1935

HUDSON

and

TERRAPLANE

Technical Information Handbook

HUDSONTECH
2004

☙ 1935 Hudson & Terraplane ❧

General Chassis Data

Series	Serial Number.	CYL.	Bore x Stroke	Disp.	NACC HP	W/B
Hudson:						
53 GH - Big Six	53-101 to 53-7724	6	3 x 5	212	21.6	116
54 HT - Special 8	54-101 to 54-7250	8	3 x 4½	254	28.8	117
55 HU - Deluxe 8	55-101 to 55-3197	8	3 x 4½	254	28.8	117
56 HHU - Custom 8	56-101 to 56-1560	8	3 x 4½	254	28.8	124
57 HTL - Special 8	57-101 to 57-1068	8	3 x 4½	254	28.8	124
58 HUL - Deluxe 8	58-101 to 58-821	8	3 x 4½	254	28.8	124
Terraplane:						
51 G - Special	51-101	6	3 x 5	212	21.6	112
51 G - Commercial	51-101	6	3 x 5	212	21.6	112
52 GU - Deluxe	52-101	6	3 x 5	212	21.6	116

Starting motor numbers: Hudson 6 cyl. - 70000; Hudson 8 cyl. – 55000: Terraplane – 103,000
Start Serial Numbers – Canada: C-51-101, C-52-101,C53-101, C54-101, C55-101, C56-101, C57-101, C58-101

General Body Data - Hudson

Body Style	GH	HT	HU	Body Style	HHU	HTL	HUL
2-P. Coupe	$695	$760	$845	5-P. Club Sed.	$1025	$ 880	$ 975
5-P. Coach	710	780	875	5-P. Suburban Sed	1057	912	1007
4-P. RS Coupe	740	810	895	5-P. Brougham	1095	1095	1025
5-P. Trg. Brougham	742	812	907	5-P. Trg. Brougham	1127	962	1057
5-P. Sedan	770	840	935				
4-P. RS Conv. Coupe	790	860	955				
5-P. Suburban Sedan	802	872	967				

General Body Data – Terraplane

Body Style	G	GU	Body Style	G - Commercial
2-Pass. Coupe	$585	$645	¾ Ton Chassis	$430
5-Pass. Coach	595	645	¾ Ton Chassis w/cab	515
4-Pass. RS Coupe	625	675	¾ Ton Cab Pickup	545
5-Pass. Touring Brougham	625	675	½ Ton Utility Coach	565
5-Pass. Suburban Sedan	685	735	¾ Ton Panel Delivery	675
4-Pass. Convertible Coupe	N/A	725		

Electrical Equipment: AUTO-LITE

Starter : MAB-4060 - 1935 Hudson 6 to eng. #76665; 1935 Terraplane to engine #143134
: MAB-4061 - 1935 Hudson 8 to eng. #63836
: MAB-4074 - 1935 Hudson 6 after eng. #76665: 1935 Terraplane G, GU after eng. #143134
: MAB-4075 - 1935 Hudson 8 after eng. # 63836
Generator : GAM-4503 - 1935 G Commercial
: GBK-4601-2 - 1935 Terraplane Model G exc. Commercial
: GBK-4602-1 - 1935 Hudson, Terraplane GU
Regulator : TC-4304A - 1935 Terraplane Model G to eng. #143134
Distributor : IGB-4301A - 1935 Hudson 6 to eng. #73791; 1935 Terra. G, GU to eng. #128077
: IGB-4301B - 1935 Hudson 6 after eng. #73791; 1935 Terra. G, GU after eng. #128077;
: IGP-4001A - 1935 Hudson 8 to eng. #65247
: IGP-4001B - 1935 Hudson 8 after eng. #65247
Ignition Coil : IG-4311 - 1935 Terraplane Commercial
: IG-4616 - 1935 Hudson 6, Terraplane all exc. Commercial Models
: CE-4617 - 1935 Hudson 8

Fuel System

Carburetor (Carter) : W1-309S - 1935 Hudson 6: 1935 Terraplane GU
: W1-310S - 1935 Hudson 8
: W1-311S - 1935 Terraplane Model G
Fuel Pump (A. C.) : R-1521540 - 1935 Hudson 6, 8

Shipments

Hudson - 29,476
Terraplane Pass. – 70,323
Terraplane Commercial – 1,281

Notes

1) Introduction dates: GH, HT, HU, HHU - Dec. 27 1934
HTL, HUL - May 20, 1934
Terraplane – all - Nov. 21, 1934
2) Body suppliers: Briggs - Convertible Coupe
3) Replacement Carburetors: - 309-S - use -329-S (1936 Hudson 6)
- 310-S - use -330-S (1936 Hudson 8)
- 311-S – use -331-S (1936 Terraplane Model 62)

1935 Service Information and Adjustments

	Terraplane Special	*Terraplane De Luxe*	*Hudson Six*	*Hudson Special*	*Hudson De Luxe*	*Hudson Custom*
Starting Serial No. (U. S. Plant	*51-101*	*52-101*	*53-101*	*54-101*	*55-101*	*56-101*
Starting Engine No. (All Plants)	*103000*	*103000*	*70000*	*55000*	*55000*	*55000*
Starting Serial No. (Canadian)	*C51-101*	*C52-101*	*C53-101*	*C54-101*	*C55-101*	*C56-101*

	Terraplane Special	Terraplane De Luxe	Hudson Six	Hudson Special and De Luxe	Hudson Custom
FRONT AXLE					
Type	Elliot	Elliot	Elliot	Elliot	Elliot
Caster (Actual on Car)	3¼º to 3¾º	3¼º to 3¾º	4º - 4½º	4º - 4½º	4º - 4½º
Max. Variation-Right and Left Ends	½º	½º	½º	½º	½º
Camber	1º - 1½º	1º - 1½º	1º - 1½º	1º - 1½º	1º - 1½º
Toe-in	0 - 1/8"	0 - 1/8"	0 - 1/8"	0 - 1/8"	0 - 1/8"
Spindle Pin Inclination (Angle with Spring Pad)					
Transverse	7º	7º	7º	7º	7º
Forward	1½º	1½º	1½º	1½º	1½º
Steering Spindle Pin Diameter	¾"	¾"	¾"	¾"	¾"
Steering Spindle Thrust Bearing	Ball	Ball	Ball	Ball	Ball
Wheel Bearing-Type	Taper Roller	Taper Roller	Taper Roller	Taper Roller	Taper Roller
End Play	.001" - .003"	.001" - .003"	.001" - .003"	.001" - .003"	.001" - .003"
Tie Rod joint --Type	Ball Trunion	Ball Bearings	Ball Bearings	Ball Bearings	Ball Bearings
Tie Rod Adjustment	Screw	Screw	Screw	Screw	Screw
To Adjust Tie Rod					
Turn Clockwise - To (As seen from right)	Lengthen	Lengthen	Lengthen	Lengthen	Lengthen
Turn Counter-clockwise To (As seen from right)	Shorten	Shorten	Shorten	Shorten	Shorten
REAR AXLE					
Type	Semi-floating	Semi-floating	Semi-floating	Semi-floating	Semi-floating
Ratio - Standard	4.11	4.11	4.11	4.11	4.11
- Optional	4.56	4.56	4.56	4.56	4.56
Pinion Bearings					
Type	Roller	Roller	Roller	Roller	Roller
Adjustment	Shim	Shim	Shim	Shim	Shim
End Play .	.000" - .001"	.000" - .001"	.000-.001”	.000" - .001"	.000-.001”
Differential Bearings					
Type	Roller	Roller	Roller	Roller	Roller
Adjustment	Screw	Screw	Screw	Screw	Screw
End Play	.009" Tension	.009" Tension	.009" Tension	.009" Tension	.009" Tension
Wheel Bearings					
Type	Taper Roller	Taper Roller	Taper Roller	Taper Roller	Taper Roller
Adjustment	Shim	Shim	Shim	Shim	Shim
End Play	.004" - .010"	.004" - .010"	.004" - .010"	004" - .010"	.004" - .010"
Pinion and Gear					
Adjustment	Shim	Shim	Shim	Shim	Shim
Lash in Gears.	0005" .003'	.0005" - .003"	.0005” . 003”	.0005” . 003”	.0005” . 003”
Lubrication -					
Quantity (Pints)	3	3	3	3	3

	Terraplane Special	*Terraplane De Luxe*	*Hudson Six*	*Hudson Special and De Luxe*	*Hudson Custom*
BRAKES					
Location	4 Wheels	4 Wheels	4 Wheels	4 Wheels	4 Wheels
Operation by	Cables	Cables	Cables	Cables	Cables
Drum Diameter	9”	9”	9”	9”	11”
Drum Material	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
Lining-Type	Moulded	Moulded	Moulded	Moulded	Moulded
Width	1¾"	1¾”	2¼"	2¼"	1¾”
Thickness	5/32”	5/32”	5/32”	5/32”	5/32”
Length per Wheel	19-3/16”	19-3/16”	19-3/16”	9-3/16”	23-13/16”
Pieces per Wheel	2	2	2	2	2
Adjustments:					
Anchor Pin - Movable	Radially	Radially	Radially	Radially	Radially
Upper Shoe	Eccentric	Eccentric	Eccentric	Eccentric	Eccentric
Lower Shoe	Screw	Screw	Screw	Screw	Screw
Clearance:					
Anchor Pin End of Shoes	.010"	.010"	.010"	.010"	.010"
Adj. Screw End of Shoes	.010	.010"	.010”	.010"	.010”
Max. Variation per Shoe	.003”	.003”	.003”	.003”	.003”
CLUTCH					
Type - Single Disc in Oil	Yes	Yes	Yes	Yes	Yes
Facing	Cork	Cork	Cork	Cork	Cork
No. Inserts (Cork).	90	90	90	108	108
Pilot Bearing	Ball	Ball	Ball	Ball	Ball
Throwout Bearing	Ball	Ball	Ball	Ball	Ball
Lubrication:					
Housing - Type	Hudsonite	Hudsonite	Hudsonite	Hudsonite	Hudsonite
Quantity	1/3 Pint	1/3 Pint	1/3 Pint	1/3 Pint	1/3 Pint
Location of Filler	Front of Flywheel	Front of Flywheel	Front of Flywheel	Front of Flywheel	Front of Flywheel
Throwout Bearing Quantity	1 oz.	1 oz.	1 oz.	1 oz.	1 oz.
Type of Fitting	Zerk	Zerk	Zerk	Zerk	Zerk
Location of Fitting	Right Bell Housing	Right Bell Housing	Right Bell Housing	Right Bell Housing	Right Bell Housing
ELECTRICAL EQUIPMENT					
Coil (Ignition):					
Make (Autolite)	IG-4616*	IG-4616*	IG-4616	CE-4617	CE-4617
Location	Instrument Panel	Dash	Dash	Dash	Dash
Distributor (Ignition):					
Make - Autolite	IGB-4301A**	IGB-4301A**	IGB-4301A**	IGP-4001A**	IGP-4001A**
Drive	Camshaft	Camshaft	Camshaft	Camshaft	Camshaft
Advance	Automatic	Automatic	Automatic	Automatic	Automatic
Breaker Point Gap	.020	.020"	.020”	.020"	.020”
Timing	D. C.	D. C.	D.C.	D. C.	D.C. .
Firing Order	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-6-2-5-8-3-7-4	1-6-2-5-8-3-7-4
Lubrication	Light Motor Oil	Light Motor Oil	Light Motor Oil	Light Motor Oil	Light Motor Oil
Quantity	Fill Cup	Fill Cup	Fill Cup	Fill Cup	Fill Cup

* IG-4311 – 1935 Terraplane Commercial

** IGB-4301A – 1935 Terraplane to Eng. #128077, 1935 Hudson 6 to Eng. #73791; IGP-4001A – 1935 Hudson 8 to Eng. #65247
IGB-4301B – 1935 Terraplane after Eng. #128077, 1935 Hudson 6 after Eng. #73791; IGP-4001B – 1935 Hudson 8 after Eng. #65247

	Terraplane Special	*Terraplane De Luxe*	*Hudson Six*	*Hudson Special and De Luxe*	*Hudson Custom*
Electrical Equipment (Cont'd)					
Generator:					
Make – Autolite	GBk-4601-2*	GBK-4602-1	GBK-4602-1	GBK-4602-1	GBK-4602-1
Drive	V-Belt	V-Belt	V-Belt	V-Belt	V-Belt
Belt Adjustment	Swing Mounting	Swing Mounting	Swing Mounting	Swing Mounting	Swing Mounting
Regulation - Internal	Third Brush	Third Brush	Third Brush	Third Brush	
- External	None	Voltage Regulator	Voltage Regulator	Voltage Regulator	Voltage Regulator
Charging Rate - Cold	17 Amps	22 Amps	22 Amps	22 Amps	22 Amps
- Hot	13 Amps	17 Amps	17 Amps	17 Amps	17 Amps
Lubrication	Motor Oil	Motor Oil	Motor Oil	Motor Oil	Motor Oil
Quantity - each Bearing	2 Drops	2 Drops	2 Drops	2 Drops	2 Drops

*GAM-4503 – 1935 Terraplane Commercial; Generator GBK-4602-1 – 1935 Terraplane G, except Commercial:

Lamps:					
Bulb Voltage	6-8	6-8	6-8	6-8	6-8
Candle Power and Bases (Contact - Single – S; Double - D)					
Head	21-32 (D)	21-32 (D)	21-32 (D)	21-32 (D)	21-32 (D)
Parking	3 (S)	3 (S)	3 (S)	3 (S)	3 (S)
Dash Signals	3 (D)	3 (D)	3 (D)	3 (D)	3 (D)
Instruments	3 (S)	3 (S)	3 (S)	3 (S)	3 (S)
Stop and Tail	2-21 (D)	2-21 (D)	2-21 (D)	2-21 (D)	2-21 (D)
Dome	15 (S)	15 (S)	15 (S)	15 (S)	15 (S)
Fuse - Headlamp Circuit	20 Amps	20 Amps	20 Amps	20 Amps	20 Amps
Tail Lamp Circuit	20 Amps	20 Amps	20 Amps	20 Amps	20 Amps
Windshield Wiper Circuit	7½ Amps	7½ Amps	7½ Amps	7½ Amps	7½ Amps
Generator Regulator	7½ Amps	7½ Amps	7½ Amps	7½ Amps	7½ Amps
Spark Plugs:					
Size	14 m.m.	14 m.m.	14 m.m.	14 m.m.	14 m.m.
Gap	022"	.022"	.022"	.022"	022"
Starting Motor:					
Make - Autolite	MAB-4060[1]	MAB-4060[1]	MAB-4061[1]	MAB-4061[2]	MAB-4061[2]
Drive	Bendix	Bendix	Bendix	Bendix	Bendix
Control	Solenoid	Solenoid	Solenoid	Solenoid	Solenoid
Lubrication	Motor Oil	Motor Oil	Motor Oil	Motor Oil	Motor Oil
Quantity (Each Bearing)	2 Drops	2 Drops	2 Drops	2 Drops	2 Drops

[1] MAB-4060 – 1935 Terraplane to Eng. #143134, 1935 Hudson 6 to Eng. #76665
[1] MAB-4074 – 1935 Terraplane after Eng. #143134; 1935 Hudson 6 after Eng. #76665
[2] MAB-4061 – 1935 Hudson 8 to Eng. #63836; MAB-4075 1935 Hudson 8 after Eng. #63836

Battery:					
Make	National	National	National	Exide	Exide
No. Plates	17	17	17	19	19
Capacity	105 Amp. Hrs.	105 Amp. Hrs.	105 Amp. Hrs.	125 Amp. Hrs.	125 Amp Hrs.
Dimensions - Length	10-9/16"	10-9/16"	10-9/16"	11-13/16"	11-13/16"
Width	6¾"	6¾"	6¾"	6¾"	6¾"
Height (Overall)	7-13/16"	7-13/16"	7-13/16"	7-11/16"	7-11/16"
Terminal Grounded	Positive	Positive	Positive	Positive	Positive

