NATIONAL SERVICE MANUAL

1936 SUPPLEMENTS

TUNE UP – ELECTRICAL – CARBURETION

NATIONAL AUTOMOTIVE SERVICE
SAN FRANCISCO, CALIFORNIA

1936 CAR MODEL INDEX – TUNE UP & ELECTRICAL

EQUIPMENT INSTALLED

					BATTERY		LIGHTING				CARBURETION	
								Switch		Circuit	Carburetor	Fuel Pump
Page	CAR	Model	Serial No.	Year	Make	Type	Gr. Ter.	Make	Model	Fuses Breaker	Make and Model	Make and Model
1412	AUBURN	654	6501	1936	U.S.L.	RN-15A	Pos.	Sor.Man.	A-5640A	20 *	Strom. EX-22	AC B-1521814
1414	AUBURN	852	4501	1936	U.S.L.	XY-15A	Pos.	Sor.Man.	A-5640A	20 *	Strom. EE-1	AC B-1522146
1414	AUBURN	Super 852	34501	1936	U.S.L.	XY-15A	Pos.	Sor.Man.	A-5640A	20 *	Strom. EX-32	AC B-1522146
1416	BUICK	Spec. 40	2,830,899	1936	Delco	13-J	Neg.	Delco-R.	479-M, L	30 *	Strom. EE-1	AC W-1521854
1418	BUICK	Cent. 60	2,830,899	1936	Delco	15-G	Neg.	Delco-R.	479-N, L	* on switch	Strom. EE-22	AC AB-1521838
1418	BUICK	Rdmstr.80	2,830,899	1936	Delco	15-G	Neg.	Delco-R.	479-N, L	* on switch	Strom. EE-22	AC AB-1521838
1418	BUICK	Ltd. 90	2,830,899	1936	Delco	15-G	Neg.	Delco-R.	479-N, L	30 on switch	Strom. EE-22	AC AB-1521838
1420	CADILLAC	V-8, 60	6,010,001	1936	Delco	17-K	Pos.	Delco-R.	487-N,P,R	* D.R.411-A	Strom. EE-25	AC AB-1522119
1420	CADILLAC	V-8,70,75	3,110,001	1936	Delco	17-D	Pos.	Delco-R.	487-N,P,R	* D.R.411-A	Strom. EE-25	AC AB-1522119
1422	CADILLAC	V-12,80,85	4,110,001	1936	Delco	21-D	Pos.	Delco-R.	487-N,P,R	* D.R.411-A	Detroit 51 (2)	AC D-1522149
1422	CADILLAC	V-16, 90	5,110,001	1936	Delco	25-A,AF	Pos.	Delco-R.	487-N,P,R	* D.R.411-A	Detroit 51 (2)	AC D-1522149
1424	CHEVROLET	Std.FB,FC,R	1001	1936	Delco	13-A,15-X	Neg.	Delco-R.	479-R,P	15 *	Carter 319-S, 34-S, 35-S	AC W-1521812
1426	CHEVROLET	Mtsr.FA,FD	1001	1936	Delco	15-T,X	Neg.	Delco-R.	479-Y	15 *	Carter 319-S, 34-S, 35-S	AC W-1521812
1428	CHRYSLER	Six C-7	6,823,301	1936	Willard	WH-2-15	Pos.	Chrysler	655559	20 *	Carter E6G1	AC B-1522237
1430	CHRYSLER	Deluxe C-8	6,710,501	1936	Willard	WH-2-15	Pos.	Chrysler	655559	20 *	Strom. EXV-3	AC D-1521803
1432	CHRYSLER	Airflow C-9	6,606,201	1936	Willard	WH-4-17	Pos.	Chrysler	655559	20 *	Strom. EXV-3	AC D-1521790
1432	CHRYSLER	Imper.C-10	See car pg.	1936	Willard	WH-4-17	Pos.	Chrysler	655559	20 *	Strom. EE-22	AC I-1521549
1432	CHRYSLER	Cust.Imp.C-11	"	1936	Willard	WH-4-17	Pos.	Chrysler	655559	20 *	Strom. EE-22	AC I-1523000
1434	CORD	810	1101	1936	U.S.L.	FN-19F	Pos.	Sor.Man.	A-5640-A	20 *	Strom. EE-15	AC B-1522146
1436	DE SOTO	S-1	See car page	1936	Willard	WH-2-15	Pos.	De Soto	655795	20 *	Carter E6G1	AC B-1522237, 1522995
1436	DE SOTO	S-2	5,089,001	1936	Willard	WH-2-15	Pos.	De Soto	655795	20 *	Carter E6G1	AC B-1522237, 1522995
1438	DODGE	D-2	See car page	1936	Willard	WT-1-15	Pos.	Dodge	652143	20 *	Strom. EXV-2	AC B-1522237, 1522995
†	DUESENBERG	J, SJ		1936	Exide	XR-21-ER	Neg.	Delco-R.	486-D	* D.R.5759	Strom. EE-3, UU-3	SW & Autopul.
1440	FORD	67,68,51	See car page	1936	Ford	40-10655-C	Pos.	Ford (R.B.M.)	B-11654-B	20 *	Strom. EE-1	AC R-1521764
1442	GRAHAM	Cr. 80, 80A	300,001	1936	Willard	WHT-1-90	Pos.	Delco-R.	481Y	20 *	Marvel B-2-SU-10-1673	AC P-1523008
1444	GRAHAM	Cav.90,90-A	200,001	1936	Willard	WHT-1-90	Pos.	Delco-R.	481-Z	20 *	Marvel B-2-10-1678	AC P-1523008
1444	GRAHAM	Super. 110	100,001	1936	Willard	WHT-1-90	Pos.	Delco-R.	481-Z	20 *	Marvel B-3-10-1680	AC R-1523009
1446	HUDSON	6 63	63-101	1936	National	ST-317-X	Pos.	R.B.M.	1650	20 *	Carter 329-S	AC R-1521450
1448	HUDSON	8 64,5,6,7	101	-1936	National	ST-319-X	Pos.	R.B.M.	1650	20 *	Carter 330-S	AC R-1521450
1450	HUPMOBILE	618-G	G-5001	1936	Willard	WS-2-15	Pos.	Cole (Hersee)		20 *	Carter 333-S	AC T-1521811
1452	HUPMOBILE	621-N	N-5001	1936	Willard	WH-2-15	Pos.	Clum	9526	15 *	Carter 317-S	AC D-1523014
1454	LA FAYETTE	3610	L-23101	1936	U.S.L.	KL-1-13	Pos.	Sor.Man.	5820-A,A-5820-A	20 *	Marvel B-10-1603	Strom.AX-2 AC W-1522152
1456	LA SALLE	36-50	2,210,001	1936	Delco	17-K	Pos.	Delco-R.	487-N,P,R	* D.R.411-A	Strom. EE-15	AC I-1522248
1458	LINCOLN ZEPHYR	H	H-1	1936	Ford	40-10655-C	Pos.	R.B.M.	H-11654	* RBM H-11654	Strom. EE-1	AC R-1521764

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EQUIPMENT INSTALLED

	IGNITION				STARTER			GENERATOR					
Make	Coil Model	Dist. Model	Switch Make	Switch Model	Make	Model	Armature Number	Model	Armature Number	Year	Model	CAR	Page
Auto-Lite	IG-4065	IGB-4318	Oakes	Hershey	Auto-Lite	MAJ-4032,3,5	MAJ-2006	GAR-4603-5	GAR-2077	1936	654	AUBURN	1412
Auto-Lite	CE-4001-G	IGP-4002	Oakes	Hershey	Auto-Lite	MAB-4063	MAJ-2006	GAR-4603-5	GAR-2077	1936	852	AUBURN	1414
Auto-Lite	CE-4001	IGH-4027	Oakes	Hershey	Auto-Lite	MAB-4063	MAJ-2006	GAR-4603-5	GAR-2077	1936	Super 852	AUBURN	1414
Delco-Remy	536-H	663-F	Oakes	Hershey	Delco-Remy	734-Z	823881	936-C,V	1854856	1936	Spec. 40	BUICK	1416
Delco-Remy	536-H	663-E	Oakes	Hershey	Delco-R.	727-W,29-B	820158	936-P,W	1854856	1936	Cent. 60	BUICK	1418
Delco-Remy	536-H	663-E	Oakes	Hershey	Delco-R.	727-W,29-B	820158	936-P,W	1854856	1936	Rdmstr. 80	BUICK	1418
Delco-Remy	536-H	663-E	Oakes	Hershey	Delco-R.	727-W,29-B	820158	936-P,W	1854856	1936	Ltd. 90	BUICK	1418
Delco-Remy	539-C	663-G	Delco-Remy	431-L,Z	Delco-R.	727-V, 29-C	820158	961-E	1857866	1936	V-8, 60	CADILLAC	1420
Delco-Remy	539-C	663-G	Delco-Remy	431-L	Delco-Remy	727-V	820158	961-E	1857866	1936	V-8, 70, 75	CADILLAC	1420
Delco-Remy	553-E	667-C	Delco-Remy	435-A	Delco-Remy	580	1837058	933-M	1854448	1936	V-12, 80, 85	CADILLAC	1422
Delco-Remy	553-E	4118	Delco-Remy	431-E	Delco-Remy	580	1837058	933-M	1854448	1936	V-16, 90	CADILLAC	1422
Delco-Remy	536-D	645-T	Delco-Remy	431-P,Y	Delco-Remy	738-G,H	1847432	946-C, 36-U	1841027	1936	Std	CHEVROLET	1424
Delco-Remy	536-D	645-T	Delco-Remy	431-P	Delco-Remy	738-G,H	1847432	935-V, 36-U	1854856	1936	Mstr	CHEVROLET	1426
Auto-Lite	IG-4631,38	IGS-4006-1,6A-1	Mitchellock	6519	Auto-Lite	MAX-4016	MAW-2030	GAR-4608A-5	GAR-2116F	1936	C-7	CHRYSLER	1428
Auto-Lite	CE-4616,21	IGT-4001-1,1D-1	Mitchellock	6519	Auto-Lite	MAX-4020	MAW-2030	GAR-4608A-5	GAR-2116F	1936	C-8	CHRYSLER	1430
Auto-Lite	CE-4618	IGT-4001C-1,1E-1	Mitchellock	6744	Auto-Lite	MAX-4003	MAW-2030	GAR-4608B-5	GAR-2116F	1936	C-9	CHRYSLER	1432
Auto-Lite	CE-4618	IGT-4001C-1,1E-1	Mitchellock	6744	Auto-Lite	MAX-4003	MAW-2030	GAR-4608B-5	GAR-2116F	1936	C-10	CHRYSLER	1432
Auto-Lite	CE-4618	IGT-4001C-1,1E-1	Mitchellock	6744	Auto-Lite	MAX-4003	MAW-2030	GAR-4608B-5	GAR-2116F	1936	C-11	CHRYSLER	1432
Auto-Lite	CE-4620	IGP-4006	Mitchellock	6679	Auto-Lite	MAX-4021,27	MAW-2006	GAR-4630-5*	GAR-2077	1936	810	CORD	1434
Auto-Lite	IG-4630,37	IGS-4006-1, 6A-1	Mitchellock	6518	Auto-Lite	MAX-4015,16	MAW-2030	GAR-4608A-5	GAR-2116F	1936	S-1	DE SOTO	1436
Auto-lite	IG-4636,39	IGS-4006-1, 6A-1	Mitchellock	6688	Auto-Lite	MAX-4016	MAW-2030	GAR-4608A-5	GAR-2116F	1936	S-2	DE SOTO	1436
Auto-Lite	IG-4628	IGS-4002-1,2A-1	Mitchellock	6508	AutoLite	MAW-4010,11	MAW-2030	GAR-4608-5	GAR-2116F	1936	D-2	DODGE	1438
Delco-Remy	553-A	4094	Delco-R.	Coil Lock	Delco-Remy	429	37895	428	827753	1936	J, SJ	DUESENBERG	†
Ford	18-12024-A3	68-12127	Oakes	Hershey	Ford	18-11002	18-11005	40-10000-B	40-10005	1936	67, 68, 51	FORD	1440
Delco-Remy	536-J	623-A	Delco-Remy	431-U	Delco-Remy	738-J,V	823881	937-Y, 36-L	1859794*	1936	80, 80-A	GRAHAM	1442
Delco-Remy	536-J	623-A	Delco-Remy	431-U	Delco-Remy	738-T,X	823881	948-B	1853593	1936	90, 90A	GRAHAM	1444
Delco-Remy	539-M	623-E	Delco-Remy	431-U	Delco-Remy	738-T,X	823881	948-B	1853593	1936	Super 110	GRAHAM	1444
Auto-Lite	IG-4638	IGB-4301-B	Mitchellock	6696	Auto-Lite	MAB-4075	MAB-2113	GAR-4701-6	GAR-2077	1936	6 63	HUDSON	1446
Auto-Lite	CE-4617	IGP-4001-B	Mitchellock	6696	Auto-Lite	MAB-4075	MAB-2113	GAR-4701-6	GAR-2077	1936	8 64,5,6,7	HUDSON	1448
Auto-Lite	IG-4619	IGB-4319	Mitchellock	6702	Auto-Lite	MAJ-4044	MAJ-2048	GBK-4604	GBK-2055	1936	618-G	HUPMOBILE	1450
Auto-Lite	CE-4611	IGP-4003	Mitchellock	6704	Auto-Lite	MAB-4081	MAB-2046	GAR-4620-5	GAR-2116B	1936	621-N	HUPMOBILE	1452
Auto-Lite	IG-4626,A	IGB-4317-A,B	Mitchellock	6708	Auto-Lite	MAB-4076	MAB-2057	GAR-4601-5	GAR-2214	1936	3610	LA FAYETTE	1454
Delco-Remy	539-C	663-J	Delco-Remy	431-L	Delco-Remy	727-N	823881	961-D	1857866	1936	36-50	LA SALLE	1456
Ford	H-12004	H-12000	Oakes	Hershey	Ford	18-11002	18-11005	68-10000-A, B*	68-10005	1936	H	LINCOLN ZEPHYR	1458

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EQUIPMENT INSTALLED

					BATTERY			LIGHTING				CARBURETION	
								Switch			Circuit	Carburetor	Fuel Pump
Page	CAR	Model	Serial No.	Year	Model	Type	Gr. Ter.	Make	Model	Fuses	Breaker	Make and Model	Make and Model
1460	LINCOLN V-12	K	5501	1936	Exide	X-21-L	Neg.	R.B.M.	1300	*	R.B.M. 1630	Strom. EE-22	AC I-1521218
1462	NASH	3620	R-303,301	1936	U.S.L.	KL-1-13	Pos.	Sor.Man.	A-5820-A	20	*	Strom. EX-32	AC W-1522153
1464	NASH	3640-A	C-1001	1936	U.S.L.	KL-1-13	Pos.	Sor.Man.	A-5820-A	20	*	Strom. AX-2	AC W-1522152
1466	NASH	3680	B-77,325	1936	U.S.L.	KW-15-A	Pos.	Sor.Man.	A-5820-A	20	*	Strom. EE-1	AC W-1522154
1468	OLDSMOBILE	F-36	F-200,001	1936	Delco	15-T	Neg.	Delco-R.	479-K,H	*	D.R.on sw'ch	Carter 327-S, 339-S	AC T-1522189
1470	OLDSMOBILE	L-36	L-100,001	1936	Delco	17-K, J	Neg.	Delco-R.	479-K,H	*	D.R.on sw'ch	Carter 328-S, 341-S	AC T-1522188
1472	PACKARD	120-B	See car page	1936	P-O-L	HP-2-17	Pos.	Delco-R.	480-Y	20	D.R.on sw'ch	Strom. EE-14	AC X-1521808
1474	PACKARD	1400,1,2	See car page	1936	P-O-L	H4-21	Pos.	R.B.M.	1400	20	D.R.1050-W	Strom. EE-23	AC F-1521777
1474	PACKARD	1403,4,5	See car page	1936	P-O-L	H4-21	Pos.	R.B.M.	1400	20	D.R.1050-W	Strom. EE-23	AC F-1521777
1476	PACKARD	1407, 8	See car page	1936	P-O-L	H4-21	Pos.	R.B.M.	1400	20	D.R.1050-W	Strom. EE-3	AC I-1521778
1478	PIERCE ARROW	1601	See car page	1936	Willard	WH-4-17	Pos.	Delco-R.	479-M	*	D.R. 410-N	Strom. EE-3	AC D-1522112
1480	PIERCE ARROW	1602, 3	See car page	1936	Willard	WH-5-19	Pos.	Delco-R.	479-M	*	D.R. 410-N	Strom. EX-32 (2)	AC D-1523010
1482	PLYMOUTH	P1Std	See car page	1936	Willard	WHT-1-90	Pos.	Plym.	659631, 635451	20	*	Carter C6E1, C6E2, B6F1	AC B-1522237
1482	PLYMOUTH	P2Del	See car page	1936	Willard	WHT-1-90	Pos.	Plymouth	635451	20	*	Carter C6E1, C6E2, B6F1	AC B-1522237
1484	PONTIAC	Mstr.36-26B	6BB-1001	1936	Delco	15-T,17-J	Neg.	Delco-R.	479-S,J	20	*	Carter 324-S	AC R-1522221
1484	PONTIAC	Del.36-26A	6BA-1001	1936	Delco	15-T,17-J	Neg.	Delco-R.	479-S,J	20	*	Carter 324-S	AC R-1522221
1486	PONTIAC	36-28	8BA-1001	1936	Delco	17-K, J	Neg.	Delco-R.	479-S,J	20	*	Carter 322-S	AC R-1522221
1488	REO	Fly.Cld.6-D	6D-100	1936	Willard	WH-1-13	Neg.	Reo	18255	20	*	Carter 338-S	AC E-1521116
1490	STUDEBAKER	Dict.3A,4A	See car page	1936	Willard	WH-1-13	Pos.	Douglas	30	*	Strom. EX-23	AC W-1522227
1492	STUDEBAKER	Pres. 2-C	See car page	1936	Willard	WH-1-13	Pos.	Studebaker	188006	*	D.R.410-R	Strom. EE-1	AC J-1521797
†	STUTZ	SV-16		1936	P-O-L	H4-21	Neg.	Delco-R.	486-G	*	D.R.410-F, N	Zenith 105-DS	Kingston
†	STUTZ	DV-32		1936	P-O-L	H4-21	Neg.	Delco-R.	486-G	*	D.R.410-F, N	Strom. EE-3	AC
1494	TERRAPLANE	Deluxe 61	61-101	1936	National	ST-317-X	Pos.	R.B.M.	1650	20	*	Carter 331-S	AC R-1521450
1494	TERRAPLANE	Cust. 62	62-101	1936	National	ST-317-X	Pos.	R.B.M.	1650	20	*	Carter 329-S	AC R-1521450
1496	WILLYS	77	42,000	1936	U.S.L.	A-13A	Neg.	Culver-Stearns		20	*	Tillotson D-1E	AC P-1521390

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EQUIPMENT INSTALLED

	IGNITION				STARTER			GENERATOR					
Make	Coil Model	Dist. Model	Switch Make	Switch Model	Make	Model	Armature Number	Model	Armature Number	Year	Model	CAR	Page
Auto-Lite	CE-4001-L(2)	IGM-4003,A	Oakes	Hershey	Auto-L.	MAO-4003-B,4B	MAO-2006	GBC-4103	GBC-2035	1936	K	LINCOLN V-12	1460
Auto-Lite	CE-4402-A	IGE-4012-A,B	Oakes	Hershey	Auto-Lite	MAB-4077	MAB-2057	GAR-4601-5*	GAR-2214	1936	3620	NASH	1462
Auto-Lite	IG-4626-A	IGB-4328-B	Mitchellock	6708	Auto-Lite	MAB-4076	MAB-2057	GAR-4618-2*	GAR-2214	1936	3640-A	NASH	1464
Auto-Lite	CE-4402-A	IGK-4101	Oakes	Hershey	Auto-Lite	MAB-4054,57	MAB-2047	GBR-4602-4	GAR-2214	1936	3680	NASH	1466
Delco-Remy	536-E	647-C	Delco-Remy	435-B	Delco-Remy	738-S	823881	936-T	1854856	1936	F-36	OLDSMOBILE	1468
Delco-Remy	536-E	663-K	Delco-Remy	435-B	Delco-Remy	727-Z	823881	936-T	1854856	1936	L-36	OLDSMOBILE	1470
Auto-Lite	CE-4614,15	IGH-4026-A	Mitchellock	6513,14	Auto-Lite	MAX-4006	MAW-2006	GAR-4611A-5*	GAR-2611	1936	120-B	PACKARD	1472
Delco-Remy	539-K	662-T	Delco-Remy	430-L	Auto-Lite	MAX-4014	MAW-2090	CO-1300	23865	1936	1400, 1, 2	PACKARD	1474
Delco-Remy	539-K	662-T	Delco-Remy	430-L	Owen-Dyneto	DN-1298	13409	CO-1300	23865	1936	1403, 4, 5	PACKARD	1474
Auto-Lite	CE-4022,23	IGO-4002-A	Delco-Remy	430-M	Owen-Dyneto	DN-1299	13409	CO-1309	23691	1936	1407, 8	PACKARD	1476
Delco-Remy	539-K	662-J	Delco-Remy	430-U	Owen-Dyneto	DI-1314	16437	CO-1309	23691	1936	1601	PIERCE ARROW	1478
Delco-Remy	553-E	4105	Delco-Remy	430-T	Owen-Dyneto	DI-1313	16437	CO-1309	23691	1936	1602, 3	PIERCE ARROW	1480
Auto-Lite	IG-4629	IGS-4003-1,3	A-1,3B-1	Mitchel'ck 6517	Auto-L.	MAW-4009, 11	MAW-2030	GBM-4603B-1	GBM-2006F	1936	P1	PLYMOUTH	1482
Auto-Lite	IG-4629	IGS-4003-1,3	A-1,3B-1	Mitchel'ck 6517	Auto-L.	MAW-4009, 11	MAW-2030	GAR-4608E-5	GAR-2116F	1936	P2	PLYMOUTH	1482
Delco-Remy	539-L	647-B	Delco-Remy	431-L	Delco-R.	727-Y, 37-C	823881*	935-W, 36-R	1854856	1936	Mstr. 6	PONTIAC	1484
Delco-Remy	539-L	647-B	Delco-Remy	431-L	Delco-R.	727-Y, 37-C	823881*	935-W, 36-R	1854856	1936	Del. 6	PONTIAC	1484
Delco-Remy	539-L	663-H	Delco-Remy	431-L	Delco-Remy	727-S	823881*	935-W, 36-R	1854856	1936	36-28 8	PONTIAC	1486
Delco-Remy	536-G	623-D	Delco-Remy	435-C	Delco-Remy	738-K	1847432	937-Z, 36-M	1838448*	1936	6-D	REO	1488
Auto-Lite	IG-4634	IGW-4001	Delco-Remy	430-R	Auto-L.	MAX-4019, 18	MAW-2091	GBM-4604A-2*	GBM-2006B*	1936	Dict. 3A, 4A	STUDEBAKER	1490
Delco-Remy	537-B	662-M	Delco-Remy	430-R	Delco-Remy	737-J, K	1863128	936-X	1856072	1936	Pres. 2-C	STUDEBAKER	1492
Delco-Remy	531-C(2)	4028	Oakes	Hershey	Delco-Remy	727-C	822187	391	37826	1936	SV-16	STUTZ	†
Delco-Remy	531-C	660-W	Oakes	Hershey	Delco-Remy	727-C	822187	391	37826	1936	DV-32	STUTZ	†
Auto-Lite	IG-4633	IGB-4301-B	Mitchellock	6696	Auto-Lite	MAB-4075	MAB-2113	GAR-4702	GAR-2077	1936	Del. 61	TERRAPLANE	1494
Auto-Lite	IG-4633	IGB-4301-B	Mitchellock	6696	Auto-Lite	MAB-4075	MAB-2113	GAR-4701-6	GAR-2077	1936	Cst. 62	TERRAPLANE	1494
Auto-Lite	IG-4090	IGS-4007	Mitchellock	5159	Auto-Lite	MZ-4033	MZ-2089	GAM-4504	GAM-2055	1936	77	WILLYS	1496

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Cam Angles for Delco-Remy distributors are correct with breaker gap set midway between limits and breaker arm fibre bumper worn in (1000 miles).

Cam Angles for Auto-Lite distributors correct with gap specified by car manufacturer except in instances where special gap specified under 'Cam Angle.'

SERIAL NUMBER:—First number—654-6501. On right hand side of cowl under engine hood. Letter following serial number indicates body type.

COMPRESSION:—Ratio—6.2-1. Std. aluminum head.
Pressure—Approximately 105 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 20" with engine idling at 7-8 M.P.H.

IGNITION:—Coil Model IG-4065. Mounted on right side of engine block.

Ignition Current—2.5 amperes idling, 4.5-5.5 amperes at 6.0 volts with engine stopped.

Ignition Switch:—Oakes-Hershey co-incidental ignition switch and steering post lock. Switch used on cars with Startix has two 'on' positions. Lower or 'STX' position of lever is normal running position with Startix operative. Upper or 'IGN' position should be used to check ignition or whenever automatic cranking is not desired.

Distributor Model IGB-4318. Single breaker, 6 lobe cam, full automatic advance.

Breaker Gap—.020-.024" (first 1000 miles with new points), .018-.020" (after first 1000 miles).

Cam Angle or Dwell—Closed 34°, Open 26° (distributor).

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

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
2	540	4	1080
4	780	8	1560
6	1020	12	2040
8	1260	16	2520
10	1500	20	3000

Distributor Removal:—Mounted on cylinder head. To remove, take out hold-down screw in advance arm, lift distributor out.

IGNITION TIMING:— Flywheel Degs. Piston Position
All engines .....3° BTDC.....0042" BTDC

To Set Timing—With #1 piston on compression, turn engine over until piston is 3° before top dead center, stop when flywheel mark '/' lines up with indicator in inspection hole in flywheel housing. This mark is 3° or approximately 1 tooth before top dead center mark '1/6'. Then loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor is opposite #1 segment in distributor cap.

Motor Gauge—Weidenhoff #114 Adapter, #42 Rod.

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

Spark Plugs:—Champion, Type J-6. 14 MM. Metric.
Spark Plug Gaps—Set at .025".

CARBURETION:—Carburetor—Stromberg Model EX-22. 1¼" downdraft type with manual choke control.

NOTE—Do not adjust cabruretor until engine is warmed up so that engine will idle at hot or slow idling speed.

Idle Adjustment—With engine hot and choke valve fully released (choke button in against dash), set throttle stopscrew to idle engine at 7-8 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. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Pump lever has two holes for pump link engagement. Set as follows:
Outer hole (Max. stroke)—Winter temperatures.
Inner Hole (Min. stroke)—Summer temperatures.

Throttle Cracking:—No adjustment required.

Air Cleaner:—AC. #1525997 oil-wetted type standard, heavy duty oil bath type optional.

Fuel Pump:—AC. Type B #1521814. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—K-S Telegauge hydrostatic type. K-S Part No. 5297 (dash unit), 5310 (tank unit). See article in Carburetion Section.

VALVE TIMING:—Tappet Clearance—.008-.010" all valves engine hot.

Valve Spring Pressure—42-47 lbs. at 2 3/16" (valve closed), 88-94 lbs. at 1⅞" (valve open).

To Check Valve Timing—Set tappet clearance #1 intake valve at .012". This valve should open with piston #1 .0253" before top dead center when flywheel mark '1/6' (dead center mark) is approximately 2.29 teeth before the indicator on the flywheel housing. Reset tappet clearance at .008-.010" with engine hot.

Motor Gauge—Weidenhoff Adapter #114, Rod #42.

LUBRICATION:—Crankcase capacity—6 qts. (refill).

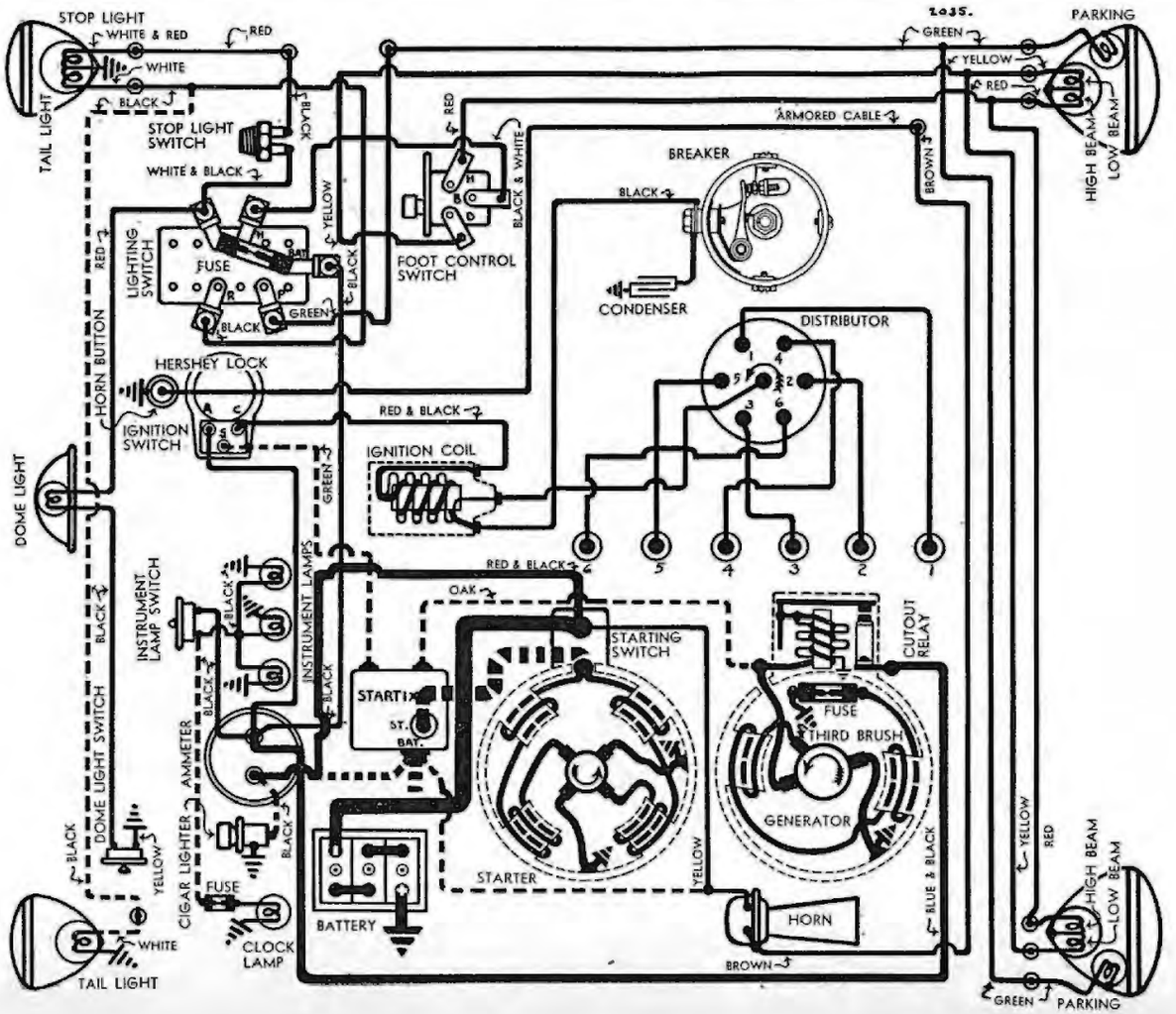
Normal Oil Pressure—15 lbs. idling, 40 lbs. maximum engine R.P.M. with warm oil.

BATTERY:—U.S.L. Type RN-15A. 6 volt, 90 ampere hour capacity (20 hour rate).

Starting Capacity—115 amperes for 20 minutes.

Zero Capacity—300 amperes for 2.9 minutes.

Grounded Terminal—Positive (+) terminal.



Location—Under right hand front seat.

STARTER:—Model MAJ-4032 (Std.), MAJ-4035 (RHD), MAJ-4033 (with Startix). Armature No. MAJ-2006.

Drive—Inboard Bendix Type R11FX-10.

Cranking Engine—155 R.P.M. 170 amperes at 5.2 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—44-56 ozs. (MAJ-4032, 33), 31-42 ozs. (MAJ-4035) with new brushes.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	4100	5.5	57
.3 "	2500	5.5	100
2.25 "	1450	5.0	200
4.6 "	960	4.5	300
7.3 "	575	4.0	400
10.3 "	225	3.5	500
12.0 "	Lock	3.0	550
17.0 "	Lock	4.0	750

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

Starting Switch:—(MAJ-4032,35) SW-3737S. Mounted on starter and operated through pull cable by button on instrument panel. Pull required to close switch contacts must be 2.3 lbs. minimum measured at end of lever.

(MAJ-4033). Startix Type D. Automatic starting controlled by ignition switch. See article in Equipment Section.

GENERATOR:—Model GAR-4603-5. Armature No. GAR-2077. Air-cooled. Third brush control type.

Charging Rate Adjustment—Take off commutator cover band. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate. Brush held in position by friction.

Standard Charging Rate Setting—20 amperes (cold), 16 amperes (hot), 2300 R.P.M. or 25 M.P.H.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	720	0	6.4	760
4	6.8	860	4	6.8	925
8	7.25	1000	8	7.25	1125
12	7.7	1160	12	7.7	1350
16	8.1	1360	16	8.1	1680
20	8.5	1660	19.2	8.4	2600
22.4	8.8	2300			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-36 ozs. (new brushes).

Field Current—3.70-4.10 amperes at 6.0 volts.

Field Fuse—5 ampere under cover on generator field frame near cutout relay.

Motoring Current—4.65-5.15 amperes at 6.0 volts.

Removal:—Pivot mounted at right front of engine. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Adjusted in usual mannner by swinging generator out. Belt tension should be just sufficient to drive generator and water pump without slipping.

CUTOUT RELAY:—Model CB-4021. Mounted on generator. See article in Equipment Section for complete data.

Cuts In—6.75-7.5 volts, 800 R.P.M.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.025-.035".

Air Gap—.010-.030" with contacts closed.

LIGHTING:—Headlamps—Headlamps aimed straight ahead. Upper and lower beams controlled by foot selector switch on toeboard.

Switches

Lighting—Soreng-Manegold Model A-5640-A.

Foot Selector—Delco-Remy.

Stop Light—Motometer No. 58012 hydraulic type.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2330
Parking, Instrmt., Clock	3	63
Stop and Tail	21-3	1158
Dome	6	81

FUSES:—Lighting—20 ampere on lighting switch.

Clock Lamp—10 ampere on clock.

HORNS:—Schwarze Vibrator type. Current draw 6 amp.

SERIAL NUMBER:—First number (852) 4501, (Schgd. 852) 34501. On right hand side of cowl under engine hood. Letter following serial number indicates body type.

COMPRESSION:—Ratio—6.2-1 Std. aluminum head. **Pressure**—Approximately 105 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 20" with engine idling at 7-8 M.P.H.

IGNITION:—Coil Model CE-4001G (852), CE-4001 (Schgd. 852). Mounted on right side of engine blk.

Ignition Current—3 amperes idling, 4.5-5.5 amperes at 6.0 volts stopped.

Ignition Switch:—Oakes Hershey type co-incidental ignition switch and steering post lock. Switch has two 'on' positions. Lower or 'STX' position of lever is normal running position with Startix operative. Upper or 'IGN' position should be used to check ignition or whenever automatic cranking is not desired.

Distributor (852) Model IGP-4002. Single breaker, 8 lobe cam, full automatic advance type. No synchronization.

Breaker Gap—.013-.017" (.015-.019" for first 1000 miles with new points).

Cam Angle or Dwell—Closed 27.5°. Open 17.5° with .017" breaker gap.

Breaker Arm Spring Tension—18 ozs. min., 20 ozs. max.

Condenser—Part No. IG-2671. Capacity .20-.25 mfd.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
2	540	4	1080
4	780	8	1560
6	1020	12	2040
8	1260	16	2520
10	1500	20	3000

Distributor (Schgd. 852) Model IGH-4027. Double breaker, 4 lobe cam, full automatic advance type. Breaker contacts open alternately at 45° intervals corresponding to 90° engine firing intervals. Contacts must be synchronized (see Timing).

Breaker Gap—.018-.020".

Cam Angle or Dwell—Closed 32°. Open 13° with .020" gap (both sets together when synchronized).

Breaker Arm Spring Tension—16-20 ounces.

Condenser—Part No. IGB-1025C. Capacity .20-.25 mfd.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	400	0	800
1	700	2	1400
2	990	4	1980
3	1280	6	2560
4	1560	8	3120
5.5	2000	11	4000

Distributor Removal:—Mounted on cylinder head. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:— Flywheel Degs. Piston Position

All engines (Eight)..... 3° BTDC.....0042" BTDC
All engines (SChgd)....3-4° BTDC.....0042" BTDC

NOTE—No synchronization necessary on distributor model IGP-4002 (Eight).

Timing—With #1 piston on compression, turn engine over until piston is 3-4° before top dead center, stop when flywheel mark '/' lines up with indicator in inspection hole in right front face of flywheel housing. This mark is approximately 1-1½ teeth before the top dead center mark '1/8'. Then loosen advance arm clamp bolt, rotate distributor until contacts (stationary—mounted directly on breaker plate, on IGH-4027 distributor) begin to open, tighten clamp bolt, see that rotor is opposite #1 segment in distributor cap.

Synchronization (Movable Contacts)—Manufacturer recommends use of a Winn Synchrometer to synchronize contacts. No flywheel marks are provided and some type of equipment must be used for this purpose. Change position of movable sub-plate carrying second set of contacts by loosening two lockscrews and shifting plate until movable contacts open exactly 45° after stationary set. Distributor firing intervals are regular 45-45-45 distributor deg.

Auto-Lite Synchronizing Tool ST-206—See Equipment Section for complete directions on synchronizing distributor with this tool. Used in connection with 45-degree marks on rotor fantail.

NOTE—Manufacturer recommends use of Neon Timing Light in setting ignition. See article in Equipment Section for directions.

Motor Gauge—Weidenhoff #105 Adapter, #5 Rod.

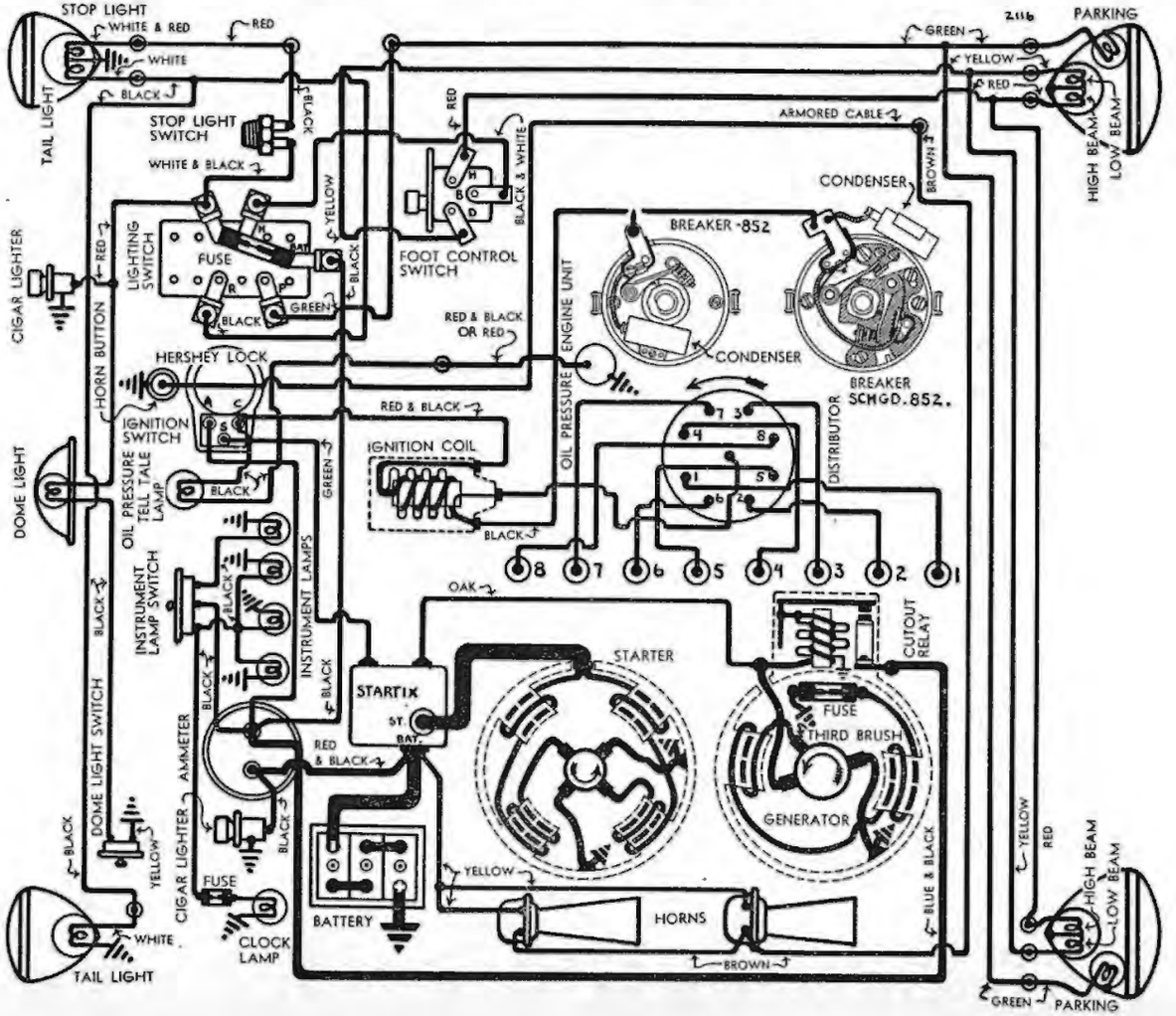
Firing Order:—1-6-2-5-8-3-7-4. See diagram.

Spark Plugs:—Champion Type J-6 (852), J-9 (Schgd. 852). 14 MM. Metric type.

Spark Plug Gaps—Set at .025".

CARBURETION:—Carburetor (852)—Stromberg Model EE-1, 1' dual downdraft type with manual choke control. See Carburetion Section for adjustment, overhaul and Jet Specifications.

NOTE—Do not adjust carburetor until engine is



warmed up so that engine will idle at slow or hot idling speed.

Idle Adjustment—With engine hot, close throttle, see that choke control button on dash is in off position (choke valve fully released), set throttle stopscrew so that engine idles at 5-6 M.P.H. Turn inner idle adjusting screw in until engine misses, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly; repeat with outer idle adjusting screw. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Pump lever has two holes for pump link engagement. Set as follows: Inner Hole (Min. stroke)—Summer temperatures. Outer Hole (Max. stroke)—Winter temperatures.

Throttle Cracking—No adjustment required. See separate article in Carburetion Section.

Carburetor (Schgd. 852):—Stromberg Model EX-32, 1½" plain tube, downdraft type with manual choke control. See Carburetion Section for adjustment, overhaul and Jet Specifications.

Idle Adjustment—With engine hot, close throttle, see that choke control button on dash is in off position (choke valve fully released), set throttle stop screw so that engine idles at 5-6 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. Readjust throttle stopscrew for correct idling speed.

Air Cleaner:—AC. #1525598 oil-wetted type standard, heavy duty oil-bath type optional.

Fuel Pump:—AC. Type B #1522146 diaphragm type (both models). See article in Carburetion Section.

Gasoline Gauge:—K-S Telegauge hydrostatic type. K-S Part No. 5297 (dash unit—both models), 5652 (tank unit—852), 5310 (tank unit—Schgd. 852).

VALVE TIMING:—Tappet Clearance—.008-.010" all valves with engine hot.

Valve Spring Pressure—42-47 lbs. at 2 3/16" (valve closed), 88-94 lbs. at 1⅞" (valve open).

To Check Valve Timing—Set tappet clearance #1 intake valve at .012". This valve should open with piston #1 .0253" before top dead center when flywheel mark '1/8' (dead center mark) is approximately 2.29 teeth before the indicator on the flywheel housing. Reset tappet clearance at .008-.010" with engine hot.

Motor Gauge—Weidenhoff Adapter #105, Rod #5.

LUBRICATION:—Crankcase Capacity—8 qts. (refill).
Normal Oil Pressure—15 lbs. idling, 40 lbs. maxim'm.

BATTERY:—U.S.L. Type XY-15A. 6 volt, 15 plate, 105 ampere hour capacity (20 hour rate).
Starting Capacity—122 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.3 minutes.
Grounded Terminal—Positive (+) terminal.
Location—Under right hand front seat.

STARTER:—Model MAB-4063. Armature No. MAB-2006.
Drive—Inboard Bendix Type R11FX-10.
Cranking Engine—140 R.P.M. 160 amperes at 5.2 v.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—44-56 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	3.5	575
22.5 "	Lock	4.0	750

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

Starting Switch:—Startix Type D. Automatic starting controlled by ignition switch. See article in Equipment Section.

GENERATOR:—Model GAR-4603-5. Armature No. GAR-2077. Air-cooled. Third brush control type.
Charging Rate Adjustment—Take off commutator band. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate. Brush held in position by friction.
Standard Charging Rate Setting—20 amperes (cold), 16 amperes (hot), 2300 R.P.M. or 25 M.P.H.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	720	0	6.4	760
4	6.8	860	4	6.8	925
8	7.25	1000	8	7.25	1125
12	7.7	1160	12	7.7	1350
16	8.1	1360	16	8.1	1680
20	8.5	1660	19.2	8.4	2600
22.4	8.8	2300			

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-36 ozs. (new brushes).
Field Current—3.70-4.10 amperes at 6.0 volts.
Field Fuse—5 ampere under cover on generator field frame near cutout relay.
Motoring Current—4.65-5.15 amperes at 6.0 volts

Removal:—Generator pivot mounted at right front of engine. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Adjusted in usual manner by swinging generator out until belt tension just sufficient to drive generator and water pump without slipping.

CUTOUT RELAY:—Model CB-4021. Mounted on generator. See article in Equipment Section for complete data.
Cuts In—6.75-7.5 volts, 800 R.P.M.
Cuts Out—.5-2.5 ampere discharge current.
Contact Gap—.025-.035".
Air Gap—.010-.030" with contacts closed.

LIGHTING:—Headlamps—Headlamps aimed straight ahead. Upper and lower beams controlled by foot selector switch on toeboard.

Switches
Lighting—Soreng-Manegold Model A-5640-A.
Foot Selector—Delco-Remy.
Stop Light—Motometer No. 50812 hydraulic type.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320
Parking, Instrmt., Clock	3	63
Stop and Tail (L.H.)	21-3	1158
Tail (R.H.)	3	63
Dome	6	81

FUSES:—Lighting—20 ampere on lighting switch.
Clock Lamp—10 ampere on clock.

HORNS:—Schwarze Vibrator type. Horn current 6 amperes each.

SERIAL NUMBER:—First number—2,830,899. On right frame siderail at rear of right front wheel.

COMPRESSION:—Ratio 5.55-1. Pressure 118 lbs. at 1000 R.P.M. or 96 lbs. (approx.) at cranking speed of 135 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" of HG. with engine idling at 400-450 R.P.M. or 7-8 M.P.H.

IGNITION:—Coil Model 536-H. On right side of block near distributor.

Coil Draw—2½ amperes idling, 4½ stopped.

Ignition Switch:—Oakes Hershey type co-incidental ignition switch and steering post lock.

Ignition Lock—Briggs & Stratton.

Distributor Model 663-F.—Single breaker, 8 lobe cam, full automatic advance type with integral vacuum spark control and Octane Selector adjustment.

Breaker Gap—.015". Limits .0125-.0175".

Cam Angle or Dwell—31° (closed), 14° (open).

Breaker Arm Spring Tension—19-23 ozs.

Condenser—Part No. 1855968. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	250	3.5	500
7	400	14	800
13	1050	26	2100

Vacuum Spark Control—Vacuum unit mounted on side of distributor, linked directly to breaker plate. Provides additional advance at speeds greater than 18 M.P.H. except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	5- 7"
10-13°	10-13"

Octane Selector—Adjustment at distributor providing advance or retard from standard setting (pointer midway on scale) to compensate for fuel characteristics. See Ignition Timing for setting.

Distributor Removal:—Mounted on right side of crankcase. To remove, take out two hold-down screws in mounting flange.

IGNITION TIMING:—Initial setting for fuel of 70 Octane rating as given. See Octane Selector for final setting.

	Flywheel Degrees	Piston Position
All Engines	2° BTDC	.0015" BTDC

To Set Timing (Synchroscope)—Recommended by manufacturer. Insert one Synchroscope lead in #1 terminal in distributor cap, clip other lead to #1 spark plug cable. Direct Synchroscope light on flywheel through inspection hole in front face of housing above starter. Idle engine at speed not more than 400 R.P.M. Note position of flywheel timing mark 'ADV/', loosen two distributor hold-down screws, rotate distributor slowly until timing mark coincides with reference line on housing, tighten hold-down screws. If reference line on Octane Selector pointer does not coincide with center line on scale, loosen pointer lockscrew, shift pointer, tighten lockscrew.

NOTE—The 'ADV/' flywheel mark is less than ¼" before the dead center mark and is filled in with paint to be more easily distinguished.

To Set Timing (Without Synchroscope)—No means provided to crank engine (engage gears and roll car on floor). With #1 piston on compression, turn engine over until #3 exhaust valve (fifth valve from front of engine) begins to open, stop when flywheel mark 'ADV/' lines up with mark on housing (inspection hole in right front face of housing above starter). Use timing light or form spark gap between distributor high tension lead and housing to check contact opening. Loosen two hold-down screws, rotate distributor until contacts begin to open, tighten hold-down screws, loosen Octane Selector pointer lockscrew, center pointer reference line on scale, tighten lockscrw.

Timing (Motor Gauge)—Weidenhoff #113 Adapter, #31 Rod.

Octane Slector—Should be set for final ignition setting dependent upon fuel used. To adjust, loosen two distributor hold-down screws, rotate distributor clockwise so that pointer moves toward 'Low' end of scale for fuel of less than 70 Octane rating or counter-clockwise toward 'High' end of scale for fuel of higher rating until slight 'ping' noticeable at speeds between 10-15 M.P.H. but not at higher speeds when car is accelerated with wide open throttle.

Firing Order:—1-6-2-5-8-3-7-4. See diagram.

Spark Plugs:—AC. Type H-9. 18 MM. Metric type.

Spark Plug Gaps—.020-.025".

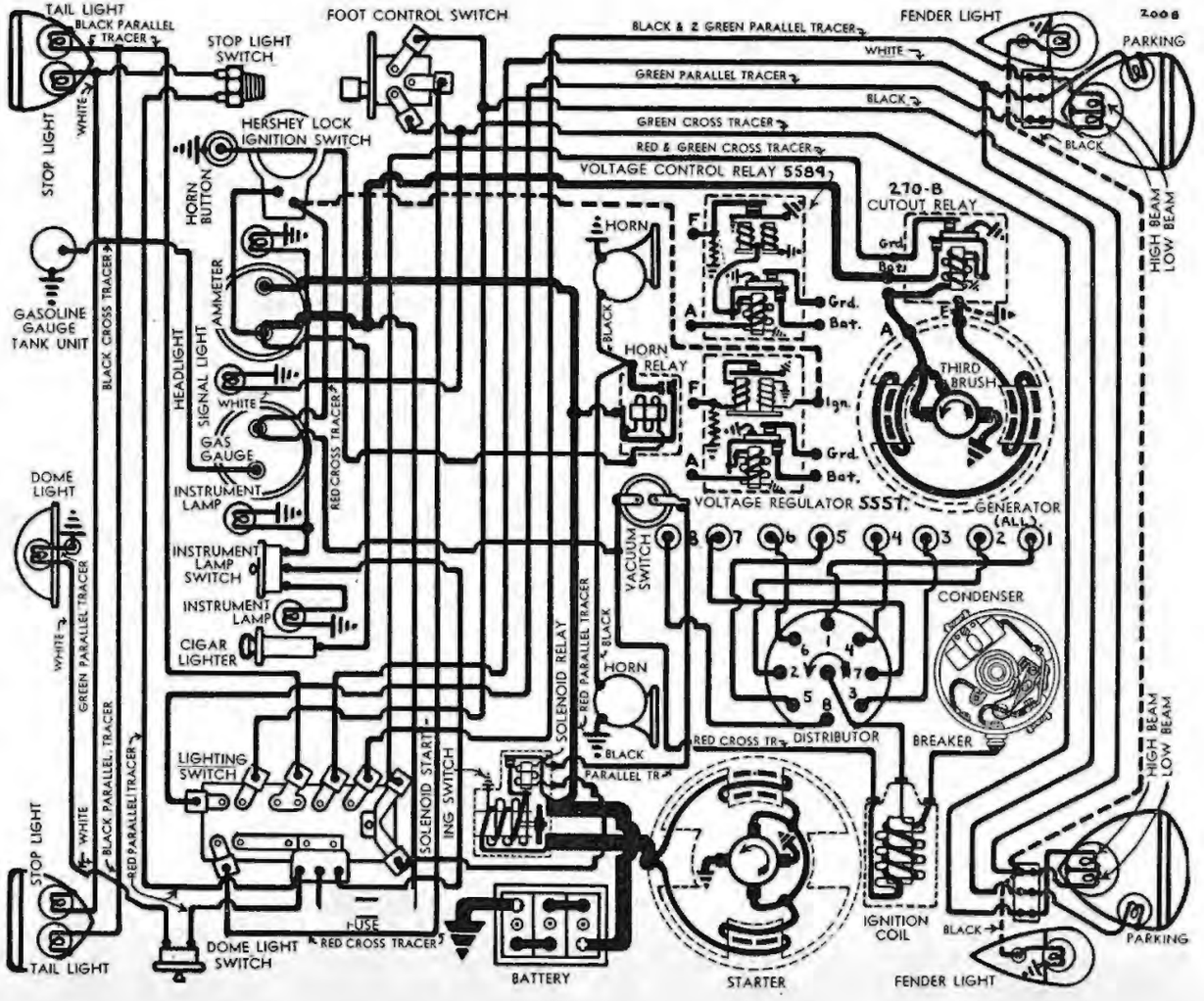
NOTE—Gap may be set at .030" if necessary in extreme cases to secure good idling performance. This gap may result in high speed missing after some service.

Radio Suppressors. One suppressor installed in distributor high tension terminal only. If suppressors used on spark plugs maximum resistance should be 15000 ohms (preferably 10000).

CARBURETION:—Carburetor—Stromberg Model EE-1, 1" dual, downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.

NOTE—Do not adjust carburetor until engine is thoroughly warmed up with choke valve wide open and idling at slow or hot idling speed.

Idle Adjustment—Adjust throttle stopscrew so that engine idles at 400-440 R.P.M. or 7-8 M.P.H. Turn idle adjusting screw for each carburetor barrel (in succession) in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.



Accelerating Pump—Not adjustable.

Fast Idle—Buick Cold Idle Control. See article in Carburetion Section.

Accelerator Linkage Adjustment:—Linkage adjustment must be maintained to provide correct throttle opening for starting. With carburetor set for 7-8 M.P.H. idling speed and throttle button pushed in, rotate fast idle cam to extreme left against stop (fast idle position), adjust vacuum switch rod length so that switch lever reference line coincides with 'Fast Idle' line on housing. Hold cam in fast idle position, depress accelerator pedal, note throttle position when vacuum switch makes contact and starter operates. Gap between point of throttle stopscrew and cam must be at least 5/32".

Automatic Choke Delco-Remy Model 498-H:—See article in Carburetion Section for complete checking data.

Choke Setting—Connecting rod is engaged in inner hole in automatic choke lever marked 'R' for standard setting. Shift to center hole if over-richness experienced. Outer hole marked 'H' used only to overcome over-richness due to highly volatile gasoline.

Air Cleaner:—AC. #1525959 or 1526659 oil-wetted type standard. #1525921 or 1526654 oil-bath type option'l. NOTE—Smaller main metering jets must be used with the heavy duty oil-bath type cleaners. See Stromberg Jet Specification table in Carburetion Section.

Fuel Pump:—AC. Type W #1521854. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—AC. Electric. #1515205 (dash unit), #1515416 (tank unit). See article in Carburetion Sec.

VALVE TIMING:—Tappet Clearance—.015" for all valves with engine hot.

Valve Spring Pressure—52½-62½ lbs. (valve closed), 134½-146½ lbs. (valve open) total for both springs.

To Check Valve Timing—Set up dial indicator over #2 or 7 exhaust valve spring cap so as to measure valve movement. Set indicator at '0' with valve closed. Indicator reading should be .150" with pistons #1 and 8 on top dead center and flywheel mark 'TDC/1-8' lined up with indicator in inspection hole in right front face of housing.

LUBRICATION:—Crankcase Capacity—6 qts. refill.

Normal Oil Pressure—10 lbs. idling, 45 lbs. at 35 M.P.H. maximum.

BATTERY:—Delco, Type 13-J. 6 volt, 98 A.H. capacity (20 hour rate).

Starting Capacity—117 amperes for 20 minutes.

Zero Capacity—300 amperes for 3 minutes.

Grounded Terminal—Negative (—) terminal.

Location—Under right front seat.

STARTER:—Model 734-Z. Armature No. 823881.

Drive—Solenoid pinion shift and overrunning clutch.

Cranking Engine—135 R.P.M., 150 amperes at 4.5 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 ft. lbs.	Lock	3.63	475

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

Starting Switch:—Solenoid Switch Type 1512. Vacuum Switch Type 1594. Solenoid switch controlled through relay by vacuum switch operated by accelerator pedal with ignition 'on.' See article in Equipment Section.

Solenoid Switch

Closes against 70 lb. pull with ½" air gap drawing 65-71 amperes at 5 volts. Holds switch closed with draw of 12-14 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—4 volts max. **Open**—1.6-2.0 volts.
Contact Gap—.030-.045". **Air Gap**—.010-.014" (closed).

Vacuum Switch

Contacts Close—10-14° rotation counter-clockwise from latch position.
Unlatch Action—3.4-4.6" of Hg. approximately 30° from latch position.

GENERATOR—STANDARD:—Model 936-C. Armature No. 1854856. Third brush control type. Voltage Control Relay (step-voltage control) optional. Ventilated by fan on drive pulley.

Charging Rate Rdjustment—Contact test ammeter in charging line at 'BAT' terminal. On cars with step-voltage control, ground generator field 'F' terminal to frame. Loosen lockscrew on commutator end plate, shift third brush adjusting handle (visible through upper ventilating hole on commutator endplate) counter-clockwise to increase or clockwise to decrease charging rate. Tighten lockscrew and remove generator field ground.

Maximum Charging Rate—20 amperes (cold), 17 amperes (hot), 8.2-8.5 volts, 2760 R.P.M., 31 M.P.H. Manufacturer allows maximum generator output of 24 amperes (cold), 19 amperes (hot) with heavy accessory load when step-voltage unit is installed.

Performance Data

	Amperes	Volts	R.P.M.
Cold	17-20	8.2-8.5	2400
Hot	13-15	7.7-8.0	3000

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third brush).

Field Current—2.3-2.6 amperes at 6.0 volts.

Motoring—500-700 R.P.M., 4.5-5.5 amperes at 6 volts.

Removal:—Generator pivot mounted at left front of engine. To remove, take out two pivot capscrews and one clamp bolt.

Belt Adjustment:—Loosen clamp bolt and pivot screws, pull generator away from engine until belt deflection midway between generator and fan pulleys is ½" with light pressure, tighten clamp bolt and screws.

GENERATOR—CANADIAN:—Model 936-V. Armature No. 1854856. Third brush control in conjunction with Vibrating Voltage Regulator. All specifications, performance data, and adjustments same as for Model 936-W (Canadian production generator on Models 60, 80, 90). See next page.

GENERATOR—SPECIAL SERVICE:—Model 931-Z. Third brush regulation in conjunction with external step-voltage control. Used on Taxicabs. See article on Special Generators in Equipment Section.

CUTOUT RELAY:—Model 270-B (Std. on Model 936-C). Mounted on generator. Has ground contacts for starter solenoid relay control. See article in Equipment Section.

Cuts In—6.75-7.5 volts, 900 R.P.M., 10 M.P.H.
Cuts Out—0-3.5 ampere discharge.
Contact Gap—.018-.025".
Air Gap—.018-.022" with contacts closed.

CONTROL UNIT (STEP-VOLTAGE TYPE):—Model 5589 (Optl. on Model 936-C). Cutout Relay and Voltage Control Relay in case on generator. See article in Equipment Section.

Cutout Relay

Cuts In—6.4-6.8 volts, 900 R.P.M., 10 M.P.H.
Cuts Out—3 amperes maximum discharge current.
Contact Gap and Air Gap—Same as for Mod. 270-B.

Voltage Control Relay

Contacts Open—8.35-8.65 volts at 70° F.
Contacts Close—7.3-7.7 volts at 70° F.
Contact Gap—.008-.013".
Contact Spring Tension—.7-.9 ounces.
Air Gap—.028-.040" between armature and core (armature down against lower stop), .028-.040" armature travel (between armature and lower stop).

CONTROL UNIT (VOLTAGE REGULATOR):—Model 5557 (Std. on Model 936-V). Vibrating Voltage Regulator. All specifications and adjustments same as when used on Models 60, 80, 90. See next page.

LIGHTING:—Headlamps—Guide Multi-beam, Prefocused, cross-beam type with special non-interchangeable lenses. Headlamps aimed straight-ahead with lenses removed. Assymetrical passing beam (upper beam left hand headlamp, lower beam right hand headlamp) controlled by foot selector switch with lighting switch in fourth or 'Country Beam' position.

Headlamp Beam Indicator—Located at top of instrument cluster (above speedometer dial). Lighted whenever 'Country Beam' or upper headlamp beams are lighted.

Switches

Lighting—Delco-Remy Model 479-M, 479-L Export.
Foot Selector—Delco-Remy Model 471-T.
Instrument Lamp—Delco-Remy Model 1404.
Stop Lamp—Hydraulic type on brake distributor mounted on left front leg of 'X' member.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320-L
Parking Bulbs (Std.)	1.5	55
Fender (Optl).	3	63-L
Instrument, Beam Indicator..	1	51
Map Light	1.5	55
Tail	3	63-L
Stop	15	87-L
Dome	6	81-L

NOTE—Bulbs are Long-Life 'L' type.

FUSES:—Lighting—30 ampere in connector in lighting switch feed line (#6 terminal) from ammeter.

HORNS:—Klaxon Model K-33-S. Type 2051 (low note—right side), Type 2052 (high note—left side). Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
2051 Low Note	11-13	.042-.046"
2052 High Note	10-12	.032-.036"

Horn Relay:—Model 268-W. Requires .25 amperes at 2 volt minimum to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.
Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—First number—2,830,899. On right frame siderail at rear of front wheel.

COMPRESSION:—Ratio 5.45-1. **Pressure**—108 lbs. at 1000 R.P.M. or 94 lbs. (approx.) at cranking speed of 135 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" of HG. with engine idling at 400 R.P.M. or 7-8 M.P.H.

IGNITION:—Coil Model 536-H. On right side of block near distributor.

Coil Draw—2½ amperes idling, 4½ stopped.

Ignition Switch:—Oakes Hershey type co-incidental ignition switch and steering post lock.

Ignition Lock—Briggs & Stratton.

Distributor Model 663-E.—Single breaker, 8 lobe cam, full automatic advance type with integral vacuum spark control and Octane Selector adjustment.

Breaker Gap—.015". Limits .0125-.0175".

Cam Angle or Dwell—31° (closed), 14° (open).

Breaker Arm Spring Tension—19-23 ozs.

Condenser—Part No. 1855968. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	250	3.5	500
7	400	14	800
15	1300	30	2600

Vacuum Spark Control—Vacuum unit mounted on side of distributor, linked directly to breaker plate. Provides additional advance at speeds greater than 15 M.P.H. except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	5- 7"
10-13°	10-13"

Octane Selector—Adjustment at distributor providing advance or retard from standard setting (pointer midway on scale) to compensate for fuel characteristics. See Ignition Timing for setting.

Distributor Removal:—Mounted on right side of crankcase. To remove, disconnect vacuum line, take out two hold-down screws in mounting flange.

IGNITION TIMING:—Initial setting for fuel of 75 Octane rating as given. See Octane Selector for final setting.

	Flywheel Degrees	Piston Position
All engines	10° BTDC	.0442" BTDC

To Set Timing (with Synchroscope)—Recommended by manufacturer. Insert one Synchroscope lead in #1 terminal in distrubutor cap, clip second lead to #1 spark plug cable. Direct Synchroscope light at flywheel through timing inspection hole in right front face of flywheel housing above starter. Idle engine at speed not greater than 400 R.P.M. Note position of flywheel timing mark 'ADV/'. If 'ADV' line does not coincide with line on housing, loosen two distributor hold-down screws, rotate distributor slowly until lines coincide, tighten hold-down screws. Check position of Octane Selector pointer. If reference line on pointer does not coincide with center line of scale, loosen pointer lockscrew, shift pointer, tighten lock-screw.

NOTE—The 'ADV/' ignition timing mark filled with paint.

To Set Timing (Without Synchroscope)—No means provided to crank engine (engage gears and roll car to turn engine over). With #1 piston on compression, turn engine over until #3 exhaust valve (fifth valve from front of engine) begins to open, stop when flywheel mark 'ADV/' lines up with mark on flywheel housing (timing inspection hole in right front face of housing above starter). Use timing light or form spark gap between distributor high tension lead and housing to check contact opening. Loosen two distributor hold-down screws, rotate distributor until contacts begin to open, tighten hold-down screws. Check position of Octane Selector pointer. If reference line on pointer does not line up with center line on scale, loosen pointer lock-screw, shift pointer, tighten lockscrew.

Timing (Motor Gauge)—Weidenhoff #113 Adapter, #31 Rod.

Octane Selector—Should be adjusted for final ignition setting dependent upon Octane Rating of fuel used by car owner. Initial setting (above) correct for fuel of 75 Octane Rating. To adjust, loosen two distributor hold-down screws, rotate distributor clockwise so that pointer moves toward 'Low' end of scale for fuel of lower rating, or counter-clockwise (toward 'High' end of scale) for higher rating until a slight 'ping' is noticeable at speeds between 10 and 15 M.P.H. but not at higher speeds when car is accelerated with wide open throttle.

Firing Order—1-6-2-5-8-3-7-4 (see diagram).

Spark Plugs:—AC. Type H-9. 18MM. Metric type.

Spark Plug Gaps—Set at .020-.025".

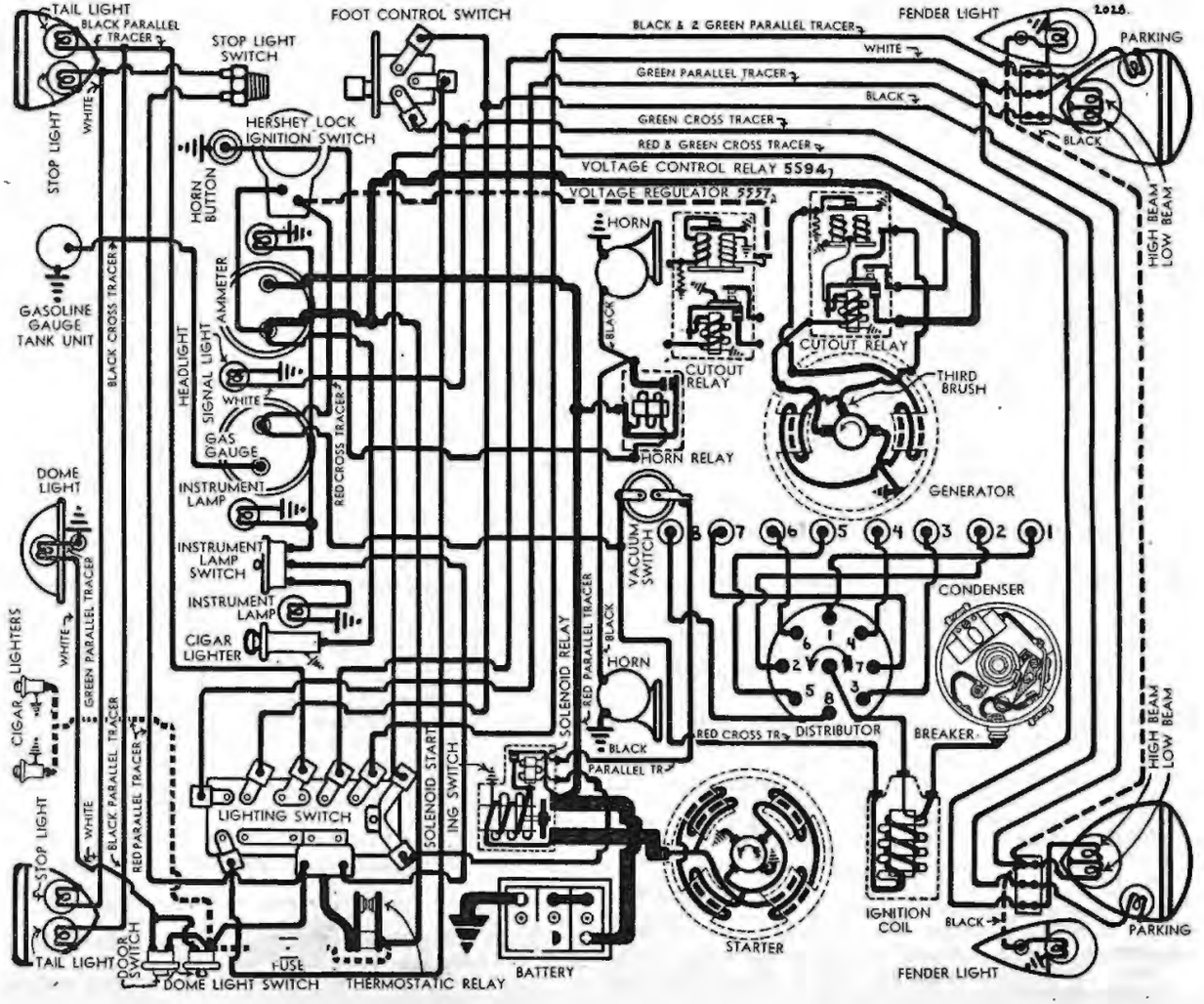
NOTE—In extreme cases gaps may be set at .030" if necessary to secure good idling performance. This setting may result in high speed missing after some service.

Radio Suppressors—One suppressor installed in center distributor high tension terminal only. If suppressors used on spark plugs, maximum resistance should be 15000 ohms (preferably 10000 ohms).

CARBURETION:—Carburetor—Stromberg Model EE-22 1¼" dual, downdraft type. See Carburetion Section for adjustment, overhaul and Jet Specifications.

NOTE—Do not adjust carburetor until engine is thoroughly warmed up with choke valve wide open and idling at hot or slow idling speed.

Idle Adjustment—Set throttle stopscrew so that engine idles at 400 R.P.M. or 7-8 M.P.H. Turn idling adjusting screw for each carburetor barrel (in succession) in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally



turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump—Not adjustable.

Fast Idle:—Buick Cold Idle Control. See article in Carburetion Section.

Accelerator Linkage Adjustment:—Must be maintained to provide correct throttle opening for starting. With carburetor set for correct 7-8 M.P.H. hot idling speend and throttle button pushed in, rotate fast idle cam to extreme left against stop (fast idle position), adjust vacuum switch rod length so that switch lever reference line coincides with 'Fast Idle' line on housing. Hold cam in fast idle position, depress accelerator pedal, note throttle position when vacuum switch makes contact and starter operates. Gap between throttle stopscrew and cam must be at least 5/32" at this point.

Automatic Choke Delco-Remy Model 498-J:—See article in Carburetion Section for complete data.

Choke Setting—Connecting rod is engaged in inner hole in automatic choke lever marked 'R' for standard setting. Shift to center hole if over-richness is experienced. Outer hole marked 'H' used only for over-richness due to highly volatile gasoline.

Air Cleaner:—AC. #1525960 (60), #1525982 (80,90) oil-wetted type standard, #1526618 (60,80), #1526619 (90) oil-bath type optional.

