

1936 Terraplane
Models 61, 62
Mechanical Specifications

ENGINE NUMBER: - First number-157,000. Stamped on left side of cylinder block opposite #6 cylinder. oil drain slots. Rings are straight cut and are positioned by pin in piston ring groove.

ENGINE SPECIFICATIONS: - Type-6 cyl. "L" head.

Bore - 3". Stroke - 5".

Displacement - 212 cubic inches.

Rated Horsepower - 21.6 (AMA).

Developed Horsepower - 88 at 3800 R.P.M. (Std. 6.0-1 head), 100 at 3800 R.P.M. (Optl. 7.0-1 head).

Compression Ratio & Pressure - To check pressures, remove spark plugs, crank engine with throttle wide open.

Standard 6.0-1 Head 111 lbs. at 215 R.P.M.

Optional 7.0-1 Head 127 lbs. at 207 R.P.M.

Vacuum Reading - Gauge should show steady reading of 18-19" of HG. with engine idling at 350 R.P.M. or 7 M.P.H.

NOTE - High Octane fuel must be used in engines with optional high compression 7.0-1 head.

PISTONS:-Own Lo-Ex aluminum alloy, "T" slot, Cam ground type. Use finished replacement pistons when reconditioning engine. Weight-10.5 ozs. stripped. Stamped on piston head.

Length-3 3/16".

Removal - Pistons and rods removed from above.

Clearance - Top - .016", Skirt - .002".

NOTE - These pistons are interchangeable with 1935 and may be installed in complete sets on 1934 model.

Reconditioning Cylinders: - Size of original bore indicated by letter stamped on lower edge of valve chamber opposite cylinder as follows: A - 3.000", B - 3.0005", C - 3.001", D - 3.0015", E - 3.002", AO - 3.010", BO - 3.0105", CO - 3.011", DO - 3.0115", EO - 3.012". Recondition cylinder to standard oversize for which, replacement piston and rings are available (see piston and ring data below).

Replacement Pistons: - Standard and oversize pistons marked by letter on head available for cylinder bores of size indicated: 'B' - 3.000 & 3.0005", 'D' - 3.001 & 3.0015", 'F' - 3.002 & 3.0025", 'J' - 3.004", 'L' - 3.005", 'BO' - 3.010 & 3.010511, 'DO' - 3.011 & 3.0115", 'FO' - 3.012 & 3.0125", 'LO'-3.015", 'BB' - 3.020", 'DD' - 3.021", 'FF' - 3.022". All pistons installed in engine must be of same weight as indicated by mark on head.

Fitting New Pistons: - Use .0015" feeler 1/2" wide on side opposite slot at right angles to pin bosses to check clearance. Tension to withdraw feeler must be 3-4 lbs.

Installing Pistons: - Slot toward left or away from camshaft.

PISTON RINGS: - Two compression, one oil ring above pin, one oil ring below pin per piston. Upper oil ring groove drilled with twelve 5/16" oil drain holes and two 5/16" holes to pins. Lower oil ring groove drilled with four 5/16" holes and two

Ring	Width	End Gap	Wall Thickness
Comp .	3/32"	.005" Min	.123"
Oil (both)	3/16"	.005" Min	.128"

NOTE - Use standard or oversize rings of size indicated for replacement pistons (see Replacement Piston section above): 3.000" - B, D, F; 3.003" - J - 3.005" - L; 3.0101" - BO, DO, FO; 3.015" - LO; 3.020" - BB, DD, FF. If rings are filed, clearance at pin must be kept uniform with end gap.

PISTON PIN: - Diameter 3/4", Length 2-7/16".

Pin floats in piston and rod. Held by locking ring at each end. Pin hole in rod is bronze-bushed. Pins furnished standard, .002", .005", .010", oversize.

Pin Fit in Piston - Hand push fit with piston heated to 200° F.

Pin Fit in Rod Bushing - .0003" clearance. With this clearance rod will just turn of own weight.

CONNECTING ROD: - Weight 29.4 ozs. Length 8-3/16".

Crankpin Journal Diameter - 1-15/16".

Lower Bearing - Spun-babbitt lined type. Rods serviced on 'exchange' basis.

Clearance - .001". Sideplay - .006-.010".

Bearing Adjustment: - Laminated shims. Do not file rods or caps.