	Terraplane Special	*Terraplane De Luxe*	*Hudson Six*	*Hudson Special and De Luxe*	*Hudson Custom*
			ENGINE		
Number of Cylinders	6	6	6	8	8
Arrangement .	Vertical	Vertical	Vertical	Vertical	Vertical
Bore	3”	3”	3”	3”	3”
Stroke	5"	5”	5"	4 1/2"	4 1/2"
Piston Displacement	212	212	212	254	254
Taxable Horse Power	21.6	21.6	21.6	28.8	28.8
Actual Horse Power:					
Standard Compression	88 @ 3800	88 @ 3800	93 @ 3800	113 @ 3800	113 @ 3800
High Compression	100 @ 3600	100 @ 3600	100 @ 3800	124 @ 3800	124 @ 3800
Compression Ratio:					
Standard	6.00	6.00	6.25	6.00	6.00
Optional	7.00	7.00	7.00	7.00	7.00
Firing Order	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-6-2-5-8-3-7-4	1-6-2-5-8-3-7-4
Engine Mounting	Rubber	Rubber	Rubber	Rubber	Rubber
Camshaft:					
Drive	Gear	Gear	Gear	Gear	Gear
Number of Teeth	56	56	56	56	56
- Camshaft Gear					
- Crankshaft Gear	28	28	28	28	28
Timing Indicated by Marks on	Gears	Gears	Gears	Gears	Gears
Camshaft Bearings:					
Diameter and Length					
No. 1	2x1-3/16"	2x1-3/16"	2x1-3/16"	2-1/32x1-3/8"	2-1/32x1-3/8"
No. 2	1-31/32x1-1/16"	1-31/32x1-1/16"	1-31/32x1-1/16"	2 x 1”	2 x 1”
No. 3	1½x15/16"	1½x15/16"	1½x15/16"	1-31/32 x 1¼"	1-31/32 x 1¼"
No. 4			1-15/16 x 1"	1-15/16 x 1"	
No. 5				1½ x 1½"	1½x1½”
Radial Clearance	0015”	0015”	.0015”	.0015”	.0015”
End Play Prevented by	Spring	Spring	Spring	Spring	Spring
Connecting Rods:					
Material	D. F. Steel	D. F. Steel	D. F. Steel	D. F. Steel	D. F. Steel
Weight (Ounces)	29.4	29.4	29.4	29.4	29.4
Length (C to C)	8-3/16"	8-3/16"	8-3/16"	8-3/16”	8-3/16”
Lower End Bearing					
Diameter	1-15/16"	1-15/16"	1 -15/16"	1-15/16”	1-15/16”
Length	1-3/8	1-3/8	1-3/8”	1-3/8”	1-3/8”
Clearance	001”	.001"	.001”	.001”	.001”
End Play	006"-.010	.006"-.010"	.006"-.010"	.006”-.010”	.006”-.010”
Material	Spun Babbitt	Spun Babbitt	Spun Babbitt	Spun Babbitt	Spun Babbitt
Upper End Bearing					
Diameter	¾”	¾”	¾”	¾”	¾”
Length	15/16"	15/16”	15/16”	15/16”	15/16”
Radial Clearance	.0003"	.0003"	.0003"	.0003”	.0003”
Material	Bronze	Bronze	Bronze	Bronze	Bronze

	Terraplane Special	*Terraplane De Luxe*	*Hudson Six*	*Hudson Special and De Luxe*	*Hudson Custom*
ENGINE - *(Cont'd)*					
Cooling System:					
Circulation by	Pump	Pump	Pump	Pump	Pump
Temperature Control	None	Thermostat	Thermostat	Thermostat	Thermostat
Capacity (Gallons)	4½	4½	4½	5¾	5¾
Upper Rad. Hose - Length	9"	9”	3¼"	7-5/8”	7-5/8”
- Diameter	1-9/16"	1-9/16"	1-9/16”	1-9/16”	1-9/16”
Lower Rad. Hose -Length	9”	9”	3¼”	3¼”	3¼”
- Diameter	1-9/16”	1-9/16”	1-9/16”	1½”	1½”
Pump Drive	V-Belt	V-Belt	V-Belt	V-Belt	V-Belt
Fan Drive	Pump Shaft	Pump Shaft	Pump Shaft	Pump Shaft	Pump Shaft
Belt Adjustment	Generator Mtng.	Generator Mtng.	Generator Mtng.	Generator Mtng.	Generator Mtng.
Pump Bearing Type	Needle Roller	Needle Roller	Needle Roller	Needle Roller	Needle Roller
Lubrication Fitting	Zerk	Zerk	Zerk	Zerk	Zerk
Packing Gland Adjustment	Finger Tight	Finger Tight	Finger Tight	Finger Tight	Finger Tight
Crankshaft:					
Type	Fully Compensated	Fully Compensated	Fully Compensated	Fully Compensated	Fully Compensated
Number of Bearings	3	3	3	5	5
Bearing Material	Bronze Backed Babbitt	Bronze Backed Babbitt	Bronze Backed Babbitt	Bronze Backed Babbitt	Bronze Backed Babbitt
Bearing Diameter and Length					
No. 1	2 11/32x1-5/8"	2-11/32"x1-5/8"	2-11/32"x1-5/8"	2-9/32x1-5/8"	2-9/32x1-5/8"
No. 2	2-3/8x1¾"	2-3/8x1¾"	2-3/8x1¾"	2-5/16"x1-3/8"	2-5/16"x1-3/8"
No. 3	2-13/32x2-3/8"	2-13/32x2-3/8"	2-13/32x2-3/8"	2-11/16x1-7/8"	2-11/16x1-7/8"
No. 4				2 3/8”x1-3/8"	2 3/8”x1-3/8"
No. 5				2-13/32x2"	2-13/32x2"
End Play Taken by Bearing No.	2	2	2	3	3
Bearing End Play	.006”-.012"	.006"-.012"	.006"-.012"	.006”-.012”	.006”-.012”
Bearing Clearance	001"	.001"	.001"	.001”	.001”
Adjustment Type	Shim	Shim	Shim	Shim	Shim
Fuel System:					
Carburetor - Make Carter	W1-311S	W1-309S	W1-309S	W-310S	W-310S
- Type	Down Draft	Down Draft	Down Draft	Down Draft	Down Draft
- Size	1¼”	1¼”	1¼”	1¼”	1¼”
Heat Control	Automatic	Automatic	Automatic	Automatic	Automatic
Choke Control	Automatic	Automatic	Automatic	Automatic	Automatic
Fuel Delivered by	Pump	Pump	Pump	Pump	Pump
Pump Drive from Camshaft by	Cam	Cam	Cam	Cam	Cam
Air Cleaner and Silencer	A. C.	A. C.	A. C.	A. C.	A. C.
Gasoline Tank Capacity (Gal.)	11	15½	15½	15½	15½

	Terraplane Special	*Terraplane De Luxe*	*Hudson Six*	*Hudson Special and De Luxe*	*Hudson Custom)*
ENGINE - *(Cont'd)*					
Lubrication System:					
Type - Hudson Duoflo Automatic	Yes	Yes	Yes	Yes	Yes
Pump Type	Oscillating Plunger	Oscillating Plunger	Oscillating Plunger	Oscillating Plunger	Oscillating Plunger
Pump Drive	Camshaft	Camshaft	Camshaft	Camshaft	Camshaft
Oil Cooling	Baffles in Reservoir	Baffles in Reservoir	Baffles in Reservoir	Baffles in Reservoir	Baffles in Reservoir
Oil Filter	Screen	Screen	Screen	Screen	Screen
Screen Mesh	40	40	40	40	40
Capacity – Total (Quarts)	6 Quarts	6 Quarts	6 Quarts	9 Quarts	9 Quarts
- Reservoir (Quarts)	5 Quarts	5 Quarts	5 Quarts	7 Quarts	7 Quarts
Pistons:					
Type	Cam Ground	Cam Ground	Cam Ground	Cam Ground	Cam Ground
Material	Lo-Ex Alum. Alloy	Lo-Ex Alum. Alloy	Lo-Ex. Alum Alloy	Lo-Ex. Alum Alloy	Lo-Ex. Alum. Alloy
Weight (Oz.)	10.5	10.5	10.5	10.5	10.5
Length	3-3/16”	3-3/16”	3-3/16”	3-3/16”	3-3/16”
Pin Center to Top	1-11/16”	1-11/16”	1-11/16”	1-11/16”	1-11/16”
Clearance					
Skirt	.001”	.001”	.001”	.001”	.001”
Top of Piston	.016”	.016”	.016”	.016”	.016”
Depth of Grooves	5/32”	5/32”	5/32”	5/32”	5/32”
Piston Pin Hole – Size	¾”	¾”	¾”	¾”	¾”
Finish	Diamond Bore	Diamond Bore	Diamond Bore	Diamond Bore	Diamond Bore
Piston Pin:					
Type	Floating	Floating	Floating	Floating	Floating
Method of Locking	Snap Rings	Snap Rings	Snap Rings	Snap Rings	Snap Rings
Diameter	¾”	¾”	¾”	¾”	¾”
Length	2-7/16”	2-7/16”	2-7/16”	2-7/16”	2-7/16”
Fit in Piston (at 200^0 F.)	.0003”	.0003”	.0003”	.0003”	.0003”
Fit in Rod	.0003”	.0003”	.0003”	.0003”	.0003”
Piston Rings:					
Material	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron
Joint – Type	Straight Cut	Straight Cut	Straight Cut	Straight Cut	Straight Cut
Compression Rings – No.	2	2	2	2	2
Width	3/32”	3/32”	3/32”	3/32”	3/32”
Gap	.009-.011”	.009-.011”	.009-.011”	.009-.011”	.009-.011”
Oil Rings – No.	2	2	2	2	2
Width - Upper	3/16”	3/16”	3/16”	3/16”	3/16”
- Lower	3/16”	3/16”	3/16”	3/16”	3/16”
Gap	.009-.011”	.009-.011”	.009-.011”	.009-.011	.009 -.011”

	Terraplane Special	*Terraplane De Luxe*	*Hudson Six*	*Hudson Special and De Luxe*	*Hudson Custom*
Engine (cont)					
Valves and Tappets:					
Inlet Valve – Material	Silicon Steel	Silicon Steel	Silicon Steel	Silicon Steel	Silicon Steel
Head – Outside Diameter	1-3/8”	1-3/8”	1-3/8”	1½”	1½”
Opening	1¼”	1¼”	1¼”	1-3/8”	1-3/8”
Valve Lift	11/32”	11/32”	11/32”	11/32”	11/32”
Stem Length	5-11/32”	5-11/32”	5-11/32”	5-3/32”	5-3/32”
Stem Diameter	5/16”	5/16”	5/16”	5/16”	5/16”
Exhaust Valve – Material	Silicon Chrome Steel	Silicon Chrome Steel	Silicon Chrome Steel	Silicon Chrome Steel	Silicon Chrome Steel
Head – Outside Diameter	1-3/8”	1-3/8”	1-3/8”	1-3/8”	1-3/8”
Opening	1¼”	1¼”	1¼”		1¼”
Valve Lift	11/32”	11/32”	11/32”	11/32”	
Stem Length	5-11/32”	5-11/32”	5-3/32”	5-3/32”	
Stem Diameter	5/16”	5/16”	5/16”	5/16”	
Valve Stem Guides	Removable	Removable	Removable	Removable	
Valve Spring Pressure	53 lbs. @ 2”	53 lbs.	53 lbs.	53 lbs.	
	104 lbs. @ 1-21/32”		104 lbs.	104 lbs.	104 lbs.
SPRINGS					
Front - Type	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic	
Material	Chrome Vanadium Steel	Chrome Vanadium Steel	Chrome Vanadium Steel	Chrome Vanadium Steel	
Length	31”	31”	31”	31”	
Width.	1¾"	1¾"	1¾"	1¾	
No. of Leaves	8	8	8	8	
Shackle Location	Front	Front	Front	Front	
Shackle Type	Self Adjusting	Self Adjusting	Self Adjusting	Self Adjusting	
Rear - Type	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic	
Material	Chrome Vanadium Steel	Chrome Vanadium Steel	Chrome Vanadium Steel	Chrome Vanadium Steel	
Length	48¾”	48¾``	48¾”	55¾"	
Width	1¾”	1¾”	1¾”	1¾”	
No. of Leaves	8	8	9	9	
Shackle Location	Rear	Rear	Rear	Rear	
STEERING GEAR					
Type	Worm & Sector	Worm & Sector	Worm & Sector	Worm & Roller	
Ratio	15	15	15	16.4	
Adjustments					
Worm Shaft	Shims	Shims	Shims	Shims	
Cross Shaft	Set Screw	Set Screw	Set Screw	Set Screw	
Gear Mesh	Eccentric Cover Screw	Eccentric Cover Screw	Eccentric Cover Screw	Eccentric Cover Screw	
Steering Wheel Height	Column Bracket	Column Bracket	Column Bracket	Column Bracket	
TIRES					
Size - Standard	17x5.50”	16x6.00”	16x6.25”	16x6.50”	
Optional	16x6.00"				
Air Pressure Minimum: (Front/Rear)	28/30	22/28	22/28	22/26	
Air Pressure 16x6.00 (Front/Rear)	22/28				

	Terraplane Special	Terraplane De Luxe	Hudson Six	Hudson Special and De Luxe	Hudson Custom
TRANSMISSION					
Location:	Unit	Unit	Unit	Unit	Unit
Speeds - Forward	3	3	3	3	3
Speeds - Reverse	1	1	1	1	1
Main Drive Gear Type	Helical	Helical	Helical	Helical	Helical
Countershaft Gear Type	Helical	Helical	Helical	Helical	Helical
Countershaft Second Type	Helical	Helical	Helical	Helical	Helical
Mainshaft Second Gear Type	Helical	Helical	Helical	Helical	Helical
Gear Ratios:					
Low	2.42	2.42	2.42	2.42	2.42
Second	1.61	1.61	1.61	1.61	1.61
High	1.	1.	1.	1.	1.
Reverse	3.30	3.30	3.30	3.30	3.30
Free Wheeling	No	No	No	No	No
Lubricant Capacity (Pts.)	3	3	3	3	3
Bearings:					
Mainshaft Pilot	Ball	Ball	Ball	Ball	Ball
Mainshaft Bearings	Ball	Ball	Ball	Ball	Ball
Mainshaft Pocket Bearing	Roller	Roller	Roller	Roller	Roller
Mainshaft Pocket Thrust Bearing.	Ball	Ball	Ball	Ball	Ball
Countershaft Bearings-Type	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt
Size-Front	812"	.812"	.812"	.812"	.812"
Rear	.812"	.812"	.812"	.812"	.812"
Clearance	.0005"	.0005”	.0005"	.0005"	.0005"
Second Speed M. S. Gear Type	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt	Steel Backed Babbitt
Diameter	2.188"	2.188'	2.188"	2.188"	2.188"
Clearance	.0005"	.0005”	.0005"	.0005”	.0005”
End Play	.009”	..009"	.009"	.009”	.009”
Reverse Idler Bearings	Bound Brook	Bound Brook	Bound Brook	Bound Brook	Bound Brook
Diameter	.8075"	.8075"	.8075"	.8075"	.8075"
Clearance	003"	.003"	.003"	.003"	.003"
Mainshaft End Play	.006-009"	.006-.009"	.0067.009”	.006-009"	.006-.009"
Adjustment	Shims	Shims	Shims	Shims	Shims
Shim Location	Front Bearing Cap	Front Bearing Cap	Front Bearing Cap	Front Bearing Cap	Front Bearing Cap
Countershaft End Play	005-.008"	005-.008"	.005-008"	.005-008"	.005-008"
Adjustment	Shims	Shims	Shims	Shims	Shims
Location	Rear Bearing Cap	Rear Bearing Cap	Rear Bearing Cap	Rear Bearing Cap	Rear Bearing Cap
WHEELS					
Type	Steel Artillery	Steel Artillery	Steel Artillery	Steel Artillery	Wood Artillery
Rim Type	Drop Base	Drop Base	Drop Base	Drop Base	Drop Base
Rim Size-Standard	16x4.00"	16x4.00"	16x4.00" 16x4.00"		16x4.50"
Hub Type	Demountable	Demountable	Demountable	Demountable	Demountable

	Terraplane Special	Terraplane De Luxe	Hudson Six	Hudson Special and De Luxe	Hudson Custom
CHASSIS AND GENERAL DIMENSIONS					
Wheel Base	112”	.112"	116"	117"	124"
Tread - Front	56"	56"	56”	56"	56"
- Rear	56"	56"	56"	56"	57½"
Road Clearance					
Front Axle	8-1/8"	8-1/8"	8-1/8”	8 -1/8"	8-/8"
Rear Axle	8 ½"	8½"	8½"	8½"	8 ½"
Clearance for Jack (OneTire Flat)					
Front Axle	5½"	5½"	5½"	5 ½"	5 ½"
Rear Axle	6-5/8"	6-5/8"	6 -5/8"	6 -5/8"	6-5/8"
Overall Length (Include Bumpers)					
5 Passenger Closed Cars	186”	186"	190”	190”	197"
5 Passenger Closed Cars with Trunk	188½"	188½"	192½"	192½”	199½"
Coupes	190”	190”	194”	194”	
Overall Height (Loaded)					
5 Passenger Closed Cars	67½”	67½"	67½"	67½"	67½"
Coupe-Business and Rumble	66¼"	66¼"	66¼"	66¼"	66¼"
Coupe-Convertible	63	63"	63"	63"	63"
Overall Width	68"	68"	68"	68"	68”

1 9 3 5

Hudson & Terraplane

Tune-up Specifications
and
Adjustments

1935 Hudson – Model GH, Big Six

Tune-up and Electrical Specifications
AUTO-LITE Electrical System

MODEL IDENTIFICATION

SERIAL NUMBER: - First number, 53-101. On plate on engine side of dash. All model numbers will carry prefix '53'.