NOTE—Smaller main metering jets must be used with the heavy-duty oil-bath type cleaner. See Jet Specification table in Carburetion Section.

Fuel Pump:—AC. Type AB #1521838. Diaphragm type combination fuel-and-vacuum pump. See article in Carburetion Section.

Gasoline Gauge:—AC. Electric. #1515205 (dash unit), #1515416 (tank unit - 60), #1515415 (tank unit - 80, 90). See article in Carburetion Section.

VALVE TIMING:—Tappet clearance—.015" for all valves with engine hot.

Valve Spring Pressure—52½-62½ lbs. (valve closed) 134½-146½ lbs. (valve open) total for both springs.

To Check Valve Timing—Set up dial indicator over #2 or 7 exhaust valve so as to measure valve movement. Set indicator at 'O' with valve closed. Indicator reading should be .155" with pistons #1 and 8 on top dead center and flywheel mark 'TDC/1-8' lined up with indicator in right front face of housing.

LUBRICATION:—Crankcase Capacity—8 qts. (refill).

Normal Oil Pressure—10 lbs. idling, 45 lbs. maximum at 45 M.P.H.

BATTERY:—Delco, Type 15-G. 6 volt, 15 plate, 114 amp. hour capacity (20 hour rate).

Starting Capaciy—137 amperes for 20 minutes.

Zero Capaciy—300 amperes for 4.5 minutes.

Grounded Terminal—Negative (—) terminal.

Location—Under right front seat.

STARTER:—Model 727-W, 729-B (RHD. 60). Armature No. 820158.

Drive—Solenoid pinion shift and overrunning clutch.

Cranking Engine—115 R.P.M., 175 amperes at 5 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5500	5	65
16 ft. lbs.	Lock	3	600

Removal:—Mounted on right front face of flywheel housing. To remove, take out capscrews.

Starting Switch:—Solenoid Switch Type 1512 (727-W), 1530 (729-B). Vacuum Switch Type 1601. Solenoid switch controlled through relay by vacuum switch operated by accelerator pedal with ignition 'on'. See article in Equipment Section.

Solenoid Switch Type 1512, 1530

Closes against 70 lb. pull with ½" air gap drawing 65-71 amperes at 5 volts. Holds switch closed with draw of 12-14 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—4 volts max. **Open**—1.6-2.0 volts.

Contact Gap—.030-.045". **Air Gap**—.010-.014" (closed)

Vacuum Switch

Contacts Close—10-14° rotation counter-clockwise from latch position.

Unlatch Action—3.4-4.6" of HG. approximately 30° from latch position.

GENERATOR—STANDARD:—Model 936-P. Armature No. 1854856. Third brush control type with Voltage Control Relay (step voltage control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Connect test ammeter in charging line at 'BAT' terminal, ground generator field 'F' terminal to frame. Loosen lockscrew on commutator end plate, shift third brush adjusting handle (visible through upper ventilating hole on commutator endplate) counter-clockwise to increase or clockwise to decrease charging rate. Tighten lockscrew and remove generator field ground.

Maximum Charging Rate—21 amperes (cold), 18 amperes (hot), 8.3-8.5 volts, 2770 R.P.M., approx. 36 M.P.H. Manufacturer allows maximum generator output of 24 amperes (cold), 19 amperes (hot) with heavy accessory load.

Performance Data

	Amperes	Volts	R.P.M.
Cold	18-21	8.2-8.5	2400
Hot	15-18	7.9-8.3	2900

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third).

Field Current—2.3-2.6 at 6 volts.

Motoring—500-700 R.P.M., 4.5-5.5 amperes at 6 volts.

Removal:—Generator pivot mounted at left front of engine. To remove, take out two pivot capscrews and one clamp bolt.

Belt Adjustment:—Belt deflection midway between generator and fan pulleys should be ½" with light pressure.

GENERATOR—CANADIAN:—Model 936-W. Armature No. 1854856. Third brush conrtol in conjunction with vibrating voltage regulator. Ventilated by fan on drive pulley.

Charging Rate Adjustment—Adjusted by changing setting of voltage regulator. See Regulator data below and special article in Equipment Section. Do not shift third brush or run generator on open-circuit.

Maximum Charging Rate—As shown in table below. Reached at approx. 38 M.P.H. To check charging rate, connect test ammeter in charging line at 'BAT' terminal of regulator, voltmeter between 'BAT' terminal and ground, ground 'F' terminal to eliminate regulator action.

Performance Data

	Amperes	Volts	R.P.M.
Cold	22-26	8.7-9.1	3300
Hot	18-21	8.2-8.7	3500

Rotation, Brush Spring Tension, Field Current, Removal and Belt Adjustment same as for standard generator above.

CONTROL UNIT (STEP VOLTAGE TYPE):—Model 5594 Cutout Relay and Voltage Control Relay in case on generator. See article in Equipment Section.

Cutout Relay

Cuts In—6.4-6.8 volts, 900 R.P.M., 10 M.P.H.

Cuts Out—3 amperes maximum discharge current.

Contact Gap—.018-.025".

Air Gap—.018-.022" with contacts closed.

Voltage Control Relay

Contacts Open—8.35-8.65 volts at 70° F.

Contacts Close—7.3-7.7 volts at 70° F.

Contact Gap—.008-.013".

Contact Spring Tension—.7-.9 ounces.

Air Gap—.028-.040" between armature and core (armature down against lower stop), .028-.040" armature travel (between armature and lower stop).

CONTROL UNIT (VOLTAGE REGULATOR):—Model 5557. Std. on Madel 936-W Generator. Cutout Relay and Vibrating Voltage Regulator in case on generator. See articles in Equipment Section.

Cutout Relay

Cuts In—6.5-7.25 volts.

Cuts Out—3 ampere max. discharge at 6.3 volts.

Contact Gap & Air Gap—Same as for Model 270-B.

Voltage Regulator

Setting—7.55-7.85 volts at 70° F., 7.45-7.55 volts at 150° F. Regulator must be checked at these points.

Adjustment—Disconnect lead on 'IGN' terminal of regulator, connect jumper between 'IGN' and 'BAT' terminals, connect ammeter in charging line at 'BAT' terminal, connect voltmeter between 'IGN' terminal and ground. Operate generator at 2800-3000 R.P.M., adjust charging rate to 8-10 amperes, change regulator armature spring tension by bending spring hanger at lower end of spring slightly.

NOTE—Regulator cover must be in place when tests are made. Do not operate generator on open-circuit.

Contact Gap—.015-.025".

Air Gap—.060-.070" between armature and center of core with armature down and fibre bumper just touching stop, .008-.013" between fibre bumper and stop with armature up.

LIGHTING:—Headlamps—Guide Multi-beam, Prefocused, cros-beam type with special non-interchangeable lenses. Headlamps aimed straight-ahead with lenses removed. Assymetrical passing beam (upper beam left hand headlamp, lower beam right hand headlamp) controlled by foot selector switch with lighting switch in fourth or 'Country Beam' position.

Headlamp Beam Indicator—Located at top of instrument cluster (above speedometer dial). Lighted whenever 'Country Beam' or upper headlamp beams are lighted. **Switches**

Lighting—Delco-Remy Model 479-M, 479-L Export.

Foot Selector—Delco-Remy Model 471-T.

Instrument Lamp—Delco-Remy Model 1404.

Stop Lamp—Hydraulic type on brake distributor on outside of left front leg of 'X' member.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320-L
Parking Bulbs (Std.)	1.5	55
Fender (Optl).	3	63-L
Instrument, Beam Indicator	1	51
Map Light	1.5	55
Tail	3	63-L
Stop	15	87-L
Dome	6	81-L

NOTE—Bulbs are Long-Life 'L' type.

THERMOSTATIC RELAY:—Mounted on lighting switch (part of assembly). Non-adjustable. Contacts will remain closed with current of 25 amperes but will open in one minute with current of 38 amperes at temperature of 70-80° F.

FUSES:—Dome Light and Rear Cigar Lighters (90). 30 ampere in connector in dome lamp feed wire from lighting switch at rear of instrument board.

HORNS:—Klaxon Model K-33-S. Type 2051 (low note—right side), Type 2052 (high note—left side). Vibrator type, blended tone, twin horns operated by horn relay. See Model 40 (previous page) for horn and relay data.

SERIAL NUMBER:—Same as engine number. Located on top of crankcase behind fan support. First number 6010001 (60), 3110001 (70, 75).

COMPRESSION:—Ratio 6.25-1 Std. 5.75-1 Optl.
Pressure—155 lbs. (60), 170 lbs. (70, 75) at 1000 R.P.M. or approximately 105-110 lbs. at cranking speed for std. 6.25-1 head.

VACUUM READING:—Gauge should show steady reading of 20-21" with engine idling at 6 M.P.H.

IGNITION:—Coil Model 539-C. Mounted on dash.
Ignition Current—2.2 amperes idling, 4.4 stopped.

Ignition Switch:—Delco-Remy Model 431-L (60), 431-Z (60 RHD.), 435-A (70, 75). Switch and cable assembly. Connected to coil by armored cable. See article in Equipment Section.
Ignition Lock—Briggs & Stratton.

Distributor Model 663-G. Single breaker, 8 lobe cam, automatic advance type with auxiliary vacuum spark control and manual adjustment (see Timing).
Breaker Gap—Set at .015". Limits .012-.018".
Cam Angle or Dwell—31° closed, 14° open.
Breaker Arm Spring Tension—19-23 ounces.
Condenser—Part No. 1855968. Capacity .20-.25 mfd.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	500	1	1000
12	2000	24	4000

Vacuum Spark Control—Integral with distributor. Mounted on housing and linked directly to breaker plate. Provides additional advance for speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring in unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	9-11"
15° Max.	16-18"

Distributor Removal:—Mounted between cylinder banks at rear of engine. Take out two capscrews in mounting bracket.
NOTE—When installing distributor on engine, turn crankshaft to firing position for #1 piston, mesh distributor drive gear to that slot in upper end of shaft is offset toward rear of engine.

IGNITION TIMING:—Setting for all engines is as follows. See Manual Adjustment section below.

	Flywheel Degrees	Piston Position
All engines	4° BTDC	.0069" BTDC

To Set Timing (Using Synchroscope)—Recommended by manufacturer. Clip Synchroscope lead to #1 spark plug and direct light on crankshaft pulley at front of engine. Idle engine, loosen hold-down screw in advance arm, rotate distributor until pulley mark 'IG/A' which is 4° before top dead center mark 'C.1/6' lines up with pointer on chain case cover, tighten hold-down screw.
Timing (Without Synchroscope)—Turn engine over until #1 piston (front piston left block) reaches firing position 4° before top dead center on compression stroke, stop when crankshaft pulley mark 'IGN' at front of engine lines up with pointer on chain case cover, loosen hold-down screw in advance arm, rotate distributor until contacts begin to open, tighten hold-down screw.
Motor Gauge—Weidenhoff #114 Adapter, #42 Rod.
Manual Adjustment—With ignition set as above, slight 'ping' should be noticeable when engine is accelerated with wide open throttle at speeds below 15 M.P.H. If ping is too severe, loosen hold-down screw in advance arm, rotate distributor one graduation on scale counter-clockwise to retard spark, repeat test. Adjustment permits 10° advance or retard from center 'O' position.
NOTE—Check engine for faulty spark plugs, excessive carbon deposits or localized 'hot spots' before changing the manual adjustment.

Firing Order:—1-8-7-3-6-5-4-2 with spark plugs numbered 1-3-5-7 (left bank), 2-4-6-8 (right bank), with 1 and 2 nearest radiator.

Spark Plugs:—AC. Type K-7. 14 MM. Metric type.
Spark Plug Gaps—Set at .025-.030".

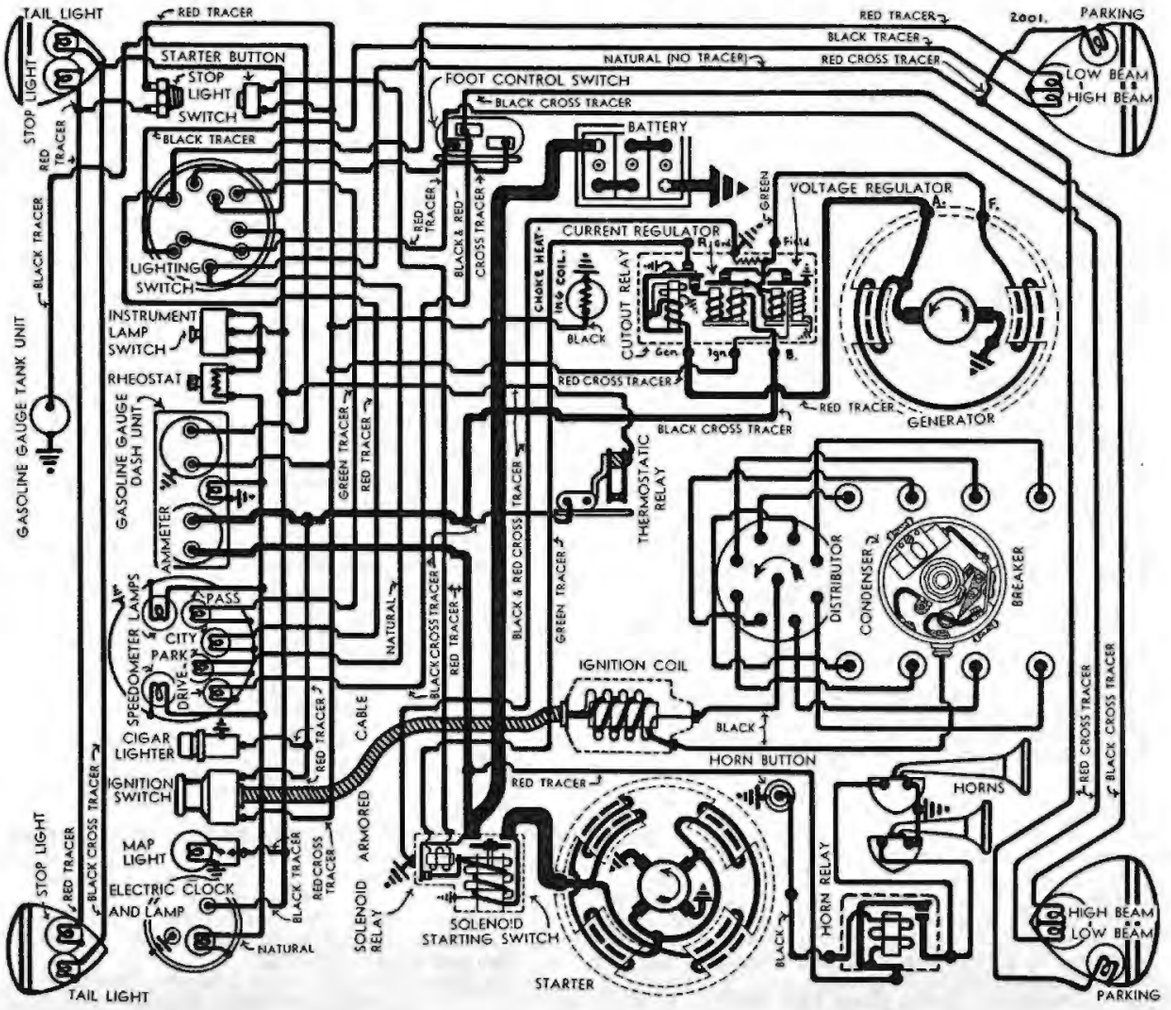
CARBURETION:—Carburetor—Stromberg Model EE-25, 1¼" Dual, downdraft type. See Carburetion Section for adjustment, overhaul, and Jet Specifications.
NOTE—Do not adjust carburetor until engine is warmed up so that choke valve is wide open and engine idling at hot or slow idling speed.
Idle Adjustment—Set throttle stopscrew so that idling speed is 6 M.P.H.. Turn each idle adjusting screw in until engine begins to miss, out until engine begins to roll, finally turn screws in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.
Accelerating Pump Setting—Not adjustable.

Fast Idle—Integral with Carburetor. See article on Fast Idle and Automatic Choke as used on EE-15 & EE-25 Carburetors in Carburetion Section.

Automatic Choke:—Triple Range Automatic and manual choke control. See article on Automatic Choke as used on EE-15 and EE 25 Carburetors in Carburetion Section.

Air Cleaner:—AC. #1525988 oil-wetted type standard, #1525966 oil-bath type optional.
NOTE—Smaller main metering jets must be used in carburetor when heavy duty oil-bath type cleaner is used. See Stromberg Jet Specifications in Carburetion Section.

Fuel Pump:—AC. Type AB. #1522119 combination fuel and vacuum pump. See article in Carburetion Sec.



Gasoline Gauge:—AC. Electric. #1515303 (dash unit—all models), #1515419 (tank unit—60), #1515420 tank unit—70, 75). See article in Carburetion Sec.

VALVE TIMING:—To Check Timing—Intake valve for #1 cylinder (front cylinder—left bank) should open with piston on top dead center when 'C.1/4' mark on crankshaft pulley at front of engine lines up with pointer on chain case cover.

Tappet Clearance—None in service (hydraulic tappet take-up used). See article in Mechanical Section.

Valve Spring Pressure—62-69 lbs. at 1 15/16" (valve closed), 140-151 lbs. at 1 9/16" (valve open).

LUBRICATION:—Crankcase Capacity—7 qts. refill.

Normal Oil Pressure—15 lbs. idling, 30 lbs. at 60 M.P.H.

BATTERY:—(60) Delco, Type 17-K. 6 volt, 17 plate, 110 ampere hour capacity (20 hour rate).

Starting Capacity—131 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.4 minutes.

Grounded Terminal—Positive (+) terminal.

Location—Under left front seat (all models).

(Model 70, 75) Delco, Type 17-D. 6 volt, 17 plate, 130 ampere hour capacity (20 hour rate).

Starting Capacity—156 amperes for 20 minutes.

Zero Capacity—300 amperes for 5.0 minutes.

STARTER:—Model 727-V, 729-C (60 RHD). Armature No. 820158.

Drive—Overrunning Clutch and manual pinion shift operated by solenoid switch.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5500	5.0	65
16 ft. lbs.	Lock	3.0	600

Removal:—Flange mounted on right front face of flywheel housing. To remove, take out flange mounting screws, pull starter forward and remove from below.

Starting Switch:—Solenoid Switch Type 1512 (727-V), 1532 (729-C). Pushbutton Switch Type 1405 (60), 1407 (70, 75). Solenoid switch controlled through relay by push button on instrument board. Operative only with ignition 'on.' See article in Equipment Section.

Solenoid Switch

Closes against 70 lb. pull with ½" air gap drawing 65-71 amperes at 5 volts. Holds switch closed with current draw of 12-14 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—4 volts max. **Open**—1.6-2.0 volts.

Contact Gap—.030-.045". **Air Gap**—.010-.014" (closed)

GENERATOR:—Model 961-E. Armature No. 1857866. Straight shunt (two brush) type with external voltage and current regulation. Ventilated by fan on drive pulley.

Charging Rate Adjustment—No adjustment at generator. Charging rate controlled by Voltage Regulator and maximum output controlled by Current Regulator. See Control Unit section below and special article in Equipment Section.

Maximum Charging Rate—20 amperes (cold) with discharged battery as indicated on test ammeter connected in charging line at 'BAT' terminal on control unit. Decreases as battery comes up on charge. Generator output constant at all speeds above 1700 R.P.M. or 20 M.P.H.

Performance Data—Generator Cold

Amperes	Volts	R.P.M.
7	7.0-7.2	900
22	8.1-8.3	1900

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—22-26 ounces.

Field Current—1.7-1.9 amperes at 6.0 volts.

Removal:—Pivot mounted at left front of engine. To remove, take off left front wheel, remove cover in dust shield under left front fender by taking out three screws. Take out two generator pivot bolts and one clamp bolt, remove generator through opening.

Belt Adjustment:—Loosen generator pivot bolts and clamp bolt, pull generator out until belt deflection midway between pulleys is ⅞-1" (measured from straightedge with ⅞" projection at center laid along belt).

CONTROL UNIT:—Model 5559. Mounted on dash. Consists of Vibrating Voltage Regulator, Vibrating Current Regulator, and Cutout Relay. See article in Equipment Section for complete data on these units.

Cutout Relay

Cuts In—6.5-7.0 volts, 12 M.P.H.

Cuts Out—3 ampere max. discharge at 6.3 volts.

Contact Gap—.018-.025".

Air Gap—.018-.022" with contacts closed.

Voltage Regulator

Setting—7.55-7.85 volts at 72° F., 7.45-7.55 volts at 150° F. Regulator is over-compensated for temperature and must be checked at these points.

Adjustment—Disconnect lead at 'IGN' terminal on regulator case, connect jumper between 'IGN' and 'BAT' terminals, connect test ammeter in charging line at 'BAT' terminal, connect voltmeter between 'IGN' terminal and ground, short out Current Regulator by connecting jumper across contacts. Operate generator at 2800-3200 R.P.M., adjust charging rate to 8-10 amperes, set regulator by bending spring hanger at lower end of armature spring until performance is as shown above. Remove jumpers, restore original connections.

NOTE—Do not operate generator on open-circuit at any time, or at excessive speed with Current Regulator shorted out. Voltage Regulator readings must be taken with cover on unit and setting should be checked by decreasing speed until Cutout Relay contacts open, and then increasing speed to original point.

Contact Gap—.015-.025".

Contact Spring Tension—3.5 ozs. minimum.

Air Gap—.060-.070" between armature and core with armature down so that fibre bumper just touches stop, .007-.010" between fibre bumper and stop with armature up.

Current Regulator

Setting—20-22 amperes.

Adjustment—Make connections as above (Voltage Regulator test), except that voltage regulator should be shorted out with jumper across contacts. Operate generator and set regulator by bending spring hanger at lower end of armature spring until maximum output is as given.

NOTE—Generator voltage must not be allowed to exceed 8.5 volts with Voltage Regulator shorted out.

Contact Gap—.015-.025".

Contact Spring Tension—3.5 ozs. minimum.

Air Gap—.070-.080" between armature and core with armature down so that fibre bumper just touches stop, .007-.010" between fibre bumper and stop with armature up.

LIGHTING:—Headlamps—Guide Multi-beam, Pre-focused, Cross-beam type with special non-interchangeable lenses. Headlamps aimed straight-ahead with lenses removed. Assymetrical passing beam (upper beam left hand headlamp, lower beam right hand headlamp), controlled by foot selector switch with lighting switch in 'Country Driving' position.

Headlamp Beam Indicators—Consists of four bulbs in lower half of speedometer which illuminate markers as follows:

City—Lower beam both headlamps.
Drive—Upper beam both headlamps.
Pass—Assymetrical passing beam (see above).
Park— Parking bulbs in headlamps.

Switches

Lighting—Delco-Remy Model 487-N,P. 487-U (RHD)

Foot Selector—Delco-Remy Mod. 471-Z,471-U(RHD)

Instrument Lamp—Delco-Remy Model 1364.

Stop Lamp—Hydraulic type on distributor at rear of brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamp (Right)	50-32	2530-L
Headlamp (Left)	32-32	2330-L
Instrmt., Map, Qtr., Step, Tail	3	63
Parking, Clock	1.5	55
Beam Indicators	1	51
Stop, Dome	15	87

NOTE—Headlamp bulbs are Pre-focused, 'Long-life' type. In all states where 50 cp. bulbs are prohibited, the 32-32 cp. 2330-L bulb is used in both headlamps.

THERMOSTATIC RELAY:—Model 411-A. Contacts remain closed with current of 25 amperes but open within one minute with load of 38 amperes. Non-adjustable.

HORNS:—Klaxon Model K-33-B, Type 1855 (low note), 1856 (high note). Vibrator type, twin horns with blended tone operated by horn relay.

Horn Type	Current at 6 Volts	Air Gap
1855	12-14	.045-.050"
1856	11-13	.036-.040"

NOTE—Horns identified by letter stamped on front of power unit cover and projectors must be assembled as follows: 'S'—low note, short projector; 'L'—high note, long projector.

Horn Relay:—Model 266-T. Requires .25 amperes at 2 volts min. to close contacts. Current draw .8 amps. **Contact Gap**—.015-.025". **Spring Tension**—6-8 ozs. **Air Gap**—.012-.017" with contacts closed.

SERIAL NUMBER:—Same as engine number. Located on right hand side of chain case in front of generator. First number 4110001 (80, 85). 5110001 (90).

COMPRESSION:—Ratio 6.0-1 Std. 5.65-1 (80, 85), 5.57-1 (90) Optional.

Pressure—145 lbs. (80,85), 154 lbs. (90) at 1000 R.P.M. or approximately 100-105 lbs. at cranking speed for standard 6.0-1 head.

VACUUM READING:—Gauge should show steady reading of 20-21" with engine idling at 320 R.P.M.

IGNITION:—Coil Model 553-E. Two coil unit assembled with ignition switch.

Ignition Current—2.2 amperes idling, 4.4 stopped (each coil).

Ignition Switch:—Delco-Remy Model 435-A (80, 85), 431-E (90). Switch and cable assembly. Connected to coil unit by armored cable. See article in Equipment Section.

Ignition Lock—Briggs & Stratton.

Series 80, 85 Distributor (Model 667-C):—Double breaker, 6 lobe cam, full automatic type with manual adjustment (see Timing). Contacts open alternately at 37½° and 22½° intervals, corresponding to 75° and 45° firing intervals of engine (unequal firing intervals caused by 45° included angle betwee cylinder banks). Contacts must be synchronized (see Timing).

Breaker Gap—Set at .020". Limits .018-.024".
Cam Angle or Dwell—Closed 39°. Open 21° (distributor degrees). Each set operates independently.
Breaker Arm Spring Tension—17-21 ounces.
Condenser—Part No. 1837231. Capacity .20-.25 mfds.

Series 90 Distributor (Model 4118):—Double breaker, 8 lobe cam, full automatic advance type. Contacts open alternately at regular 22½° intervals, corresponding to 45° firing intervals of engine. Contacts must be synchronized (see Timing).
Breaker Gap—Set at .016". Limits .014-.018".
Cam Angle or Dwell—Closed 31°. Open 14° (distributor degrees). Each set operates independently and controls one coil.

Breaker Arm Spring Tension—17-21 ounces.
Condenser—Part No. 1837963. Capacity .20-.25 mfds.

Automatic Advance—667-C

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	2	600
12	800	24	1600
16	1100	32	2200
19	1400	38	2800

Automatic Advance—4118

Start	200	2.5	400
8.25	600	16.5	1200
17	1100	34	2200

Distributor Removal:—Mounted between cylinder banks at front of engine. Take out two capscrews in mounting bracket.
NOTE—When installing distributor on engine, turn crankshaft to firing position for #1 piston, mesh distributor drive gear so that slot in upper end of shaft is offset toward rear of engine.

IGNITION TIMING:—Setting for all engines as follows. See Manual Adjustment section below.

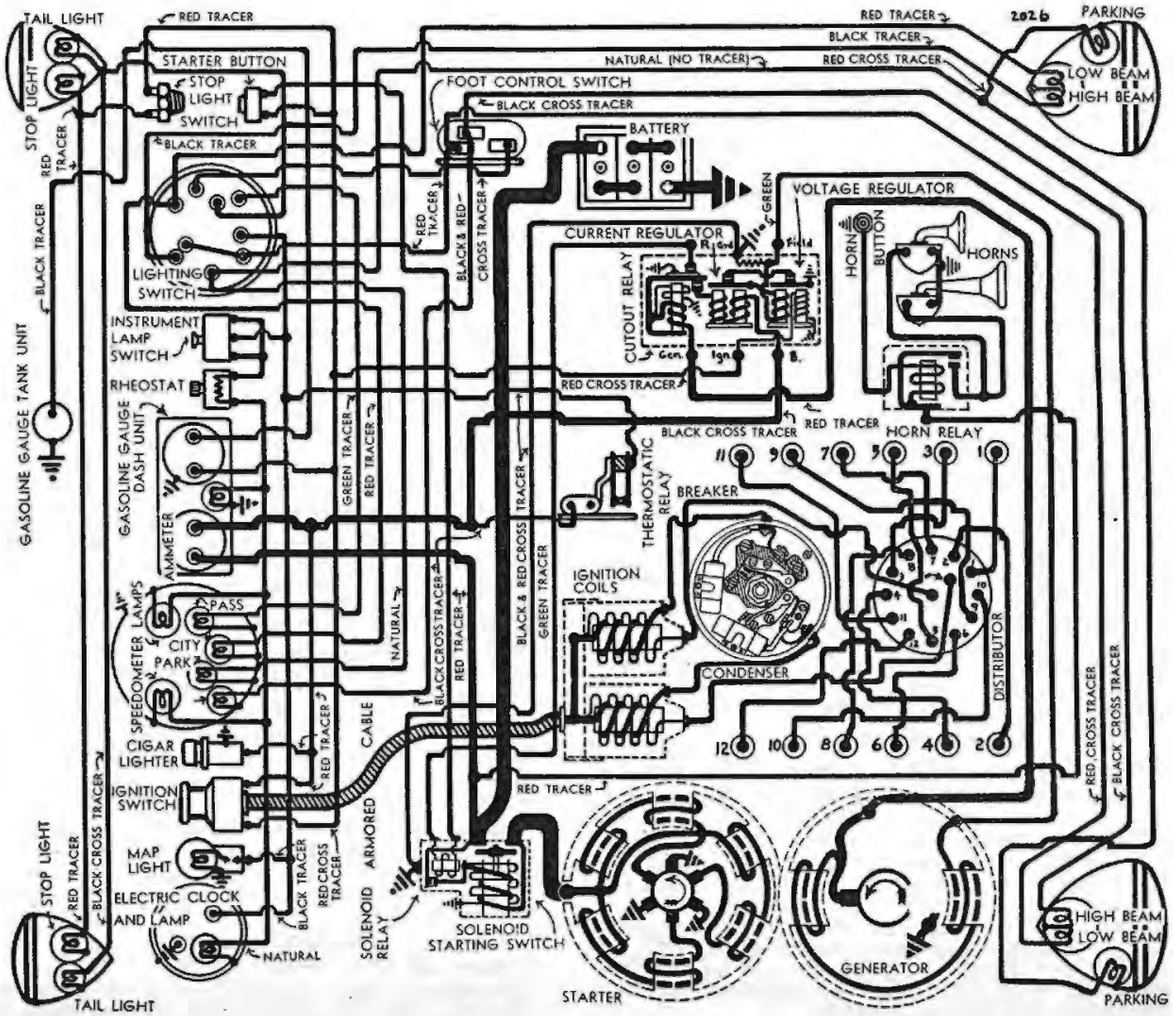
	Flywheel Deg.	Piston Pos.
All engines (80, 85, 90)	4° BTDC	.0058" BTDC

Timing (Stationary Contacts)—Loosen hold-down screw in advance arm, center distributor pointer on quadrant scale by rotating distributor, tighten hold-down screw, take off cover plate over inspection hole in flywheel housing. With #1 piston on compression, crank engine by jacking up one rear wheel, placing car in gear and turning wheel, stop with piston 4° before top dead center when flywheel mark 'IG/A' (which is 4° before top dead center mark 'C/1-11' on 80, 85, 'C/1-15' on 90) lines up with indicator on housing, loosen taper lock screw in center of breaker cam, carefully locate cam so that stationary contacts (mounted directly on breaker plate) are beginning to open, tighten locking screw, check rotor position and spark plug cable connections (see diagram). Then synchronize movable contacts as directed below.

Synchronization (Movable Contacts)—1st method: Turn engine over 75° or slightly less than ¼ revolution to firing position of piston #4 (80, 85), or 45° or ⅛ revolution to firing position of piston #8 (90), stop when flywheel mark 'IG/A' (4° before top dead center mark 'C/4-10' on 80, 85) lines up with indicator on housing, loosen lock screws on movable sub-plate (carrying second set of contacts), turn accentric adjusting screw until contacts begin to open, tighten locking screws.

Synchronization—2nd Method: Use synchronizing tool, Cadillac Part No. 109224. Install tool and adjust so that stationary contacts begin to open when pointer opposite farthest indicating point on quadrant 'R.H.', turn engine over until pointer is directly opposite '12 L.H.' (80, 85), or '16 L.H.' (90) mark on quadrant. Loosen lockscrews on movable sub-plate, turn eccentric adjusting screw until contacts open, tighten lockscrew.

Motor Gauge—Weidenhoff Adapter #113, Rod #33.
Manual Adjustment—With ignition set as above, slight 'ping' should be noticeable when engine is accelerated with wide open throttle at speeds below



15 M.P.H. If ping is too severe, loosen hold-down screw on pointer, rotate distributor one graduation on scale clockwise to retard spark, repeat test. Adjustment permits advance or retard of 10° from center 'O' position.

NOTE—Check engine for faulty spark plugs, excessive carbon deposits or localized 'hot spots' before changing the manual adjustment.

Firing Order:—1-4-9-8-5-2-11-10-3-6-7-12 (80, 85—see diagram). 1-8-9-14-3-6-11-2-15-10-7-4-13-12-5-16 (See 1935 V16 diagram). Spark plug cables not connected in this order.

Spark Plugs:—AC. Type G-7. 18 MM. Metric type.

Spark Plug Gaps—Set at .025-.030".

CARBURETION:—Carburetor—Detroit Model 51, 1½" expanding vane or air valve, updraft type. One carburetor used for each bank with interconnected throttles. Carburetor throttles must be synchronized. See Carburetion Section for adjustment and overhaul.

Automatic Choke:—Detroit semi-automatic type. See special article in Carburetion Section.

Air Cleaner:—AC. #1526626 oil-wetted type standard.

Fuel Pump:—AC. Type D. #1522149. See article in Carburetion Section.

Gasoline Gauge:—AC. Electric. #1515303 (dash unit—80, 85), #1515135 (dash unit—90), #1515428 (tank unit—80, 85), #1515059 (tank unit—90).

VALVE TIMING:—To Check Timing—Intake valve for #1 cylinder (front cylinder—left bank) should open with piston on top dead center when flywheel mark 'C/1-11' (80, 85) or 'C/1-15' (90) lines up with indicator on housing.

Motor Gauge—Weidenhoff Adapter #113, Rod #33.

Tappet Clearance—None in service (hydraulic tappet take-up used). See article in Equipment Section.

Valve Spring Pressure:—Inner spring—18-21 lbs. at 1¾" (valve closed), 49-52 lbs. at 1 7/16" (valve open) Outer spring—48-52 lbs. at 1 15/16" (valve closed), 111-120 lbs. at 1 9/16" (valve open).

LUBRICATION:—Crankcase Capacity—9 qts. (80, 85), 10 qts. (90).

Normal Oil Pressure—30 lbs. at 60 M.P.H.

BATTERY:—(80, 85) Delco, Type 21-D. 6 volt, 21 plate, 164 ampere hour capacity (20 hour rate).

Starting Capacity—195 amperes for 20 minutes.

Zero Capacity—300 amperes for 7.1 minutes.

Grounded Terminal—Positive (+) terminal.

Location—Under left front seat (all models).

(Series 90) Delco, Type 25-A, 25-AF (Export). 6 volt, 25 plate, 196 ampere hour capacity (20 hour rate).
Starting Capacity—234 amperes for 20 minutes.
Zero Capacity—300 amperes for 8.50 minutes.

STARTER:—Model 580, SM-1748 (RHD—80, 85). Armature No. 1837058.

Drive—Solenoid pinion shift and overrunning clutch type with reduction gears.

Rotation—Counter-clockwise (armature shaft) at commutator end.

Brush Spring Tension—36-40 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	2200	5.7	70
35 ft. lbs.	Lock	3.0	600

Removal:—Flange mounted on rear face of flywheel housing at right of transmission. To remove, take out 3 flange capscrews.

Starting Switch:—Solenoid Switch Type 1515. Push-button Switch 1407 (80, 85), 1379 (90). Solenoid switch controlled through relay by push button on instrument board. Operative only with ignition 'on'. See article in Equipment Section.

Solenoid Switch

Closes against 70 lb. pull with ½" air gap drawing 65-71 amperes at 5 volts. Holds switch closed with current draw of 12-14 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—4 volts. max. **Open**—1.6-2.0 volts.
Contact Gap—.030-.045". **Air Gap**—.010-.014" (closed)

GENERATOR:—Model 933-M. Armature No. 1854448. Straight shunt (two brush) type with external voltage and current regulation.

Charging Rate Adjustment—No adjustment at generator. Charging rate controlled by Voltage Regulator and maximum output controlled by Curren Regulator. See Control Unit section below and special article in Equipment Section.

Maximum Charging Rate—20 amperes (cold) with discharged battery as indicated on test ammeter connected in charging line at 'BAT' terminal on control unit. Decreases as battery comes up on charge. Generator output constant at all speeds above 1700 R.P.M. or 20 M.P.H.

Performance Data—Generator Cold

Amperes	Volts	R.P.M.
7	7.0-7.2	900
22	8.1-8.3	1900

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—22-26 ounces.
Shunt Field Curent—1.7-2.0 amperes at 6 volts.

Removal:—Flange mounted on rear face of timing chain case at right of engine. To remove, disconnect water pump drive coupling, take out flange mounting screws. Chain adjustment automatic, requires no attention during life of chain.

CONTROL UNIT:—Model 5599. Mounted on dash. Consists of Vibrating Voltage Regulator, Vibrating Current Regulator, and Cutout Relay. See article in Equipment Section for complete data on these units.

Cutout Relay

Cuts In—6.5-7.0 volts, 12 M.P.H.
Cuts Out—3 amperes max. discharge at 6.3 volts.
Contact Gap—.018-.025".
Air Gap—.018-.022" with contacts closed.

Voltage Regulator

Setting—7.55-7.85 volts at 72° F., 7.45-7.55 volts at 150° F. Regulator is over-compensated for temperature and must be checked at these points.

Adjustment—See Control Unit paragraph and 'Voltage Regulator' adjustments on previous page on Cadillac V-8 Series 60.

Contact Gap—.015-.025".

Contact Spring Tension—3.5 ozs. minimum.

Air Gap—.060-.070" between armature and core with armature down so that fibre bumper just touches stop, .007-.010" between fibre bumper and stop with armature up.

Current Regulator

Setting—20-22 amperes.

Adjustment, Contact Gap, Contact Spring Tension, and Air Gap same as for Cadillac V-8 Series 60. See Control Unit paragraph on previous page.

LIGHTING:—Headlamps—Guide Multi-beam, Pre-focused, Cross-beam type with special non-interchangeable lenses. Headlamps aimed straight-ahead with lenses removed. Assymetrical passing beam (upper beam left hand headlamp, lower beam right hand headlamp), controlled by foot selector switch with lighting switch in 'Country Driving' position.

Headlamp Beam Indicators—Consists of four bulbs in lower half of speedometer which illuminate markers as follows:

City—Lower beam both headlamps.

Drive—Upper beam both headlamps.

Pass—Assymetrical passing beam (see above).

Park— Parking bulbs in headlamps.

Switches

Lighting—Delco-Remy Model 487-N,P. 487-R (RHD)

Foot Selector—Delco-Remy Mod. 471-Z,471-U (RHD)

Instrument Lamp—Delco-Remy Model 1364.

Stop Lamp—Hydraulic type on distributor at rear of brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamp (Right)	50-32	2530-L
Headlamp (Left)	32-32	2330-L
Instrmt., Map, Qtr., Step, Tail	3	63
Parking, Clock	1.5	55
Beam Indicators	1	51
Stop, Dome	15	87

NOTE—Headlamp bulbs are Pre-focused, 'Long-life' type. In all states where 50 cp. bulbs are prohibited, the 32-32 cp. 2330-L bulb is used in both headlamps.

THERMOSTATIC RELAY:—Model 411-A. Contacts remain closed with current of 25 amperes but open within one minute with load of 38 amperes at 70-80° F. Non-adjustable.

HORNS:—Klaxon Model K-33-B, Type 1855 (low note), 1856 (high note). Vibrator type, twin horns with blended tone operated by horn relay. See previous Cadillac V-8, Series 60 page for horn data and Horn Relay.

FLEET 'ECONOMY' MODEL NOTE:—All models available with special Economy Engine and rear axle ratios as follows:

Model	Axle Ratio	Top Speed (No Governor)
FB, FC	4.11-1	
FC	3.82-1	65 M.P.H.
FB	3.82-1	60 M.P.H.
R	6.16-1	
R	5.43-1	51 M.P.H.

These models identified by special name plate on instrument panel stating that performance curtailed in interest of economy and by plate on valve rocker arm cover listing special tune up specifications (see note) and by prefix 'V' on engine number.

NOTE—Economy engine fitted with special carburetor (painted gray) which has throttle stop pin limiting throttle opening to half-throttle and requires special spark plug gap, tappet clearance, and engine oil. See data below. Throttle stop pin may be removed to permit top speed if necessary. See article on carburetor in Carburetion Section.

SERIAL NUMBER:—First number—1001. Prefixes 1-FA-03 indicate assembly plant (1 to 21), Model (FB, FC, RA, RB, RC, RD), and month (01 to 12). Located on right front sill (passenger cars), or on dash (trucks).

COMPRESSION:—Ratio 6.0-1 Std. Pressure 102 lbs. actual pressure at cranking speed or 90 lbs. minimum with all cylinders alike within 5-10 lbs.

VACUUM READING:—Gauge should show steady reading of 20-22" of HG. with engine idling at 400 RPM or 9.7 M.P.H.

IGNITION:—Coil Model 536-D. Mounted on right side of block directly above distributor.
Coil Draw—2.5 amperes idling, 4.8 stopped.

Ignition Switch:—Delco-Remy Model 431-P. Connected to coil by armored cable. See article in Electrical Equipment Section.
Ignition Lock—Briggs & Stratton.

Distributor Model 645-T. Single breaker, 6 lobe cam, full automatic advance type with vacuum spark control and Octane Selector.
Breaker Gap—.018". Limits .018-.024".
Cam Angle or Dwell—36° (closed), 24° (open).
Breaker Arm Spring Tension—17-21 ozs.
Condenser—Part No. 1861709. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	2.25	600
14	1500	28	3000

Vacuum Spark Control Model 680-L—Mounted on Octane Selector and linked to distributor advance arm. Provides additional advance except when engine is suddenly accelerated (retarded by return spring within unit) or at high speeds with wide open throttle (vacuum port in carburetor cut off by throttle valve shaft).

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	5"
17° Max.	9-11"

NOTE—Spark control spacer or stop may be installed to limit vacuum advance to 12° to overcome pinging. See Octane Selector under Ignition Timing below.

Octane Selector—Consists of adjustment at distributor providing 10° advance or retard from standard ignition setting to compensate for fuel rating. See Ignition Timing below.

Removal:—Distributor mounted on right side of crankcase. To remove, loosen clamp bolt in advance arm (does not disturb Octane Selector mounting).

IGNITION TIMING:—Initial setting with Octane Selector set at 'O' as follows. See Octane Selector for final setting.

	Flywheel Degrees	Piston Position
All engines	5° BTDC.	.0097" BTDC.

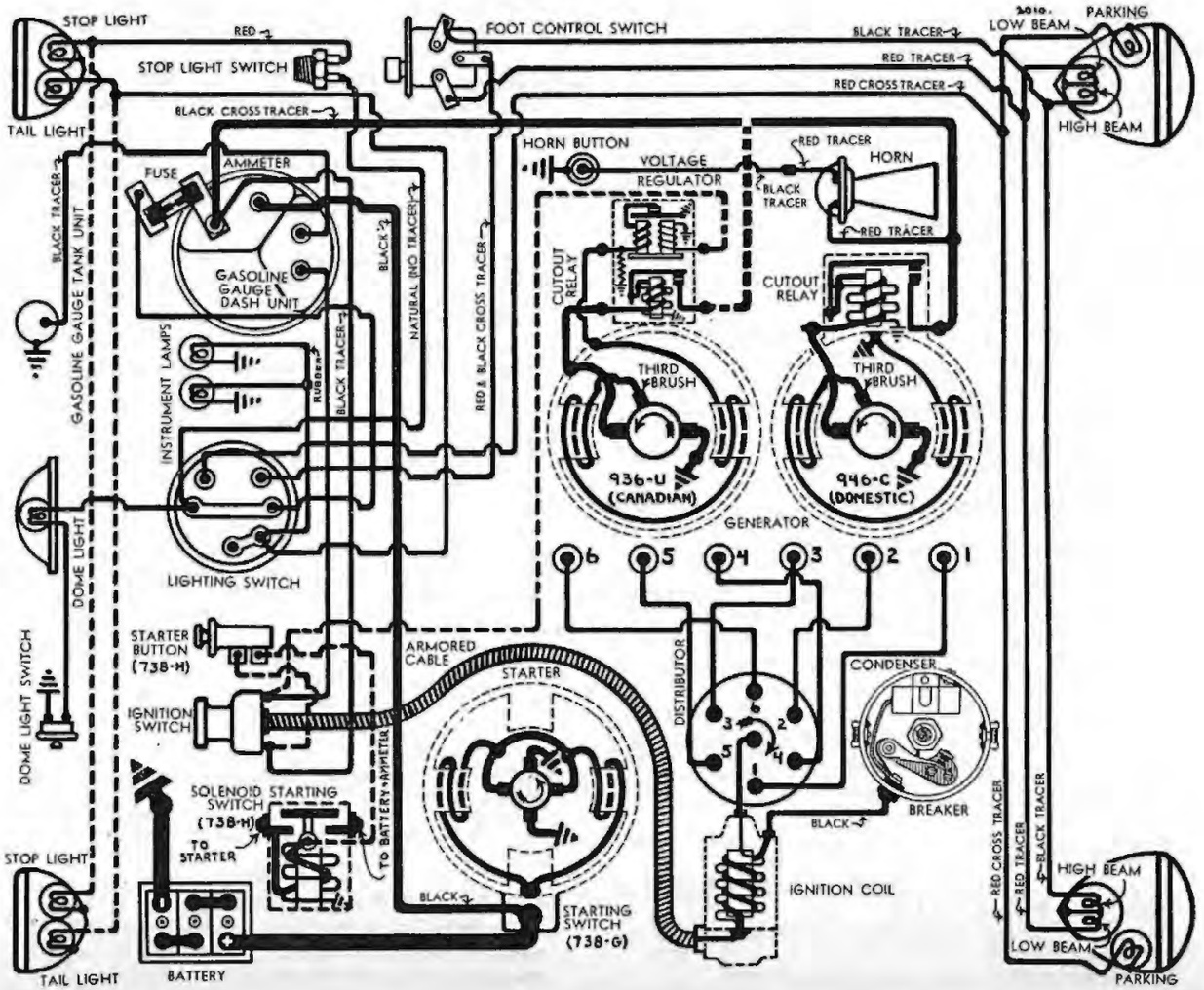
To Set Timing (Neon Light)—Recommended by manufacturer. Mount timing light so that it is directed on flywheel through inspection hole in right front face of housing. Clip one lead to #1 spark plug. Set Octane Selector at 'O' on scale by turning thumb nut. Idle engine, loosen advance arm clamp bolt, rotate distributor until steel ball timing mark on flywheel lines up with pointer on housing. Tighten clamp bolt.

Timing (Without Neon Light)—With #1 piston on compresion, turn engine over until piston is 5° or .0097" before top dead center, stop when steel ball timing mark on flywheel lines up with pointer in inspection hole in right front face of housing, loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt.

Timing (Motor Gauge)—Use Weidenhoff #113 Adapter and 152 attachment, #33 Rod. Settings given above.

Final Setting (Octane Selector)—Provides 10° advance or retard from standard setting to compensate for fuel. For maximum performance and economy, road test car, advance Octane Selector setting until slight ping is noticeable when accelerating with wide open throttle.

NOTE—If ping is objectionable at 20-25 MPH speed, this can be eliminated by installing Vacuum Spark



Control Stop or Spacer No. 602111. Provides 5° retard without same loss of economy resulting from retarding Octane Selector setting.

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

Spark Plugs:—AC. Type K-11. 14 MM. Metric type.
Spark Plug Gap (Standard Engines)—.032-.035".
Spark Plug Gap (Economy Engines)—.040".

CARBURETION:—Carburetor—Carter Model 319-S superseded by Model 334-S (Std. Engines), Mod. 335-S (Economy Engines). 1¼" downdraft type. See Carburetion Section for complete adjustment, overhaul and Jet Specifications.

Idle Adjustment—With engine warm, adjust throttle stopscrew so that speed is 400 R.P.M. Turn idle adjusting screw in until engine begins to miss, turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for correct speed.

Accelerating Pump Setting—Pump lever (under dust cover) has three holes for pump link engagement. Change setting for seasonal requirements as follows:

Outer Hole—Normal summer weather.
Inner Hole—Extremely hot weather or high altitude
Upper Hole—Extremely cold weather.

NOTE—Lean and extra-lean metering rods available to compensate for fuel or altitude requirements. See Jet Specification table in Carburetion Section.

Air Cleaner:—AC. #1525978 (FB, R), #1526603 (FC), oil-wetted type standard, #1526764 (1525983 for cars with governors) oil-bath type optional.

Fuel Pump:—AC. Type W #1521812. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—AC. Electric #1515207 dash unit; #1515405 tank unit (FC), #862723 tank unit (FB, R), #1515427 tank unit (FB). See article in Carburetion Section.

VALVE TIMING:—Tappet Clearance (Stand. Engines)—.006" Min. (.006-.008") Int., .013" Min. (.013-.015") Exh. with engine hot.

Tappet Clearance (Economy Engine)—.010" Int. .016" Exh. with engine hot.

To Check Valve Timing—Check tappet clearance #1 intake valve. This valve should open with piston 4° or .0061" before top dead center when point on flywheel approximately 1½ teeth before dead center mark lines up with pointer in inspection hole in right front face of flywheel housing.

Using Motor Gauge—See Ignition section for rod and adapter data. Gauge reading should be .0061" BTDC.

LUBRICATION:—Crankcase Capacity—5 qts. refill.
Normal Oil Presure—12 lbs. at 50 M.P.H.
NOTE—SAE #10-W oil recommended for Economy engine. Oil heavier than #20 must not be used in this engine at any time.

BATTERY:—(Std. Model FC) Delco, Type 13-AA. 6 volt, 13 plate, 86 ampere hour capacity (20 hour rate).
Starting Capacity—102 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.0 minutes.
Grounded Terminal—Negative (—) terminal.
Location—On right side under front floor.

(Comm. Mod. FB, Truck Mod. R) Delco Type 15-X, T. 6 volt, 15 plate, 94 amp. hour capacity (20 hr. rate).
Starting Capacity—115 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.3 minutes.

STARTER:—Model 738-G, 738-H (RHD). Armature No. 1847432.
Drive—Bendix Barrel Type No. A-1718.
Cranking Engine—65 R.P.M.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 "	Lock	3.63	475

Removal:—Starter flange mounted on right front face of flywheel housing. To remove, take out flange mounting screws.
Starting Switch:—Part No. 362941. Mounted on starter. Operated by starting pedal on toeboard.

GENERATOR—STANDARD:—Model 946-C. Armature No. 1841027. Third brush control type. Ventilated by fan on drive pulley.
Charging Rate Adjustment—Loosen lockscrew on commutator end plate, remove cover band, shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate, tighten locking screw.
Maximum Charging Rate—15 amperes (cold), 1600 R.P.M. or 20-25 M.P.H.

Performance Data

	Amperes	Volts	R.P.M.
Cold	15-17	7.9-8.0	1600
Hot	11-13	7.5-7.8	1750-1850

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third brush).
Field Current—4.0-5.9 amperes at 6.0 volts.

GENERATOR—CANADIAN:—Model 936-U. Armature No. 1854856. Fixed third brush control type with external vibrating voltage regulator. Ventilated by fan on drive pulley.

NOTE—Third brush is set for maximum safe output and must not be disturbed.

Charging Rate Adjustment—Adjusted by changing setting of voltage regulator. See Regulator data below and special article in Equipment Section. Do not operate generator on open circuit.

Maximum Charging Rate—As given in table below. To check charging rate, connect ammeter in charging line at 'BAT' terminal of regulator, voltmeter between 'BAT' terminal and ground, ground 'F' terminal to eliminate regulator action.

Performance Data

	Amperes	Volts	R.P.M.
Cold	22-26	8.7-9.1	3300
Hot	18-21	8.2-8.7	3500

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third brush).
Field Current—2.3-2.6 amperes at 6.0 volts.

Removal (All models):—Generator pivot mounted at left front of engine with fan belt drive. To remove, take out two pivot bolts, one clamp bolt.

Belt Adjustment (All models):—Belt adjusted in usual manner by loosening clamp bolt and swinging generator away from engine.

CUTOUT RELAY:—Model 265-G (946-C). Mounted on generator. See article in Equipment Section for complete data.
Cuts In—6.75-7.5 volts, 675 R.P.M., 8 M.P.H.
Cuts Out—0-2.5 amperes discharge current.
Contact Gap—.015-.025".
Air Gap—.012-.017" with contacts closed.

CONTROL UNIT (VOLTAGE REGULATOR):—Model 5588 (936-U). Mounted on generator. Consists of Cutout Relay and vibrating type Voltage Regulator. See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.75-7.25 volts.
Cuts Out—3 ampere maximum discharge at 6.3 volts
Contact Gap—.018-.025".
Air Gap—.018-.022" with contacts closed.

Voltage Regulator

Setting—7.55-7.85 volts at 70° F., 7.45-7.55 volts at 150° F. Regulator is over-compensated for temperature and must be checked at these points.

Adjustment—Disconnect lead on 'IGN' terminal of regulator, connect jumper between 'IGN' and 'BAT' terminals, connect ammeter in charging line at 'BAT' terminal, connect voltmeter between 'IGN' terminal and ground. Operate generator at 2800-3000 R.P.M., adjust charging rate to 8-10 amperes, change regulator armature spring tension by bending spring hanger at lower end of spring slightly until setting is as given above.
NOTE—Regulator cover must be in place when tests are made. Do not operate generator on open circuit.

Contact Gap—.015-.025".

Contact Spring Tension—2.7-3.5 ounces.

Air Gap—.060-.070" between armature and center of core with armature down so that fibre bumper just touches stop, .008-.013" between fibre bumper and stop with armature up.

LIGHTING:—Headlamps—Guide Multi-beam, Pre-focused type. Headlamps aimed straight ahead. Upper and lower beams controlled by foot selector switch.

Switches

Lighting—Delco-Remy Model 479-R (FC), 479-P (FB, R).

Foot Selector—Delco-Remy Model 471-P.

Stop Light—Delco-Remy Model 476-U (FC), 474-Y (FB, R). Hydraulic type mounted at rear of brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320
Parking	1½	55
Instrument	1	51
Stop, Tail	3	63
Dome	6	81

FUSES:—Lighting—15 ampere on back of ammeter.
Stop Light (R-1½ ton model)—15 ampere in cartridge type holder in stop light lead (lead taken from ignition switch on this model).

HORNS:—Klaxon Model K-31 Type 1359 (FC), K-26-L Type 1601 (FB, R). Vibrator type horns.

Type	Current at 6 volts	Air Gap
K-31-1359	5.0-7.5	.020-.022"
K-26L-1601	6.5-8.5	.025-.029"

FLEET 'ECONOMY' MODEL NOTE:—All models available with special Economy Engine and special rear axle ratios of 4.11-1 and 3.82-1. See Fleet Note on Standard Model (preceeding page).

NOTE:—Master Models FA and FD are identical except that 'Knee Action' is standard on Model FA only. All data below applies to both models.

SERIAL NUMBER:—First No.—1001. Prefixes 1-FA-03 indicate assembly plant (1 to 21), Model (FA, FD) and month (01 to 12). Located on right front sill.

COMPRESSION:—Ratio 6.0-1 Std. Pressure 102 lbs. actual pressure at cranking speed or 90 lbs. min. with all cylinders alike within 5-10 lbs.

VACUUM READING:—Gauge should show steady reading of 20-22" of HG. with engine idling at 400 R.P.M. or 9.7 M.P.H.

IGNITION:—Coil Model 536-D. Mounted on right side of block directly above distributor.

Coil Draw—2.5 amperes idling, 4.8 stopped.

Ignition Switch:—Delco-Remy Model 431-P. Connected to coil by armored cable. See article in Electrical Equipment Section.

Ignition Lock—Briggs & Stratton.

Distributor Model 645-T. Single breaker, 6 lobe cam, full automatic advance type with vacuum spark control and Octane Selector.

Breaker Gap—.018". Limits .018-.024".

Cam Angle or Dwell—36° (closed), 24° (open).

Breaker Arm Spring Tension—17-21 ozs.

Condenser—Part No. 1861709. Capacity .20-.25 mfd.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	2.25	600
14	1500	28	3000

Vacuum Spark Control Model 680-L:—Mounted on Octane Selector and linked to distributor advance arm. Provides additional advance except when engine is suddenly accelerated (retarded by return spring within unit) or at high speeds with wide open throttle (vacuum port in carburetor cut off by throttle valve shaft).

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	5"
17° Max.	9-11"

NOTE—Spark control spacer or stop may be installed to limit vacuum advance at 12° to overcome pinging. See Octane Selector under Ignition Timing below.

Octane Selector—Consists of adjustment at distributor providing 10° advance or retard from standard ignition setting to compensate for fuel rating. See Ignition Timing below.

Removal:—Distributor mounted on right side of crankcase. To remove, loosen clamp bolt in advance arm (does not disturb Octane Selector mounting).

IGNITION TIMING:—Initial setting with Octane Selector set at 'O' as follows. See Octane Selector for final setting.

	Flywheel Degrees	Piston Position
All Engines	5° BTDC	.0097" BTDC.

To Set Timing (Neon Light)—Recommended by manufacturer. Mount timing light so that it is directed on flywheel through inspection hole in right front face of housing. Clip one lead to #1 spark plug. Set Octane Selector at 'O' on scale by turning thumbnut. Idle engine, loosen advance arm clamp bolt, rotate distributor until steel ball timing mark on flywheel lines up with pointer on housing. Tighten clamp bolt.

Timing (Without Neon Light)—With #1 piston on compression, turn engine over until piston is 5° or .0097" before top dead center, stop when steel ball timing mark on flywheel lines up with pointer in inspection hole in right front face of housing, loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt.

Timing (Motor Gauge)—Use Weidenhoff #113 Adapter and 152 attachment, #33 Rod. Settings given above.

Final Setting (Octane Selector)—Provides 10° advance or retard from standard setting to compensate for fuel. For maximum performance and economy, road test car, advance Octane Selector setting until slight ping is noticeable when accelerating with wide open throttle.

NOTE—If ping is objectionable at 20-25 M.P.H. speed, this can be eliminated by installing Vacuum Spark Control Stop or Spacer No. 602111. Provides 5° retard without same loss of economy resulting from retarding Octane Selector setting.

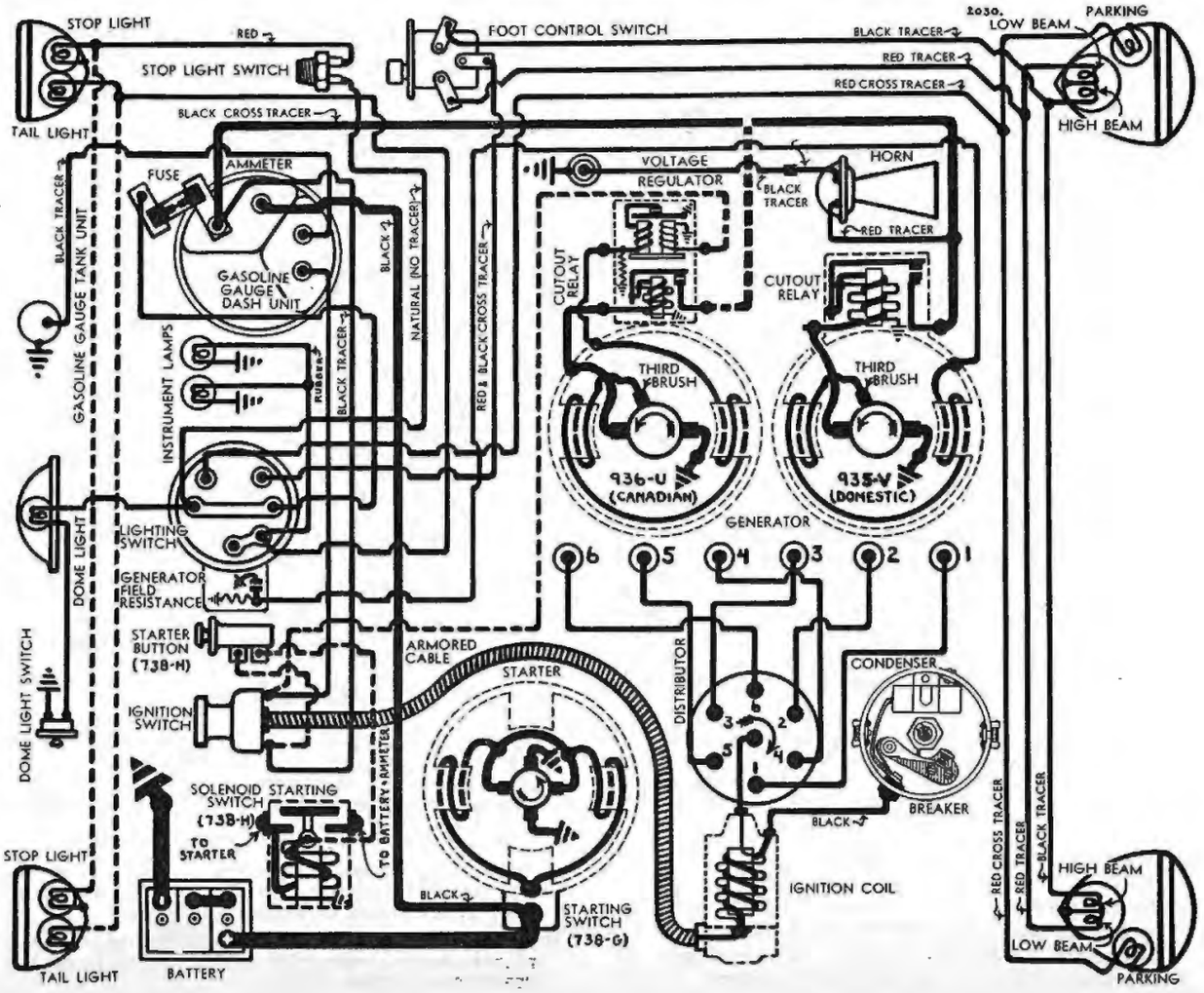
Firing Order:—1-5-3-6-2-4. See diagram.

Spark Plugs:—AC. Type K-11. 14 MM. Metric type.

Spark Plug Gap (Standard Engines)—.032-.035".

Spark Plug Gap (Economy Engines)—.040".

CARBURETION:—Carburetor—Carter Model 319-S superseded by Model 334-S (Std. Engines), Mod. 335-S (Economy Engines). 1¼" downdraft type. See Car-



buretion Section for complete adjustment, overhaul and Jet Specifications.

Idle Adjustment—With engine warm, adjust throttle stopscrew so that speed is 400 R.P.M. Turn idle adjusting screw in until engine begins to miss, turn screw out until engine begins to roll, finally turn screw slowly in until engine fires smoothly. Readjust throttle stopscrew for correct speed.

Accelerating Pump Setting—Pump lever (under dust cover) has three holes for pump link engagement. Change setting for seasonal requirements as follows:

Outer Hole—Normal summer weather.
Inner Hole—Extremely hot weather or high altitude.
Upper Hole—Extremely cold weather.

NOTE—Lean and extra-lean metering rods available to compensate for fuel or altitude requirements. See Jet Specification table in Carburetion Section.

Accelerator Linkage Adjustment:—⅛" clearance between top of accelerator slot and Starterator lever and ⅜-½" free travel between end of Starterator link and starter switch spring seat must be maintained to provide proper accelerator lead for easy starting. See article on Starterator in Equipment Section.

Air Cleaner:—AC. #1526603 oil-wetted type standard, #1526764 (1525983 for cars with governors) oil-bath type optional.

Fuel Pump:—AC. Type W #1521812. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—AC. Electric #1515207 dash unit, #1515405 tank unit. See article in Carburetion Sect.

VALVE TIMING:—Tappet Clearance (Stand. Engines)—.006" Min. (.006-.008") Int., .013" Min. (.013-.015") Exh. with engine hot.
Tappet Clearance (Economy Engine)—.010" Int., .016" Exh. with engine hot.
To Check Valve Timing—Check tappet clearance #1 intake valve. This valve should open with piston 4° or .0061" before top dead center when point on flywheel approximately 1½ teeth before dead center mark lines up with pointer in inspection hole in right front face of flywheel housing.
Motor Gauge—Weidenhoff Adapter #113 with #152 attachment, Rod #33.

LUBRICATION:—Crankcase Capacity—5 qts. refill.
Normal Oil Pressure—12 lbs. at 50 M.P.H.

NOTE—SAE #10-W oil recommended for Economy engine. Oil heavier than #20 must not be used in this engine at any time.

BATTERY:—Delco, Type 15-T, X. 6 volt, 15 plate, 94 ampere hour capacity (20 hour rate).
Starting Capacity—115 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.3 minutes.
Grounded Terminal—Negative (—) terminal.
Location—Right side under front floor.

STARTER:—Model 738-G, 738-H (RHD). Armature No. 1847432.
Drive—Bendix Barrel Type No. A-1718.
Cranking Engine—65 R.P.M.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 "	Lock	3.63	475

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

Starting Switch (738-G):—Starterator operated by accelerator pedal with Type 1575 vacuum unit control (start—2" of HG., full travel 5/16" at 6.5" of HG.). See article in Equipment Section.
(738-H)—Type 1503 magnetic switch controlled by pull switch (Model 1378) on instrument panel.

GENERATOR:—Model 936-V. Armature No. 1854856. Third brush regulation, lighting switch control. Field resistance on switch is shorted out with lamps turned on, increasing generator output. Special switch position between 'Off' and 'Park' provides this high charging rate with lamps off. See 'Lamp Control Generators' in Equipment Section. Ventilated by fan on drive pulley.
Charging Rate Adjustment—Third brush set for maximum safe output at factory. Manufacturer recommends that position of third brush not be changed. To check charging rate, ground field terminal on generator to frame, use test ammeter to check output, shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate, remove field ground.
Maximum Charging Rate—20 amperes (cold), 15 amperes (hot), 2400 R.P.M., 26-27 M.P.H.

Performance Data

	Amperes	Volts	R.P.M.
Cold	18-21	8.2-8.5	2400
Hot	12-15	7.6-8.0	2900

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—22-26 ounces (main), 16-20 ounces (third brush).
Field Current—2.3-2.6 amperes at 6.0 volts.
Field Resistance—Std. 1 ohm. Optional ¾ ohm and 1½ ohm. Should be changed only for unusual operating conditions, excessive night driving, etc.

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

Belt Adjustment:—Belt adjusted in usual manner by loosening clamp bolt and swinging generator away from engine.

GENERATOR—CANADIAN:—Mod. 936-U. See Standard Model (preceeding page) for all data, including Control Unit (Voltage Regulator Model 5588) used with this generator.

CUTOUT RELAY:—Mod. 265-G. Mounted on generator. See article in Equipment Section for complete data.
Cuts In—6.75-7.5 volts, 720 R.P.M., 8 M.P.H.
Cuts Out—0-2.5 amperes discharge current.
Contact Gap—.015-.025".
Air Gap—.012-.017" with contacts closed.

LIGHTING:—Headlamps—Guide Multi-beam, Pre-focused type. Headlamps aimed straight ahead. Upper and lower beams controlled by foot selector switch.

Switches

Lighting—Delco-Remy Model 479-Y.
Foot Selector—Delco-Remy Model 471-P.
Stop Lamp—Delco-Remy Model 476-U. Hydraulic type mounted at rear of brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320
Parking	1½	55
Instrument	1	51
Stop, Tail	3	63
Dome	6	81

FUSES:—Lighting—15 ampere on back of ammeter.

HORNS:—Klaxon Model K-26-L Type 1601. Vibrator type. Current draw 6.5-8.5 amperes at 6 volts. Air Gap .025-.029".

SERIAL NUMBER:—First number—6,823,301 (Detroit), 9,704,601 (Canada). Located on right front door hinge post.

COMPRESSION:—**Ratio**—6.0-1 Std. cast-iron head, 6.5-1 (optional aluminum head).

Pressure—(6.0-1 Std. head) 120-130 lbs. at 1000 RPM or approx. 103 lbs. at cranking speed, (6.5-1 Optl. head) 125-135 lbs. at 1000 R.P.M. or approx. 110 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 16-18" with engine idling at 6 M.P.H.

IGNITION:—**Coil Model IG-4638 (Conv. Sedan & Coupe) IG-4631 (all others).** Service Winding (coil less switch and cable) IG-3224S. Mounted on dash.

Ignition Current—2.5 amperes idling, 5.5 stopped.

Ignition Switch:—Mitchellock Model 24-B, Type 6519. Connected to coil by armored cable.

Ignition Lock—Yale & Towne Mod. DP-108, Mitchell No. 6286.

Distributor Model IGS-4006-1, IGS-4006A-1. Single breaker, 6 lobe cam, full automatic advance type with auxiliary vacuum spark control.

Breaker Gap—Set at .020".

Cam Angle or Dwell—38° closed, 22° open.

Breaker Arm Spring Tension—9-13 ounces.

Condenser—Part No. IG-2671F. Capacity. 20-.25 mfd.

Automatic Advance—IGS-4006-1

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
3	400	6	800
6	775	12	1550
9	1150	18	2300
12	1530	24	3060

Automatic Advance—IGS-4006A-1

Start	300	0	600
3	400	6	800
6	850	12	1700
9	1300	18	2600
12	1750	24	3500

Vacuum Spark Control—Integral with distributor. Mounted on distributor housing and linked directly to breaker plate. Provides additional advance for speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG)
Start	5.1"
1.4	6"
8	10-11"
16	15"

Distributor Removal:—Mounted on left side of crankcase. To remove, take out hold-down screw in advance arm, disconnect vacuum line.

IGNITION TIMING:

	Flywheel Deg.	Piston Position
6.0-1 Std. Head	At TDC	.0000" TDC.
6.5-1 Optl. Al. Head	5° ATDC	.0118" ATDC.

NOTE—Impulse neutralizer at front of engine marked 'O' at top dead center with 15 one degree graduations before and after this point.

Timing (Using Timing Light)—Connect timing light between distributor terminal and battery terminal on generator control unit. With #1 piston on compression, turn engine over until piston reaches firing position (see table), stop when correct line on impulse neutralizer lines up with pointer on chain case cover. Loosen distributor hold-down screw, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until timing light just goes out, tighten clamp bolt. **Timing (Using Synchroscope)**—Clip lead to #1 spark plug, direct light on impulse neutralizer, fill in correct mark with chalk or white paint. See Equipment Section.

Timing (Motor Gauge)—Weidenhoff #103 Adapter, #12 Rod. Timing hole located above #6 piston.

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

Spark Plugs:—(6.0-1 Cast-iron head) AC. Type K-9 superseded by Champion Type J-8. (6.5-1 Al. Head) AC. Type S-9 superseded by Champion Type H-10. 14 MM. Metric.

NOTE—Spark plugs used in aluminum head engines have longer thread length. Not interchangeable with standard plugs.

