and locknut on link at clutch fork).

Removal:—Remove transmission (see data below), mark clutch and flywheel, take out six mounting screws in cover flange. NOTE—Install two mounting screws with long shank in second hole on each side of locating dowel when installing clutch.

TRANSMISSION

TRANSMISSION (STD.):—Own Make. All helical gear, constant-mesh, synchro-mesh (second & high), sliding gear (low & reverse) with new remote shift. **G-40 Note**—First 6488 cars use 15" transmission extension (same as '39), later cars 11" extension.
See Transmission Section for complete data.

Transmission Control:—Oldsmobile 'Handi-shift' type.
See Transmission Section for complete data.

Removal:—Disconnect shift and selector rods and speedometer cable at transmission, remove propeller shaft (disconnect rear U-joint pull shaft out), remove clutch housing underpan (and reinforcing plate if used) for access to 2 lower transmission mounting bolts & nuts, remove 2 mtg. screws at top.

HYDRA-MATIC DRIVE

HYDRA-MATIC DRIVE (OPTL.):—Own Make—Consists of fluid coupling & automatic transmission.
See Transmission Section for complete data.

Lubrication—Check fluid level in transmission every month or every 1000 miles. Drain and refill after first 5000 miles and every 10,000 miles thereafter. Use only "Oldsmobile Hydra-Matic Fluid."

Capacity—Approx. 9 qts. (9½ qts. if pan removed).

Checking Fluid Level—Clean all sand, lint, and dirt away from sheet metal cover in floor under right front corner of front compt. rug. Run engine several minutes. Stop engine, wait 1 minute. Remove sheet metal cover from floor for access to dip stick. Measure level with dip stick, add fluid until level is at "FULL" mark.

Draining & Refilling—*See Oldsmobile Hydra-Matic Drive in Transmission Section.*

Linkage Adjustment—*See Hydra-Matic Drive in Transmission Section.*

Removal: *See Hydra-Matic Drive in Transmission Section.*

UNIVERSALS

UNIVERSAL JOINTS:—Mechanics 2C. Roller bearing.
See Universals Section for complete data.
NOTE—Slip joint formed at rear of transmission ahead of front U-joint (driveshaft 1 piece type).

REAR AXLE

REAR AXLE:—Own Make. Semi-floating, hypoid gear type with torque taken through 2 support arms.
See Rear Axle Section for complete data.

Ratio—4.1-1 (F40), 4.3-1 (G40), 4.55-1 (Optl). Ring gear ratio stamped on top side of carrier.

Backlash—.004-.008". Screw adjustment.

Removal:—Disconnect drive shaft at rear universal, (do not disengage spline joint at transmission), remove axle shafts (see below), remove capscrews on carrier flange, pull carrier assembly out.

Axle Shaft Removal:—Hoist rear end, remove wheel, brake drum, backing plate mounting nuts, static collector and loosen bearing retainer (do not allow backing plate to shift to damage brake line). Pull shaft and bearing with puller J-942 (do not allow shaft to drag on oil seal), replace one backing plate nut. **Wheel Bearing Adjustment**—None.

Rear Suspension:—Quadri-coil type (support arms).
See Rear Axle Section for complete data.

SHOCK ABSORBERS

SHOCK ABSORBERS:—Delco. Front—Model 1947-C (right), 1947-D (left). **Rear**—1754-L (right), 1754-M (left). Double acting, hydraulic types.

FRONT SUSPENSION

Front Suspension:—Independent, linked parallelogram type with coil springs.
See Front Suspension Section for complete data.

Kingpin Inclination—4°51'10".

Caster—0-¾° negative. Adjustable.

Camber—Negative ¼° to Pos. ¾°. Adjustable.

Toe In—1/16-⅛". Adjust each tie rod.

Steering Geometry (Toe-out on Turns)—Inner wheel turned 23° ± ½°. Outer wheel 20°.

STEERING GEAR

Steering Gear: Saginaw Worm-and-Roller type with steering linkage with idler arm on right frame rail.
See Steering Gear Section for complete data.

BRAKES

BRAKES:—Service. Bendix hydraulic, duo-servo, single anchor type without eccentric adjustment. Hand lever applies rear wheel service brakes.
See Brake Section for complete data.

Wheel Cylinder Bore—Front wheel 1 3/32". Rear 1".

Drums—Cast-iron. Diameter—11".

Lining—Molded. Width 1¾". Thickness 3/16".
Length—Primary Shoe 9 11/32", Secondary 11 31/32".

Clearance—.015" both ends of secondary shoe (with primary shoe forced out against drum).

Hand Brake:—See Service Brakes above.

MISC. MECHANICAL

Power Operated Convertible Top: Vacuum Power type.
See Miscellaneous Section for complete data.

pears in line with pointer in inspection hole, tighten clamp bolt. Check Octane Selector setting.

Timing (Without Synchroscope)—Turn engine over to firing position for #1 piston with steel ball insert in flywheel in line with pointer in inspection hole in left front face of flywheel housing. Loosen hold-down screw in advance arm, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until contacts begin to open (using timing light connected between ignition terminal and ground and turn on ignition, light will go on as contacts open), tighten clamp bolt. Check Octane Selector setting.

Octane Selector Setting—Set for slight ping when accelerating engine with wide open throttle at speeds below 15 MPH. To adjust, loosen distributor hold-down screw, rotate distributor clockwise toward 'Adv' end of scale (if no ping noted), counter-clockwise toward 'Ret' end of scale (if ping too severe). Check performance after making adjustment.

CARBURETOR

CARBURETION:—Carburetor—Carter Type WDO, Model 389-S (Conventional transmission), Model 471-S (with Hydra-matic drive). 1¼" dual downdraft type. #192 cast on face of flange.

For complete data, refer to Carburetor Index.

Hydra-matic Drive Car Note—Throttle linkage must be adjusted for correct transmission performance.

See Hydra-Matic Transmission article in Transmission Section for Throttle Linkage Adjustment procedure.

Idle Adjustment—With engine warm and running at slow idle speed (choke valve wide open, fast idle inoperative), set throttle stopscrew for 6 MPH idle speed (high gear—Conv. Trans.), 375 Engine R.P.M. Hydra-matic drive). Adjust idle adjusting screw for each barrel (in succession) until engine fires smoothly (½-1¼ turns open—turn screws in for leaner mixture). Readjust idle speed.

Float Level—⅜" from top of float to gasket seat on cover with needle valve seated (invert to check).

NOTE—This setting supersedes former setting of 9/32" (also 13/32" setting to correct hard starting).

Accelerator Pump Setting—Not adjustable.

Fast Idle—Integral type (built-in carburetor).

For complete data, refer to Carburetion Equip. Index.

Fast Idle Setting—Adjust fast idle screw to give .030" clearance between throttle stopscrew and stop (choke valve closed, stopscrew set for 6 MPH idle). NOTE—On cars with Hydra-matic drive, setting should be .025".