Installing Rods: - Lower bearings are offset. Install rods with right hand offset (widest half of bearing toward rear) in cylinders #1, 2, 4, and rods with left hand offset (widest half of bearing toward front) in cylinders #3, 5, 6. Oil scoop on bearing cap must be toward camshaft on all rods.

CRANKSHAFT: - 3 bearing. Integral counterweights.

Journal Diameters - #1 - 2-11/32"; #2 - 2-3/8"; #3 - 2-13/32".

Bearing Type - Removable bronze-backed, babbitt lined. Bearings furnished for service reamed to standard size or unfinished with 1/32" stock to permit reaming to desired size.

Clearance - .001".

Bearing Adjustment: - Laminated shims. Do not file bearing caps.

End Thrust: - Taken by flanges on #2 (center) main bearing. Endplay - .006-.012". Adjusted by replacing bearing.

CAMSHAFT: - Three bearing. Gear driven.

Journal Diameters - #1 - 2"; #2 - 1-31/32"; #3 - 1-1/2".

Bearing Clearance - .0015".

End Thrust: - Taken by spring-loaded plunger in end of camshaft and thrust plate on gear case cover.

NOTE - If gear case cover removed, see that spring and plunger are in place when cover is replaced.

(Cont'd)

Timing Gears: - Crankshaft gear cast-iron. Camshaft gear GE. or Cont. Diamond Fibre Bakelite.

Camshaft Setting: - Gears are marked. Mesh marked tooth of crankshaft gear between two marked teeth on camshaft gear.

VALVES: -	Head Diameter	Stem Diameter	Length
All valves	1-3/8"	3/8"	5-11/32"
	Seat Angle	Lift	Stem Clearance
Intake	45°	11/32"	.0015-.003"
Exhaust	45°	11/32"	.003-.005"

Tappet Clearance - .006" Intake, .008" Exhaust with engine hot.

Valve Guides: - Removable type. Pressed in block. Finish ream guides after installation to size giving correct clearance.

Valve Springs: - Cages installed on bottom of all springs. Springs should be installed with open side of cage toward cylinder.

	Spring Pressure	Spring Length
Valve Closed	44 lbs	2"
Valve Open	102 lbs	1-21/32"

Valve Lifters: - Slipper type operating in individual removable guides. Lifter is prevented from turning by pin in guide.

Valve Timing: - See Camshaft Setting above.

Intake Valves - Open 10°40, BTDC. Close 60° ALDC.

Exhaust Valves - Open 50° BLDC. Close 18°44' ATDC.

These figures correct with .010" tappet clearance.

To Check Timing - Set tappet clearance #1 intake valve at .010". This valve should open with piston 10°40 or .0562" before top dead center when point on flywheel approximately 3.94 teeth before "UDC.1-6/". A mark lines up with indicator in hole in left front face of flywheel housing. Reset tappet clearance at .006". hot.

Motor Gauge - Weidenhoff #114 Adapter, #44 Rod.

LUBRICATION: - Duo-flow (splash) system. Force feed by oil pump to connecting rod troughs and timing gears. Splash to all other bearing points from troughs.

Normal Oil Pressure - 3 lbs.

Oil Pressure Regulator - Operates at 3 lbs. Located on right side of crankcase. Not adjustable.

Crankcase Capacity - 6 qts. refill.

Oil Pump: - Oscillating plunger type pump mounted on right side of crankcase and driven by gears from the camshaft.

Oil Pressure Indicator: - Consists of signal light on instrument panel and switch built in oil pressure regulator.

CLUTCH: - Own Make. Single plate, cork insert type operating in oil. Driven plate can be recorked but is customarily replaced.

Clutch Plate - Thickness.203". Inside diameter 5.375".

Outside diameter 8.625". Facing consists of 90 cork inserts.

Adjustment: - Free movement of clutch pedal must be 1-1/2" at all times. To adjust, remove clevis pin in clutch pedal link rod (between frame and leg of 'X' member below clutch pedal shaft), loosen locknut at top of clevis, turn clevis to shorten or lengthen rod as required, tighten locknut, replace clevis pin. On cars with automatic clutch control, check linkage whenever clutch is adjusted.

Automatic Clutch Linkage Adjustment - Hold accelerator pedal in depressed position, pull backward on clutch control power unit rod at left of engine. With rod in extreme rear position check clearance between back of slot in rod yoke and clevis pin which attaches it to operating lever. Clearance at this point must be 7/8".

Servicing: - Oil in clutch should be renewed at 5000 mile intervals.