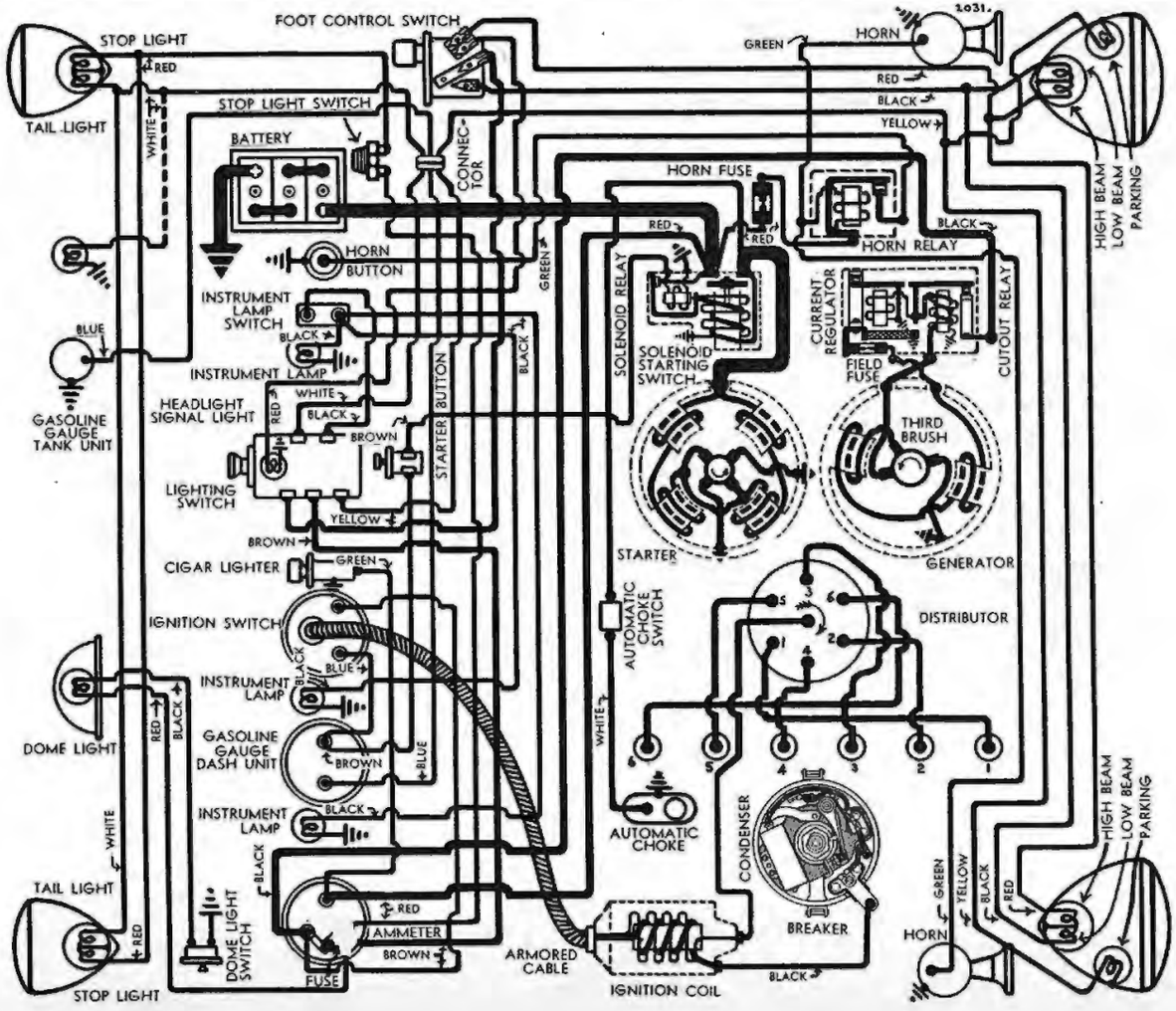
Spark Plug Gap—.025".

CARBURETION:—**Carburetor**—Carter (Ball & Ball) Model E6G1, 1½" downdraft type. See Carburetion Section for complete adjustment, overhaul and Jet Specifications.

NOTE—Do not make carburetor adjustments until engine is warmed up with choke valve wide open and fast idle inoperative.

Idle Adjustment—Adjust throttle stopscrew so that idle speed is 300 R.P.M. or 6 M.P.H. Turn idle adjusting screw in until engine begins to hesitate or miss, then out until engine begins to roll, finally turn screw in until engine fires smoothly. Final setting should be ¼-1 turn of screw from inner closed or seated position. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Engage pump link in



proper hole in throttle lever for seasonal requirements as follows:
Inner Hole (Min. stroke)—Extremely warm weather.
Center Hole—Normal summer temperatures.
Outer Holue (Max. stroke)—Winter temperatures.
NOTE—5% and 10% lean main metering screws (high altitude calibration) may be used at lower altitudes for maximum fuel economy although with considerably reduced speed and power. See Carter (B & B) Jet Specifications in Carburetion Section.

Fast Idle:—Integral with carburetor. No adjustment.

Automatic Choke:—Sisson Type AC-751. See article in Carburetion Section for data and linkage adjustmt.

Air Cleaner:—Burgess oil-wetted type standard, AC. #1526838 heavy duty oil-bath type optional.

Fuel Pump:—AC. Type B #1522237. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Motometer Electric No. NG-7781-D or NG-7879-D (dash unit), NG-7687-T (tank unit). See article in Carburetion Section.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .010". This valve should open with piston on top dead center when 'O' mark on impulse neutralizer lines up with pointer on chain case cover. Reset tappet clearance at .006" hot. **Motor Gauge**—Weidenhoff #103 Adapter, #12 Rod.

Tappet Clearance:—.006" Int., .008" Exh. with engine hot. .010" Exh. recommended for sustained high speed.

Valve Spring Pressure:—46-50 lbs. at 2 1/32" (valve closed), 104-110 lbs. at 1 11/16" (valve open).

LUBRICATION:—Crankcase Capacity—6 qts. refill.
Normal Oil Pressure—30-40 lbs. at 30 M.P.H.

BATTERY:—Willard, Type WH-2-15, RH-2-15 (Export). 6 volt, 15 plate, 119 ampere hour capacity (20 hour rate).
Starting Capacity—140 amperes for 20 minutes.
Zero Capacity—300 amperes for 4.3 minutes.
Grounded Terminal—Positive (+) terminal.
Location—On left side under drivers seat.

STARTER:—Model MAX-4016. Armature MAW-2030.
Drive—Magnetic shift outboard pinion.
Cranking Engine—Approx. 200 amperes 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.	5300	5.5	65
.65 "	3300	5.5	100
2.75 "	1630	5.0	200
5.5 "	970	4.5	300
8.7 "	600	4.0	400
12.0 "	300	3.5	500
16.5 "	Lock	3.0	640
25.0 "	Lock	4.0	880

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

Starting Switch:—Solenold Switch Type SS-4104. Controlled through relay by pushbutton on dash. Operative with ignition turned 'on'.

Solenoid Switch

Closes against 105 lb. pull with 3/8" air gap drawing 65 amperes. Holds switch closed with draw of 15 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—3.5-4.5 volts. **Open**—1.5-2.5 volts.
Contact Gap—.025-.030". **Air Gap**—.005-.007" (closed)

GENERATOR:—Model GAR-4608A-5. Armature GAR-2116F. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Use test meters. Connect jumper between fuse cup on regulator and ground. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate until output is 21 amperes at 8.6 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.

Commutator Bar Method—Shift third brush until exactly 4 commutator bars are exposed between brush and nearest main brush.

Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold Regulator Contacts Closed			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	800	0	6.4	825
4	6.8	950	4	6.8	1000
8	7.25	1100	8	7.25	1200
12	7.7	1275	12	7.7	1440
16	8.1	1525	16	8.1	1825
21	8.6	2400	18.5	8.35	2500

Rotation—Counterclockwise at commutator end.
Brush Spring Tension—24 ozs. min. (old brushes), 36 ozs. max. (new brushes).
Field Current—3.89-3.51 amperes at 6.0 volts.
Motoring Current—5.03-5.57 amperes at 6.0 volts.
Field Fuse—5 ampere in plug on regulator case.

Removal:—Pivot mounted at left front of engine. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Swing generator away from engine until 45-50 lb. reading indicated on scale attached to generator frame.

RELAY-REGULATOR:—Model TC-4301A. Mounted on generator. Consists of Cutout Relay and Current Regulator two-rate charging control). See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.5-7.25 volts.
Cuts Out—.5-2.5 ampere discharge current.
Contact Gap—.015-.045".
Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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 beam, with lenses in place). Lower beam deflected slightly to right. Upper and lower beams controlled by foot selector switch.

Headlamp Beam Indicator—In light switch knob. Lighted when headlamp upper beams in use.

Switches

Lighting—Chrysler Part No. 655559. Douglas Switch which is available only through Chrysler Parts Dept
Foot Selector—Clum Model 9657.
Stop Light—R.B.M. No. 910. Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Instrmt., Ign. Sw.	1½	55
Stop and Tail	21-3	1158
Dome	15	87

FUSES:—Lighting—20 amperes on back of ammeter.
Generator Field—5 ampere in plug on regulator.
Twin Horns—30 ampere in connector near starter.

HORNS:—Std. Motometer. Optl. Klaxon Model K-33-C Type 2151 (low note), 2152 (high note). Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
2151	11-13	.042-.046"
2152	10-12	.032-.036"

Horn Relay:—Model 266-TK. Requires .25 amperes at 2 volts min. to close contacts. Current draw .8 amps.
Contact Gap—.015-.025".
Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—First number—6,710,501 (Detroit), 9,755,816 (Canada). Located on right front door hinge post.

COMPRESSION:—Ratio—6.2-1 Std. cast-iron hd, 7.0-1 (optional aluminum head).

Pressure—(6.2-1 Std. head) 125-135 lbs. at 1000 RPM or approx. 106 lbs. at cranking speed., (7.0-1 Optl. head) 130-140 lbs. at 1000 R.P.M. or approx. 117 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 16-18" with engine idling at 7-8 M.P.H.

IGNITION:—Coil Model CE-4621 (Conv.Sedan & Coupe) CE-4616 (all others). Service Winding (coil less switch and cable) CE-3224S. Coil mounted on dash.

Ignition Current—2.5 amperes idling, 5.5 stopped.

Ignition Switch:—Mitchellock Model 24-B, Type 6519. Connected to coil by armored cable.

Ignition Lock—Yale & Towne Mod. DP-108, Mitchell No. 6286.

Distributor Model IGT-4001-1, IGT-4001D-1. Single breaker, 8 lobe cam, full automatic advance type with auxiliary vacuum spark control.

Breaker Gap—Set at .017".

Cam Angle or Dwell—27° closed, 18° open.

Breaker Arm Spring Tension—9-13 ounces.

Condenser—Part No. IG-2671G. Capacity .20-.25 mfd

Automatic Advance—IGT-4001-1

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	350	0	700
3	400	6	800
7	900	14	1800
11	1400	22	2800
13	1650	26	3300

Automatic Advance—IGT-4001D-1

Start	350	0	700
3	400	6	800
6	850	12	1700
9	1300	18	2600
13	1900	26	3800

Vacuum Spark Control—Integral with distributor. Mounted on distributor housing and linked directly to breaker plate. Provides additional advance for speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG)
Start	5.1"
1.4	6"
12	12"

Distributor Removal:—Mounted on left side of crankcase. To remove, take out hold-down screw in advance arm, disconnect vacuum line.

IGNITION TIMING:

	Flywheel Deg.	Piston Position
6.2-1 Std. Head	At TDC	.0000" TDC.
7.0-1 Opt. hd., std. fuel	At TDC	.0000" TDC.
7.0-1 Opt. hd., Ethyl fuel	4° BTDC	.0062 BTDC.

NOTE—Impulse neutralizer at front of engine marked 'O' at top dead center with 15 one degree graduations before and after this point.

Timing (Using Timing Light)—Connect timing light between distributor terminal and battery terminal on generator control unit. With #1 piston on compression, turn engine over until piston reaches firing position (see table), stop when correct line on impulse neutralizer lines up with pointer on chain case cover. Loosen distributor hold-down screw, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until timing light goes out, tighten clamp bolt.

Timing (Using Synchroscope)—Clip lead to #1 spark plug, direct light on impulse neutralizer, fill in correct mark with chalk or white paint. See Equipment Section.

Timing (Motor Gauge)—Weidenhoff #103 Adapter, #12 Rod. Timing hole located above #8 piston.

Firing Order:—1-6-2-5-8-3-7-4 (see diagram).

Spark Plugs:—(6.2-1 Cast-iron head) AC. Type K-9 superseded by Champion Type J-8. (7.0-1 Al head)) AC. Type S-9 superseded by Champion Type H-10. 14 MM. Metric.

NOTE—Spark plugs used in aluminum head engines have longer thread length. Not interchangeable with standard plugs.

Spark Plug Gap—.025".

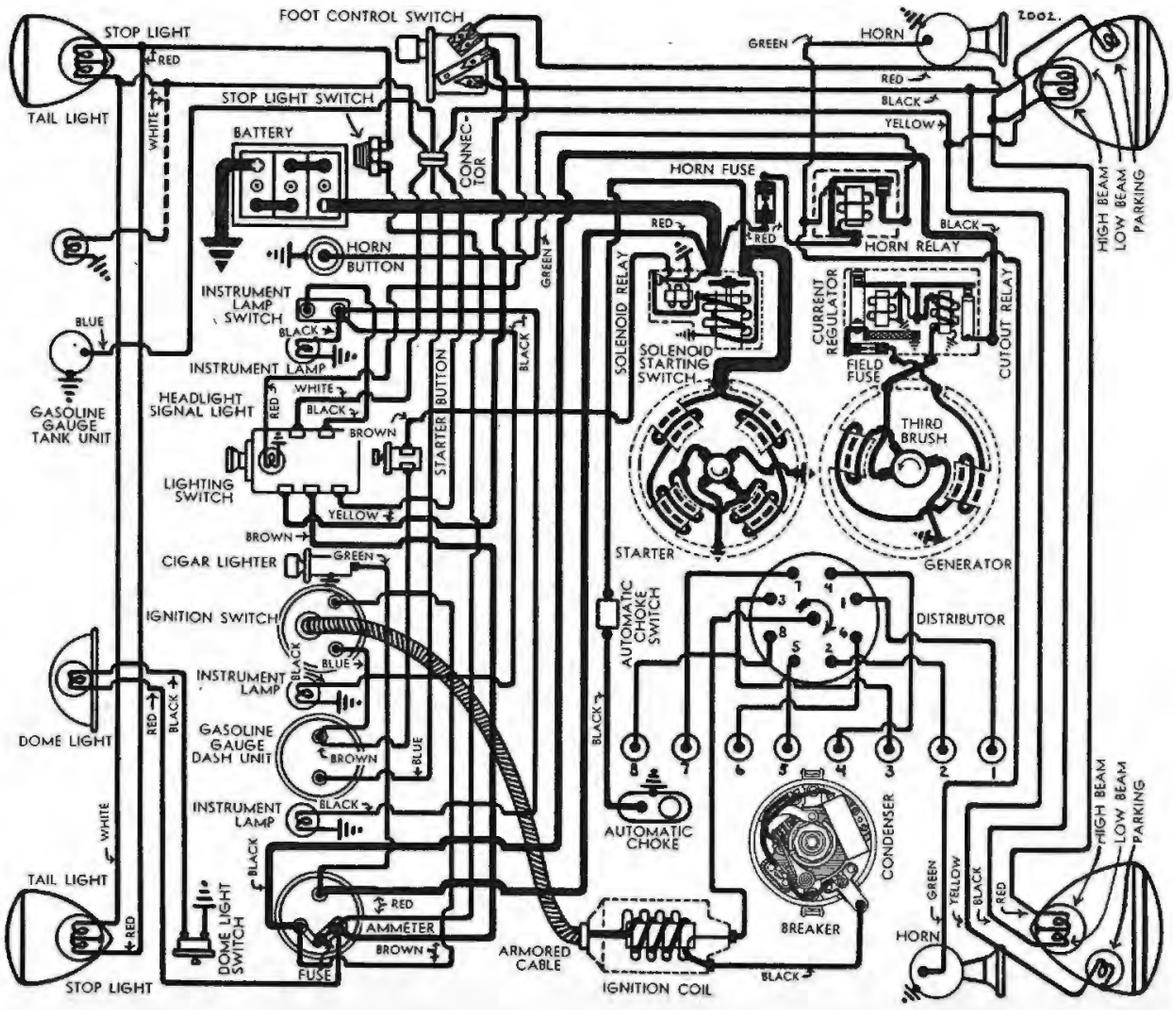
CARBURETION:—Carburetor—Stromberg Mod. EXV-3, 1½" downdraft type. See Carburetion Section for adjustment, overhaul and Jet Specifications.

NOTE—Do not adjust carburetor until engine is warmed up so that engine will idle at hot or slow idling speed with choke valve wide open.

Idle Adjustment—With engine hot, set throttle stop screw to idle engine at 7-8 M.P.H. Turn idle adjusting screw in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed if necessary.

Accelerating Pump Setting—Pump lever has three holes for pump link engagement. Set as follows:
Inner Hole (Min. stroke)—Summer temperatures.
Center Hole (Med. stroke)—Standard setting.
Outer Hole (Max. stroke)—Winter temperatures.

Fast Idle:—No adjustment required Throttle stopscrew should rest on high point of cam with choke valve closed.



Automatic Choke:—Sisson Type AC-751. See article in Carburetion Section for data and linkage adjustmt.

Air Cleaner:—AC. #1526374 oil-wetted type standard. #1526837 heavy duty oil bath type optional.

Fuel Pump:—AC. Type D #1521803 diaphragm type. Type I #1523023 combination fuel & vacuum pump (cars with overdrive). See separate articles in Carburetion Section for each type.

Gasoline Gauge:—Motometer Electric. Dash unit No. NG-7790-D. Tank unit No. NG-7687-T. See article in Carburetion Section.

VALVE TIMING:—To Check Timing—With engine cold set tappet clearance on #8 intake valve at .011". This valve should open with piston 2° or .0015" before top dead center when 2° BTDC line on impulse neutralizer at front of engine lines up with pointer on chain case cover.

Motor Gauge—Weidenhoff Adapter #103, Rod #12.

Tappet Clearance:—.006" Int., .008" Exh. with engine hot. .010" Exh. recommended for sustained high speed.

Valve Spring Pressure:—104-110 lbs. at 1 11/16" (valve closed). 46-50 lbs. at 2 1/32" (valve open).

LUBRICATION:—Crankcase Capacity—6 qts. refill.

Normal Oil Pressure—30-45 lbs. at 30 M.P.H.

BATTERY:—Willard, Type WH-2-15, RH-2-15 (Export). 6 volt, 15 plate, 119 ampere hour capacity (20 hour rate).

Starting Capacity—140 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.3 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under drivers seat.

STARTER:—Model MAX-4020. Armature MAW-2030.

Drive—Magnetic shift outboard pinion.

Cranking Engine—Approx. 200 amperes 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.	5300	5.5	65
.65 "	3300	5.5	100
2.75 "	1630	5.0	200
5.5 "	970	4.5	300
8.7 "	600	4.0	400
12.0 "	300	3.5	500
16.5 "	Lock	3.0	640
25.0 "	Lock	4.0	880

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

Starting Switch:—Solenoid Switch Type SS-4106. Controlled through relay by pushbutton on dash. Operative with ignition turned 'on'.

Solenoid Switch

Closes against 105 lb. pull with 3/8" air gap drawing 65 amperes. Holds switch closed with draw of 15 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—3.5-4.5 volts. **Open**—1.5-2.5 volts.

Contact Gap—.025-.030". **Air Gap**—.005-.007" (closed)

GENERATOR:—Model GAR-4608A-5. Armature GAR-2116F. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Use test meters. Connect jumper between fuse cup on regulator and ground. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate until output is 21 amperes at 8.6 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.

Commutator Bar Method—Shift third brush until exactly 4 commutator bars are exposed between brush and nearest main brush.

Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold Regulator Contacts Closed			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	800	0	6.4	825
4	6.8	950	4	6.8	1000
8	7.25	1100	8	7.25	1200
12	7.7	1275	12	7.7	1440
16	8.1	1525	16	8.1	1825
21	8.6	2400	18.5	8.35	2500

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24 ozs. min. (old brushes), 36 ozs. max. (new brushes).

Field Current—3.89-3.51 amperes at 6.0 volts.

Motoring Current—5.03-5.57 amperes at 6.0 volts.

Field Fuse—5 ampere in plug on regulator case.

Removal:—Pivot mounted at left front of engine. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Swing generator away from engine until 45-50 lb. reading indicated on scale attached to generator frame.

RELAY-REGULATOR:—Model TC-4301A. Mounted on generator. Consists of Cutout Relay and Current Regulator (two-rate charging control). See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.5-7.25 volts.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.015-.045".

Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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 beam, with lenses in place). Lower beam deflected slightly to right. Upper and lower beams controlled by foot selector switch.

Headlamp Beam Indicator—In light switch knob. Lighted when headlamp upper beams in use.

Switches

Lighting—Chrysler Part No. 655559. Douglas Switch which is available only through Chrysler Parts Dept.

Foot Selector—Clum Model 9657.

Stop Light—R.M.B. No. 910. Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Instrmt., Ign. Sw.	1½	55
Stop and Tail	21-3	1158
Dome	15	87

FUSES:—Lighting—20 amperes on back of ammeter.

Generator Field—5 ampere in plug on regulator.

Twin Horns—30 ampere in connector near starter.

HORNS:—Std. Motometer. Optl. Klaxon Model K-33-C Type 2151 (low note), 2152 (high note). Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
2151	11-13	.042-.046"
2152	10-12	.032-.036"

Horn Relay:—Model 266-TK. Requires .25 amperes at 2 volts min. to close contacts. Current draw .8 amps.

Contact Gap—.015-.025".

Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—On right front door hinge pillar post. First number each model as follows:

	Detroit	Canada
Model C-9	6,606,201	9,821,216
Model C-10	7,014,901	9,850,436
Model C-11	7,803,851	none

COMPRESSION:—Ratio—6.2-1 Cast-iron hd. (Std. C9), 6.5-1 Aluminum head (Optl. C9, Std. C10, 11), 7.45-1 Aluminum head (Optl. C10, 11).
Pressure—6.2-1 Cast-iron head 120-130 lbs. at 1000 R.P.M. or approx. 106 lbs. at cranking speed. **6.5-1 Al. head** 145-155 lbs. at 1000 R.P.M. or approx. 117 lbs. at cranking speed. **7.45-1 Al. head** 160-170 lbs. at 1000 R.P.M. or approx. 124 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 16-18" with engine idling at 7-8 M.P.H.

IGNITION:—Coil Model CE-4618. Service Winding (coil less switch and cable) CE-3224S. Mounted on hood ledge.
Ignition Current—2.5 amperes idling, 5.5 stopped.
Ignition Swith:—Mitchellock Model 24-B, Type 6744. Connected to coil by armored cable.
Ignition Lock—Yale & Towne Mod. DP-108 Mitchell No. 6286.
Distributor Model IGT-4001C-1, IGT-4001E-1. Single breaker, 8 lobe cam, full automatic advance type with auxiliary vacuum spark control.
Breaker Gap—Set at .017".
Cam Angle or Dwell—27° closed, 18° open (distrib.).
Breaker Arm Spring Tension—9-13 ounces.
Condenser—Part No. IG-2671G. Capacity .20-.25 mfd.

Automatic Advance—IGT-4001C-1

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	350	0	700
3	400	6	800
6	850	12	1700
9	1300	18	2600
11	1600	22	3200

Automatic Advance—IGT-4001E-1

Start	350	0	700
3	400	6	800
6	950	12	1900
9	1500	18	3000
11	1850	22	3700

Vacuum Spark Control—Provides additional advance for intermediate speed range above idling except when engine is accelerated or operated with wide open throttle.

Vacuum Spark Advance—IGT-4001C-1

Engine Degrees	Vacuum
1	6" of HG
10	14" of HG

Vacuum Spark Advance—IGT-4001E-1

1.4	6" of HG
12	12" of HG

Distributor Removal:—Mounted on left side of crankcase. To remove, take out hold-down screw in advance arm, lift out. Distributor accessible by taking off cover plate under left front fender.

IGNITION TIMING:—Settings for all engines as follows

	Flywheel Degs. Piston Position
6.2-1 Std C9 hd.	At TDC. 0000" TDC.
6.5-1 Optl. C9 hd. std. fuel	5° ATDC. 0118" ATDC.
6.5-1 Optl. C9 hd. Ethyl	" 2° BTDC. 0019" BTDC.
6.5-1 Std. C10, 11 hd.	5° ATDC. 0118" ATDC.
7.45-1 Optl.	" Ethyl fuel 9° ATDC. 0381" ATDC.

NOTE—Impulse neutralizer at front of engine marked with 15 one degree graduations before and after 'O' mark at top dead center.

Timing (Using Timing Light)—Connect timing light between distributor terminal and batery terminal on generator control unit. With #1 piston on compression, turn engine over until piston reaches firing position (see table above), stop when correct mark on impulse neutralizer at front of engine is directly in line with pointer on chain case cover. Loosen advance arm hold-down screw, center pointer on scale (opposite 'O' mark), tighten hold-down screw, loosen advance arm clamp bolt, rotate distributor until test lamp goes out indicating that contacts are just opening, tighten clamp bolt, check spark plug conections.

Timing (Using Synchroscope)—Clip lead to #1 spark plug, direct light on impulse neutralizer, fill in correct mark with chalk or white paint. See Equipment Section.

Timing (Motor Gauge)—Weidenhoff Adapter #103, Rod #12. Timing hole located over #1 piston.

Firing Order:—1-6-2-5-8-3-7-4. See diagram.

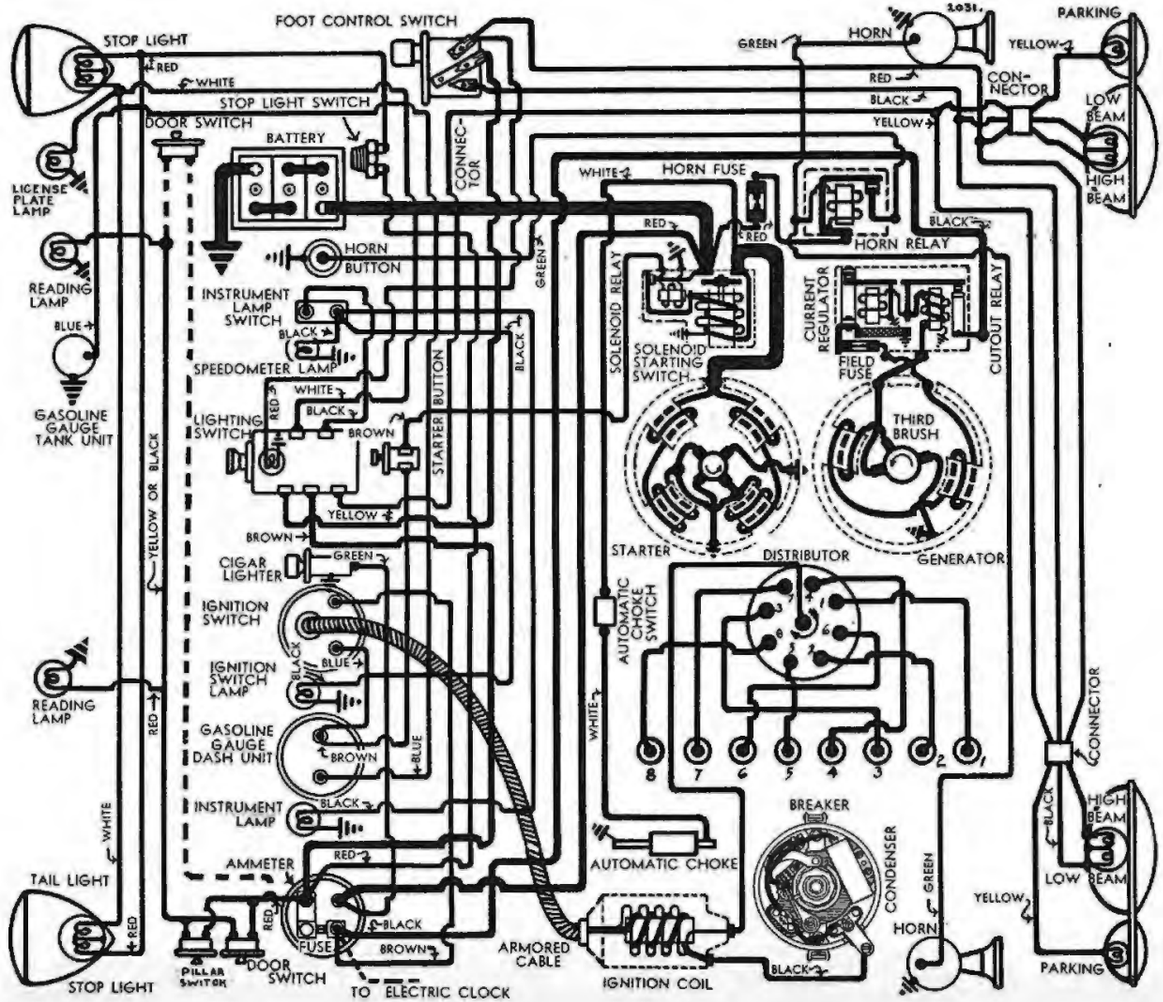
Spark Plugs:—Champion Type J-8 supersedes AC. Type K-9 (for C9 Std. 6.2-1 cast-iron head only). Champion Type H-10 (for all aluminum heads) supercedes AC. Type S-9. Plugs are 14MM. Metric type.

NOTE—On C9 only—do not interchange spark plugs as those used in aluminum heads have longer threads.

Spark Plug Gap—.025".

CARBURETION:—Carburetor—C9—Stromberg Model EXV-3, 1½" downdraft type. **C10, 11**—Stromberg Model EE-22, 1¼" dual downdraft type. See Carburetion Section for adjustment, overhaul and Jet Specifications.

NOTE—Do not adjust carburetor until engine is warmed up so that engine will idle at hot or slow idling speed with choke valve wide open.



Idle Adjustment—One idle adjusting screw on C9 carburetor, two on C10, 11 carburetor. Adjust C10, 11 screws simultaneously. With engine hot set throttle stopscrew to idle engine at 7-8 M.P.H. Turn one (C9) or both (C10, 11) idle adjusting screws in until engine begins to lag or miss, then turn screws out until engine begins to roll, finally turn screws in slowly until engine fires smoothly. Readjust throttle stopscrew for corect idling speed if necessary.

Accelerating Pump Setting—Pump lever has three (C9), two (C10, 11) holes for pump link engagement. Set as follows:
Inner Hole (Min. stroke)—Summer temperatures.
Center Hole (C9 only)—Standard setting.
Outer Hole (Max. stroke)—Winter temperatures.

Fast Idle:—No adjustment required. Throttle stopscrew should rest on high point of cam with choke valve closed.

Automatic Choke:—Sisson Type AC-751 (C9), AC-600 (C10, 11). See article in Carburetion Section for data and linkage adjustment.

Air Cleaner:—AC. #1525933 (C9), #1526747 (C10, 11) oil-wetted type standard, #1526588 (C9), #1526589 oil-bath heavy duty type optional.

Fuel Pump:—AC. Type D #1521790 diaphragm type (C9 only). Type I #1523023 (C9 with overdrive), #1521549 (C10,11 std) combination fuel and vacuum pump. See separate articles in Carburetion Section on each type.

Gasoline Gauge:—Motometer Electric. Dash unit—NG-7808-D, Tank unit—NG-6876-T.

VALVE TIMING:—To Check Timing—With engine cold set tappet clearance on #1 intake valve at .011". This valve should open with piston 2° (.0019") before top dead center when 2° BTDC line on impulse neutralizer at front of engine lines up with pointer on chain case cover.
Motor Gauge—Weidenhoff Adapter #103, Rod #12. Gauge hole over #1 piston.

Tappet Clearance:—.006" Int., .008" Exh. with engine hot. .010" Exh., recommended for sustained high speed.

Valve Spring Pressure:—104-110 lbs. at 1 11/16" (valve closed), 46-50 lbs. at 2 1/32" (valve open).
NOTE—Right front wheel and cover plate under fender should be removed for work on valves.

LUBRICATION:—Crankcase Capacity—6 qts. refill.
Normal Oil Pressure—30-45 lbs. at 30 M.P.H.

BATTERY:—Willard, Type WH-4-17, RH-4-17 (Export). 6 volt, 17 plate, 136 ampere hour capacity (20 hour rate).
Starting Capacity—160 amperes for 20 minutes.
Zero Capacity—300 amperes for 5.4 minutes.
Grounded Terminal—Positive (+) terminal.
Location—Under left hand front seat.

STARTER:—Model MAX-4003. Armature MAW-2030.
Drive—Magnetic shift outboard pinion.
Cranking Engine—Approx. 200 amperes at 5.0 volts.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—31-42 ozs. (new brushes).

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5300	5.5	65
2.75 "	1630	5.0	200
5.5 "	970	4.5	300
8.7 "	600	4.0	400
12.0 "	300	3.5	500
16.5 "	Lock	3.0	640
25.0 "	Lock	4.0	880

Removal:—Flange mounted on left front face on flywheel housing. Accessible by removing left front wheel and housing cover under fender. To remove, take out two flange mounting screws.

Starting Switch:—Solenoid Switch Type SS-4101. Controlled through relay by pushbutton on dash. Operative with ignition turned 'on'.

Solenoid Switch

Closes against 105 lb. pull with 3/8" air gap drawing 65 amperes. Holds switch closed with draw of 15 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—3.5-4.5 volts. **Open**—1.5-2.5 volts.
Contact Gap—.025-.030" **Air Gap**—.005-.007" (closed)

GENERATOR:—Model GAR-4608B-5. Armature GAR-2116-F. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.
Charging Rate Adjustment—Use test meters. Connect jumper between fuse cup on regulator and ground. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate until output is 21 amperes at 8.6 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.

Commutator Bar Method—Shift third brush until exactly 4 commutator bars are exposed between brush and nearest main brush.
Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold Regulator Contacts Closed			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	800	0	6.4	825
4	6.8	950	4	6.8	1000
8	7.25	1100	8	7.25	1200
12	7.7	1275	12	7.7	1440
16	8.1	1525	16	8.1	1825
21	8.6	2400	18.5	8.35	2500

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24 ozs. min. (old brushes), 36 ozs. max. (new brushes).
Field Current—3.51-3.89 amperes at 6.0 volts.
Motoring Current—5.03-5.57 amperes at 6.0 volts.
Field Fuse—5 amperes in plug on regulator case.

Removal:—Pivot mounted at front of engine. Accessible by removing left front wheel and housing cover under fender. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Loosen mounting bolts, pull generator out or away from engine until tension as measured on spring scale is 45-50 lbs.

RELAY-REGULATOR:—Model TC-4301A. Mounted on generator. Consists of Cutout Relay and Current Regulator (two rate chaging control). See article in Equipment Section.

Cutout Relay

Cuts In—6.5-7.25 volts.
Cuts Out—.5-2.5 amperes discharge current.
Contact Gap—.015-.045".
Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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 beam, with lenses in place). Lower beam deflected slightly to right. Upper and lower beams controlled by foot selector switch.
Headlamp Beam Indicator—In light switch knob. Lighted when headlamp upper beams in use.

Switches

Lighting—Chrysler Part No. 655559. Douglas Switch which is available only through Chrysler Parts Dept.
Foot Selector—Clum Model 9661.
Stop Light—R.B.M. No. 910. Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Ign.Sw.	1½	55
Stop and Tail	21-3	1158
Instrument	3	63
Reading	15	87

FUSES:—Lighting—20 ampere on back of ammeter.
Generator Field—5 ampere in plug on regulator.
Twin Horns—30 ampere in connector near starter.

HORNS:—Klaxon Model K-33-D Type 1955 (low note), 1956 (high note). Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
1955 (low note)	12-14	.045-.050"
1956 (high note)	11-13	.036-.040"

Horn Relay:—Model 266-TK. Requires .25 amperes at 2 volts min. to close contacts. Current draw .8 amps.
Contact Gap—.015-.025".
Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—First number—1101. Stamped on Service Motor plate on right side of cowl under hood.

COMPRESSION:—**Ratio**—6.5-1 Std. aluminum head.
Pressure—Approximately 110 lbs. at cranking speed of 130 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" with engine idling at 6 M.P.H.

IGNITION:—**Coil Model CE-4620.** Service Winding (coil less switch and cable) CE-3224S.
Ignition Current—3 amperes idling, 4½-5½ amperes at 6.0 volts stopped.

Ignition Switch:—Mitchellock Model 16-S, Type 6679. Connected to coil by armored cable. Switch has two 'on' positions—right hand (Startix operative, regular running position), left hand (Startix not operative, ignition on).
Ignition Lock—Yale & Towne Model 9366. Mitchell No. 6622.

Distributor Model IGP-4006. Single breaker, 8 lobe cam, full automatic advance type. No sychronization required.
Breaker Gap—Set at .017".
Cam Angle or Dwell—27.5° closed, 17.5° open.
Breaker Arm Spring Tension—18-20 ozs.
Condenser—Part No. IG-2671. Capacity .20-.25 mfd.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
2.5	600	5	1200
5	900	10	1800
7.5	1200	15	1500
10	1500	20	3000

Removal:—Distributor mounted between cylinder banks at forward end of engine. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:— **Flywheel Deg.** **Piston Position**
All engines .....5° BTDC.....0089" BTDC
NOTE—Use left hand 'on' position of switch if ignition turned on to check timing to avoid automatic cranking.
To Set Timing—Crank engine by engaging transmission and rolling car on floor or by jacking up one rear wheel and turning wheel by hand. With #4L piston (rear piston left bank) on compression, turn engine over until piston reaches firing position, stop when point of flywheel exactly 2 teeth before top dead center mark '4L' lines up with pointer in inspection hole in right side of flywheel housing. Loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt.

Firing Order:—4L-2L-2R-1R-3R-4R-1L-3L with cylinder banks right (R) and left (L) viewed from driver's seat and #1 cylinder nearest radiator. See diagram.

Spark Plugs:—Champion Type J9B. 14 MM. Metric.
Spark Plug Gaps—.025".

CARBURETION:—**Carburetor**—Stromberg Model EE-15, 1" dual, downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.
NOTE—Do not make carburetor adjustments until engine is warmed up and idling at hot or slow idling speed with choke valve wide open.
Idle Adjustment—Set throttle stopscrew so that idling speed is 6 M.P.H. Turn each idling adjusting screw, in succession, in until engine begins to miss, then out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.
Accelerating Pump—Not adjustable.

Fast Idle:—Integral with carburetor. See article in Carburetion Section on Fast Idle and Automatic Choke as used with EE-15 carburetors. Not adjustable.

Automatic Choke:—Integral with carburetor. See article in Carburetion Section (same as Fast Idle above).

Air Cleaner:—AC. #1525598 oil-wetted type std.

Fuel Pump:—AC. Special. Diaphragm type. See article in Carburetion Section.

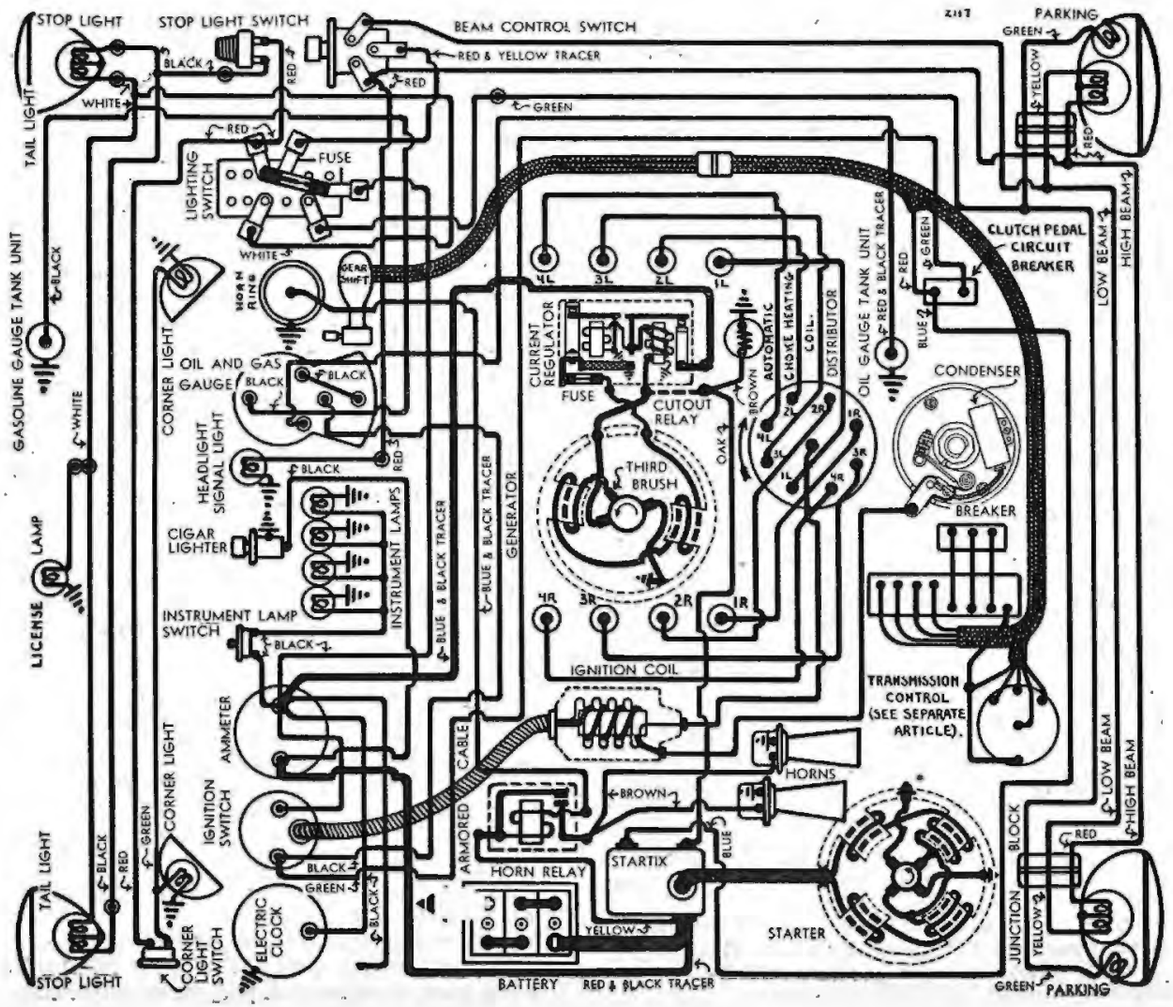
Gasoline Gauge:—Stewart-Warner. Combination electric gasoline and oil gauge.

VALVE TIMING:—**To Check Timing**—Set tappet clearance #4L (rear cylinder—left bank) intake valve at .016". This valve should be about to open (with clearance not taken up) with piston 7½° or .0200" before top dead center when point on flywheel approximately 3 teeth before dead center mark '4L' lines up with pointer in inspection hole in right hand side of clutch housing. Reset tappet clearance at .008".

Tappet Clearance:—.008" all valves—engine cold.

Valve Spring Pressure:—42-47 lbs. (valve closed), 88-94 lbs. (valve open).

LUBRICATION:—**Crankcase Capacity**—8 qts.
Normal Oil Pressure—30-40 lbs. (warm oil).



TRANSMISSION REMOTE CONTROL GEAR SHIFT:—Bendix electro-pneumatic type gear shift standard. See article in Equipment Section for complete description, wiring diagram and trouble shooting on this unit.

BATTERY:—U.S.L. Type FN-19F. 6 volt, 19 plate, 108 ampere hour capacity (20 hour rate).

Starting Capacity—135 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.9 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under driver's seat.

STARTER:—Model MAX-4021. Armature No. MAW-2006.

Drive—Bendix Barrel Type No. A-1729.

Cranking Engine—130 R.P.M., 180 amperes at 5.1 v.

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.	5300 Min.	5.5	65 Max.
.65 "	3300	5.5	100
2.75 "	1630	5.0	200
5.5 "	970	4.5	300
8.7 "	600	4.0	400
12.0 "	300	3.5	500
16.5 "	Lock	3.0	640
25.0 "	Lock	4.0	880

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

Starting Switch:—Startix Type D. Automatic starting controlled by ignition switch and operative only with clutch disengaged (lead taken through Electric Hand clutch pedal circuit breaker or 'master shift switch'). See article in Equipment Section.

GENERATOR:—Model GAR-4630-5, or GBR-4603-4. Armature No. GAR-2077. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley. NOTE—Model GBR-4603-4 fitted with resistance-jumper control switch on side of regulator case which should be opened (regulator operative) for summer driving and closed (regulator resistance short-circuited) for winter driving.

Charging Rate Adjustment—Use test meters to check output. Short out regulator by closing control switch (above) or by connecting jumper between fuse cup on regulator case and ground. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate. Brush held in position by friction. Remove jumper wire.

Maximum Charging Rate—22 amperes. (GAR-4630-5) 26 amperes (GBR-4603-4) cold, reached at 2400 R.P.M., 1500 engine R.P.M. (tachometer).

Performance Data—GAR-4630-5

Cold — Regulator Contacts Closed			— Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	720	0	6.4	760
4	6.8	860	4	6.8	925
8	7.25	1000	8	7.25	1125
12	7.7	1160	12	7.7	1350
16	8.1	1360	16	8.1	1680
20	8.5	1660	19.2	8.4	2600
22.4	8.8	2400			

Performance Data—GBR-4603-4

0	6.4	720	0	6.4	780
4	6.65	820	4	6.7	900
8	6.9	920	8	6.95	1060
12	7.1	1050	12	7.2	1250
16	7.4	1200	16	7.5	1440
20	7.6	1400	20	7.8	1840
26	8.0	2400	23	8.0	2800

Rotation—Counter-clockwise at commutator end.

Bush Spring Tension—24 ozs. min., 36 ozs. max.

Field Current—3.51-3.89 (GAR-4630-5), 4.18-4.62 (GBR-4603-4) amperes at 6.0 volts.

Field Fuse—5 ampere in cup on regulator.

Motoring Current—5.03-5.67 (GAR-4630-5), 5.60-6.20 (GBR-4603-4) amperes at 6.0 volts. Allow ½ ampere additional if relay and regulator in circuit.

Removal:—Generator pivot mounted between cylinder banks at rear of engine with fan belt drive. To remove, take out two pivot bolts, one clamp bolt.

Belt Adjustment:—Adjusted in usual manner by loosening pivot bolts and clamp bolt and swinging generator up until belt is tight.

RELAY-REGULATOR:—Model TC-4302-A (GAR-4630-5), TC-4306-A (GBR-4603-4). Consists of Cutout Relay and Current Regulator (two-rate charging control) in case on generator frame. See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.75-7.5 volts.
Cuts Out—.5-2.5 ampere discharge at 6.3 volts.
Contact Gap—.015-.045".
Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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—Corcoran-Brown, Prefocused type. Upper and lower beams controlled by foot selector switch on toeboard. Headlamps fold into fenders and are elevated for use by turning cranks at each end of instrument panel (independent control for each headlamp).

Switches

Lighting—Soreng-Manegold Model A5640A.
Foot Selector—Delco-Remy.
Stop Light—Motometer Model 50812 hydraulic type.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking	1½	55
Instrument, License	3	63
Stop and Tail	21-2	1158
Corner	6	81

FUSES:—Lighting—20 ampere on lighting switch.
Generator Field—5 ampere in cup on regulator.

HORNS:—Swarze Vibrator type twin horns operated by horn relay. Horn current approximately 6 amperes each.

SERIAL NUMBER:—On right front door hinge pillar post. First number for each model as follows:

Model	Detroit	Canada
Custom S1	6,043,001	9,664,641
Deluxe S1	5,500,001	9,664,641
S2	5,089,001	9,603,551

COMPRESSION:—Ratio—6.0-1 Std. cast-iron head (S1), 6.5-1 Aluminum head (Optl. S1, Std. S2), 7.0-1 Alum. head (Optl. S2).

Pressure—(S1 Std. 6.0-1 head) 120-130 lbs. at 1000 R.P.M. or approx. 103 lbs. at cranking speed. (Optl. S1, Std. S2 6.5-1 Al. head) 125-135 lbs. at 1000 R.P.M. or approx. 110 lbs. at cranking speed. (S2—Optl. 7.0-1 Al. head) 130-140 lbs. at 1000 R.P.M. or approx. 117 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 16-18″ with engine idling at 6 M.P.H.

IGNITION:—Coil Model IG-4630, (S1), IG-4637 (S1-Conv. sedan and coupe) IG-4636 (S2), IG-4639 (S2-RHD). Service Winding (coil less switch and cable IG-3224S.

Ignition Current—2.5 amperes idling, 5.5 stopped.

Ignition Switch:—Mitchellock Model 24-B. Type 6518 (S1), 6746 (S1-Conv. sedan and coupe), 6688 (S2). Connected to coil by armored cable.

Ignition Lock—Yale & Towne Mod. DP-108, Mitchell No. 6286.

Distributor Model IGS-4006-1, IGS-4006A-1. Single breaker, 6 lobe cam, full automatic advance type with auxiliary vacuum spark control.

Breaker Gap—Set at .020″. Limits .018-.020″.

Cam Angle or Dwell—38° closed, 22° open.

Breaker Arm Spring Tension—9-13 ounces.

Condenser—Part No. IG-2671F. Capacity .20-.25 mfd

Automatic Advance—IGS-4006-1

Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine R.P.M.
Start	300	0	600
3	400	6	800
6	775	12	1550
9	1150	18	2300
12	1530	24	3060

Automatic Advance—IGS-4006A-1

Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine R.P.M.
Start	300	0	600
3	400	6	800
6	850	12	1700
9	1300	18	2600
12	1750	24	3500

Vacuum Spark Control—Integral with distributor. Mounted on distributor housing and linked directly to breaker plate. Provides additional advance for all speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (″ of HG.)
Start	5.1″
1.4	6″
8	10-11″
16	15″

Distributor Removal:—Mounted on left side of crankcase. To remove, take out hold-down screw in advance arm, disconnect vacuum line. On S2 distributor accessible by removing left front wheel and cover plate under fender.

IGNITION TIMING:—Settings for all engines as follows

	Flywheel Degrees	Piston Pos.
6.0-1 Std. hd. (S1)	At TDC.	.0000″ TDC.
6.5-1 Optl. hd. (S1)	5° ATDC.	.0108″ ATDC.
6.5-1 Std. hd. (S2)	5° ATDC.	.0108″ ATDC.
7.0-1 Optl. hd. Ethyl fuel	7° ATDC.	.0211″ ATDC.

NOTE—Impulse neutralizer at front of engine marked 'O' at top dead center with 15 one degree graduations before and after this point.

Timing (Using Timing Light)—Connect timing light between distributor terminal and battery terminal on generator control unit. With #1 piston on compression, turn engine over until piston reaches firing position (see table), stop when correct line on impulse neutralizer lines up with pointer on chain case cover. Loosen distributor hold-down screw, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until timing light just goes out, tighten clamp bolt.

Timing (Using Synchroscope)—Clip lead to #1 spark plug, direct light on impulse neutralizer, fill in correct mark with chalk or white paint. See Equipment Section.

Timing (Motor Gauge)—Weidenhoff Adapter #103, Rod #12. Timing hole located over #1 piston (S1), #6 piston (S2).

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

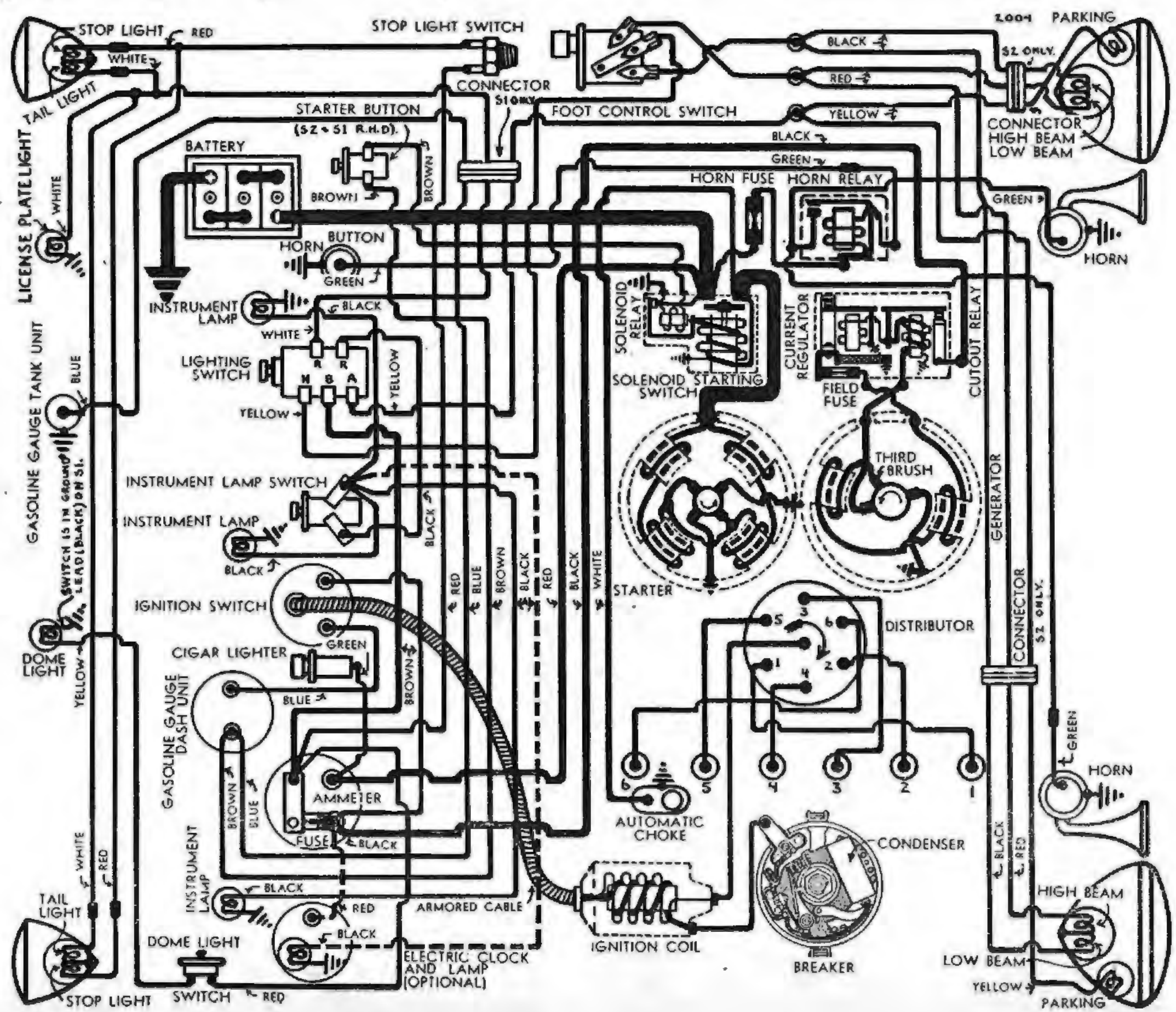
Spark Plugs:—(6.0-1 Cast-iron head S1) AC. Type K-9 superseded by Champion Type J-8. (All aluminum heads) AC. Type S-9 superseded by Champion Type H-10. 14MM. Metric.

NOTE—S1 only—spark plugs used in aluminum heads have longer thread. Not interchangeable with standard plugs.

Spark Plug Gap—.025″.

CARBURETION:—Carburetor—Carter (B & B) Model E6G1, 1½″ downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.

NOTE—Do not make carburetor adjustments until



engine is well warmed up so that choke valve is wide open and fast idle inoperative.

Idle Adjustment—Adjust throttle stopscrew so that engine speed is 300 R.P.M. or 6 M.P.H. Turn idle adjusting screw in until engine begins to miss, then out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Setting should be ¼-1 turn of the screw from closed or seated position. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Engage pump link in proper hole in throttle lever for seasonal requirements as follows:

Inner Hole (Min. stroke)—Extremely warm weather
Center Hole—Normal summer temperatures.
Outer Hole (Max. stroke)—Winter temperatures.

NOTE—5% and 10% lean main metering screws (high altitude calibration) may be used in lower altitudes for maximum fuel economy although with considerably reduced speed and power. See Carter (B & B) Jet Specifications in Carburetion Section.

Fast Idle:—Integral with carburetor. No adjustment.

Automatic Choke:—Sisson Type AC-751. See article in Carburetion Section for data and linkage adjustment.

Air Cleaner:—Burgess oil-wetted type standard, AC. #1526712 oil-bath type optional.

Fuel Pump:—AC. Type B, #1522237 (first cars), #1522995 (later cars). Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Motometer Electric. No. NG-7796-D (dash unit), No. NG-7687-T (tank unit). See article in Carburetion Section.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .010". This valve should open with piston on top dead center when 'O' mark on impulse neutralizer lines up with pointer on chain case cover. Reset tappet clearance at .006" hot.
Motor Gauge—Weidenhoff Adapter #103, Rod #12.

Tappet Clearance:—.006" Int., .008" Exh., with engine hot. .010" Exh., recommended for sustained high speed.

Valve Spring Pressure:—46-50 lbs. at 2 1/32" (valve closed), 104-110 lbs. at 1 11/16" (valve open).

LUBRICATION:—Crankcase Capacity—6 qts. (refill).
Normal Oil Pressure—30-40 lbs. at 30 M.P.H.

BATTERY:—Willard Type WH-2-15, RH-2-15 (Export). 6 volt, 15 plate, 119 ampere hour capacity (20 hour rate).

Starting Capacity—140 amperes for 20 minutes.
Zero Capacity—300 amperes for 4.3 minutes.
Grounded Terminal—Positive (+) terminal.
Location—On left side under driver's seat.

STARTER:—MAX-4015 (S1), MAX-4016 (S1 Export, S2 Std.) Armature MAW-2030.

Drive—Manual shift (S1), magnetic shift S1 Exp, S2), with outboard pinion.
Cranking Engine—Approx. 200 amperes at 5.0 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.	5300	5.5	65
.65 "	3300	5.5	100
2.75 "	1630	5.0	200
5.5 "	970	4.5	300
8.7 "	600	4.0	400
12.0 "	300	3.5	500
16.5 "	Lock	3.0	640
25.0 "	Lock	4.0	880

Removal:—Flange mounted on left front face of flywheel housing. To remove, take out capscrews. On S2 remove left front wheel and cover plate under fender.

Starting Switch:—S1—Type SW-2813 (MAX-4015). See Equipment Section for pedal adjustment. S-1 (Exp), S2—Solenoid Switch Type SS-4104. Controlled through relay by push-button on dash. Operative with ignition turned 'on.'

Solenoid Switch

Closes against 105 lb pull with ⅜" air gap drawing 65 amperes. Holds switch closed with draw of 15 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—3.5-4.5 volts. **Open**—1.5-2.5 volts. **Contact Gap**—.025-.030". **Air Gap**—.005-.007" (closed).

GENERATOR:—Model GAR-4608A-5. Armature GAR-2116F. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Use test meters. Connect jumper between fuse cup on regulator and ground. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate until output is 21 amperes at 8.6 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.

Commutator Bar Method—Shift third brush until exactly 4 commutator bars are exposed between brush and nearest main brush.
Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold — Regulator Contacts Closed — Hot					
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	800	0	6.4	825
4	6.8	950	4	6.8	1000
8	7.25	1100	8	7.25	1200
12	7.7	1275	12	7.7	1440
16	8.1	1525	16	8.1	1825
21	8.6	2400	18.5	8.35	2500

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24 ozs. min. (old brushes), 36 ozs. max. (new brushes).
Field Current—3.51-3.89 amperes at 6.0 volts.
Motoring Current—5.03-5.57 amperes at 6.0 volts.
Field Fuse—5 ampere in plug on regulator case.

Removal:—Pivot mounted at left front of engine. To remove, take out pivot bolts and clamp bolt. On S2 remove left front wheel and cover plate under fender.

Belt Adjustment:—Swing generator away from engine until 45-50 lb. reading on scale attached to generator frame.

RELAY-REGULATOR:—Model TC-4301A. Mounted on generator. Consists of Cutout Relay and Current Regulator (two-rate charging control). See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.5-7.25 volts.
Cuts Out—.5-2.5 ampere discharge current.
Contact Gap—.015-.045".
Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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—Corcoran Brown, Prefocused type. Headlamps aimed straight ahead (upper beam with lenses in place). Lower beam deflected slightly to right. Upper and lower beams controlled by foot seelctor switch.

Switches

Lighting—DeSoto Part No. 655795. Douglas Switch which is available only through DeSoto Parts Dept.
Foot Selector—Clum Model 9654 (S1), 9661 (S2).
Stop Light—R.B.M. No. 910. Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking	3	63
Stop and Tail	21-3	1158
Instrument, Ign. Sw.	1½	55
Dome	15	87

FUSES:—Lighting—20 ampere on back of ammeter.
Generator Field—5 ampere in plug on regulator.
Twin Horns—30 ampere in connector near starter.

HORNS:—Std. Motometer (S1). Klaxon Model K-33-C Type 2151 (low note), 2152 (high note) (S1 Optl.). Klaxon Model K-33-F Type 2107 (low note), 2108 (high note) (S2 Std.). Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 Volts	Air Gap
2107 (low note)	11-13	.040-.044"
2108 (high note)	9-11	.032-.036"
2151 (low note)	11-13	.042-.046"
2152 (high note)	10-12	.032-.036"

Horn Relay:—Model 266-TK. Requires .25 amperes at 2 volts min. to close contacts. Current draw .8 amp.
Contact Gap—.015-.025".
Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—First number—4,015,051 (Detroit), 9,405,681 (Canada). On right front door hinge pillar post.

COMPRESSION:—Ratio—6.5-1 Std. cast-iron head. No optl. ratios.

Pressure—135-145 lbs. at 1000 R.P.M. or approx. 110 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 16-18" with engine idling at 7-8 M.P.H.

IGNITION:—Coil Model IG-4628. Service Winding (coil less switch and cable) IG-3224S.

Ignition Current—2.5 amperes idling, 5.5 stopped.

Ignition Switch:—Mitchellock Model 24-R, Type 6508. Connected to coil by armored cable.

Ignition Lock—Yale & Towne Mod. DP-108, Mitchell No. 6286.

Distributor Model IGS-4002-1, IGS-4002A-1. Single breaker, 6 lobe cam, full automatic advance type with auxiliary vacuum spark control.

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

Cam Angle or Dwell—38° closed, 22° open.

Breaker Arm Spring Tension—9-13 ounces.

Condenser—Part No. IG-2671F. Capacity .20-.25 mfd.

Automatic Advance—IGS-4002-1

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
3	400	6	800
6	775	12	1550
9	1150	18	2300
12	1530	24	3060

Automatic Advance—IGS-4002A-1

Start	300	0	600
3	400	6	800
6	850	12	1700
9	1300	18	2600
12	1750	24	3500

Vacuum Spark Control—Integral with distributor. Mounted on distributor housing and linked directly to breaker plate. Provides additional advance for all speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	4-9
8	8-9
16	12

Distributor Removal:—Mounted on left side of crankcase. To remove, disconnect vacuum line, take out hold-down screw in advance arm.

IGNITION TIMING:— **Flywheel Degrees** **Piston Pos.**
All engines ..... 4° ATDC ..... .0068" ATDC

Timing (Using Timing Light)—Connect timing light between distributor terminal and battery terminal and battery terminal on generator control unit. With #1 piston on compression, turn engine over until piston is 4° (or .0068") past top dead center, stop when fourth graduation to left of center 'O' mark on fan pulley at front of engine lines up with pointer on chain case cover. Loosen hold-down screw in advance arm, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until lamp goes out, tighten clamp bolt.

Timing (Using Synchroscope)—Clip lead to #1 spark plug, direct light at fan pulley, fill in 4° mark to left of center 'O' mark with chalk or white paint. See Equipment Section.

Timing (Motor Gauge)—Weidenhoff Adapter #103, Rod #12. Timing hole located over #6 piston.

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

Spark Plugs:—AC. Type K-9 superseded by Champion Type J-8. 14 MM. Metric.

Spark Plug Gap—Set at .025".

CARBURETION:—Carburetor—Stromberg Model EXV-2, 1¼" downdraft type. See Carburetion Section for adjustment, overhaul, and Jet Specifications.

NOTE—Do not adjust carburetor until engine is warmed up so that engine will idle at hot or slow idling speed with choke valve wide open.

Idle Adjustment—Adjust throttle stopscrew so that idle speed is 7-8 M.P.H. Turn idle adjusting screw in until engine begins to hesitate or miss, then out until engine begins to roll, finally turn screw in until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Engage pump link in proper hole in throttle lever for seasonal requirements as follows:

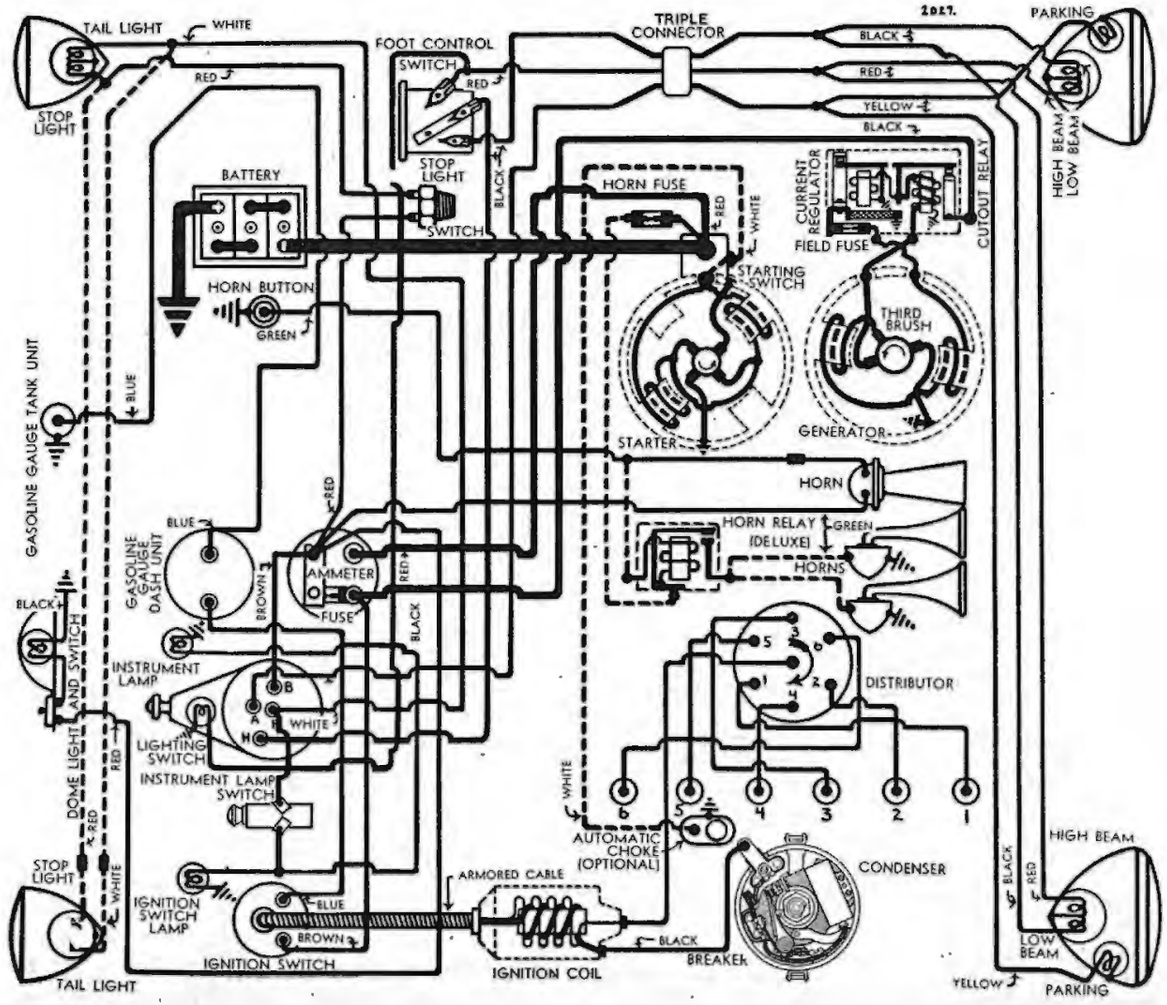
Inner Hole—(Min. stroke)—Extremely warm weather.

Center Hole—Normal summer temperatures.

Outer Hole—(Max. stroke)—Winter temperatures.

NOTE—5% and 10% lean main metering jets (high altitude calibration) may be used at lower altitudes for maximum fuel economy although with considerably reduced speed and power. See Stromberg Jet Specifications in Carburetion Section.

Fast Idle:—No adjustment required. Throttle stopscrew should rest on high point of cam.



Automatic Choke:—Sisson Type AC-751B. See article in Carburetion Section for data and linkage adjustment.

Air Cleaner:—AC. #1525919 oil-wetted type standard, #1526712 heavy duty oil-bath type optional.

Fuel Pump:—AC. Type D #1522237 (early cars), #1522995 (later cars) diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Motometer Electric. No. NG-7687-T (tank unit), NG-7720-D (dash unit). See article in Carburetion Section.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .011". This valve should open with piston 6° (.0153") past top dead center, when sixth graduation to left of center 'O' mark on fan pulley at front of engine lines up with pointer on chain case cover. Reset tappet clearance at .006" hot.

Motor Gauge—Weidenhoff Adapter #103, Rod #12. Timing hole over #6 piston.

Tappet Clearance:—.006" Int., .008" Exh., with engine hot. 010" Exh., recommended for sustained high speed.

Valve Spring Pressure:—34-38 lbs. at 1¾" (valve closed), 77-83 lbs. at 1 7/16" (valve open).

LUBRICATION:—Crankcase Capacity—5 qts. (refill). **Normal Oil Pressure**—30-40 lbs. at 30 M.P.H.

BATTERY:—Willard, Type WT-1-15, WT-1-90 (Export). 6 volt, 15 plate, 90 ampere hour capacity (20 hour rate).

Starting Capacity—117 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.1 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under driver's seat.

R-2-15 (Special Export):—6 volt, 15 plate, 105 ampere hour capacity (20 hour rate).

Starting Capacity—127 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.3 minutes.

STARTER:—MAW-4010, MAW-4011 (RHD). Armature MAW-2030.

Drive—Positive shift outboard pinion.

Cranking Engine—Approx. 175 amperes 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.	4900	5.5	65
.60 "	3300	5.5	100
2.75 "	1480	5.0	200
5.45 "	820	4.5	300
8.50 "	400	4.0	400
11.55 "	110	3.5	500
11.5 "	Lock	3.0	505
18.0 "	Lock	4.0	670

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

Starting Switch (MAW-4010):—SW-2813. Mounted on starter field frame and operated by pinion shaft (starting pedal). See Equipment Section for pedal adjustment.

(MAW-4011)—Solenoid Switch Type SS-4104. Controlled through relay by pushbutton on dash. Operative with ignition turned 'on'.

Solenoid Switch

Closes aaginst 105 lb. pull with ⅜" air gap drawing 65 amprees. Holds switch closed with draw of 15 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—3.5-4.5 volts. **Open**—1.5-2.5 volts. **ContactGap**—.025-.030". **AirGap**—.005-.007" (closed).

GENERATOR:—Model GAR-4608A-5. Armature GAR-2116F. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Use test meters. Connect jumper between fuse cup on regulator and ground. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate until output is 21 amperes at 8.6 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.

Commutator Bar Method—Shift third brush until exactly 4 commutator bars are exposed between brush and nearest main brush.

Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold — Regulator Contacts Closed — Hot

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	800	0	6.4	825
4	6.8	950	4	6.8	1000
8	7.25	1100	8	7.25	1200
12	7.7	1275	12	7.7	1440
16	8.1	1525	16	8.1	1825
21	8.6	2400	18.5	8.35	2500

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24 ozs. min. (old brushes), 36 ozs. max. (new brushes).

Field Current—3.51-3.89 amperes at 6.0 volts.

Motoring Current—5.03-5.57 amperes at 6.0 volts.

Field Fuse—5 ampere in plug on regulator case.

Removal:—Pivot mounted at left front of engine. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Swing generator away from engine until 45-50 lb. reading on scale attached to generator frame.

RELAY-REGULATOR:—Model TC-4301A. Mounted on generator. Consists of Cutout Relay and Current Regulator (two-rate charging control). See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.5-7.25 volts.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.015-.045".

Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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—Corcoran Brown, Pro-focused type. Headlamps aimed straight ahead (upper beam with lenses in place). Lower beam deflected slightly to right. Upper and lower beams controlled by foot selector switch.

Headlamp Beam Indicator—In light switch knob. Lighted when headlamp upper beams in use.