ENGINE NUMBER: - First number, 70,000. Stamped on left side of cylinder block opposite #6 cylinder.

TUNE-UP

COMPRESSION: - Ratio-6.25-1 (Standard cast-iron head). 7.0-1 (Optional aluminum-iron composite head.)

Pressure - 116 lbs. at 219 R.P.M. (6.25-1 head), 127 lbs. at 207 R.P.M. (7.0-1 head) with all spark plugs removed and throttle wide open.

VACUUM READING: - Gauge should show steady reading of 18-201, with engine idling at 350 R.P.M.

AUTOMATIC SHIFT (ELECTRIC HAND): - Bendix electro-pneumatic type optional on these cars.

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap - .020" Cam Angle 38' (closed).

Automatic Advance - 15º max. at 2000 RPM (IGB4301-A), 14º max. at 1580 RPM. (IGB-4301-B). Distributor degrees & RPM.

IGNITION TIMING: See Ignition Timing.

Std. Setting - 4½º BTDC (Before Eng. No. 73790), At TDC (After Eng. No. 73791) with flywheel mark 'UDC.1-6/1' ½" ahead (4½º setting), or at indicator (TDC setting) in left front face of housing.

CARBURETION: See Carburetor & Carb. Equipment.

Idle Setting - Idle screw ½-1 turn open. Idle speed 350 RPM or 7 MPH.

Float Level – 3/8" from gasket seat on cover to nearest point on float (top at free end).

Accelerating Pump - Center hole Normal. Inner hole Summer), Outer hole (Winter) for temperature extremes.

Fuel Pump Pressure: 3½ lbs. maximum.

VALVES: See Valve Timing.

Tappet Clearance - .006" Intake, .008" Exhaust, Hot.

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

COIL: Auto-Lite Model IG-4616. Resistance unit mounted on distributor connected in primary circuit.

Ignition Switch - Mitchellock Model 24-B, Type 6509. Connected to coil by armored cable.

Ignition Current - 2.5 amperes idling, 4.5 stopped.

CONDENSER: Auto-Lite Part No. IGB-1025A.

Capacity - .20-.25 microfarad.

DISTRIBUTOR: Auto-Lite IGB-4301-A (first 3790), **IGB-4301-B** (Eng. No. 73791 up). Single breaker, 6 lobe cam, full automatic advance type.

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

Cam Angle or Dwell - Closed 38º, Open 22º (distr.).

Automatic Advance-IGB-4301-A

Distributor		Engine	
Degrees	R.P.M.	Degrees	R.P.M.
Start	400	0	800
3	720	6	1440
6	1040	12	2080
9	1360	18	2720
12	1680	24	3360
15	2000	30	4000

Automatic Advance-IGB-4301-B

Start	300	0	600
3	400	6	800
5	615	10	1230
10	1150	20	2300
14	1580	28	3160

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

IGNITION TIMING

IGNITION TIMING: - Flywheel Deg. Piston Pos.

First 3790 cars	4½º or ½" BTDC	.0101" BTDC.
Eng. No. 73791 up	At TDC	.0000" TDC

Timing (Initial Setting) -With #1 piston on compression, turn engine over until piston reaches top dead center, stop when flywheel mark 'UDC.1-6/' lines up with pointer on edge of inspection hole in left front face of flywheel housing above starter after Eng. No. 73791, or 3/8" before this point on first cars. Loosen hold-down screw in advance arm, turn distributor clockwise to limit of advance arm slot, then turn distributor slowly counterclockwise until contacts just open, tighten hold-down screw, see that rotor is opposite #1 segment in distributor cap. Car should then be road-tested and spark advanced as much as operating conditions and fuel will allow.

Timing (Final Setting) - With engine at normal operating temperature, and running at 8 M.P.H, in high gear on level road, accelerate engine rapidly and note performance from 10-15 M.P.H. A slight spark knock should be noticed. If no knock is heard, loosen hold-down screw and advance distributor one graduation on scale (turn distributor counter- clockwise). If knock is too severe, retard distributor one graduation (clockwise). Repeat test until satisfactory setting is secured. Final setting must not be beyond maximum advance mark on flywheel (3/4" before mark 'UDC.1-/6).

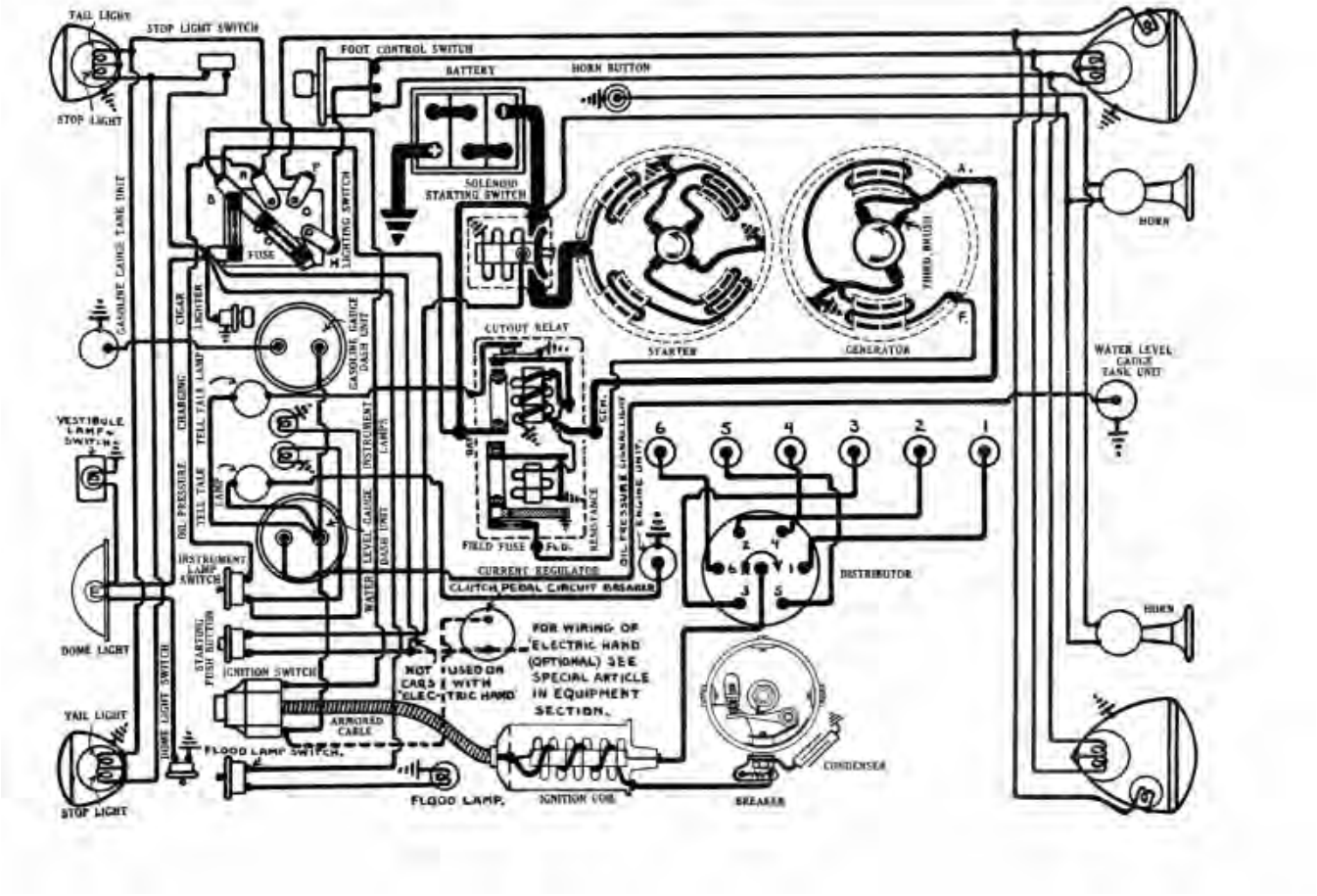
Breaker Arm Spring Tension - 16-22 ounces.

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

Spark Plugs: Champion Type J-7S. 14 mm. Metric

Spark Plug Gaps: - .022"

1935 Hudson, Model G (53)



CARBURETOR

Carburetor: - Carter, Model 309-S, 1¼", downdraft type with drop-bar type Fast Idle.

Automatic Choke - Carter Climatic Control Integral with carburetor.

CARB. EQUIPMENT

Fuel Pump: - A.C., Type R-1521540 diaphragm type.

Gasoline Gauge: - King-Seeley Electric. K-S #5200 (dash unit), #5582 (tank unit).

BATTERY

BATTERY: - National, Type ST-3-17X. 6 volt, 17, plate, 96 A.H. capacity (20 hour rate).

Starting Capacity - 120 amperes for 20 minutes.

Grounded Terminal - Positive (+) terminal.

Location - On left hand side under front floor boards.

STARTER

Auto-Lite Model MAB-4060 (first cars), MAB-4074 After Serial No. 53-6449. Armature No. MAB-2114.

Starter Drive - Inboard Bendix, Type A-1588.

Rotation - Counter-clockwise at commutator end.

Brush Spring Tension - 44-56 ozs. (new brushes).

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

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 switch.

Starting Switch: - **Type SS-4001**. Solenoid type switch mounted on starter field frame controlled by pushbutton switch on instrument panel.

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

Belt Adjustment: - Loosen pivot bolts and clamp bolt,
pull generator out from engine until slack on belt midway between crankshaft and generator pulleys is 11/4" (measure from straightedge across pulleys), tighten mounting bolts.

REGULATOR

Auto-Lite Model TC-4304-A. Consists of Cutout Relay and Current Regulator (Two-rate relay) in a single case On the dash. See Equipment Section for complete article on these units. 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.

Cuts out - .5-2.5 ampere discharge current.

Relay 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 70º F.

Contacts Close - 1.2-1.4 volts below opening point.

Contact Gap - .005" minimum.

Air Gap - .045" with contacts closed.

LIGHTING

LIGHTING: - Soreng-Manegold Switch Model 5770-A. R.B.M. Foot Control Switch, Model 1076,A. Foot switch used to control Country Driving (high) and City (low) beams with lighting switch in driving or second position. Headlight bulbs are pre-focused type.

Bulb Specifications

Position	C.P.	Mazda No.
Headlights	32-21	2320-C
Parking, Instrument	3	63
Signal Lights	3	64 (DC)
Stop & Tail	21-2	1158
Dome	15	87

MISC. ELECTRICAL

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

HORNS: - Auto-Lite Type HA-4003, 4004 (Std), Klaxon Model KQ-26-M, Type 1716 (high note), 1717 (low note) matched tone, twin horns (optional

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

Generator Field - 5 ampere in regulator.

ENGINE

ENGINE: - Own. Six cylinder, 'L' head type.

Bore - 3". Stroke-5".

Piston Displacement - 212.058 cubic inches.

Rated Horsepower - 21.6.

Developed Horsepower - 93 at 3800 R.P.M. (Standard 6.25-1 head), 100 at 3800 R.P.M. (7.0-1 head).

Compression Ratio - 6.25-1 (Standard cast-iron head), 7.0-1 (optional composite aluminum-iron head).

Compression Pressure - 116 lbs. at 219 R.P.M. (6.25-1 head), 127 lbs. at 207 R.P.M. (7.0-1 head) with all spark plugs removed and throttle wide open.

NOTE - High-octane type fuel must be used in engines with 7.0-1 ratio composite head.

Vacuum Reading - Gauge should show steady reading of 18-201, with engine idling.

Pistons: - Own, Lo-Ex silicon-aluminum alloy, 'T' slot, cam ground type. Use refinished replacement pistons when reconditioning engine. See Reconditioning paragraph.

Weight - 10.88 ozs. stripped, 12.99 ozs. with rings and pin.

Length - 3-3/16".

Removal - Pistons and rods removed from above.

Clearance - Top .016'. Bottom .001".

Reconditioning Cylinders - Size of original bore indicated by letter stamped on lower edge of valve chamber opposite cylinder as follows: A - 3.000"; B - 3.0005"; C - 3.001"; D - 3.0015"; E - 3.002"; AO - 3.010"; BO - 3.0105"; CO - 3.011"; DO - 3-0115"; EO - 3.012". Recondition cylinder to standard oversize for which replacement piston and rings are available (see piston and ring data below).

Replacement Pistons - Standard and oversize pistons marked by letter on head available for cylinder bores of size indicated: 'B' - 3.000 & 3.0005", 'D' - 3.001 & .0015", 'F' - 3.002 & 3.0025', 'J' - 3.004-, 'L' -3.005". 'BO' 3.010 & 3.0105", 'DO' - 3.011 & 3.0115", 'FO' - 3.012 & .0125", 'LO' - 3.015", 'BB' - 3-020", 'DD' - 3.021, 'FF' - .022". All pistons installed in engine must be of same weight as indicated by mark on head.

Fitting New Pistons - Use feeler gauge .0015-.002" thick to check clearance. It should be possible to withdraw feeler from between piston and cylinder wall on side opposite slot when grasped between thumb and forefinger with 3-4 lbs. pull.

Installing Pistons - Slot should be to left or away from valves.

Piston Rings: - Two compression rings, one oil control ring above pin, one oil control ring below pin. Lower ring groove drilled radially with oil drain holes.

Ring	Width	End Gap	Wall Thickness
Comp.	.093"	.006-.016"	.123"
Oil Cont.	.187	.006-.016 "	.128"

NOTE - Use standard or oversize rings of size indicated for replacement pistons (see Replacement Piston section above); 3.000" - B, D, F; 3.003" - J; 3.005" - L; 3.010" - BO, DO, FO; 3.015" - LO; 3.020" - BB, DD, FF. If rings are filed, clearance at pin must be kept uniform with end gap.

Piston Pin: - Diameter 3/4'. Length 2-7/16". Pin floats in piston and rod. Held by retaining rings.

Pin Fit in Piston - Snug fit with piston at 200º F.

Clearance in Rod Bushing - .0003".

Connecting Rod: - Weight 28.96 ozs. Length 8-3/16'.

Crankpin Journal Diameter - 1-15/16".

Lower Bearing - Spun babbitt-lined type.

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

Adjustment - Shims (laminated type). Do not file rod or caps.

Installing Rods - Connecting rod lower bearings are offset. Install rods with right hand offset (widest half of bearing toward rear) in cylinders #1, 2, 4, and rods with left hand offset (widest half of bearing toward front) in cylinders #3,5,6.

Crankshaft: - Three bearings. Integral counterweights.

Journal Diameters - #1 - 2-11/32", #2 - 2-3/8', #3 – 2-13/32'.

Bearing Type - Removable bronze-backed, babbitt lined.

Clearance - .001".

Adjustment - Laminated shims. Do not file caps.

End Thrust - Taken by #2 (center) bearing. Endplay .006-.012".

Camshaft: - Three bearing. Gear driven.

Timing Gears - Crankshaft gear steel. Camshaft gear GE. Bakelite.

NOTE: 1941 Type Timing Gear Set can be installed on these models (tooth angle redesigned to provide quieter operation).

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

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

Valves: -	Head Diameter	Stem Diameter	Length
All Valves	1-3/8"	5/16"	5-11/32"

	Seat Angle	Lift	Stem Clearance
Intake	45º	11/32"	.0015-.003"
Exhaust	45º	11/32"	.003-.005"

Valve Springs: - Dampeners originally used on bottom of all springs. Car manufacturer recommends that they be omitted when servicing valves.

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

VALVE TIMING

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

Valve Timing - See Camshaft Setting (above)

Intake Valves. - Open 10º40' BTDC. Close 60º ALDC.

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

To Check Valve Timing - Set tappet clearance #1 intake valve at .010". This valve should open with piston 10º 40' or .0562" before top dead center when a point on the flywheel approximately 3.17 teeth before the dead center mark 'UDC.1-6' lines up with the pointer on the housing. No flywheel mark provided.

LUBRICATION

Lubrication: - DuoFlow (splash) system with positive pump feed to oil troughs and timing gears. Oscillating plunger type oil pump mounted on right side of crankcase.

Normal Oil Pressure - 3 lbs.

Oil Pressure Relief Valve - Operates at 3 lbs. Located on right hand side of crankcase at rear (combined with oil pressure signal light switch).

Capacity and Oil - 5 quarts (refill), 6 quarts (dry). Use SAE. #30 (above 40ºF.), #20-W (40. to 0ºF.), #10-W (0º to -15ºF.).