STEERING: - Steering Gear-Gemmer Worm-and-Sector type. See article in Steering Section for adjustments.

NOTE - An adjustable drag link with 3/4" adjustment (made by shifting shims from front to rear of pitman arm ball seat) is used on Model 61 after #61-10394 (except 61-10601 to 61-10650), Model 62 after #62-3419 (except 62-3506 to 62-3661 incl.).

Front Suspension: - Conventional 'I' beam section front axle with Elliott type ends and semi-elliptic springs. Torque arm at each end of axle connected to frame at rear by rubber-bushed bolt maintains axle alignment.

King Pin Inclination-7° crosswise.

NOTE -Kingpin end thrust taken by five loose balls in upper bushing above king pin. Ball seat formed in bushing and on king pin end. To install king pin, assemble sufficient shims to allow .006-.010" endplay below spindle, insert king pin until it enters top bushing, drop 5 loose balls through lubrication fitting hole on top of bushing, insert driver J-479-1 (or suitable replacement) in hole to position balls, drive king pin up into place.

Caster - 3-1/2-4-1/2°. To adjust, loosen nut on horizontal arm attaching torque arm to axle yoke, take out capscrew between arm and yoke at top, decrease shim thickness between arm and yoke to increase caster, or increase shim thickness to decrease caster. .060" difference in shim thickness changes caster 1°. Shim thickness on both sides of car must be kept equal.

Camber - 1-1-1/2°. No adjustment. Axle may be bent cold for minor corrections.

Toe In - 1/8" (0-1/8"). Adjusted in usual manner by loosening clamp nuts and turning tie rod.

Steering Geometry - Inner wheel turned 20°, outer wheel 17°. Check tie rod ends and steering arms for looseness, replace steering arms if bent.

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BRAKES: - Service - Bendix Hydraulic. Due-Servo, Single Anchor type. Brake pedal connected to rear wheel brakes through cable linkage for additional reserve mechanical application of brakes. Hand lever applies rear wheel brakes through this same linkage.

Brake Drum Diameters - 10-1/16".

Lining - Moulded & Woven type. Width - 1-3/4". Thick

ness 7/32". Length 2-2-1/8" per wheel.

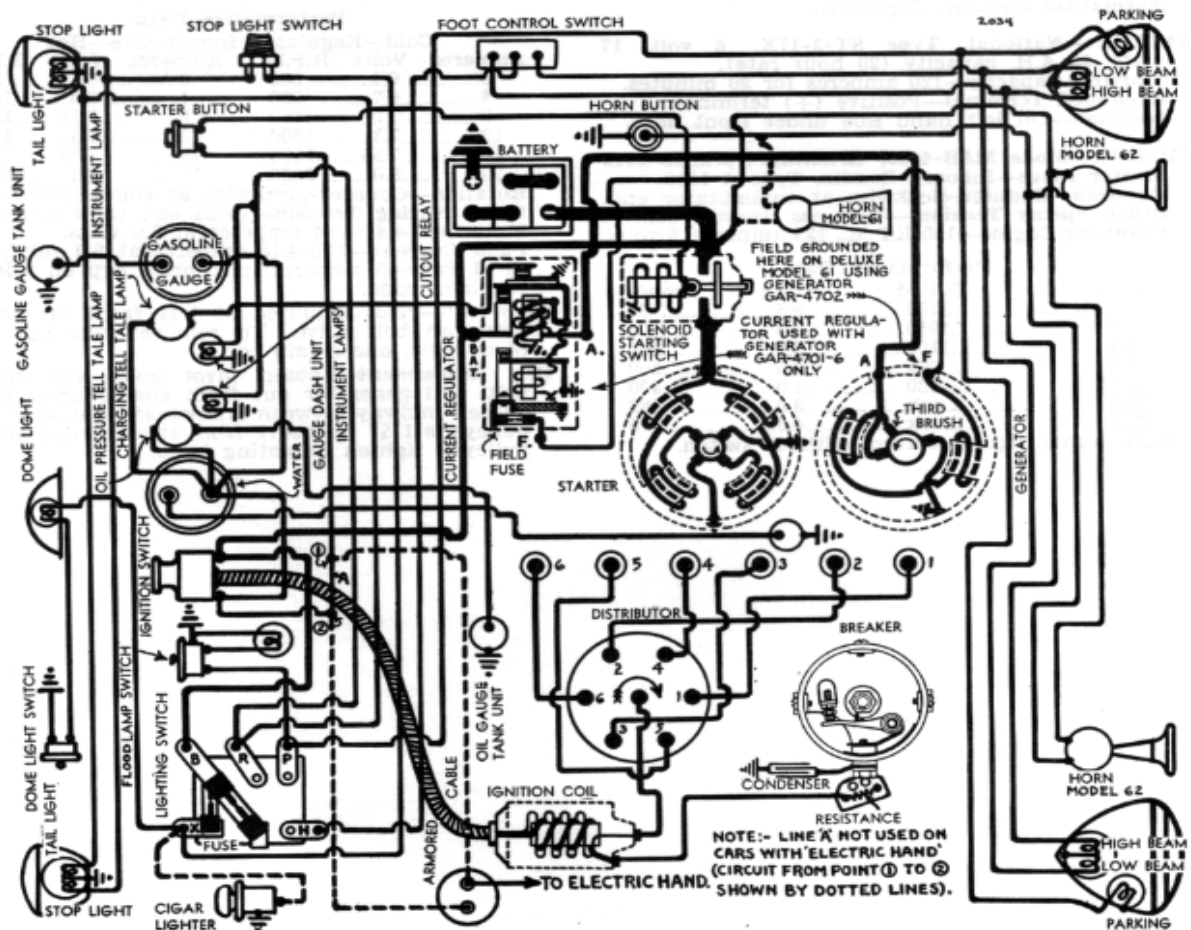
Brake Clearance - .010" heel and toe of each shoe.