Switches

Lighting—Dodge Part No. 652143. Douglas Switch which is available only through Dodge Parts Dept.

Foot Selector—Clum Model 9654.

Stop Lamp—R.B.M. Model 910. Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Instr., Indicator	1½	55
Stop and Tail	21-3	1158
Dome	15	87

FUSES:—Lighting—20 ampere on back of ammeter.

Generator Field—5 ampere in plug on regulator case.

Twin Horns—30 ampere in connector near starter.

HORNS:—Auto-Lite Model HA-4018 Std. Klaxon Model K-33-C Type 2151 (low note), 2152 (high note) Optl. (with horn relay).

Horn Type	Current at 6 volts	Air Gap
2151 (low note)	11-13	.042-.046"
2152 (high note)	10-12	.032-.036"

Horn Relay:—Model 266-TK. Requires .25 amperes at 2 volts min. to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025".

Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—Same as engine number. Stamped on top of clutch housing and on left frame side member in front of dash bracket. First number 68-2,207,111 (Sept. 4, 1935).

COMPRESSION:—Ratio—6.3-1 Aluminum Head (68, 67), 5.32-1 Cast-iron Head (51 Trucks).

Pressure—105 lbs. (68, 67), 90 lbs. (51) at cranking speed of 100 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" with engine idling at 5-7 M.P.H.

IGNITION:—Complete ignition unit Part No. 48-12127-B or 68-12127 (part production). Mounted on front of gear case. Driven through tongue-and-slot coupling from camshaft.

NOTE—These ignition units interchangeable as a unit although specifications are not identical (see data below). Parts are not interchangeable. May be identifed by round top coil (48-12127-B), flat type coil (68-12127) and by part No. 68-12116 stamped on inner face of terminal plate on 68-12127 units.

Ignition Coil Part No. 18-12024-A3. Mounted on top of ignition unit.

Ignition Current—2.8 amperes idling, 4 stopped.

Ignition Resistance—Part No. 40-12250 mounted on fuse block and connected in coil primary circuit.

Ignition Switch:—Oakes Hershey type co-incidental ignition switch and steering post lock.

Distributor Model 48-12127-B. Double breaker, 8 lobe cam, full automatic advance type with Vacuum Brake Control (see Ignition Setting for adjustment). Same design as used previously on Ford V-8 with one set of contacts used to load coil (this set closes first and opens first) and one set for ignition timing.

Breaker Gap—.012-.014" (both sets). Adjusted by loosening lockscrew on stationary contact bracket and turning contact stud (accessible through hole in housing after removing rubber plug).

NOTE—Use .012-.014" two-step feeler labeled 'Breaker V-8' in BV-45 Ford Feeler Gauge Sets as 'Go' and 'No-go' gauges in setting gap.

Cam Angle or Dwell—34° closed. 11° open for both sets operating together with correct coil-loading lead.

Breaker Arm Spring Tension—22-27 ounces.

Condenser—Part No. 18-12300-B. Capacity .33-.36 mfd.

Automatic Advance
(High Vacuum—Vacuum Brake Inoperative)

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	200	0	400
2	325	4	650
3	425	6	850
5	825	10	1650
8	1475	16	2950

Distributor Model 68-12127. Same design as 48-12127-B except for breaker plate design (new type breaker arm and contact mounting). See diagram.

Breaker Gap—.014-.016" (both sets). Adjust by loosening lockscrew and turning eccentric adjusting screw on stationary contact mounting plate accessible through terminal plate opening after plates removed).

NOTE—New two-step feeler blade marked '.014-.016"' can be added to BV-45 feeler gauge set for use in setting these contact gaps.

Cam Angle or Dwell—34° closed. 11° open. Same as previous type distributor due to new breaker arm design.

Breaker Arm Spring Tension—20-24 ounces.

Condenser—Part No. 18-12300-B. Capacity .30-.36 mfd.

Automatic Advance
(High Vacuum—Vacuum Brake Inoperative)

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	200	0	400
2	300	4	600
3	375	6	750
5	600	10	1200
8	950	16	1900

Distributor Removal:—At front of engine. To remove, disconnect vacuum line and take out 3 capscrews in mounting flange.

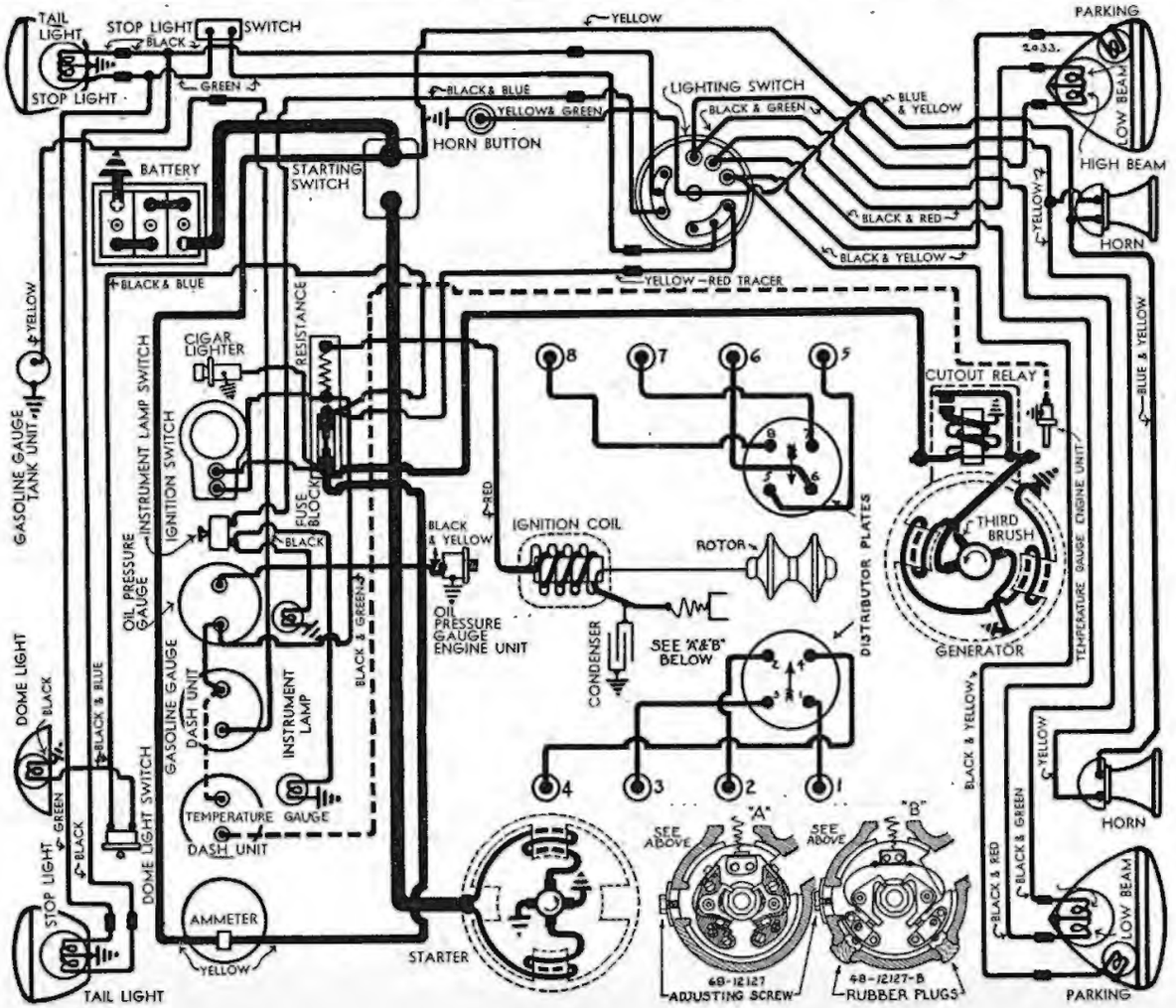
IGNITION TIMING:—

	Flywheel Degrees	Piston Pos'n
All Engines	4° BTDC	.0058" BTDC

NOTE—See Vacuum Brake Setting section below.

To Set Timing—No flywheel marks provided. Timing designed to be set with piston on top dead center. With #1 piston on top dead center entering power stroke, loosen timing adjusting screw on left side of ignition unit, place screw in retard position at lower end of slot, move screw upward in slot until contacts begin to open. Note graduation of scale on plate under screw head in line with reference mark on housing, move screw up one additional graduation, tighten screw. This will give correct 4° BTDC. setting.

NOTE—Top dead center position of Piston #1 can be determined by inserting gauge rod in cylinder or by measuring distance to tops of pistons #2 and 3 which should be equal.



Motor Gauge—Weidenhoff Adapter #104, Rod #40.

Vacuum Brake Setting:—Vacuum Brake should be adjusted for best performance with particular fuel or operating conditions. To adjust, loosen locknut, back off adjusting screw until engine 'pings' under load, turn up adjusting screw just enough to eliminate ping, tighten locknut.

Firing Order:—1-5-4-8-6-3-7-2 with cylinders numbered as indicated on diagram.

Spark Plugs:—Champion No. 7. 18 MM. Metric.

Spark Plug Gaps:—.025".

CARBURETION:—Carburetor—Stromberg Model EE-1, 1" dual, downdraft type. Various type used as follows:

Ford Part No.	Service
48-9510-D	Std. on Models 68, 67.
67-9510-A	Part production Models 68, 67, 51.
SE-67-9510	Service option on all models.
67-9510-B	Altitudes of 5000-10000 ft.
67-9510-C	Altitudes of 10000-15000 ft.
67-9510-D	Altitudes above 15000 ft.

See Carburetion Section for complete adjustment, overhaul and Jet Specifications. Adjustment on all models is similar.

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

Idle Adjustment—Manufacturer recommends use of vacuum gauge and adjustment of idling screws for highest vacuum reading. If vacuum gauge not used, adjust throttle stopscrew for 5-7 M.P.H. idling speed, turn each idle adjusting screw in until engine begins to miss, out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for idling speed.

NOTE—The 67-9510A carburetor used in part production is equipped with a .97" venturi and slightly smaller main metering jet which gives better fuel economy. This model may be identified by figure '97' cast on body under connector link. Type SE-67-9510 has 13/16" venturi and smaller main metering jet (see Stromberg Jet Specifications in Carburetion Section). Both types have accelerating pump adjustment.

Accelerating Pump Setting (67-9510A, SE-67-9510 only)—Two studs provided on throttle lever for pump link connection and marked as follows:
S—3/16" shorter pump stroke for summer operat'n.
W—Normal stroke for winter or improved performance.

Fast Idle:—Integral with carburetor. Operative with choke valve closed. No adjustment required.

Air Cleaner:—AC. #1525501 oil-wetted type std., Heavy duty oil-bath type optional.

Fuel Pump:—AC. Type R #1521764 Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—King-Seeley Electric. Ford Part No. 68-9280-A (dash unit—68 Std., 67), 68-9280-B (dash unit—68 Deluxe), 68-9275 (tank unit—all).
Model 51—K-S Telegauge hydrostatic type. Ford Part No. 51-9280-B (dash unit), 51-9275 (tank unit). See articles on each type in Carburetion Section.

VALVE TIMING:—To Check Timing—No flywheel marks or other means provided to check timing. If top dead center position for piston #1 established on flywheel, intake opening point for this cylinder will be approximately 2.96 teeth on flywheel before dead center point with piston .0327" before top dead center.

Motor Gauge—Weidenhoff Adapter #104, Rod #40.

Tappet Clearance:—.0125-.0135". No adjustment.

Valve Spring Pressure—32-36 lbs. at 2.13" (valve closed), 62-66 lbs. at 1.84" (valve open).

LUBRICATION:—Crankcase Capacity—5 qts.

Normal Oil Pressure—30 lbs. at 55 M.P.H.

BATTERY:—Ford No. 40-10655-C. 6 volt, 17 plate, 96 ampere hour capacity (20 hour rate).

Starting Capacity—120 amperes for 20 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under front floor.

STARTER:—Ford No. 18-11002. Armature No. 18-11005.

Drive—Inboard Bendix Type L11FX-10.

Cranking Engine—100 R.P.M., 225 amperes at 4.75 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—2 lbs. each.

Performance Data

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

Starting Switch:—Ford No. 48-11450. Operated by pedal on toeboard.

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

GENERATOR:—Model 40-10000-B (68, 67), 67-10000-A1, A2 (67, 51 Std.), 51-10000-A1, A2 (51). Armature No. 40-10005. Air-cooled. Third brush control type.

NOTE—These generators are the same except for pulley diameter and type as follows:

Generator	Pulley Diameter	Pulley Type
40-10000-B	4.30"	Single Sheave
67-10000-A1, A2	5.18"	Single Sheave
51-10000-A1, A2	4.08"	Double Sheave

Charging Rate Adjustment—Take off commutator cover band, shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate. Brush held in position by friction.

Standard Charging Rate Setting—16 amperes (hot), at 1810 R.P.M. or 30 M.P.H. (68 with 4.3" pulley).

Performance Data

Generator Hot

Amperes	Volts	R.P.M.
0	6.2	650
4	6.4	815
8	6.5	1020
12	6.6	1300
16	6.7	1810
18	6.8	3000

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—18-20 ounces.

Field Current—4.6 amperes at 6.1 volts maximum at 850-1200 R.P.M. of generator.

Removal:—Mounted on bracket at front of engine between cylinder banks with fan mounted on forward end. Driven in tandem with two water pumps by Vee belt. To remove, take off nut on bracket mounting stud.

Belt Adjustment:—Loosen nut on bracket flange mounting stud, move generator up until total side-play on belt at point midway between water pump and crankshaft pulleys is ¾-1", tighten nut.

CUTOUT RELAY:—Ford No. B-10505. Mounted on generator. Generator field lead grounded to relay mounting screw.

Cuts In—7 volts, 10 M.P.H.

Cuts Out—3 ampere maximum discharge.

Contact Gap—.015-.020".

Air Gap—.010-.015" with contacts closed.

LIGHTING:—Headlamps—Corcoran-Brown 'Two-Lite,' Pre-fosused type. Headlamps aimed straight ahead. Upper and lower beams controlled by lighting switch handle on steering wheel.

Switches

Lighting—R.B.M. Model B-11654-B. Ford Part No. B-11657 (body and contact assembly), B-11673 (plate), B-11655-B (cover)—not furn'd assembled.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2330-C
Stop and Tail	21-2	1158
All others	3	63

FUSES:—Fuse Block Ford Part No. 40-12250. Ignition resistance unit mounted on fuse block.

Lighting—20 ampere capacity on fuse block.

HORNS:—Sparton. Vibrator type. Current 6-8 amp. ea.

SERIAL NUMBER:—First number—300,001. On plate on floor in body inside right door.

COMPRESSION:—Ratio 6.8-1. Pressure 115 lbs. at 50 R.P.M.

VACUUM READING:—Gauge should show steady reading of 15-17" with engine idling at 5-7 M.P.H.

IGNITION:—Coil Model 536-J. Mounted on dash.

Ignition Current—2 amperes idling, 4 stopped.

Ignition Switch:—Delco-Remy Model 431-U. Switch and cable assembly. Connected to coil by armored cable.

Distributor Model 623-A. Single breaker, 6 lobe cam, full automatic advance type with auxiliary vacuum spark control.

Breaker Gap—Set at .018". Limits .018-.024".

Cam Angle or Dwell—Closed 36°. Open 24° Distributor degrees.

Breaker Arm Spring Tension—17-21 ounces.

Condenser—Part No. 829092. Capacity .20-.25 mfds.

Automatic Advance

Distributor		Engine	
Degrees	R.P.M.	Degrees	R.P.M.
Start	400	2	800
9	1400	18	2800

Vacuum Spark Control Model 680-N, 681-C. Provides additional advance for intermediate speeds above idling except when engine is suddenly accelerated or is operated with wide open throttle when spark will be retarded by return spring in unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	7"
10-12°	9-13"

Distributor Removal:—Mounted on cylinder head. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:— Flywheel Degrees Piston Pos.
All engines ..... 2° BTDC ..... .0016" BTDC

To Set Timing—With #1 piston on compression, turn engine over until piston is 2° or 3/16" before top dead center, stop when flywheel mark '/SA-1' lines up with indicator on housing, loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor is opposite #1 segment in distributor cap.

Timing (Motor Gauge)—Weidenhoff Adapter #114, Rod #2.

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

Spark Plugs:—Champion Type C-7. 18 MM. Metric.

Spark Plug Gap—Set at .025". Limits .023-.027".

CARBURETION:—Carburetor—Marvel B-2-SU-10-1673. 1⅛" downdraft type with manual choke contral. See Carburetion Section for adjustment, overhaul and Jet Specifications.

NOTE—See Carburetion Section for recommended jet changes on carburetors before Carburetor Serial No. 5093894. Do not adjust carburetors until engine is warmed up so that it is idling at hot or slow idling speed

Idle Adjustment—With engine hot, close throttle, see that choke control button on instrument panel is pushed in, set throttle stopscrew so that engine idles at 300 R.P.M. or 5-7 M.P.H., turn idle adjusting screw out until engine begins to roll, then turn screw in until engine begins to miss, finally turn screw out until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Pump lever has four holes for pump link engagement, set for seasonal requirements as follows:
#1—(Min. stroke) High test fuel or hot climate.
#2—Recommended for moderate climate.
#3—Cold climate or low test fuel.
#4—(Max. stroke) Extremely cold weather.

Fast Idle:—Integral with carburetor. No adjustment. See article on this carburetor in Carburetion Sec.

Air Cleaner:—AC. #1525951 oil-wetted type standard. Heavy duty oil-bath type optional.

Fuel Pump:—AC. Type P #1523008. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Motometer Electric. NG-7842-D (early), NG-8042-D (late), (dash units); NG-7823-T (tank unit).

VALVE TIMING:—To Check Timing—Set tappet clearance #1 exhaust valve at .012". This valve should close with #1 piston .0079" past top dead center when flywheel mark 'EC.-1' lines up with indicator in right front face of flywheel housing. Reset tappet clearance at .010" with engine warm.

Motor Gauge—Weidenhoff Adapter #114, Rod #2.

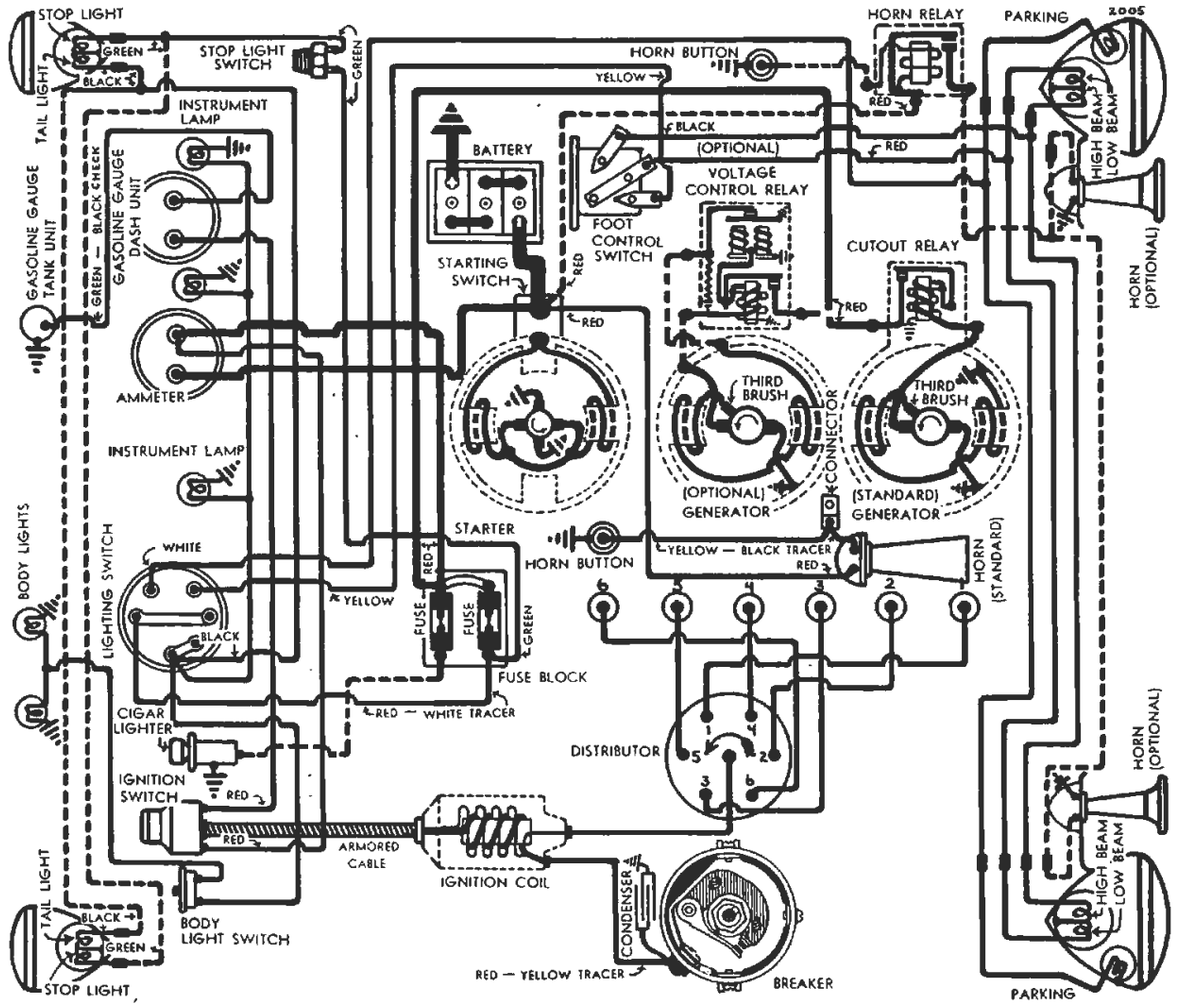
Tappet Clearance:—.010" all valves. Engine hot.

Valve Spring Pressure:—32.2-34.2 lbs. at 1 21/32" (valve closed), 71-75 lbs. at 1⅜" (valve open).

LUBRICATION:—Crankcase Capacity—5 qts. (refill). **Normal Oil Pressure**—50 lbs. at 30 M.P.H.

BATTERY:—Willard, WHT-1-90, RHT-1-90 (Export). 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.

Grounded Terminal—Positive (+) terminal.

Location—Under front seat.

Cars with Radio—Type WH-1-13, RH-1-13 (Export). 6 volt, 13 plate, 102 ampere hour capacity (20 hour rate).

Starting Capacity—120 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.1 minutes.

STARTER:—Model 738-J, 738-V. Armature No. 823881.

Drive—Manual pinion shift with overrunning clutch. Full travel—⅛" clearance between pinion and housing.

Cranking Engine—60 R.P.M., 175 amperes.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 "	Lock	3.63	475

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

Starting Switch:—Delco-Remy No. 820052. Monted on starter field frame. Operated by pinion shift lever (starting pedal).

GENERATOR:—Model 937-Y, Armature No. 1859794. Model 936-L (Radio). Armature No. 1860284. Third brush control. External voltage (Step-voltage) control (936-L). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Connect test ammeter in charging line at 'BAT' terminal. On 936-L model short out Voltage Control Relay by connecting jumper wire from generator field 'F' terminal to frame. Loosen lockscrew on commutator end plate, shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate, tighten lockscrew. Remove jumper wire (936-L).

Maximum Charging Rate (937-Y)—18 amps. (cold), 15 amps. (hot), 8.3 volts, 2000 R.P.M., 22-23 M.P.H. **(936-L)**—23 amperes (cold) at 8.8 volts, 2800 R.P.M., 23-26 M.P.H., 20 amps. (hot) at 8.5 volts, 3100 R.P.M.

Performance Data—937-Y

	Amperes	Volts	R.P.M.
Cold	15-18	7.9-8.3	2000
Hot	13-15	7.7-8.0	2400

Performance Data—936-L

Cold	20-23	8.5-8.8	2800
Hot	16-20	8.1-8.5	3100

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—(937-Y) 23-27 ounces (all brushes). (936-L) 22-26 ozs. (main), 16-20 ozs. (third).

Field Current—(937-Y) 3.5-4.5 amperes, (936-L) 2.3-2.6 amperes, at 6 volts.

Removal:—Cradle mounted at left front of engine with fan belt drive. To remove, slack off drive belt, disconnect water pump coupling, loosen mounting clamp band.

Belt Adjustment:—Belt adjustment provided at fan bracket. With correct adjustment sideplay of belt should be 1" between pulleys.

SPECIAL GENERATOR:—Model 933-R (Police Service). Model 5596 Current and Voltage Regulator used in conjunction with this generator. See article in Equipment Section for complete data.

CUTOUT RELAY:—Model 265-B. Used on 937-Y generator. Mounted on generator. See Equipment Section for complete data.

Cuts In—6.75-7.5 volts.

Cuts Out—0-2.5 amperes discharge.

Contact Gap—.015-.025".

Air Gap—.012-.017" with contacts closed.

CONTROL UNIT (STEP-VOLTAGE TYPE):—Mod. 5585. Used on 936-L generator. Consists of Cutout Relay and Voltage Control Relay in single case on generator. See article in Equipment Section.

Cutout Relay

Cuts In—6.4-6.8 volts.

Cuts Out—3 amperes at 6.3 volts, discharge.

Contact Gap—.015-.025".

Air Gap—.012-.017" with contacts closed.

Voltage Control Relay

Contacts Open—8.35-8.65 volts at 70° F.

Contacts Close—7.3-7.7 volts at 70° F.

Contact Gap—.008-.013".

Air Gap—.028-.040" between armature and core (armature down against lower stop), .028-.040" armature travel (between armature and lower stop)

LIGHTING:—Headlamps—Corcoran-Brown, Prefocused type. Headlamps aimed straight ahead (upper beam with lenses in place). Upper and lower driving beams controlled by foot selector switch.

Switches

Lighting—Delco-Remy Model 481-Y.

Foot Selector—Delco-Remy Model 471-P.

Stop Lamp—Hydraulic type mounted on master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking	1½	55
Stop and Tail	21-3	1158
Instrument, Body	3	63

FUSES:—Lighting—One 20 ampere fuse mounted on fuse block on rear side of dash panel. Extra fuse on fuse block.

Cigar Lighter—One 20 ampere fuse on fuse block.

HORNS:—Klaxon Model K-16 Type 2001 Std. Two optl. sets as follows: (1) Klaxon Model K-33-F Type 2103 (left side—low note), 2104 (right side—high note). (2) Klaxon Model K-33-B Type 1864 (left side—high note), K-33-C Type 2155 (right side—low note). Horn relay used on cars with optl. horns.

Horn Type	Current at 6 volts	Air Gap
2001	5-7.5	.020-.022"
2103 (left side—low)	11-13	.040-.044"
2104 (right side—high)	9-11	.032-.036"
1864 (left side—high)	11-13	.036-.040"
2155 (right side—low)	11-13	.042-.046"

Horn Relay:—Model 266-T. Requires .25 amperes at 2 volts minimum to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.

Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—First number—200,001 (90, 90-A), 100,101 (110). On plate on floor within body back of right front seat.

COMPRESSION:—Ratio 6.7-1 Std. aluminum head. No optl. hds. Pressure 115 lbs. (90, 90-A), 120 lbs. (110) at cranking speed.

VACUUM READING:—Gauge should show steady reading of 15-17" with engine idling at 5-7 M.P.H.

IGNITION:—Coil Model 536-J (90, 90-A), 539-M (110).

Ignition Current—1.8 amperes idling, 3 stopped.

Ignition Switch—Delco-Remy Model 431-U. Switch and cable assembly connected to coil by armored cable.

Distributor Mod. 623-A (90, 90-A), 623-E (110). Single breaker, 6 lobe cam, full automatic advance type with auxiliary vacuum spark control.

Breaker Gap—Set at .018". Limits .018-.024".

Cam Angle or Dwell—36° (closed), 24° (open).

Breaker Arm Spring Tension—17-21 ounces.

Condenser—Part No. 829092. Capacity .20-.25 mfds.

Automatic Advance—623-A

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	400	2	800
9	1400	18	2800

Automatic Advance—623-E

Start	300	2	600
6	1000	12	2000

Vacuum Spark Control Model 681-C. Provides additionel advance for intermediate speeds above idling except when engine is suddenly accelerated or is operated with wide open throttle when spark will be retarded by return spring in unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	7"
10-12°	9-13"

Distributor Removal:—Mounted on cylinder head. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:—

	Flywheel Degrees	Piston Pos.
All engines	TDC	0000" TDC

To Set Timing—With #1 piston on compression, turn engine over until piston reaches top dead center, stop when flywheel mark 'IGN' lines up with indicator on right front face of flywheel housing, loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor is opposite #1 segment in distributor cap.

Timing (Motor Gauge)—Weidenhoff Adapter #114, Rod #2.

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

Spark Plugs:—Champion Type J-9. 14 MM. Metric.

Spark Plug Gap—Set at .025". Limits .023-.027".

CARBURETION:—Carburetors—Marvel Model B-2 No. 10-1678 (90, 90-A), B-3 No. 10-1680 (110). 1¼" (90, 90-A) and 1½" (110) downdraft type with manual choke control. See Carburetion Section for adjustment, overhaul and Jet Specifications.

NOTE—See Carburetion Section for recommended jet changes on carburetors before carburetor No. 5092447 (90, 90-A), and No. 5090942 (110). Also changes in Accelerating Pump Assembly (after carburetor No. 6002388) and Vacuum Step-up Spring (after first 300 cars) on Supercharger models only.

NOTE—Do not adjust carburetors until engine is warmed up so that engine is idling at slow or hot idling speed.

Idling Adjustment—With engine hot, close throttle, see that choke control button on dash is pushed in; set throttle stopscrew so that engine idles at 5-7 M.P.H. or 350 R.P.M., turn idle adjusting screw in until engine begins to miss, then turn screw out until engine begins to roll, finally turn screw in until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Pump lever has four holes for pump link engagement as follows:
#1—(Min stroke)—High test fuel or hot climate.
#2—Recommended standard setting.
#3—Recommended setting for B-3 carburetors (after carburetor No. 6002387) with No. 194-540 Accelerating Pump Assembly.
#4—(Max. stroke)—Low test fuels or low temps.

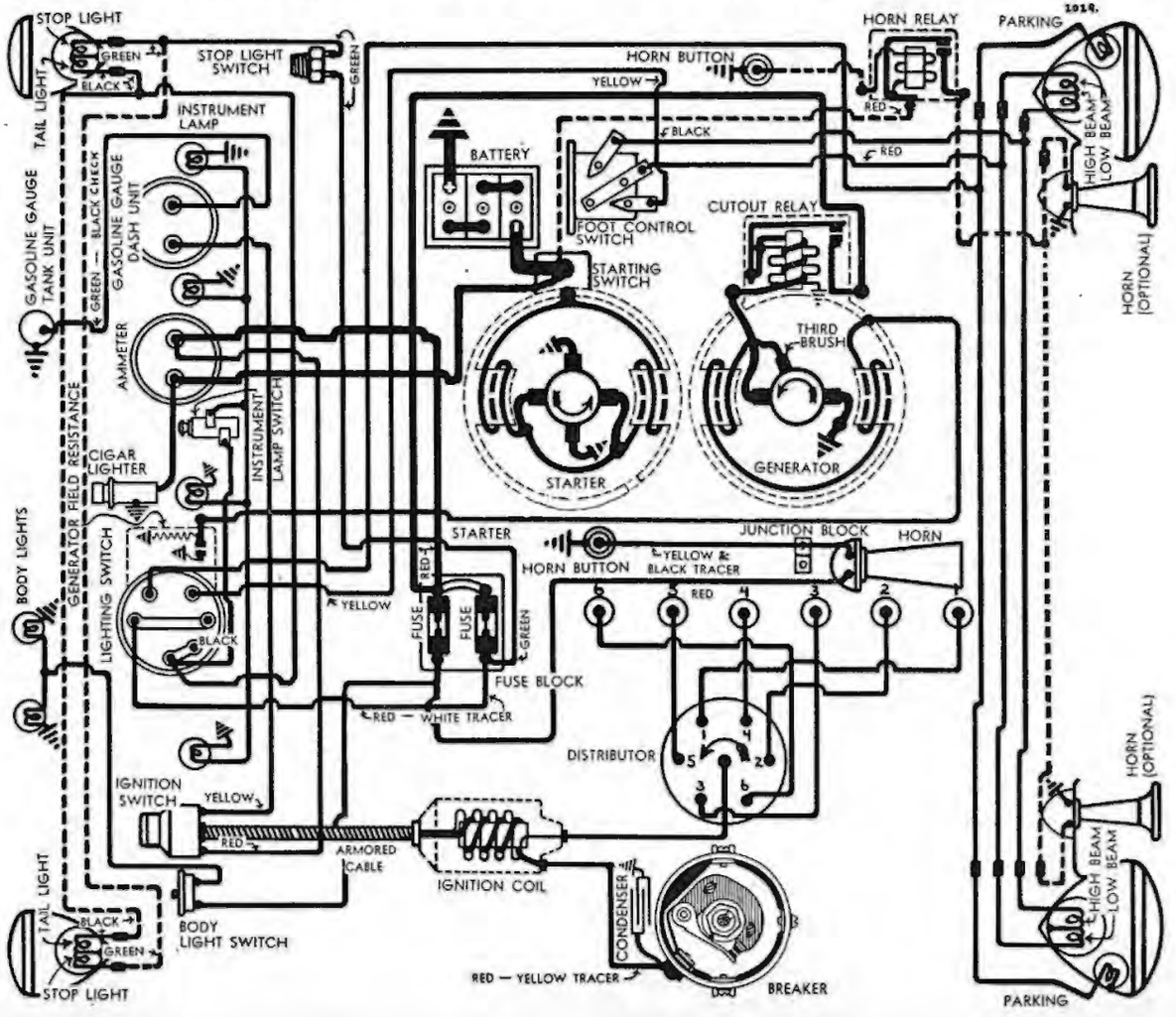
Fast Idle:—Integral with carburetor. No adjustment. See article for this carburetor in Carburetion Sec.

Air Cleaner:—AC. #1526750 (90, 90-A), #1526753 (110) oil-wetted type standard. Heavy duty oil-bath type optional.

Fuel Pump:—AC. Type P #1523008 (90, 90-A), Type R #1523009 (110). Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Motometer Electric. Early type—NG-7842-D (dash), NG-7818-T (tank); Late type—NG-8042-D (dash), NG-7823-T (tank).

VALVE TIMING:—To Check Timing—Set tappet clearance #1 exhaust valve at .012". This valve should close with #1 piston .0088" past top dead center (90, and 110) and .0472" past top dead center (90-A)



when flywheel mark 'EC-1' lines up with indicator in right front face of flywheel housing. Reset tappet clearance at .010" with engine hot.

Motor Gauge—Weidenhoff Adapter #114, Rod #2.

Tappet Clearance—.010" all valves. Engine hot.

Valve Spring Pressure:—34 lbs. at 2 3/16" (valve closed), 87 lbs. at 1⅞" (valve open).

LUBRICATION:—Crankcase Capacity—5 qts. (refill).

Normal Oil Pressure—50 lbs. at 30 M.P.H.

BATTERY:—Willard Type WHT-1-90, RHT-1-90 (Export). 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.

Grounded Terminal—Positive (+) terminal.

Location—Under front seat.

Cars with Radio:—Type WH-1-13, RH-1-13 (Export). 6 volt, 13 plate, 102 ampere hour capacity (20 hour rate).

Starting Capacity—120 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.1 minutes.

STARTER:—Model 738-T, 738-X (RHD). Armature No. 823881.

Drive—Manual pinion shift (738-T), solenoid pinion shift (738-X), with overrunning clutch.

Cranking Engine—200 amperes at 5 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 "	Lock	3.63	475

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

Starting Switch (738-T):—Delco-Remy No. 820052. Mounted on starter field frame. Operated by pinion shift lever (starting pedal).

(738-X)—Solenoid Switch Type 1516. Starter Push Switch Type 1388. Solenoid switch controlled through relay by push switch on instrument panel. See article in Equipment Section.

Solenoid Switch

Close against 70 lbs. pull with .5" air gap drawing 65-71 amperes at 5 volts. Holds switch closed with draw of 12-14 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—3.2 volts max. **Open**—1.6-2.0 volts.

Contact Gap—.030-.045". **Air Gap**—.010-.014" (closed)

GENERATOR:—Model 948-B. Armature No. 1853593. Third brush regulation, lighting switch control. Field resistance on switch is shorted out with lamps turned on, increasing generator output. Special switch position between 'Off' and 'Park' provides this high charging rate with lamps off. See 'Lamp Control Generators' in Equipment Section. Ventilated by fan on drive pulley.

Charging Rate Adjustment—Pull light switch out to first position (lights off, resistance shorted out), connect test ammeter in line at 'BAT' terminal, loosen lockscrew on commutator end plate, shift third brush by hand counter-clockwise to increase, or clockwise to decrease charging rate, tighten lockscrew. Push light switch to 'Off' position.

Maximum Charging Rate—21 amperes (cold), 18 amperes (hot), 8.5 volts, 2400 R.P.M., 38-40 M.P.H.

Performance Data

	Amperes	Volts	R.P.M.
Cold	18-21	8.2-8.5	2400
Hot	15-18	7.9-8.3	2900

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third).

Field Current—2.3-2.6 amperes at 6 volts.

Removal:—Generator pivot mounted at left front of engine. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Loosen mounting bolts, swing generator away from engine until belt sideplay midway between pulleys is 1", tighten mounting bolts.

SPECIAL GENERATOR:—Model 934-F (Police Service). See article in Equipment Section. Control Unit (Current and Voltage Regulator Model 5597) used in conjunction with this generator.

CUTOUT RELAY:—Mod. 265-H. Mounted on generator. See article in Equipment Section.

Cuts In—6.75-7.5 volts, 11 M.P.H.

Cuts Out—0-2.5 amperes discharge current.

Contact Gap—.015-.025".

Air Gap—.012-.017".

LIGHTING:—Headlamps—Corcoran - Brown, Pre-focused type. Headlamps aimed straight ahead (upper beams with lenses in place). Upper and lower driving beams controlled by foot selector switch.

Switches

Lighting—Delco-Remy Model 481-Z.

Foot Selector—Delco-Remy Mod. 471-P, 471-U (RHD)

Stop Lamp—Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Instr., Body	3	63
Tail	3	63
Stop	15	87

FUSES:—Lighting—20 ampere fuse mounted on fuse block on dash.

Body Lights and Standard Horn—20 ampere fuse on fuse block. One extra fuse mounted on fuse block.

HORNS:—Klaxon Model K-26-L. Type 1608 Standard. Klaxon Model K-33-B Type 1864 (left side—high note), K-33-C Type 2155 (right side—low note) optl. All horns are vibrator type. Optional horns are matched tone and operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
1608	6.5-8.6	.025-.029"
1864 (left side—high)	11-13	.036-.040"
2155 (right side—low)	11-13	.042-.046"

Horn Relay:—Model 266-T. Requires .25 amperes at 2 volts minimum to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.

Air Gap—.012-.017" with contacts closed.

NOTE:—'Electric Hand' Bendix electro-pneumatic type gear shift optional on all models. See article in Electrical Equipment Section for specifications, trouble shooting and repair.

SERIAL NUMBER:—First number—63-101. Stamped on plate on dash under engine hood.

COMPRESSION:—Ratio 6.25-1 Std cast-iron head, 7.0-1 Optl. high compression aluminum head. Check compression pressure by removing all spark plugs and cranking engine with throttle wide open.

Cylinder Head	Compression Pressure
Std. 6.25-1	116 lbs. at 219 R.P.M.
Optl. 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.

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 mfds.

Automatic Advance

Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine 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 crankcase. 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 one 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 ¾" 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 eng.). J-9 (Optl. 7.0-1 eng.). 14MM Metric type.

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

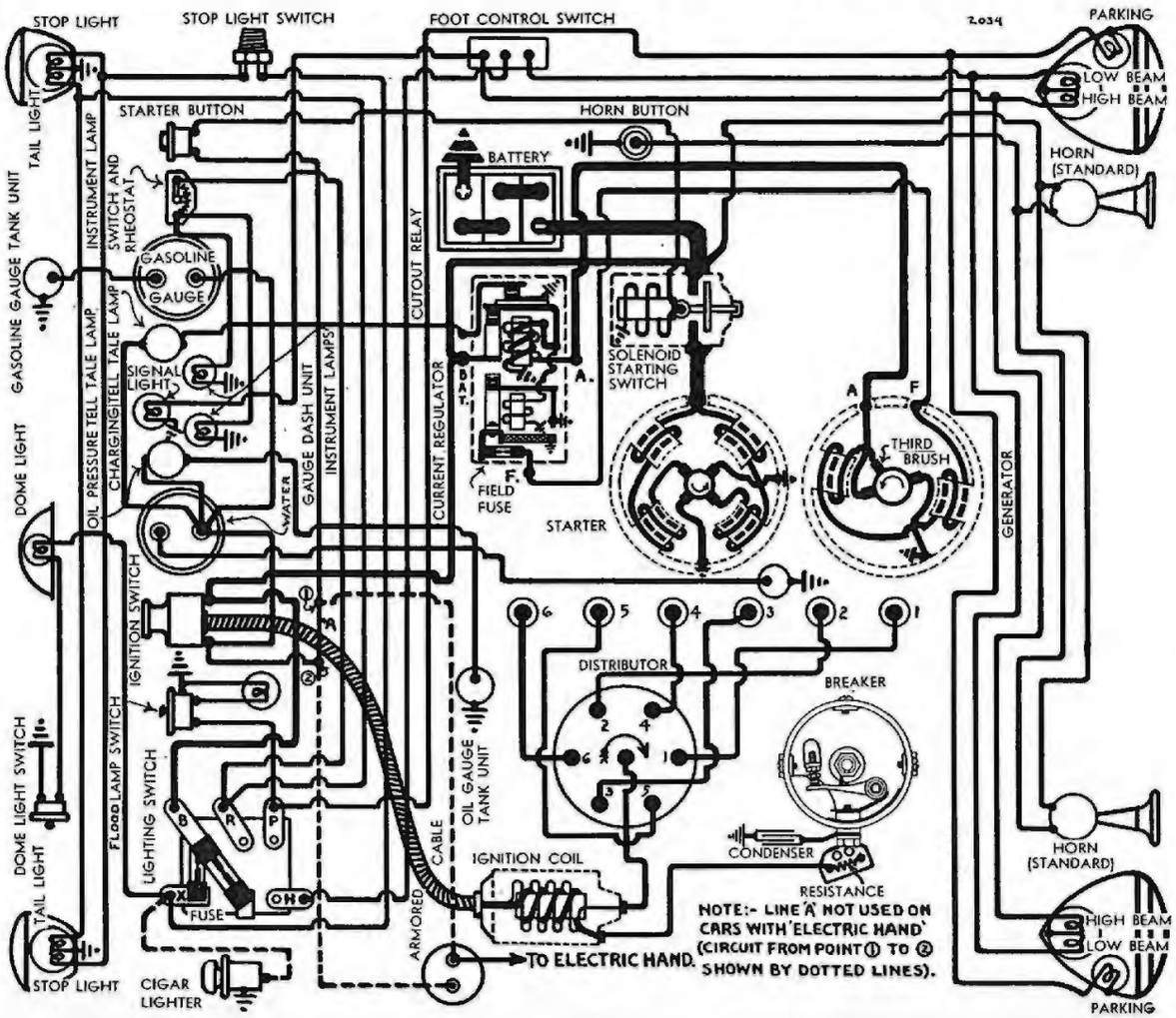
CARBURETION:—Carburetor—Carter Mod. 329-S, 1¼" downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.

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 stopscrew 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 ½-1 turn open from seated position. Readjust throttle stopscrew 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.



Fast Idle:—Integral with carburetor. No adjustment required. See article on Carter Fast Idle in Carburetion Section.

Automatic Choke:—Carter Climatic Control. See article in Carburetion Section.

Air Cleaner:—AC. #1526650 Std. #1526651 on cars with Electric Hand. Heavy duty oil-bath type optl.

Fuel Pump:—AC. Type R #1521450. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—King-Seeley Electric. See article in Carburetion Section.

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 .006" with engine hot.

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

LUBRICATION:—Crankcase Capacity—5 qts. refill.

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

Oil Pressure Signal Light—Used instead of pressure gauge. Controlled by oil pressure regulator valve. See complete article in Equipment Section.

BATTERY:—National. Type ST-317X. 6 volt, 17 plate, 96 ampere hour (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 board.

STARTER:—Madel MAB-4075. Armature MAB-2113.

Drive—Inboard Bendix, Type A-1673.

Cranking Engine—150 R.P.M. 120-125 amps. at 5 vs.

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 Switch Type SS-4001. Controlled by pushbutton switch (R.B.M. Model 1800) on dash. Operative with ignition turned 'on'. On cars with Electric Hand clutch must be disengaged also. See article in Equipment Section.

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:—Model GAR-4701-6. Armature GAR-2077. 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 generator output. Short out current 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 until output is 22.8 amperes at 8.0 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.

Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold Regulator Inoperative			Hot		
Amps.	Volts	R.P.M.	Amps.	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

Rotation—Counter-clockwise at commutator end.

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

Field Curent—3.51-3.89 amperes at 6.0 volts.

Motoring Current—5.32-5.88 amperes at 6 volts.

Field Fuse—5 ampere in knurled cup on side of regulator case.

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

Belt Adjustment:—Swing generator away from engine until slack on belt midway between fan pulley and generator pulley is 1¼" (measure from straightedge across pulleys).

RELAY-REGULATOR:—Model TC-4304A. Mounted on engine side of dash. Consists of Cutout Relay and Current Regulator (two-rate charging control). See Equipment Section article for complete data. 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. 8 M.P.H.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.015-.045" (with upper or ground contacts closed—ground contacts must be open with main contacts closed).

Air Gap—.010-.030" with contacts closed.

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 beam with lenses in place). Upper and lower beams controlled by foot selector switch.

Headlamp Beam Indicator—In lower portion of speedometer dial. Lighted when upper beams in use.

Switches

Lighting—R.B.M. Model 1650.

Foot Selector—R.B.M. Model 1082.

Instrument Lights—Soreng-Manegold Mod. K2060A.

Stop Light—Motometer Model 58012-C hydraulic type mounted in brake line on 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 Telltale and Oil Pressure Tell-tale lights mounted on instrument panel. See Equipment Section for complete data.

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

Generator Field—5 ampere in regulator.

HORNS:—E.A. Vibrator type. Twin horns.

NOTE:—'Electric Hand' Bendix electro-pneumatic type gear shift optional on all models. See article in Electrical Equipment Section for specifications, trouble shooting and repair.

SERIAL NUMBER:—First number (64) 64101, (65) 65101, (66) 66101, (67) 67101. On plate on engine side of dash. All model numbers will carry these prefixes: '64', '65', '66', or '67'.

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

Cylinder Head	Compression Pressure
Std. 6.0-1	110 lbs. @ 150 R.P.M.
Optl. 7.0-1	128 lbs. @ 150 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 CE-4617. Resistor unit mounted on distributor terminal is connected in series with coil primary.

Resistance Unit—Part No. SP-4009.

Coil Draw—2.5 amperes idling, 4.5 amps. 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 IGP-4001B. Single breaker, 8 lobe cam, full automatic advance type.

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

Cam Angle or Dwell—27½° (closed), 17½° (open).

Breaker Arm Spring Tension—18 ozs. minimum, 20 ozs. maximum.

Condenser—Part No. IG-2671. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
3	400	6	800
5	575	10	1150
10	1025	20	2050
15	1475	30	2950
17.5	1700	35	3400

Distributor Removal:—Mounted on right side of crankcase. 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	.00" 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 1-8/' 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 one 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 ¾" on flywheel before 'UDC 1-8/' mark.

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

Firing Order:—1-6-2-5-8-3-7-4. See diagram.

Spark Plugs:—Champion Type J-8. (Std. 6.0-1 engines), J-9 (Optl. 7.0-1 engines). 14MM. Metric type.

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

CARBURETION:—Carburetor—Carter Model 330-S, 1¼" downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.

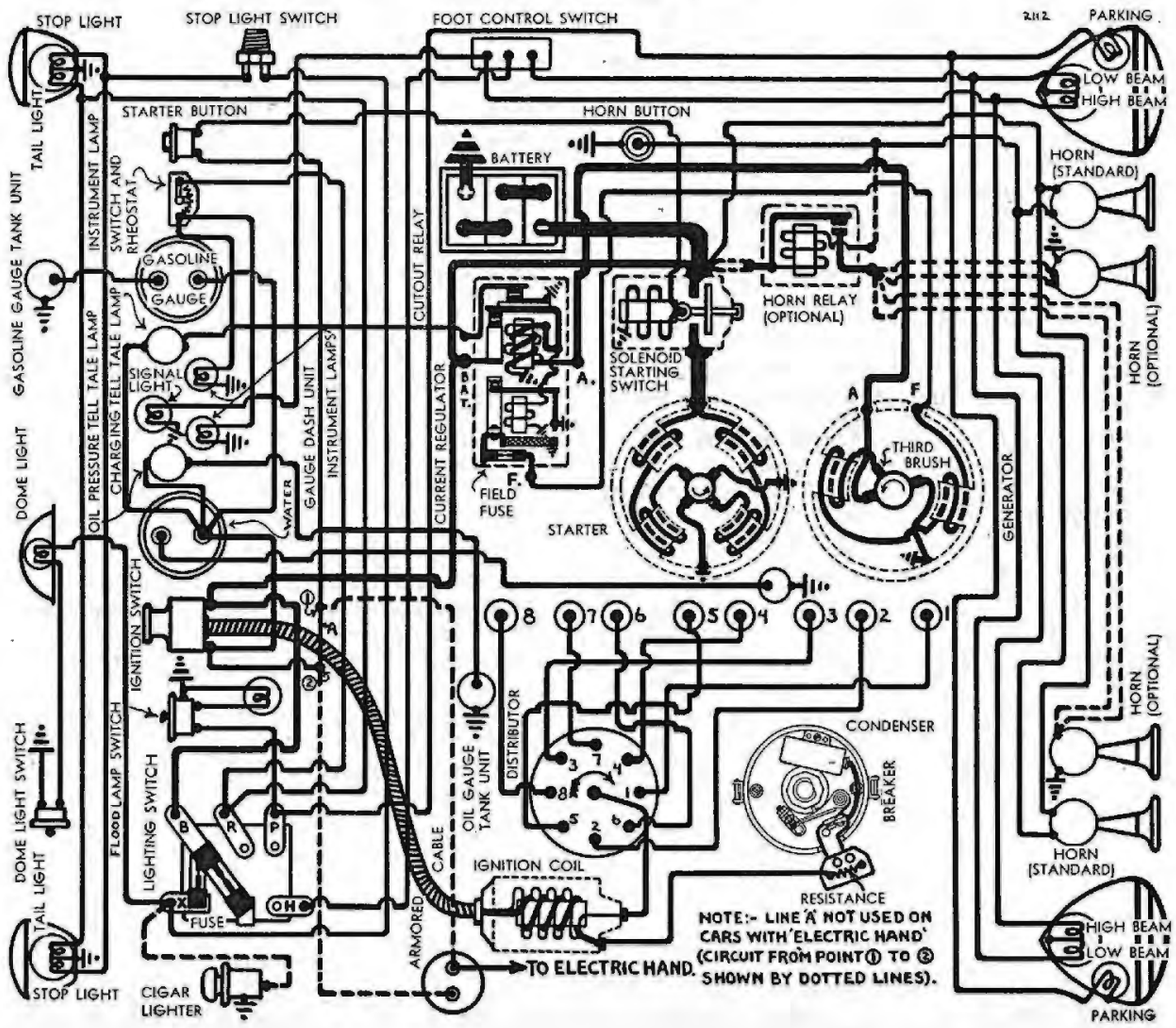
NOTE:—Do not adjust carburetor until engine warmed up so that choke valve is wide open and engine idling at slow or hot idling speed.

Idle Adjustment—Adjust throttle stopscrew 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 ½-1 turn open from seated position. Readjust throttle stopscrew 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.

Fast Idle:—Integral with carburetor. No adjstment required. See article on Carter Fast Idle in Carburetion Section.



Automatic Choke:—Carter Climatic Control. See article in Carburetion Section.

Air Cleaner.—AC. #1526650 Std. # 1526651 on cars with Electric Hand. Heavy duty oil-bath type optl.

Fuel Pump:—AC. Type R #1521450. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—King-Seeley Electric. See article In Carburetion Section.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .010". This valve should open with piston 10°40' or .0494" before top dead center when a point on flywheel approximately 3.94 teeth before the dead center mark 'UDC.1-8/' lines up with pointer in inspection hole in left front face of housing. Reset tappet clearance at .006" with engine hot.

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

Tappet Clearance:—.006" Int., .008" Exh., hot.

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

LUBRICATION:—Crankcase Capacity—7 qts. (refill).

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

Oil Pressure Signal Light—Used instead of pressure gauge. Controlled by oil pressure regulator valve. See complete article in Equipment Section.

BATTERY:—National, Type ST-319X. 6 volt, 19 plate, 108 ampere hour (20 hour rate).

Starting Capacity—135 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.3 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left hand side under front floor bds.

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 v.

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 Switch Type SS-4001. Controlled by pushbutton switch (R.B.M. Model 1800) on dash. Operative with ignition turned 'on.' On cars with Electric Hand clutch must be disengaged also. See article in Equipment Section.

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:—Model GAR-4701-6. Armature GAR-2077. 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 generator output. Short out current 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 until output is 22.8 amperes at 8.0 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.

Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold — Regulator Inoperative — Hot					
Amperes	Volts	R.P.M.	Ampere	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

Rotation—Counter-clockwise at commutator end.

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

Field Current—3.51-3.89 amperes at 6.0 volts.

Motoring Current—5.32-5.88 at 6.0 volts.

Field Fuse—5 ampere in knurled cup on side of regulator case.

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

Belt Adjustment:—Swing generator away from engine until slack on belt midway between fan pulley and generator pulley is 1¼" (measure from straight-edge across pulleys).

RELAY-REGULATOR:—Model TC-4304A. Mounted on engine side of dash. Consists of Cutout Relay and Current Regulator (two-rate charging control). See Equipment Section article for complete data. Cut-out Relay has extra set of ground contacts for generator charging tell-tale signal light control.

Cutout Relay

Cuts In—6.5-7.25 volts, 8 M.P.H.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.015-.045" (with upper or ground contacts closed—ground contacts must be open with main contacts closed).

Air Gap—.010-.030" with contacts closed.

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

Headlamp Beam Indicator—In lower portion of speedometer dial. Lighted when upper beams in use.

Switches

Lighting—R.B.M. Model 1650.

Foot Selector—R.B.M. Model 1082.

Instrument Lights—Soreng-Manegold Model K2060A.

Stop Light—Motometer Model 58012-C hydraulic type mounted in brake line on 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 Telltale and Oil Pressure Tell-tale lights mounted on instrument panel. See Equipment Section for complete data.

FUSES:—Lighting—Two 20-ampere capacity on switch.
Generator Field—5 ampere in regulator.

HORNS:—E. A. Vibrator type. Twin horns.

SERIAL NUMBER:—First number—G-5001. On plate on right side of dash under engine hood.

COMPRESSION:—Ratio—5.75-1 Std. cast-iron head, 6.2-1 optl. aluminum head.

Pressure—(5.75-1 std. head) 141 lbs. at 3000 R.P.M. or 107 lbs. at 160 R.P.M. (cranking speed).

VACUUM READING:—Gauge should show steady reading of 18-20" at idling speed.

IGNITION:—Coil Model IG-4619. Service Winding (coil less switch and cable) **IG-3224S.**

Ignition Current—2.5 amperes idling, 4-5 stopped.

Ignition Switch:—Mitchellock Model 24-B, Type 6702. Conected to coil by armored cable.

Ignition Lock—Briggs & Stratton Model 50184, Mitchell No. 6095.

Distributor Model IGB-4319. Single breaker, 6 lobe cam, full automatic advance type. Manual adjustment consists of adjustment at distributor.

Breaker Gap—Set at .018-.020".

Cam Angle or Dwell—Closed 34°, Open 26° distributor.

Breaker Arm Spring Tension—16-22 ounces.

Condenser—Part No. IGB-1025. Capacity .20-.25 mfds.

Automatic Advance

Distributor		Engine	
Degrees	R.P.M.	Degrees	R.P.M.
Start	400	0	800
2	680	4	1360
4	970	8	1940
6	1260	12	2520
7	1400	14	2800

Manual Advance—12° (engine). Slot in advance arm permits distributor to be advanced or retarded 6° from center '0' position.

Removal:—Mounted on left side of crankcase. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:—

	Flywheel Degrees	Piston Pos.
All engines	7° BTDC	.022"BTDC

Timing—With piston #1 on compression, turn engine over until piston is 7° (.022") before top dead center, stop when ignition mark on flywheel lines up with finished bosses on right hand front face of clutch housing. This mark is 7° before the top dead center mark 'DC/1-6'. Loosen hold-down screw in advance arm, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt and rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor is opposite #1 segment in distributor cap, check spark plug connections (see diagram).

Motor Gauge—Weidenhoff Adapter #104, Rod #2.

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

Spark Plugs:—Champion Type C7-A. 18 MM. Metric.

Spark Plug Gap—Set at .0275-.030".

CARBURETION:—Carburetor—Carter Model 333-S, 1¼" downdraft type. See Carburetion Section for complete adjustment, overhaul and Jet Specifications.

NOTE—Do not make carburetor adjustments until engine is warmed up with choke valve wide open and choke control on instrument panel pushed in.

Idle Adjustment—Adjust throttle stopscrew so that idle speed is 300 R.P.M. Turn idle adjusting screw in until engine begins to hesitate or miss, then out until engine begins to roll, finally turn screw in until engine fires smoothly. Final setting should be ⅜-1 turn of screw from inner closed position. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Engage pump link in proper hole in throttle lever for seasonal requirements as follows:
Inner Hole—(Min. stroke)—Extremely warm weath.
Center Hole—Normal summer temperatures.
Outer Hole—(Max. stroke)—Winter temperatures.

Air Cleaner—Burgess oil-wetted type.

Fuel Pump:—AC. Type T #1521811. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Stewart-Warner, Electric type. See article in Carburetion Section.

VALVE TIMING:—To Check Timing—Set tappet clearance of #1 valves at .014" Int., .021" Exh. With #6 piston on top dead center entering power stroke and flywheel mark 'DC/1-6' lined up with finished bosses on right front face of clutch housing, #1 intake and exhaust valves should be closed. Reset tappet clearance at .010" Int., .013" Exh., engine warm.

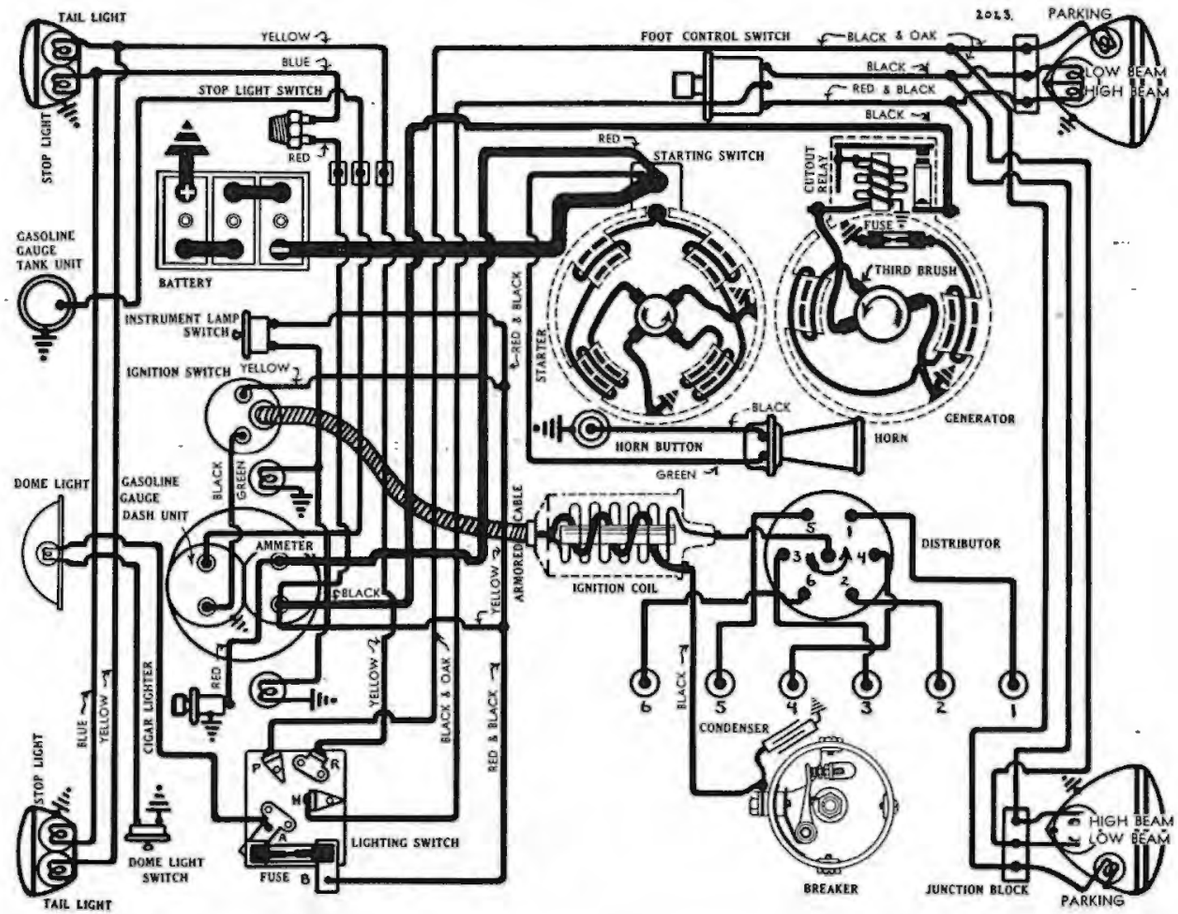
Motor Gauge—Weidenhoff Adapter #104, Rod #2.

Tappet Clearance:—.010" Int., .013" Exh., running clearance with engine warm. Clearance for timing is .014" Int. opening, .018" Int., closing, .017" Exh. opening, .021" Exh. closing.

Valve Spring Pressure:—40 lbs. at 1 13/16" (valve closed). 100 lbs. at 1 15/32" (valve open).

LUBRICATION:—Crankcase Capacity—6 qts. (refill).

Normal Oil Pressure—3-5 lbs. idling, 30 lbs. at 30 M.P.H.



BATTERY:—Willard, Type WS-2-15, R-2-15 (Export). 6 volt, 15 plate, 100 ampere hour (20 hour rate).

Starting Capacity—122 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.3 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under front floor boards.

STARTER:—Model MAJ-4044. Armature MAJ-2048.

Drive—Inboard Bendix Type LCD-11FX-10.

Cranking Engine—160 R.P.M., 150 amperes at 5.25 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.	4100	5.5	67
.3 "	2500	5.5	100
2.25 "	1450	5.0	200
4.6 "	960	4.5	300
7.3 "	575	4.0	400
10.3 "	225	3.5	500
12.0 "	Lock	3.0	550
17.0 "	Lock	4.0	750

Removal:—Flange mounted on left front face of flywheel housing. To remove, take out two flange capscrews.

Starting Switch:—Model SW-3737. Pull switch type mounted on starter controlled by pull button on instrument panel. Pull of not less than 5½ lbs. required to close switch as measured at end of switch lever and at right angles to lever.

GENERATOR:—Model GBK-4604. Armature GBK-2055. Air cooled. Third brush control type.

Charging Rate Adjustment—Take off commutator band, shift third brush by hand counter-clockwise to increase, or clockwise to decrease charging rate. Third brush held in position by friction.

Maximum Charging Rate—20 amperes (cold), 17 amperes (hot), 8.0 volts, 2200 R.P.M., 29-30 M.P.H.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	840	0	6.4	850
4	6.7	1000	4	6.8	1040
8	7.05	1160	8	7.2	1200
12	7.4	1325	12	7.55	1480
16	7.7	1550	16	7.95	2000
20	8.0	2200	17	8.0	2400

Rotation—Counter-clockwise at commutator end.

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

Field Current—3.94-4.36 amperes at 6.0 volts.

Motoring Current—4.56-5.04 amperes at 6.0 volts.

Field Fuse—5 amperes under cover on generator field frame.

Removal:—Pivot mounted at left front of engine. To remove, take out two pivot bolts and one clamp bolt.

Belt Adjustment:—Swing generator away from engine taking up all slack in belt, tighten pivot and clamp bolts.

CUTOUT RELAY:—Model CB-4023. Mounted on generator. See Equipment Section for complete data on this unit.

Cuts In—6.75-7.5 volts. 10 M.P.H.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.025-.035".

Air Gap—.010-.030" with contacts closed.

LIGHTING:—Headlamps—Hall, Pre-focused type. Headlamps aimed straight ahead (upper beam, lenses in place). Upper and lower beams controlled by foot selector switch.

Switches

Lighting—Cole-Hersee.

Stop Light—Hydraulic type mounted at forward end of brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320-C
Parking, Instr., Tail	3	63
Stop	15	87
Dome	6	81

FUSES:—Lighting—20 amperes on back of lighting switch.

Generator Field—5 amperes under fuse cover on generator field frame.

HORNS:—Auto-Lite Vibrator type. Horn current draw 12 amperes.

SERIAL NUMBER:—First number—'N'-5001. On plate on right hand side of dash under engine hood.

COMPRESSION:—Ratio—5.80-1 Std. cast-iron head, no optional.

Pressure—5.80-1 std. head, 142 lbs. at 2000 R.P.M. or 113 lbs. at 160 R.P.M. (cranking speed).

VACUUM READING:—Gauge should show steady reading of 18-20" at idling speed.

IGNITION:—Coil Model CE-4611. Service Winding (coil less switch and cable) CE-3224S.

Ignition Current—2-3 amperes idling, 4½-5½ amperes stopped.

Ignition Switch:—Mitchellock Model 24-B, Type 6704. Connected to coil by armored cable.

Ignition Lock—Briggs & Stratton.

Distributor Model IGP-4003. Single breaker, 8 lobe cam, full automatic advance type. Manual advance consists of adjustment at distributor.

Breaker Gap—Set at .017".

Cam Angle or Dwell—27.5° closed, 17.5° open.

Breaker Arm Spring Tension—18-20 ounces.

Condenser—Part No. IG-2671. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	400	0	800
2	750	4	1500
4	1150	8	2300
6	1500	12	3000
6.5	1600	13	3200

Removal:—Mounted on right hand side of cylinder head. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:— Flywheel Degrees Piston Pos.
All engines .....7° BTDC.....0221 BTDC

Timing—With #1 piston on compression, turn engine over until piston is 7° (.0221") before top dead center, stop when straight line mark '/' on flywheel lines up with indicator in inspection hole in right front face of flywheel housing. This mark is 7° before the dead center mark '1°8'. Loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor is opposite #1 segment in distributor cap, check spark plug cable connections.

Motor Gauge—Weidenhoff Adapter #104, Rod #2.

Firing Order:—1-4-7-3-8-5-2-6. See diagram

Spark Plugs:—Champion Type C-7A. 18 MM. Metric.

Spark Plug Gap—Set at .0275-.030".

CARBURETION:—Carburetor—Carter Model 317-S. Dual downdraft type. See Carburetion Section for complete adjustment, overhaul and Jet Specifications.

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

Idle Adjustment—Adjust throttle stopscrew so that engine idles at 350 R.P.M. Turn idle adjusting screw for each carburetor barrel (in succession) in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in until engine fires smoothly. Final setting for each screw should be ¾-1¼ turns from closed or seated position. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Seting—Pump lever under dust cover at top of carburetor has two holes for pump link engagement. Change for reasonal requirem'ts: Outer Stroke—(max. stroke)—Cold weather. Inner Stroke—(min. stroke)—Hot weather.

Fast Idle:—Integral with carburetor. See article on Carter Fast Idle in Carburetion Section.

Automatic Choke:—Carter Climatic Control. See article in Carburetion for servicing directions.

Air Cleaner:—Burgess oil-wetted type.

Fuel Pump:—AC. Type D #1523014 Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Stewart-Warner Electric.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 valves at .010" Int., .017" Exh. With #8 piston on top dead center entering power stroke and flywheel mark '1°8' lined up with indicator in inspection hole in right hand top face of flywheel housing, #1 intake and exhaust valves should be closed. Reset tappet clearance at .006" Int., .013" Exh., engine warm.

Motor Gauge—Weidenhoff Adapter #104, Rod #2.

Tappet Clearance:—.006" Int., .013" Exh., running clearance with engine warm. Clearance for timing is .010" Int., .017" Exh.

Valve Spring Pressure:—40 lbs. at 1 13/16" (valve closed), 100 lbs. at 1 15/32" (valve open).

LUBRICATION:—Crankcase Capacity—8 qts. (refill).

Normal Oil Pressure—3-5 lbs. idling, 30 lbs. at 50 M.P.H.

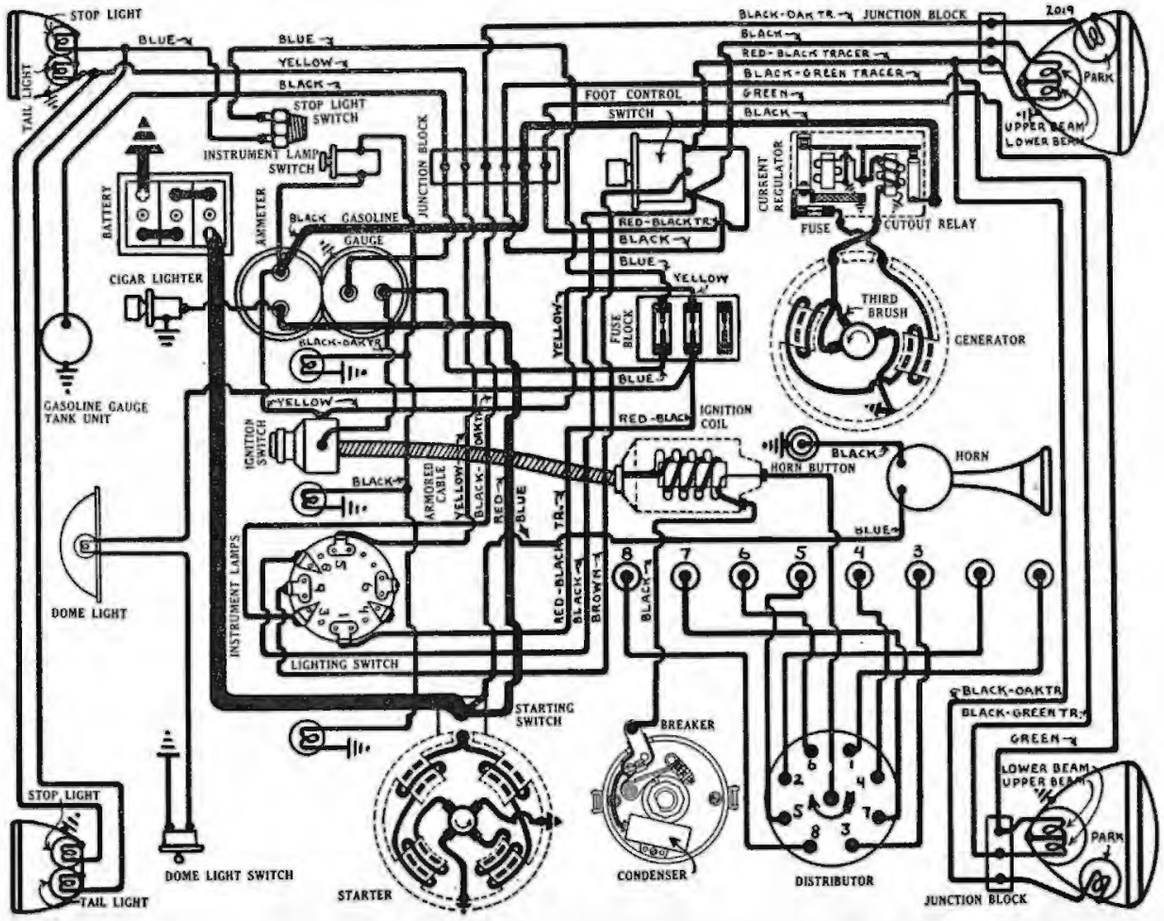
BATTERY:—Willard, Type WH-2-15, RH-2-15 (Export). 6 volt, 15 plates, 119 ampere hours (20 hour rate).