CLUTCH

CLUTCH: - Own make. Single plate type operating in oil. No adjustment for wear required.

Clutch Pedal Adjustment - Free movement of clutch pedal must 1-1/2". To adjust, loosen lock nut on clutch pedal connecting link, remove clevis pin at lower end of link, turn clevis until free movement of pedal is 1-1/2", replace pin and tighten lock nut. See adjustment for Automatic Clutch linkage below.

Automatic Clutch Control - On cars with Automatic Clutch, check control linkage whenever clutch pedal is adjusted. Depress accelerator pedal, pull back on clutch control unit cable (left side of engine), check clearance between back of slot In cable yoke and clevis pin which attaches It to operating lever. This clearance should be 7/8'.

Clutch Lubrication - Oil in clutch should be drained and replaced at 5000-15000 mile intervals. To drain oil, turn flywheel until filler plug is visible In inspection hole

Clutch Lubrication (Cont'd)

(left hand front face of flywheel housing), remove plug, turn flywheel until star stamped on flywheel is visible in Inspection hole, allow at least one minute in this position for draining, turn flywheel until filler plug hole is visible, insert 1/3 pint Hudsonite Clutch Compound, replace filler plug.

Clutch Facings - Driven plate is 5-3/8" I.D., 8-5/8" O.D., .203" thick. Facing consists of 90 cork inserts mounted on driven plate.

FRONT SUSPENSION

Front Suspension: Consists of conventional "I" beam section front axle with Elliott type ends and semi-elliptic springs (standard), or Axle-flex articulated axle (optional). Data and adjustments for both types are the same.

Kingpin Inclination - 7º crosswise.

Caster - 3-1/4-3-3/4º. Adjust by inserting wedge shims between springs and spring pad on axle.

Camber - 1/2º. No adjustment. Axle may be bent cold to correct camber.

Toe In - 1/8" measured 10" above ground. Adjust by loosening tie rod end clamp bolts and rotating tie rod in direction that wheels revolve to increase toe-in, or in opposite direction to decrease toe-in.

NOTE - ,End thrust on kingpin Is taken by five ball bearings in plug above kingpin. Bearing lower race is machined directly in kingpin end.

STEERING GEAR

Steering Gear: - Gemmer Worm-and-Sector type.

BRAKES

BRAKES: - Service - Bendix mechanical, Duo-Servo, Single anchor type. Hand lever applies all service brakes.

Drum Diameter - 9".

Lining - Moulded type. Width 2-1/4". Thickness 3/16".

Length per wheel - 19-3/16".

Clearance - 014" heel, .008", toe, between lining and drum for each shoe.

MISC. MECHANICAL

AUTOMATIC SHIFT (ELECTRIC HAND): - Bendix electro-pneumatic type optional on these cars.

1935 HUDSON Eight

Series 54 (HT), 55 (HU), 56 (HHU)
57 (HTL), 58 (HUL)

MODEL IDENTIFICATION

SERIAL NUMBER: - First number, 54-101 (HT), 55-101 (HU), 56-101 (HHU, 57-101 (HTL), 58-101 (HUL). On plate on engine side of dash. All model numbers will carry prefix '54'. '55', '56', '57' or '58'.

ENGINE NUMBER: - First number, 55,000. Stamped on left side of cylinder block opposite #8 cylinder.

TUNE-UP

COMPRESSION: - Ratio - 6.0-1 (Std. cast-iron head). 7.0-1 (Optional aluminum-iron composite head.)

Pressure: - 110 lbs. at 150 R.P.M. (6.0-1 head), 128 lbs. at 150 R.P.M. (7.0-1 head) with all spark plugs removed and throttle wide open.

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

AUTOMATIC SHIFT (ELECTRIC HAND): Bendix electro-pneumatic type optional on Models HT, HU; standard on Model HHU.

FIRING ORDER: - 1-6-2-5-8-3-7-4. See diagram.

SPARK PLUGS: - Champion Type J-7-S. 14 mm. Metric.

Gap: - .022"

IGNITION: - See Coil, Condenser, and Distributor.

IGNITION TIMING: See **IGNITION TIMING**.

Std. Setting: - 4½º BTDC (Before Eng. No. 65246), At TDC (After Eng. No. 65246) with flywheel mark "UDC. 1-8/" ½" ahead (4½º setting), or at indicator (TDC setting) in left front face of housing.

CARBURETION: See Carburetor & Carb. Equipment.

VALVES: See Valve Timing.

Tappet Clearance: - .006" Intake, .008" Exhaust - Hot.

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

COIL: - Auto-Lite Model ce-4606. Resistance mounted on distributor connected in primary circuit.

Ignition Current: - 2.5 amperes idling, 4.5 stopped.

Ignition Switch: - Mitchellock Model 24-B, Type 6509. Connected to coil by armored cable.

CONDENSER: - Auto-Lite IG-2671. Capacity-.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite IG-4001-A (first 10246), **IGB-4001-B** (Eng. No. 65247 up). Single breaker, 8 lobe cam, full automatic advance type.

Breaker Gap: - .017" Cam Angle 27.5º (closed).

Breaker Arm Spring Tension: - 18 ounces. Min, 20 ounces Max

Cam Angle - Closed 27.5º, Open 17.5º. (distributor).

Automatic Advance: - 17½º max. at 2000 RPM (IGP-4001-A), 1700 RPM (IGP-4001-B). Distributor degrees & RPM.

Automatic Advance - IGB-4001-A

Degrees	RPM	Degrees	RPM
Start	400	0	800
4	760	8	1520
8	1120	16	2240
12	1500	24	3000
17½	2000	35	4000

Automatic Advance - IGB-4001-B

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

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

IGNITION TIMING

IGNITION TIMING: - Flywheel Deg. Piston Pos.
First 10246 cars - 4½º or ½" BTDC .0089" BTDC.
Eng. No. 65247 up - At TDC .0000" TDC.

Timing (Initial Setting) – 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 left front face of flywheel housing above starter (after 10247 cars, or ½" before this point on first cars). Loosen hold-down screw in advance arm, rotate distributor clockwise to limit of advance arm slot, then turn distributor slowly counter-clockwise until contacts just open, tighten hold-down screw, see that rotor is opposite #1 segment in distributor cap. Car should then be road-tested and spark advanced as much as operating conditions and fuel will allow.

Timing Final Setting) - With engine at normal operating temperature, and running at 7 M.P.H. in high gear on level road, accelerate engine rapidly and note performance from 10-15 M.P.H. A slight spark knock
should be noticed. If no knock is heard, loosen hold-down screw and advance distributor one graduation on
scale (turn distributor counter-clockwise). If knock is too severe, retard distributor one graduation (turn distributor clockwise). Repeat test until satisfactory setting is secured. Final setting must not be beyond maximum advance mark on flywheel 3/4" before mark (UDC.1-8/').

CARBURETOR

CARBURETOR - Carter, Model 310-S, 1¼" downdraft type with drop-bar Fast Idle.

Automatic Choke – Carter Climatic Control

Idle Setting: - Idle screw 1/2-1 turn open. Idle speed 350 RPM or 7 MPH.

Carburetor (Cont'd)

Float Level: - 3/8" from gasket seat on cover to nearest point on float (top at free end).

Accelerating Pump: - Center hole Normal. Inner hole (Summer), Outer hole (Winter) for temperature extremes.

Fuel Pump Pressure: - 3½ lbs. maximum.

CARBURETOR EQUIPMENT

Fuel Pump: - A.C., Type R-1521540 diaphragm type. Gasoline Gauge: - King-Seeley Electric., K-S #5200 (dash unit), #5582 (tank unit),

BATTERY

BATTERY: - Exide, Type XTL- I 9-17-F. 6 volt, 19 plate, 108 A. H. capacity (20 hour rate). Starting **Capacity** - 130 amperes for 20 minutes. Grounded Terminal - Positive (+) terminal. Location - On left hand side under front floor.

STARTER

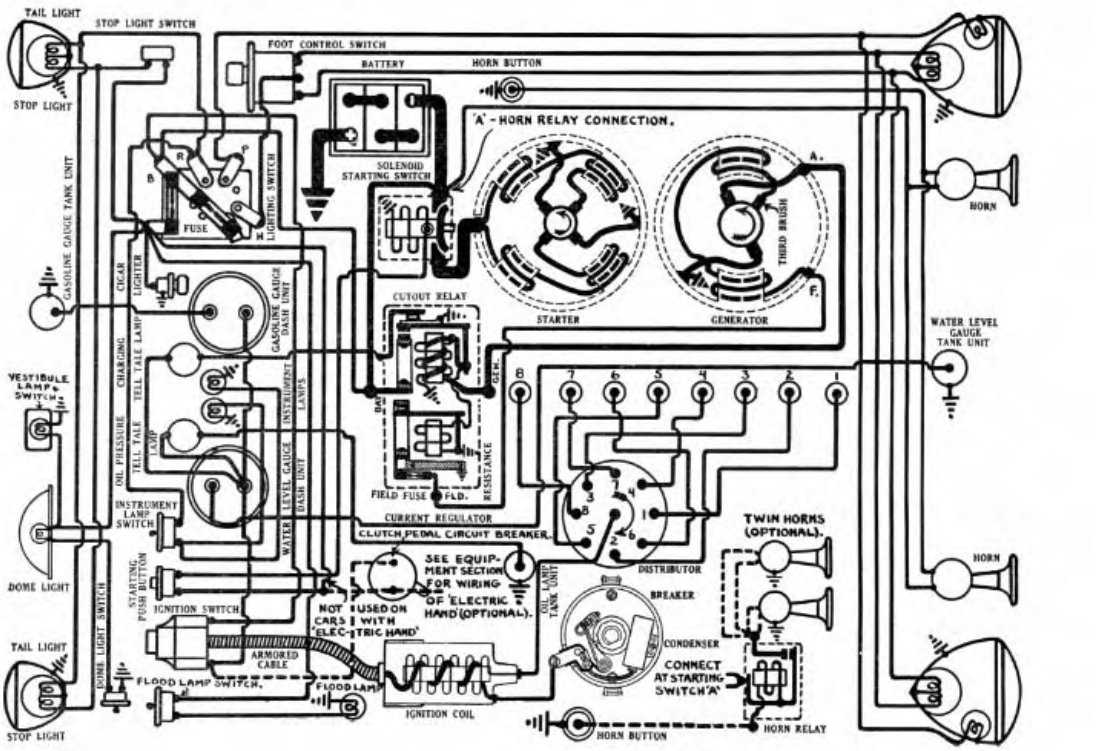
Auto-Lite Model MAB4061 (first cars), MAB-4075 Eng. No. 68336 Up). Armature No. MAB-2113 Drive Inboard Bendix (barrel), Type A-1673. Rotation - Counter-clockwise at commutator end bolts.

Cranking Engine - 150 RPM, 125 amps., 5 volts. Brush Spring Tension - 44-56 ounces (new brushes).

Performance Data

Torque	RPM	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.



1935 Hudson 8 - All Models

Starting Switch: - Type SS-4001. Solenoid type switch mounted on starter field frame controlled by pushbutton Switch.

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

GENERATOR

Auto-Lite Model GBK4602-1. Armature Number GBK- 2055. Ventilated, third brush control type with external voltage regulation (two-step charging rate).

Charging Rate Adjustment - Use test meters to check generator output. Short out current regulator by connecting jumper wire from T' terminal on generator to ground. Take off commutator cover band, shift third brush by hand, counterclockwise to increase, or clockwise to decrease charging rate. Remove jumper wire.

Maximum Charging Rate - 22 amperes (cold) or 18 amperes (hot), 8,0 volts, 2400 RPM, 28 MPH

Performance Data

Cold - Regulator Inoperative - Hot

Amperes	Volts	RPM	Amperes	Volts	RPM
0	6.4	800	0	6.4	840
4	6.7	980	4	6.8	1025
8	7.0	1085	8	7.15	1200
12	7.3	1300	12	7.5	1450
16	7.55	1500	16	7.85	1760
22	8.0	2200	18	8.0	2400

Rotation - Counter-clockwise at commutator end.

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

Motoring - 4.56-5,04 amperes at 6.0 volts.

Field Current - 3.94-4.36 amperes at 6.0 volts.

Field Fuse - 5 ampere In knurled cup on side of regulator case.,

Generator (Cont'd)

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

Belt Adjustment - Loosen pivot bolts and clamp bolt, pull generator out from engine until slack on belt midway between fan and generator pulleys is 1-1/4 (measure from straightedge across pulleys), tighten mounting bolts.

REGULATOR

Auto-Lite Model TC-4304-A. Consists of Cutout Relay and Current Regulator (Two-rate relay) in a single case on the dash. 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.

Cuts Out -.5-2.5 ampere discharge current.

Relay Contact Gap - .015-.045' (with upper or front 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 70º F.

Contacts Close - 1.2-1.4 volts below opening point. pin.

Contact Gap -.005" minimum.

Air Gap - .045" with contacts closed.

LIGHTING

LIGHTING: - Soreng-Manegold Switch Model 5770-A, R.B.M. Foot Control Switch, Model 1076,A. Foot switch used to control Country Driving (high) and City (low) beams with lighting switch in driving or second position. Headlight bulbs are pre-focused type.

Bulb Specifications

Position	C.P.	Mazda No.
Headlights	32-21	2320-C
Parking, Instrument	3	63
Signal Lights (DC)	3	64
Stop & Tail	21-2	1158
Dome	15	97

MISC. ELECTRICAL

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

HORNS: - Auto-Lite Type RA-4003,, 4004 (Std), Klaxon (Std. on HT, HU). Klaxon Model K-33-M, Type 1901 high note), 1902 low note, (Optional. On HT, IlU, Std. on HHU). Klaxon horns are matched tone, twin horns operated by horn relay.

Horn Relay: - Model 268-T. Current draw .8 amps Contact Gap -.015-.025" Air Gap - .0 12,017 with contacts closed

FUSES: - Lighting - Two 20 ampere capacity on switch. Generator Field - 5 ampere in regulator.

ENGINE

ENGINE: -Own. Eight cylinder, 'L' head type.

Bore - 3". Stroke-4V2".

Piston Displacement - 254.47 cubic Inches.

Rated Horsepower - 28.8.

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

Model	Ratio	HP	Press. @ 150 RPM
HT, HU, HHU	6.0-1	113@3800	110 lbs
HT, HU, HHU	7.0-1	124@4000	128 lbs.

NOTE: 6.25-1 AND 7.0-1 heads are aluminum composite. High octane fuel must be used with these heads.

Vacuum Reading: - Gauge should show steady reading of 18-20", with engine idling.

PISTONS

Pistons: - Own, Lo-Ex silicon-aluminum alloy, T slot, cam ground type. Use finished replacement pistons when reconditioning engine.

Weight: - 10.88 ounces stripped, 12-99 ounces with rings and pin.

Length - 3 3/16".

Removal - Pistons and rods removed from above.

Clearance - Top 016", Bottom .002".

NOTE: 1935 pistons may be used in 1934 engines as complete sets only.

Pistons – Reconditioning (Cont'd)

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

Replacement Pistons - Standard and oversize pistons marked by letter on head available for cylinder bores of size indicated: 'B' - 3.000 & 3.0005", 'D' - 3.001 & 3.0015", 'F' - 3.002 & 3.0025", 'J' - 3.004", 'L' - 3.005", 'BO'- 3.010 & 3.0105", 'DO' - 3.011 & 3.0115", 'FO' - 3.012 & 3.0125", 'LO' - 3.015", 'BB' - 3020", 'DD' - 3.021", 'FF' - 3.022". All pistons installed in engine must be of same weight as indicated by mark on head.

Fitting New Pistons - Use feeler gauge .0015-.002" thick to check clearance. It should be possible to withdraw feeler from between piston and cylinder wall on side opposite slot when grasped between thumb and forefinger with 3-4 lbs. pull.

Installing Pistons - Slot should be to left or away from valves.

Piston Rings - Four rings per piston, two compression rings, one oil control ring above pin, one oil control ring below pin. Lower ring groove drilled radially with oil drain holes.

1935 Piston Rings

Ring	Width	End Gap	Wall Thickness
Comp.	.093	.006-.016"	.123"
Oil Cont.	.187	.006-016"	.128"

NOTE - Use standard or oversize rings of size indicated for replacement pistons (see Replacement Piston section above); 3.000" - B, D, F; 3.003" - J; 3.005" - L; 3.010" - BO, DO, FO; 3.015" - LO; 3.020" - BB, DD, FF. If rings filed, clearance at pin must be kept uniform with end gap.

Piston Pin - Diameter - 3/4", Length - 2-7/16", Pin floats in piston and rod. Held by retaining rings.

Pin Fit in Piston - Snug fit with piston at 200º F.