Accelerator Linkage Adjustment:—Must be set for correct 'throttle cracking' action for starting. To adjust, disconnect starter cable (to prevent cranking), fully depress starter switch pedal, loosen eccentric pin locknut, adjust pin to give .070" clearance between throttle lever stopscrew and stop on carburetor body (with fast idle screw contacting highest step of fast idle cam—fast idle position), tighten lockscrew.

Automatic Choke:—Carter Climatic Control.

For complete data, refer to Carburetion Equip. Index.

Choke Setting—Set at center index mark.

CARB. EQUIPMENT

Air Cleaner:—AC #1528974 oil wetted type std.

Fuel Pump:—AC Type AJ #1523895 combination fuel-and-vacuum pump mounted on special adapter, AC #1523903, which has additional operating linkage.

For complete data, refer to Carburetion Equip. Index.

Gasoline Gauge:—AC Electric type. #1515372 (dash unit), #1516206 (tank unit).

For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—Delco Model 17E-1. 6 volt, 17 plate, 115 amperes hour capacity (20 hour rate).

Starting Capacity—137 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.3 minutes. Five second voltage—4.40 volts.

Grounded Terminal—Negative (—) terminal grounded to starter motor housing.

Dimensions—Length 19 5/16". Width 4". Height 9".

Location—Left side under engine hood.

Police Battery:—Delco Model 19E-1. 6 volt, 19 plate, 130 amperes hour capacity (20 hr. rate).

Starting Capacity—150 amperes for 20 minutes.

Zero Capacity—300 amperes for 5.3 minutes. Five second voltage—4.55 volts.

All other data as given above for 17E-1.

STARTER

Delco-Remy Model 1107907 (Std.), 1107922 (With Hydra-matic Drive). Armature No. 1867897 (All).

See Electrical Equipment Section for recommended correction for burning of starter commutators.

NOTE—Model 1107922 has provision for Hydra-matic Drive Interlock mounting. ***See Oldsmobile Hydra-matic Drive article in Transmission Section for Starter Interlock Adjustment.***

Drive—Overrunning clutch (manual pinion shift).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces each.

Cranking Engine—140-150 amperes, 5 volts, 100 RPM (summer temperatures).

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	6000	5.0	60
15 "	Lock	3.0	600

Removal:—Mounted on left front face of flywheel housing. To remove, take out mounting screws.

Starting Switch—No. 820052. Mounted on starter. Operated by starting pedal.

GENERATOR

Delco-Remy Model 1102664. Armature No. 1879002. (Std.), 1106403 (City Police), 1105851 or 1105856 (State Police). Two brush (shunt) type with voltage and current regulation.

Charging Rate Adjustment—No adjustment at generator. Charging rate controlled by Voltage Regulator and maximum output by Current Regulator.

See Regulator data following.

Maximum Charging Rate—33 amperes min. (hot or cold), 8.0 volts, 2400 RPM or approx. 20 MPH and above with load or discharged battery (Current Regulator setting). Actual charging rate controlled by Voltage Regulator and dependent on battery condition.

Performance Data Cold

	*Amperes	Volts	R.P.M.
1102664	30	8.0	1750
1106403	35	8.0	1040
1105851, 6	40	8.0	1850

*—Not maximum output—See Current Regulator.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—25 ounces each.

Field Current—1.75-1.9 amperes (1102664), 1.77-2.0 amperes (1106403), 1.62-1.82 amperes (1105851, 6) at 6.0 volts.

Removal:—Pivot mounted at left front of engine. To remove, take out clamp and pivot bolts.

Belt Adjustment:—Swing generator out until belt deflection midway between generator and fan pulley is ¾" with light pressure on belt.

REGULATOR

Delco-Remy Model 1118201 (for 1102664 Generator), 1118229 (1106403 Gen.), 1118237 (1105851, 6 Gen.), 'Single Core' Type. Vibrating type voltage and current regulators in a single case.

CAUTION—Check generator for grounded fields before changing regulator settings.

For complete data, refer to Electrical Equipment Index.

Cutout Relay

Cuts In—6.2-6.7 volts (hot), 600 Gen. RPM.

Cuts Out—0-4.0 amperes discharge current.

Contact Gap—.020" (same for both sides).

Air Gap—.020" (with points just closed).

Voltage Regulator

Setting—7.2-7.4 volts hot (1118201), 7.0-7.2 volts hot (1118229 & 1118237) at operating temperature

To Check—Connect ammeter in charging line at 'BAT' regulator terminal, voltmeter between 'BAT' terminal and ground. Operate generator at approx. 3000 RPM, adjust charging rate to 8-10 amperes (use variable rheostat or 'AVR' set). With regulator hot, retard generator speed until cut-out relay points open, then increase speed to approx. 3000 RPM and check hot voltage setting (above) with cover in place.

To Adjust—Change regulator armature spring tension slightly by bending lower spring hanger for light (left) spring (or one spring if both alike) only.

If further adjustment required, see Single Core Regulator article in Electrical Equipment Section for Heavy (or other spring) adjustment.

Air Gap—.070" between center of core and armature with contacts just closed.

Current Regulator

Setting—34-36* amperes (1118201, 1118229), 38-40 amperes (1118237) hot (at operating temperature).

To Check—Remove cover, connect short jumper from voltage regulator frame to upper contact support bracket (shorting out Voltage Regulator). Connect ammeter in charging line at 'BAT' regulator terminal. Turn on lights and accessories, operate generator and increase speed until output remains stationary (run until hot). Check setting with regulator at hot operating temperature.

CONTINUED ON NEXT PAGE

See Oldsmobile Shop Notes for data on late 1940 type Clutch Release Bearing with Lubrication Fitting.

Facings—Spiral wound (spirally grooved) molded woven, 2 used. Inside Diam. 7". O. D. 10". ⅛" thick.

Pedal Adjustment:—Free travel 1-1½" (adjusting clevis and locknut on link at clutch fork).

Removal:—Remove transmission (see data below), mark clutch and flywheel, take out six mounting screws in cover flange. NOTE—Install two mounting screws with long shank in second hole on each side of locating dowel when installing clutch.

TRANSMISSION

TRANSMISSION (STD.):—Own Make. All helical gear, constant-mesh, synchro-mesh (second & high), sliding gear (low & reverse) with new remote shift.

See Transmission Section for complete data.

Transmission Control:—Oldsmobile 'Handi-shift' type.

See Transmission Section for complete data.

Removal:—Disconnect shift and selector rods and speedometer cable at transmission, remove propeller shaft (disconnect rear U-joint pull shaft out), remove clutch housing underpan (and reinforcing plate if used) for access to 2 lower transmission mounting bolts & nuts, remove 2 mtg. screws at top.