Starting Capacity—140 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.3 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under driver's seat.



STARTER:—Model MAB-4081. Armature MAB-2046.

Drive—Outboard Bendix Type RCD-10FXD-9.

Cranking Engine—160 R.P.M., 110 amperes, 5.48 v.

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	3.0	582
22.5 "	Lock	4.0	775

Lock Torque figures correct without starting switch.

Removal:—Starter sleeve mounted in right front face of flywheel housing. To remove, take out pilot mounting screw in top of flywheel housing.

Starting Switch:—Model SW-3752. Pull switch type mounted on starter controlled by pull button on instrument panel. Pull of not less than 5½ lbs. required to close switch as measured at end of switch lever and at right angle to it.

GENERATOR:—Model GAR-4620-5. Armature GAR-2116-B. Third brush control type in conjunction with Current Regulator (two-rate charge control). Ventilated by fan on drive pulley. See Equipment Section for complete data.

Charging Rate Adjustment—Use test meters to check charging rate. Connect jumper between fuse cup on regulator and ground. 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.

Maximum Charging Rate—22 amperes (cold), 19 amperes (hot), 8.75 volts, 2200 R.P.M., 28 M.P.H.

Performance Data

Cold — Regulator Contacts Closed — Hot					
Amperes	Volts	R.P.M.	Ampere	Volts	R.P.M.
0	6.4	720	0	6.4	760
4	6.8	860	4	6.8	925
8	7.25	1000	8	7.25	1125
12	7.7	1160	12	7.7	1350
16	8.1	1360	16	8.1	1680
20	8.5	1660	19.2	8.4	2600
22.4	8.8	2200			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-36 ozs. (new brushes).

Field Current—3.51-3.89 amperes at 6.0 volts.

Motor Current—5.03-5.57 amperes at 6.0 volts (½ ampere additional if relay and regulator in circuit).

Field Fuse—5 ampere in knurled cup on side of regulator case.

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

Belt Adjustment:—Inspect at 1000-mile intervals. Adjust in usual manner by loosening pivot and clamp bolts and swinging generator away from engine to take up all slack in belt.

RELAY-REGULATOR:—Model TC-4302-A. Mounted on generator. Consists of Cutout Relay and Current Regulator in a single case. See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.5-7.25 volts.
Cuts Out—.5-2.5 ampere discharge current.
Contact Gap—.015-.045".
Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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. Headlamps aimed straight ahead (upper beam, lenses in place). Upper and lower beams controlled by foot selector switch.

Switches

Lighting—Clum Switch Model 9526.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320-C
Parking, Tail	3	63
Instrument, Dome	6	81
Stop	15	87

FUSES:—Lighting—15 amperes on fuse block behind instrument panel.

Stop Light—15 amperes on fuse block behind instrument panel.
NOTE—Spare (third) fuse mounted on fuse block.

Generator Field—5 amperes in knurled cup on regulator case.

HORN:—Sparton—Vibrator type. Horn current 15 amp.

SERIAL NUMBER:—First number—L-23101. On right side of frame under hood.

COMPRESSION:—**Ratio** 5.54-1 Std. cast-iron head, aluminum high compression head optional. **Pressure**—Aprpoximately 95 lbs. at cranking speed (std. cast-iron head).

VACUUM READING:—Gauge should show steady reading of 18-20" with engine idling at 5 M.P.H.

IGNITION:—Coil Model IG-4626, IG-4626-A. Service Winding (coil less switch and cable) IG-3224-S (IG-4626), IG-3224-DS (IG-4626-A).

Ignition Current—2.5 amperes idling, 4 stopped.

Ignition Switch:—Mitchellock Model 24-B. Type 6708. Connected to coil by armored cable.

Ignition Lock—Briggs & Stratton #50184, Mitchell #6760.

Distributor Model IGB-4317-A, IGB-4317-B. Single breaker, 6 lobe cam, full automatic advance type.

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

Cam Angle or Dwell—Closed 40°. Open 20°.

Breaker Arm Spring Tension—16-20 ounces.

Condenser—Part No. IGB-1025. Capacity .20-.25 mfds.

Automatic Advance

Distributor		Engine	
Degrees	R.P.M.	Degrees	R.P.M.
Start	300	0	600
2	600	4	1200
4	900	8	1800
5	1050	10	2100

Distributor Removal:—Mounted on right side of cylinder head. To remove, loosen locknut and take out mounting screw on side of cylinder head.

IGNITION TIMING:— **Flywheel Deg.** **Piston Position**
All engines ..... at TDC ..... .0000" TDC

Timing—With #1 piston on compression, turn engine over until 'DC/IGN' mark on vibration dampener at front of engine lines up with pointer on chain case cover, loosen locknut and mounting setscrew on side of cylinder head, rotate distributor until contacts begin to open, tighten setscrew and locknut. See that rotor is opposite #1 segment in distributor cap and check spark plug connections (see diagram).

Motor Gauge—Weidenhoff Adapter #104, Rod #40.

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

Spark Plugs:—Champion Type #7. 18 MM. Metric.
Spark Plug Gaps—.025" (.030" cars with radio).

CARBURETION:—Carburetors—Marvel Model B-2 10-1603 (Early cars)., 1¼" downdraft type. Stromberg Model AX-2 (Later cars), downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.
NOTE—Do not adjust carburetor until engine is thoroughly warmed up and choke valve is wide open.
Idle Adjustment—Adjust throttle stopscrew so that idle speed is 5-7 M.P.H. Turn idle adjusting screw in until engine begins to hesitate or miss, then out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Engage pump link in proper hole in throttle lever for seasonal requirements as follows:
#1 Inner Hole (Min. stroke)—Extremely hot weather.
#2 Normal summer driving.
#3 Normal winter driving.
#4 (Marvel only)—Extremely cold weather.

Air Cleaner:—AC. #1525967 oil-wetted type standard. Heavy duty oil-bath type optional.

Fuel Pump:—AC. Type W #1522152. Type R #1522133 (RHD). Diaphragm types. See article in Carburetion Section for complete data.

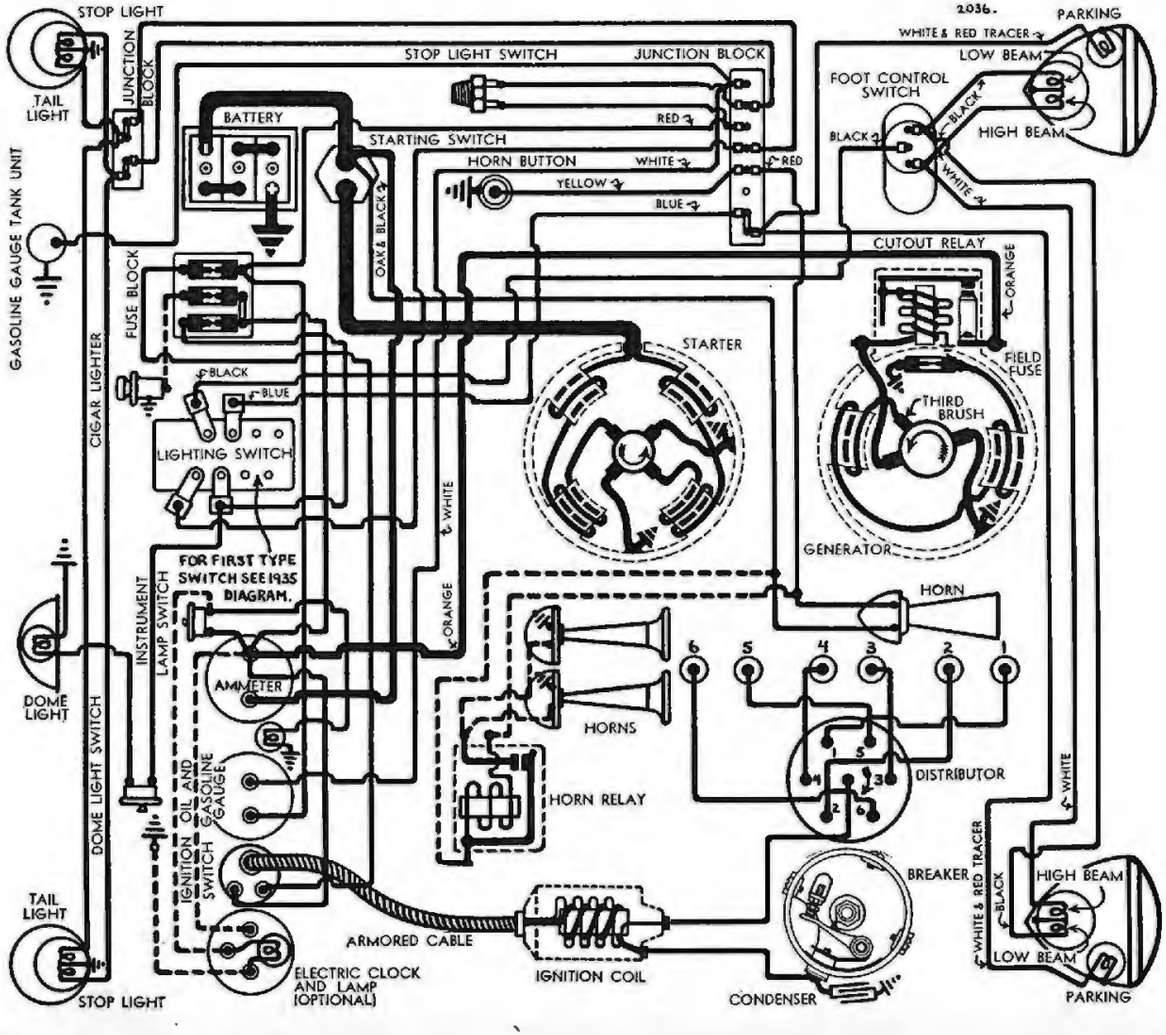
Gasoline Gauge:—Motometer Electric No. NG-7623-D (dash unit), NG-7441-T (tank unit). See article in Carburetion Section for complete data.

VALVE TIMING:—To Check Timing—No means provided for checking timing other than Camshaft Setting. Remove chain case cover at front of engine. Sprockets are marked. Mesh chain with sprockets turned so that marks are adjacent and in line with a straightedge across the shaft centers. Remove and install chain 'endless.' Use special gear pullers and pushers, keep sprockets lined up so as to avoid side-strain on chain or sprockets.

Motor Gauge—Weidenhoff Adapter #104, Rod #40.

Tappet Clearance:—.015" all valves—hot or cold.

LUBRICATION:—Crankcase Capacity—7 quarts.
Normal Oil Pressure—25 lbs. (10 lbs. idling).



BATTERY:—U.S.L. Type KL-1-13. 6 volt, 13 plate, 100 ampere hour (20 hour rate).

Starting Capacity—120 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.1 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under driver's seat.

STARTER:—Model MAB-4076. Armature MAB-2057.

Drive—Inboard Bendix Type LCD11FX-10.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ounces (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	3.0	582
22.5 "	Lock	4.0	775

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

Starting Switch:—Type SW-4005. Mounted at left of engine at lower end of steering column. Operated by depressing clutch pedal.

GENERATOR:—Model GAR-4601-5. Armature GAR-2214. Third brush control type. Air cooled.

Charging Rate Adjustment—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.

Standard Charging Rate Setting—20 amperes (cold), 16 amperes (hot), 2300 R.P.M.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	720	0	6.4	760
4	6.8	860	4	6.8	925
8	7.25	1000	8	7.25	1125
12	7.7	1160	12	7.7	1350
16	8.1	1360	16	8.1	1680
20	8.5	1660	19.2	8.4	2600
22.4	8.8	2300			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-36 ounces.

Field Current—4.46-4.94 amperes at 6.0 volts.

Motoring Current—4.89-5.41 amperes at 6.0 volts.

Field Fuse—7½ amperes. Under cover on generator.

Removal:—Cradle mounted at left front of engine with fan belt drive. Water pump driven by generator shaft extension. To remove, disconnect water pump drive coupling, slack off belt adjustment, loosen mounting clamp band, lift generator out.

Belt Adjustment:—Adjust when belt sideplay exceeds 1½" midway between generator and fan pulleys. To adjust, loosen two capscrews on fan bracket, raise bracket up (bracket pivots on one screw) until belt sideplay is approximately 1", tighten mounting screws.

CUTOUT RELAY:—Model CB-4014. Mounted on generator. See article in Equipment Section for complete data.

Cuts In—6.75-7.5 volts, 750 R.P.M.

Cuts Out—.5-2.5 amperes discharge current.

Contact Gap—.025-.035".

Air Gap—.010-.030" with contacts closed.

LIGHTING:—Headlamps—Corcoran-Brown, Pre-focused type. Upper and lower beams controlled by foot selector switch.

Switches

Lighting—Soreng-Manegold Model 5820-A (early cars), Model A-5820-A (later cars).

Foot Selector—H. A. Douglas.

Stop Light—Hydraulic type.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Stop and Tail	21-3	1158
Parking, Instrument	3	63
Dome	6	81

FUSES:—Lighting—20 ampere capacity on lighting switch (early cars), on fuse block (later cars).

Generator Field—7½ ampere on generator.

Accessory—One or two 20 ampere fuses on fuse block on steering column brace behind instrument panel.

HORNS:—Auto-Lite Model HA-4014, Std. single horn. Dual horns optl. operated by horn relay.

Horn Relay:—R.B.M. Type 10072. Current draw .4-.55 amperes at 6.0 volts. Coil resistance 11-14 ohms. Contacts must close with 4 volts across winding with relay in inverted position.

SERIAL NUMBER:—Same as engine number. Located on left hand top front corner of cylinder block (below head). First No. 2,210,001.

COMPRESSION:—Ratio—6.25-1 Std. 5.75-1 Optl. **Pressure**—160 lbs. at 1000 R.P.M. or approximately 105-110 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 20-21" with engine idling at 6 M.P.H.

IGNITION:—Coil Model 539-C. Mounted on dash. **Ignition Current**—2.2 amperes idling, 4.4 stopped.

Ignition Switch:—Delco-Remy Model 431-L. Switch and cable asembly. Connected to coil by armored cable.

Ignition Lock—Briggs & Stratton.

Distributor Model 663-J. Single breaker, 8 lobe cam, automatic advance type with auxiliary vacuum spark control and manual adjustment (see Timing). **Breaker Gap**—Set at .016". Limits .012-.018". **Cam Angle or Dwell**—31° (closed), 14° open). **Breaker Arm Spring Tension**—19-23 ounces. **Condenser**—Part No. 1837231. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	500	1	1000
5.75	1300	11.5	2600
14.	1800	28	3700

Vacuum Spark Control—Integral with distributor. Mounted on housing and linked directly to breaker plate. Provides additional advance at speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring in unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG)
Start	8-10"
18° Max.	15-18"

Distributor Removal:—Mounted on cylinder head. To remove, disconnect vacuum line, take out hold-down screw in advance arm.

IGNITION TIMING:—Setting for all engines as follows. See Manual Adjustment Section below.

	Flywheel Degrees	Piston Position
All engines	8° BTDC	.0264" BTDC

To Set Timing (Using Synchroscope)—Recommended by manufacturer. Clip Synchroscope lead to #1 spark plug and direct light on harmonic balancer at front of engine. Idle engine, loosen hold-down screw in advance arm, rotate distributor until timing mark 'IG/A' which is 8° before top dead center mark 'C.1/6', lines up with pointer on chain case, tighten hold-down screw.

Timing (Without Synchroscope)—With #1 piston on compression, turn engine over until piston is 8° (or .0264") before top dead center, stop when 'IG/A' mark on harmonic balancer lines up with pointer on chain case, losen hold-down screw, rotate distributor until contacts begin to open, tighten hold-down screw.

Motor Gauge—Weidenhoff Adapter #114, Rod #40.

Manual Adjustment—With ignition set as above, slight 'ping' should be noticeable when engine is accelerated with wide open throttle at speeds below 15 M.P.H. If 'ping' is too severe, loosen hold-down screw in advance arm, rotate distributor one graduation on scale clockwise to retard spark, repeat test. Adjustment permits 10° advance or retard from center '0' position.

NOTE—Check engine for faulty spark plugs, excessive carbon deposits or localized 'hot spots' before changing manual adjustment.

Firing Order:—1-5-2-6-8-3-7-4. See diagram.

Spark Plugs:—AC. Type K-7. 14 MM. Metric type.

Spark Plug Gaps—Set at .025-.030".

CARBURETION:—Carburetor—Stromberg Model EE-15, 1" dual downdraft type. See Carburetion Section for adjustment, overhaul and Jet Specifications.

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

Idle Adjustment—Set throttle stopscrew so that idling speed is 6 M.P.H. Turn each idle adjusting screw in until engine begins to lag or miss, then turn each out until engine begins to roll, finally turn screws in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelrating Pump Setting—Not adjustable.

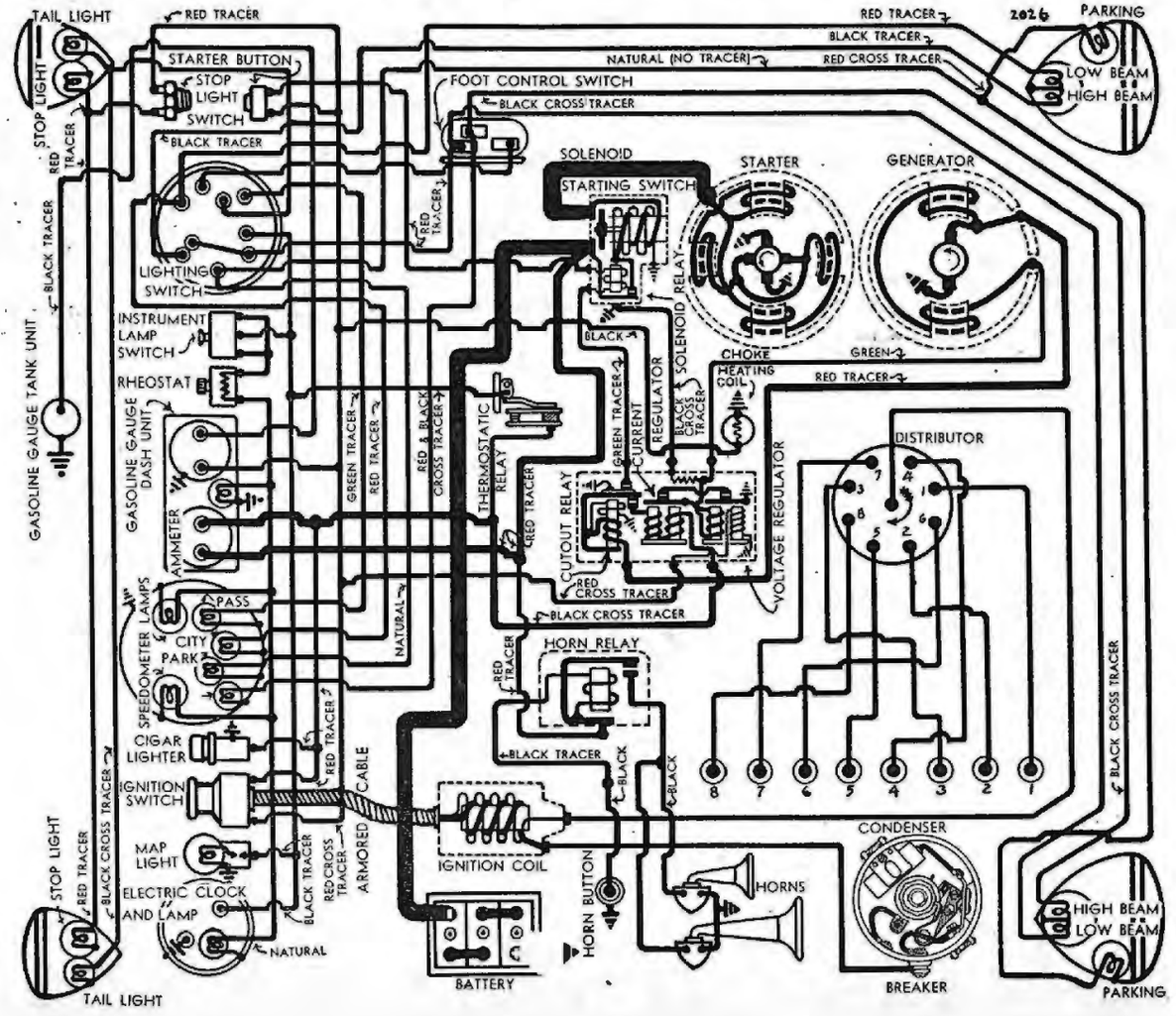
Fast Idle:—Integral with carburetor. See article on Fast Idle and Automatic Choke as used on EE-15 and EE-24 carburetors in Carburetion Section.

Automatic Choke:—Triple Range Automatic and manual choke control. See article in Carburetion Section.

Air Cleaner:—A.C. #1525600 oil-wetted type standard, #1525979 oil-bath type heavy duty optional.

NOTE—Smaller main metering jet must be used in carburetor when heavy duty oil-bath type cleaner used. See Stromberg Jet Specifications in Carburetion Section.

Fuel Pump:—AC. Type I #1522248 combination fuel-and-vacuum pump. See article in Carburetion Sec.



Gasoline Gauge:—AC. Electric type. #1515303 (dash unit), #1515428 (tank unit).

VALVE TIMING:—To Check Timing—Intake valve for #1 cylinder should open with piston on top dead center when 'C.1/6' (TDC) mark on harmonic balancer lines up with pointer on chain case, with tappet clearance of .0118". Reset tappet clearance .006" with engine hot.
Motor Gauge—Weidenhoff Adapter #114, Rod #40.

Tappet Clearance:—.006" Int., .009" Exh., hot.

Valve Spring Pressure:—40-46 lbs. at 2¼" (valve closed), 112-120 lbs. at 1 15/16" (valve open).

LUBRICATION:—Crankcase Capacity—7 qts. (refill).
Normal Oil Pressure—15 lbs. idling, 25 lbs. at 60 M.P.H.

BATTERY:—Delco, Type 17-K. 6 volt, 17 plate, 110 ampere hour capacity (20 hour rate).
Starting Capacity—131 amperes for 20 minutes.
Zero Capacity—300 amperes for 4.4 minutes.
Grounded Terminal—Positive (+) terminal.
Location—Under right hand front seat.

STARTER:—Model 727-N. Armature No. 823881.
Drive—Overrunning clutch and manual pinion shift operated by solenoid switch.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5500	5.0	65
15 "	Lock	3.0	600

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

Starting Switch:—Solenoid Switch Type 1516. Push-button Switch Type 1405. Solenoid switch controlled through relay by push button on instrument board. Operative only with ignition turned 'on'. See article in Equipment Section for complete data.

Solenoid Switch

Closes against 70 lb. pull with ½" air gap drawing 65-71 amperes at 5 volts. Holds switch closed with current draw of 12-14 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—4 volts max. **Open**—1.6-2.0 volts.
Contact Gap—.030-.045". **Air Gap**—.010-.014" (closed).

GENERATOR:—Model 961-D. Armature No. 1857866. Straight shunt (two brush) type with external voltage and current regulation. Ventilated by fan on drive pulley.

Charging Rate Adjustment—No adjustment at generator. Charging rate controlled by Voltage Regulator and maximum output controlled by Current Regulator. See Control Unit Section below and specitl article in Equipment Section.

Maximum Charging Rate—20 amperes (cold) with discharged battery as indicated on test ammeter connected in charging line at 'BAT' terminal on control unit. Decreases as battery comes up on charge. Generator output constant at all speeds above 1700 R.P.M. or 20 M.P.H.

Performance Data—Generator Cold

Amperes	Volts	R.P.M.
7	7.0-7.2	900
22	8.1-8.3	1900

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

Belt Adjustment:—Loosen generator pivot bolts and clamp bolt, pull generator out until belt deflection midway between fan and generator pulleys is ⅞-1" (measured from straightedge with ⅞" projection at center laid along belt).

CONTROL UNIT:—Model 5559. Mounted on dash. Consists of Vibrating Voltage Regulator, Vibrating Current Regulator, and Cutout Relay. See article in Equipment Section for complete data on these units.

Cutout Relay

Cuts In—6.5-7.0 volts, 12 M.P.H.
Cuts Out—3 ampere max. discharge at 6.3 volts.
Contact Gap—.018-.025".
Air Gap—.018-.022" with contacts closed.

Voltage Regulator

Setting—7.55-7.85 volts at 72° F., 7.45-7.55 volts at 150° F. Regulator is over-compensated for temperature and must be checked at these points.
Adjustment—Disconnect lead at 'IGN' terminal on regulator case, connect jumper between 'IGN' and 'BAT' terminals, connect test ammeter in charging line at 'BAT' terminal, connect voltmeter between 'IGN' terminal and ground, short out Current Regulator by connecting jumper across contacts. Operate generator at 2800-3200 R.P.M., adjust charging rate to 8-10 amperes, set regulator by bending spring hanger at lower end of armature spring until performance is as shown above. Remove jumpers, restore original connections.
NOTE—Do not operate generator on open-circuit at any time, or at excessive speed with Current Regulator shorted out. Voltage Regulator readings must be taken with cover on unit and setting should be checked by decreasing speed until Cutout Relay contacts open, and then increasing speed to original point.
Contact Gap—.015-.025".
Contact Spring Tension—3.5 ozs. minimum.
Air Gap—.060-.070" between armature and core with armature down so that fibre bumper just touches stop, .007-.010" between fibre bumper and stop with armature up.

Current Regulator

Setting—20-22 amperes.
Adjustment—Make connections as above (Voltage Regulator test), except that voltage regulator should be shorted out with jumper across contacts. Operate generator and set regulator by bending spring hanger at lower end of armature spring until maximum output is as given.
NOTE—Generator voltage must not be allowed to exceed 8.5 volts with Voltage Regulator shorted out.
Contact Gap—.015-.025".
Contact Spring Tension—3.5 ozs. minimum.
Air Gap—.070-.080" between armature and core with armature down so that fibre bumper just touches stop, .007-.010" between fibre bumper and stop with armature up.

LIGHTING:—Headlamps—Guide Multi-beam, Pre-focused, Cross-beam type with special non-interchangeable lenses. Headlamps aimed straight-ahead with lenses removed. Assymetrical passing beam (upper beam left hand headlamp, lower beam right hand headlamp), controlled by foot selector switch with lighting switch in 'Country Driving' position.
Headlamp Beam Indicators—Consist of four bulbs in lower half of speedometer which illuminate markers as follows:
City—Lower beam both headlamps.
Drive—Upper beam both headlamps.
Pass—Assymetrical passing beam (as above).
Park—Parking bulbs in headlamps.

Switches

Lighting—Delco-Remy Model 487-N, P. 487-R (RHD).
Foot Selector—Delco-Remy Model 471-Z.
Instrument Lamp—Delco-Remy Model 1364.
Stop Lamp—Hydraulic type on distributor at rear of brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamp (Right)	50-32	2530-L
Headlamp (Left)	32-32	2330-L
Instrmt., Map, Qtr., Step, Tail	3	63
Parking, Clock	1.5	55
Beam Indicators	1	51
Stop, Dome	15	87

NOTE—Headlamp bulbs are Pre-focused, 'Long-life' type. In all states where 50 cp. bulbs are prohibited, the 32-32 cp. 2330-L bulb is used in both headlamps.

THERMOSTATIC RELAY:—Model 411-A. Contacts remain closed with current of 25 amperes but open within one minute with load of 38 amperes. Non-adjustable.

HORNS:—Klaxon Model K-33-D, Type 1951 (low note), 1952 (high note). Vibrator type, twin horns with blended tone operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
1951	12-14	.045-.050"
1952	11-13	.036-.040"

NOTE—Horns identified by letter stamped on front of power unit cover and projectors must be assembled as follows: 'S'—low note, short projector; 'L' high note, long projector.

Horn Relay:—Model 266-T. Requires .25 amperes at 2 volts min. to close contacts. Current draw .8 amp.
Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.
Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—Same as engine number. Stamped on top of clutch housing and on left side of front frame cross member (on frame channel on first cars). First number—H-1.

COMPRESSION:—Ratio—6.7-1 Std. aluminum head. **Pressure**—105 lbs. at cranking speed of 100 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" with engine idling at 5 M.P.H.

IGNITION:—Part No. H-12000 (Complete Ignition Unit). Mounted on front of gear case and driven through tongue-and-slot coupling from camshaft.

Ignition Coil Part No. H-12004. Two coil unit mounted on top of ignition unit (one coil for each bank).

Ignition Current—3.2 amperes idling, 4.2 stopped.

Ignition Resistance—Mounted on lighting circuit breaker. One resistance unit connected in each coil primary circuit. Resistance per unit .325-.375 ohms at 68° F.

Ignition Switch:—Oakes Hershey type co-incidental ignition switch and steering post lock.

Distributor Model H-12000. Double breaker, 6 lobe cam, full automatic advance type with Vacuum Brake Control (see Ignition Setting for adjustment). Right hand contacts (movable or adjustable set) control right hand coil and fire spark plugs in right cylinder bank. Left hand contacts (fixed set) control left hand coil and fire plugs in left bank. Contacts open alternately at 37½ and 22½ degree intervals corresponding to 75 and 45 degree engine firing intervals (caused by 75° angle between banks) and must be synchronized (see Ignition Timing).

Breaker Gap—.014-.016" (both sets). Adjusted by loosening lockscrew and turning eccentric adjusting screw on stationary contact mounting bracket. Accessible through terminal plate opening after plates removed.

NOTE—New two-step feeler blade marked '014-.016" can be added to Ford BV-45 Feeler Guage Set and used as 'Go'—'No Go' gauge in setting gaps.

Cam Angle or Dwell—36.5° closed, 23.5° open. Each set operating independently.

Breaker Arm Spring Tension—20-24 ounces.

Condenser—Part No. H-12300 (2 used). Capacity .30-.34 mfd.

Automatic Advance
(High Vacuum—Vacuum Brake Inoperative)

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	200	0	400
2	300	4	600
3	375	6	750
4	480	8	960
6	720	12	1440
8	950	16	1900

Distributor Removal:—At front of engine. To remove, disconnect vacuum line, take out 3 capscrews in mounting flange.

IGNITION TIMING:—See Vacuum Brake Sec. below.

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

NOTE—Movable contacts should be synchronized when ignition is set and Timing Fixture V-126 must be used for this purpose. Manufacturer recommends use of this fixture for both synchronization and timing. V-126 fixture (Ford) modified for use on Zephyr by addition of correct timing marks on edge of disc.

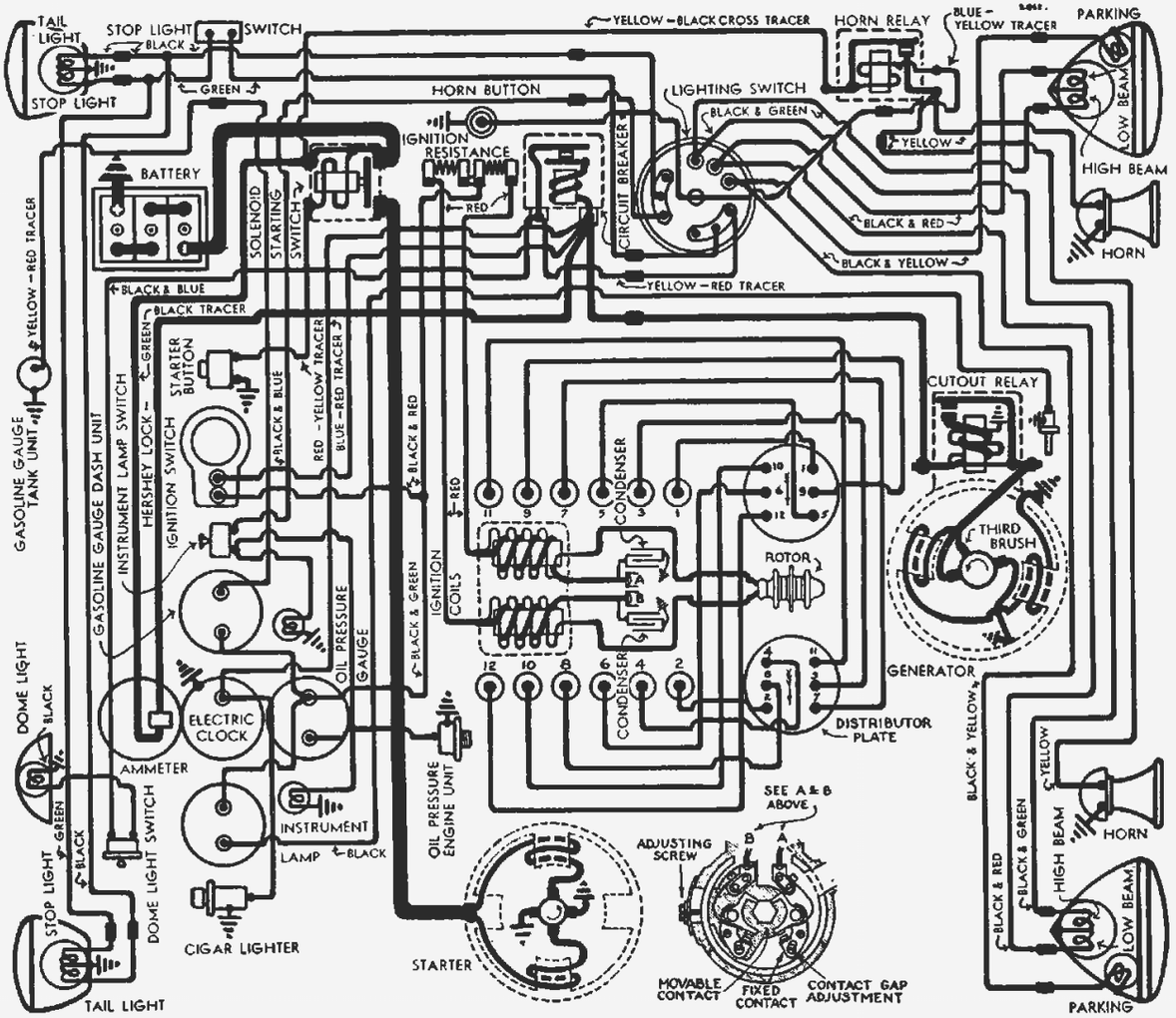
Timing (Fixed Set—on V126 Fixture)—Mount ignition unit on fixture, check contact gap and breaker arm spring tension, rotate disc in direction of arrow (counter-clockwise) until hole lines up with locking plunger, clip timing light lead to left hand coil terminal, loosen adjusting screw on side of ignition unit housing, move screw down (away from coil) to bottom of slot, then move screw up slowly until timing light goes out, tighten screw. Check by rotating disc one full revolution, stop when timing mark on outer edge of disc lines up with pointer on fixture. Contacts should open at this point.

Synchronization (Movable Set—on V-126 Fixture) Clip timing light lead to right hand coil, rotate disc counter-clockwise until next mark on edge of disc lines up with pointer. If timing light does not go out at this point, remove adjusting screw and graduated plate on side of housing, turn eccentric adjusting screw in slot clockwise to advance or counter-clockwise to retard spark until movable contacts begin to open and timing light goes out. Readjust breaker point gap (changed by synchronizing adjustment), repeat test.

Timing (On Engine)—With #1 piston on top dead center, loosen adjusting screw on 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 exactly one additional graduation, tighten screw. This will provide correct 4° BTDC. setting. No means provided to synchronize contacts on engine (use V-126 fixture).

Motor Gauge—Weidenhoff Adapter #114, Rod #40.

Vacuum Brake Setting:—Vacuum Brake should be adjusted for best performance with particular fuel and operating conditions. To adjust, loosen locknut, back off adjusting screw until engine 'pings' under load, turn up adjusting screw just enough to elimi-



nate ping, tighten locknut. With correct adjustment and no vacuum to release plunger, automatic advance starts at 850 R.P.M. (engine).

Firing Order:—1-4-9-8-5-2-11-10-3-6-7-12 with cylinders numbered as shown on diagram.

Spark Plugs:—Champion Type J-9. 14 MM. Metric.

Spark Plug Gaps—.025".

CARBURETION:—Carburetor—Stromberg Model EE-1. 31/32" dual, downdraft type. See Carburetion Section for complete adjustment, overhaul and Jet Specifications.

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

Idle Adjustment—Manufacturer recommends use of Vacuum Gauge and adjustment of idling screws for highest vacuum reading. If vacuum gauge is not used, set throttle stopscrew for 5 M.P.H. idling speed, turn each idle adjusting screw (in succession) in until engine begins to miss, out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump—Not adjustable.

Fast Idle:—Integral with carburetor and operative with choke valve closed. No adjustment required.

Air Cleaner:—AC. #1526761 oil-wetted type standard. Heavy duty oil-bath type optional.

Fuel Pump:—AC. Type R #1521764 Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—King-Seeley Electric. K-S No. 5766 (dash unit), 5850 (tank unit). Units identified by figure 'G' stamped on edge (dash unit), and by stamped number 'Lincoln H-9275' (tank unit). See article in Carburetion Section.

VALVE TIMING:—To Check Timing—No flywheel marks or other means provided to check timing. If top dead center position for piston #2 established on flywheel, intake opening point for this cylinder will be approximately 6 2/3 teeth before this point with piston .1268" before top dead center.

Motor Gauge—Weidenhoff Adapter #114, Rod #40.

Tappet Clearance:—.0125-.0135" all valves. No adjustment.

Valve Spring Pressure:—32-36 lbs. at 2.13" (valve closed), 62-66 lbs. at 1.84" (valve open).

LUBRICATION:—Crankcase Capacity—6 qts.
Normal Oil Pressure—30 lbs .at 35 M.P.H.

BATTERY:—Ford No. 40-10655-C. 6 volt, 17 plate, 96 ampere hour capacity (20 hour rate).
Starting Capacity—120 amperes for 20 minutes.
Grounded Terminal—Positive (+) terminal.
Location—Under left front seat.

STARTER:—Ford No. 18-11002. Armature No. 18-11005.
Drive—Inboard Bendix Type L11FX-10.
Cranking Engine—100 R.P.M., 225 amps. at 4.75 vs.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—2 lbs. each.

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:—Part No. H-11450-A. Magnetic type mounted on engine side of dash and controlled by pushbutton on instrument panel.

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

GENERATOR:—Part No. 68-10000-A or B (Std.), 68-10000-HA or HB (Radio). Armature No. 68-10005. Air-cooled. Third brush control type in conjunction with Two Rate Relay (voltage regulator) on 68-10000-HA, HB only.
NOTE—Pulleys used on these generators vary according to service requirements as given below:

Generator	Pulley Diameter
68-10000-A, HA	4.2"
68-10000-B, HB	3.4"

Charging Rate Adjustment—Take off commutator cover band, shift third brush by hand counter-clockwise (down) to increase or clockwise to decrease charging rate. Brush held in position by friction.

Standard Charging Rate Setting—(68-10000-A, B) 18 amperes hot at 6.75 volts reached at 1650 R.P.M. or 27.5 M.P.H. 68-10000-A), 22.2 M.P.H. (68-10000-B). **(68-10000-HA, HB)** 31.6 amperes hot at 7.7 volts reached at 2000 R.P.M. or 33 M.P.H. (68-10000-HA), 27 M.P.H. (68-10000-HB).

Performance Data

Models 68-10000-A, B—Generator Hot

Amperes	Volts	R.P.M.
0	6.2	660
5	6.45	865
10	6.6	1110
14	6.65	1315
18	6.75	1650
20.4	6.8	2775

Models 68-10000-HA HB—Generator Hot

0	6.2	660
5	6.4	790
10	6.55	900
15	6.7	1030
20	6.95	1180
25	7.3	1400
30	7.6	1800
31.6	7.7	2000

Rotation—Counter-clockwise at commutator end.
Field Current—4.4 amperes at 6.45 volts (maximum) at 1300-1500 R.P.M. of generator (68-10000-A, B), 3.65 amperes at 5.6 volts (maximum) at 1050 R.P.M. of generator (68-10000-HA, HB).

Removal:—Generator mounted on bracket between cylinder banks at front of engine. Driven by fan belt in tandem with two water pumps. To remove, take out support bolts in bracket under generator.

Belt Adjustment:—Loosen support bolts, raise generator until total sideplay on belt midway between water pump and generator pulleys is ¾-1", tighten support bolts.

CUTOUT RELAY:—Part No. B-10505. Mounted on generator field frame. Generator field lead (black wire) grounded to relay mounting screw on generator.

Cuts In—7 volts, 10 M.P.H.

Cuts Out—3 ampere maximum discharge.

Contact Gap—.015-.020".

Air Gap—.010-.015" with contacts closed.

RELAY-REGULATOR:—Part No. 68-10505 (68-10000-HA, HB Generators). Cutout relay and voltage regulator (two-rate relay) in case on generator. See article in Equipment Section on these units.

Cutout Relay—Specifications same as B-10505 above.

Regulator—Contacts open at 8.5 volts reducing charging rate to approximately 20% of high rate, and remain open until cutout relay contacts open.

LIGHTING:—Headlamps—Headlamps aimed straight ahead (adjust with lenses removed, check with lenses in place). Upper and lower beams controlled by light switch handle on steering wheel. Bulbs are pre-focused type.

Switches

Lighting—R.B.M. Model H-11654.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2330
Parking	1½	55
Instrument, Dome	6	81
Stop and Tail	21-3	1158

CIRCUIT BREAKER:—R.B.M. Model 1640, Ford Part No H-11624. Vibrating type circuit breaker mounted on dash. Connected in lighting circuits. Begins to operate with load of 52-54 amperes limiting load to 15 amperes.

HORNS:—Sparton Vibrator type twin horns operated by horn relay.

Horn Relay:—R.B.M. Model 10072. Contacts close with terminal voltage of 4.0 volts maximum with relay inverted.

Current Draw—.40-.55 amperes at 6.0 volts.

Coil Resistance—11-14 ohms.

SERIAL NUMBER:—On plate on front of dash. Use engine number (5501) stamped on left side of crankcase at center.

COMPRESSION:—Ratio—6.38-1. Std. Aluminum head. **Pressure**—105-110 lbs. at cranking speed of 100 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" with engine idling at 5-7 M.P.H.

IGNITION:—Coil Model CE-4001-L. Two coil unit mounted on dash above distributor.

Ignition Current—1.5 amperes idling, 5 amperes stopped for each coil.

Ignition Switch:—Oakes Hershey co-incidental ignition switch and steering post lock.

Distributor Model IGM-4003, IGM-4003A (export). Double breaker, 6 lobe cam, full automatic advance type.

Firing Interval—Alternate opening at 33½ and 26½° intervals corresponding to unequal 67 and 53° firing intervals of engine. Contacts must be synchronized. See Timing.

Breaker Gap—Set at .020" (both sets equal).

Cam Angle or Dwell—36° closed, 24° open. Each set operates independently.

Breaker Arm Spring Tension—14-16 ounces.

Condenser—Part No. IG-2671A, IG-2671E (one each).

Condenser Capacity—.20-.25 mfd.

Automatic Advance—IGM-4003

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
2	660	4	1320
4	1000	8	2000
6	1365	12	2730
8.5	1800	17	3600

Automatic Advance—IGM-4003-A

Start	300	0	600
4	450	8	900
6	800	12	1600
8	1140	16	2280
10	1500	20	3000
12	1840	24	3680

Removal:—Distributor mounted between banks at rear of engine. To remove, take off distributor conduits and cap, take out hold-down screws in advance arm.

IGNITION TIMING:— **Flywheel Degrees** **Piston Pos.**
All engines.....At TDC.....000" TDC.

NOTE—Right hand (stationary) contacts control right coil and fire spark plugs in right cylinder bank. Left hand (movable) contacts control left coil and fire plugs in left bank.

Timing (Stationary Contacts)—With #2 piston (front cylinder, right bank) on top dead center entering power stroke and flywheel mark 'D2/12C' at indicator in inspection hole in right top face of flywheel housing, loosen taper lockscrew in center of breaker cam, carefully locate cam so that right hand (stationary) contacts are beginning to open, tighten lockscrew. Then synchronize movable contacts.

Synchronization (Movable Contacts)—Turn engine over 67° to firing position of piston #1 (front cylinder, left bank), stop with piston on top dead center when flywheel mark 'D1/11C' lines up with indicator. 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.

Motor Gauge—Weidenhoff #113 Adapter, #37 Rod.

Firing Order:—1-4-9-8-5-2-11-10-3-6-7-12 with cylinders numbered as indicated on diagram. Spark plugs not connected in this order on distributor cap.

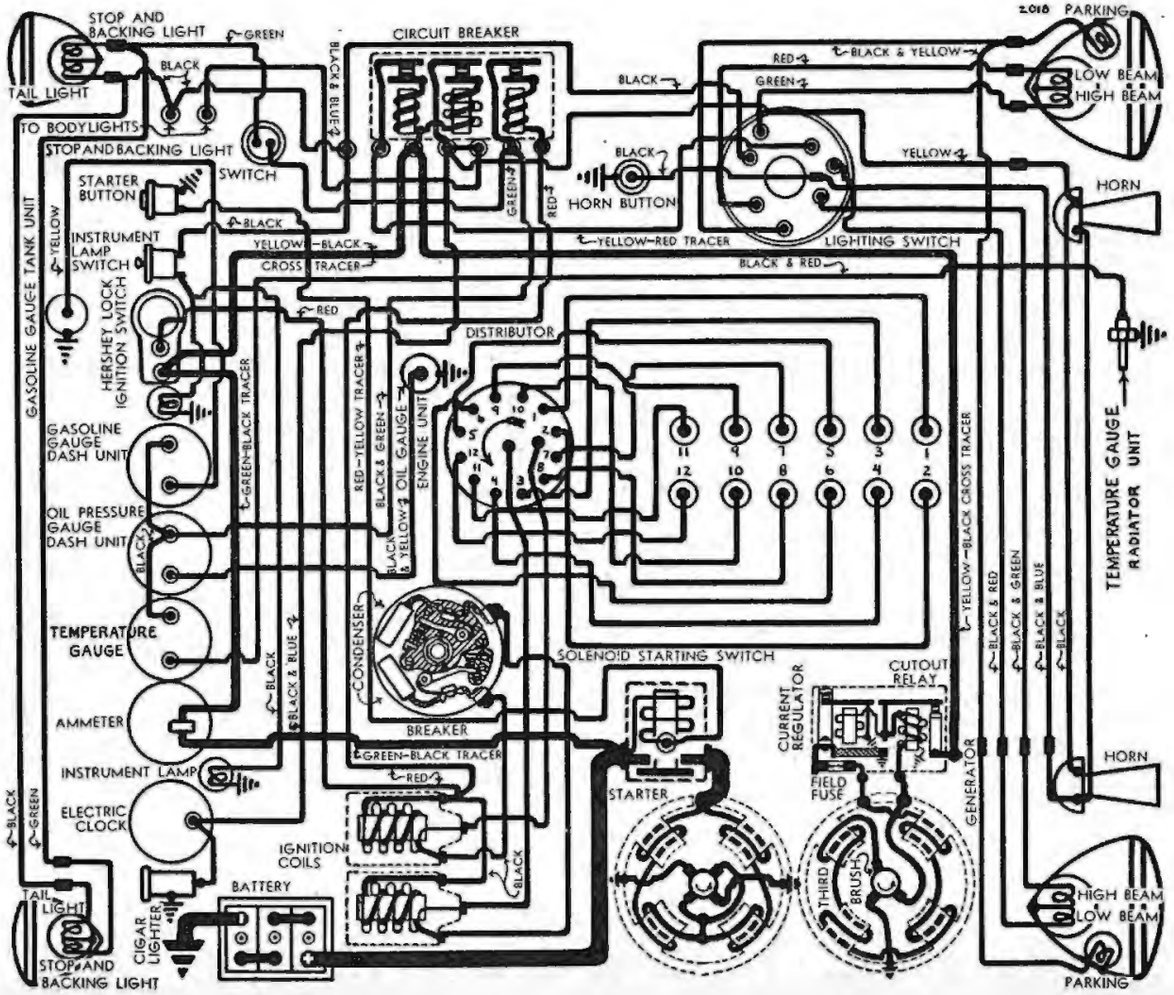
Spark Plugs:—Champion Type 7. 18 MM. Metric.
Spark Plug Gaps—.025".

CARBURETION:—Carburetor—Stromberg Model EE-22, 1.437" (1 7/16"), dual downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.

NOTE—Do not make carburetor adjustments until engine is warmed up and choke valve is wide open.

Idle Adjustment—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 on all 12 cylinders and readjust throttle stopscrew for correct idling speed.

Idling adjustment can also be made by turning one idling adjusting screw in until it is seated and then adjusting the second idling adjusting screw as directed above. The first adjusting screw should



then be turned out slowly until engine fires evenly on all 12 cylinders.

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

Air Cleaner:—AC. #1525939 oil-wetted type std.

Fuel Pump:—AC. Type I #1521218 combination fuel and vacuum pump. See article in Carburetion Sec.

Gasoline Gauge:—King-Seeley Electric. Part No. 5766 (dash unit), 5852 (tank unit). See article in Carburetion Section.
NOTE—Dash unit identified by letter 'G' stamped on edge, tank unit stampedl 'Lincoln K-8380-E'.

VALVE TIMING:—To Check Timing—No flywheel marks provided. Intake valve for cylinder #2 open with piston 21° or .1768" before top dead center when point on flywheel approximately 6.77 teeth before top dead center mark 'D2/12C' lines up with indicator in inspection hole in right top face of housing.

Tappet Clearance:—.004" Int., .006" Exh. Cold.

Valve Spring Pressure:—60-66 lbs. at 2.687" (valve closed), 187-199 lbs. at 2.343" (valve open).

LUBRICATION:—Crankcase Capacity—12 qts. (refill).
Normal Oil Pressure—40 lbs. at 50 M.P.H.

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:—Model MAO-4003B, MAO-4004B Export. Armature No. MAB-2006.
Drive—Outboard Bendix Type RB10FXXTD.
Cranking Engine—100 R.P.M., 150-200 amperes at 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). Magnetic type mounted on starter and controlled by pushbutton on instrument panel. See article in Equipment Section.

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

GENERATOR:—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 cup 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.
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		
Amperes	Volts	R.P.M.	Amperes	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 setting will be lost requiring resetting.

RELAY - REGULATOR:—Model TC-4302A, TC-4305A (Export). Mounted on generator. Consists of Cutout Relay and Current Regulator (two-rate charge control). See article in Equipment Section for complete data.

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.

Current Regulator

Contacts Open—8.25-8.75 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. Upper and lower beams controlled by lighting switch lever on steering wheel. Assymetrical passing beam (lower beam left hand headlamp, upper beam, right hand headlamp) provided with switch lever in #2 position. Left hand headlamp aimed straight ahead, right hand headlamp slightly to right.

Switches

Lighting—R.B.M. Model 1300.
Compartment—R.B.M. Model 1260.
Door Switch—R.B.M. Model 1550.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320-C
Parking	1½	55
Stop and Tail	21-3	1158
All others	6	81

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 ozs. minimum.

FUSES:—Generator Field—5 ampere in cup on regulator.

HORNS:—Sparton. Vibrator type twin horns. Operated by horn relay. Horn current 20 amperes (both).
Horn Relay:—R.B.M. Model 10072. Contacts close at 4 volts maximum across windlng with relay inverted.
Current Draw—.4-.55 amperes at 6.0 volts.
Coil Resistance—11-14 ohms.

SERIAL NUMBER:—First number—R-303301. On right hand frame side rail under engine hood.

COMPRESSION:—Ratio—5.25-1 Cast-iron head.
Pressure—125 lbs. at 350 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" with engine idling.

IGNITION:—Coil Model CE-4402-A (2 used). Coils are mounted on dash.
Ignition Current—2 amperes (running), 4 amperes (stopped) for each coil.

Ignition Switch:—Oakes Hershey type co-incidental ignition switch and steering post lock.
Ignition Lock—

Distributor Model IGE-4012-A, IGE-4012-B (after serial number R-303971 and R-303920 excepting cars R-303058 to 304077 inclusive). Double breaker, 6 lobe cam, full automatic advance type. Contacts open simultaneously to fire both spark plugs in each cylinder at the same instant. Each set of contacts controls one coil and fires one spark plug in each cylinder. Contacts must be synchronized—see Timing.
Breaker Gap—Set at .020". Limits .018-.020".
Cam Angle or Dwell—Closed 35°. Open 25°.
Breaker Arm Spring Tension—16-20 ounces.
Condenser—Part No. IG-2671. Capacity .20-.25 mfds.

Automatic Advance—IGE-4012-A

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	200	0	400
3	360	6	720
6	520	12	1040
9	680	18	1360

Automatic Advance—IGE-4012-B

Start	200	0	400
3	475	6	950
6	740	12	1480
9	1000	18	2000

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

IGNITION TIMING:—Stationary Contacts—With #1 piston on compression, turn engine over until 'IGN' mark on vibration dampener at front of engine lines up with pointer on chain case cover. The second line indicates top dead center. Loosen advance arm clamp bolt, rotate distributor until fixed contacts (mounted directly on breaker plate) begin to open, tighten clamp bolt. Then check synchronization of movable contacts.

Synchronization (Movable Contacts)—Movable contacts (mounted on sub-plate) should open at the same instant as the fixed set (see above). After timing stationary contacts, and without disturbing position of crankshaft or distributor, loosen lockscrews on movable sub-plate carrying the second set of contacts, shift plate by prying with a screwdriver inserted in the slot in the edge of the plate until contacts begin to open, tighten lockscrews. See Equipment Section for complete article on Synchronization of IGE type distributors.
Motor Gauge—Weidenhoff Adapter #113 (with #152 Adapter plus No. X4615 Collar), Rod #37.

Firing Order:—1-5-3-6-2-4. Spark plug cables are not connected in this order on distributor cap (see diagram).

Spark Plugs:—AC. Type K-12 14 MM. Metric. Type K-7 used on cars with overdrive.
Spark Plug Gaps—Set at .025" (.030" on cars with radio).

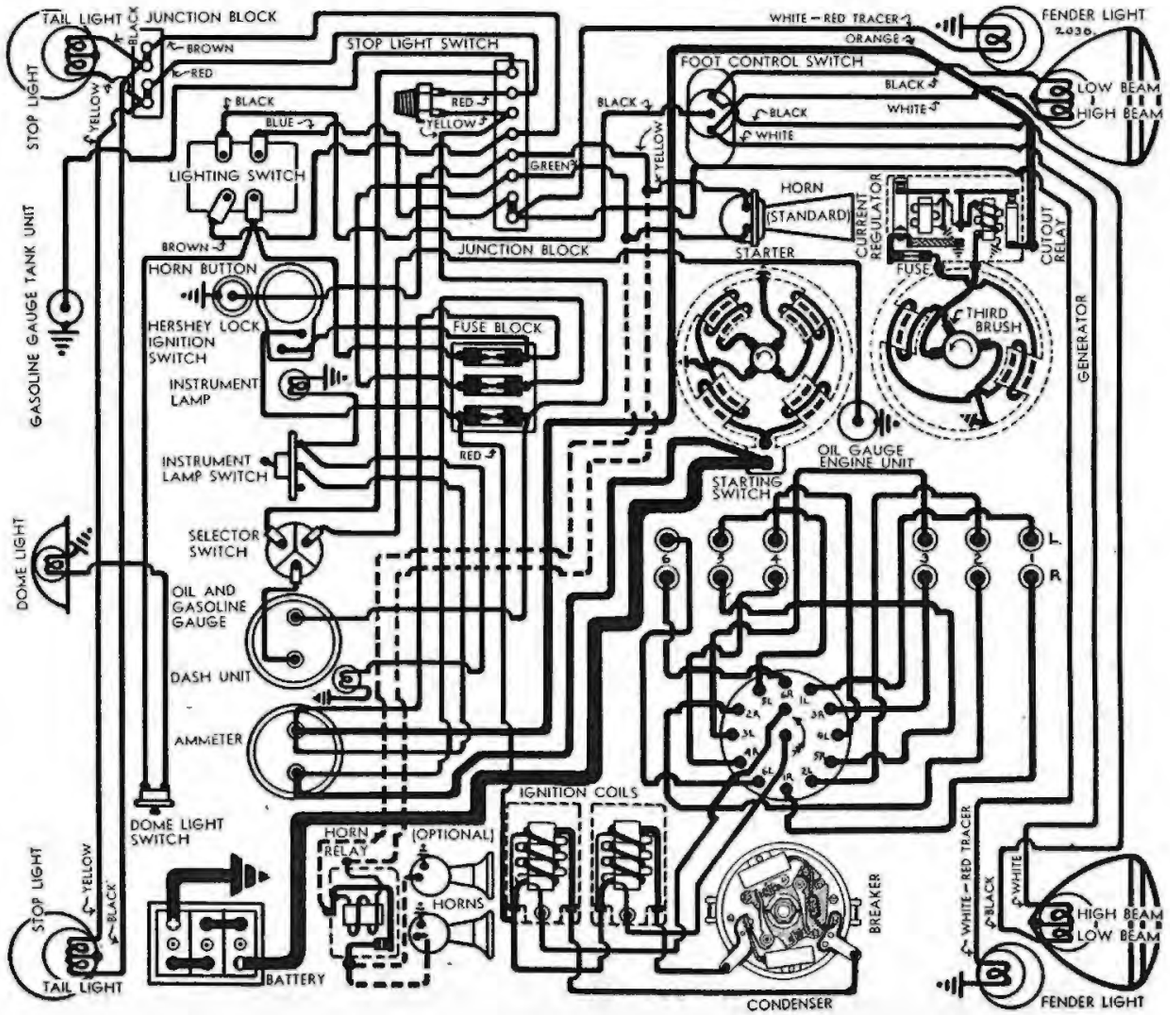
CARBURETION:—Carburetor—Stromberg Model EX-32, 1¼" downdraft type with manual choke control. See Carburetion Section for adjustment, overhaul and Jet Specifications.
NOTE—Do not adjust carburetor until engine is warmed up so that choke valve is wide open and engine idling at hot or slow idling speed.

Idle Adjustment—With engine hot and choke valve fully released, set throttle stopscrew to idle engine at 5-7 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. Readjust throttle stopscrew for correct idling speed if necessary.
Accelerating Pump Setting—Pump lever has two holes for pump link engagement. Change for seasonal requirements:
Outer Hole—(Max. stroke)—Winter temperatures.
Inner Hole—(Min. stroke)—Summer temperatures.

Air Cleaner:—AC. #1525945 oil-wetted type standard, heavy duty oil-bath type optional.

Fuel Pump:—AC. Type W #1522153. Diaphragm type. See article in Carburetion Section for complete data.

Gasoline Gauge:—Stewart Electric type, combination oil and gasoline gauge.



VALVE TIMING:—To Check Timing—No means provided for checking timing other than Camshaft Setting. Remove chain case cover at front of engine. Sprockets are marked. Mesh chain with sprockets turned so that marks are adjacent and in line with a straightedge across shaft centers. Remove and install chain 'endless'. Use special gear pullers and pushers, keep sprockets lined up so as to avoid side-strain on chain or sprockets.

Motor Gauge—Weidenhoff Adapter #113 (with #152 Adapter plus No. X4615 Collar), Rod #37.

Tappet Clearance:—.015" all valves with engine hot, running at idling speed.

LUBRICATION:—Crankcase Capacity—7 quarts.
Normal Oil Pressure—25 lbs. (10 lbs. idling).

BATTERY:—U.S.L. Type KL-1-13. 6 volt, 13 plate, 100 ampere hour (20 hour rate).
Starting Capacity—120 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.1 minutes.
Grounded Terminal—Positive (+) terminal.
Location—Under right front seat.

STARTER:—Model MAB-4077. Armature MAB-2057.
Drive—Inboard Bendix Type LCD11FX-10.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—42-53 ounces (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	3.0	582
22.5 "	Lock	4.0	775

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

Starting Switch:—Model VC-4002. Vacuum control type. Mounted on starter field frame and operated by clutch pedal. See artiele in Equipment Section for complete data.
Starting switch cable adjustment—Starting switch should make contact just after clutch is released. To check, engage transmission gears, depress clutch pedal, note when starter engages. If clutch is not completely released (car will tend to move) or if pedal travel is excessive, adjust by loosening two clamp bolts on clutch throwout shaft lever to which switch cable is attached and move clamp in (for later engagement) or out (for earlier engagement) of starter.

GENERATOR (First cars):—Model GAR-4601-5. Armature GAR-2214. Third brush control type. Air cooled.
Charging Rate Adjustment—Take off commutator band. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate. Brush held in position by friction.
Standard Charging Rate Setting—20 amperes (cold), 16 amperes (hot), 2300 R.P.M.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	720	0	6.4	760
4	6.8	860	4	6.8	925
8	7.25	1000	8	7.25	1125
12	7.7	1160	12	7.7	1350
16	8.1	1360	16	8.1	1680
20	8.5	1660	19.2	8.4	2600
22.4	8.8	2300			

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-36 ounces.
Field Current—4.46-4.94 amperes at 6.0 volts.
Motoring Current—4.89-5.41 amperes at 6.0 volts.
Field Fuse—7½ amperes. Under cover on generator.

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

Belt Adjustment:—Adjust belt when sideplay at point midway between generator and fan pulley exceeds 1½". To adjust, loosen two capscrews on fan bracket, raise bracket up (bracket pivots on one screw) until sideplay on belt is approximately 1", tighten screws.

GENERATOR (Later cars):—Model GBR-4602-4. Armature GAR-2214. Third brush control in conjunction with Current Regulator (two-rate charging control). Air cooled.
Charging Rate Adjustment—Use test meters to check generator output. Short out current regulator by conencting jumper wire from 'F' terminal on generator to ground. Take off commutator band, shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate until output is 26 amperes at 8.0 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.
Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold — Regulator Inoperative — Hot

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	720	0	6.4	780
4	6.65	820	4	6.7	900
8	6.9	920	8	6.95	1060
12	7.1	1050	12	7.2	1250
16	7.4	1200	16	7.5	1440
20	7.6	1400	20	7.8	1840
26	8.0	2400	23	8.0	2800

Field Current—4.13-4.57 amperes at 6.0 volts.
Motoring Current—5.84-6.46 amperes at 6.0 volts.
Field Fuse—5 ampere in knurled cup on side of regulator case.
Rotation, Brush Spring Tension, Removal and Belt Adjustment same as for generator on first cars. See above.

CUTOUT RELAY:—Model CB-4014 (Used on GAR-4601-5 generator). Mounted on generator. See article in Equipment Section for complete data.
Cuts In—6.75-7.5 volts, 750 R.P.M.
Cuts Out—.5-2.5 amperes discharge current.
Contact Gap—.025-.035".
Air Gap—.010-.030" with contacts closed.

RELAY-REGULATOR:—Model TC-4313-A (used on GBR-4602-4 generator). Mounted on generator. Consists of Cutout Relay and Current Regulator (two-rate charging control). See Equipment Section article for complete data.

Cutout Relay

Cuts In—6.5-7.25 volts, 750 R.P.M.
Cuts Out—.5-2.5 ampere discharge current.
Contact Gap—.015-.045" (with upper or ground contacts closed—ground contacts must be open with main contacts closed).
Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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—Corcoran-Brown, Pre-focused type. Upper and lower beams controlled by foot selector switch.

Switches

Lighting—Soreng-Manegold Model A-5820-A.
Foot Selector—H. A. Douglas. Nash Part No. 46939.
Stop Light—Motometer Hydraulic #58012. Nash Part No. 47601.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Stop and Tail	21-3	1158
Fender, Instrument	3	63
Dome	6	81

FUSES:—Lighting—20 ampere on fuse block mounted on steering column brace in back of instrument panel.
Horn—20 (single horn), 30 ampere (dual horns) on fuse block as above.
Stop Light and Gasoline Gauge—20 ampere on fuse block as above.
Generator Field—7½ ampere on generator frame (GAR). 5 ampere in knurled cup on regulator case (GBR).

HORNS:—Sparton Model B-6366 Std. Single horn. Dual horns Nash Part Nos. 47607-A (long), 47608-A (short), operated by horn relay. All horns vibrator type.

Horn Relay:—R.B.M. Type 10072. Current draw .4-.55 amperes at 6.0 volts. Coil resistance 11-14 ohms. Contacts must close with 4 volts across winding with relay in inverted position.

SERIAL NUMBER:—First number—C-1001. On plate on right frame side member under engine hood and on caution plate on left front door corner post.

COMPRESSION:—Ratio—5.58-1 Cast-iron head.
Pressure—125 lbs. at 350 R.P.M.

VACUUM READING:—Gauge should show steady read-reading of 18-20" with engine idling.

IGNITION:—Coil Model IG-4626-A. Mounted on cowl.
Ignition Current—2½ amperes idling, 4 stopped.

Ignition Switch:—Mitchellock Model 24-B, Type 6708. Conected to coil by armored cable.
Ignition Lock—Briggs & Stratton Model 50184, Mitchell No. 6760.

Distributor Model IGB-4328-B. Single breaker, 6 lobe cam, full automatic advance type.
Breaker Gap—Set at .020". Limits .018-.020".
Cam Angle or Dwell—Closed 40°. Open 20° (distributor degrees).
Breaker Arm Spring Tension—16-20 ounces.
Condenser—Part No. IGB-1025. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
3	390	6	790
7	500	14	1000
10	800	20	1600
12	1100	24	2200

Distributor Removal:—Mounted on right side of cylinder head. To remove, loosen locknut and take out mounting setscrew inside of cylinder head opposite distributor.

IGNITION TIMING:— **Flywheel Deg.** **Piston Position**
All engines ..... at TDC ..... .0000" TDC
Timing—With #1 piston on compression, turn engine over until piston reaches top dead center, stop when 'IGN-DC' mark on vibration dampener at front of engine lines up with pointer on chain case cover. Loosen locknut and setscrew on side of cylinder head, rotate distributor until contacts begin to open, tighten setscrew and locknut.
NOTE—Manufacturer recommends Timing Light for this operation.
Motor Gauge—Weidenhoff Adapter #113 (with #152 Adapter plus No. X4615 Collar), Rod #37.

Firing Order:—1-5-3-6-2-4. (see diagram).

Spark Plugs:—AC. Type G-8. 18 MM. Metric.
Spark Plug Gaps—Set at .025". (.030" on cars with radio). In some cases performance has been improved by setting the gaps at .020" in the field.

CARBURETION:—Carburetor—Stromberg Model AX-2, downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.
NOTE—Do not adjust carburetor until engine is thoroughly warmed up and choke valve is wide open.
Idle Adjustment—Adjust throttle stopscrew so that idle speed is 5-7 M.P.H. Turn idle adjusting screw in until engine begins to hesitate or miss, then out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Engage pump link in proper hole in throttle lever for seasonal requirements as follows:
#1—Inner hole (Min. stroke)—Extremely hot temperatures.
#2—Center hole (Med. stroke)—Normal summer temperatures.
#3—Outer hole (Max. stroke)—Winter temperatures.

Air Cleaner:—AC. #152967 oil-wetted type standard. Heavy duty oil-bath type optional.

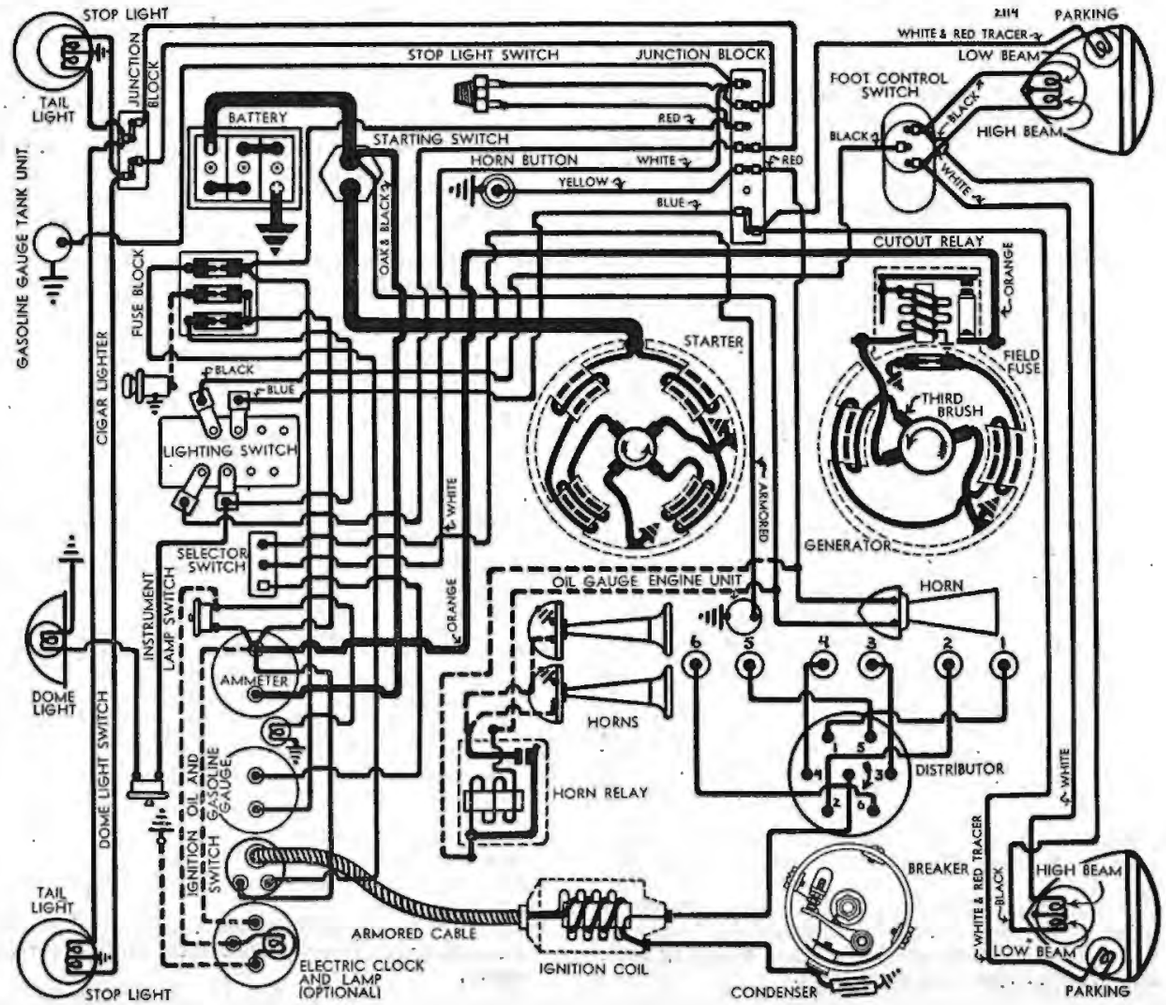
Fuel Pump:—AC. Type W #1522152, Type R #1522133 (RHD), diaphragm types. See article in Carburetion Section.

VALVE TIMING:—To Check Timing—No means provided for checking timing other than Camshaft Setting. Remove chain case cover at front of engine. Sprockets are marked. Mesh chain with sprockets turned so that marks are adjacent and in line with a straightedge across the shaft centers. Install chain 'endless' with camshaft sprocket off engine.
Motor Gauge—Weidenhoff Adapter #113 (with #152 Adapter plus No. X4615 Collar), Rod #37.

Tappet Clearance:—.015" all valves. Engine hot or cold.

LUBRICATION:—Crankcase Capacity—7 quarts.
Normal Oil Pressure—25 lbs. (10 lbs. idling).

BATTERY:—U.S.L. Type KL-1-13. 6 volt, 13 plate, 100 ampere hour capacity (20 hour rtae).
Starting Capacity—120 amperes for 20 minutes.



Zero Capacity—300 amperes for 3.1 minutes.

Grounded Terminal—Positive (+) terminal is grounded to frame and to transmission cover bolt.

Location—On left side under drivers' seat.

STARTER:—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
.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

NOTE—Lock torque figures correct without switch.