Brake Pedal Adjustment: For correct mechanical follow-up feature, adjust position of nut on connecting rod so that clearance between face of nut and end of push rod is 1-29-32" with equalizer against stop.

Hand Brake Adjustment: - See Service Brakes.

1936 Terraplane
Model 61 Deluxe, Model 62 Custom
Tune-up and Electrical Specifications

1936 Terraplane Electrical Diagram



1936 Terraplane - Mod. 61, 62
Tune-up and Electrical Specs. - Cont'd

NOTE: - 'Electric Hand' Bendix electro-pneumatic type gear shift optional on all models.

SERIAL NUMBER: - First number - (61) 61-101 (U.S.), 61-C-101 (Canada); (62) 62-101 (U.S.), 62-C-101 (Canada). Stamped on plate on dash under hood.

COMPRESSION: - Ratio 6.0-1 Standard cast-iron head, 7.0-1 Optional high compression aluminum head. Check compression pressure by removing all spark plugs and cranking engine with throttle wide open.

Cylinder Head	Compression Pressure
Standard 6.0-1	111 lbs. at 215 R.P.M.
Optional 7.0-1	127 lbs. at 207 R.P.M.

VACUUM READING: - Gauge should show steady reading of 18-20" of HG. with engine idling at 350 R.P.M.

IGNITION: - Coil Model IG-4633. Resistor unit mounted on distributor terminal is connected in series with coil primary.

Resistance Unit - Part No. SP-4008.

Coil Draw - 2.5 amperes idling, 4.5 stopped.

Ignition Switch: - Mitchellock Model 24-B, Type 6696, Connected to coil by armored cable.

Ignition Lock - Briggs & Stratton No. 50184, Mitchell No. 6095.

Distributor Model IGB-4301B. Single breaker, 6 lobe cam, full automatic advance type.

Breaker Gap - Set at .020". Limits .018-.020".

Cam Angle or Dwell - 40° (closed), 20° (open).

Breaker Arm Spring Tension - 16-20 ounces.

Condenser - Part No. IGB-1025J. Capacity .20-.25 mfd.

Automatic Advance			
Distributor		Engine	
Degrees	R.P.M.	Degrees	R.P.M.
Start	300	0	600
3	400	6	800
5	615	10	1230
10	1150	20	2300
14	1580	28	3160

Distributor Removal: - Mounted on right side of crank case. To remove, take out hold-down screw in advance arm.

IGNITION TIMING: - Initial setting for all engines as shown. See Final Setting Section for adjustment in accordance with octane rating of fuel used.

Flywheel Degrees	Piston Position
At TDC	.000" TDC.

NOTE - High octane type fuel must be used in engines with high compression 7.0-1 aluminum head.