HYDRA-MATIC DRIVE

HYDRA-MATIC DRIVE (OPTL.):—Own Make—Consists of fluid coupling & automatic transmission.

See Transmission Section for complete data.

Lubrication—Check fluid level in transmission every month or every 1000 miles. Drain and refill after first 5000 miles and every 10,000 miles thereafter. Use only "Oldsmobile Hydra-Matic Fluid."

Capacity—Approx. 9 qts. (9½ qts. if pan removed).

Checking Fluid Level—Clean all sand, lint, and dirt away from sheet metal cover in floor under right front corner of front compt. rug. Run engine several minutes. Stop engine, wait 1 minute. Remove sheet metal cover from floor for access to dip stick. Measure level with dip stick, add fluid until level is at "FULL" mark.

Draining & Refilling—*See Oldsmobile Hydra-Matic Drive in Transmission Section.*

Linkage Adjustment—*See Hydra-Matic Drive in Transmission Section.*

Removal: *See Hydra-Matic Drive in Transmission Section.*

UNIVERSALS

UNIVERSAL JOINTS:—Mechanics 2C. Roller bearing.

See Universals Section for complete data.

NOTE—Slip joint formed at rear of transmission ahead of front U-joint (driveshaft 1 piece type).

REAR AXLE

REAR AXLE:—Own Make. Semi-floating, hypoid gear type with torque taken through 2 support arms.

See Rear Axle Section for complete data.

Ratio—4.3-1 Std. 4.55-1 Optl. Ring and pinion gear ratio stamped on upper outside of carrier.

Backlash—.004-.008". Screw adjustment.

Removal:—Disconnect drive shaft at rear universal, (do not disengage spline joint at transmission), remove axle shafts (see below), remove capscrews on carrier flange, pull carrier assembly out.

Axle Shaft Removal:—Hoist rear end, remove wheel, brake drum, backing plate mounting nuts, static collector and loosen bearing retainer (do not allow backing plate to shift to damage brake line). Pull shaft and bearing with puller J-942 (do not allow shaft to drag on oil seal), replace one backing plate nut. **Wheel Bearing Adjustment**—None.

Rear Suspension:—Quadri-coil type (support arms).

See Rear Axle Section for complete data.

SHOCK ABSORBERS

SHOCK ABSORBERS:—Delco. Front—Model 1947-C (right), 1947-D (left). **Rear**—1754-L (right), 1754-M (left). Double acting, hydraulic types.

FRONT SUSPENSION

Front Suspension:—Independent, linked parallelogram type with coil springs.

See Front Suspension Section for complete data.

Kingpin Inclination—4°51'10".

Caster—0-¾° negative. Adjustable.

Camber—Negative ¼° to Pos. ¾°. Adjustable.

Toe In—1/16-⅛". Adjust each tie rod.

Steering Geometry (Toe-out on Turns)—Inner wheel turned 23° ± ½°. Outer wheel 20°.

STEERING GEAR

Steering Gear: Saginaw Worm-and-Roller type with steering linkage with idler arm on right frame rail.

See Steering Gear Section for complete data.

BRAKES

BRAKES:—Service. Bendix hydraulic, duo-servo, single anchor type without eccentric adjustment. Hand lever applies rear wheel service brakes.

See Brake Section for complete data.

Wheel Cylinder Bore—Front wheel 1 3/32". Rear 1".

Drums—Cast-iron. Diameter—11".

NOTE—Drum turn down limit .030" cut.

Lining—Molded type. Width 2". Thickness 3/16". Length—Primary Shoe 9 11/32", Secondary 11 31/32".

Clearance—.015" both ends of secondary shoe (with primary shoe forced out against drum).

Braking Power—54½% front, 45½% rear.

Hand Brake:—See Service Brakes above.

MISC. MECHANICAL

Power Operated Convertible Top: Vacuum Power type.

See Miscellaneous Section for complete data.

Vacuum Spark Control Model 681-P (for 1941 Cars), Model 1116035 (for 1942 Car Models). On distributor (integral type linked directly to breaker plate). Provides additional advance at speeds above idling except when engine accelerated or operated with wide open throttle when spark retarded by return spring within unit.

Plunger Travel—3/16" (681-P), 1/8" (1116035).

Vacuum Advance—681-P

Distr. Degrees	Eng. Degrees	Vacuum (" of HG)
Start	0°	5-7"
10°	20°	15.5-18.5"

Vacuum Advance—1116035

Distr. Degrees	Eng. Degrees	Vacuum (" of HG)
Start	0°	7.5-9.5"
6°	12°	14.6-16.6"①

①—At .103" travel.

Octane Selector—Adjustment permits 10° advance or retard from center '0' position. See Ignition Timing for adjustment directions.

Removal:—Distributor mounted on left side of engine. To remove, disconnect vacuum line, take out hold-down screw in advance arm.

IGNITION TIMING

IGNITION TIMING:—See Octane Selector Setting for correction dependent on fuel used.