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

Starting Switch:—Type SW-4005. Mounted at left of engine. Operated by depressing clutch pedal.

GENERATOR:—Model GAR-4618-2. Armature GAR-2155. (First cars). Model GAR-4634-2. Armature GAR-2214 (Later cars). Air cooled. Third brush control type.

Charging Rate Adjustment—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.

Maximum Charging Rate—18 amperes (cold), 16 amperes (hot), 8.0 volts, 2300 R.P.M.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	800	0	6.4	800
4	6.8	940	4	6.85	960
8	7.15	1125	8	7.25	1160
12	7.5	1380	12	7.65	1500
16	7.85	1740	16	8.0	2300
18	8.0	2250			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-36 ozs. (new brushes).

Field Current—3.7-4.1 amperes at 6.0 volts.

Motoring Current—4.94-5.46 amperes at 6.0 volts.

Field Fuse—5 ampere on generator field frame.

Removal:—Generator cradle mounted at left front of engine with fan belt drive. Water pump impellor mounted on generator shaft. To remove, drain radiator, take out water pump mounting bolts or remove water pump cover screws. Slack off belt adjustment. Loosen mounting clamp band, lift out water pump and generator.

Belt Adjustment:—Adjust when slack or sideplay of belt midway between generator and fan pulleys exceeds 1½". To adjust, loosen two capscrews on fan bracket, lift bracket up (pivots on one screw) until sideplay is approximately 1", tighten capscrews.

CUTOUT RELAY:—Model CB-4014. Mounted on generator. See Equipment Section article for complete data on this unit.

Cuts In—6.75-7.5 volts, 800 R.P.M.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.025-.035".

Air Gap—.010-.030" with contacts closed.

LIGHTING:—Headlamps—Corcoran-Brown, Pre-fo-fused type. Foot selector switch controls upper and lower beams.

Switches

Lighting—Soreng-Manegold Model A-5820-A.

Foot Selector—H. A. Douglas.

Stop Light—Motometer Hydraulic #58012. Nash Part No. 47601.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Stop and Tail	21-3	1158
Parking, Instrument	3	63
Dome	6	81

FUSES:—Lighting—20 ampere on fuse block on back of instrument panel.

Stop Light and Gasoline Gauge—20 ampere on fuse block as above.

Generator Field—5 ampere on generator frame.

SERIAL NUMBER:—First number B-77325. On right front side rail under engine hood.

COMPRESSION:—Ratio—5.25-1 Cast-iron head.
Pressure—110 lbs. at 350 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" with engine idling.

IGNITION:—Coil Model CE-4402-A (2 used). Coils are mounted on dash.

Ignition Current—2 amperes (running), 4 amperes stopped.

Ignition Switch:—Oakes Hershey type co-incidental ignition switch and steering post lock.

Distributor Model IGK-4101. Double breaker, 8 lobe cam, full automatic advance type. Contacts open simultaneously to fire both spark plugs in each cylinder at the same instant. Each set of contacts controls one coil and fires one spark plug in each cylinder. Contacts must be synchronized (see Timing).

Breaker Gap—.015". Limits .013-.017" (.015-.019" first 1000 miles with new contacts).

Cam Angle or Dwell—Closed 28°. Open 17° (distributor). Each set operates independently and controls one coil.

Breaker Arm Spring Tension—20 ounces.
Condenser—Part No. IG-2671. Capacity .20-.25 mfds.

Automatic Advance

Distributor		Enigine	
Degrees	R.P.M.	Degrees	R.P.M.
Start	200	0	400
3	360	6	720
6	520	12	1040
9	680	18	1360
12	840	24	1680
15	1000	30	2000

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

IGNITION TIMING:—Stationary Contacts—With #1 piston on compression, turn engine over until first line on vibration dampener at front of engine lines up with pointer on chain case cover. This line is the 'IGN' mark and the second line indicates top dead center. Loosen advance arm clamp bolt, rotate distributor until stationary contacts (mounted directly on breaker plate) begin to open, tighten clamp bolt. Then check synchronization of movable contacts.

Synchronization (Movable Contacts)—Movable contacts (mounted on sub-plate) should open at the same instant as the stationary set (see above). After timing stationary contacts, and without disturbing position of crankshaft or distributor, loosen lockscrews on sub-plate carrying the second set of contacts, shift plate by prying with a screwdriver inserted in the slot in the edge of the plate until contacts begin to open, tighten lockscrews. See Equipment Section for complete article on synchronization of IGK type distributors.

Motor Gauge—Weidenhoff Adapter #113, Rod # 31.

Firing Order:—1-6-2-5-8-3-7-4. Spark plugs not connected in this order on distributor cap (see diagram).

Spark Plugs:—AC. Type K-12. 14 MM. Metric. Type K-7 used on cars with overdrive.

Spark Plug Gaps—Set at .025" (.030" on cars with radio).

CARBURETION:—Carburetor—Stromberg Model EE-1. 1" dual, downdraft type with manual choke control. NOTE—Do not adjust carburetor until engine is hot and engine will idle at slow idling speed with choke valve wide open.

Idle Adjustment—With engine hot and choke valve wide open, set throttle stopscrew to idle engine at 5-7 M.P.H. Turn both idling adjusting screws in simultaneously until engine begins to lag or miss, then turn screws out until engine begins to roll, finally turn screws out until engines fires smoothly. Readjust throttle stopscrew for correct idling speed if necessary.

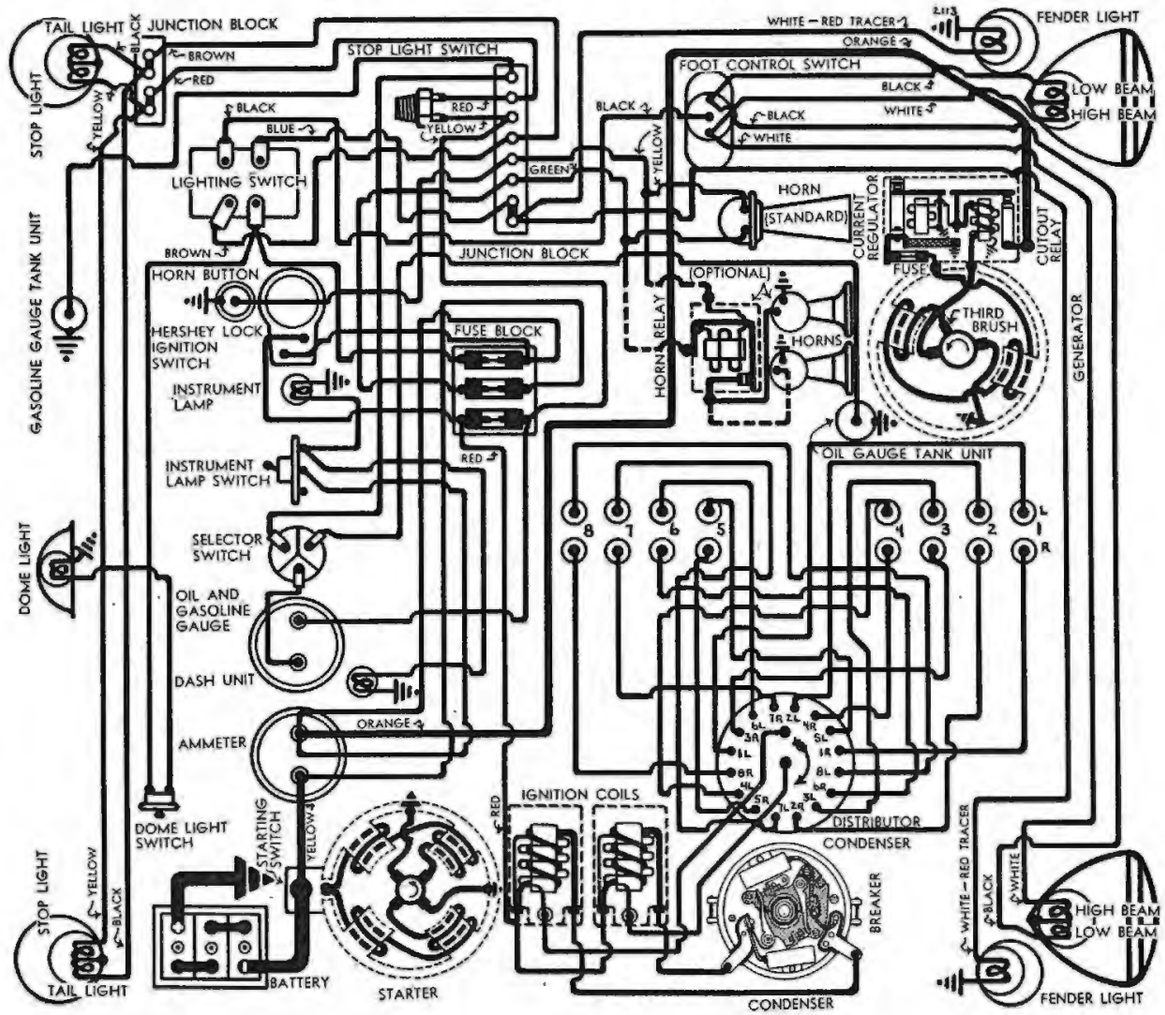
Accelerating Pump Setting—Pump lever has two holes for pump link engagement. Change for seasonal requirements:—
Outer Hole (Max. stroke)—Winter temperatures.
Inner Hole—(Min. stroke)—Summer temperatures.

Air Cleaner:—AC. #1525949 oil-wetted type standard. Heavy duty oil-bath type optional.

Fuel Pump:—AC. Type W #1522154. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Stewart Electric. Combination oil and gasoline gauge.

VALVE TIMING:—To Check Valve Timing—No means provided for checking timing other than Camshaft Setting. Remove chain case cover at front of engine. Sprockets are marked. Mesh chain with



sprockets turned so that marks are adjacent and in line with a straightedge across the shaft centers. Remove and install chain 'endless.' Use special gear pullers and pushers, keep sprockets lined up so as to avoid sidestrain on chain or sprockets.

Motor Gauge—Weidenhoff Adapter #113, Rod #31.

Tappet Clearance:—.015" all valves with engine hot, running at idling speed.

LUBRICATION:—Crankcase Capacity—7 quarts.

Normal Oil Pressure—25 lbs.

BATTERY:—U.S.L. Type KW-15-A. 6 volt, 15 plate, 116 ampere hour capacity (20 hour rate).

Starting Capacity—140 amperes for 20 minutes.

Zero Capacity—300 amperes for 4.0 minutes.

Grounded Terminal—Positive (+) terminal is grounded to frame and to transmission cover bolt.

Location—Under right front seat.

STARTER:—Model MAB-4054, MAB-4057 (Export). Armature No. MAB-2047.

Drive—Inboard Bendix Type LCD11FX-10.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—44-56 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	3.0	582
22.5 "	Lock	4.0	775

NOTE—Lock torque figures correct without switch.

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

Starting Switch:—Model VC-4003, VC-4002 (Export). Vacuum control type, mounted on starter field frame and operated by clutch pedal. See Equipment Section for complete article.

Starting Switch Cable Adjustment—Starting switch should make contact just after clutch is released. To check, engage transmission gears, depress clutch pedal, note when starter engages. If clutch is not entirely released (car will tend to move), or if pedal travel is excessive, adjust by loosening two clamp bolts on clutch throw-out shaft lever to which switch cable is attached and move cable clamp in (for later engagement) or out (for earlier engagement of starter).

GENERATOR:—Model GBR-4602-4. Armature GAR-2214. Third brush control in conjunction with Current Regulator (two rate charging control). Air-cooled.

Charging Rate Adjustment—Use test meters to check generator output. Short out current regulator by connecting jumper wire from 'F' terminal on generator to ground. Take off commutator band, shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate until output is 26 amperes at 8.0 volts with generator at room temperature. Third brush held in position by friction. Remove jumper.

Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold — Regulator Inoperative — Hot					
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	720	0	6.4	780
4	6.65	820	4	6.7	900
8	6.9	920	8	6.95	1060
12	7.1	1050	12	7.2	1250
16	7.4	1200	16	7.5	1440
20	7.6	1400	20	7.8	1840
26	8.0	2400	23	8.0	2800

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-36 ounces.

Field Current—4.13-4.57 amperes at 6.0 volts.

Motoring Current—5.84-6.46 amperes at 6.0 volts.

Field Fuse—5 ampere in cup on side of regulator case.

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

Belt Adjustment:—Adjust when sideplay at point midway between generator and fan pulley exceeds 1½". To adjust, loosen two capscrews on fan bracket, raise bracket up (bracket pivots on one screw) until sideplay on belt is approximately 1", tighten screws.

RELAY-REGULATOR:—Model TC-4313-A.
Mounted on generator. Consists of Cutout Relay and Current Regulator (two-rate charging control). See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.5-7.25 volts, 750 R.P.M.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.015-.045" (with upper or ground contacts closed—ground contacts must be open with main contacts closed).

Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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—Corcoran-Brown, Pre-fo-fused type. Upper and lower beams controlled by foot selector switch.

Switches

Lighting—Soreng-Manegold Model A-5820-A.

Foot Selector—H. A. Douglas.

Stop Light—Motometer Hydraulic #58012. Nash Part No. 47601.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Stop and Tail	21-3	1158
Fender, Instrument	3	63
Dome	6	81

FUSES:—Lighting—20 ampere on fuse block mounted on steering column brace in back of instrument panel.

Horn—20 ampere (single), 30 ampere (dual horns) on fuse block as above.

Stop Light and Gasoline Gauge—20 ampere on fuse block as above.

Generator Field—5 ampere in cup on side of regulator case.

HORNS:—Single horn, Sparton, std. Dual horns optl. operated by horn relay. All horns vibrator type.

Horn Relay:—R.B.M. Type 10072. Current draw .4-.55 amperes at 6.0 volts. Coil resistance 11-14 ohms. Contacts must close with 4 volts across winding with relay in inverted position.

SERIAL NUMBER:—First number—F200,001. On left hand frame side member.

COMPRESSION:—Ratio 6.0-1. Pressure 146 lbs. at 1000 R.P.M. or 106-116 lbs. at cranking speed of 100 R.P.M.

VACUUM READING:—Gauge should show steady reading of 17" of HG. minimum with engine idling at 350 R.P.M. or 6 M.P.H.

IGNITION:—**Coil Model 536-E.** Mounted on engine side of dash.

Coil draw—2.0 amperes idling, 4.5 stopped.

Ignition Switch:—**Delco-Remy Model 435-B**—Switch and cable assembly connected to coil by armored cable.

Ignition Lock—Briggs & Stratton.

Distributor Model 647-C—Single breaker, 6 lobe cam, full automatic advance with auxiliary vacuum spark control.

Breaker Gap—.020". Limits .018-.024".

Cam Angle or Dwell—36° (closed), 24° (open).

Breaker Arm Spring Tension—17-21 ozs.

Condenser—Part No. 1858571. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	250	2	500
3.75	400	7.5	800
13.5	1450	27	2900

Vacuum Spark Control—Integral with distributor. Mounted on distributor housing and linked directly to breaker plate. Provides additional advance at speeds above idling (vacuum port in carburetor above throttle) except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	5-7"
15° Max.	15.5-18.5"

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

IGNITION TIMING:—For all engines as follows:

Flywheel Degrees	Piston Position
0° at TDC	.000" TDC.

Timing (Using Synchroscope)—This method recommended. Clip Synchroscope lead to #1 spark plug, direct light on flywheel through inspection hole in left front face of housing. Idle engine at 350 R.P.M. or 6-7 M.P.H. Loosen hold-down screw in advance arm, center pointer on scale (arrow at 'O' mark), tighten hold-down screw, loosen advance arm clamp bolt, rotate distributor until timing mark (steel ball insert) on flywheel lines up with pointed end of inspection hole cover screw, tighten clamp bolt.

Timing (Without Synchroscope)—Use timing light connected between distributor terminal and ground, turn on ignition to check contact opening. With #1 piston on compression, turn engine over until piston reaches top dead center, stop when steel ball insert on flywheel lines up with pointed end of inspection hole cover screw in left front face of housing. Loosen hold-down screw in advance arm, center pointer on scale (arrow at 'O' mark), tighten hold-down screw, loosen advance arm clamp bolt, rotate distributor until timing lamp lights (contacts opening), tighten clamp bolt.

Timing (Motor Gauge)—Weidenhoff #104 Adapter, #40 Rod.

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

Spark Plugs:—AC. Type G-9, 18 MM. Metric type.

Spark Plug Gaps—.030-.033".

CARBURETION:—**Carburetor**—Carter Model 327-S (Before F-217,745), Model 339-S (After F-217,746). 1¼" downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.

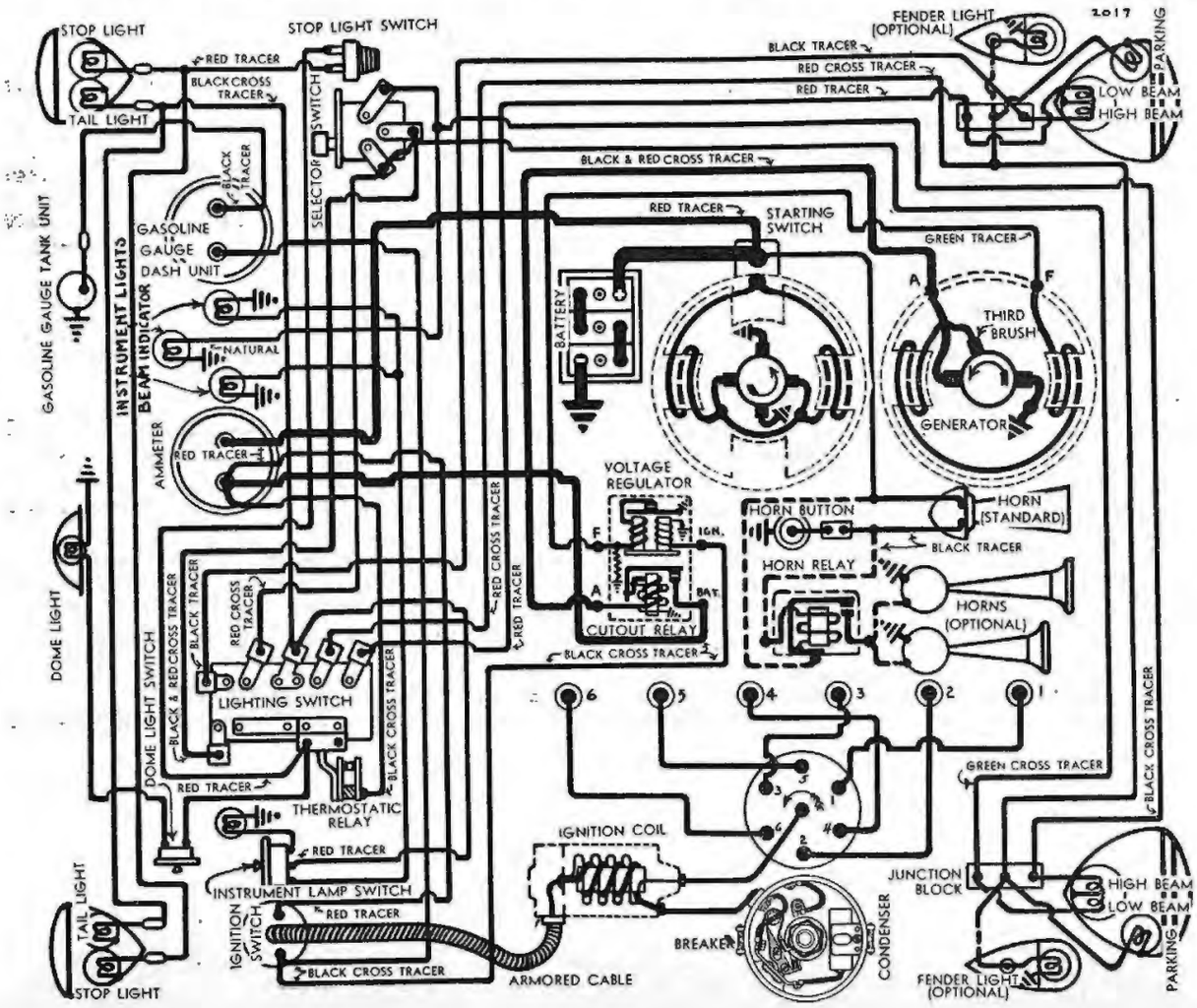
NOTE—Do not adjust carburetor until engine is warmed up so that choke valve is wide open and engine idles at hot or slow idle speed.

Idle Adjustment—Adjust throttle stopscrew so that idling speed is 350 R.P.M. or 6 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 ¾-1¼ turn open of the screw from the seated position. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Pump lever under dust cover at top of engine has three holes for pump link engagement. Change for seasonal requirements:
Outer Hole—Normal temperature ranges.
Inner Hole (Min. stroke)—Extremely hot weather.
Upper hole (Max. stroke)—Extremely cold weather.

Fast Idle:—Integral with carburetor. No adjustment. See article on Carter Fast Idle in Carburetion Section.

Accelerator Linkage Adjustment:—Must be maintained to provide correct 'throttle cracking' action for starting. To adjust, remove starting cable at starting switch to prevent cranking, place .090"



feeler between throttle stopscrew and carburetor casting, fully depress starting pedal, loosen adjusting screw on throttle cross shaft lever and adjust cross shaft so that lever contacts pin on starter shift lever.

Automatic Choke:—Carter Climatic Control. See article in Carburetor Section for servicing directions.

Air Cleaner:—AC. #1525989 oil-wetted type standard, #1525991 heavy duty oil-bath type optional.

Fuel Pump:—AC. Type T #1522189 standard. Combination fuel-and-vacuum Type AA #1522249 optional. See articles in Carburetion Section.

Gasoline Gauge:—AC. Electric. #1515313 (dash unit), #1515428 (tank unit). See article in Carburetion Section.

VALVE TIMING:—Tappet Clearance—.008" Int., .010" Exh., with engine warm.

Valve Spring Pressure—43 lbs. at 2 9/32" (valve closed), 116 lbs. at 1 15/16" (valve open).

To Check Valve Timing—Check tappet clearance #1 intake valve. This valve should open with piston 5° or .0163" before top dead center when point on flywheel approximately 2 teeth before top dead center mark (steel ball insert) lines up with pointer in inspection hole in left front face of housing.

Using Motor Gauge—Weidenhoff #104 Adapter, #40 Rod.

LUBRICATION:—Crankcase Capacity—6 qts. refill.

Normal Oil Pressure—25-30 lbs.

BATTERY:—Delco, Type 15-T. 6 volt, 15 plate, 94 ampere hour capacity (20 hour rate).

Starting Capacity—115 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.3 minutes.

Grounded Terminal—Negative (—) terminal.

Location—Left side under drivers seat.

STARTER:—Model 738-S. Armature No. 823881.

Drive—Overrunning clutch and manual pinion shift operated by starting pedal.

Cranking Engine—100 R.P.M., 190 amperes at 5 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ozs. each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 ft. lbs.	Lock	3.63	475

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

Starting Switch:—Part No. 820052. Mounted on starter. Operated by starting pedal.

GENERATOR:—Model 936-T. Armature No. 1854856. Fixed third brush control type with external vibrating voltage regulator. Ventilated by fan on drive pulley.

NOTE—Third brush is clamped in position for maximum safe output and must not be disturbed.

Charging Rate Adjustment—Adjusted by changing setting of voltage regulator. See Regulator data below and special article in Equipment Section for procedure and settings. Do not operate generator on open-circuit.

Maximum Charging Rate—As given in table below. Reached at car speed of 34-36 M.P.H. To check charging rate, connect test ammeter in line at 'BAT' terminal of regulator, voltmeter between 'BAT' terminal and ground, ground 'F' terminal to eliminate regulator action.

Performance Data

	Amperes	Volts	R.P.M.
Cold	22-26	8.7-9.1	3300
Hot	18-21	8.2-8.7	3500

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third brush).

Field Current—2.3-2.6 amperes at 6.0 volts.

Removal:—Generator pivot mounted on left front of engine. To remove, take out two pivot bolts and clamp bolt.

Belt Adjustment:—Loosen clamp bolts and pivot bolt, swing generator out until deflection of belt is ¾" midway between generator and crankshaft pulleys when pressed lightly.

CONTROL UNIT (VOLTAGE REGULATOR):—Model 5588. Mounted on left side of dash. Consists of Cut-out Relay and vibrating type voltage regulator. See article in Equipment Section for complete data on these units.

Cutout Relay

Cuts In—6.5-7.25 volts, 838 R.P.M., 9½ M.P.H.

Cuts Out—3 amperes max. at 6.3 volts.

Contact Gap—.018-.025".

Air Gap—.018-.022" with contacts closed.

Voltage Regulator

Setting—7.55-7.85 volts at 70° F., 7.45-7.55 volts at 150° F. Regulator is over-compensated for temperature and must be checked at these points.

Adjustment—Disconnect lead on 'IGN' terminal of regulator, connect jumper between 'IGN' and 'BAT' terminals, connect test ammeter in charging line at 'BAT' terminal, connect voltmeter between 'IGN' terminal and ground. Operate generator at 2800-3000 R.P.M., adjust charging rate to 8-10 amperes, change regulator armature spring tension by bending spring hanger at lower end of spring slightly until setting is as given above.

NOTE—Regulator cover must be in place when tests are made. Do not operate generator on open-circuit.

Contact Gap—.015-.025".

Contact Spring Tension—2.7-3.5 ounces.

Air Gap—.060-.070" between armature and center of core with armature down and fibre bumper touching stop; .008-.013" between fibre bumper and stop with armature up.

LIGHTING:—Headlamps—Guide Multi-beam, pre-focused, cross-beam type with special non-interchangeable lenses. Headlamps aimed straight ahead with lenses removed. Special assymetrical 'Passing' beam (upper beam left hand headlamp, lower beam right hand headlamp) controlled by foot selector switch with lighting switch in driving or third position.

Headlamp Beam Indicator—Located at top of speedometer dial. Lighted whenever driving or upper headlamp beams are lighted.

Switches

Lighting—Delco-Remy Model 479-R, 479-H Export.

Foot Beam Selector—Delco-Remy Model 471-Z.

Instrument Lamp—Delco-Remy Model 1404.

Stop Lamp—Hydraulic type on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	T-2320-L
Parking	1½	55.
Instrument, Tail	3	63.
Beam Indicator; Frt. Compt.	1	51.
Stop	15	87.
Dome	6	81.

NOTE—Headlamps are Pre-focused 'Long-Life' type.

THERMOSTATIC RELAY:—Mounted on lighting switch (part of assembly). Non-adjustable. Operates with load of 24-27 amperes limiting current to 18 amps.

HORNS:—Klaxon Model K-26-L Type 1602 Std., Model K-33-D, Type 1951 (low note), 1952 (high note) blended tone twin horns operated by horn relay Optl. All horns are vibrator type.

Horn Type	Current at 6 Volts	Air Gap
K-26-L, 1602	6.5-8.5	.025-.029"
K-33-D, 1951	12-14	.045-.050"
K-33-D, 1952	11-13	.036-.040"

NOTE—Twin horns are stamped 'L' (low note—long horn), 'S' (high note—short horn), on motor shell.

Horn Relay:—Model 268-L. Requires .25 amperes at 2 volts minimum to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.

Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—First number—L100,001. On left hand frame side member.

COMPRESSION:—Ratio 6.2-1. Pressure 152 lbs. at 1000 R.P.M. or 116-126 lbs. at cranking speed of 100 R.P.M.

VACUUM READING:—Gauge should show steady reading of 17" of HG. minimum with engine idling at 300 R.P.M. or 6 M.P.H.

IGNITION:—**Coil Model 536-E.** Mounted on engine side of dash.

Coil Draw—2.0 amperes idling, 4.5 stopped.

Ignition Switch Delco-Remy Model 435-B:—Switch and cable assembly connected to coil by armored cable.

Ignition Lock—Briggs & Stratton.

Distributor Model 663-K:—Single breaker, 8 lobe cam, full automatic advance type with vacuum spark control.

Breaker Gap—.015". Limits .0125-.0175".

Cam Angle or Dwell—31° (closed), 14° (open).

Breaker Arm Spring Tension—19-23 ounces.

Condenser—Part No. 1837231. Capacity .20-.25 mfds.

Automatic Advance

Distributor		Engine	
Degrees	R.P.M.	Degrees	R.P.M.
Start	300	4.5	600
4	400	8	800
15	1900	30	3800

Vacuum Spark Control—Integral with distributor. Mounted on distributor housing and linked directly to breaker plate. Provides additional advance at speeds above idling (vacuum port in carburetor above throttle) except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	5-7"
11° Max.	13-16"

Distributor Removal:—Mounted on top of engine. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:—For all engines as follows:

Flywheel Degrees	Piston Position
2° BTDC.	.002" BTDC.

Timing (Using Synchroscope)—This method recommended. Clip Synchroscope lead to #6 spark plug, direct light on flywheel through inspection hole in left front face of housing. Idle engine at 300 R.P.M. or 6-7 M.P.H. Loosen hold-down screw in advance arm, center pointer on scale (arrow at '0' mark), tighten hold-down screw, loosen advance arm clamp bolt, rotate distributor until timing mark (steel ball) on flywheel lines up with pointed end of inspection hole cover screw, tighten clamp bolt.

Timing (Without Synchroscope)—Use timing light connected btween distributor terminal and ground, turn on ignition to check contact opening. With #6 piston on compression, turn engine over until piston reaches 2° before top dead center, stop when steel ball on flywheel lines up with pointed end of inspection hole cover screw in left front face of housing. Loosen hold-down screw in advance arm, center pointer on scale (arrow at '0' mark), tighten hold-down screw, loosen advance arm clamp bolt, rotate distributor until timing lamp lights (contacts opening), tighten clamp bolt.

Timing (Motor Gauge)—Weidenhoff #104 Adapter, #40 Rod.

Firing Order:—1-6-2-5-8-3-7-4. See diagram.

Spark Plugs:—AC. Type G-9. 18MM. Metric type.

Spark Plug Gaps—.030-.033".

CARBURETION:—**Carburetor**—Carter Models 328-S (before Serial No. L-127334) 341-S (after Serial No. L-127335). Dual downdraft type. See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.

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

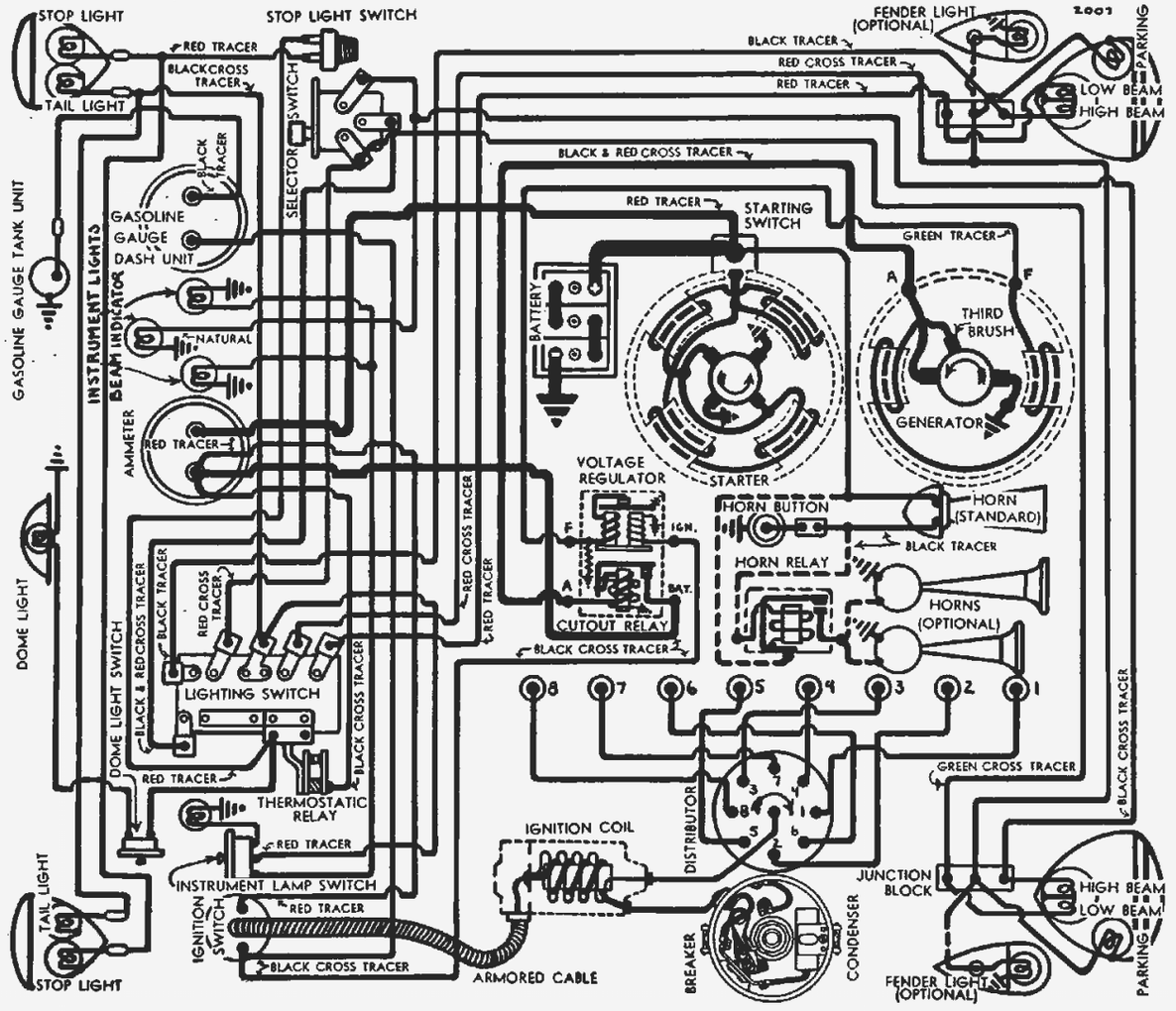
Idle Adjustment—Adjust throttle stopscrew so that engine idles at 300 R.P.M. or 6 M.P.H. Turn idle adjusting screw for each carburetor barrel (in succession) in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in until engine fires smoothly. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Pump lever under dust cover at top of carburetor has two holes for pump link engagement. Change for seasonal requirements:
Outer Hole (Max. stroke)—Cold weather.
Inner Hole (Min. stroke)—Hot weather.

Fast Idle:—Integral with carburetor. Adjustable.

Adjustment—With fast idle screw resting against high lobe of fast idle cam (choke valve closed) and with correct slow idle setting (see above), adjust fast idle screw to give .030" clearance between throttle stopscrew and carburetor body.

Accelerator Linkage Adjustment:—Must be maintained to provide correct 'throttle cracking' action for starting. To adjust, remove starting cable at starting switch to prevent cranking, place .090" feeler between throttle stopscrew and carburetor cast-



ing, fully depress starting pedal, loosen adjusting screw on throttle cross shaft lever and adjust cross shaft so that lever contacts pin on starter shift lever.

Automatic Choke:—Carter Climatic Control. See article in Carburetion Section for servicing directions.

Air Cleaner:—AC. #1525990 standard oil-wetted type, #1525992 heavy duty oil-bath type optional.

Fuel Pump:—AC. Type T #1522188 standard, Combination fuel-and-vacuum Type AA #1522250 optional. See articles in Carburetion Section.

Gasoline Gauge:—AC. Electric. #1515313 (dash unit), #1515428 (tank unit). See article in Carburetion Section.

VALVE TIMING:—Tappet Clearance—.008" Int., .010" Exh., with engine warm.

Valve Spring Pressure—43 lbs. at 2 9/32" (valve closed), 116 lbs. at 1 15/16" (valve open).

To Check Valve Timing—Check tappet clearance #6 intake valve. This valve should open with piston on top dead center (.000") when flywheel mark 'TDC/' lines up with pointed end of inspection hole cover screw (left front face of housing).

Motor Gauge—Weidenhoff #104 Adapter, #40 Rod.

NOTE—Steel ball insert in flywheel not TDC.

LUBRICATION:—Crankcase Capacity—7 qts. (refill).

Normal Oil Pressure—25-30 lbs.

BATTERY:—Delco, Type 17-K. 6 volt, 17 plate, 110 ampere hour capacity (20 hour rate).

Starting Capacity—131 amperes for 20 minutes.

0° F. Capacity—300 amperes for 4.4 minutes.

Delco, Type 17-J (Special Equipment). 6 volt, 17 plate, 125 ampere hours (20 hour rate).

Grounded Terminal—Negative (—) terminal.

Location—Left side under drivers seat.

STARTER:—Model 727-Z. Armature No. 823881.

Drive—Overrunning clutch and manual pinion shift operated by starting pedal.

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	5.0	60
15 ft. lbs.	Lock	3.0	600

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

Starting Switch:—Part No. 820052. Mounted on starter. Operated by starting pedal.

GENERATOR:—Model 936-T. Armature No. 1854856. Fixed third brush control type with external vibrating voltage regulator. Ventilated by fan on drive pulley.

NOTE—Third brush is clamped in position for maximum safe output and must not be disturbed.

Charging Rate Adjustment—Adjusted by changing setting of voltage regulator. See Regulator data below and special article in Equipment Section for procedure and settings. Do not operate generator on open-circuit.

Maximum Charging Rate—As given in table below. Reached at car speed of 34-36 M.P.H. To check charging rate, connect test ammeter in line at 'BAT' terminal of regulator, voltmeter between 'BAT' terminal and ground, ground 'F' terminal to eliminate regulator action.

Performance Data

	Amperes	Volts	R.P.M.
Cold	22-26	8.7-9.1	3300
Hot	18-21	8.2-8.7	3500

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third).

Field Current—2.3-2.6 amperes at 6.0 volts.

Removal:—Generator pivot mounted at left front of engine. To remove, take out two pivot bolts and clamp bolt.

Belt Adjustment:—Loosen clamp bolts and pivot bolt, swing generator out until deflection of belt is 1" midway between generator and crankshaft pulleys when pressed lightly.

CONTROL UNIT (VOLTAGE REGULATOR):—Model 5588. Mounted on left side of dash. Consists of Cut-out Relay and vibrating type voltage regulator. See article in Equipment Section for complete data on these units.

Cutout Relay

Cuts In—6.5-7.25 volts, 800 R.P.M., 9.5 M.P.H.

Cuts Out—3 amperes max. at 6.3 volts.

Contact Gap—.018-.025".

Air Gap—.018-.022" with contacts closed.

Voltage Regulator

Setting—7.55-7.85 volts at 70° F., 7.45-7.55 volts at 150° F. Regulator is over-compensated for temperature and must be checked at these points.

Adjustment—Disconnect lead on 'IGN' terminal of regulator, connect jumper between 'IGN' and 'BAT' terminals, connect test ammeter in charging line at 'BAT' terminal, connect voltmeter between 'IGN' terminal and ground. Operate generator at 2800-3000 R.P.M., adjust charging rate to 8-10 amperes, change regulator armature spring tension by bending spring hanger at lower end of spring slightly until setting is as given above.

NOTE—Regulator cover must be in place when tests are made. Do not operate generator on open-circuit.

Contact Gap—.015-.025".

Contact Spring Tension—2.7-3.5 ounces.

Air Gap—.060-.070" between armature and center of core with armature down and fibre bumper touching stop; .008-.013" between fibre bumper and stop with armature up.

LIGHTING:—Headlamps—Guide Multi-beam, pre-focused, cross-beam type with special non-interchangeable lenses. Headlamps aimed straight ahead with lenses removed. Special assymetrical 'Passing' beam (upper beam left hand headlamp, lower beam right hand headlamp) controlled by foot selector switch with lighting switch in driving or third position.

Headlamp Beam Indicator—Located at top of speedometer dial. Lighted whenever driving or upper headlamp beams are lighted.

Switches

Lighting—Delco-Remy Model 479-K, 479-H Export.

Foot Beam Selector—Delco-Remy Model 471-Z.

Instrument Lamp—Delco-Remy Model 1404.

Stop Lamp—Hydraulic type on brake master cyl.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	T-2320-L
Parking, Ins't., Tail	3	63
Beam Indicator, Front Comp.	1	51
Stop	15	87
Dome	6	81

NOTE—Headlamps are Pre-focused 'Long-Life' type.

THERMOSTATIC RELAY:—Mounted on lighting switch (part of assembly. Non-adjustable. Operates with load of 24-27 amperes limiting current to 18 amps.

HORNS:—Klaxon Model K-26-L Type 1602 Std., Model K-33-D, Type 1551 (low note), 1552 (high note) blended tone twin horns operated by horn relay Optl. All horns are vibrator type.

Horn Type	Current at 6 Volts	Air Gap
K-26-L, 1602	6.5-8.5	.025-.029"
K-33-D, 1651	12-14	.045-.050"
K-33-D, 1652	11-13	.036-.040"

NOTE—Twin horns are stamped 'L' (low note—long horn), 'S' (high not—short horn), on motor shell.

Horn Relay:—Model 268-L. Requires .25 amperes at 2 volts minimum to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.

Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—Stamped on plate on left front side of dash. Use engine number (X-27900 and up) stamped on boss on upper left hand corner of cylinder block (obscured by oil filter when filter is installed).

COMPRESSION:—Ratio 6.5-1 Std. aluminum head, no optl. Pressure 110 lbs. at 125 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-19" with engine idling at 300 R.P.M. or 6 M.P.H.

IGNITION:—Coil Model CE-4614, CE-4615 (RHD). Service winding (coil less switch and cable) **CE-3224ES.** Coil mounted at left of engine.

Ignition Switch:—Mitchellock Model 24-B, Type 6513, 6514 (RHD). Connected to coil by armored cable.

Ignition Lock—Briggs & Stratton Model 50184, Mitchell No. 6760.

Distributor Model IGH-4026-A. Double breaker, 4 lobe cam, full automatic advance type with 'Fuel Compensator' or manual adjustment at distributor. Contacts open alternately at 45° intervals corresponding to 90° firing interval of engine and must be synchronized. See Ignition Timing.

Breaker Gap—Set at .020". Limits .018-.022".

Cam Angle or Dwell—Closed at 32°. Open 13° distributor. Both sets together when properly synchronized.

Breaker Arm Spring Tension—16-20 ounces.

Condenser—Part No. IGB-1025C. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine R.P.M.
Start	300	0	600
2	660	4	1320
4	1100	8	2200
6	1460	12	2920
8	1830	16	3660
10	2200	20	4400

Fuel Compensator—Manual adjustment at distributor providing 10° maximum advance and retard from center 'O' position. See Ignition Timing for setting.

Distributor Removal:—Mounted at left side of crankcase. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:—Standard Setting as shown. See Fuel Compensator Setting below.

	Flywheel Degrees	Piston Position
All engines	7° BTDC	.0202" BTDC.

NOTE—On cars with Startix, wire on 'IGN' terminal must be disconnected and taped to prevent automatic starting.

Timing (Stationary Contacts)—Remove cover over timing inspection hole in left front face of flywheel housing under starter. Loosen thumbnut and set Fuel Compensator at 'O'. With #1 piston on compression turn engine over (engage gears and roll car) until piston reaches firing position, stop when white mark (midpoint between third and fourth graduations to right of line marked '#1 UP D.C.') on flywheel lines up with pointer on housing. Loosen advance arm clamp bolt, rotate distributor until contacts just open, tighten clamp bolt. Then synchronize movable contacts.

Timing (With Neon Timing Light)—This method recommended by manufacturer. Connect lead to #1 spark plug wire. With engine idling, adjust distributor so that timing mark (as indicated above) lines up with pointer on housing.

Synchronizing (Movable Contacts)—Synchronization may be checked with the Neon Timing Light. Connect lead to #6 spark plug wire, remove cover over timing inspection hole as directed above and direct light at flywheel. White mark on flywheel (to right of line '#6 UP D.C.') should line up with pointer on housing, with engine idling. Engine must be stopped to set synchronization. To adjust, place #6 piston in firing position (turn engine over by rolling car with gears engaged), loosen lockscrews on movable sub-plate carrying second set of contacts, shift plate until contacts begin to open, tighten lockscrews.

Synchronization (Other Methods)—See Equipment Section for directions on synchronization using indicator and synchronizing marks on rotor fantail. If other methods are used, firing intervals should be regular 45-45-45 distributor degrees.

NOTE—Manufacturer recommends use of Winn Synchrometer ST-913 to synchronize contacts.

Timing (Motor Gauge)—Weidenhoff Adapter #114, Rod #5.

Fuel Compensator—Should be set at 'O' for fuel of 68-70 octane rating and advanced or retarded for fuel of higher or lower rating to secure slight 'ping' pulling heavy load.

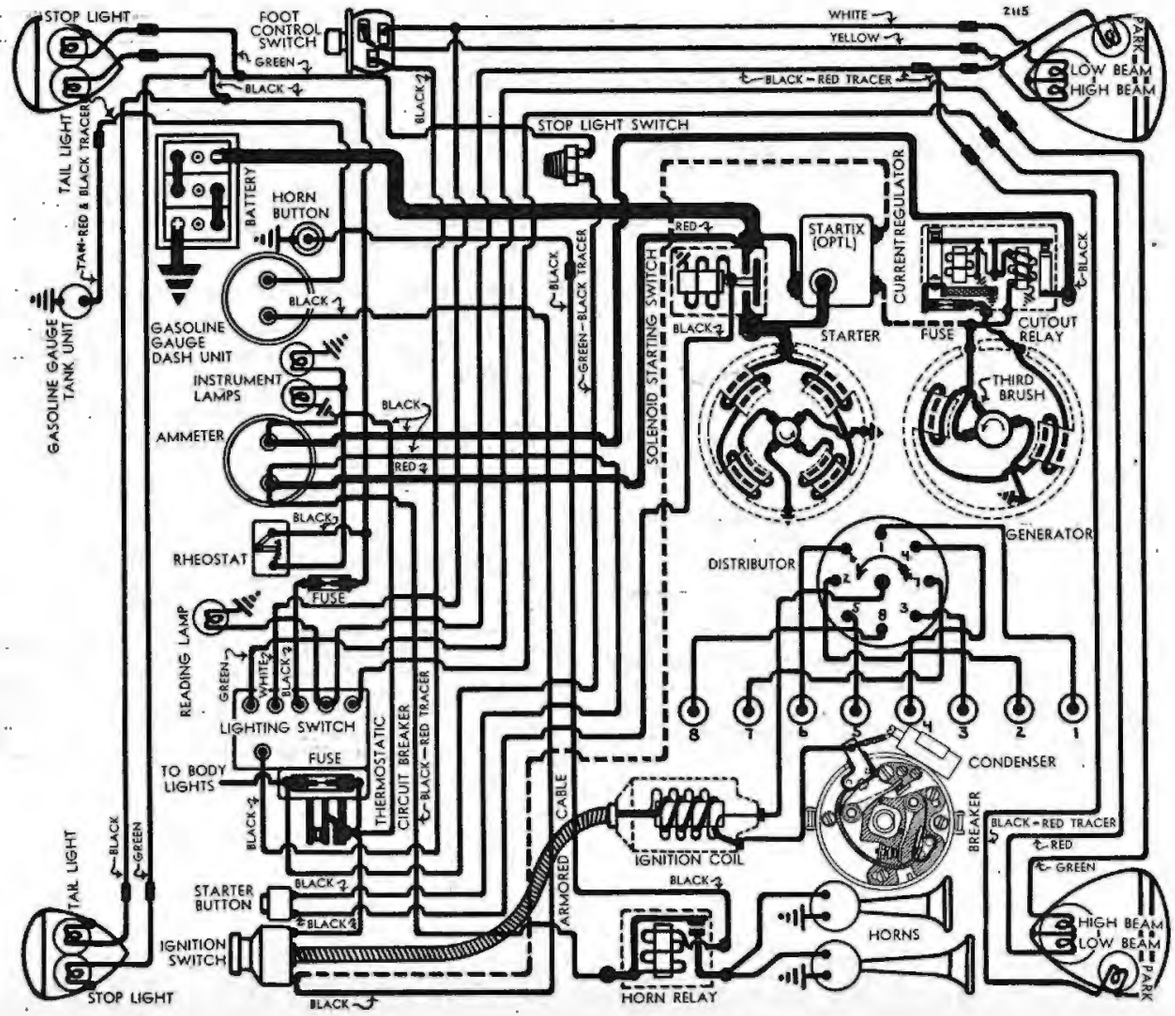
Firing Order:—1-6-2-5-8-3-7-4. See diagram.

Spark Plugs:—AC. Type K-7, Champion J-8, 14 MM Metric.

Spark Plug Gap—Set at .028". Limits .028-.030".

CARBURETION:—Carburetor—Stromberg Mod. EE-14. 1" dual downdraft type. See Carburetion Section for adjustments, overhaul and Jet Specifications.

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—Set throttle stopscrew so that engine idles at 300 R.P.M. or 6 M.P.H. Turn inner idling adjusting screw in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Repeat with outer idling adjusting screw. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump—Non-adjustable.

Fast Idle:—Stromberg type. No adjustment required.

Automatic Choke:—See separate article in Carburetion Section for complete data.

Air Cleaner:—AC. #1525940 oil-wetted type standard, #1526714 heavy duty oil bath optional.

Fuel Pump:—AC. Type X #1521808. Combination fuel-and-vacuum pump. See article in Carburetion Sec.

Gasoline Gauge:—AC. Electric #1515200 (dash unit-early cars) #1515315 (dash unit—later cars), #1515149 (tank unit on all cars). See article in Carburetion Section.

VALVE TIMING:—To Check Timing—Use gauge to measure #1 piston travel. Set tappet clearance #1 exhaust valve at .006". This valve should be fully closed with piston .006" after top dead center when 5° point on flywheel (midpoint between second and third graduation to the left of line marked '#1 UP D.C.') lines up with indicator in inspection hole in left front face of flywheel housing under starter. Reset tappet clearance at .010" with engine hot.

Motor Gauge—Weidenhoff Adapter #114, Rod #5.

Tappet Clearance:—.007" Int., .010" Exh., hot.

NOTE—Splasher in right front fender should be removed when valve adjustments are made.

Valve Spring Pressure:—40 lbs. at 1⅝" (valve closed), 110 lbs. at 1 5/16" approx. (valve open).

LUBRICATION:—Crankcase Capacity—7 qts. (full).

Normal Oil Pressure—35 lbs.

BATTERY:—Prest-O-Lite, Type HP2-17 HiLeval. 6 volt, 17 plate, 114 ampere hour capacity (20 hour rate).

Starting Capacity—133 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.5 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under driver's seat.

STARTER:—Model MAX-4006. Armature MAW-2006.

Drive—Outboard barrel type Bendix A-1729.

Cranking Engine—125 R.P.M., 200 amps. at 5.0 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—31-42 ozs. (new brushes).

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs	5300	5.5	65
2.75 "	1630	5.0	200
5.5 "	970	4.5	300
8.7 "	600	4.0	400
12.0 "	300	3.5	500
16.5 "	Lock	3.0	640
25.0 "	Lock	4.0	880

Removal:—Flange mounted on left front face of flywheel housing. To remove, take out two flange cap-screws.

Starting Switch:—Auto-Lite Solenoid Type SS-4001. Delco-Remy Control Switch Type 1400. Solenoid switch mounted on starter and controlled by switch on instrument panel. See Equipment Section for complete data.

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.

NOTE—Startix Type 'D' optional. Type 'F' must not be used on these cars. See article in Equip. Section.

GENERATOR:—Mod. GAR-4611A-5. GBR-4601-5. Armature GAR-2116. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.

NOTE—Early 1936 cars with 'GAR' generators equipped with large pulleys. These should be checked and replaced with pulley (Part No. SP-185) which has a 2" diameter measured at bottom of belt groove or 3½" at top of groove. This pulley increases generator output at lower car speeds.

Charging Rate Adjustment—Use test meters to check generator output. Short out current 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.

Maximum Charging Rate—22 amperes at 8.8 volts (GAR), 22 amps. at 8.0 volts (GBR). Do not exceed.

Performance Data—GAR-4611A-5

Cold Regulator Contacts Closed			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	720	0	6.4	760
4	6.8	860	4	6.8	925
8	7.25	1000	8	7.25	1125
12	7.7	1160	12	7.7	1350
16	8.1	1360	16	8.1	1680
22.4	8.8	2400	19.2	8.4	2600

Performance Data—GBR-4601-5

0	6.4	720	0	6.4	760
4	6.7	810	4	6.75	880
8	7.0	950	8	7.1	1030
12	7.3	1080	12	7.4	1460
16	7.6	1500	16	7.8	1660
22	8.0	2700	19.4	8.0	2800

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24 ozs. min. (worn brushes), 36 ozs. max. (new brushes).

Field Current—(GAR) 3.51-3.89 amperes at 6 volts, (GBR) 4.13-4.57 amperes at 6 volts.

Field Fuse—5 ampere in plug on regulator case.

Removal:—Pivot mounted at left front of engine. To remove, take out two pivot bolts, one clamp bolt and one lock bolt.

Belt Adjustment:—Loosen pivot bolts, clamp bolt and lock bolt on link, pull generator away from engine by spring scale looped on generator lug parallel to link until scale reading is 25 lbs.

RELAY-REGULATOR:—Model TC-4302-A, TC-4302-B. Mounted on generator. Consists of Cutout Relay and Current Regulator (two-rate charging control). See article in Equipment Section for complete data.

Cutout Relay

Cuts In—6.5-7.25 volts.

Cuts Out—.5-2.5 ampere discharge current.

Contact Gap—.015-.045".

Air Gap—.010-.030" with contacts closed.

Current Regulator

Contacts Open—8.25-8.75 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 with special non-interchangeable lenses. Left headlamp aimed straight ahead, right headlamp deflected slightly to right (upper beam with lenses in place). Passing beam (lower beam left hand headlamp, upper beam right hand headlamp) controlled by foot selector switch with lighting switch in third or 'Clear Road Beam' position.

Switches

Lighting—Delco-Remy Model 480-Y.

Foot Selector—Delco-Remy Model 471-T, 471-U, or R.B.M. Model 1050-A.

Instrument Light Rheostat—Soreng-Manegold No. I-2060-A.

Stop Light—Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2330-C
Parking	1	51
Instrument, Tail	3	63
Stop	15	87
Dome	6	81

THERMOSTATIC RELAY:—Mounted on lighting switch (part of assembly). Non-adjustable. Contacts will remain closed with current of 25 amperes but will open in one minute with current of 38 amperes at temperature of 70-80° F.

FUSES:—Body and Stop Light—20 amperes on back of lighting switch.

Tail Lamp—20 amperes in connector near lighting switch.

Generator Field—5 amperes on regulator case.

HORNS:—Sparton. Vibrator type. One horn standard. twin horns optl. Operated by horn relay.

Horn Relay:—R.B.M. Model 10072. Current draw .4-.55 amperes at 6.0 volts. Coil resistance 11-14 ohms. Contacts must close with 4 volts across winding with relay in inverted position.

SERIAL NUMBER:—Stamped on plate on engine side of dash. Use engine number (390000-1400, 1, 2; 757000-1403, 4, 5) stamped on left side of block at front of engine near oil filter.

COMPRESSION:—Ratio and pressure (std. head) as follows:

Model	Std Head	Optl. Hds.	Compres. (Std. Hd.)
1400, 1, 2	6.5-1	6.0-1, 7.0-1	110 lbs. @ 125 R.P.M.
1403, 4, 5	6.3-1	6.0-1. 7.0-1	110 lbs. @ 125 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-19" with engine idling at 350 R.P.M. or 7 M.P.H.

IGNITION:—Coil Model 539-K. Mounted on cylinder head at side of distributor.

Ignition Current—2.2 amperes idling, 4.4 stopped.

Ignition Switch:—Model 430-L. Connected to coil by armored cable. Switch has two 'on' positions (key turned to right or left). On cars with Startix, right hand 'on' position is regular running position with Startix operative. Left hand 'on' position is used to secure gasoline gauge reading or to run engine with automatic starting inoperative.

Distributor Model 662-T. Double breaker, 4 lobe cam, full automatic advance type with manual control. Contacts open alternately at regular 45° intervals corresponding to 90° firing interval of engine and must be synchronized. (See Ignition Timing).

Breaker Gap—Set at .020". Limits .018-.022".

Cam Angle or Dwell—Closed 34°. Open 11° distributor. Both sets together when properly synchronized.

Breaker Arm Spring Tension—19-23 ounces.

Condenser—Part No. 829092. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	1	600
10	1800	20	3600

Fuel Compensator—Manual adjustment at distributor providing 12° maximum advance and retard from center 'O' position. See Ignition Timing for setting.

Distributor Removal:—Mounted on left side of cylinder head. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:—Initial settings as shown. See Fuel Compensator Setting below.

	Flywheel Degrees	Piston Position
All Models (Std. Hd.)	6° BTDC	.0168" BTDC
All Models (6.0-1 Hd.)	8° BTDC	.0299" BTDC
All Models (7.0-1 Hd.)	4° BTDC	.0075" BTDC

Timing (Stationary Contacts)—Loosen thumbnut and set Fuel Compensator at 'O'. With #1 piston on compression, turn engine over until piston reaches firing position, stop when correct graduation on vibration dampener at front of engine lines up with pointer on chain case cover (vibration dampener has fifteen 1° graduations before the dead center mark 'DC/1-8'—see table above for setting for each type engine). 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.

Timing (With Neon Timing Light)—This method recommended by manufacturer. Connect lead to #1 spark plug wire. With engine idling, adjust distributor so that timing mark (as indicated above) lines with pointer on chain case cover.

Synchronization (Movable Contacts)—Synchronization may be checked with the Neon Timing Light. Connect lead to #6 spark plug wire and direct light at pointer on chain case. With correct line before mark 'DC/2-6' marked in chalk for better visibility (see table above), idle engine. This line should line up with pointer on chain case cover. Engine must be stopped to set synchronization. To adjust, turn engine over to #6 firing position, loosen lockscrews on sub-plate carrying movable contacts, turn eccentric adjusting screw until contacts begin to open, tighten lockscrews.

Synchronization (Other Methods)—See Equipment Section for directions on synchronization using Delco-Remy synchronizing tool #1838182. If distributor synchronized by using other types of equipment, set firing intervals at regular 45-45-45 (distributor degrees).

NOTE—Manufacturer recommends use of Winn Synchrometer (Packard Tool #ST-913) to synchronize contacts.

Timing (Motor Gauge)—Weidenhoff Adapter #114, Rod #5.

Fuel Compensator Setting—Provides manual adjustment at distributor for octane rating of fuel used. After ignition set as above, road test car to give a slight 'ping' pulling heavy load. Adjusted by loosening thumbnut and advancing or retarding pointer on scale. Adjustment permits 12° advance or retard from center 'O' position.

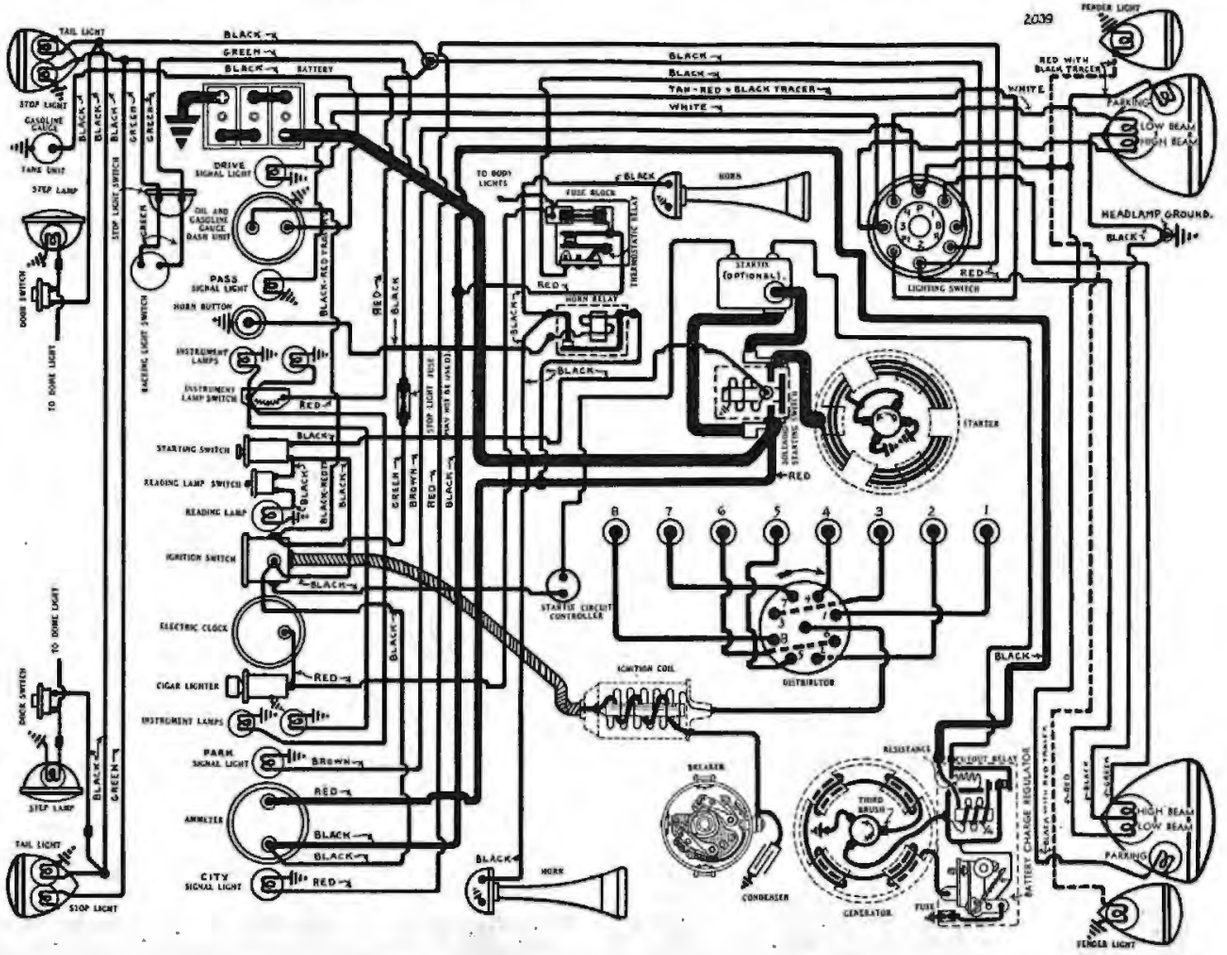
Firing Order:—1-6-2-5-8-3-7-4. See diagram.

Spark Plugs:—AC. Type K-7, Champion J-8, 14 MM. Metric.

Spark Plug Gap—.028-.030".

CARBURETION:—Carburetor—Stromberg Model EE-23. 1¼" dual downdraft type with integral automatic choke. See Carburetion Section for adjustments, overhaul and Jet Specifications.

NOTE—Do not adjust carubretor until engine is



warmed up so that choke valve is wide open and engine idling at slow or hot idling speed.

Idle Adjustment—Set throttle stopscrew so that engine idles at 350 R.P.M. or 7 M.P.H. Turn inner idling adjusting screw in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Repeat with outer idling adjusting screw. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Adjusted by changing position of pump link rod in throttle valve lever. Inner Hole (Min. stroke)—Summer temperatures. Outer Hole (Max. stroke)—Winter temperatures.

Fast Idle:—Integral with carburetor. For complete data see article on Stromberg Automatic Choke on EE-23 Carburetors.

Adjustment—With engine cold, open and close the throttle allowing choke to close; if engine hot, choke must be held in closed position manually. With fast idle adjusting screw backed away from fast idle cam, turn screw in until it just contacts cam, then turn screw in 2½-3 turns.

Automatic Choke:—With integral Fast Idle. See separate article (Stromberg EE-23) in Carburetion Section for complete data.

Air Cleaner:—AC. #1525441 oil-wetted type standard, #1525905 heavy duty oil bath type optional.

Fuel Pump:—AC. Type F. #1521777. Combination fuel-and-vacuum pump. See separate article in Carburetion Section.

Gasoline Gauge:—AC. Electric #1515310 (dash unit), #1515400 (tank unit—except sedan), #1515401 (tank unit—sedan only).

VALVE TIMING:—To Check Timing—Check tappet clearance #1 intake valve. This valve should open with piston 30° or .4070" before top dead center when flywheel mark 'INT' (visible through starter mounting hole in flywheel housing with starter removed) lines up with indicator on housing within case.

Motor Gauge—Weidenhoff Adapter #114, Rod #5.

Tappet Clearance:—.004" Int., .006" Ehx., engine warm.

Valve Spring Pressure:—73 lbs. at 3 1/16" (valve closed).

LUBRICATION:—Crankcase Capacity—8 qts. (1400,1,2), 9½ qts. (1403,4,5).

Normal Oil Pressure—35 lbs.

BATTERY:—Prest-O-Lite, Type H4-21. 6 volt, 21 plate, 150 ampere hour capacity (20 hour rate).

Starting Capacity—175 amperes for 20 minutes.

Zero Capacity—300 amperes for 6.3 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under rear compartment floor boards.

Willard, Type RH-5-19 (Export). 6 volt, 19 plate, 153 ampere hour capacity (20 hour rate).

Starting Capacity—180 amperes for 20 minutes.

Zero Capacity—300 amperes for 6.6 minutes.

STARTER (1400, 1, 2):—Auto-Lite Model MAX-4014.

Armature No. MAW-2090.

Drive—Outboard Barrel Type Bendix Model A-1729.

Cranking Engine—125 R.P.M., 160 amperes, 5.2 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.	5300	5.5	65
.65 "	3300	5.5	100
2.75 "	1630	5.0	200
5.5 "	970	4.5	300
8.7 "	600	4.0	400
12.0 "	300	3.5	500
16.5 "	Lock	3.0	640
25.0 "	Lock	4.0	880

Removal:—Starter sleeve mounted in left front face of flywheel housing. To remove, take out pilot mounting screw in flywheel housing.

Starting Switch:—Solenoid Type SS-4001. Controlled by pushbutton switch on instrument panel. Operative with ignition switch 'on.' See Equipment Section for complete data.

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.

Startix (optional)—Type 'F' automatic starting switch and Startix circuit controller (anti-backfire unit), controlled by ignition switch. See article in Electrical Equipment Section for complete data.

NOTE—Control Unit (Relay Regulator) has extra terminal and resistance coil which are used with Startix Type 'F.'

STARTER (1403, 4, 5):—Owen-Dyneto Model DN-1298.

Armature No. 13409.

Drive—Outboard Bendix Type RCD10FXTD.

Cranking Engine—125 R.P.M., 130 amperes, 5.6 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—56-60 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	3000	6.0	50
2 "	1600	5.6	120
3.3 "	1200	5.45	150
6.3 "	800	5.2	210
15.0 "	400	4.65	360
35.0 "	Lock	3.5	650
39.0 "	Lock	3.6	810

Starting Switch:—Solenoid Type SS-4001A. See data directly above for this switch, Startix and Removal.

GENERATOR:—Model CO-1300. Armature No. 23865. Air-cooled. Third brush control type with Battery Charge Regulator (two-step charging rate).

Charging Rate Adjustment—Third brush shifted through rack-and-pinion control by slotted screw on commutator end plate. Turn adjusting screw to right or clockwise to increase, and left or counter-clockwise to decrease charging rate.

Maximum Charging Rate—30-33 amperes (cold), 24-27 amperes (hot) at 8.0 volts.

Performance Data

Cold — Regulator Inoperative — Hot

Amps.	Volts	R.P.M.	Amps.	Volts	R.P.M.
0	7.0	580	0	7.3	625
5	7.2	630	5	7.5	700
10	7.5	700	10	7.7	800
15	7.7	790	15	7.9	930
20	7.9	910	20	8.0	1100
25	8.0	1080	25	8.0	1380
30	8.0	1380	28	8.0	2000
32	8.0	1900			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—20-22 ozs. (main), 12-14 ozs. (third).

Field Current—4.5 amperes at 7.5 volts.

Field Fuse—5 ampere capacity in knurled plug in side of regulator case.

Removal:—Generator flange mounted on right rear face of timing chain case. To remove, take out three mounting screws, pull generator to rear to disengage drive coupling, lift out. Do not disturb intermediate flange carrying drive sprocket.

Chain Adjustment:—Loosen generator flange mounting screw, pull generator out or away from engine until sideplay as measured at chain case is ¼", tighten mounting screws. Adjust chain whenever sideplay exceeds ½".

CONTROL UNIT (RELAY-REGULATOR):—Model 40210. Consists of Cutout Relay (No. 40203) with auxiliary contacts and resistance coil (for use with Startix Type 'F') and Battery Charge Regulator.

Cutout Relay

Cuts In—6.8-7.2 volts, 600 R.P.M.

Cuts Out—0-2.5 amperes discharge current.

Contact Gap—.030-.032".

Air Gap—.020-.025" with contacts closed.

Auxiliary Contacts—Should open when main contacts close, close when main contacts open.

Battery Charge Regulator

Setting—8.2 volts (cold), 7.8 volts (hot)—contact opening point.

Regulator Resistance—1.85 ohms.

LIGHTING:—Headlamps—Hall, Pre-focused Flex-beam type with special non-interchangeable lenses. Headlamps aimed straight ahead with lighting switch in 'Country Driving' (upper beam) position. 'Country Passing' beam (upper beam right hand headlamp, lower beam left hand headlamp) controlled by lighting switch.

Headlamp Beam Indicator—Separate beam indicator for each position of lighting switch (1—Parking, 2—City Driving, 3—Country Driving, 4—Country Passing), located on instrument panel.

Switches

Lighting—R.B.M. Model 1400.

Instrument Lamp Rheostat—Soreng-Manegold No. J2060A.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2330
Parking or Fender	3	63
Instr., Tail, Courtesy	3	63
Stop	15	87
Dome	6	81
Indicators	1	51

THERMOSTATIC RELAY:—(On Delco-Remy Model 1050-W Fuse Block). Thermostatic arm type current limit relay (no winding). Connected in lighting circuits. Contacts open with current load of 38 amperes at 70° F.

FUSES:—Body Lights—20 ampere on fuse block (see above).

Generator Field—5 amperes in knurled plug on side of regulator case.

HORNS:—Sparton Twin Horns. Vibrator type. Operated by horn relay.

Horn Relay:—R.B.M. Model 10072. Current draw .4-.55 amperes at 6.0 volts. Coil resistance 11-14 ohms. Contacts must close with relay in inverted position.

ENGINE NUMBER:—Stamped on plate on left front side of dash. Use engine number stamped on front of left cylinder block below head. First number—904000.

COMPRESSION:—Ratio 6.4-1 (Std. aluminum head)., 6.0-1, 7.0-1 (optl. aluminum heads). Compression 110 lbs. at 125 R.P.M. for standard head (6.4-1).

VACUUM READING:—Gauge should show steady reading of 18-19" with engine idling at 375 R.P.M. or 8 M.P.H.

IGNITION:—Coil Model CE-4022 (1407), CE-4023 (1408). Two coil unit mounted at front of engine.

Ignition Current—6 amps. idling, 10 amps. stopped (total for both coils).

Ignition Switch:—Delco-Remy, Type 430-M. Connected to coil unit by armored cable. Switch has two 'on' positions (key turned to left or right). On cars with automatic starting, right hand 'on' position is regular running position. Key should be turned to left to secure gasoline gauge reading with engine not running.

Distributor Model IGO-4002-A. Double breaker, 6 lobe cam, full automatic advance type with 'Fuel Compensator' or manual adjustment at distributor. Contacts open alternately at 33½ and 26½ degree intervals corresponding to unequal 67 and 53 degree firing intervals of engine (caused by 67° included angle between banks) and must be synchronized (see Timing).

Breaker Gap—Set at .020". Limits .018-.022".

Cam Angle or Dwell—Closed 40°. Open 20° distributor. Eeach set operates separately and controls one coil.

Breaker Arm Spring Tension—20 ozs. at tip of arm.

Condenser—Part No. IG-2671E,A. (one of each). Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
2	525	4	1050
4	750	8	1500
6	975	12	1950
8	1200	16	2400

Fuel Compensator—Manual adjustment at distributor providing 10° maximum advance and retard from center 'O' position. See Ignition Timing for setting.