Clearance in Rod Bushing - .0003"

Pistons (Cont'd)

Connecting Rod - Weight 28.96 ounces. Length 8-3/16".

Crankpin Journal Diameter - 1-15/16".

Lower Bearing - Spun babbitt-lined type.

Clearance - .001", Side play .006-.010"

Adjustment - Shims (laminated type). Do not file caps.

Installing Rods - Connecting rod lower bearings are offset. Install rods with right hand offset (widest half of bearing toward rear) in cylinders # 1, 3, 5, 7 and rods with left hand offset (widest half of bearing toward front) in cylinders #2,4,6,8.

Crankshaft - Five bearings. Eight counterweights.

Journal Diameters - #1, 2-9/32", #2, 2-5/16", #3, 2-11/32" #4, 2-5/8"; #5, 2-13/32".

Bearing Type - Removable bronze-backed, babbitt lined. Clearance - .00 1'.

Adjustment - Laminated shims. Do not file caps.

End Thrust - Taken by #3 (center) bearing. Endplay .006-.012".

Camshaft - Three bearing. Gear driven.

Timing Gears - Crankshaft gear steel. Camshaft gear GE. Bakelite.

NOTE: 1941 Type Timing Gear Set can be installed on these models (tooth angle redesigned to provide quieter operation.

End Thrust - taken by spring-loaded plunger in camshaft gear and thrust plate on gear cover.

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

Valves -	Head Dia.	Stem Dia.	Length
Intake	1-1/2"	5/16"	5-3/32"
Exhaust	1-3/8"	5/16"	5-3/32"

	Seat Angle	Lift	Stem Clearance
Intake	45º	11/32	.0015-.003"
Exhaust	45º	11/32	.003-.005"

Valve Springs- Dampeners originally used on bottom of all springs. Car manufacturer recommends that they be omitted when servicing valves.

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

VALVE TIMING

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

Valve Timing - See Camshaft Setting (above)

Intake Valves - Open 10º 40' BTDC. Close 60' ALDC.

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

To Check Valve Timing - Set tappet clearance #1 intake valve at .010". This valve should open with piston 10º 40' or .0494" before top dead center when a point on the flywheel approximately 3.97 teeth before the dead center mark 'UDC. 1 -8' lines up with the pointer on the housing. No flywheel mark provided.

LUBRICATION

Lubrication - Duo-flow (splash) system with positive pump feed to oil troughs and timing gears. Oscillating plunger type oil pump mounted on right side of crankcase. Normal Oil Pressure - 3 lbs.

Oil Pressure Relief Valve - Operates at 3 lbs. Located on right hand side of crankcase at rear (combined with oil pressure signal light switch).

Capacity and Oil - 7 quarts (Refill), 9 quarts (dry). Use SAE. #30 (above 40º F.), #20-W (40º to Oº F.), #10-W (0'º to -15º F)

CLUTCH

CLUTCH: - Own make. Single plate type operating in oil. No adjustment for wear required.

Clutch Pedal Adjustment - Free movement of clutch pedal must be 1-1/2". To adjust, loosen lock nut on clutch pedal connecting link, remove clevis pin at lower end of link, turn clevis until free movement of pedal is I-1/2", replace pin and tighten lock nut. See adjustment for Automatic Clutch linkage below.

Automatic Clutch Control - On cars with Automatic Clutch, check control linkage whenever clutch pedal is adjusted, Depress accelerator pedal, pull back on clutch control unit cable (left side of engine), check clearance between back of slot in cable yoke and clevis pin which attaches it to operating lever. This clearance should be 7/8".

Clutch Lubrication - Oil In clutch should be drained and replaced at 5000-15000 mile intervals. To drain oil, turn flywheel until filler plug is visible in inspection hole (left hand front face of flywheel above starter), remove plug, turn flywheel until star stamped on flywheel is visible in inspection hole, allow at least I minute in this position for draining, turn flywheel until filler plug hole is visible, insert 1/3 pint Hudsonite Clutch Compound, replace filler plug.

1935 Terraplane
Model G Standard Six
Model GU Deluxe 6
Tune-up Specifications

MODEL IDENTIFICATION

SERIAL NUMBER: - First No. (G) 51-101, (GU) 52-101. On plate on engine side of dash. NOTE - All cars have this model prefix '51' or '52'.

ENGINE NUMBER: - First number 103,001. Stamped on left side of engine opposite #6 cylinder.

TUNE-UP

COMPRESSION: - Ratio-6.0-1 Std. (cast-iron) head. 7.0-1 Optional (composite aluminum-iron) head.

Pressure - 111 lbs. at 150 RPM (std. head), 127 lbs. at 150 RPM (optional head) with all spark plugs removed and throttle wide open.

VACUUM READING: - Gauge should show steady reading of 18-19" with engine idling at 350 R.P.M. or 7 M.P.H.

FIRING ORDER: 1-5-3-6-2-4. See diagram.

SPARK PLUGS: Champion Type J-7S. 14 mm. Metric. Gaps-.022".

IGNITION: See Coil, Condenser, and Distributor. Breaker Gap-.020". Cam Angle-38º (closed).

Automatic Advance – 15º max. at 2000 RPM (IGB4301A Distr.), 14º max. at 1580 RPM (IGB-4301B Distr.). Distributor degrees & RPM.

IGNITION TIMING: See Ignition Timing.

Standard Setting – 4½º BTDC (First 25076 Cars), at TDC (Eng. No. 128077 Up) with flywheel mark 'UDC.1-6' ½" ahead of indicator (4½º setting), or at indicator (TDC setting) in inspection hole in left front face of housing.

CARBURETION: See Carburetor & Carb. Equipment.

Idle Setting - Idle screw 1/4-1 turn open. Idle speed 350 RPM or 7 MPH.

Float Level - 3/811 from gasket seat on cover to top of float at free end (invert to check)

Accelerating Pump - Center hole (medium stroke) Normal. Inner hole (Summer), Upper hole (Winter) for extreme temperatures.

Fuel Pump Pressure: 3½ lbs. maximum.

VALVES: See Valve Timing.

Tappet Clearance – 006" Intake; .008: Exhaust: Hot.

STARTING: See Battery, Starter, Generator, and Regulator (when used).

IGNITION

IGNITION SWITCH: MitchelLock Model 24B, Type 6509 Connected to coil by armored cable.

COIL: Auto-Lite Model IG-4616. Resistance unit is mounted on distributor connected in primary circuit.

Ignition Current - 2.5 amperes idling, 4.5 stopped

CONDENSER: Auto-Lite Part No. IGB-1025J.

Capacity - 20-25 microfarad.

DISTRIBUTOR: Auto-Lite Model IGB-4301-A (First 25076 Cars), IGB-4301-B Eng. No. 128077 Up). Single breaker, 6 lobe cam, full automatic advance type

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

Cam Angle or Dwell – 38º closed, 22º open (distr.)

Breaker Arm Spring Tension - 16-22 ounces.

Automatic Advance-IGB-4301-A

Distributor		Engine	
Degrees	R.P.M.	Degrees	R.P.M
Start	400	0	800
3	720	6	1440
6	1040	12	2080
9	1360	18	2720
12	1680	24	3360
15	2000	30	4000

Automatic Advance - IGB-4301-B

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

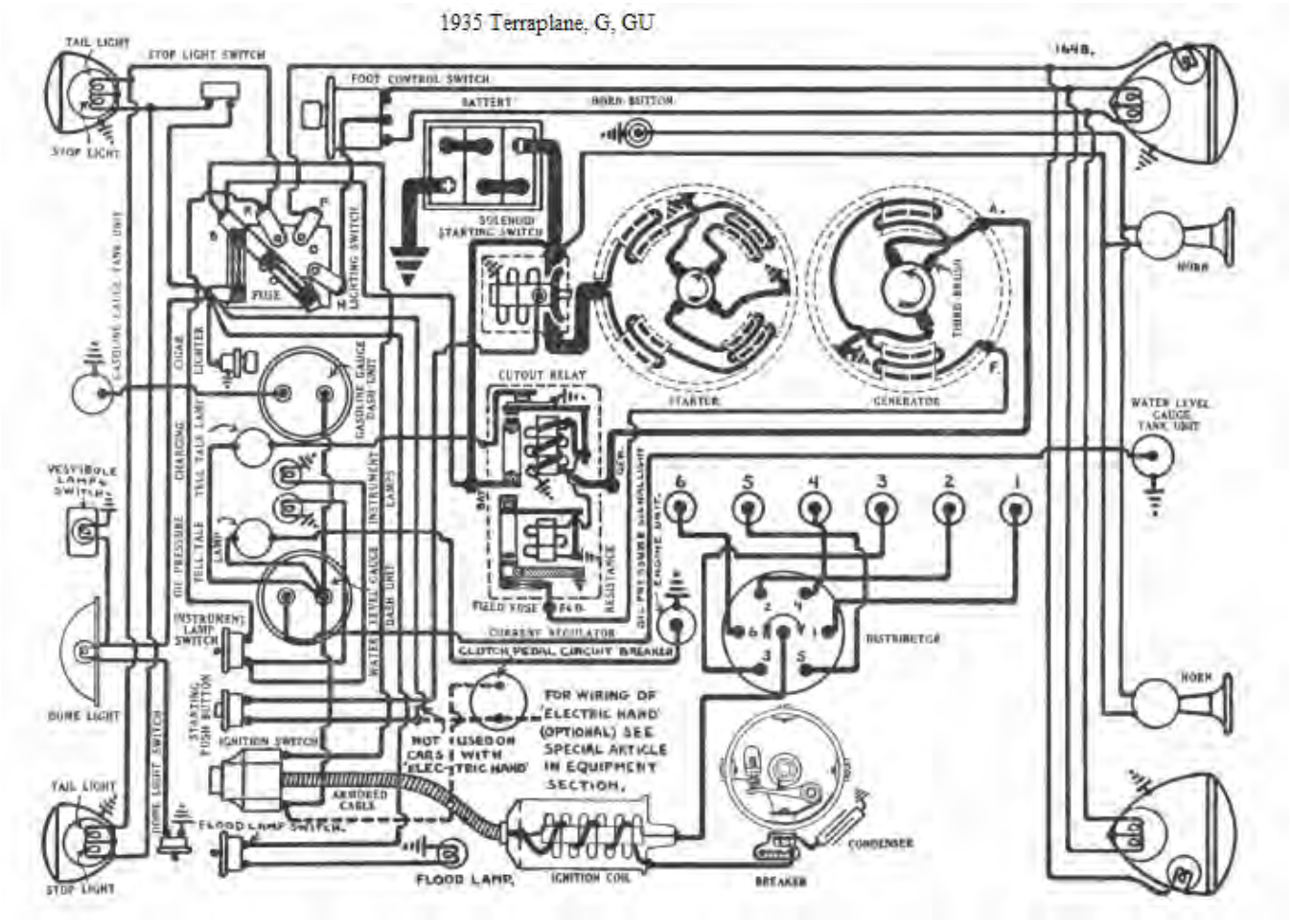
Removal:- Mounted on right side of crankcase. To remove, take out hold-down screw in advance arm, lift out.

IGNITION TIMING

IGNITION TIMING:	Flywheel Degs.	Piston Pos.
First 25076 cars	4½º or ½" BTDC	.0101" BTDC.
Eng. No. 128077 up	At TDC	.0000" TDC.

Timing (Initial Setting) - With #1 piston on compression, turn engine over until piston reaches top dead center, stop when flywheel mark 'UDC. 1-6/ ' lines up with pointer on edge of inspection hole in left front face of flywheel housing above starter (after 25076 cars or ½" before this point on first cars). Loosen hold-down screw in advance arm, turn distributor clockwise to limit of advance arm slot then turn distributor slowly counter-clockwise until contacts just open, tighten hold-down screw, see that rotor Is opposite #1 segment in distributor cap. Car should be road tested and spark advanced as much as operating conditions and fuel will allow.

Timing (Final Setting) - With engine at normal operating temperature, and running at 8 M.P.H. in high



Automatic Advance - IGB-4301-B

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

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

IGNITION TIMING

IGNITION TIMING: - Flywheel Degs. Piston Pos.

First 25076 cars	4½° or ½" BTDC	.0101" BTDC
Eng. No. 128077 up	At TDC	.0000" TDC.

Timing (Initial Setting) - With #1 piston on compression, turn engine over until piston reaches top dead center, stop when flywheel mark 'UDC. 1-6/'lines up with pointer on edge of inspection hole in left front face of flywheel housing above starter (after 25076 cars or ½" before this point on first cars). Loosen hold-down screw in advance arm, turn distributor clockwise to limit of advance arm slot then turn distributor slowly counter-clockwise until contacts just open, tighten hold-down screw, see that rotor is opposite #1 segment in distributor cap. Car should be road tested and spark advanced as much as operating conditions and fuel will allow.

Timing (Final Setting) - With engine at normal operating temperature, and running at 8 M.P.H. in high gear on level road, accelerate engine rapidly and note performance from 10-15 M.P.H. A slight spark knock should be noticed. If no knock is heard, loosen hold-down screw and advance distributor one graduation on scale (turn distributor counter-clockwise). If knock Is too severe, retard distributor one graduation (clockwise). Repeat test until satisfactory setting Is secured. Final setting must not be beyond maximum advance mark on flywheel (3/4" before mark 'UDC.1-6/'.

CARBURETOR

Carburetor: - Carter Model 311-S (G), 309-S (GU). 1¼" downdraft type. Model 309-S has Fast Idle and Climatic Control (Automatic Choke).

CARB. EQUIPMENT

Fast Idle (309-S): - Drop Bar type. Non-adjustable.

Automatic Choke (309-S): - Carter Climatic Control.

Setting - Reference mark centered on scale.

Fuel Pump: - AC. Type R-1521540 diaphragm type.

Gasoline Gauge: - King-Seeley Electric. K-S No. 5240 (Dash Unit-G), 5200 (Dash Unit-GU)), No. 5582 (Tank Unit-All Models).

BATTERY

BATTERY: - National, Type ST-3-17X. 6 volt, 17 plate, 96 A.H. capacity (20 hour rate).

Starting Capacity - 120 amperes for 20 minutes.

Grounded Terminal - Positive (+) terminal.

Location - On left hand side under front floor.

STARTER

Auto-Lite Model MAB-4060 (First Cars), MAB-4074 (After Eng. No. 143134). Armature No. MAB-2114.

Starter Drive - Inboard Bendix, Type A-1588.

Rotation - Counter-clockwise at commutator end.

Brush Spring Tension - 44-56 ozs. (new brushes).

Cranking Engine - 150 R.P.M., 125 amperes, 5 volts.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs	3700	5.5	60
.6 " "	1910	5.5	100
3 " "	1100	5.0	200
6 " "	695	4.5	300
10 " "	420	4.0	400
15.8 " "	Lock	3.0	582
22.5 " "	Lock	4.0	775

Lock torque figures correct without switch.

Starting Switch: - Type SS-4001. Solenoid type switch mounted on starter field frame controlled by pushbutton switch on instrument panel.

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

GENERATOR
SPECIAL SIX G

Auto-Lite Model GBK-4601-2. Armature Number GBK-2055. Air-cooled. Third brush control type. Current Regulator (two-rate charging control) used on some models.

Charging Rate Adjustment - Use test meters to check generator output. On cars with Current Regulator, short out regulator by connecting jumper wire from "F" terminal on generator to ground on generator frame. Take off commutator cover band, shift third brush by hand counter-clockwise to increase charging rate, or clockwise to decrease charging rate. Third brush held In position by friction. Remove Jumper wire.

Maximum Charging Rate - 17 amperes (cold) or 13 amperes (hot) cars without regulator or 22 amperes (cold), 17 amperes (hot) cars with regulator, 8.0 volts, 2200 R.P.M., 28 M.P.H.

NOTE - On generators used without the regulator, the field terminal on the generator frame is grounded by a grounding cup assembled on the terminal. This ground cup must be removed when a regulator Is Installed.

Performance Data - No Regulator

Cold			Hot		
Amps.	Volts	R.P.M.	Amps.	Volts	R.P.M.
0	6.4	800	0	6.4	840
4	6.8	1000	4	6.85	1050
8	7.2	1200	8	7.3	1260
12	7.6	1400	12	7.7	1560
16.5	8.0	2200	14.8	8.0	2250

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.

Fuse - 5 ampere in knurled cup on side of regulator case (no fuse when regulator not used).

Motoring Current - 4.18-4.62 amperes at 6.0 volts.

GENERATOR
DELUXE SIX GU

Auto-Lite Model GBK-4602-1. Armature Number GBK-2055. Ventilated, third brush control type with external current regulation (two-step charging rate)..

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. Remove jumper wire.

Maximum Charging Rate - 22 amperes (cold) or 18 amperes (hot), 8.0 volts, 2400 R.P.M., 28 M.P.H.