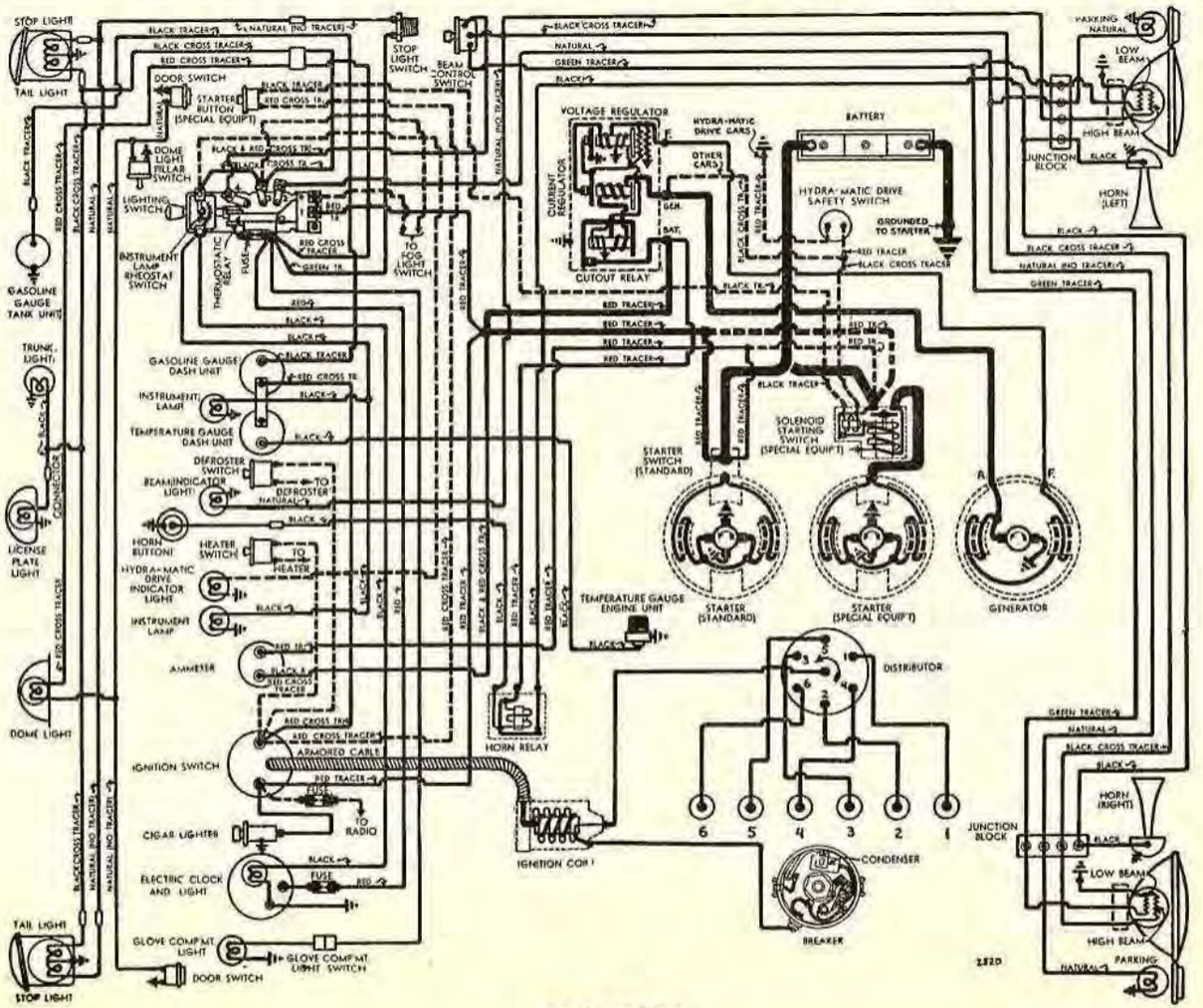
	Flywheel Degrees	Piston Position
Std. Trans. Cars	At TDC	.000" TDC.
Hydra-Matic Trans.		.001" BTDC.

Timing (With Synchroscope)—Recommended method. Loosen hold-down screw in advance arm, center Octane Selector scale ('0' at indicator line), tighten hold-down screw. Clip synchroscope lead to #1 spark plug, direct synchroscope light on flywheel through inspection hole in left front face of housing above starter. Idle engine, loosen advance arm clamp bolt, rotate distributor until ignition mark (steel ball insert) on flywheel lines up with indicator on housing, tighten clamp bolt, check Octane Selector setting (below).

NOTE—On cars with Hydra-Matic drive, use dial indicator and set distributor so contacts open with piston .001" before top dead center.

Timing (Without Synchroscope)—Turn engine over to firing position for #1 piston with steel ball insert in flywheel at indicator in inspection hole in left front face of flywheel housing (or with piston .001" BTDC. on cars with Hydra-Matic drive). Loosen hold-down screw in advance arm, center pointer on scale ('0' mark at indicator), tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt and check Octane Selector setting.

Octane Selector Setting—Set for slight ping when accelerating engine with wide open throttle at speeds below 15 MPH. To adjust, loosen distributor hold-down screw, rotate distributor clockwise toward 'Adv' end of scale (if no ping noted), counter-clockwise toward 'Ret' end of scale (if ping too severe) one graduation at a time until correct performance secured.



1942 MODELS

CARBURETOR

Model	Type	Size	Car Model
504-S	WA-1	1½"	1941 Conv. Trans.
481-S	WA-1	1½"	'41-42 Hydra-Matic
523-S	W1 Cast-iron	1½"	1942 Conv. Trans.

For complete data, refer to Carburetor Index.

Idle Adjustment—With engine warm so that choke valve wide open and fast idle inoperative, set throttle stopscrew for idle speed of 425 RPM. (Std), 375 RPM. (Hydra-Matic Drive cars). Adjust idle adjusting screw for smooth idle (screw should be ½-1½ turns open from inner seated position—turn screw in for leaner mixture). Recheck idle speed. ***See Hydra-Matic Transmission article in Transmission Section for Throttle Linkage Adjustment procedure.***

Accelerating Pump Setting—Pump arm (under dust cover) has three holes for pump connector link engagement (481-S, 504-S only). Set as follows:
Lower (Med. Stroke)—Normal all-year setting.
Inner (Min. Stroke)—Hot weather or High Alt.
Outer (Max. Stroke)—Cold weather, low-test fuel.

Float Level—(504-S, 481-S). ½" from projection on underside of bowl cover to top of seam on free end of float (invert to check).
(523-S) 9/16" from top of float at free end to lower face of bowl cover.

Metering Rods & Jets—*See Carter Jet Table in Carburetor Section for complete data.*

Throttle Cracker Adjustment:—Must be set for correct throttle opening for starting. To adjust, disconnect starter cable at starter switch (for foot operated starters), disconnect coil lead to distributor (for solenoid operated starters), depress starter pedal or pushbutton to full down position (engine will be turning over on solenoid starter cars) to fully mesh starter pinion, loosen locknut and turn adjusting screw on accelerator bell-crank (screw contacts lug on lever linked to starter pinion shift lever) so that clearance between throttle stopscrew and highest step of fast idle cam is .0625-.0825"

Fast Idle:—Integral (built-in each carburetor).
For complete data, refer to Carburetion Equip. Index.
Setting (523-S)—Hold choke valve wide open and allow fast idle cam to drop free. Back off throttle stop screw until throttle valve closed and screw just clears low step of fast idle cam. Hold throttle valve closed, release choke valve. Choke will move fast idle cam until stopscrew rests against second position of cam. Bend offset portion of fast idle link (do not disturb cam) so choke valve opening is 5/8".

CONTINUED ON NEXT PAGE

HORNS:

Delco-Remy Numbers	Current (at 6 Volts)	Air Gap
①1999535 (low note)	19-21 amperes	.044-.049"
①1999536 (high note)	18-20 amperes	.034-.039"
②1999843 (low note)	7-11 amperes	.032-.038"
②1999844 (high note)	6-10 amperes	.021-.025"
③1999573 (low note)	19-21 amperes	.047-.052"
③1999574 (high note)	18-20 amperes	.039-.044"

①—1941 Models. Twin horns operated by relay.

②—1941 Models. Penetone horns with relay, used on F-41 after Ser. No. 66-62790, G-41 No. 76-55579.

③—1942 Models. Twin horns operated by relay.

Horn Relay:—Delco-Remy No. 1116775.

Contact Gap—.025". **Air Gap**—.015" (closed).

Contacts Close—2.75-4.0 volts.

ENGINE

ENGINE SPECIFICATIONS:—6 cylinder, 'L' head.

Bore—3½". **Stroke**—4⅛".