Distributor Removal:—Distributor mounted on bracket between cylinder banks at front of engine. To remove, take out screws in bracket.

IGNITION TIMING:—Initial setting as shown. See Fuel Compensator Setting below.

	Flywheel Degrees	Piston Pos.
7.0-1 High Comp.	4° BTDC	.0060" BTDC
6.4-1 Std. Comp	6° BTDC	.0134" BTDC
6.0-1 Low Comp.	8° BTDC	.0256" BTDC

Timing (Stationary Contacts):—Loosen thumbnut and set Fuel Compensator at 'O'. With #1R piston (front piston—right bank) on compression, turn engine over until piston reaches firing position, stop when correct graduation on vibration dampener at front of engine lines up with pointer on chain case cover (vibration dampener has fifteen 1° graduations before the dead center mark '1R-UDC' see table above for correct setting). Loosen clamp screw on mounting bracket, rotate distributor until stationary contacts (mounted directly on breaker plate) begin to open, tighten clamp screw. Then synchronize movable contacts.

Timing (With Neon Timing Light)—This method recommended by manufacturer. Connect lead to #1 spark plug wire. With engine idling, adjust distributor so that timing mark (as indicated above) lines up with pointer on chain case cover. Mark should be painted white for better visibility.

Motor Gauge—Weindenhoff Adapter #114, Rod #2.

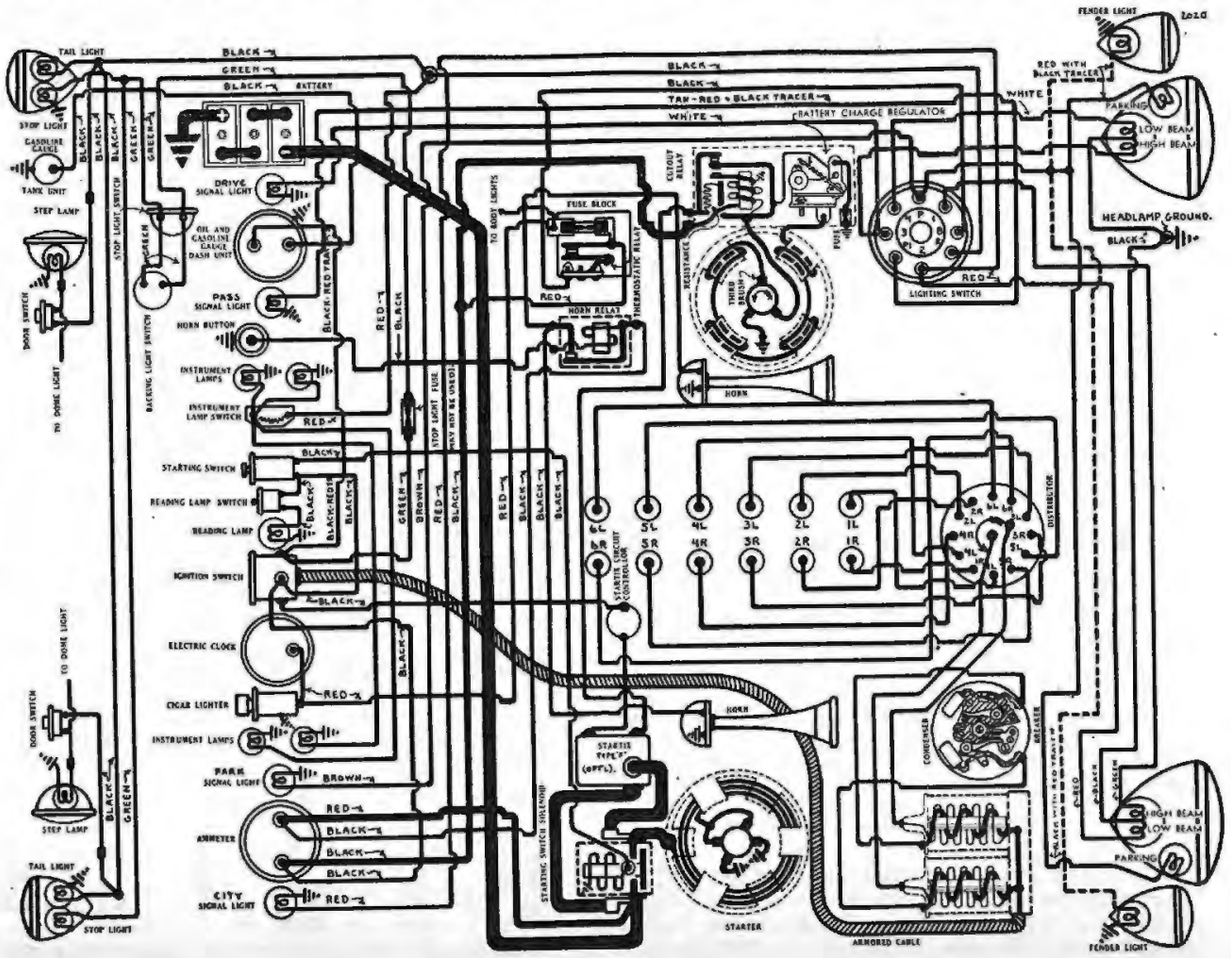
Synchronization (Movable Contacts):—Synchronization may be checked with Neon Timing Light. Connect lead to #6L spark plug wire and direct light at pointer on chain case. With correct line before mark '6L-UDC' (see table above) marked in chalk for better visibility, idle engine. This line should line up with pointer on chain case cover. Engine must be stopped to set synchronization. To adjust, turn engine over to #6L firing position, loosen lockscrews on movable sub-plate, shift plate by turning eccentric adjusting screw until movable contacts begin to open, tighten lockscrews.

Synchronization (Other Methods)—If distributor synchronized by other methods, set movable points to open 33½° after fixed points. Distributor firing intervals are unequal 33½-26½-33½ distributor degrees.

NOTE—Manufacturer recommends use of Winn Synchrometer (Packard Tool #ST-913) to synchronize contacts.

Fuel Compensator Setting:—Should be set to provide best performance with a slight ping pulling heavy load. Adjusted by loosening thumbnut and moving pointer to left or right from center 'O' position.

Firing Order:—1R-6L-5R-2L-3R-4L-6R-1L-2R-5L-4R-3L with cylinder banks right (R) and left (L) as viewed from driver's seat and #1 cylinder nearest radiator. Spark plugs not connected in this order on distributor cap (see diagram).



Spark Plugs:—AC. Type K-7, Champion J-8, 14 MM. Metric.

Spark Plug Gap—.028-.030".

CARBURETION—Carburetor—Stromberg Model EE-3. 1½" dual downdraft type with Stromberg type 'C' automatic choke. See Carburetion Section for adjustments, overhaul and Jet Specifications.
NOTE—Do not adjust carburetor until engine is warmed up and choke valve is wide open and engine idling at slow or hot idling speed.

Idle Adjustment—Set throttle stopscrew so that engine idles at 375 R.P.M. or 8 M.P.H. Turn inner idling adjusting screw in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Repeat with outer idling adjusting screw. Readjust throttle stopscrew for correct idling speed. See separate article for other methods of adjustment on Stromberg EE-3 carburetors.

Accelerating Pump Setting—Adjusted by changing position of pump link rod in throttle valve lever.
Inner Hole (Min. stroke)—Summer temperatures.
Outer Hole (Max. stroke)—Winter temperatures.

Fast Idle:—To adjust with engine cold, open and close throttle allowing choke to close (if engine hot hold fast idle stopweight down with fast idle adjusting screw resting on ear of fast idle stopweight). Loosen locknut on adjusting screw, back off screw until it is free of stop, turn screw in until it just contacts stop, then turn screw in 2-2½ turns, finally tighten locknut on adjusting screw. See article in Carburetion Section.

Automatic Choke:—Stromberg Type 'C'. No adjustment required. See separate article in Carburetion Section for complete data.

Air Cleaner:—AC. #1525442 oil-wetted type standard, #1525902 heavy duty oil bath type optional.

Fuel Pump:—AC. Type I. #1521778. Combination fuel-and-vacuum pump.

Gasoline Gauge:—AC. Electric #1515309 (dash unit), #1515400 (tank unit—except sedan), #1515401 (tank unit—sedan only).

VALVE TIMING:—To Check Timing—Intake valve in #1 cylinder of right hand bank (1R) should begin to open with piston No. 6R on top dead center entering power stroke when mark '1R-UDC' on vibration dampener at front of engine lines up with pointer on chain case cover.

Motor Gauge—Weidenhoff #114 Adapter, #2 Rod.

Tappet Clearance:—None in service (automatic take-up). See article in Equipment Section.

Valve Spring Pressure:—70 lbs. at 2 7/32" (valve closed).

LUBRICATION:—Crankcase Capacity—10 qts.
Normal Oil Pressure—35 lbs. at 1000 R.P.M.

BATTERY:—Prest-O-Lite, Type H4-21. 6 volt, 21 plate, 150 ampere hour capacity (20 hour rate).

Starting Capacity—175 amperes for 20 minutes.

Zero Capacity—300 amperes for 6.3 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under rear compartment floor boards.

STARTER:—Model DN-1299. Armature No. 13409.

Drive—Outboard Bendix Type RCD10FXTD.

Cranking Engine—125 R.P.M., 130 amps. at 5.6 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—56-60 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	3000	6.0	50
2 "	1600	5.6	120
3.3 "	1200	5.45	150
6.3 "	800	5.2	210
15.0 "	400	4.65	360
35.0 "	Lock	3.5	650
39.0 "	Lock	3.6	810

Removal:—Starter sleeve mounted on right front face of flywheel housing. To remove, take out pilot mounting screw in flywheel housing.

Starting Switch:—Solenoid Type SS-4001A. Mounted on starter and controlled by pushbutton switch on instrument panel. Operative with ignition switch turned 'on'. See Equipment Section for complete data.

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 6.0 volts.

Startix (Optional)—Type 'F' automatic starting switch and Startix Circuit Controller (back-fire unit), controlled by ignition switch. See article in Electrical Equipment Section for complete data.

NOTE—Control unit (Cutout Relay) has extra terminal and resistance coil which are used with Startix Type F.

GENERATOR:—Model CO-1309. Armature No. 23691. Air-cooled, third-brush control type with Battery Charge Regulator (two-step charging control).

Charging Rate Adjustment—Third brush shifted through rack-and-pinion control by slotted screw on commutator end plate. Turn adjusting screw to right or clockwise to increase, and left or counter-clockwise to decrease charging rate.
Maximum Charging Rate—30-33 amperes (cold), 24-27 amperes (hot) at 8.0 volts.

Performance Data—Regulator Inoperative

Cold			Hot		
Amps.	Volts	R.P.M.	Amps.	Volts	R.P.M.
0	7.0	580	0	7.3	625
5	7.2	630	5	7.5	700
10	7.5	700	10	7.7	800
15	7.7	790	15	7.9	930
20	7.9	910	20	8.0	1100
25	8.0	1080	25	8.0	1380
30	8.0	1380	28	8.0	2000
32	8.0	1900			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—20-22 ozs. (main), 12-14 ozs. (third).

Field Current—4.5 amperes at 7.5 volts.

Field Fuse—5 ampere capacity in knurled plug in side of regulator case.

Removal:—Generator mounted on special sliding bracket at left front of engine with fan belt drive. To remove, loosen nuts on two studs on mounting slide, move generator toward engine, slip off drive belt, take off nuts, lift generator out.

Belt Adjustment—Loosen slide nuts, pull generator out until reading on scale attached to generator frame is 180 lbs., tighten nuts.

CONTROL UNIT (RELAY-REGULATOR):—Mod. 40210. Consists of Type 40203 Cutout Relay with auxiliary contacts and resistance coil (for use with Type 'F' Startix) and Battery Charge Regulator in case on generator. See Equipment Section for data on these units.

Cutout Relay

Cuts In—6.8-7.2 volts, 600 R.P.M.

Cuts Out—0-2.5 amperes discharge current.

Contact Gap—.030-.032".

Air Gap—.020-.025" with contacts closed.

Auxiliary Contacts—Should open when main contacts close, close when main contacts open.

Battery Charge Regulator

Setting—8.2 volts (cold), 7.8 volts (hot)—contact opening point.

Regulator Resistance—1.85 ohms.

LIGHTING:—Headlamps—Hall, Pre-focused Flex-beam type with special non-interchangeable lenses. Head lamps aimed straight ahead with lighting switch in 'Country Driving' (upper beam) position. 'Country Passing' beam (upper beam right hand headlamp, lower beam left hand headlamp) controlled by lighting switch.

Headlamp Beam Indicator—Separate beam indicator for each position of lighting switch (1—Parking, 2—City Driving, 3—Country Driving, 4—Country Passing), located on instrument panel.

Switches

Lighting—R.B.M. Model 1400.

Instrument Lamp Rheostat—Soreng-Manegold No. J2060A.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2330
Parking or Fender	3	63
Instrument, Tail, Courtesy	3	63
Stop	15	87
Dome	6	81
Indicators	1	51

THERMOSTATIC RELAY:—(On Delco-Remy Model 1050-W Fuse Block). Thermostatic arm type current limit relay (no winding). Connected in lighting circuits. Contacts open with current load of 38 amperes at 70° F.

FUSES:—Body Lights—20 ampere on fuse block (see above).

Generator Field—5 amperes in knurled plug on side of regulator case.

HORNS:—Sparton Twin Horns. Vibrator type. Operated by horn relay.

Horn Relay:—R.B.M. Model 10072. Current draw .4-.55 amperes at 6.0 volts. Coil resistance 11-14 ohms. Contacts must close with relay in inverted position.

SERIAL NUMBER:—First number—(438-138" WB)—2,215,001. (444-144" WB)—2,600,001. Stamped on plate on right frame side rail at rear of right front spring rear shackle.

COMPRESSION:—**Ratio**—6.4-1 Standard aluminum hd. No optl. ratios. **Pressure**—150 lbs. at 3400 R.P.M. or 75-80 lbs. at cranking speed (100-105 R.P.M.).

VACUUM READING:—Gauge should show steady reading of 19-20" with engine idling.

IGNITION:—**Coil Model 539-K.** Mounted on dash.

Ignition Current—2 amperes idling, 4 stopped.

Ignition Switch:—Delco-Remy Model 430-U. Switch and cable assembly. Connected to coil by armored cable. See article in Equipment Section.

Distributor Model 662-J. Double breaker, 4 lobe cam, semi-automatic advance type. Contacts open alternately at 45° intervals corresponding to 90° firing interval of engine, and must be synchronized. See Timing.

Breaker Gap—Set at .018". Limits .018-.024".

Cam Angle or Dwell—34° closed, 11° open (distrib.). Both sets together when properly synchronized.

Breaker Arm Spring Tension—19-23 ounces.

Condenser—Part No. 829092. Capacity .20-.25 mfds.

Manual Advance—33° (engine-maximum). Consists of retard operated by pulling out button on dash. Used for hand cranking or heavy pulling.

Automatic Advance

Distributor		Engine	
Degrees	R.P.M.	Degrees	R.P.M.
Start	300	2	600
9	1550	18	3100

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

IGNITION TIMING:— **Flywheel Degrees** **Piston Pos.**
All engines ..... 5° BTDC ..... .0123" BTDC

Timing (Stationery Contacts)—Advance spark control button (push button in), turn ignition key to 'on' position with automatic starting inoperative (if ignition turned on), remove cover over inspection hole in flywheel housing. With #4 piston on compression, turn engine over until flywheel mark 'IGN/4' lines up with indicator on housing (mark is 5° before top dead center mark 'UDC/4'), loosen advance arm clamp bolt, rotate distributor until stationery contacts (mounted directly on breaker plate) begin to open, tighten clamp bolt, then check synchronization.

Synchronization (Movable Contacts)—Turn engine over 90° or ¼ revolution to firing position for piston #1, stop when flywheel mark 'IGN./1-8' lines up with indicator (mark is 5° before top dead center mark 'UDC./1-8'), loosen lockscrews on movable sub-plate, turn eccentric adjusting screw until contacts begin to open, tighten lockscrews, check spark plug connections.

Synchronization (Using Tool)—Use special synchronizing tool, Delco-Remy Part No. 1838182, and follow complete directions in Equipment Section.

Motor Gauge—Weidenhoff Adapter #114, Rod #29.

Firing Order:—1-6-2-5-8-3-7-4. See diagram.

Spark Plugs:—Champion Type J-6. 14 MM. Metric.
Spark Plug Gap—.025". Limits .022-.025".

CARBURETION:—**Carburetor**—Stromberg Mod. EE-3, 1½" dual downdraft type. See Carburetion Section for adjustment, overhaul and Jet Specifications. NOTE—Do not adjust carburetor until engine is warmed up so that choke valve is wide open and engine idling at hot or slow idling speed.

Idle Adjustment—Adjust each screw individually with engine idling on four cylinders (ground #1, 2, 7, 8 plug cables when adjusting inner screw, #3, 4, 5, 6 while adjusting outer screw). Turn screw in until engine begins to lag or miss, then out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Repeat with other adjusting screw in the same manner. Adjust throttle stopscrew so that idle speed is 37-39 explosions in 15 seconds (checked by removing plug in exhaust manifold).

Accelerating Pump Setting—Adjusted by changing position of pump link rod in throttle valve lever. Inner Hole (Min. stroke)—Summer temperatures. Outer Hole (Max. stroke)—Winter temperatures.

Fast Idle:—Stromberg type. See special article in Carburetion Section.

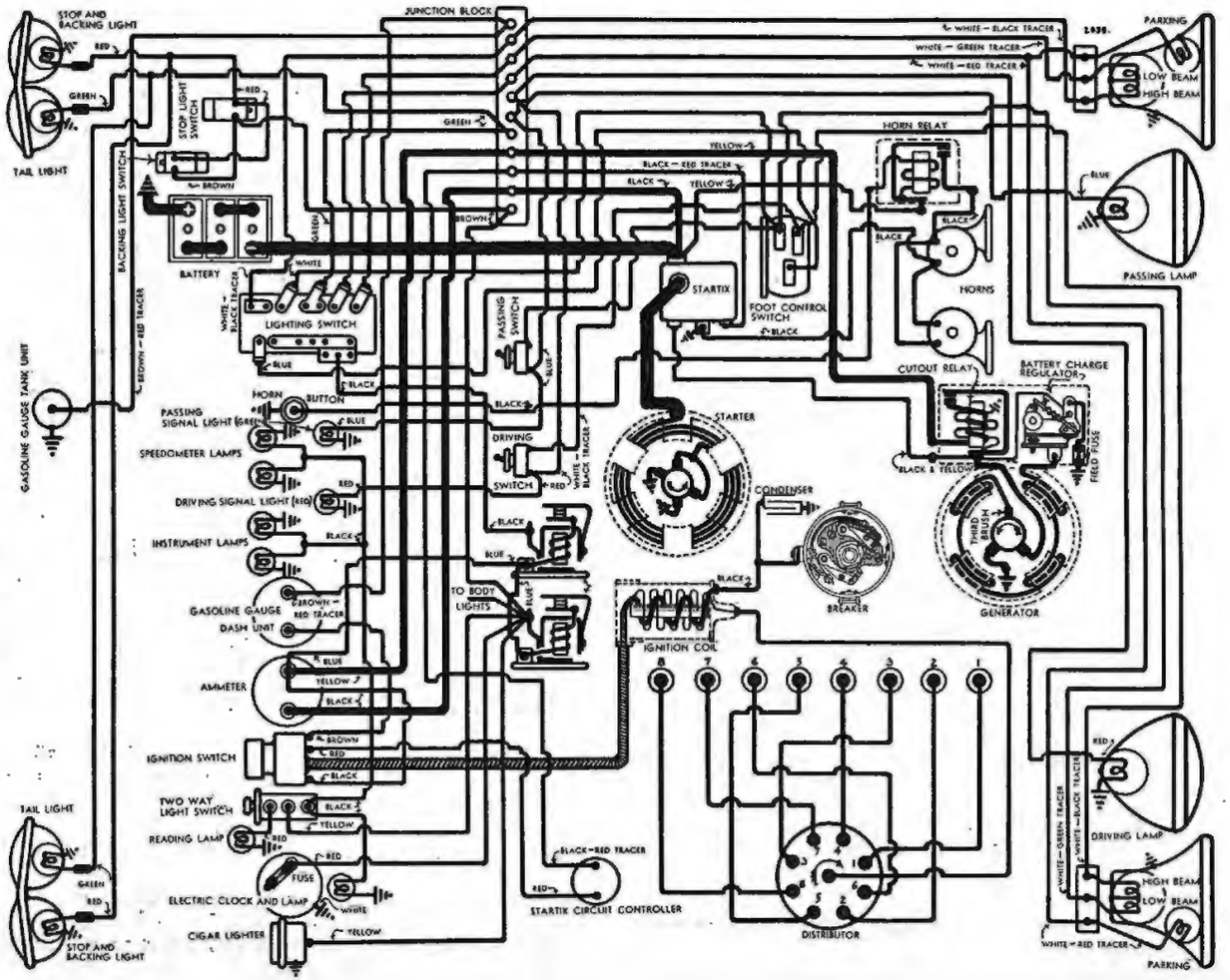
Automatic Choke:—Stromberg Type 'C' No. A-17630. See special article in Carburetion Section.

Air Cleaner:—AC. oil-wetted type standard.

Fuel Pump:—AC. Type D #1522112. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Motometer Electric. Dash unit—NG-7833-D. Tank unit—NG-7741-T. See article in Carburetion Section.

VALVE TIMING:—**To Cheek Timing**—Remove #1 intake hydraulic valve lifter, pull out plunger, remove spring, wash lifter assembly in gasoline, replace plunger, install lifter in bracket. Check clearance



between end of plunger and valve stem (valve closed—clearance will be about .070"). Insert sufficient feeler stock to take up all except .010" clearance. Turn engine over until piston #1 is .0123" past top dead center, stop when flywheel mark 'IN.OP./1-8' lines up with indicator on housing. #1 intake valve should begin to open at this point. Remove feeler stock, reassemble hydraulic valve lifter (see article in Equipment Sec. for complete directions).

NOTE—Hydraulic valve lifter dimensions changed. All service instructions same as for previous models but lifters not interchangeable in part or as assembly with previous types or between eight and twelve cylinder engines.

Motor Gauge—Weidenhoff Adapter #114, Rod #29.

Tappet Clearance:—None in service. See article in Equipment Section on Hydraulic tappet take up.

Valve Spring Pressure:—60-65 lbs. at 2 3/32" (valve closed), 120-128 lbs. at 1 25/32" (valve open).

LUBRICATION:—Crankcase Capacity—9 qts. (refill). 10 qts. (dry).

Normal Oil Pressure—40-45 lbs. at 40 M.P.H.

BATTERY:—Willard, Type WH-4-17, RH-4-17 (Export) 6 volt, 17 plate, 136 ampere hour capacity (20 hour rate).

Starting Capacity—160 amperes for 20 minutes.

Zero Capacity—300 amperes for 5.4 minutes.

Grounded Terminal—Positive (+) term. grounded to transmission cover bolt.

Location—Left hand side under front floor.

STARTER:—Model DI-1314. Armature No. 16437.

Drive—Bendix Type RCD11FXT-10.

Cranking Engine—100-105 R.P.M., 175 amperes at 5.35 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—56-60 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	4500	6.0	60
2 "	1600	5.5	130
3.6 "	1200	5.35	170
7.4 "	800	5.05	250
14.4 "	400	4.5	400
28.0 "	Lock	3.5	650
29.24 "	Lock	3.6	720

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

Starting Switch:—Startix Type 'D'. Automatic starting switch and Startix circuit controller (anti-backfire unit), controlled by ignition switch. See special article in Equipment Section for complete data.

GENERATOR:—Model CO-1309. Armature No. 23691. Air-cooled. Third brush control type with Battery Charge Regulator (two-step charging rate).

Charging Rate Adjustment—Third brush shifted through rack-and-pinion control by slotted adjusting screw on commutator end plate. To adjust, turn adjusting screw to right or clockwise to increase, and to left or counter-clockwise to decrease charging rate.

Maximum Charging Rate—32 amperes (cold), 8.0 volts, 1900 R.P.M., 25-30 M.P.H.

Performance Data—Regulator Inoperative

Cold			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	7.0	580	0	7.3	625
5	7.2	630	5	7.5	700
10	7.5	700	10	7.7	800
15	7.7	790	15	7.9	930
20	7.9	910	20	8.0	1100
25	8.0	1080	25	8.0	1380
30	8.0	1380	28	8.0	2000
32	8.0	1900			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—20-22 ozs. (main), 12-14 ozs. (third).

Field Current—4.5 amperes at 7.5 volts.

Field Fuse—5 ampere capacity in knurled plug in side of regulator case.

Removal:—Generator cradle mounted at left front of engine with fan belt drive (double Vee belt). To remove, slack off drive belt, disconnect water pump drive coupling, loosen mounting clamp band.

Belt Adjustment:—To adjust, loosen clamp bolt on fan bracket, turn eccentric shaft spindle until 10 lb. pull on belt midway between pulleys causes 1" deflection, tighten clamp bolt. Additional range of adjustment secured by taking bracket off engine and moving bracket up until mounting bolts engage lower holes.

CONTROL UNIT (RELAY-REGULATOR):—Mod. 40300. Consists of Cutout Relay and Battery Charge Regulator in a single case on generator field frame. See Equipment Section for complete data on Battery Charge Regulator.

Cutout Relay

Cuts In—6.8-7.2 volts, 600 R.P.M., 8 M.P.H.

Cuts Out—0-2.5 amperes discharge current.

Contact Gap—.030-.032".

Air Gap—.020-.025" with contacts closed.

Battery Charge Regulator

Setting—8.2 volts (cold), 7.8 volts (hot)—contact opening point.

Regulator Resistance—1.85 ohms.

LIGHTING:—Headlamps—Guide Multi-beam, Pre-focused, Cross-beam type with special non-interchangeable lenses. Headlamps aimed straight ahead with lenses removed. Assymetrical passing beam (upper beam left hand headlamp, lower beam right hand headlamp), controlled by foot selector switch with lighting switch in 'Country Driving' position.

Driving Lamp—Mounted on right of radiator. Controlled by separate switch on instrument panel with Red indicator lamp lighted with driving lamp 'on'. Lighted with lighting switch in 'Country Driving' position except when Driving Lamp Switch turned off.

Passing Lamp—Mounted at left of radiator. Controlled by separate switch on instrument panel with Green indicator lamp lighted with passing lamp 'on'. Lighted with lighting switch in 'City Driving' position or with foot selector switch in passing position (see Headlamps above) except when Passing Lamp Switch turned off.

Switches

Lighting—Delco-Remy Model 479-M.

Instrument Lamps—Delco-Remy Model 1411.

Foot Selector—Delco-Remy Model 471-Z.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2330
Stop and Backing	21	1129
Driving and Passing	32	1323 * *
Driving and Passing Pilots	3	64
License Plate	3	63
Instrument Panel, Parking	1½	55
Tail, Dome & Corn., Smoke Cab.	6	81

* * This bulb Pre-focused, single contact type.

FUSES:—Electric Clock—5 ampere on back of clock.

Generator Field—5 ampere in regulator case.

CURRENT LIMIT RELAY:—Model 410-N. Two units used. Vibrating type. Starts to operate with current load of 35-40 amperes, limiting load to 5-22 amps.

Contact Gap—.012-.030".

Air Gap—.015-.030" with contacts closed.

Spring Tension—5 ounces minimum measured at brass button.

HORNS:—Klaxon Model K-33-S. Type 2051 (low note), 2052 (high note). Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
2051 (low note)	11-13	.042-.046"
2052 (high note)	10-12	.032-.036"

Horn Relay:—Model 266-TK. Requires .25 amperes to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025".

Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—First number—(1602-138" WB) 3,130,001. (1602-144" WB) 3,140,001. (1603-147" WB) 3,150,001. Stamped on plate on right frame side rail at rear of right front spring rear shackle.

COMPRESSION:—**Ratio**—6.4-1 Standard aluminum head. No optl. ratios. **Pressure**—140 lbs. at 2500 R.P.M. or 80-85 lbs. at cranking speed (100-105 R.P.M.)

VACUUM READING:—Gauge should show steady reading of 19-20" with engine idling.

IGNITION:—**Coil Model 553-E (2).** Coils mounted on dash.

Ignition Current—2 amperes idling, 4 amperes stopped, for each coil.

Ignition Switch:—Delco-Remy Model 430-T. Switch and cable assembly. Connected to coil unit by armored cable. See article in Equipment Section.

Distributor Model 4105. Double breaker, 6 lobe cam, semi-automatic advance type. Contacts open alternately at 20° and 40° intervals corresponding to 40° and 80° firing intervals of engine (unequal firing interval caused by 80° included angle of cylinder banks). Contacts must be synchronized—see Timing.

Breaker Gap—Set at .018". Limits .018-.024".

Cam Angle or Dwell—Closed 39°. Open 21° (distributor). Each set operates independently.

Breaker Arm Spring Tension—19-23 ounces.

Manual Advance—33° (engine—maximum). Consists of a retard operated by pulling button on dash out. Used for hand cranking or heavy pulling.

Condenser—Part No. 1837231. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	400	2	800
7	1400	14	2800

Distributor Removal:—Mounted at rear of engine between cylinder banks. Take out distributor bracket screws.

IGNITION TIMING:— **Flywheel Deg.** **Piston Position**
All engines ..... 5° BTDC ..... .0091" BTDC

Timing (Stationary Contacts)—Advance spark control (push button in), if ignition turned 'on' turn key to 'on' position with automatic starting inoperative, remove cover over inspection hole in flywheel housing. With #1 piston on compression, turn engine over until flywheel mark 'IGN.#1' lines up with indicator on housing (mark is 5° before top dead center mark 'UDC/No.1'). Loosen locking screw in center of breaker cam, carefully locate cam so that stationary contacts (mounted directly on breaker plate) are just opening, tighten locking screw, check rotor position. Then check synchronization.

Motor Gauge—Weidenhoff #114 Adapter, #42 Rod.
Synchronization (Movable Contacts)—Turn engine over 40° or exactly 1/9 revolution to firing position of piston #4 (#2 on right hand bank), stop when flywheel mark 'IGN/No. 4' lines up with indicator on housing (mark is 5° before top dead center mark 'UDC/No. 4'). Loosen lockscrews on movtable subplate, turn eccentric adjusting screw until contacts open. Tighten lockscrews.

Synchronization—Other Methods—Use synchronizing tool or rotary spark gap, set movable contacts to open exactly 20° after first or stationary contacts (adjust by loosening lockscrews and turning eccentric adjusting screw on sub-plate). Firing intervals are 20-40-20 (distributor degrees).

Firing Order:—1-4-9-8-5-2-11-10-3-6-7-12 with cylinders numbered as shown on diagram (Right bank—1,3,5,7,9,11; Left bank—2,4,6,8,10,12 with #1 and 2 cylinders nearest radiator). Spark plug cables not connected in this order on distributor cap (see diagram).

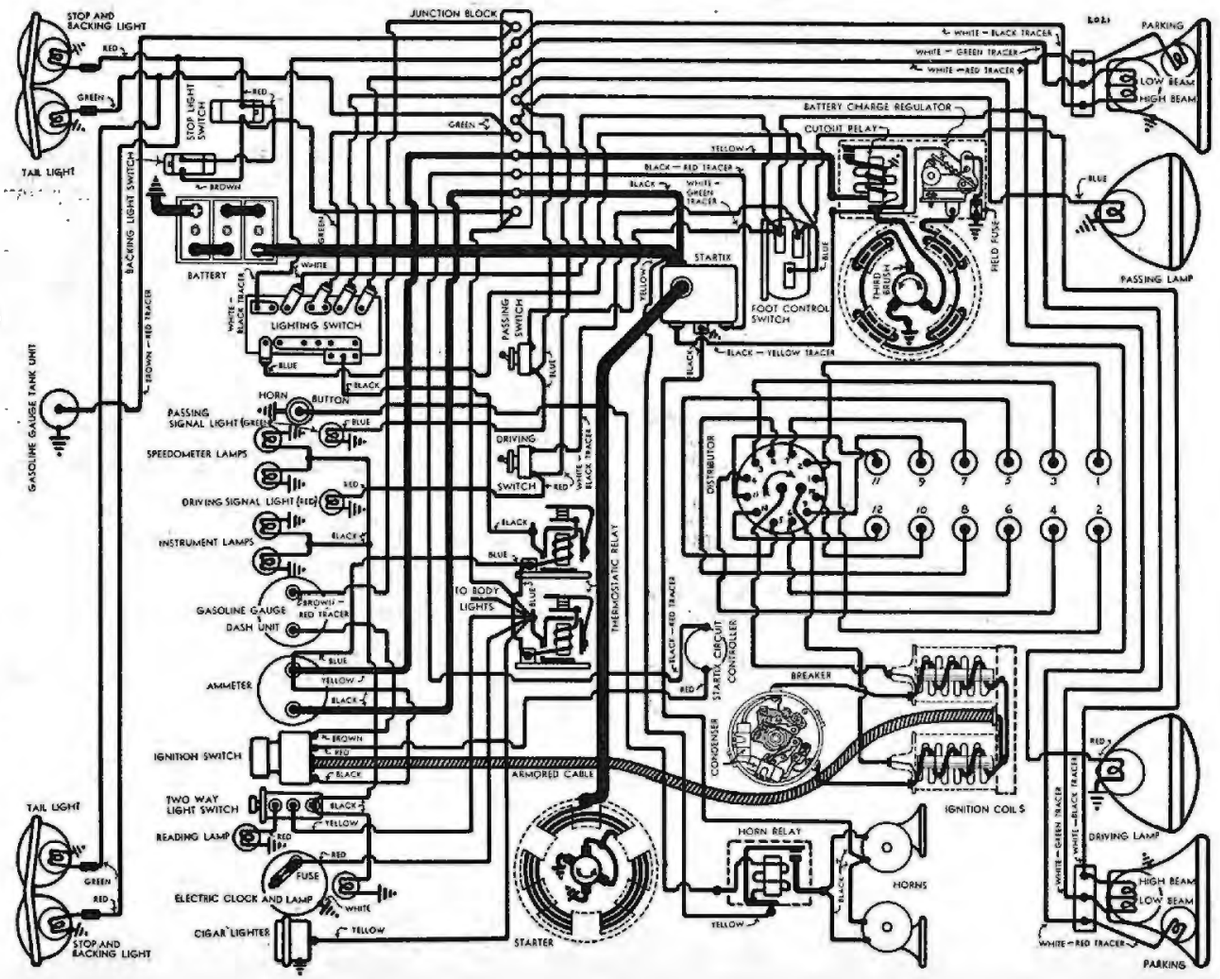
Spark Plugs:—Champion Type J-6. 14 MM. Metric type.

Spark Plug Gap—.025". Limits .022-.025".

CARBURETION:—**Carburetor**—Stromberg Model EX-32, 1½" downdraft type. One carburetor used for each bank of cylinders (throttles must be synchronized.) See Carburetion Section for adjustment, overhaul and Jet Specifications.

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

Idle Adjustment—Adjust one carburetor at a time. Cut out the six cylinders of the other bank by grounding the high tension lead of the coil firing that bank. Turn idle adjusting screw in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Then check idling speed by taking out plug in exhaust manifold and counting explosions or form small gap by disconnecting one high tension lead at spark plug and count sparks. Adjust throttle lever stopscrew so that there are 37-39 explosions in 15 seconds. Recheck idle adjusting screw setting (this must be reset if idling speed has been changed. After adjusting each carburetor, connect both coils, idle engine on all twelve cylin-



ders and check throttle valve synchronization (see article in Carburetion Section).

Accelerating Pump Setting—Adjusted by changing position of pump link rod in throttle valve lever. Inner Hole (Min. stroke)—Summer temperatures. Outer Hole (Max. stroke)—Winter temperatures.

Fast Idle:—Stromberg type. See special article in Carburetion Section.

Automatic Choke:—Stromberg Type 'C' No. A-16090. See special article in Carburetion Section.

Air Cleaner:—AC. oil-wetted type standard, oil-bath heavy duty type optional.

Fuel Pump:—AC. Type D #1523010. Diaphragm type. See Carburetion Section for complete data.

Gasoline Gauge:—Motometer Electric. Dash unit—NG-8055-D. Tank Unit—NG-7741-T.

VALVE TIMING:—To Check Timing—Remove #1 intake hydraulic valve lifter, pull out plunger, remove spring, wash lifter assembly in gasoline to remove all oil, replace plunger, install lifter in bracket, check clearance between end of plunger and valve stem (valve closed—clearance will be about .070"). Insert sufficient feeler stock to take up all but .004" clearance, turn engine over with #11 piston on compression, stop when flywheel mark 'IN.OP#1/' lines up with indicator on housing, #1 intake valve should begin to open at this point. Remove feeler stock, reassemble hydraulic valve lifter (see article in Equipment Section for complete directions).

NOTE—Hydraulic valve lifter dimensions changed. All service instructions same as for previous models but lifters not interchangeable in part or as assembly with previous types or between eight and twelve cylinder engines.

Motor Gauge—Weidenhoff #114 Adapter, #42 Rod.

Tappet Clearance:—None in service. See article in Equipment Section on Hydraulic Tappet Take-up.

Valve Spring Pressure:—60-65 lbs. at 2 3/32" (valve closed), 120-128 lbs. at 1 25/32" (valve open).

LUBRICATION:—Crankcase Capacity—11 qts. (refill). **Normal Oil Pressure**—45 lbs. at 53 M.P.H.

BATTERY:—Willard, Type WH-5-19, RH-5-19 (Export). 6 volt, 19 plate, 153 ampere hour capacity (20 hour rate).

Starting Capacity—180 amperes for 20 minutes.

Zero Capacity—300 amperes for 6.6 minutes.

Grounded Terminal—Positive (+) terminal.

Location—Left hand side under front floor.

STARTER:—Model DI-1313. Armature No. 16437.

Drive—Bendix Type RCD11FXT-10.

Cranking Engine—100-105 R.P.M., 175 amperes at 5.35 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—56-60 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	4500	6.0	60
2 "	1600	5.5	130
3.6 "	1200	5.35	170
7.4 "	800	5.05	250
14.4 "	400	4.5	400
28.0 "	Lock	3.5	650
29.24 "	Lock	3.6	720

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

Staring Switch:—Startix Type 'D'. Automatic starting switch and Startix circuit controller (anti-backfire unit), controlled by ignition switch. See special article in Equipment Section for complete data.

GENERATOR:—Model CO-1309. Armature No. 23691. Air-cooled. Third brush control type with Battery Charge Regulator (two-step charging rate).

Charging Rate Adjustment—Third brush shifted through rack-and-pinion control by slotted adjusting screw in commutator end plate. To adjust, turn adjusting screw to right or clockwise to increase, and to left or counter-clockwise to decrease charging rate.

Maximum Charging Rate—32 amperes (cold), 8.0 volts, 1900 R.P.M., 25-30 M.P.H.

Performance Data—Regulator Inoperative

Cold			Hot		
Amps	Volts	R.P.M.	Amps	Volts	R.P.M.
0	7.0	580	0	7.3	625
5	7.2	630	5	7.5	700
10	7.5	700	10	7.7	800
15	7.7	790	15	7.9	930
20	7.9	910	20	8.0	1100
25	8.0	1080	25	8.0	1380
30	8.0	1380	28	8.0	2000
32	8.0	1900			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—20-22 ozs. (main), 12-14 ozs. (third).

Field Current—4.5 amperes at 7.5 volts.

Field Fuse—5 ampere capacity in knurled plug in side of regulator case.

Removal:—Generator cradle mounted on left front of engine with fan belt drive (double Vee belt). To remove, slack off drive belt, disconnect water pump drive coupling, loosen mounting clamp band.

Belt Adjustment:—To adjust, loosen clamp bolt on fan bracket, turn eccentric shaft spindle until 10 lb. pull on belt midway between pulleys causes 1" deflection, tighten clamp bolt. Additional range of adjustment secured by taking bracket off engine and moving bracket up until mounting bolts engage lower holes.

CONTROL UNIT (RELAY-REGULATOR):—Mod. 40300. Consists of Cutout Relay and Battery Charge Regulator in a single case on generator field frame. See Equipment Section for complete data on Battery Charge Regulator.

Cutout Relay

Cuts In—6.8-7.2 volts, 600 R.P.M., 8 M.P.H.

Cuts Out—0-2.5 amperes discharge current.

Contact Gap—.030-.032".

Air Gap—.020-.025" with contacts closed.

Battery Charge Regulator

Setting—8.2 volts (cold), 7.8 volts (hot)—contact opening point.

Regulator Resistance—1.85 ohms.

LIGHTING:—Headlamps—Guide Multi-beam, Pre-focused, Cross-beam type with special non-interchangeable lenses. Headlamps aimed straight ahead with lenses removed. Assymatrical passing beam (upper beam left hand headlamp, lower beam right hand headlamp), controlled by foot selector switch with lighting switch in 'Country Driving' position.

Driving Lamp—Mounted on right of radiator. Controlled by separate switch on instrument panel with Red indicator lamp lighted with driving lamp 'on'. Lighted with lighting switch in 'Country Driving' position except when driving lamp switch turned off.

Passing Lamp—Mounted on left of ratiator. Controlled by separate switch on instrument panel with Green indicator lamp lighted with passing lamp 'on'. Lighted with lighting switch in 'City Driving' position or with foot selector switch in passing position (see Headlamps above) except when passing lamp switch turned off.

Switches

Lighting—Delco-Remy Model 479-M.

Instrument Lamps—Delco-Remy Model 1411.

Foot Selector—Delco-Remy Model 471-Z

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2330
Stop and Backing	21	1129
Driving and Passing	32	1323**
Driving and Passing Pilots	3	64
License Plate	3	63
Instrument Panel, Parking	1½	55
Tail, Dome & Corn., Smok. Cab.	6	81

** This bulb Pre-focused, single contact type.

FUSES:—Electric Clock—5 ampere on back of clock.
Generator Field—5 ampere in regulator case.

CURRENT LIMIT RELAY:—Model 410-N. Two units used. Vibrating type. Starts to operate with current load of 35-40 amperes, limiting load to 5-22 amperes.

Contact Gap—.012-.030".

Air Gap—.015-.030" with contacts closed.

Spring Tension—5 ounces minimum measured at brass button.

HORNS:—Klaxon Model K-33-S. Type 2051 (low note), 2052 (high note). Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
2051 (low note)	11-13	.042-.046"
2052 (high note)	10-12	.032-.036"

Horn Relay:—Model 266-TK. Requires .25 amperes to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025".

Air Gap—.012-.017" with contacts closed.

NOTE—Economy Model equipped with smaller carburetor, intake manifold and 3.7-1 ratio rear axle. This series may be distinguished by letter 'E' inserted in engine number: thus P2-E241409. This letter 'E' should not be confused with letters 'A', 'B', etc., following engine number. This series does not have separate serial numbers.

SERIAL NUMBER:—On right front door hinge pillar post. First number:

	Detroit	Los Angeles	Evansville	Canada
P1	1,111,701	3,151,151	9,000,101	9,397,351
P2	2,641,401	3,040,601	9,025,101	9,332,286

COMPRESSION:—Ratio—6.7-1 Std. cast-iron head, 6.07-1 cast-iron head (available for export only).
Pressure—(6.7-1 Std. head) 140-150 lbs. at 1000 R.P.M. or approx. 113 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of 16-18" with engine idling at 6 M.P.H.

IGNITION:—Coil Model IG-4629. Service Winding (coil less switch and cable) IG-3224S. Coil mounted on dash.

Ignition Current—2.5 amperes idling, 5.5 stopped.

Ignition Switch:—Mitchellock Model 24-R, Type 6517. Connected to coil by armored cable.

Ignition Lock—Yale & Towne Model DP-108, Mitchell No. 6286.

Distributor Model IGS-4003-1, IGS-4003A-1, IGS-4003B-1. Single breaker, 6 lobe cam, full automatic advance type with auxiliary vacuum spark control.

Breaker Gap—Set at .020".

Cam Angle or Dwell—38° closed, 22° open.

Breaker Arm Spring Tension—9-13 ounces.

Condenser—Part No. IG-2671F. Capacity .20-.25 mfd

Automatic Advance—IGS-4003-1, IGS-4003A-1

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	350	0	700
3	400	6	800
6	850	12	1700
9	1300	18	2600
11	1600	22	3200

Automatic Advance—IGS-4003B-1

Start	350	0	700
3	400	6	800
6	950	12	1900
9	1500	18	3000
11	1850	22	3700

Vacuum Spark Control—Integral with distributor. Mounted on distributor housing and linked directly to breaker plate. Provides additional advance for all speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG)
Start	5"
10	9-10"
20	14"

Distributor Removal:—Mounted on left side of engine. To remove, disconnect vacuum line, take out hold-down screw in advance arm.

IGNITION TIMING:—Flywheel Degrees — Piston Pos.
6.7-1 Std. head ..... 4° ATDC ..... .0068" ATDC.
6.07-1 Export ..... 4° ATDC ..... .0068" ATDC.

Timing (Using Timing Light)—Connect timing light between distributor terminal and battery terminal on generator control unit. With #1 piston on compression, turn engine over until piston is 4° (or .0068") past top dead center, stop when fourth graduation to left of center '0' mark on fan pulley at front of engine lines up with pointer on chain case cover. Loosen hold-down screw in advance arm, center pointer on scale, tighten hold-down screw. Loosen advance arm clamp bolt, rotate distributor until lamp goes out, tighten clamp bolt.

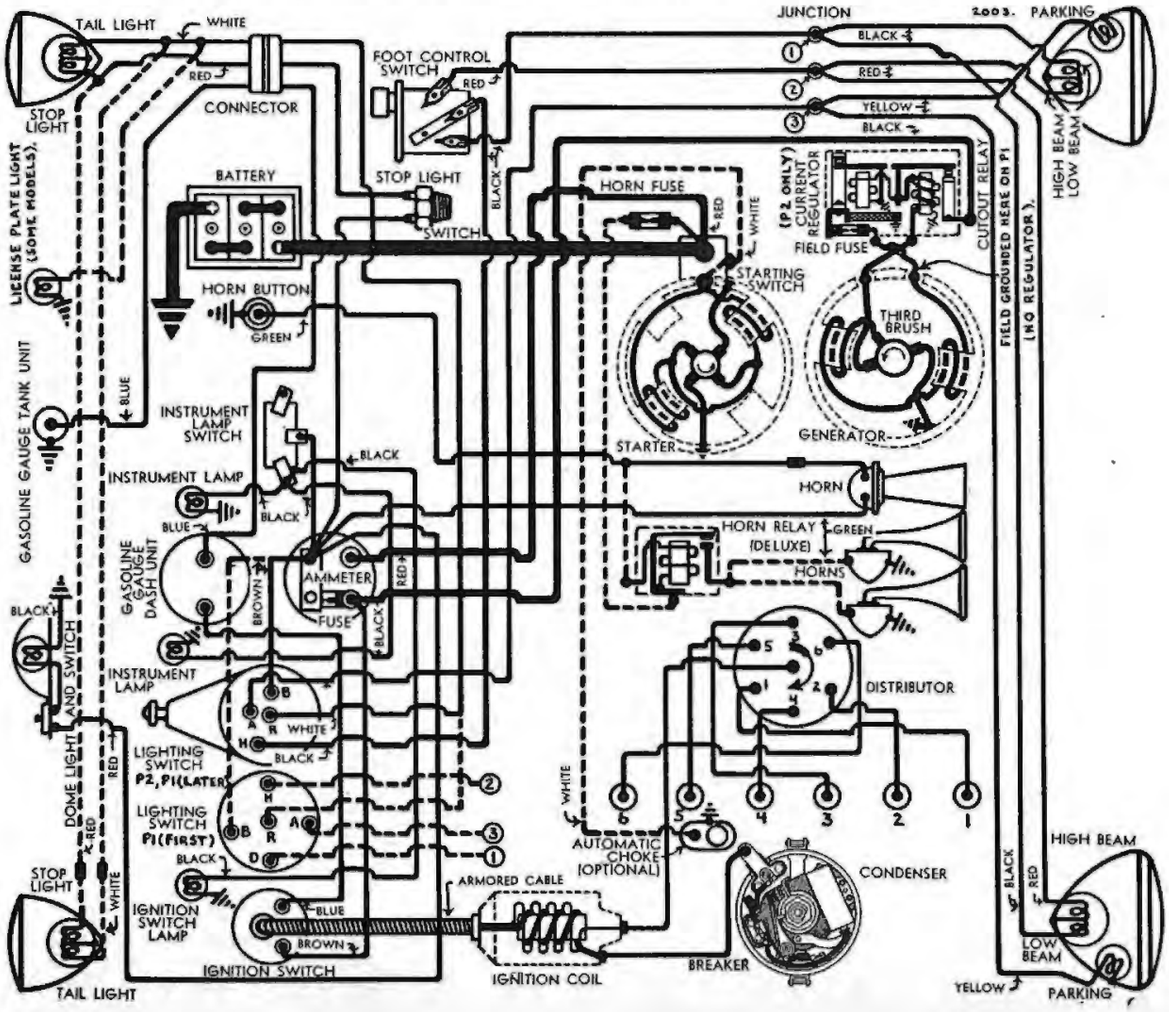
Timing (Using Synchroscope)—Clip lead to #1 spark plug, direct light at fan pulley, fill in 4° mark to left of center '0' mark with chalk or white paint. See Equipment Section.

Timing (Motor Gauge—Weidenhoff Adapter #103, Rod #12. Timing hole located over #6 piston.

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

Spark Plugs:—AC. Type K-9 superseded by Champion Type J-8. 14MM. Metric.
Spark Plug Gap—Set at .025".

CARBURETION:—Carburetor—Carter (Ball & Ball) Model C6E1 (Motor No. P2-1001 to P2-269322 inclusive), C6E2 (P2-269323 and up), 1¼" downdraft type with Fast Idle. Model B6F1, 1" downdraft type (No. P2-E241409 and up—Economy Model). See Carburetion Section for complete adjustment, overhaul, and Jet Specifications.
NOTE—Do not make carburetor adjustments until engine is warmed up with choke valve wide open and fast idle inoperative.
Idle Adjustment—Adjust throttle stopscrew so that idle speed is 300 R.P.M. or 6 M.P.H. Turn idle adjusting screw in until engine begins to lag or miss, then out until engine begins to roll, finally turn screw in until engine fires smoothly. Final setting should be ⅛-¾ (C6E1, 2), ¼-¾ (B6F1) turn of screw from inner closed or seated position. Readjust throttle stopscrew for correct idling speed.



Accelerating Pump Setting—Engage pump link in proper hole in throttle lever for seasonal requirements as follows:

Inner Hole (Min. stroke)—Extremely warm weather

Center Hole—Normal summer setting.

Outer Hole (Max. stroke)—Extremely cold weather.

NOTE—5% and 10% lean main metering screws (high altitude calibration) may be used at lower altitudes for maximum fuel economy although with considerably reduced speed and power. See Carter (B & B) Jet Specifications in Carburetion Section.

Fast Idle:—Integral with carburetor (C6E1, C6E2 only) No adjustment.

Automatic Choke:—Sisson Type AC-751B available as optional equipment on C6E1, C6E2 carburetors. See article in Carburetion Section for complete data.

Air Cleaner:—AC. #1526642 oil-wetted type standard, #1526712 heavy duty oil-bath type optional.

Fuel Pump:—AC. Type B #1522237 (early cars), #1522995 (later cars). Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Motometer Electric. Dash unit—NG-7762-D (P1), NG-7642-D (P2). Tank unit—NG-7687-T (all). See article in Carburetion Section.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .011". This valve should open with piston 6° (.0153") past top dead center, when sixth graduation to left of center '0' mark on fan pulley at front of engine lines up with pointer on chain case cover. Rest tappet clearance at .006" hot.

Motor Gauge—Weidenhoff Adapter #103, Rod #12. Timing hole over #6 piston.

Tappet Clearance:—.006" Int., .008" Exh., with engine hot. .010" Exh., recommended for sustained high speed.

Valve Spring Pressure:—34-38 lbs. at 1¾" (valve closed), 77-83 lbs. at 1 7/16" (valve open).

LUBRICATION:—Crankcase Capacity—5 qts. (refill).

Normal Oil Pressure—30-40 lbs. at 30 M.P.H.

BATTERY:—Willard, Type WHT 1-90, R 1-90 (Export). 6 volt, 13 plate, 90 ampere hour capacity(20 hour rate).

Starting Capacity—114, 109 (Exp.) amps. for 20 min.

Zero Capacity—300 amperes for 3.0, 2.3 (Exp.) mins.

Willard, Type WT 1-90 (Radio). 6 volt, 15 plate, 90 ampere hour capacity (20 hour rate).

Starting Capacity—117 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.1 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under front seat.

STARTER:—MAW-4009, MAW-4011 (RHD). Armature MAW-2030.

Drive—Positive shift outboard pinion.

Cranking Engine—Approx. 175 amperes 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.	4900	5.5	65
.60 "	3300	5.5	100
2.75 "	1480	5.0	200
5.45 "	820	4.5	300
8.50 "	400	4.0	400
11.55 "	110	3.5	500
11.5 "	Lock	3.0	505
18.0 "	Lock	4.0	670

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

Starting Switch:—SW-2677A. Mounted on starter field frame and operated by pinion shift (starting pedal). See Equipment Section for pedal adjustment.

GENERATOR:—Model P1—Model GBM-4603-B. Armature No. GBM-2006F. Air cooled, third brush control.

Charging Rate Adjustment—Use test meters to check generator output. Shift third brush by hand counter-clockwise to increase, or clockwise to decrease charging rate until output is 17-19 amperes at 8.25 volts, with generator at room temperature (70° F.). Third brush held in position by friction.

Commutator Bar Method—Shift third brush until there are exactly 4 commutator bars exposed between edge of third brush and nearest main brush.

Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold			Hot		
Amps.	Volts	R.P.M.	Amps.	Volts	R.P.M.
0	6.4	800	0	6.4	850
4	6.8	950	4	6.9	1050
8	7.25	1125	8	7.4	1250
12	7.7	1375	12	7.9	1680
16	8.1	1800	15.2	8.3	2500
18	8.3	2400			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24 ozs. min. (old brushes), 36 ozs. max. (new brushes).

Field Current—3.80-4.20 amps. at 6.0 volts.

Motoring Current—5.32-5.88 amps. at 6.0 volts.

Removal:—Pivot mounted at left front of engine. To remove, take out two pivot bolts and one clamp bolt.

Belt Adjustment:—Swing generator away from engine until 40-50 lb. reading indicated on scale attached to generator frame.

GENERATOR:—Model P2—Model GAR-4608E-5. Armature No. GAR-2116F. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Use test meters. Connect jumper between fuse cup on regulator and ground. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate until output is 21 amperes at 8.6 volts with generator at room temperature (70°F.). Third brush held in position by friction. Remove jumper.

Commutator Bar Method—Shift third brush until exactly 4 commutator bars are exposed between brush and nearest main brush.

Maximum Charging Rate—As given above. Do not exceed.

Performance Data

Cold			Regulator Contacts Closed			Hot		
Amps.	Volts	R.P.M.	Amps.	Volts	R.P.M.	Amps.	Volts	R.P.M.
0	6.4	800	0	6.4	825	0	6.4	825
4	6.8	950	4	6.8	1000	4	6.8	1000
8	7.25	1100	8	7.25	1200	8	7.25	1200
12	7.7	1275	12	7.7	1440	12	7.7	1440
16	8.1	1525	16	8.1	1825	16	8.1	1825
21	8.6	2400	18.5	8.35	2500	21	8.6	2400

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24 ozs. min. (old brushes), 36 ozs. max. (new brushes).

Field Current—3.51-3.89 amps. at 6.0 volts.

Motoring Current—5.03-5.57 amps. at 6.0 volts.

Field Fuse—5 ampere in plug on regulator case.

Removal:—Pivot mounted at left front of engine. To remove, take out pivot bolts and clamp bolt.

Belt Adjustment:—Swing generator away from engine until 40-50 lb. reading indicated on scale attached to generator frame.

CUTOUT RELAY:—Model P1—Model CB-4014. Mounted on generator. See article in Equipment Section.

Cuts In—6.75-7.5 volts.

Cuts Out—.5-2.5 amperes discharge current.

Relay Contact Gap—.025-.035".

Air Gap—.010-.030" with contacts closed.

RELAY-REGULATOR:—Model P2—Model TC-4301A. Mounted on generator. Consists of Cutout Relay and Current Regulator (two-rate charging control). See article in Equipment Section for complete data.

Cutout Relay—See above. Data same except for Cut In at 6.5-7.25 volts and Contact Gap which is .015-.045".

Current Regulator

Contacts Open—8.25-8.75 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—Corcoran Brown Pre-focused type. Headlamps aimed straight ahead (upper beam with lenses in place). Lower beam deflected slightly to right. Upper and lower beams controlled by foot selector switch except for early P1 models.

Switches

Lighting—Plymouth Part No. 659631 (early P1), 635451 (P2 and later P1 models). Douglas switch which is available only through Plymouth Parts Dpt

Foot Selector—Clum Model 9654.

Stop Light—R.B.M. No. 910. Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Location	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Ign.Sw.	1½	55
Stop and Tail	21-3	1158
Instrument	3	63
Dome	15	87

FUSES:—Lighting—20 ampere on back of ammeter.

Generator Field—5 ampere in plug on regulator (P2 only).

Twin Horns—20 ampere in connector near starter.

HORNS:—Auto-Lite Model HA-4001 (P1), HB-4001 (P2), Std. Klaxon Model K-33-F Type 2101 (low note), 2102 (high note) Optl. Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
2101	11-13	.040-.044"
2102	9-11	.032-.036"

Horn Relay:—Model 266-TK. Requires .25 amperes at 2 volts min. to close contacts. Current draw .8 amps.

Contact Gap—.015-.025".

Air Gap—.012-.017" with contacts closed.

NOTE:—Models 36-26A Deluxe Six and 36-26B Master Six are similar except that 'Knee Action' standard only on Model 36-26A. All data below applies to both models.

SERIAL NUMBER:—First number (36-26A) 6BA-1001, (36-26B) 6BB-1001. On top of left frame siderail in front of steering gear under engine hood.

COMPRESSION:—Ratio 6.2-1. Pressure 149 lbs. at 1000 R.P.M. or approx. 106 lbs. at cranking speed.
NOTE—Special thick head gasket which may be installed to correct ping due to low altitude or use of low-octane fuel reduces compression ratio to 5.7-1

VACUUM READING:—Gauge should show steady reading of 18-20" of HG. with engine idling at 360 R.P.M. or 6 M.P.H.

IGNITION:—Coil Model 539-L. Mounted on engine side of dash
Coil Draw—3.5 amperes at 6.2 volts.

Ignition Switch:—Delco-Remy Model 431-L. Switch and cable assembly. Connected to coil by armored cable.
Ignition Lock—Briggs & Stratton.

Distributor:—Model 647-B. Single breaker, 6 lobe cam, full automatic advance type with vacuum spark control and Gaselector adjustment at distributor.
Breaker Gap—.020". Limits .018-.024".
Cam Angle or Dwell—36° (closed), 24° (open).
Breaker Arm Spring Tension—17-21 ozs.
Condenser—Part No. 1858571. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	275	2	550
5.5	800	11	1600
11	1900	22	3800

Vacuum Spark Control—Integral with distributor. Mounted on housing and linked directly to breaker plate. Provides additional advance at speeds above idling (vacuum port above throttle in carburetor) except when engine accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	9-11"
15° Max.	16-18"

Gaselector—Consists of adjustment at distributor providing 10° advance or retard from center 'O' position. See Ignition Timing for setting.

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

IGNITION TIMING:—Standard setting as shown. See Gaselector Setting below.

	Flywheel Degrees	Piston Position
All engines	6° BTDC	.0133" BTDC.

NOTE—The two straight lines of the ingnition mark 'IGN.1-6/' indicate allowable timing range of 4° on flywheel. Use first or 6° line in setting ignition.

To Set Timing (Using Timing Light)—Connect timing light between distributor terminal and ground, turn on ignition. With #1 piston on compression, turn engine over until piston is 6° or .0133" before top dead center, stop when first line of ignition mark '/IGN.1-6/' lines up with pointer in inspection hole in left front face of flywheel housing. Loosen Gaselector thumbnut, center pointer on scale, tighten thumbnut, loosen advance arm clamp bolt, rotate distributor until timing lamp lights (contacts opening), tighten clamp bolt.

Timing (Synchroscope)—Connect Synchroscope between #1 spark plug cable and distributor cap, fill in first line of flywheel mark '/IGN.1-6/' with white paint or chalk, idle engine at 360 R.P.M., adjust distributor as directed above until line coincides with pointer on housing.

Timing (Motor Gauge)—Weidenhoff #114 Adapter, #42 Rod.

Gaselector Setting—Should be set to provide best performance without spark knock or ping for particular operating conditions and octane rating of fuel used. To adjust, loosen thumbnut, move pointer clockwise to advance, or counter-clockwise to retard spark.

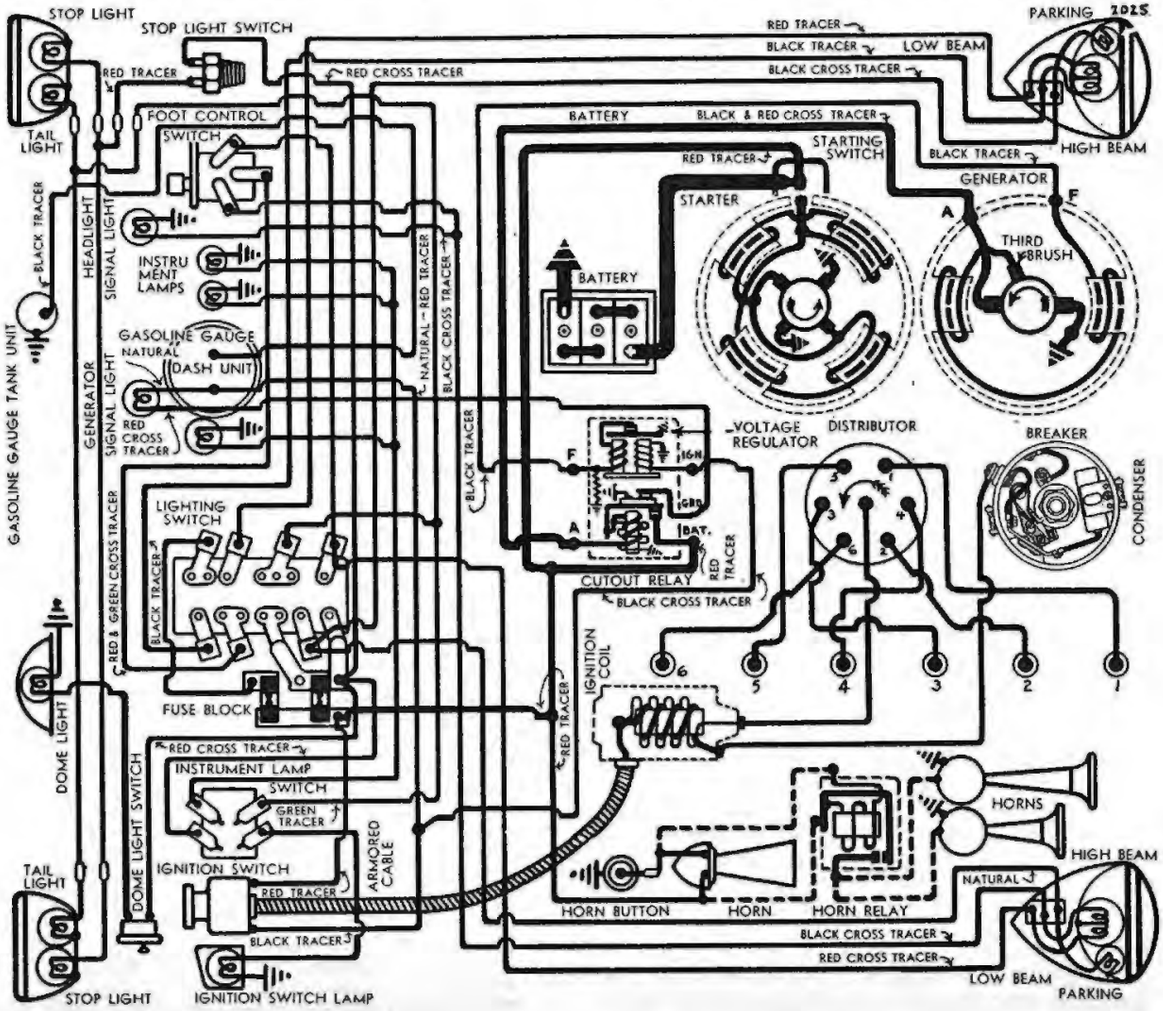
Firing Order:—1-5-3-6-2-4. See diagram.

Spark Plugs:—AC. Type K-7. 14 MM. Metric type..
Spark Plug Gaps—.025" (.022" on cars with radio).

CARBURETION:—Carburetor—Carter Mod. 324-S Standard, Model 340-S Taxicab. 1¼" downdraft type. See Carburetion Section for adjustment, overhaul, and Jet Specifications.

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

Idle Adjustment—Vacuum Gauge (Tool J-89) recommended. With engine hot, adjust idle adjusting screw to give steady vacuum reading of 18-20" of HG. at idling speed of 360 R.P.M. or 6 M.P.H. To adjust without gauge, set throttle stopscrew for correct idling speed, 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. Setting should be ½-1¼ turn open of the screw from the inner seated position. Readjust throttle stopscrew 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 requirement: Outer Hole—Ordinary temperatures, std. gasoline. Upper Hole (Max. stroke)—Extremely cold weather. Inner Hole (Min. stroke)—Extremely hot weather.

Fast Idle:—Integral with carburetor. No adjustment. See article on Carter Fast Idle in Carburetion Sect.

Accelerator Linkage Adjustment:—Must be maintained to provide correct 'throttle cracking' action for starting. To adjust, after setting carburetor idle speed at 6 M.P.H., loosen hand throttle wire lockscrew, pull button ⅛" out from instrument board, position hand throttle lever so that no clearance exists between lever and throttle cross shaft, tighten lockscrew. Turn throttle stopscrew in 3 turns, see that fast idle bar is up or in slow idle position and that stopscrew contacts carburetor casting, disconnect battery cable at starting motor to prevent cranking, fully depress starting pedal, adjust length of throttle cracking rod so that all clearance between cross shaft lever and accelerator pedal lever is taken up. Reset throttle stopscrew for correct idling speed.

Automatic Choke:—Carter Climatic Control. See article in Carburetion Sec. for servicing directions.

Air Cleaner:—AC. #1525996 oil-wetted type standard, #1525998 heavy duty oil-bath type optional.

Fuel Pump:—AC. Type R #1522221. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—AC. Electric. #1515304 (dash unit), 1515258 (tank unit). See article in Carburetion Section.

VALVE TIMING:—Tappet Clearance—.009-.011" for all valves with engine hot. Use .009" and .011" felers as 'go' and 'no go' gauges. Set exhaust clearances at .011" for sustained high speed driving.

NOTE—Hood sill must be removed to check or adjust front valves.

Valve Spring Pressure—52 lbs. at 1 29/32" (valve closed), 82 lbs. at 1 19/32" (valve open).

To Check Valve Timing—Set tappet clearance #6 intake valve at .0125". This valve should open with piston 5° or .0092" before top dead center with first straight line of flywheel mark '/IGN.1-6/' slightly past indicator in inspection hole in left front face of housing. Rest tappet clearance at .010" with engine hot.

Using Motor Gauge—Weidenhoff Adapter #114, Rod #42.

LUBRICATION:—Crankcase Capacity—6 qts. refill.

Normal Oil Pressure—45 lbs. at 35 M.P.H.

BATTERY:—Delco, Type 15-T. 6 volt, 15 plate, 94 amp. hour capacity (20 hour capacity).

Starting Capacity—115 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.3 minutes.

Delco, Type 17-J (Special Equipment). 6 volt, 17 plate, 125 ampere hour capacity (20 hr. rate).

Grounded Terminal—Negative (—) terminal.

Location—Left hand side under front floor board.

STARTER:—Model 727-Y. Armature No. 823881. Model 737-C (RHD). Armature No. 1847432.

Drive—Overrunning clutch and manual pinion shift operated by starting pedal (727-Y), Bendix Drive (737-C).

Cranking Engine—200-225 amperes at 5 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ouces each.

Performance Data—727-Y

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	6000	5.0	60
15 ft. lbs.	Lock	3	600

Performance Data—737-C

0 ft. lbs.	6000	5	65
15 ft. lbs.	Lock	3.15	570

Removal:—Mounted on left front face of flywheel housing. To remove, take out capscrews.

Starting Swith (727-Y):—Part No. 820052. Mounted on starter. Operated by starting pedal.

Starting Swith (737-C):—Magnetic Switch Type 1528. Vacuum Switch Type 1588.

Magnetic Switch

Closes contacts with 7.5-8.5 amperes draw at 3 volts and holds contacts closed with .85-.95 amperes draw at 1.5 volts (hold-in coil only).

Vacuum Switch

Contacts Close—10-14° rotation counter-clockwise from latch position.

Unlatch Action—3.4-4.6" of HG. approximately 30° from latch position.

GENERATOR:—Model 935-W, 936-R (taxicab). Armature No. 1854856. Fixed third brush control type with external vibrating voltage regulator. Ventilated by fan on drive pulley.

NOTE—Third brush is clamped in position for maximum safe output and must not be disturbed.

Charging Rate Adjustment—Adjusted by changing setting of voltage regulator. See Regulator data below and special article in Equipment Section for procedure and setings. Do not operate generator on open-circuit.

Maximum Charging Rate—19-21 amperes at 8.2 volts (cold), 16-18 amperes at 7.6 volts (hot). Reached at car speed of 40 M.P.H. To check charging rate, connect test ammeter in line at 'BAT' terminal of regulator, voltmeter between 'BAT' terminal and ground, ground 'F' terminal to eliminate regulator action.

Generator Charge Indicator—Red jewel light at bottom of right group of instruments on instrument board. Lights when ignition key is turned on and remains lighted until generator begins to charge, then it goes out. If lamp does not light when ignition key is turned on, ground 'GRD' terminal on Cutout Relay, if lamp still does not light replace bulb. See Bulb Specifications below.

Performance Data

	Amperes	Volts	R.P.M.
Cold	22-26	8.7-9.1	3300
Hot	18-21	8.2-8.7	3500

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third).

Field Current—2.3-2.6 amperes at 6 volts.

Removal:—Pivot mounted at left front of engine. To remove, take out two pivot bolts and one clamp bolt.

Belt Adjustment:—Loosen pivot bolts and clamp bolt, move generator out or away from engine to take up stretch or slack in belt.

CONTROL UNIT (VOLTAGE REGULATOR):—Model 5557. Mounted on engine side of dash. Consists of Cutout Relay and Vibrating type Voltage Regulator. See article in Equipment Section for complete data on these units.

Cutout Relay

Cuts In—6.5-7.25 volts, 830 R.P.M., 10 M.P.H.

Cuts Out—3 amperes maximum at 6.3 volts.

Contact Gap—.018-.025".

Air Gap—.018-.022" with contacts closed.

Voltage Regulator

Setting—7.55-7.65 volts at 70° F., 7.45-7.55 volts at 150° F. Regulator is over-compensated for temperature and must be checked at these points.

Adjustment—Disconnect lead on 'IGN' terminal of regulator, connect jumper between 'IGN' and 'BAT' terminals, connect test ammeter in charging line at 'BAT' terminal, connect voltmeter between 'IGN' terminal and ground. Operate generator at 2800-3000 R.P.M., adjust charging rate to 8-10 amperes, change regulator armature spring tension by bending spring hanger at lower end of spring slightly until setting is as given above.

NOTE—Regulator cover must be in place when tests are made. Do not operate generator on open-circuit.

Contact Gap—.015-.025".

Contact Spring Tension—2.7-3.5 ounces.

Air Gap—.060-.070" between armature and center of core with armature down and fibre bumper touching stop; .008-.013" between fibre bumper and stop with armature up.