To Set Timing (Initial Setting) - With #1 piston on compression, turn engine over until flywheel mark "UDC.1-6/" lines up with pointer in inspection hole in left front face of flywheel housing above starter. Loosen hold-down screw in advance arm, rotate distributor clockwise to limit of advance arm slot, then slowly rotate distributor counter-clockwise until contacts begin to open, tighten hold-down screw.

Final Setting - Check ignition setting by road testing car. With engine warm and running in high gear on level road, a slight spark knock should be evident when car is accelerated from 10-15 M.P.H. with wide open throttle. Adjust by loosening hold-down screw in advance arm and rotating distributor graduation on scale counter-clockwise (if no knock evident) or clockwise (if knock too severe). Repeat test until slight knock is evident. Final setting must not be more than 3/41, on flywheel before "UDC.1-6/" mark.

Timing (Motor Gauge) - Weidenhoff #114 Adapter, #44 Rod.

Firing Order: - 1-5-3-6-2-4. See diagram.

Spark Plugs: - Champion Type J-8 (Std. 6.25-1 engines), J-9 (Optl. 7.0-1 engines). 14 MM. Metric type.

Spark Plug Gaps - .025" (Std. engine), .022" (Optl. H. C. engine).

CARBURETION: - Carburetor - (61) Carter Model 331-S, (62) Carter Model 329-S. 1-1/4" downdraft types.

NOTE - Do not adjust carburetor until engine is warmed up so that choke valve is wide open and engine idling at slow or hot idling speed.

Idle Adjustment - Adjust throttle stop-screw so that speed is 350 R.P.M. or 7 M.P.H. Turn idle adjusting screw in until engine begins to miss, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Final setting should be 1/4-1 (331-S), 1/2-1 (329-S) turn open from seated position. Readjust throttle stop screw for correct idling speed.

Accelerating Pump Setting - Pump lever (under dust cover at top of carburetor) has three holes for pump link engagement. Change for seasonal requirements as follows:

Center Hole - Normal summer temperatures.

Inner Hole (Min. stroke) - Extreme hot weather.

Upper Hole (Max. stroke) - Extreme cold weather.

Throttle Cracking (331-S only): - Opens throttle valve .036-.040" with choke fully closed. No adjustment.

Fast Idle (329-S only): - Integral with carburetor. No adjustment required.

Automatic Choke (329-S only): - Carter Climatic Control.

Air Cleaner: - AC. #1526650 Standard, #1526651 on cars with Electric Hand. Heavy duty oil-bath type optional.

Fuel Pump: - AC. Type R #1521450. Diaphragm type.

Gasoline Gauge: - King-Seeley Electric.

VALVE TIMING: - Tappet Clearance - .006" Intake, .008" Exhaust, with engine hot.

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Automatic Choke (329-S only): - Carter Climatic Control.

Air Cleaner: - AC. #1526650 Standard, #1526651 on cars with Electric Hand. Heavy duty oil-bath type optional.

Fuel Pump: - AC. Type R #1521450. Diaphragm type.

Gasoline Gauge: - King-Seeley Electric.

VALVE TIMING: - Tappet Clearance - .006" Intake, .008" Exhaust, with engine hot.

Valve Spring Pressure - 44 lbs. at 2" (valve closed), 102 lbs. at 1-21/32" (valve open).

To Check Valve Timing - Set tappet clearance #1 intake valve at .010". This valve should open with piston 10° 40' or .0562" before top dead center when point on flywheel approximately 3.94 teeth before dead center mark "UDC.1-6/" lines up with pointer in inspection hole in left front face of housing. Reset tappet clearance at .0061, with engine hot.

Motor Gauge - Weidenhoff #114 Adapter, #44 Rod.

LUBRICATION: - Crankcase Capacity - 5 quarts, refill.

Normal Oil Pressure - 3 lbs. (no gauge).

Oil Pressure Signal Light - Used instead of pressure gauge. Controlled by oil pressure regulator valve.

BATTERY: - National, Type ST-317X. 6 volt, 17 plate, 96 ampere hour capacity (20 hour rate).

Starting Capacity - 120 amperes for 20 minutes.

Zero Capacity - 300 amperes for 3.2 minutes.

Grounded Terminal - Positive (+) terminal.

Location - On left hand side under front floor.

STARTER: - Model MAB-4075. Armature MAB-2113.

Drive - Inboard Bendix (barrel), Type A-1673.

Cranking Engine - 150 R.P.M., 120-125 amps. at 5 volts.