Displacement—238.1 cu. ins. **Rated HP**—29.4.

Developed Horsepower—100 at 3400 RPM (Std. hd.).

Compression Ratio and Pressure—As follows:

Ratio	Pressure at 1000 RPM	At 100 RPM
1941—6.1-1	138 lbs.	115 ± 10 lbs.
1942—6.5-1	150 ± 5 lbs.	102 ± 10 lbs.

Vacuum Reading—Steady 17" min. at idling speed.

See Oldsmobile Shop Notes for Cylinder Head Servicing.

PISTONS (1941): Aluminum alloy, T-slot, cam ground with electro-hardened oxide bearing surface.

Weight—17.37 ozs. (stripped). **Length**—4 1/32".

Removal—Pistons and rods removed from above.

Clearance—Top .023-.028". Skirt .0005-.0010".

NOTE—Piston skirt taper inward from bottom to top should be .0015-.002". Differs from Eight.

Replacement Pistons:—Finished pistons (pins fitted) .003", .005", .010", .015", .030" oversize. Same wt. as std.

Fitting New Pistons:—Check piston for size with micrometers (pin removed) 90° from pin bosses ⅜" below lower ring groove and ⅜" from bottom of skirt. Insert .002" x ½" feeler between piston (pin removed) and cylinder wall on valve side with piston inverted and T-slot on opposite side from feeler. Pull to withdraw feeler must be 4 to 11 lbs. (piston and block at 70°—low limit below 70°, high above).

Installing pistons:—Mark 'V-S' on head toward valves (slot away from valves). Pin hole offset 3/32" to left.

PISTONS (1942): Cast-iron (before Eng. G-441345), Armasteel type (Eng. No. G-441345 and above).

Weight—27 ozs. (stripped). **Length**—3¾".

Removal—Pistons and rods removed from above.

Clearance—Top land .023-.030". Skirt .00125-.00175".

IMPORTANT—Cast-iron pistons are 3 ring type with groove on skirt, Armasteel are 4 ring type. Pistons interchangeable in sets only.

Replacement Pistons:—Finished pistons (with fitted pins) furnished .003", .005", .010", .015", .030" oversize.

Fitting New Pistons:—Check piston for size with micrometers (pin removed) 90° from pin bosses ⅜" below lower ring groove and ⅜" from bottom of skirt. Insert .0015"x½"x12" feeler between piston (pin removed) and cylinder wall with piston inverted and feeler 90° from pin. Pull to withdraw feeler 7-20 lbs.

Installing Pistons:—Mark 'V-S' on head toward valves.

NOTE—Pin holes in piston offset 3/32".

PISTON RINGS (1941): 2 coated compression (install with mark TOP up), 2 oil control, all above pin.

Ring	Width	End Gap	Side Clearance
Compr.	.0925-.0935"	.008-.018"	.001-.003"
Oil Contr.	.1860-.1865"	.007-.015"	.001-.0025"

Replacement Rings:—.010", .020", .030" oversize.

PISTON RINGS (1942): 3 rings (Cast-iron), 4 (Armasteel), per piston, all above pin. NOTE—Install Compression ring with side marked TOP up.

Ring	Width	EndGap	Side Clearance
Compr.	.0925-.0935"	.008-.018"	.001-.003"
Oil Contr.	.1860-.1865"	.007-.015"	.001-.0025"

Replacement Rings:—.010", .020", .030" oversize.

PISTON PIN (1941): Diam. .8554-.8557" Length 3 5/32". Pin locked in one piston boss by lockscrew (opposite end slotted). Pin bosses are plated and must not be reamed. Standard size pins only serviced.

Pin Fit in Piston—.0001" loose to .0002" tight (plain boss end), .0002-.0005" tight (lock boss end).

Pin Fit in Rod Bushing—.0003-.0006" clearance.

See Oldsmobile Shop Notes for Pin Fitting directions.

PISTON PIN (1942): Diam. .8554-.8557" Length 3 5/32". Pin locked by screw in one boss. Ream piston bosses for oversize pins (.001" & .003" OS.).

Pin Fit in Piston—.0000-.0002" (plain boss end), .0003-.0006" (piston lockscrew boss).

Pin Fit in Rod Bushing—.0003-.0006".

See Oldsmobile Shop Notes for Piston Pin fitting data.

CONNECTING ROD (1941): Lgth. 7 13/16" Wt. 28.0 ounces (complete except for bearing inserts).

NOTE—Six and Eight rods not interchangeable.

Crankpin Journal Diameter—2.123-2.124".

Lower Bearing—Removable steel-backed, babbitt.

Clearance—.0005-.0025". **Sideplay**—.0055-.0105".

Bearing Adjustment:—None. Replace bearings.

Installing Rods:—Oil spit hole at lower end toward valves and grooves on rod and cap bolt boss (part number side) matched. Special ground cap bolts with self-locking nuts used and should be tightened with torque wrench to 50-55 lbs. ft. tension.

CONNECTING ROD (1942): Lgth. 7 13/16" Wt. 28.4 ozs

NOTE—1942 eight cyl. rods can be used in 1942 six cyl. (and 1941 six cyl. engines after G-378163).

Crankpin Journal Diameter—2.123-2.124".

Lower Bearing—Removable steel-backed, Durex-babbitt overlay bearing shells.

Clearance—.0005-.0025". **Sideplay**—.0055-.0105".

Bearing Adjustment:—None. Replace bearings.

Installing Rods:—Oil spit hole at lower end toward valves and grooves on rod and cap bolt boss (part number side) matched. Special ground cap bolts with self-locking nuts used. Tighten to 50-55 lbs. ft.

CRANKSHAFT:—4 bearings, integral counterweights.

Journal Diameters—#1, 2.478-2.479"; #2, 2.5405-2.5415"; #3, 2.6655-2.6665"; #4, 2.6855-2.6865".

Bearings (1941)—Removable, steel-backed, babbitt. **(1942)**—New type removable steel-backed, Durex-babbitt overlay bearing shells. CANNOT BE USED ON PREVIOUS MODELS. All front bearings have oil groove to front for thrust plate lubrication.

Clearance—.0005-.002" (rear), .001-.003" (all others).

Bearing Adjustment:—None (no shims). Replace bearings. Do not file caps. **Endplay**—.004-.008".

NOTE—9/16" cap bolts on rear bearing, ½" others.

See Oldsmobile Shop Notes for Main Bearing Removal, Crankshaft End Thrust and Oil Seal data.

CAMSHAFT:—4 bearing. Non-adjustable chain drive.

Journal Diam. ('41)—#1, 1.9970-1.9975"; #2, 1.9345-1.9350"; #3, 1.8720-1.8725"; #4, 1.8095-1.8100".

Journal Diam ('42)—#1, 1.9975-1.9980"; #2, 1.9350-1.9355"; #3, 1.8725-1.8730"; #4, 1.8100-1.8105".