LIGHTING:—Headlamps—Guide Multi-beam, pre-focused, cross-beam type with special non-interchangeable lenses. Headlamps aimed straight ahead with lenses removed. Special assymetrical 'Passing' beam (upper beam left hand headlamp, lower beam right hand headlamp) controlled by foot selector switch with lighting switch in driving or third position.

Headlamp Beam Indicator—Located at bottom of speedometer dial. Lighted whenever driving or upper headlamp beams are lighted.

Switches

Lighting—Delco-Remy Model 479-S, 479-J Export.

Foot Beam Selector—Delco-Remy Model 471-T.

Instrument Lamp—Delco-Remy Model 1406.

Stop Lamp—Hydraulic type on brake master cyl.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320-L
Parking	1½	55
Speedometer, Dash, Indicators	1	51
Oil, Gas, Temp., Tail	3	63
Stop	15	87
Dome	6	81

NOTE—Headlamps are Pre-focused 'Long-Life' type

FUSES:—Fuse Block Model 1050-Z. On lighting switch on back of instrument panel. Two 20 ampere capacity fuses, one spare fuse. Fuse toward rear protects left hand headlamp circuit. Fuse toward engine protects all other lighting circuits.

HORNS:—Klaxon Model K-26-L Type 1601 Std., Model K-33-B, Type 1857 (low note), 1858 (high note) blended tone twin horns operated by horn relay Opt. All horns are vibrator type.

Horn Type	Current at 6 Volts	Air Gap
K-26-L, 1601	6.5-8.5	.025-.029"
K-33-B, 1857	12-14	.045-.050"
K-33-B, 1858	11-13	.036-.040"

NOTE—Twin horns are stamped 'L' (low note—long horn), 'S' (high note—short horn), on motor shell.

Horn Relay:—Model 266-T. Requires .25 amperes at 2 volts minimum to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.

Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER—First number—8-BA-1001. On left hand frame side rail under front fender.

COMPRESSION:—Ratio 6.2-1. Pressure 144 lbs. at 1000 R.P.M. or aprox. 106 lbs. at cranking speed.
NOTE—Special thick head gasket which may be installed to correct ping due to low altitude or use of low-octane fuel reduces compression ratio to 5.7-1

VACUUM READING:—Gauge should show steady reading of 18-20" of HG. with engine idling at 360 R.P.M. or 6 M.P.H.

IGNITION:—Coil Model 539-L. Mounted on engine side of dash.
Coil Draw—3.5 amperes at 6.2 volts.
Ignition Switch:—Delco-Remy Model 431-L. Switch and cable assembly. Connected to coil by armored cable.
Ignition Lock—Briggs & Stratton.
Distributor Model 663-H. Single breaker, 8 lobe cam, full automatic advance type with 'Vacuumatic' spark advance and Gaselector adjustment at distributor.
Breaker Gap—Set at .018". Limits .015-.020".
Cam Angle or Dwell—31° (closed), 14° (open).
Breaker Arm Tension—19-23 ozs.
Condenser—Part No. 1855968. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	3	600
5	600	10	1200
11	1700	22	3400

Vacuum Spark Control—Integral with distributor. Mounted on housing and linked directly to breaker plate. Provides additional advance at speeds above idling (vacuum port above throttle in carburetor) except when engine accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	4-6"
20°	16-21"

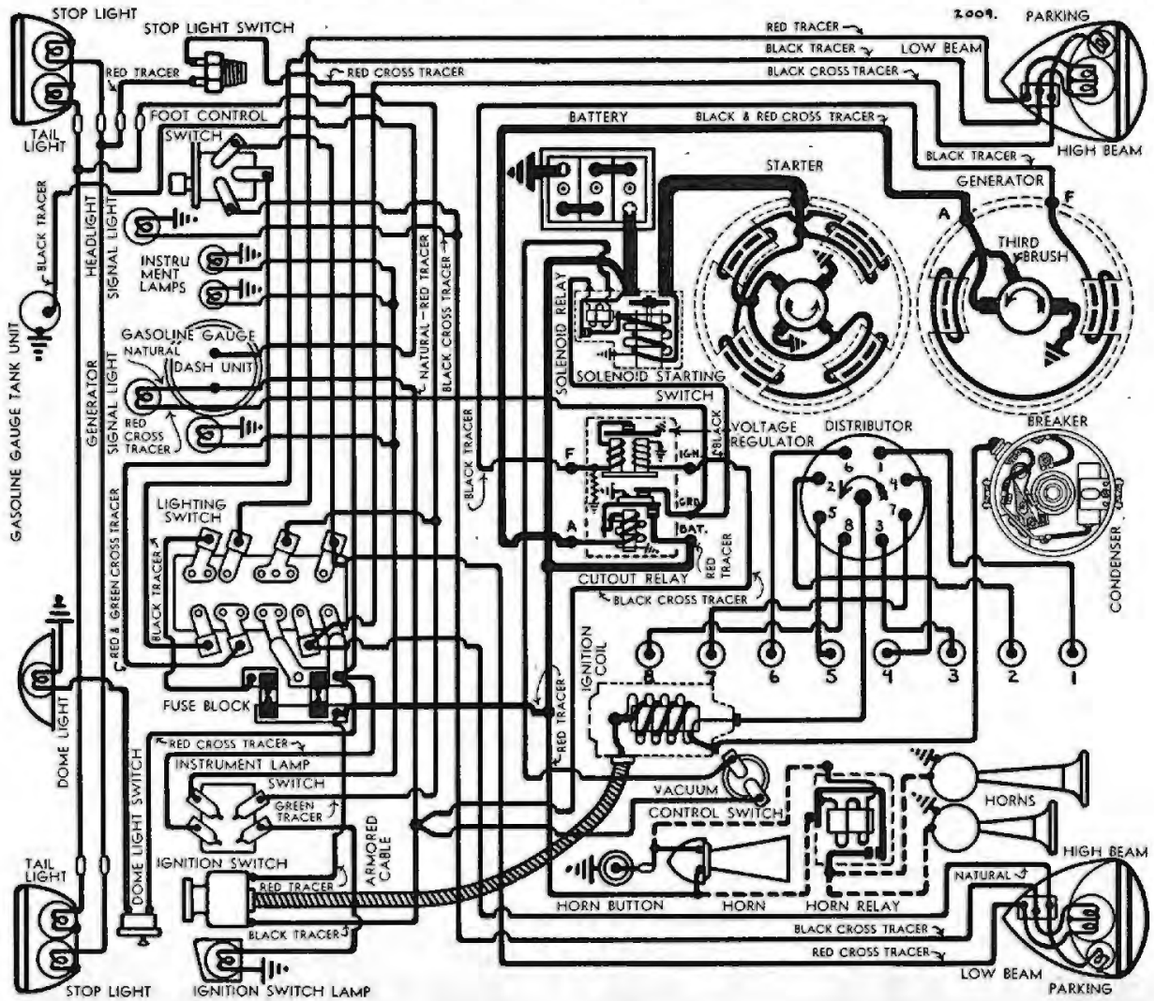
Gaselector—Consists of adjustment at distributor providing 10° advance or retard from center 'O' position. See Ignition Timing for setting.
Distributor Removal:—Mounted on left side of crankcase. To remove, take out hold-down screw in advance arm.

IGNITION TIMING:—Standard setting as shown. See Gaselector Setting below.

	Flywheel Degrees	Piston Position
All engines	6° BTDC	.0117" BTDC.

NOTE—The two straight lines of the ignition mark '/IGN.1-8/' indicate allowable timing range of 4° on flywheel. Use first or 6° line in setting ignition.
To Set Timing (Using Timing Light)—Connect timing light between distributor terminal and ground, turn on ignition. With #1 piston on compression, turn engine over until piston is 6° or .0117" before top dead center, stop when first line of ignition mark '/IGN.1-8/' lines up with pointer in inspection hole in left front face of flywheel housing. Loosen Gaselector thumbnut, center pointer on scale, tighten thumbnut, loosen advance arm clamp bolt, rotate distributor until timing light lights (contacts opening), tighten clamp bolt.
Timing (Synchroscope)—Connect Synchroscope between #1 spark plug cable and distributor cap, fill in first line of flywheel mark '/IGN.1-8/' with white paint or chalk, idle engine at 360 R.P.M., adjust distributor as directed above until line coincides with pointer on housing.
Timing (Motor Gauge)—Weidenhoff #114 Adapter, #42 Rod.
Gaselector Setting—Should be set to provide best performance without spark knock or ping for particular operating conditions and octane rating of fuel used. To adjust, loosen thumbnut, move pointer clockwise to advance, or counter-clockwise to retard spark.
Firing Order:—1-6-2-5-8-3-7-4. See diagram.
Spark Plugs:—AC. Type K-7. 14 MM. Metric type.
Spark Plug Gaps—.025" (.022" on cars with radio).

CARBURETION:—Carburetor—Carter Mod. 322-S Std., Model 340-S Taxicab. 1¼" downdraft type. See Carburetion Section for adjustment, overhaul, and Jet Specifications.
NOTE—Do not adjust carburetor until engine is warmed up so that choke valve is wide open and engine idling at hot or slow idling speed.
Idle Adjustment—Vacuum Gauge (Tool J-89) recommended. With engine hot, adjust idle adjusting screw to give steady vacuum reading of 18-20" of HG. at idling speed of 360 R.P.M. or 6 M.P.H. To adjust without gauge, set throttle stopscrew for correct idling speed, 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. Setting should be ½-1¼ turn open of the screw from the inner seated position. Readjust throttle stopscrew 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 requirement:
Outer Hole—Ordinary temperatures, std. gasoline.
Upper Hole (Max. stroke)—Extremely cold weather.
Inner Hole (Min. stroke)—Extremely hot weather.
Fast Idle:—Integral with carburetor. No adjustment. See article on Carter Fast Idle in Carburetion Sect.
Accelerator Linkage Adjustment:—Adjust rod connecting bell cranks on side of manifold so that accelerator pedal just touches floor board with carburetor throttle valve wide open. Release accelerator pedal and with throttle valve in closed position, set



adjusting screw in lever at forward end of this connecting rod so that clearance between this lever and lever which operates carburetor throttle valve rod is .235-.265" (use gauge #J-635-1). Disconnect vacuum switch operating rod at switch lever, turn switch lever so that pointer lines up with line on switch body, adjust length of rod by turning trunnion on rod until rod can be connected to switch lever without disturbing position of lever. See that hand throttle is fully closed, loosen set screw in throttle cable trunnion (at lower end of cable), adjust cable length so that clearance between lever at forward end of hand throttle operating rod and carburetor throttle valve rod lever is 1/16" minimum (use gauge #J-635-2). Check setting after opening and closing hand throttle. These clearances are important.

Automatic Choke:—Carter Climatic Control. See article in Carburetion Sec. for servicing directions.

Air Cleaner:—AC. #1525997 oil-wetted type standard, #1525998 heavy duty oil bath type optional.

Fuel Pump:—AC. Type R #1522221. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—AC. Electric. #1515304 (dash unit), #1515258 (tank unit). See article in Carburetion Section.

VALVE TIMING:—Tappet Clearance—.009-.011" for all valves with engine hot. Use .009" and .011" felers as 'go' and 'no go' gauges. Set exhaust clearances at .011" for sustained high speed driving.
NOTE—Hood sill must be removed to check or adjust front valves.

Valve Spring Pressure—52 lbs. at 1 29/32" (valve closed), 82 lbs. at 1 19/32" (valve open).
To Check Valve Timing—Set tappet clearance #8 intake valve at .0125". This valve should open with piston 5° or .0082" before top dead center with first straight line of flywheel mark '/IGN.1-8/' slightly past indicator in inspection hole in left front face of housing. Rest tappet clearance at .010" with engine hot.

Using Motor Gauge—Weidenhoff Adapter #114, Rod #42.

LUBRICATION:—Crankcase Capacity—7 qts. (refill).
Normal Oil Pressure—45 lbs. at 35 M.P.H.

BATTERY:—Delco, Type 17-K. 6 volt, 17 plate, 110 amp. hour capacity (20 hour rate).
Starting Capacity—131 amperes for 20 minutes.
Zero Capacity—300 amperes for 4.4 minutes.

Delco, Type 17-J (Special Equipment). 6 volt, 17 plate, 125 ampere hour capacity (20 hr. rate).
Grounded Terminal—Negative (—) terminal.
Location—Left hand side under front floor boards.

STARTER:—Model 727-S. Armature No. 823881.
Drive—Overrunning clutch and manual pinion shift operated by solenoid switch.
Cranking Engine—220-225 amperes at 5 volts.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs	550	5	65
15 ft. lbs.	Lock	3	600

Removal:—Mounted on left front face of flywheel housing. To remove, take out capscrews.

Starting Switch:—Solenoid Switch Type 1516. Vacuum Switch Type 1588. Solenoid switch controlled thru relay by vacuum switch operated by accelerator pedal with ignition switch turned on. See article in Equipment Section.

Solenoid Switch

Close against 70 lbs. with .5" air gap drawing 65-71 amperes at 5 volts. Holds switch closed with draw of 12-14 amperes (hold-in coil only).

Solenoid Relay

Contacts Close—4 volts. **Open**—1.6-2.0 volts.
Contact Gap—.030-.045". **Air Gap**—.010-.014" closed.

Vacuum Switch

Contacts Close—10-14° rotation counter-clockwise from latch position.
Unlatch Action—3.4-4.6" of HG. approximately 30° from latch position.

GENERATOR:—Model 935-W, 936-R (taxicab). Armature No. 1854856. Fixed third brush control type with external vibrating voltage regulator. Ventilated by fan on drive pulley.
NOTE—Third brush is clamped in position for maximum safe output and must not be disturbed.
Charging Rate Adjustment—Adjusted by changing setting of voltage regulator. See Regulator data and special article in Equipment Section for procedure and settings. Do not operate generator on open-circuit.
Maximum Charging Rate—19-21 amperes at 8.2 volts (cold), 16-18 amperes at 7.6 volts (hot). Reached at car speed of 40 M.P.H. To check charging rate, connect test ammeter in line at 'BAT' terminal of regulator, voltmeter between 'BAT' terminal and ground, ground 'F' terminal to eliminate regulator action.
Generator Charge Indicator—Red jewel light at bottom of right group of instruments on instrument board. Lights when ignition key is turned on and remains lighted until generator begins to charge, then it goes out. If lamp does not light when ignition key is turned on, ground 'GRD' terminal on Cutout Relay, if lamp still does not light replace bulb. See Bulb Specifications below.

Performance Data

	Amperes	Volts	R.P.M.
Cold	22-26	8.7-9.1	3300
Hot	18-21	8.2-8.7	3500

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third).
Field Current—2.3-2.6 amperes at 6 volts.

Removal:—Pivot mounted at left front of engine. To remove, take out two pivot bolts and one clamp bolt.

Belt Adjustment:—Loosen pivot bolts and clamp bolt, move generator out or away from engine to take up stretch or slack in belt.

CONTROL UNIT (VOLTAGE REGULATOR):—Model 5557. Mounted on engine side of dash. Consists of Cutout Relay and Vibrating Voltage Regulator. See article in Equipment Section for complete data on these units.

Cutout Relay

Cuts In—6.5-7.25 volts, 835 R.P.M., 10 M.P.H.
Cuts Out—3 amperes maximum at 6.3 volts.
Contact Gap—.018-.025".
Air Gap—.018-.022" with contacts closed.

Voltage Regulator

Setting—7.55-7.65 volts at 70° F., 7.45-7.55 volts at 150° F. Regulator is over-compensated for temperature and must be checked at these points.
Adjustment—Disconnect lead on 'IGN' terminal of regulator, connect jumper between 'IGN' and 'BAT' terminals, connect test ammeter in charging line at 'BAT' terminal, connect voltmeter between 'IGN' terminal and ground. Operate generator at 2800-3000 R.P.M., adjust charging rate to 8-10 amperes, change regulator armature spring tension by bending spring hanger at lower end of spring slightly until setting is as given above.
NOTE—Regulator cover must be in place when tests are made. Do not operate generator on open-circuit.
Contact Gap—.015-.025".
Contact Spring Tension—2.7-3.5 ounces.
Air Gap—.060-.070" between armature and center of core with armature down and fibre bumper touching stop; .008-.013" between fibre bumper and stop with armature up.

LIGHTING:—Headlamps—Guide Multi-beam, pre-focused, cross-beam type with special non-interchangeable lenses. Headlamps aimed straight ahead with lenses removed. Special assymetrical 'Passing' beam (upper beam left hand headlamp, lower beam right hand headlamp) controlled by foot selector switch with lighting switch in driving or third position.

Headlamp Beam Indicator—Located at bottom of speedometer dial. Lighted whenever driving or upper headlamp beams are lighted.

Switches

Lighting—Delco-Remy Model 479-S, 479-J Export.
Foot Beam Selector—Delco-Remy Model 471-T.
Instrument Lamp—Delco-Remy Model 1406.
Stop Lamp—Hydraulic type on brake master cyl.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320-L
Parking	1½	55
Speedometer, Dash, Indicators	1	51
Oil, Gas, Temp., Tail	3	63
Stop	15	87
Dome	6	81

NOTE—Headlamps are Pre-focused 'Long-Life' type

FUSES:—Fuse Block Model 1050-Z. On lighting switch on back of instrument panel. Two 20 ampere capacity fuses, one spare fuse. Fuse toward rear protects left hand headlamp circuit. Fuse toward engine protects all other lighting circuits.

HORNS:—Klaxon Model K-26-L Type 1601 Std., Model K-33-B, Type 1857 (low note), 1858 (high note) blended tone twin horns operated by horn relay Opt. All horns are vibrator type.

Horn Type	Current at 6 Volts	Air Gap
K-26-L, 1601	6.5-8.5	.025-.029"
K-33-B, 1857	12-14	.045-.050"
K-33-B, 1858	11-13	.036-.040"

NOTE—Twin horns are stamped 'L' (low note—long horn), 'S' (high note—short horn), on motor shell.

Horn Relay:—Model 266-T. Requires .25 amperes at 2 volts minimum to close contacts. Current draw .8 amperes.
Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.
Air Gap—.012-.017" with contacts closed.

SERIAL NUMBER:—First number 6D-100. On front end of left frame side rail under fender.

COMPRESSION:—Ratio—6.5-1 Std. aluminum head. No optl. **Pressure**—85 lbs. at cranking speed.

VACUUM READING:—Gauge should show steady reading of approx. 17" with engine idling at 350 R.P.M.

IGNITION:—Coil Model 536-G. Mounted on dash.

Ignition Current—2 amps. idling, 5 amps. stopped.

Ignition Switch:—Delco-Remy Model 435-C. Switch and cable assembly. Connected to coil by armored cable.

Distributor Model 623-D, 623-K. Single breaker, 6 lobe cam, full automatic advance type with auxiliary vacuum advance. Manual advance consists of adjustment at distributor.

Breaker Gap—Set at .018". Limits .018-.024".

Cam Angle or Dwell—36° (closed), 24° (open).

Breaker Arm Spring Tension—17-21 ounces.

Condenser—Part No. 829092. Capacity .20-.25 mfds.

Automatic Advance—623-D

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	3	600
10	1100	20	2200

Automatic Advance—623-K

Start	300	2	600
10	1800	20	3600

Vacuum Spark Control Model 681-D. Integral with distributor. Mounted on housing and linked directly to breaker plate. Provides additional advance at speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	7"
10°	9-13"

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

IGNITION TIMING:—

	Flywheel Deg.	Piston Position
All Engines	4° BTDC	.0070" BTDC

To Set Timing—With #1 piston on compression, turn engine over until piston is 4° or .0070" before top dead center, stop when ignition mark on flywheel which is approximately .3" or 1 2/3 teeth before top dead center mark 'UDC.#1' lines up with pointer in inspection hole in right front face of flywheel housing. Losen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor is opposite #1 segment in distributor cap.

Motor Gauge—Weidenhoff Adapter #104, Rod #2.

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

Spark Plugs:—Champion Type 7. 18 MM. Metric.

Spark Plug Gap—Set at .025".

CARBURETION:—Carburetor—Carter Model 338-S. 1¼" downdraft type. See Carburetion Section for adjustment, overhaul and Jet Specifications.

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

Idle Adjustment—With engine hot, set throttle stopscrew for correct idling speed of 350 R.P.M. or 6 M.P.H.. Turn idle adjusting screw in until engine begins to miss, then trun screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Correct idle adjusting screw setting is ½-1¼ turns open. Reset throttle adjusting 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:

Outer Hole—Ordinary temperatures, std. gasoline.
Upper Hole—(Max stroke)—Extremely eold weath'r
Inner Hole—(Min. stroke)—Extremely hot weather.

Fast Idle:—Integral with carburetor. No adjustment. See article on Carter Fast Idle in Carburetion Sec.

Automatic Choke:—Carter Climatic Control. See article in Carburetion Section for service directions.

Air Cleaner:—AC. oil-wetted type standard. Heavy Duty Oil Bath type optional.

Fuel Pump:—AC. Type E #1521116. Diaphragm type. See article in Carburetion Section.

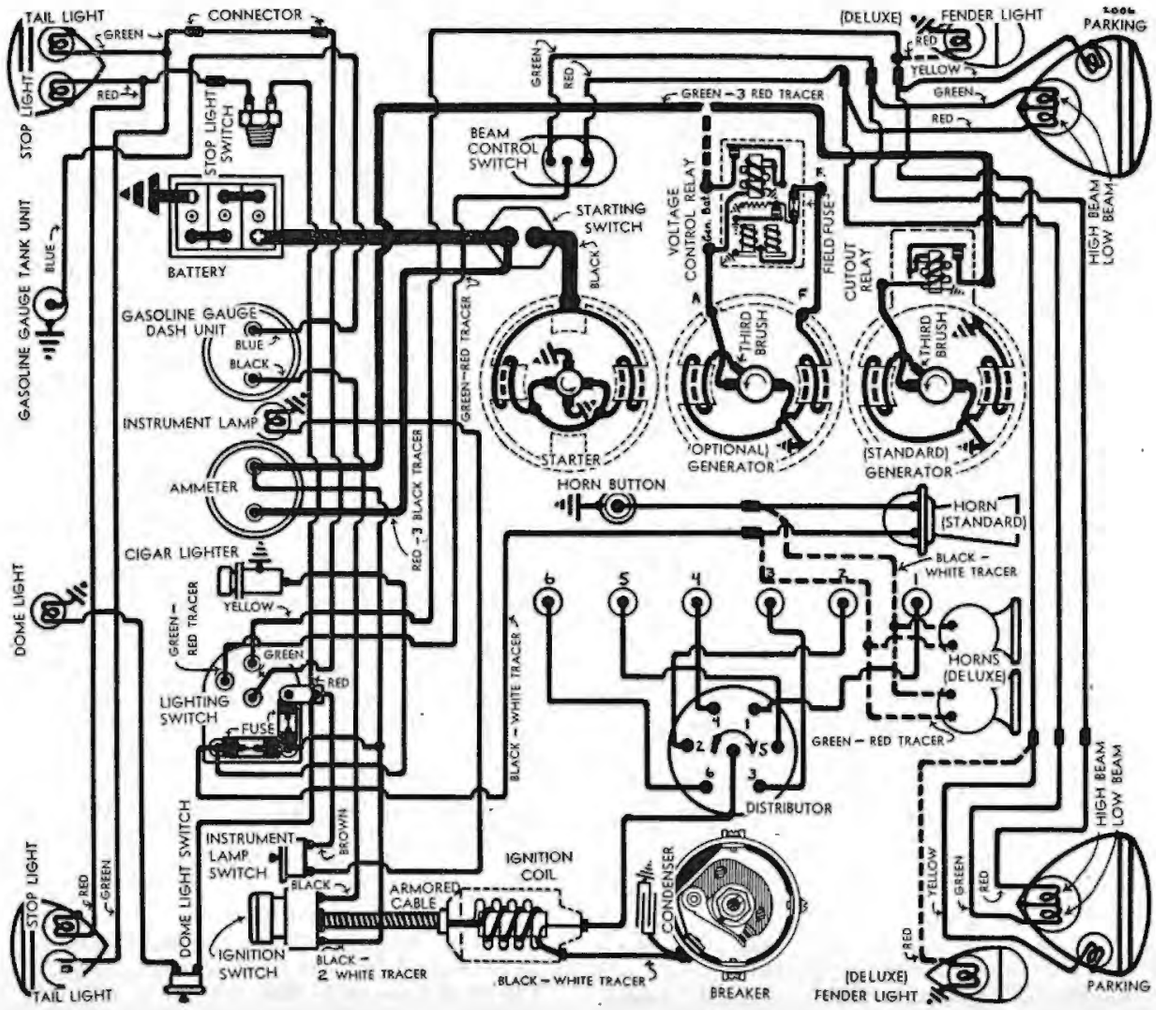
Gasoline Gauge—Motometer, electric. Dash unit—NG-7837-D, Tank unit—NG-7376-T.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .012". This valve should open with #1 piston 5° or .0100" BTDC when flywheel mark 'Intake Opens' lines up with indicator in inspection hole in right front face of flywheel housing. Reset tappet clearance at .007" with engine warm.

Motor Gauge—Weidenhoff Adapter #104, Rod #2.

Tappet Clearance:—.007" Int., .008" Exh., hot.

Valve Spring Pressure:—50-54 lbs. at 2⅜" (valve



closed), 140 lbs. + or — 5 lbs. at 2 1/16" (valve open).

LUBRICATION:—Crankcase Capacity—6 qts. (refill).
Normal Oil Pressure—40 lbs. at 40 M.P.H.

BATTERY:—Willard, Type WH-1-13, RH-1-13 (Export). 6 volt, 13 plate, 102 ampere hour capacity (20 hour rate).
Starting Capacity—120 amperes for 20 minutes.
Zero Capacity—300 amperes for 3.1 minutes.
Grounded Terminal—Negative(—) terminal.
Location—On left side under driver's seat.

STARTER:—Model 738-K. Armature No. 1847432.
Drive—Barrel Type Bendix. Type A-1718.
Cranking Engine—150 R.P.M., 130 amps., 5.4 volts.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—24-28 ounces each.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 "	Lock	3.63	475

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

Starting Switch:—Model 405-C. Operated by depressing clutch pedal.

GENERATOR (STANDARD):—Model 937-Z. Armature No. 1838448. Third brush control type. Ventilated by fan on drive pulley.
Charging Rate Adjustment—Loosen lockscrew on commutator end plate, shift third brush by hand counter-clockwise to increase, or clockwise to decrease charging rate, tighten lockscrew.
Maximum Charging Rate—18 amperes, 8.3 volts, 2000 R.P.M., 24.5 M.P.H.

Performance Data

	Amperes	Volts	R.P.M.
Cold	15-18	7.9-8.3	2000
Hot	13-15	7.7-8.0	2400

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—23-27 ounces each.
Field Current—3.5-4.5 amperes at 6 volts.

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

Belt Adjustment:—Belt tension adjusted in usual manner by loosening pivot bolts and clamp bolt and swinging generator out or away from engine.

GENERATOR (RADIO):—Model 936-M. Armature No. 1854856. Third brush control type with Voltage Control Relay (Step Voltage Control). Ventilated by fan on drive pulley.
Charging Rate Adjustment—Connect test ammeter in charging line at 'BAT' terminal, ground generator field 'F' terminal to frame. Loosen lockscrew on commutator end plate, shift third brush by hand counter-clockwise to increase, or clockwise to decrease charging rate. Tighten lockscrew and remove generator field ground.
Maximum Charging Rate—23 amperes (cold), 20 amperes (hot), 8.8 volts, 2800 R.P.M.

Performance Data

	Amperes	Volts	R.P.M.
Cold	20-23	8.5-8.8	2800
Hot	16-20	8.1-8.5	3100

Field Current—2.3-2.6 amperes at 6 volts.
Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third).
Generator Field Fuse—6 amperes in Control Unit case.
Rotation, Removal, and Belt Adjustment same as for standard generator above.

CUTOUT RELAY:—Model 265-H. Used on 937-Z generator. Mounted on generator field frame. See article in Equipment Section for complete data.
Cuts In—6.75-7.5 volts, 7 M.P.H., 850 R.P.M.
Cuts Out—0-2.5 ampere discharge current.
Contact Gap—.015-.025".
Air Gap—.012-.017" with contacts closed.

CONTROL UNIT (STEP-VOLTAGE TYPE):—Model 5542. Used on 936-M generator. Consists of Cutout Relay and Voltage Control Relay in case on generator. See article in Equipment Section.

Cutout Relay

Cuts In—6.4-6.8 volts.
Cuts Out—3 amperes maximum discharge current.
Contact Gap—.015-.025".
Air Gap—.012-.017" with contacts closed.

Voltage Control Relay

Contacts Open—8.35-8.65 volts at 70° F.
Contacts Close—7.3-7.7 volts at 70° F.
Contact Gap—.008-.013".
Contact Spring Tension—.7-.9 ounces.
Air Gap—.029-.038" between armature and core (armature down against lower stop). .029-.038" armature travel (between armature and lower stop).

LIGHTING:—Headlamps—Hall, Pre-focused type. Headlamps aimed straight ahead (upper beam, lenses in place). Upper and lower driving beams are controlled by foot selector switch.

Switches

Lighting—Douglas. Reo part number 18255.
Foot Selector—R.B.M. Model 1050.
Stop Lamp—Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-21	2320-C
Parking	1½ (Tungsol)	T-55
Stop	15	87
Dome, Tail, Instrument	3	63

FUSES:—Lighting—Two 20 ampere fuses on lighting switch at rear of instrument panel.
Generator Field (Radio Generator only)—6 ampere in Control Unit case.

HORNS:—Sparton—Vibrator type. Single horn (std)., or twin horns (deluxe).

NOTE:—These models are similar except that Model 3A fitted with conventional front axle, Model 4A with Planar type independent springing. All other data below applies to both models. Startix optional on all models.

SERIAL NUMBER:—On plate on left frame side member under front fender. First numbers as follows:

Factory	Model 3A	Model 4A
South Bend	5,512,001	5,235,001
Pacific Coast	5,850,001	5,800,001
Canada	5,960,801	5,965,801

COMPRESSION:—Ratio—6.3-1. **Pressure**—105 lbs. at cranking speed of 150 R.P.M.

VACUUM READING—Gauge should show steady reading of 18-20" of HG. with engine idling at 450 R.P.M. or 8 M.P.H.

IGNITION:—Coil Model IG-4634. Mounted on dash.

Coil Draw—½-1½ amperes idling, 4-5 stopped.

Ignition Switch:—Delco-Remy Model 430-R (switch & cable assembly). Connected to coil by armored cable. See article in Equipment Section for complete data.

Distributor Model IGW-4001. Single breaker, 6 lobe cam, full automatic advance type with auxiliary vacuum spark control.

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

Cam Angle or Dwell—40.0° closed, 20.0° open.

Breaker Arm Spring Tension—16-20 ounces.

Condenser—Part No. IGB-1025. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine R.P.M.
Start	400	0	800
2	600	4	1200
4	800	8	1600
6	1000	12	2000
8	1200	16	2400
10.5	1400	21	2800

Vacuum Spark Control Model VC-4001:—Mounted below distributor and linked to advance arm. Provides additional advance except when engine is operated at wide open throttle when spark is retarded by return spring within unit. Maximum vacuum advance—6° (engine).

Distributor Removal:—Mounted on left side of crankcase. To remove, loosen advance arm clamp bolt (not necessary to disconnect vacuum connection).

IGNITION TIMING:—Setting for all engines as follows:

Degrees	Piston Position
9/64" BTDC	.0016" BTDC

To Set Timing—Crank engine by engaging gears and rolling car on floor. On cars with Startix use left hand 'on' position of key to avoid automatic cranking if ignition turned on to check timing. With #1 piston on compression, turn engine over until straight line 'IGN' mark on vibration dampener at front of engine lines up with pointer on timing gear cover. This line is 9/64" before top dead center mark 'UDC/1-6.' Loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt.

Timing (Motor Gauge)—Weidenhoff #104 Adapter, #2 Rod.

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

Spark Plugs:—Champion #8-S. 18 MM. Metric.

Spark Plug Gap—.025".

NOTE—For extremely hard service such as fast driving in hot weather, cooler plug such as Champion #7, or #13 may be installed.

CARBURETION:—Carburetor—Stromberg Model **EX-23**, 1¼" downdraft type. See Carburetion Section for complete adjustment, overhaul, and jet specifications.

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 stopscrew so that engine idles at 450 R.P.M. or 8 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. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump Setting—Three holes provided in throttle lever for pump link engagement. Change setting for seasonal requirements as follows:

Center Hole—Normal operating conditions.

Inner Hole (Min. stroke)—Extreme warm weather.

Outer Hole (Max. stroke)—Extreme cold weather.

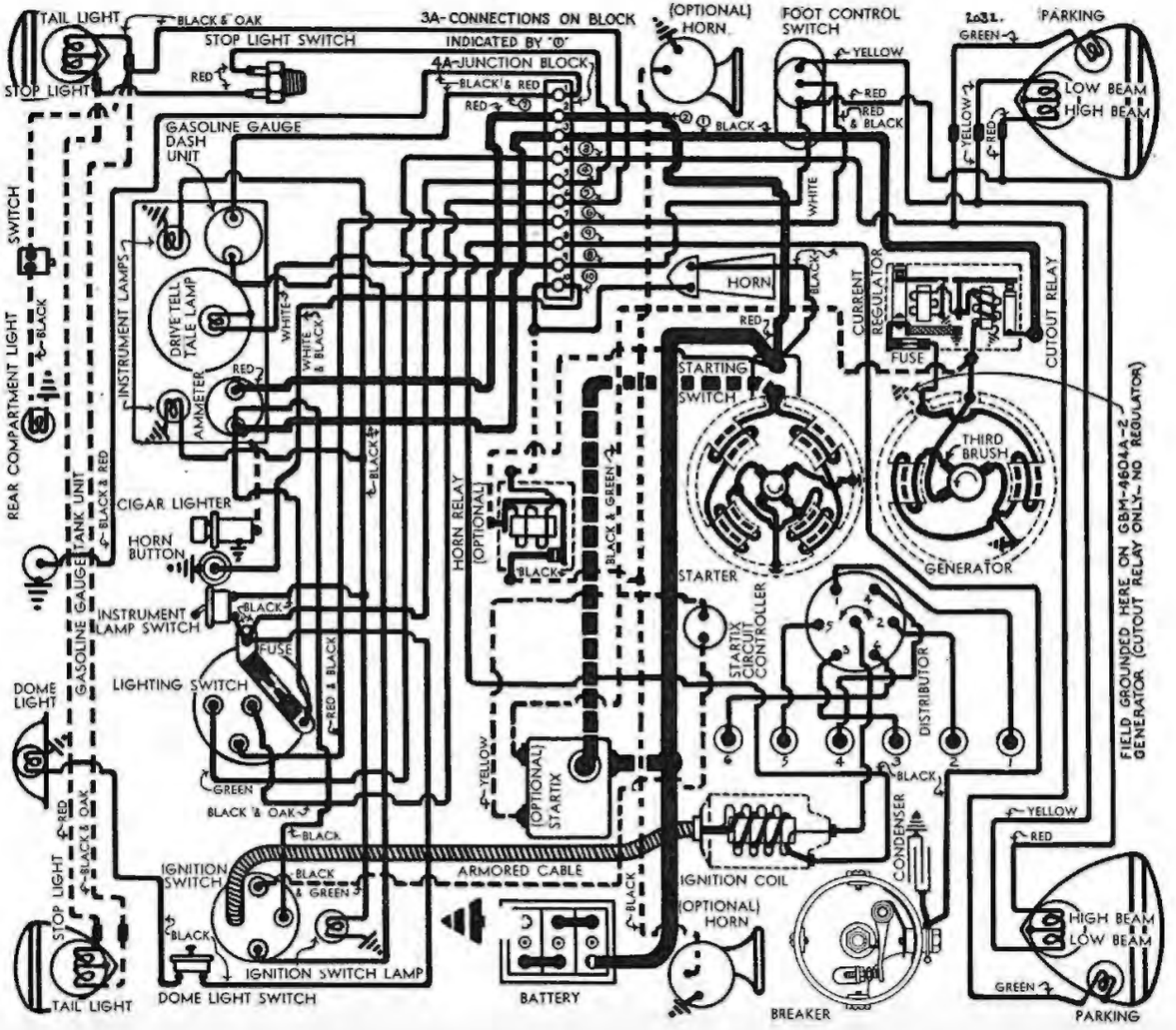
NOTE—A .056" or one size smaller main metering jet may be installed to secure greater fuel economy with a slight loss in performance. The .054" two size smaller jet should only be used for high altitudes. See Jet Specification table in Carburetion Section.

Fast Idle Control & Automatic Choke—Integral with Carburetor. No adjustment required. See special article in Carburetion Section.

Air Cleaner:—Burgess oil-wetted type standard. AC. #1526824 oil-bath type optional.

Fuel Pump:—AC. Type W #1522227. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—Motometer Electric. No. EG-7732-D (dash unit), EG-7679-T (tank unit). See article in Carburetion Section.



VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .020". This valve should open when piston #1 is 15° or .0942" before top dead center when mark 'IN.OP/1-6' on vibration dampener at front of engine lines up with pointer on gear case cover. Reset tappet clearance at .016".

Motor Gauge—Weidenhoff Adapter #104, Rod #2.

Tappet Clearance:—.016" for all valves, cold.

Valve Spring Pressure:—125-135 lbs. at 1¾" (valve open).

LUBRICATION:—Crankcase Capacity—6 quarts.

Normal Oil Pressure—40 lbs. minimum at 40 M.P.H.

BATTERY:—Willard, Type WH-1-13, RH-1-13 (Export). 6 volt, 13 plate, 102 ampere hour capacity (20 hour rate).

Starting Capacity—120 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.1 minutes.

Grounded Terminal—Positive (+) terminal.

Location—On left side under front floor boards.

STARTER:—Model MAX-4019, MAX-4018 (with Startix). Armature No. MAW-2091.

Drive—Outboard Bendix (barrel) Type A-1729.

Cranking Engine—110 R.P.M., 205 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.	5300	5.5	65
.65 "	3300	5.5	100
2.75 "	1630	5.0	200
5.5 "	970	4.5	300
8.7 "	600	4.0	400
12.0 "	300	3.5	500
16.5 "	Lock	3.0	640
25.0 "	Lock	4.0	800

Removal:—Flange mounted on left front face of flywheel housing. To remove, take out two flange capscrews.

Starting Switch (MAX-4019):—Type SW-3737A. Mounted on starter and operated through flexible cable by button on instrument panel. Pull required to close switch should be 2.3 lbs. minimum at end of switch lever.

Startix (MAX-4018)—Type 'D' automatic starting switch with Startix circuit controller (anti-backfire unit), controlled by ignition switch. See Equipment Section for complete data.

GENERATOR:—Standard—Model GBM-4604A-2. Armature No. GBM-2006-B. Air cooled, third brush control.

Charging Rate Adjustment—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.

Maximum Charging Rate—17.2 amperes at 8.3 volts (cold), 14.6 amperes at 8.05 volts (hot). Do not exceed.

Performance Data

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	760	0	6.4	820
4	6.8	920	4	6.8	1000
8	7.3	1080	8	7.3	1200
12	7.75	1300	12	7.75	1500
16	8.2	1640	14.6	8.05	2300
17.2	8.3	2050			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24 ozs. minimum (old brushes), 36 ozs. maximum (new brushes).

Field Current—3.80-4.20 amperes at 6.0 volts.

Motoring Current—5.51-6.09 amperes at 6.0 volts.

Field Fuse—5 ampere under cover on generator field frame.

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

Belt Adjustment:—Loosen pivot bolts and clamp bolt, swing generator away from engine until fan can just be turned with belt held stationary.

GENERATOR:—Radio—Model GAR-4609A-4. Armature No. GAR-2116-B. Third brush control in conjunction with Current Regulator (two-rate charging control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Use test meters. Connect jumper between fuse cup on regulator and ground. Shift third brush by hand counter-clockwise to increase or clockwise to decrease charging rate. Third brush held in position by friction. Remove jumper.

Maximum Charging Rate—24.8 amperes (cold), 21 amperes (hot), at 8.5 volts. Do not exceed.

Performance Data

Cold — Regulator Inoperative — Hot					
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	750	0	6.5	840
4	6.75	900	4	6.85	980
8	7.1	1025	8	7.25	1160
12	7.4	1200	12	7.6	1400
16	7.7	1380	16	8.0	1720
20	8.1	1675	21	8.5	2680
24.8	8.5	2400			

Field Current—3.75-4.15 amperes at 6.0 volts.
Motoring Current—4.75-5.25 amperes at 6.0 volts.

Field Fuse—5 ampere in knurled cup on regulator case. All other data same as for standard generator. See above.

CUTOUT RELAY:—Model CB-4021 (GBM-4604A-2). Mounted on generator. Special terminal connected to main brush lead for Startix connection.

Cuts In—6.75-7.5 volts.

Cuts Out—.5-2.5 amperes discharge current.

Contact Gap—.025-.035".

Air Gap—.010-.030" with contacts closed.

RELAY-REGULATOR:—Model TC-4302A (GAR-4609A-4). Mounted on generator. Consists of Cutout Relay and Current-Regulator (two-rate charging control). See article in Equipment Section for complete data.

Cutout Relay—See above. Data same except for Contact Gap which is .015-.045".

Current Regulator

Contacts Open—8.25-8.75 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—Corcoran-Brown, Pre-focused type. Headlamps aimed straight ahead (upper beam with lenses in place). Upper and lower beams controlled by foot selector switch (lower beam deflected slightly to right).

Headlamp Beam Indicator—Green dot on speedometer face. Lighted when headlamp upper beams in use.

Switches

Lighting—Douglas.

Foot Selector—R.B.M. Model 1085.

Trunk Light—R.B.M. Model 2350.

Stop Light—Hydraulic type mounted on brake master cylinder.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Ign. Key	1½	55
Stop and Tail	21-3	1158
Instruments	1	51
Dome and Trunk	6	81

FUSES:—Lighting—30 amperes on back of lighting switch.

Generator Field—5 amperes. Located on generator field frame under cover (standard gen.), on Current Regulator case under knurled cup (radio gen.).

HORNS:—Klaxon Model K-26L-1622. Vibrator type. Current draw 6.5-8.5 amperes at 6 volts. Air Gap .025-.029". See 1936 President Model (next page) for twin horns and horn relay.

NOTE:—Startix optional on all models.

SERIAL NUMBERS:—On plate on left frame side member under front fender. First numbers as follows:

Factory	Serial Number
South Bend	7,104,001
Pacific Coast	7,800,001
Canada	7,951,001

COMPRESSION:—Ratio—6.5-1. **Pressure**—105-115 lbs. at cranking speed of 150 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18-20" with engine idling at 450 R.P.M. or 8 M.P.H.

IGNITION:—Coil Model 537-B. Mounted on dash.

Coil Draw—½-1½ amperes idling, 4.5 amp. stopped.

Ignition Switch:—Delco-Remy Model 430-R (switch and cable). Connected to coil by armored cable. Key has two 'on' positions (cars with Startix). Turned right Startix operative, turned left if Startix (automatic cranking) not wanted.

Ignition Lock—Yale and Towne.

Distributor Model 662-M. Double breaker, 4 lobe cam, full automatic advance type with auxiliary vacuum spark control. Distributor contacts open alternately at 45° intervals corresponding to 90° firing interval of engine and must be synchronized. See Timing.

Breaker Gap—Set at .020". **Limits** .018-.024".

Cam Angle or Dwell—34° closed. 11° open for both contacts operating together when properly synchronized.

Breaker Arm Spring Tension—19-23 ozs.

Condenser—Part No. 1838163. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	300	0	600
14.5	1800	29	3600

Vacuum Spark Control Model 680-J:—Mounted under distributor and linked to advance arm. Provides additional advance except when engine is operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG.)
Start	3" Min.
5-7°	6" Max.

Distributor Removal:—Mounted on cylinder head. To remove, loosen advance arm clamp bolt (not necessary to disconnect vacuum connection).

IGNITION TIMING:—Setting for all engines as follows:

Flywheel Degrees	Piston Position
0° or TDC	.000" TDC

Timing (Stationary Contacts)—Crank engine by engaging gears and rolling car on floor. On cars with Startix use left hand 'on' position of key to avoid automatic cranking if ignition turned on to check timing. With #1 piston on compression, turn engine over until piston reaches top dead center, stop when flywheel mark 'UDC/1-8' lines up with pointer in inspection hole in right top edge of housing. Loosen advance arm clamp bolt, rotate distributor until stationary contacts begin to open, tighten clamp bolt, then synchronize movable contacts.

Synchronization (On Engine)—Turn engine over 90° to #6 firing position, stop when flywheel mark 'UDC/3-6' lines up with indicator. Loosen lockscrews on movable sub-plate carrying second set of contacts, turn eccentric adjusting screw until contacts begin to open, tighten lockscrews.

Synchronization (Using Tool)—Use Delco-Remy tool #1838182 and follow complete directions in Equipment Section. Distributor intervals regular 45-45-45°.

Motor Gauge—Weldenhoff #104 Adapter, #2 Rod.

Firing Order:—1-6-2-5-8-3-7-4. See diagram.

Spark Plugs:—Champion #8-S. 18 MM. Metric.

Spark Plug Gaps—.025".

NOTE—For very hard service such as fast driving in hot weather, cooler plug such as Champion #7, or #13 may be used.

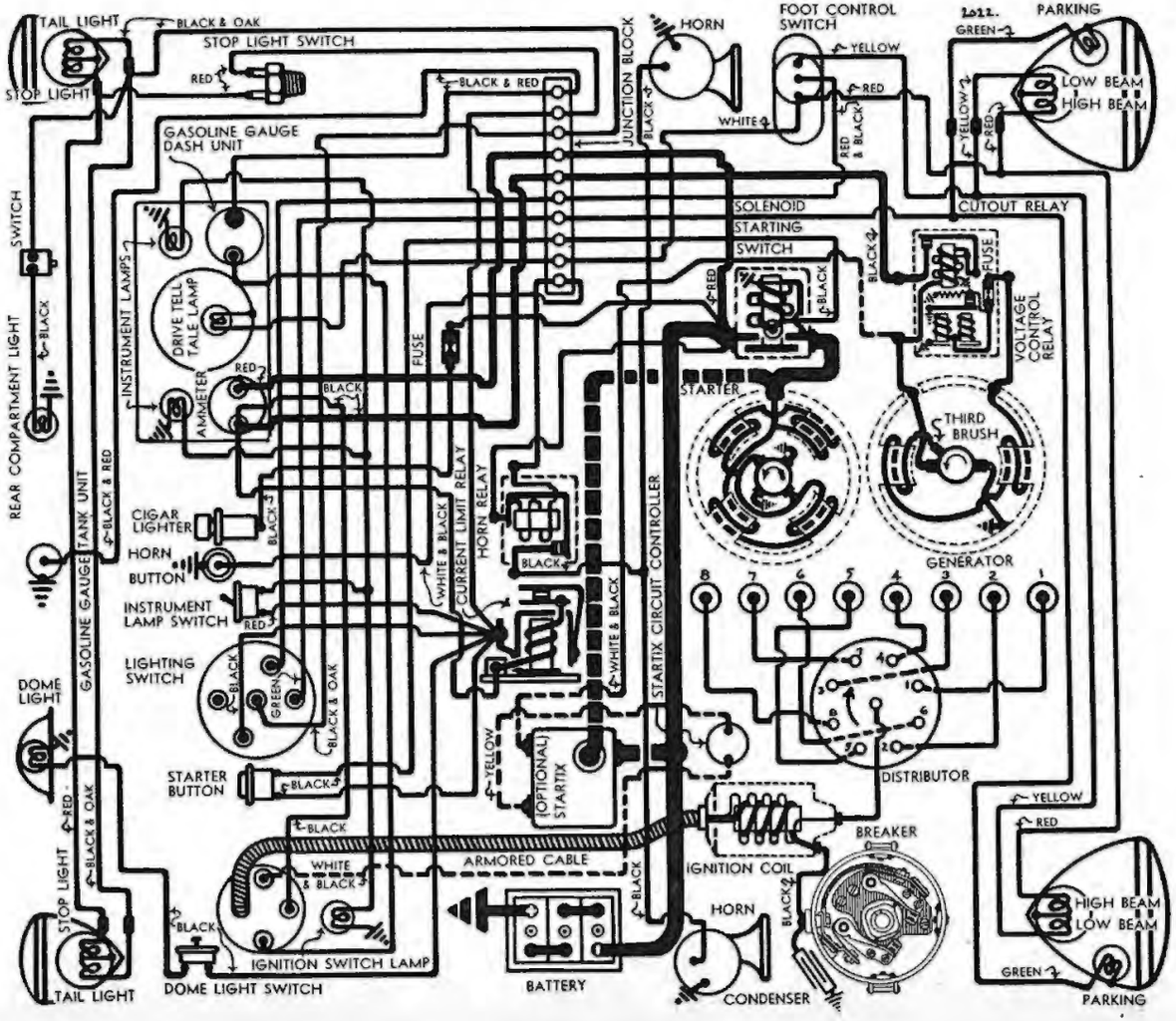
CARBURETION:—Carburetor—Stromberg Model EE-1, 1" dual, downdraft type. See Carburetion Section for complete adjustment, overhaul, and jet specifications.

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.

Idling Adjustment—Idle throttle stopscrew so that engine idles at 450 R.P.M. or 8 M.P.H. Turn inner idling adjusting screw in until engine begins to lag or miss, then turn screw out until engine begins to roll, finally turn screw in slowly until engine fires smoothly. Repeat with outer idling adjusting screw. Readjust throttle stopscrew for correct idling speed.

Accelerating Pump—Not adjustable.

NOTE—A .045" or one size smaller main metering jet may be installed to secure greater fuel economy with slight loss in performance. The .043" two size smaller jet should be used only for high altitudes. See Jet Specification table in Carburetion Section.



Fast Idle:—Stromberg type. No adjustment required.

Automatic Choke:—Stromberg Type C. See article in Carburetion Section.

Air Cleaner:—Burgess oil-wetted type standard, AC. #1526864 oil-bath type optional.

Fuel Pump:—AC. Type P #1521829 standard. Combination fuel-and-vacuum pumps Type J #1521797 or Type AD #1522228 optional. See articles in Carburetion Section.

Gasoline Gauge:—Motometer Electric No. EG-7815-D (dash unit), No. EG-7679-T (tank unit). See article in Carburetion Section.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .020". This valve should open with #1 piston 15° or .0915" before top dead center when flywheel mark 'IN.OP/1-8' lines up with indicator in inspection hole on right top surface of flywheel housing. Reset tappet clearance at .016".

Motor Gauge—Weidenhoff Adapter #104, Rod #2.

Tappet Clearance:—.016" all valves, cold.

Valve Spring Pressure:—125-135 lbs. at 1¾" (valve open).

LUBRICATION:—Crankcase Capacity—8 quarts.
Normal Oil Pressure—40 lbs. minimum at 40 M.P.H.

BATTERY:—Willard, Type WH-1-13, RH-1-13 (Export). 6 volt, 13 plate, 102 ampere hour capacity (20 hour rate).

Starting Capacity—120 amperes for 20 minutes.

Zero Capacity—300 amperes for 3.1 minutes.

Grounded Terminal—Positive (+) terminal.

Location—Left hand side under front floor boards.

STARTER:—Model 737-J, 737-K (with Startix). Armature No. 1863128.

Drive—Outboard Bendix (barrel) Type A-1729.

Cranking Engine—110 R.P.M., 200 amperes at 5 volts.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—32-36 ounces.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	6000	5	65
15 "	Lock	3.15	570

Removal:—Flange mounted on left hand front face of flywheel housing. Take out two capscrews.

Starting Switch (737-J):—Magnetic switch mounted on starter controlled by push button (R.B.M. Model 1865), on left side of instrument panel.
Startix (737-K)—Type 'D' automatic starting switch and Startix circuit controller (anti-backfire unit), controlled by ignition switch. See Equipment Section for complete data.

GENERATOR:—Model 936-X. Armature No. 1856072. Third brush control with Voltage Control Relay (step voltage control). Ventilated by fan on drive pulley.

Charging Rate Adjustment—Connect test ammeter in charging line at 'BAT' terminal, ground generator field 'F' terminal to frame. Loosen lockscrew on commutator end plate, shift third brush by hand counter-clockwise to increase, or clockwise to decrease charging rate, tighten lockscrew, remove generator field ground.

Maximum Charging Rate—21 amperes (cold), 17 amperes (hot), 8.5 volts, 2800 R.P.M., 37 M.P.H.

Performance Data

	Amperes	Volts	R.P.M.
Cold	22-25	8.7-9.1	3000
Hot	17-20	8.1-8.5	3200

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—22-26 ozs. (main), 16-20 ozs. (third).
Field Current—2.3-2.6 amperes at 6 volts.
Field Fuse—6 ampere capacity in control unit.

Removal:—Cradle mounted at left front of engine. To remove, slack off belt, disconnect water pump drive coupling, loosen mounting clamp band.

Belt Adjustment:—To take up slack in generator drive belt, loosen nut back of fan bracket, lift up fan assembly until fan can just be turned with belt held stationary, tighten bracket nut.

CONTROL UNIT (STEP-VOLTAGE TYPE):—Model 5546. Mounted on generator. Consists of Cutout Relay and Voltage Control Relay. See article in Equipment Section.

Cutout Relay

Cuts In—6.4-6.8 volts, 8.1 M.P.H.
Cuts Out—3 amperes maximum discharge current.
Contact Gap—.015-.025".
Air Gap—.012-.017" contacts closed.

Voltage Control Relay

Contacts Open—8.35-8.65 volts at 70° F.
Contacts Close—7.3-7.7 volts at 70° F.
Contact Gap—.008-.013".
Contact Spring Tension—.7-.9 ounces.
Air Gap—.028-.040" between armature and core (armature down against lower stop), .028-.040" armature travel (between armature and lower stop).

LIGHTING:—Headlamps—Corcoran-Brown, Prefocused type. Headlamps aimed straight ahead (upper beam with lenses in place. Upper and lower beams controlled by foot selector switch (lower beam deflected slightly to right).
Headlamp Beam Indicator—Green dot on speedometer face. Lighted when upper driving beam in use.

Switches

Lighting—Douglas. Studebaker Part No. 188006.

Foot Selector—R.B.M. Model 1085.

Stop Lamp—Hydraulic type mounted on brake master cylinder.

Trunk Lamp—R.B.M. Model 2350.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	32-32	2331
Parking, Ign. Key	1½	55
Stop and Tail	21-3	1158
Instruments	1	51
Dome and Trunk	6	81

CURRENT LIMIT RELAY:—Model 410-R. Vibrating circuit breaker in lighting circuits. Starts to operate with load of 30-35 amperes limiting load to 5-18 amperes.

Contact Gap—.012-.030".

Air Gap—.015-.030" with contacts closed.

Spring Tension—5 ozs. min. at brass button.

FUSES:—Cigar Lighter—7½ amperes. In connector in lead from starter.

Generator Field—6 ampere in Control Unit.

HORNS:—Klaxon Model K-33-S, Types 2059, 2060. Vibrator type, blended tone, twin horns operated by horn relay.

Horn Type	Current at 6 volts	Air Gap
2059 Low Note	11-13	.042-.046"
2060 High Note	10-12	.032-.036"

Horn Relay:—Model 269-E. Requires .25 amperes at 2 volts minimum to close contacts. Current draw .8 amperes.

Contact Gap—.015-.025". **Spring Tension**—6-8 ozs.
Air Gap—.012-.017" with contacts closed.

NOTE:—'Electric Hand' Bendix electro-pneumatic type gear shift optional on all models. See article in Electrical Equipment Section for specifications, trouble shooting and repair.

SERIAL NUMBER:—First number—(61) 61101 (U.S.), 61C101 (Canada); (62) 62101 (U.S.), 62C101 (Canada). Stamped on plate on dash under hood.

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

Cylinder Head	Compression Pressure
Std. 6.0-1	111 lbs. at 215 R.P.M.
Optl. 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 mfds.

Automatic Advance

Distributor Degrees	Distributor R.P.M.	Engine Degrees	Engine 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 compresion 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 one 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 ¾" 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 Mod. 331-S, (62) Carter Model 329-S. 1¼" downdraft types. See Carburetion Section for complete adjustment, overhaul and Jet Specifications.

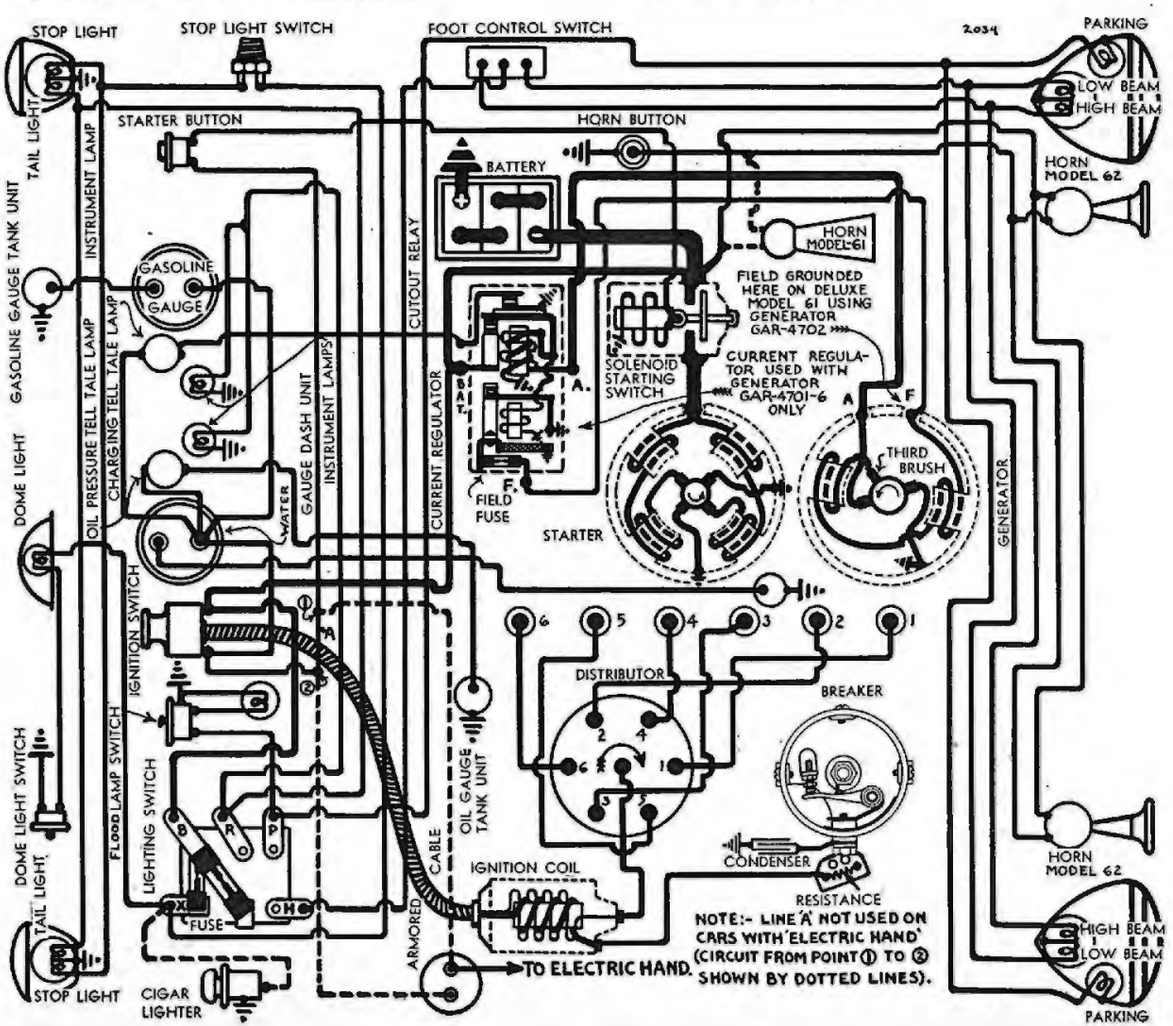
NOTE—Do not adjust carburetor until engine is warmed up so that choke valve is wide open and engine idling at slow or hot idling speed.

Idle Adjustment—Adjust throttle stopscrew 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 ¼-1 (331-S), ½-1 (329-S) turn open from seated position. Readjust throttle stopscrew 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. See article on Carter Fast Idle in Carburetion Section.



Automatic Choke (329-S only):—Carter Climatic Control. See article in Carburetion Section.

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

Fuel Pump:—AC. Type R #1521450. Diaphragm type. See article in Carburetion Section.

Gasoline Gauge:—King-Seeley Electric. See article in Carburetion Section.

VALVE TIMING:—Tappet Clearance—.006" Int., .008" Exh., 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 .006" with engine hot.

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

LUBRICATION:—Crankcase Capacity—5 qts. refill.

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

Oil Pressure Signal Light—Used instead of pressure gauge. Controlled by oil pressure regulator valve. See complete article in Equipment Section.

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 vs.

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 Mod. 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.

Belt Adjustment:—Swing generator away from engine until slack in belt midway between fan pulley and generator pulley is 1¼" (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. See article in Equipment Section for complete data.

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-.030" with contacts closed.

RELAY-REGULATOR:—Mod. TC-4304A (GAR-4701-6). Mounted on engine side of dash. Consists of Cutout Relay and Current Regulator (two-rate charging control). See Equipment Section for complete data. 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 1650.

Foot Selector—R.B.M. Model 1082.

Instrument Lights—Soreng-Manegold Mod 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. See Equipment Section for complete data.

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

Generator Field—5 ampere in regulator (on GAR-4701-6 only).

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

SERIAL NUMBER:—First number—42,000. On left hand frame member near front spring rear shackle and on body sill at left front door opening.

COMPRESSION:—Ratio—5.7-1 Std. cast-iron head. No optl. ratios. **Pressure**—87 lbs. at 216 R.P.M.

VACUUM READING:—Gauge should show steady reading of 18½" with engine idling at 7 M.P.H.

IGNITION:—Coil Model IG-4090. Mounted on right side of engine block.

Ignition Current—2.5 amperes idling, 4 amperes stopped.

Ignition Switch:—Mitchellock 17-A, Type 5159. Coil connection not armored.

Ignition Lock—Independent Lock Co. No. 4044-H, Mitchell No. 4759.

Distributor Model IGS-4007. Single breaker, 4 lobe cam, full automatic advance type with auxiliary vacuum spark control.

Breaker Gap—Set at .020".

Cam Angle or Dwell—47.0° (closed), 43.0° (open).

Breaker Arm Spring Tension—16-20 ounces.

Condenser—Part No. IG-2671G. Capacity .20-.25 mfds.

Automatic Advance

Distributor Degrees	R.P.M.	Engine Degrees	R.P.M.
Start	250	0	500
2	300	4	600
5	500	10	1000
8	900	16	1800
11	1300	22	2600
14	1700	28	3400

Vacuum Spark Control—Integral with distributor. Mounted on distributor housing and linked directly to breaker plate. Provides additional advance for all speeds above idling except when engine is accelerated or operated with wide open throttle when spark is retarded by return spring within unit.

Vacuum Advance

Engine Degrees	Vacuum (" of HG)
Start	3.5
.8	4
6	7
20	15

Distributor Removal:—Mounted on right side of engine. To remove, disconnect vacuum line, take out hold-down screw in plate.

IGNITION TIMING:—Flywheel Degrees Piston Position

All engines	5° ATDC	.0103" ATDC

To Check Timing—Take off inspection hole cover plate (top surface left hand side of flywheel housing). Turn engine over with #1 piston on compression, stop with piston 5° or .0103" after top dead center when flywheel mark 'IGN' lines up with pointed end of inspection plate screw, loosen advance arm clamp bolt, rotate distributor until contacts begin to open, tighten clamp bolt, see that rotor is opposite #1 segment in distributor cap, check spark plug connections (see diagram).

NOTE—This check must be made with all back lash eliminated in distributor drive and vacuum spark control should be in a fully released position.

Motor Gauge—Weidenhoff Adapter #104, Rod #2.

Firing Order:—1-3-4-2. See diagram.

Spark Plugs:—Champion Type C-7B. 18 MM. Metric.

Spark Plug Gap—Set at .025". Limits .024-.025".

CARBURETION:—Carburetor—Tillotson Model D-1E. 1⅛" downdraft type with manual choke control. See Carburetion Section for overhaul data.

Adjust as follows:

High Speed Adjustment—With engine warm set throttle for 25-30 M.P.H. speed. Turn idle adjusting screw in until it is closed. Then turn High Speed Adjusting Screw (screw with cross bar) in until engine misses, turn screw out until engine begins to roll, finally turn screw in (approximately ¾ turn) until engine fires smoothly. Then set Idle Adjustment as outlined below.

Idle Speed Adjustment—Open idle screw one full turn and close throttle. Set throttle stopscrew for idling speed of 7 M.P.H., turn idle adjusting screw out or left until engine misses, then turn screw in until engine fires smoothly. Reset throttle stop screw if necessary for correct idling speed.

Air Cleaner:—Monroe oil-wetted type standard.

Fuel Pump:—AC. Type P-1521390. See article in Carburetion Section.

Gasoline Gauge:—National, Electric type.

VALVE TIMING:—To Check Timing—Set tappet clearance #1 intake valve at .010". This valve should open when piston reaches top dead center and flywheel mark 'T.C.I.O.1-4' lines up with pointed end of inspection hole cover plate screw (top of flywheel housing left hand side). Reset tappet clearance at .004" with engine hot.

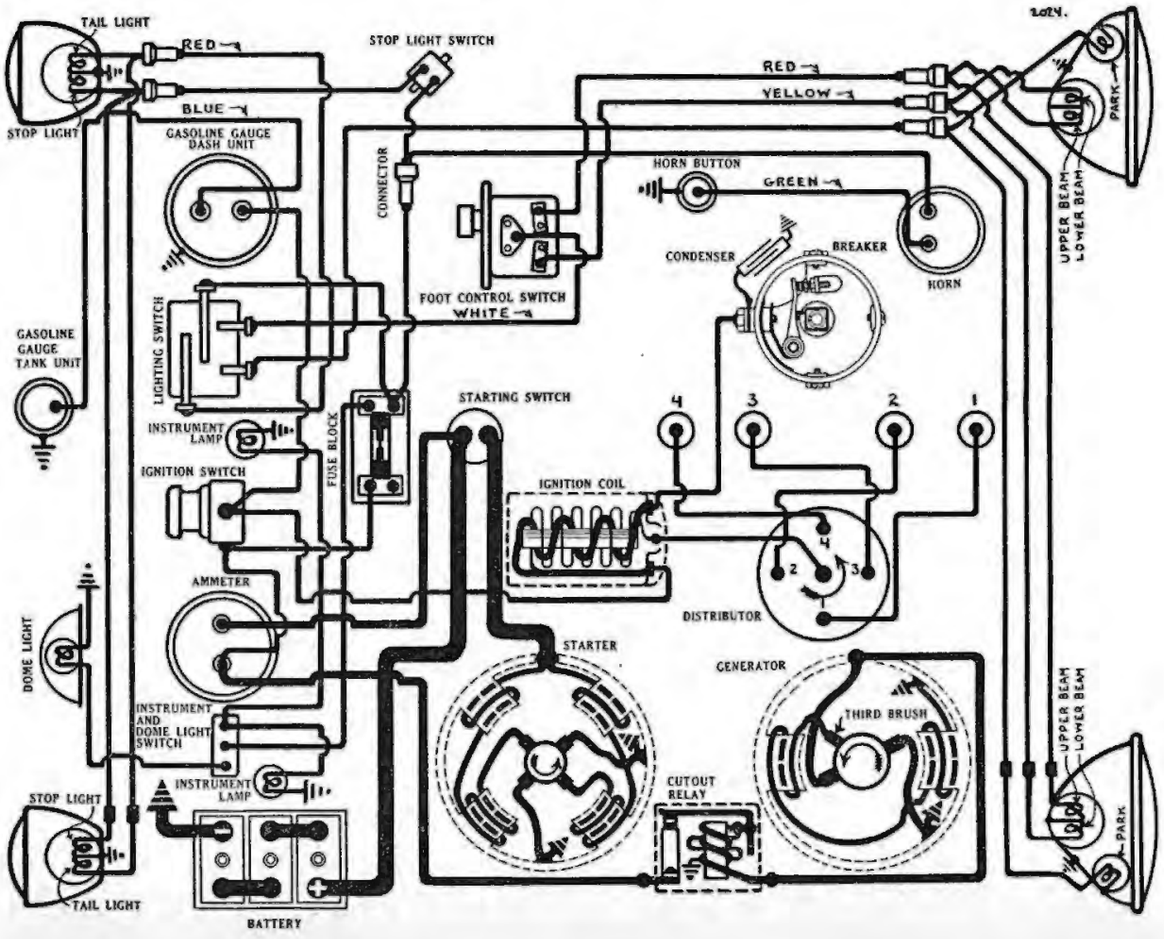
Motor Gauge—Weidenhoff Adapter #104 , Rod #2.

Tappet Clearance:—.004" Int., .006" Exh., hot.

Valve Spring Pressure:—46½ lbs. at 2¼" (valve closed), 85½ lbs. at 1 15/16" valve open).

LUBRICATION:—Crankcase Capacity—4 qts. (refill).

Normal Oil Pressure—30 lbs. at 30 M.P.H.



BATTERY:—U.S.L., Type A-13A. 6 volt, 13 plate, 78 ampere hour capacity (20 hour rate).

Starting Capacity—96 ampere hours for 20 minutes.

Zero Capacity—300 amperes for 1.9 minutes.

Grounded Terminal—Negative (—) terminal.

Location—On 'X' member under right front seat.

STARTER:—Model MZ-4033. Armature No. MZ-2089.

Drive—Special outboard Bendix No. RC10HD.

Cranking Engine—120 R.P.M., 200 amperes at 5 v.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—44-56 ozs. (new brushes).

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	4900	5.5	47
.65 "	2500	5.5	100
2.55 "	1325	5.0	200
4.95 "	750	4.5	300
7.65 "	220	4.0	400
10.1 "	Lock	3.5	470
12.25 "	Lock	4.0	545

Removal:—Flange mounted on right hand front face of flywheel housing. To remove, take out two flange capscrews and one capscrew in bracket on commutator end.

Starting Switch:—Model SW-4001. Foot plunger type mounted on toeboard.

GENERATOR:—Model GAM-4504. Armature GAM-2055. Third brush control type.

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

Maximum Charging Rate—17 amperes (cold), 8.0 volts, 1950 R.P.M.

Performance Data

Cold			Hot		
Amperes	Volts	R.P.M.	Ampere	Volts	R.P.M.
0	6.4	700	0	6.4	720
4	6.8	880	4	6.9	920
8	7.2	1075	8	7.35	1160
12	7.6	1280	12	7.8	1460
16.5	8.0	1950	13.8	8.0	2000

Rotation—Counter-clockwise at commutator end.

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

Field Current—4.08-4.52 amperes at 6.0 volts.

Motoring Current—4.94-5.46 amperes at 6.0 volts.

Removal:—Pivot mounted at right front of engine. To remove, take out two pivot bolts, one clamp bolt.

Belt Adjustment:—Loosen two pivot bolts and adjustment clamp bolt, swing generator away from engine until fan can just be turned with belt held stationary, tighten clamp bolt and pivot bolts.

CUTOUT RELAY:—Model CB-4008. Mounted on top of right hand frame side rail near generator.

Cuts In—7.0-7.5 volts, 995 R.P.M. of generator.

Cuts Out—.5-2.5 amperes discharge current.

Contact Gap—.025-.035".

Air Gap—.010-.030" with contacts closed.

LIGHTING:—Headlamps—Corcoran Brown. Fixed focus type. Headlamps aimed straight ahead (upper beam with lenses in place). Upper and lower beams controlled by foot selector switch.

Switches

Lighting—Culver-Stearns.

Foot Selector—Clum Model 9579.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlamps	21-21	1110
Stop and Tail	21-3	1158
All others	3	63

FUSES:—Lighting—20 ampere mounted on back side of engine dash under cowl.

HORNS:—Schwarze vibrator type disc horn.