Performance Data

Cold - Regulator Inoperative - Hot

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	800	0	6.4	840
4	6.7	980	4	6.8	1025
8	7.0	1110	8	7.15	1200
12	7.3	1300	12	7.5	1450
16	7.55	1500	16	7.85	1760
22	8.0	2200	18	8.0	2400

Rotation - Counter-clockwise at commutator end

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

Motoring Current - 4.56-5.04 amperes at 6.0 volts.

Field Current - 3.94-4.36 amperes at 6.0 volts.
Field Fuse - 5 amperes 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 - Loosen pivot bolts and clamp bolt, pull generator out from engine until slack on belt midway between crankshaft and generator pulleys is 1¼" (measure from straightedge across pulleys), tighten mounting bolts.

CUTOUT RELAY

Auto-Lite Model CBA-4002. (Used with GBK-4601-2 Generator). Mounted on dash. Relay has extra "ground" contacts for generator charge tell-tale control.
NOTE - CBA-4003 relay used on some cars.
Cuts In - 6.5-7.25 volts, 8 M.P.H.
Cuts Out - .5-2.5 amperes (CBA-4002), 1.5-4.5 amperes (CBA-4003) discharge current.
Contact Gap - .015-.045". With upper or ground contacts closed.
Air Gap - .010-.030' with contacts closed.

REGULATOR

Auto-Lite Model TC-4304-A. Consists of Cutout Relay and Current Regulator (two-rate relay) in a single case on the dash. 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.
Cuts Out - .5-2.5 ampere discharge current.
Relay 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.
C**ontact Gap** - .005" minimum.
Air Gap - .045" with contacts closed.

LIGHTING

LIGHTING: - Soreng-Manegold Switch F5640A (G), 5770A (GU). Beam Control Switch 1076, 1076A. Foot switch used to control Country Driving (high) and City (low) beams with lighting switch in driving or second position. Headlight bulbs are pre-focused type.

Bulb Specifications

Position	Candlepower	Mazda No.
Headlights	32-21	2320-C
Parking, Instrument	3	63
Signal Lights	3	64(DC)
Stop & Tail	21-2	1158
Dome	15	87

SIGNAL LIGHTS: - Battery Charge Tell-tale and Oil Pressure Tell-tale lights mounted on instrument panel..
HORNS: - **Auto-Lite Type HA-4003, 4004 Std. Klaxon Model,K-26-M Type 1716 (high note), 1717 (low note) Optional.** All horns are vibrator type. Optional horns are matched tone, twin horns.
FUSES: - Lighting - Two 11 ampere on back of switch.
Generator Field - 5 ampere in knurled plug on regulator case - not used without regulator.

ENGINE

ENGINE:--Own. Six cylinder, 'L' head type.
Bore-3". Stroke-5".
Piston Displacement - 212.058 cubic inches.
Rated Horsepower - 21.6.
Developed Horsepower, Compression Ratio & Pressures - To check pressure, remove spark plugs, crank engine with wide open throttle.

Model	Ratio	Horsepower	Pressure at 150 R.P.M.
G, GU	6.00-1	88 @ 3800	1ll lbs.
G, GU	7.00-1	100 @ 3800	128 lbs.

NOTE - 7.0-1 head is aluminum composite type. High Octane fuel required for this head. Vacuum Reading-Gauge should show steady reading of 18-19" idling at 350 RPM or 7 MPH
Pistons: - Own, Lo-Ex silicon-aluminum alloy, `T' slot, cam ground type. Use finished replacement pistons when reconditioning engine.
Weight - 10.88 ozs. (stripped), 12.99 ozs. (with rings and pin).
Length - 3-3/16".
Removal - Pistons and rods removed from above.
Clearance - Top .016". Bottom .002".
Reconditioning Cylinders - Size of original bore indicated by letter stamped on lower edge of valve chamber opposite cylinder as follows:
A--3.000", B--3.0005" C--3.001", D--3.0015", E--3.002", AO--3.010" BO--3.015", CO - 3.0011", DO--3.0115", E0 - 3.012". Recondition cylinder to standard oversize for which replacement piston and rings are available (see piston and ring data below).
Replacement Pistons - Standard and oversize pistons marked by letter on head available for cylinder bores of size indicated: 'B' - 3.000 & 3.0005", 'D' 3.001 & 3.0015", 'F' 3.002 & 3.0025", J -3.004", L-3.005". 'BO'-3.010 & 3.0105", 'DO'-3.011 & 3.0115", 'FO'-3.012 & 3.0125" 'LO'-3 01511, 'BB'-3 0201, 'DD'-3 021 'FF'3.022". All piston's installed in engine must be of same weight as Indicated by mark on head.
Fitting New Pistons - Use feeler gauge .0015-.002" thick to check clearance. It should be possible to withdraw feeler from between piston and cylinder wall on side opposite slot when grasped between thumb and

ENGINE (Cont'd)

forefinger with 3-4 lbs. pull.

Installing Pistons - Slot should be to left or away from valves.

Piston Rings: - Four rings per pistons, two compression, two oil control rings (top oil ring above pin, and lower oil control ring below pin). Lower ring groove drilled radially with oil drain holes. Rings are positioned by pin in piston ring groove.

Ring	Width End	Gap	Wall Thickness
Comp.	.093"	.006-.016"	.123"
Oil Control	.187"	.006-.016"	.128'

NOTE-Use standard or oversize rings of size indicated for replacement pistons (see Replacement Piston section above); 3.000" 0 -B. D. F; 3.003" - J; 3.005" - L,; 3.010" - BO, DO, FO; 3.015" - LO; 3.020" - BB DD, FF. If rings are filed, clearance at pin must be kept uniform with end gap.

Piston Pin: - Diameter ¾". Length 2-7/16". Pin floats in piston and rod. Held by retaining rings. Pins furnished standard, .002" 005", 010" oversize.

Pin Fit in Piston - Snug fit with piston at 200-F.

Clearance in Rod Bushing - .0003"..

Connecting Rod: - Weight 28.96 ozs. Length 8 3/16".

Crankpin Journal Diameter – 1-15/16".

Lower Bearing - Spun-babbitt lined type.

CIearance - .001". Sideplay .006-.010".

Adjustment - Shims (laminated type. Do not file rod or caps.

Installing Rods - Connecting rod lower bearings are offset. Install rods with right hand offset (widest half of bearing toward rear) In cylinders #1, 2, 4, and rods with left hand offset (widest half of bearing toward front) in #3, 5, and 6.

Crankshaft: - Three bearings. Integral counterweights.

Journal Diameters - #l, 2-11/32: #2, 2-3/8"'; #3, 2- 13/32".

Bearing Type - Removable bronze-backed, Babbitt lined.

Clearance - .001"

Adjustment - Laminated shims. Do not file caps.

End Thrust - Taken by #2 (center) bearing. Endplay .006-.012".

Camshaft: - Three bearing. Gear driven.

Timing Gears - Crankshaft gear Steel. Camshaft gear GE. Bakelite.

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

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

Valves: -	Head Diameter	Stem Diameter	Length
All Valves	1-3/8"	5/16"	5-11/32"
	Seat Angle	Lift	Stem Clearance
Intake	45º	11/32"	.0015-.003"
Exhaust	45º	11/32"	.003-.005"

Valve Springs: - Dampeners originally used on bottom of all springs. Car manufacturer recommends that they be omitted when servicing valves.

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

VALVE TIMING

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

Intake Valves - Open 10º40' BTDC. Close 60º ALDC.

Exhaust Valves - Open 50º BLDC. Close 18º44' ATDC. To Check Valve Timing--Set tappet clearance #1 intake valve at .010% This valve should open with piston 10*4W or .0562" before top dead center when a point on the flywheel approximately 3.17 teeth before top dead center mark 'TJDC.1-6' lines up with the indicator. Reset tappet clearance at .006" with engine warm and running.

LUBRICATION

LUBRI[CATION:-Duo-flow (splash) system with positive pump feed to oil troughs and timing gears. Oscillating plunger type oil pump mounted on right side of crankcase.

Normal Oil Pressure - 3 lbs.

Oil Pressure Relief Valve - Operates at 3 lbs. Located on right hand side of crankcase at rear (combined with oil pressure signal light switch). No adjustment required.

Capacity & Oil - 5 quarts (refill), 6 quarts (dry). Use SAE #30 (above 40ºF), 20-W (40º to OºF), #10-W (0º to -15ºF).

CLUTCH

CLUTCH: - Own make. Single plate type operating in oil. No adjustment for wear required.

Clutch Pedal Adjustment - Free movement of clutch pedal must be 1½". To adjust, loosen locknut on clutch pedal connecting link, remove clevis pin at lower end of link, turn clevis until free movement of pedal is 1½", replace pin and tighten locknut.

Automatic Clutch Control - On cars with Automatic clutch, check control linkage whenever clutch pedal is adjusted. Depress accelerator pedal, pull back on clutch control unit cable left side of engine), check clearance between back of slot in cable yoke and clevis pin which attaches it to operating lever. This clearance should be 7/8".

Clutch Lubrication - Oil in clutch should be drained and replaced at 5000-15000 mile Intervals. To drain oil, turn flywheel until filler plug Is visible in inspection hole (left hand front face of flywheel housing), remove plug, turn flywheel until star stamped

CLUTCH (Cont'd)

on flywheel is visible in inspection hole, allow at least one minute In this position for draining, turn flywheel until filler plug hole is visible, insert 1/3 pint Hudsonite Clutch Compound, replace filler plug.

Clutch Facings - Driven plate is 5-3/8" I.D., 8-5/8" O.D., .203" thick. Facing consists of 90 cork inserts mounted on driven plate.

FRONT SUSPENSION

Front Suspension: Consists of conventional "I" beam section front axle with Elliott type ends and semi-elliptic springs (standard), or Axle-flex articulated axle (optional). Data and adjustments for both types are the same.

Kingpin Inclination – 7º crosswise.

Caster - 3¼-3¾º. To adjust, Insert wedge shims between spring and spring pad on axle.

Camber - ½º. No adjustment. Axle may be bent cold to correct camber.

Toe In - ¼" measured 10" above ground. Adjust by loosening tie rod end clamp bolts and rotating tie rod in direction that wheels revolve to increase toe-in, or in opposite direction to decrease toe-in.

NOTE - End thrust on kingpin is taken by five ball bearings in plug above kingpin. Bearing lower race is machined directly in kingpin end.

STEERING GEAR

Steering Gear: - Gemmer Worm-and-Sector type.

BRAKES

BRAKES: - Service - Bendix mechanical, Duo-Servo, Single anchor type. Hand lever applies all service brakes.

Drum Diameter - 9".

Lining - Moulded. Width 1¾". Thickness 3/16". Length per wheel 19-3/16".

Clearance - .008" toe, .014" heel, for each shoe.

Hand Brake Adjustment: - See Service Brakes.

MISC. MECHANICAL

AUTOMATIC SHIFT (ELECTRIC HAND): - Bendix electro-pneumatic type optional on 1935 models.

1935-1939

Special Service Notes

1935 Brakes

Bendix Equal Action Duo Servo Type
Rotary Equalizer - Cable Control

The 1935 Terraplane and Hudson Brakes are of the Bendix Equal Action Duo Servo type and incorporate a number of new features which insure equal, softer action, increased power, longer life and make the need for adjustment less frequent.

The brake drums are heavier than those formerly used and are machined and polished on the wearing surface. The maximum tolerance for eccentricity has been reduced to .005".

The brake shoes have been redesigned so that they more readily conform to the contour of the drum, thereby giving more equal pressure over the entire contact surface. This results in less lining wear and reduced tendency to score or distort the brake drums.

The brake control layout, Fig. 1, has been completely redesigned to insure equal movement transmitted to each brake shoe regardless of the force applied to the pedal. The pedal push rod acts directly against the left end of a rugged drop forged Rotary Equalizer which is pivoted under the center of the frame "X" member. The four cables connecting to the wheel brakes are attached to the Rotary Equalizer, each located 1-7/8" inches from the pivot pin, and all at the same angle to their leverage arms represented by a line drawn through the attaching clevis pin and the equalizer pivot. (Fig. 1-upper insert). This insures equal movement of all cables throughout their entire range of movement. Since the connections are close to the pivot and the section of the drop forged Rotary Equalizer is large, any possibility of distortion even under loads of several times that which it is possible to apply to the pedal, is eliminated.

The hand brake has been located to the left of the driver with the mounting on the body dash panel. The lever extends downward from the pivot on the dash bracket so that the hand grip is conveniently located just below the instrument panel. The hand brake lever is connected to the right side of the Rotary Equalizer by a cable and actuates all four wheel brakes.

General Adjustment Instructions

The Brake Control System: The proper functioning of the brake control system is of vital importance. A freely operating brake control system permits its return to the stop provided which is a return rest at the rotary equalizer on the chassis. With the brake control system returning to the maximum released position, a longer period of operation can be expected before readjustment is necessary. No backlash should be present at the brake pedal or at the operating lever of each brake. See Paragraph 4 for adjustment of pedal rod. Do not adjust cable length except with shoes expanded as outlined in Paragraph 8.

Lubrication: The brake pedal and rotary equalizer bearings, clevis connections and other frictional parts of the braking system should be lubricated every 1000 miles of car service to insure their free return to the stops provided. Lubrication of the cable and conduit control is described in Paragraphs 14 and 15.

Return Springs: To hasten the release action of a brake control system that has been in service some time, the uniformed mechanic will some times install additional return springs at various points in the brake control system. This is detrimental to satisfactory brake performance, will increase the pedal pressure and is entirely unnecessary. It will be found that correct lubrication and proper adjustment will produce satisfactory operation of the brake control system. Check all return springs. Replace, if found weak or broken.

General Points of Importance: Satisfactory braking performance can be obtained only when all four brakes are functioning alike. The brake control system should be well lubricated, the spring clips holding the chassis springs to the front and rear axles tight, wheel bearings properly adjusted, and the four brakes balanced. The braking system should be broken-in carefully just the same as other mechanical units of the car. Hard application of the brakes before the linings have become polished may gall the linings or score the drums. It is very essential that the parking brake system be effective at all times. Adjustment for lining wear should be made when the brake pedal can be depressed within 1-1/2" of the toe board at the end of a heavy brake application.

Oily or Greasy Brake Lining: Much braking trouble will be avoided if the lubrication of the rear axle and front wheel bearings is held to the correct amount and not over-done. Where it is found that the brake lining has become excessively saturated with oil or grease, heavy pedal pressure or possibly sensitive brake action will result and the only cure is replacing the brake lining. If molded lining becomes not overly saturated with the lubricant it may be possible to remove the lubricant from the lining with the use of high test gasoline.

Lining Renewal: When lining renewal is required, use only genuine Hudson-Terraplane lining which is available from the factory parts department, boxed in complete sets (lining and rivets for one car).