Bearings—Bronze bushings. **Clearance** .0015-.0035".

End Thrust:—Forward end thrust now taken by front engine support plate. *See Oldsmobile Shop Notes.*

Timing Chain:—Whitney No. 411239. Width 1". Pitch .500" (½"). Length 47 links or 23½".

Camshaft Setting:—Mesh chain with sprocket marks adjacent and in line with a straightedge across the shaft centers (or use Tool HM-408-0).

VALVES:—

	Head Diameter	Stem Diameter	Length
Intake	1 9/16"	.3415-.3425"	5 51/64"
Exhaust	1 27/64"	.3410-.3418"	5 51/64"

	Seat Angle	Lift	Stem Clearance
Intake	30°	.303"	.00175-.00375"
Exhaust	45°	.298"	.00245-.00425"

Valve Guides:—Intake and exhaust guides same. Press guides in so top end ⅞" below top of block. (Tool J-1042 positions guide correctly in block). Ream to .34425-.34525" inside diam. (not tapered).

Valve Springs:—Same spring used on both valves and on 6&8 engines. Damper on top of each spring. Free length 2 19/32".

	Spring Pressure	Spring Length
Valve Closed	50½ lbs.	2¼"
Valve Open	95½ lbs.	1 15/16"

Valve Lifters:—Mushroom type (same on 6 & 8). Holes reamed in block have bearing-ized finish (if worn, fit oversize lifter without reaming hole) Body Diam. .6235-.6240". Furn .001", .002", .005", .010", OS.

Clearance—.0005-.0008". NOTE— 1⅛" diameter face lifter only should be used on 1941-42 models.

VALVE TIMING

Tappet Clearance:—.008" Int., .011" Exh. Hot & Idling.

NOTE—Self-locking tappet screws used. Remove right fender filler plate for access to valves.

Valve Timing:—See Camshaft Setting above.

Intake Valves—Open 5° BTDC. Close 45° ALDC.

Exhaust Valves—Open 45° BLDC. Close 5° ATDC.

Valve Timing Check—With .0124" tappet clearance, #1 intake valve should open with piston 5° (.0163") BTDC with flywheel TDC mark (steel ball insert) approx. 2 teeth before indicator (hole on left front face of housing). Reset tappet clearance at .008" hot.

LUBRICATION

LUBRICATION:—Pressure (gear type pump on right of engine). *See Oldsmobile Shop Notes for Oil Pump data.*

Normal Oil Pressure:—28-33 lbs.

Oil Pressure Regulator:—On pump, opens at 30 lbs. Non-adjustable type.

Crankcase Capacity:—5 quarts.

CONTINUED ON NEXT PAGE

HOOD, FRONT END SHEET METAL ASSEMBLY, FENDER CAP, & OIL PAN REMOVAL:—*Refer to Oldsmobile Shop Notes for removal procedure.*

MODEL IDENTIFICATION

Model Name	Model 1941	Model 1942	Car Series
Special Eight	E-41	E-42	68
Dynamic Cruiser Eight	J-41	J-42	78
Custom Cruiser Eight	L-41	L-42	98

SERIAL NUMBER:—On plate on upper left corner of dash in engine compartment. First Nos.

1941 Starting Serial Numbers

Series	Lansing	Linden, N. J.	California
68	68-1001	68L1001	68C1001
78	78-1001	78L1001	78C1001
98	98-1001	98L1001	98C1001

1942 Starting Serial Numbers

Series	Lansing	Linden, N.J.	California
68	68- 9001	68L3001	68C3001
78	78-26001	78L4001	78C4001
98	98-25001	98L6001	98C4001

ENGINE NUMBER: Top left side behind water pump. First number L-379001 ('41), L-450001 ('42). **Hydra-Matic Cars**—Carry number prefix 'LA'.

TUNE-UP

COMPRESSION: Ratio and Pressure as follows:

Ratio	Pressure at 1000 RPM	At 100 RPM
1941—6.3-1	160 lbs.	105 ± 10 lbs.
1942—6.5-1	155 ± 5 lbs.	105 ± 10 lbs.

1941 Export Head—Ratio 5.7-1

FIRING ORDER:—1-6-2-5-8-3-7-4. See diagram.

SPARKS PLUGS:—AC No. 44. 14 MM. Metric. Gaps—.030".

VACUUM READING:—Steady 17" min. at idling speed.

IGNITION: See Coil, Condenser, and Distributor. Breaker Gap—.015". Cam Angle—31° Closed. Automatic Advance—Max. advance as follows:

Distributor	Distr. Deg.	Distr. RPM
1110802	15°	2000
1110808	12°	1600

Vacuum Advance—Maximum advance as follows:

Distributor	Vacuum Unit	Distr. ° & Vacuum
1110802	681-R	7½° at 14-17"
1110808	1116036	6° at 14.6-16.6"

IGNITION TIMING: See Ignition Timing. Std. Setting—2° BTDC. Flywheel mark (steel ball) aligned with insp. hole pointer (left side housing). **Hydra-Matic Cars**—Set distributor so contacts open with piston .001" before top dead center.

CARBURETION: See Carburetor & Carb. Equipment. Idle Setting—Idle screws ½-2¼ turns open. Idle speed 425 RPM (Std.), 375 RPM (Hydra-Matic). **Float Level**—3/16" from top of float to machined surface of bowl cover with needle valve seated. **Accelerating Pump**—No seasonal adjustment. **Fuel Pump Pressure:** 4 lbs. maximum.

MANIFOLD HEAT CONTROL:—Thermostatic coil type. See that valve operates freely. **Setting**—Coil wind-up should be 160° (approx. ½ turn) at room temperature. NOTE—To check valve for correct position on shaft, use feeler gauge in slot on rear end of valve shaft. With valve closed, gauge should contact stop pin (slot 6° to left or toward engine from up-and-down position) with ⅛" clearance between valve tip and manifold.

VALVES: See Valve Timing. Tappet Clearance .008" Intake, .011" Exhaust, hot.

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

Ignition Switch: Delco-Remy 1116305 (E-41, L-41), 1116311 (J-41), 1116330 (E-42), 1116331 (J-42), 1116334 (L-42). Coil connection armored. **Ignition Lock**—Briggs & Stratton No. 45792. Key Series—8000 to 9499. Groove—No. 15.

COIL: Delco-Remy Model 1115129. On dash. **Ignition Current**—2.0 amperes idling, 4.5 stopped.

CONDENSER: Delco-Remy Part No. 1869704. Capacity—.18-.25 microfarad.

DISTRIBUTOR: Delco-Remy Model 1110802 (for 1941 Cars), Model 1110808 (for 1942 Cars). Single breaker 8 lobe cam, full automatic advance type with auxiliary vacuum spark control and Octane Selector **Breaker Gap**—.015". Limits .0125-.0175". **Cam Angle or Dwell**—31° closed, 14° open. **Breaker Arm Spring Tension**—19-23 ozs. **Rotation**—Counter-clockwise viewed from above.