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
.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.	582
22.5 "	Lock	4	775

NOTE - Lock Torque figures correct without switch.

Removal: - Flange mounted on left front face of flywheel housing. To remove, take out flange mounting bolts.

Starting Switch: - Solenoid Type SS-4001. Controlled by pushbutton switch (R.B.M. Model 1800) on dash. Operative with switch turned on. On cars with Electric Hand clutch must be disengaged to operate switch.

Solenoid Switch

Closes with terminal voltage of 4 volts or less and will remain closed until voltage drops to .75-2.0 volts. Current draw 3 amperes at 6 volts.

GENERATOR: - (61) Model GAR-4702, (62) GAR-4701-6. Armature No. GAR-2077. Ventilated, third brush control type. Current Regulator (two-rate charging control) on GAR-4701-6.

Charging Rate Adjustment - Use test meters to check generator output. On Model GAR-4701-6, short out regulator by connecting jumper wire from 'F' terminal on generator to ground. Take off commutator cover band, shift third brush by hand counter-clockwise to increase, or clockwise to decrease charging rate. Third brush held in position by friction. Remove jumper wire.

NOTE - Model GAR-4702 generator field terminal on generator frame is grounded by a grounding cup assembled on the terminal. If regulator is installed, this ground cup must be removed.

Performance Data - GAR-4701-6

Cold-Regulator Inoperative-Hot

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	780	0	6.4	820
4	6.7	930	4	6.8	1000
8	6.95	1060	8	7.1	1180
12	7.25	1210	12	7.35	1400
16	7.6	1440	16	7.8	1790
22.8	8.0	2400	18.4	8.0	2700

Model GAR-4702

Cold - No Regulator - Hot

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	860	0	6.4	830
4	6.8	1000	4	6.85	1040
8	7.2	1200	8	7.3	1300
12	7.6	1460	12	7.75	1550
16	8.0	2150	14.5	8.0	2200

Rotation - Counter-clockwise at commutator end.

Brush Spring Tension - 18-22 ozs. (new brushes).

Field Current - 3.70-4.10 amperes (GAR-4702), 3.51 3.89 amperes (GAR-4701-6) at 6.0 volts.

Motoring Current - 4.56-5.04 amperes (GAR-4702), 5.32-5.88 amperes (GAR-4701-6) at 6.0 volts.

Field Fuse - 5 ampere in knurled cup on side of regulator case (GAR-4701-6 only).

Removal: - Pivot mounted at left front of engine, with fan belt drive. To remove, take out two pivot bolts and one clamp bolt.

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Belt Adjustment: - Swing generator away from engine until slack in belt midway between fan pulley and generator pulley is 1-1/4" (measure from straight edge across pulleys).

CUTOUT RELAY: - Model CBA-4003 (GAR-4702).

Mounted on dash. Extra set of ground contacts provided for generator charging tell-tale signal light control.

Cuts In - 6.75-7.5 volts.

Cuts Out - .5-2.5 amperes discharge current.

Contact Gap - .025-.035" (with upper or ground contacts closed-ground contacts must be open with main contacts closed).

Air Gap - .010-.0301, with contacts closed.

RELAY - REGULATOR: - Model TC-4304A (GAR-4701-6). Mounted on engine side of dash. Consists of Cutout Relay and Current Regulator (two-rate charging control). Cutout Relay has extra set of ground contacts for generator charging tell-tale signal light control.

Cutout Relay

Cuts In - 6.5-7.25 volts. All other data same as for Model CBA-4003 (see above).

Current Regulator

Contacts Open - 8.0-8.50 volts at 70° F.

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. Head lamps aimed straight ahead (upper beams with lenses in place). Upper and lower beams controlled by foot selector switch.

Switches

Lighting - R.B.M. Model 1082.

Instrument Lights - Soreng-Manegold Model K2060A.

Stop Light - Motometer Model 58012-C. Hydraulic type mounted in brake line at left frame side rail in channel at rear.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Instrument	1	55
Signal Lights	1	51
Stop and Tail	21-3	1158
Dome	15	87

SIGNAL LIGHTS: - Battery Charge Tell-tale and Oil Pressure Tell-tale lights mounted on instrument panel.

FUSES: - Lighting - Two 20 ampere capacity on switch.

Generator Field - 5 ampere in regulator (on GAR4701-6 only).

HORNS: - E. A. Vibrator type. Twin horns on Model 62