There are only two adjustments in a braking system of this type to compensate for brake lining wear. These points (at the brakes proper) are as follows: *Continued on page 3*

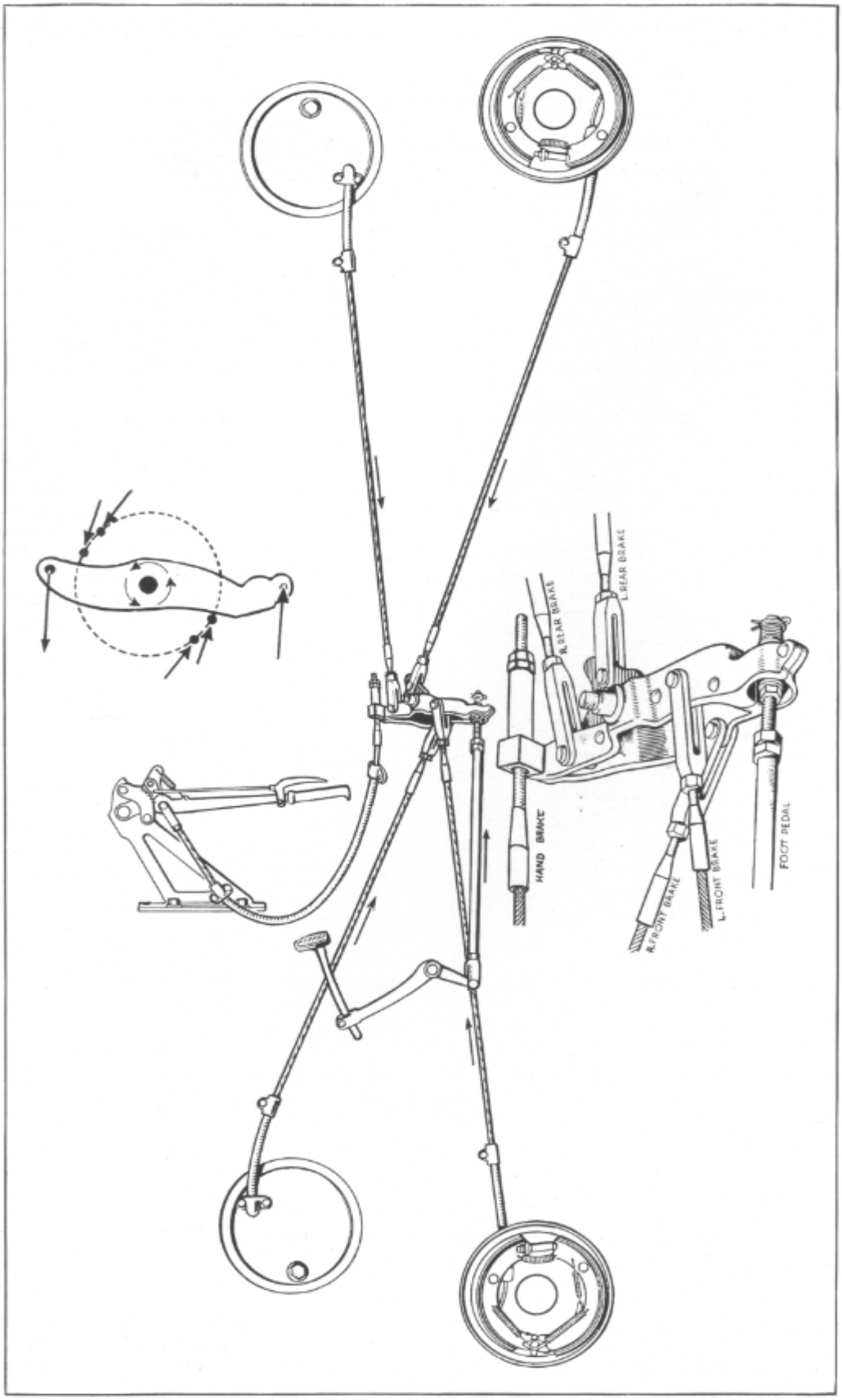

R. REAR BRAKE
L. REAR BRAKE
HAND BRAKE
R. FRONT BRAKE
L. FRONT BRAKE
FOOT PEDAL

Figure 1

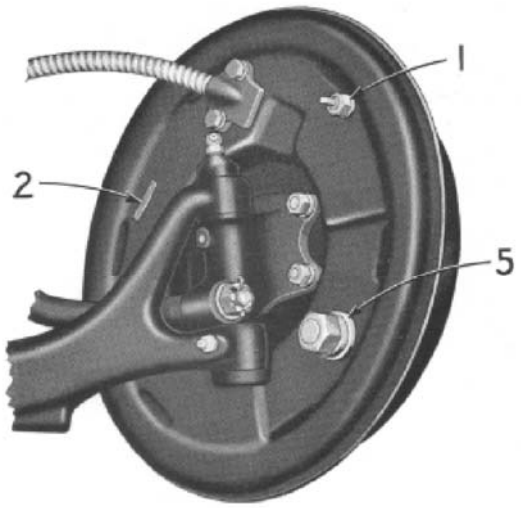


Figure 2—Left Front Brake

The Eccentric Adjustment - l - Fig. 2. This adjustment centralizes the brake shoe in the brake drum.

The Adjusting Screw - Fig. 3. This adjustment compensates for lining wear.

Do not make any adjustments in the brake control system to compensate for brake lining wear. Remember the only adjustments for lining wear are at the brake shoes, and not in the control system.

Figure 3

Adjustment For Wear Only

1. Jack up all four wheels in a safe manner.

2. Disconnect all four cables leading to front and rear brakes at the rotary equalizer, by removing safety plugs and clevis pins.

3. Lubricate brake pedal, hand brake lever, rotary equalizer bearings, over-running linkage and all clevises. See that pedal, hand lever, rotary equalizer operate freely and that linkage returns sharply to release stop when pedal and hand lever are released.

4. With the rotary equalizer against the frame bracket stop and the hand lever in the full "off " position, adjust the lock nuts on the lower end of the pedal push rod so that they are against the pedal push tube when the pedal shank is against the rubber bumper on the underside of the toe board bracket. Adjust the sleeve on the end of the hand brake cable so that it is just against the rear face of the rotary equalizer. Be sure the Rotary Equalizer is still against the frame bracket stop after the above adjustments are made.

5. Remove all wheels.

6. Remove adjustment hole covers from brake backing plates (2-Fig. 2) and inspection hole covers-from brake drums.

7. *At All Wheels:* Loosen eccentric lock nut (1-Fig. 2) on eccentric adjustment and insert .010” feeler gauge between the lining of top shoe and brake drum (Fig. 4). Turn the eccentric adjustment in the direction of forward wheel revolution until .010” feeler is just snug at anchor and adjusting ends of top shoe. Tighten eccentric lock nut. The clearance at both ends of top shoe should not vary more than .003'. Should the variation between the two ends be greater than .003', it will be necessary to relocate anchor pin as outlined in Paragraph 17. (In case of clearance variation, it is desirable that clearance at anchor end of shoe be less than at adjusting end.) (See Note on Page 5.) Do not adjust anchor pin unless this inspection shows it necessary.

8. A*t All Wheels:* Expand the brake shoes by turning notched adjusting screw toward rim of backing plate, using Bendix adjusting tool or screw driver inserted through backing plate), moving outer end of tool toward center of wheel (Fig. 3). Continue until brake drum can just be turned by hand.

9. Pull cables by hand toward rotary equalizer to remove all cable slack and lost motion at cam levers. Adjust clevises so that pin will just enter clevis and rotary equalizer freely. Lock clevis jam nuts and insert clevis pin cotters. Insert safety plugs.

1. Primary Shoe
2. Adjusting Screw
3. Adjusting End of Shoe
4. Secondary Brake Shoe
5. Anchor Pin
6. Primary Shoe Return Spring
7. Cable Return Spring
8. Backing Plate
9. Adjusting Screw Spring
10. Secondary Shoe Return Spring
11. Operating Lever Anti-Rattle Spring
12. Operating Lever
13. Brake Shoe Hold Down Spring
14 Eccentric

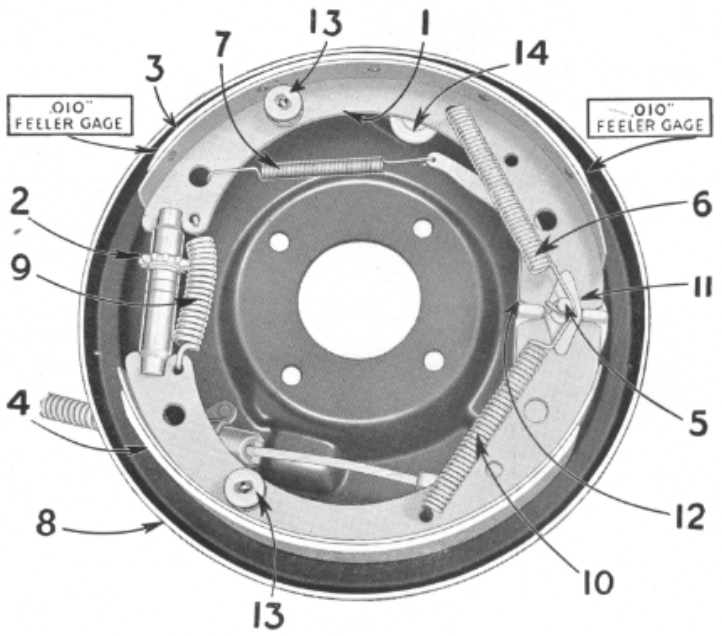


Figure 4—Left Rear Brake Brake Control System

Primary and secondary brake shoes are marked with a "P" and "S" respectively. Irrespective of the position in which the brake assembly is mounted on the axle, the primary shoe is always the one "ahead" of the anchor in the direction of the forward rotation of the drum, and transmits servo action to the secondary shoe during a forward braking application. In reverse braking the opposite brake action takes place. The heavier shoe return spring must always be attached to the shoe which "hides" the brake operating lever

10. Release adjusting screw the same number of notches at each wheel until brake drums are completely free of brake drag. Twelve to fourteen notches usually are sufficient.

11. Depress brake pedal with pedal jack or set hand lever until wheel with the least brake drag can just be turned over by hand. Then back off the adjusting on the tight brakes until the brake drag is alike on all four wheels. Pedal reserve should not be less than one-half of total pedal stroke. Recheck adjustments if pedal reserve is less than this.

12. Reassemble the covers at each drum inspection and adjustment hole.

13. Lower car and test on brake testing machine or road. *Always loosen adjusting screw on tight brakes rather than tighten adjusting screw on loose brakes.* This is a safeguard against a car going into service with one or more brakes too tight.

Complete Brake Adjustment

NOTE: These complete brake adjustment instructions are to be followed in cases where an inspection, as in paragraph 7, shows that an adjustment for lining wear only will be inadequate or where new shoes have been installed.

When a complete brake adjustment is required it is recommended that all brake drums be removed and cleaned and brakes cleaned and inspected as to lining condition. After cleaning with a stiff brush and air hose, Bendix Lubriplate grease should be lightly applied to cable ramp, shoe support ledges on backing plate, eccentric, shoe ends and all moving parts at frictional contact points.

After the car has been jacked up, with cables disconnected at rotary equalizer, and the drums and shoe removed continue as follows:

14. Lubricate cable and conduit assemblies by disconnecting cable at brake operating lever, cleaning exposed portion of cable and then pulling cables thru conduits from the brake end to expose that portion of cable which is sheathed by conduit. Clean this portion of cable, lubricate freely with Bendix cable lubricant.

15. Return cable into conduit and connect to brake operating lever, leaving rotary equalizer clevises disconnected. Conduit ends must always be firmly bottomed in abutment brackets.

16. Reinstall shoes and shoe parts and drums. Remove adjusting hole covers from backing plate and covers from drum feeler gauge holes if this has not been done.

17. Anchor Pin Adjustment: At all four wheels loosen the anchor pin nut (Fig. 5) one turn and tap anchor pin slightly in necessary direction with a soft hammer, and turn the eccentric in the direction of forward wheel rotation to give the specified clearances of .010' at the adjusting screw end and .010" at the anchor end of the shoe against which the eccentric operates.

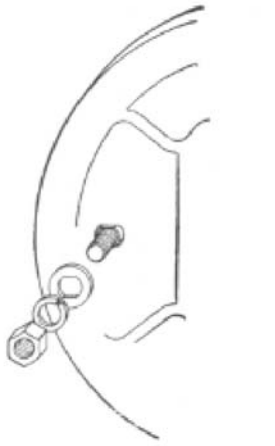


Figure 5
Sliding Adjustment Type Anchor

TIGHTEN THE ANCHOR PIN NUT AS TIGHT AS POSSIBLE WITH A SIXTEEN INCH WRENCH. Tighten eccentric lock nut. Recheck clearances to insure tightening anchor nut has not disturbed lining to drum clearance.

18. Continue adjustments as outlined in Paragraphs 8, 9, 10, 11, 12 and 13.

NOTE: Normal Servo Action is obtained when equal lining to drum clearance is maintained at both ends of the shoes. More clearance at the adjusting end than at the anchor end of the secondary shoe will reduce the effectiveness of the Servo Action. This will "harden" the brake action, and extreme adjustment of this kind will materially increase the pedal pressure required. Although .003" variation in lining to drum clearance is permissible per shoe, a combination of adjustments that will increase the Servo Action on some shoes and decrease it on others will produce unequal braking effect.

There are no short cuts to satisfactory brake performance. Follow the recommended procedure step by step. Be accurate in your measurements. This is the only way to reduce the average time per brake adjustment in the shop and also increase owner satisfaction.

1935-1938 Hudson

Special Service Notes

NOTE: Through-out this document reference will be made to "Special Tools". While these tools are available, in most cases suitable replacements will have to be utilized.

HOOD ASSEMBLY 1938 MODELS

ENGINE HOOD AND SIDE PANELS: - 112 only- Hood hinged at front. Secured by handle on each side panel. To raise, turn one handle (handles interconnected), grasp hood along edge and lift forward until self-locking hinge support locks hood in raised position. Hinge support released by raising hood slightly and pushing lower half to rear.

Side Panels - When removing panels, free hood handle from tie rod at clamp bolt on one panel, remove other panel with handle and tie rod attached as an assembly.

1939 MODELS

ENGINE HOOD LOCK: - Hood hinged at front and secured by lock handle in driver's compartment on lower edge of instrument panel to left of steering column (operates rod on engine side of dash which engages each side of hood). To unlock hood, push down on handle. Hood can then be raised by lifting on either side at rear (press support hinge forward before releasing hood).

Hood and Support Removal - Remove front bumper. Raise hood, take out 3 cap screws and tapping plate at front hood hinge, hood support upper pin springs, pins and washers, freeing hood. Remove cotter pins and washers at ends of support lower rod, unhook springs freeing hood support.

Hood Alignment - Check alignment at cowl, side panels, and at name plate. To align, raise hood, loosen 3 cap screws at front hinge, shift hood at front end until aligned, raise hood, tighten screws. Side

Panel Removal (91, 92, 93, 95, 97) -Raise hood, remove 3 bolts at shell extension and 1 capscrew at cowl. Remove 1 capscrew attaching fender to front lower frame hood side panel (accessible through hole in top of radiator shell after removing horn).

Loosen but do not remove capscrews on lower edge of panel (holes in panel slotted). Lift panel out.

CAUTION - On cars equipped with hood side panel lamps, pull sockets out.

Side Panel Removal (90 & 98) - Raise hood, remove bolts at radiator shell and along lower edge. Take out screw at cowl and lift panel out.

Right Front Fender Dust Shield Removal (91, 92, 93,95,97) - For work on right side of engine (valves, etc.) remove shield as follows: Raise hood, remove 4 capscrews along top edge of shield (in engine compartment), 4 capscrews along front edge at radiator shell, and 3 capscrews along frame side member. Jack up front end of car and remove right front wheel. Take off fender stone guard at fender and dust shield. Pull out lower edge and remove.

Right Front Fender Dust Shield Removal (90 & 98) - Remove as follows: Raise hood, remove bolts at hood side panel, radiator shell and frame side member (in engine compartment). Jack up front end of car and remove right front wheel. Remove capscrews at fender and one dust shield fender brace bolt..Pull out lower edge of shield and remove.

1940-42 MODELS

ENGINE HOOD LOCK: - Alligator type hood (hinged at front) with integral side panels and instrument panel lock. To raise hood, push forward on lock handle located under edge of instrument panel to left of steering column, lift rear of hood.

HOOD Removal -Unlock and raise hood. Disconnect hood light wires from terminals on fender junction block. Remove hood-to- hood support bolts and hood-to-hood hinge bolts. Lift hood straight up and remove from car. Align Hood and Front Fenders as directed below

Radiator Louvre Panel Removal - Remove panel-to fender bolts from under fender. Remove front bumper bolt and and loosen rear bolt permitting bumper assembly to be lowered, Remove center front screw from under panel and lift panel off.

1940-41 MODELS

HOOD AND FRONT FENDER ALIGNMENT: -U-shaped hood hinge consisting of cross-bar in back of grille with an upright arm at each end which attach to each side of hood. Hinge cross-bar equipped with loose fitting bracket at each end which is attached to frame bracket by screws. Frame and hood hinge brackets have serrated faces. Thick F and thin hinge positioning washers assembled on each end of hinge cross-bar and are retained by a large cotter pin. Each front fender positioned by brace rod anchored to frame at lower end and to fender bracket on upper end by means of positioning nuts.

HOOD Adjustments - Hood alignment can be adjusted at three points as follows: For full fore-and-aft hood movement, loosen hood-tohood hinge bolts (three on each side along lower edge of hood). For slight sidewise or lengthwise movement, loosen hood hinge frame bracket-toframe bolts. To position hood hinge assembly for sidewise movement, take out large cotter pin in each end of hinge cross-bar and add or remove washers for correct fit.

Fender Adjustment - Fender fit can be adjusted by means of positioning nut on each side of fender bracket at upper end of brace rod. Separate brace rod for each fender located under hood behind radiator louvre panel.

Radiator Louvre Panel Adjustment - Louvre panel fit can be adjusted by loosening louvre-to-fender bolts on outer ends of panel. Bolts on back side of panel and are accessible from behind panel with hood raised. Louvre panel should be pushed forward as far as possible for correct fit.

1942 MODELS

HOOD AND FRONT FENDER ALIGNMENT: - Hood alignment can be obtained by loosening fender bracket bolt at hood hinge (lower end of each hood hinge arm behind radiator louvre panel). Bolt hole in each fender is enlarged which permits hood being shifted until fitted properly. Hinge to fender bracket bolt should be installed as follows: Place flat washer on bolt, then rubber shouldered washer and assemble in hood hinge hole (see that rubber washer seats properly). slide second rubber shouldered washer, plain washer and spring over bolt, screw bolt in fender bracket and install locknut.