Automatic Advance—1110802

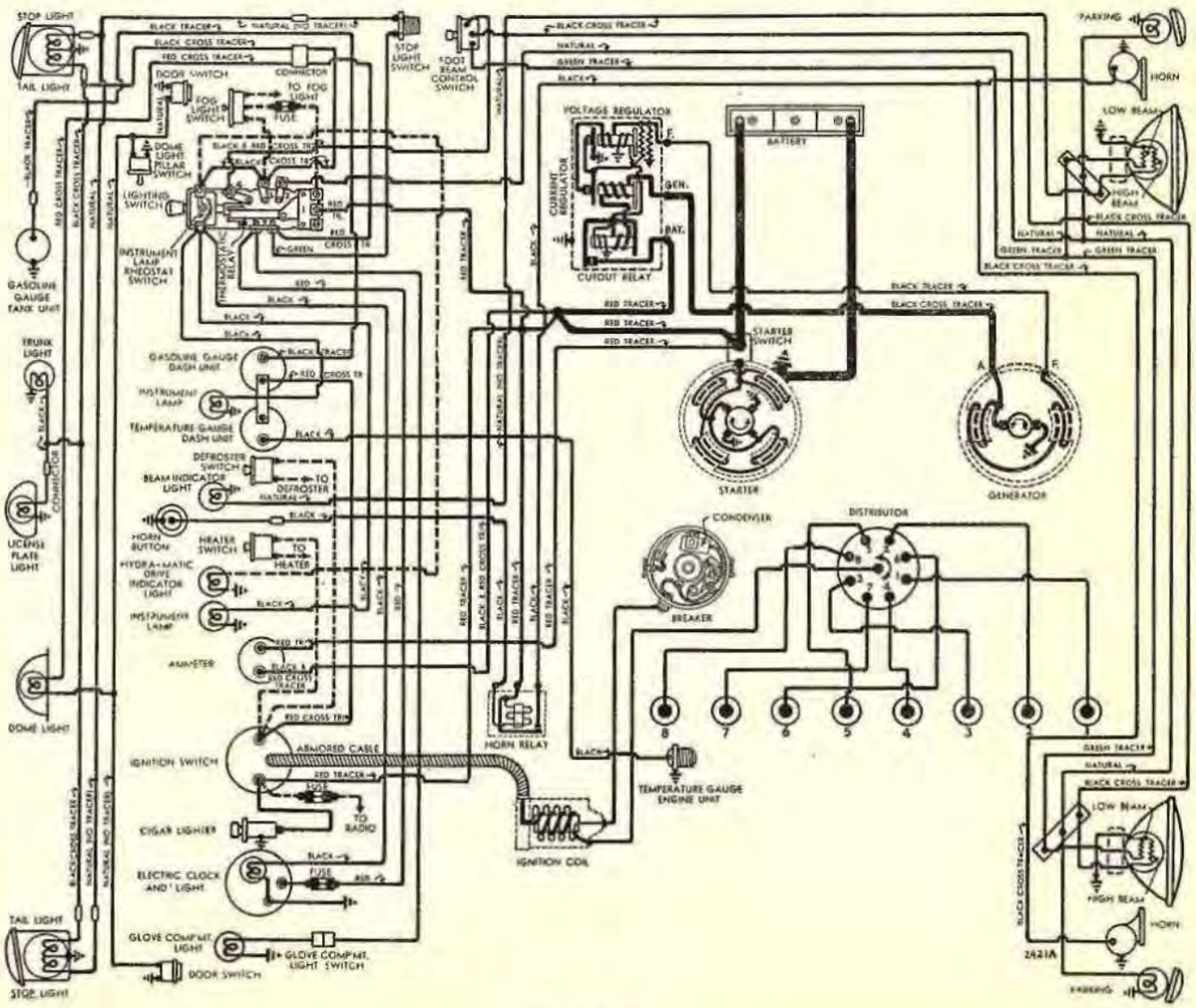
Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine R.P.M.
Start	300	2.5	600
3.5	500	7	1000
15	2000	30	4000

Automatic Advance—1110808

Start	250	3	500
3.5	500	7	1000
12	1600	24	3200

Vacuum Spark Control 681-R (for 1941 Cars), Model 1116036 (for 1942 Car Models). On distributor (integral type linked directly to breaker plate). Provides additional advance at speeds above idling except when engine accelerated or operated with wide open throttle when spark retarded by return spring within unit.

CONTINUED ON NEXT PAGE



1941 MODELS

CARB. EQUIPMENT

Air Cleaner:—AC No. 1542252 oil-wetted type Std. #1529360 (78, 98), #1542251 (68), heavy duty oil bath type Optl. Use Replacement Filter Element Type #6 (for 1542252), 1542335 (for oil bath type).

Fuel Pump:—AC 'AJ' No. 1537330—Exch. No. 535. **Fuel & Vacuum Pump. Pressure**—4 lbs. maximum.

For complete data, refer to Carburetion Equip. Index.

Gasoline Gauge: AC Electric Type. Dash Unit Nos.: 1516298 ('41), 1516410 ('42). Tank Unit: 1516285.

For complete data, refer to Carburetion Equip. Index.

BATTERY

BATTERY:—Delco Model 17E-2. 6 volt, 17 plate, 120 Ampere Hour Capacity (20 hour rate).

Starting Capacity—140 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.5 minutes. Five second voltage 4.4 volts.

Grounded Terminal—Negative (—) to Starter.

Location—On left side in engine compartment.

Police Battery Delco Model 19E-1 or 19E-3. 6 volt, 19 plate, 130 Ampere Hour Capacity (20 hour rate).

Starting Capacity—150 amperes for 20 minutes.

Grounded Terminal and Location—Same as above.

STARTER

Delco-Remy Model 1107922 (All '41; 68, 78 '42), 1107930 (Std. 98, Optl. 68, 78 '42), 1107924 (RHD '41).

Armature Number—No. 1867897 (for all models).

NOTE—All 1107922 (foot operated) starters provided with mounting holes for Hydra-Matic Drive Interlock mounting (holes plugged when Hydra-Matic Drive not used). On 1107930 (solenoid operated) starters, a Neutral Safety Switch is used on cars with Hydra-Matic Drive (starter operative only with Selector Lever in neutral position.

See Transmission Section for Oldsmobile Hydra-Matic Drive article for Interlock or Neutral Switch adjustm'ts.

Drive—Over-running clutch with manual pinion shift (1107922), solenoid pinion shift (1107924, 30).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces each.

Cranking Engine—100 RPM., 140-150 amperes, 5 volts (Summer Temperatures) for LHD. starter.

Performance Data—1107922

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	6000	5.0	60
15 "	Lock	3.0	600

Performance Data—1107924 & 1107930

0 ft. lbs.	5500	5.0	65
15 "	Lock	3.0	600

Removal:—Flange mounted on left front face of flywheel housing. To remove, take out mounting screws.

Starting Switch (1107922):—No. 820052. Mounted on starter. Operated by pinion shift lever.

(1107924)—Solenoid Switch No. 1546. Mounted on starter. Operated through relay (in switch case) by Pushbutton Switch No. 1996008 on instrument panel.

For complete data, refer to Electrical Equipment Index.

(1107930)—Solenoid Switch No. 1118021. Mounted on starter and controlled by Pushbutton Switch 1996009 on instrument panel and Neutral Safety Switch 1997761 (on cars with Hydra-Matic Drive).

For complete data, refer to Electrical Equipment Index.

GENERATOR

Delco-Remy Model 1102664. Armature No. 1879002. (Std.), 1102680 (Hydra-Matic Drive Cars), 1106403 (City Police), 1105851 or 1105856 (State Police). Two brush type with Voltage and Current regulation.

Pulley Note—Cars with Std. Trans. (1102664 Gen.) have regular 3 9/16" pulley. Hydra-Matic Drive cars (1102680 Gen.) have smaller 3 1/16" pulley to compensate for lower engine speed (max. output reached At approx. 110 Eng. RPM. less). NOTE—This pulley can be installed on cars with 3.9-1 Axle ratio for special service if output inadequate.

Charging Rate Adjustment—None. See Regulator.

Maximum Charging Rate—33 amperes, 8.0 volts, 2400 RPM. (hot) or 23 MPH. (68), 21 MPH. (78, 98) and above (Current Regulator setting) with load or discharged battery. Actual charging rate controlled by Voltage Regulator and dependent on battery condition.

Performance Data—Cold

	Amperes①	Volts	R.P.M.
1102664, 80	30	8.0	1750
1106403	35	8.0	1040
1105851, 6	40	8.0	1850

①—Not maximum output. See Current Regulator.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—25 ozs. each.

Field Current—1.75-1.9 amperes (1102664, 80), 1.77-2.0 amperes (1106403), 1.62-1.82 amperes (1105851, 6) at 6.0 volts.

Removal:—Pivot mounted at left front of engine. To remove, take out pivot and clamp bolts.

Belt Adjustment:—Check with straightedge across pulleys. Belt deflection should be ¾" inward from straightedge with light pressure at point midway between generator and fan pulleys.

REGULATOR

Delco-Remy Model 1118201 or 1118242 (for 1102664 1102680 Gen.), 1118229 (1106403 Gen.), 1118237 (1105851, 6 Gen.). Single Core Types. Voltage and Current regulators in single case with Cutout Relay.

For complete data, refer to Electrical Equipment Index.

CAUTION—Check generator for grounded field coils and leads before changing regulator settings to correct High Charging Rate or High Voltage.

Cutout Relay

Cuts In—6.2-6.7 volts hot.

Cuts Out—0-4.0 ampere discharge current.

Contact Gap—.020" (same for both sets).

Air Gap—.020" (with contacts just closed).

Voltage Regulator

Setting—7.2-7.4 volts (1118201,242), 7.0-7.2 volts (1118229, 1118237) Hot (at operating temperature).

To Check—Connect ammeter in charging line at regulator 'BAT' terminal, voltmeter between this terminal and ground. Operate generator at 2800 RPM., adjust charging rate to 8-10 amperes (use variable rheostat or AVR set). With regulator hot (150°F.), decrease generator speed until cutout relay contacts open, then increase speed to 2800 RPM. and check hot voltage setting (above).

To Adjust—Change regulator armature spring tension slightly by bending hanger at lower end of one spring only. If further adjustment required, see Single Core Regulator article in Electrical Equipment Section for other (2nd.) spring adjustment.

Air Gap—.070" between center of core and armature with contacts just closing (press down on armature to open contacts, release pressure, check gap at point where contacts just close).

Current Regulator

Setting—34-36 amperes (1118201, 1118229, 1118242), 38-40 amperes (1118237) hot (at operating temp.).

To Check—Remove regulator cover, connect short jumper between Voltage Regulator frame and upper contact support bracket (to short out Voltage Regulator), connect ammeter in charging line at regulater 'BAT' terminal, turn on car lights and accessories. Operate generator and increase speed until output remains constant. With regulator hot (150°F), current reading should agree with setting (above).

To Adjust—Same as for Voltage Regulator (above).

Air Gap—.080" (check same as Voltage Regulator).

LIGHTING

LIGHTING:—Headlamps—Guide 'Sealed Beam' type.

For complete data, refer to Electrical Equipment Index.

Headlamp Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height).

Beam Indicator—Small red indicator in upper edge of speedometer dial. Lighted when Country (upper) Beam in use.

Direction Signal—***Refer to Electrical Equip. Index.***

Switches

Lighting (1941—No Fuse)—Delco-Remy No. 1995017 (LHD cars), 1995020 (RHD cars).

Lighting (1942—with Fuse)—Delco-Remy No. 1995026 (LHD cars), 1995027 (RHD cars).

NOTE—All switches have instrument light rheostat controlled by Lighting Switch handle.

Beam Selector—Delco-Remy No. 1997002.

Stop Light—Delco-Remy No. 1997725.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps		Sealed Beam
Parking	3	63
Instrument, Clock	1½	55
Beam Ind., Glove Compt.	1	51
Stop & Tail	21-3	1154
Rear License Plate	3	63
Dome	6	82

MISC. ELECTRICAL

THERMOSTATIC RELAY:—On lighting switch. Contacts remain closed with 30 ampere current, open in 3 minutes with current of 42 amperes at 70° F. Limits current to 18 amperes with dead short-circuit. Not adjustable.

FUSES:—Clock—2 ampere. In clock lead connector.

Stop Light (1942)—9 amperes. On lighting switch.

Convertible Top—9 ampere. In switch feed line.

HORNS: Delco-Remy Numbers	Current (at 6 Volts)	Air Gap
①1999535 (low note)	19-21 amperes	.044-.049"
①1999536 (high note)	18-20 amperes	.034-.039"
②1999843 (low note)	7-11 amperes	.032-.038"
②1999844 (high note)	6-10 amperes	.021-.025"
③1999573 (low note)	19-21 amperes	.047-.052"
③1999574 (high note)	18-20 amperes	.039-.044"

①—1941 Models. Twin horns operated by relay.

②—1941 Models. Penetone horns with relay, used on E-41 after Serial No. 68-7686.

③—1942 Models. Twin horns operated by relay.

Horn Relay:—Delco-Remy No. 1116775.

Contact Gap—.025". **Air Gap**—.015" (closed).

Contacts Close—2.75-4.0 volts.

CONTINUED ON NEXT PAGE