Front Fender Alignment - Fenders can be fitted for sidewise movement at front end by means of adjusting nut and locknut on fender brace rods under hood behind radiator louvre assembly. Adjust fenders to obtain proper fit along hood.

FRONT FENDERS
1940-1941 MODELS

FRONT FENDER REMOVAL: - Unlock and raise hood. Disconnect headlamp wires at junction block, unclip wires from fender and dash and push headlamp cables through hole in fender (remove battery if left fender to be removed). Remove fender bolts at following points: running board, brace rod top nut, louvre panel, fender cross member (with spacers), brace to cross member screw, core baffle to fender screws (right fender only), radiator lower tank shield screws, hood support screws, apron support to inspection cover screw, and horn bracket to frame screws. Lift fender off.

Right Front Fender Inspection Hole Plate Removal This Plate replaces fender dust shield (now welded to fender) used on 1939 models for access to valve tappets, fuel pump, and oil pump. To remove, unlock and raise hood, remove horn mounting bolts and Push horns forward (in engine compartment). Raise front end of car, remove right front wheel and 12 cap screws along the top, bottom and front edge of plate (under fender).

1942 MODELS

FRONT FENDER REMOVAL: - Remove wheel, raise hood and support in open position. Remove battery (if left fender being removed). Disconnect light wires at junction block on left fender (if right fender being removed pull wires back through hole in fender and remove grommet). Take off dust shield hole cover (right fender only). Remove fender screws and bolts as follows: 2 bolts at hood support, 2 Phillips head screws at radiator tank lower shield, all screws in radiator baffle and remove baffle, 2 hex head bolts in louvre end bracket, I hex head bolt at frame bracket (under car), 2 hex head bolts at frame cross member, 4 hex head bolts at front bumper splash guard, 6 hex head bolts at cowl, 2 hex head bolts at hood hinge bracket, and fender brace rod nut. Lift fender off car. Mouldings, lamp and brace can be disassembled from fender after fender removed from car.

NOTE - When installing fender, assemble headlamp after fender installed on car. Fender to cowl bolts should not be tightened until hood fitted to fender.

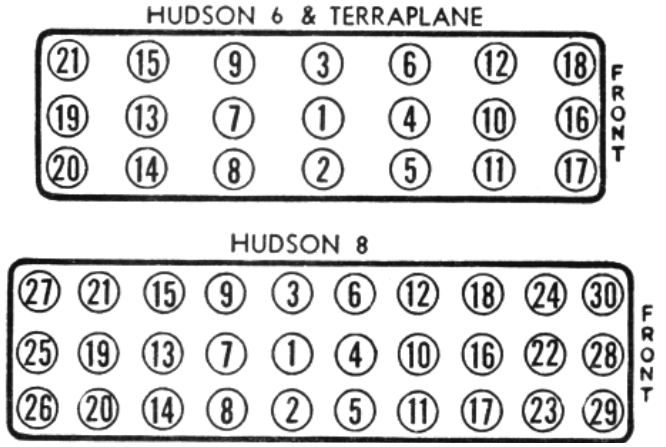
CYLINDER HEAD

CYLINDER HEAD INSTALLATION: Use a Torque Wrench to tighten cylinder head stud nuts, tighten in correct sequence as shown in the diagrams. Procedure for tightening Cast Iron and Aluminum heads is as follows:

Cast Iron Heads - With engine cold, tighten all nuts evenly to correct tension. Then run engine until it is thoroughly warmed up and recheck all nuts (additional tightening may be necessary for correct tension).

Aluminum Heads - With the engine cold, tighten all nuts to correct tension. Run engine until thoroughly warm, allow engine to cool off, and then recheck all nuts. Do not tighten aluminum heads when warm.

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



TIGHTENING (TORQUE WRENCH) SPECIFICATIONS

1935-1940 Models

	Ft. Lbs.	In. Lbs.
Cylinder Head Stud Nuts (6)	45	540
Cylinder Head Stud Nuts (8)	55	660
Main Bearing Stud Nuts	91-2/3	1100
Connecting Rod Bolt Nuts	52½	630

1941-1942 Models

	Ft. Lbs.	In. Lbs.
Cylinder Head Stud Nuts (6)	40	480
Cylinder Head Stud Nuts (8)	50	600
Spark Plugs (14 MM. Type)	28	336
Main Bearing Bolts	75	920
Connecting Rod Bolt Nuts	40	480
Flywheel to Crankshaft	45	540
Water Jacket Cover Bolt	15	180
Front Engine Support Bolt	45	540
Clutch Cover Mounting Bolts	22	264
Differential Carrier Nuts	37	444
Axle Shaft Nut	95	1140
Wheel Nuts	65	780
Brake Anchor Pin Nuts	85	1020
Clutch & Brake Pedal Nuts	22	264
Steering Wheel Nut	25	300
Pitman Arm Nut	140	1680
Steering Arm Nut	105	1260
Steering Center Arm Bolt Nut	65	780

ENGINE REMOVAL 1939 MODELS

ENGINE ASSEMBLY REMOVAL: - All engines can be removed as follows: Remove hood (see Hood and Support Removal) and radiator (see Radiator Core Removal). Disconnect generator, starter, temperature gauge and oil check valve wires. Remove wire harness along left side of engine, spark plug cables (with brackets) and distributor cap. Disconnect flexible fuel pump feed line and remove fuel line to carburetor. Disconnect throttle linkage and choke wire (if used). Remove accelerator cross shaft, carburetor and air cleaner. Disconnect exhaust pipe. Remove front motor support bolts, flywheel guard, accelerator pedal, floor mat, transmission hole cover, clutch housing-to-engine support bolts, engine ground strap and exhaust pipe bracket at rear engine support. Hoist engine out of car (move engine forward carefully to disconnect from transmission mainshaft). Finally, remove distributor, generator, fuel pump and clutch.

Installation - Reverse procedure listed above and note following points. Wrap a piece of soft wire around clutch throwout bearing oil seal with ends of wire extending up through clutch housing, lower engine in place (use care not to damage clutch driving plate assembly when engaging transmission mainshaft), pull wire out (this will prevent the seal from being curled by clutch cover). Install starter after engine in place.

1940-1942 MODELS

ENGINE ASSEMBLY REMOVAL: - All engines can be removed as follows: Remove hood (see Hood Removal), front seat cushion, accelerator pedal, front floor mat, transmission hole cover, clutch housing to engine bolts, engine ground strap, radiator core (see Radiator Core Removal), radiator stay rods and horns. Disconnect generator, starter, temperature gauge, and oil check valve wires and remove wiring harness from clips on left side of engine. Disconnect flexible fuel pump feed line and remove fuel line to carburetor. Disconnect throttle linkage leading from accelerator cross shaft and remove cross shaft (pull shaft toward spring and slip shaft out of opposite bracket). Disconnect windshield wiper hose at manifold. Remove spark plug wires and bracket, distributor cap, carburetor and air cleaner. Disconnect exhaust pipe at manifold. Remove front engine support bolts and nuts. Hoist engine out of car (use Tool J-917 attached to engine) move engine forward carefully to disconnect from transmission mainshaft. Finally, remove distributor, generator, fuel pump and clutch.

Installation - Reverse procedure listed above and note following point. Wrap a piece of soft wire around clutch throwout bearing oil seal with ends of wire extending up through clutch housing, lower engine in place (use care not to damage clutch driving plate assembly when engaging transmission mainshaft), pull wire out (this will prevent edge of seal from curling over).

ENGINE MOUNTINGS 1940-1942 MODELS

ENGINE FRONT SUPPORT REMOVAL: - Drain cooling system. Remove generator, fan belt, radiator outlet hose and raise front end of car. Remove radiator lower tank shield, vibration dampener (see Vibration Dampener Removal) and timing gears (see Timing Gear Removal). Block up front end of engine and remove front engine mounting bolts and nuts. Take out engine support bolt and locks and remove plate.

Installation - Reverse procedure listed above, note the following points: Clean front face of cylinder block thoroughly and use new gaskets. When replacing engine mounting bolts, tighten nuts until upper and lower plates are against spacer.

ORIGINAL BORE
1935-1942 MODELS

ORIGINAL BORE SIZE: - Original production (new engine) bore size indicated by code mark stamped on lower edge of valve chamber opposite cylinders. See table below for size and code marks.

Code Mark	Cylinder Diameter	Code Mark	Cylinder Diameter
A	3.000"	AO	3.010"
B	3.0005"	BO	3.0105"
C	3.001"	CO	3.011"
D	3.0015"	DO	3.0115"
E	3.002"	EO .	3.012"

Note - Recondition cylinders to size for which replacement pistons and rings available (see below).

Original Piston Size - Sizes and markings for original pistons same as for Replacement Pistons. See Replacement Piston Table and Piston Markings.

PISTONS
1935-1942 MODELS

REPLACEMENT PISTONS: - Standard and oversize pistons marked by letter stamped on head and furnished for cylinder diameter sizes listed below. See Replacement Rings (following) for ring sizes.

Piston Mark	Piston Size	Cylinder Size
B	2.9985”	3.000" & 3.0005"
D	2.9995”	3.001" & 3.0015"
F	3.0005”	3.002" & 3.0025"
J	3.0025”	3.004"
L	3.0035”	3.005"
BO	3.0085"	3.010" & 3.0105"
DO	3.0095"	3.011" & 3.0115"
FO	3.0105"	3.012" & 3.0125"
LO	3.0135"	3.015"
BB	3.0185"	3.020"
DD	3.0195"	3.021"
FF	3.0205"	3.022"

Piston Markings - Code marks stamped on head of piston indicate the following: Letter Indicates piston size and cylinder size for which piston to be fitted (see table below). Number indicates piston weight in ounces (if 2 numbers used, one over the other, to number indicates weight in ounces, lower number ¼ ounces). All pistons in one engine should be of same weight (carry same weight marks on head).

NOTE - original factory installed pistons carry two additional numbers, one number indicates cylinder in which piston installed, second number indicates cylinder block number.

PISTON RINGS
1935-1942 MODELS

REPLACEMENT RINGS: - Use standard or oversize rings for replacement pistons listed above. Ring size and pistons for each size as follows:

Ring Size	Piston Mark	Ring Size	Piston Mark
3.000"	B, D, F	3.010"	BO, DO, FO
3.003"	J	3.015"	LO
3.005"	L	3.020"	BB, DD, FF

Note - If rings filed, keep clearance at pin uniform with end gap (.005" minimum).

1939 MODELS

PISTON RINGS: - Compression. 'Granoseal’ treated rings used starting with car number 25000.

Oil Ring Width Change - Lower oil ring (below pin) changed during production as follows: Ring width reduced to 5/32" starting with following car numbers: (90) 24626, (91) all cars, (92) 24903, (93) 24896, (95 & 97) 28659, (98) 24502.

NOTE - Top oil ring width unchanged (3/16"),

PISTON PINS 1935-1942 MODELS

PISTON PIN SERVICING: - When replacing pins car manufacturer recommends that oversize piston pins be fitted to the piston boss and new piston pin bushings be installed in rod. Piston pin bosses are diamond- bored and should not be reamed.

Replacement Piston Pins - Furnished in standard size and .002", .005", .010" oversize.

Fitting Pins - Pins should be a hand press fit in piston with piston heated to 2001F. (heat in boiling water or electric furnace-do not use torch or direct heat). Replace pin bushing in rod and ream or burnish to .0003” greater diameter than pin (giving desired .0003" clearance on pin). To check pin fit in rod bushing, hold piston with rod in horizontal position, rod should just turn on pin of own weight.

CAUTION - Do not ream piston pin bosses In piston.

ORIGINAL BEARING SIZES
1935-1942 MODELS

CRANKSHAFT SIZE CODE: - Cars equipped with .010" undersize main bearing pins and connecting rod pins identified by marks stamped on left front corner of cylinder block on bottom face beside oil reservoir gasket (visible without removing oil reservoir) as follows:

MU - 010" undersize main bearing pins.
PU - .010" undersize connecting rod pins.
PMU - 010" undersize main and connecting rod pins.

NOTE - These pins require .010" undersize bearings.

CONNECTING ROD & BEARINGS
1938-1939 MODELS

CONNECTING ROD CHANGE: - On 1938 engines starting with following car numbers: (80 and 88) 54885, (81) 53909, (82) 54165, (83) 54382, (84, 85, 87) 54616 and all 1939 engines (except early "112" which started with car number 901625) new rods used, These connecting rods are drop forged steel with thinner (.015" thick) large end bearings ('Bermax alloy). Thrust now taken by sides of rod (formerly by bearing flanges). These rods may be used for replacement on earlier cars either singly or in sets.

IMPORTANT - Do not file rods or caps. If bearing clearance excessive, replace rods. No shims used.

1938-1942 MODELS

CONNECTING ROD AND MAIN BEARING PALNUTS: - Palnut (locknut or companion nut) used in place of cotter pin to lock connecting rod bolt nuts (starting with 1938 models), and main bearing cap stud nuts (starting with 1941 models). Palnut consists of a small single thread nut stamped from light gauge tempered steel.

Installation - After tightening regular nuts (refer to Tightening Specifications - Torque Wrench data on preceding pages), install palnut with smooth face toward nut, turn palnut up finger tight, then lock in place with wrench an additional 1/4-1/3 turn.

NOTE - Palnuts should not be re-used.

CRANKSHAFT & MAIN BEARINGS
1935-1939 MODELS

CRANKSHAFT REMOVAL: - 1935-38 Models. Crankshaft must be removed for main bearing replacement. To remove shaft, remove vibration dampener (following) and timing gear cover. Remove crankshaft gear with Gear Puller J-471, oil reservoir, transmission (see Car article for data) and clutch. Disconnect connecting rods. Remove maim bearing caps (use Puller J-377 for removal of Front and Rear caps) and lower crankshaft out.

1939 Models - Remove engine (see Engine Assembly Removal), vibration dampener, timing gear cover and oil reservoir. Disconnect connecting rods and remove main bearing caps as directed above.

Installation: - Reverse procedure listed above for removal and note following points. Front and rear oil seal grooves in caps and case must be cleaned of all oil packing. After caps secured in place, drive new packing in grooves using tool J-392 (install in horizontal groove first on front cap). See Connecting Rod Palnuts (above) for 1938-39 models. Use Tool J-843 to press crankshaft gear and dampener in place. Check oil seal on timing gear cover and do not fold or damage when installing. See Checking Oiling System for oil reservoir installation.

1940-1942 MODELS

CRANKSHAFT REMOVAL: - Crankshaft can be removed with engine in chassis as follows: Remove hood (see Hood (Hood) Removal above), radiator (see Radiator Core Removal following), vibration dampener (see Vibration Dampener Removal following), timing gears (see Removal instructions following), transmission and clutch (see Hudson 6 and 8 Car articles for data). Remove flywheel and engine oil pan and tray. Remove connecting rod bearing caps and push rods up clear of crankshaft. Remove front and rear main bearing caps with Puller Tool J-377. Remove center main bearing cap with care and take out crankshaft.

Installation - Reverse removal procedure listed above. Install new oil seals at front and rear main bearing cap (see Front and Rear Main Bearing Cap Installation following) and new palnuts on main and connecting rod bolts (see Connecting Rod and Main Bearing Palnut Installation above).

1935-1940 MODELS

MAIN BEARINGS: - Adjustment - Laminated shims provided on top of caps. Remove caps and remove shims until clearance is .001". See Crankshaft Installation

Replacement Bearings: - Finished bearings (with attaching screws) furnished standard and .010" undersize (see Crankpin Size Code for original bearing sizes). Unfinished bearings furnished with 1/32" extra stock and must be line-reamed (see below).

Removal: - Bearing shells are removable type and are held in case and caps by screws. To replace bearings, crankshaft must be removed (see crankshaft removal above). With shaft out, take out screws securing shells in cap and case.

Installation: - crankshaft removed, secure bearing shells in case and cap with machine screws. If unfinished bearings installed, line-ream as directed below. Install crankshaft (see Crankshaft Installation). Add or remove shims on bearing caps until .001" clearance obtained . Secure caps in place.

Line-Reaming Main Bearings: - Where unfinished bearings used for replacement, bearings must be line-reamed to size as follows: Install bearings in cap and case, place .021" shims between case and cap and

Line-Reaming Main Bearings (Con't)

tighten cap, then line ream bearings. Thrust flange on center (Six), #3 (Eight) bearing must be faced for .006" endplay.

1941-1942 MODELS

MAIN BEARINGS:-Removal and Installation (with engine in car). Bearing halves are retained in crankcase and caps by a machine screw in each half, requiring removal of crankshaft for access to screw in upper half. Remove crankshaft (see Crankshaft Removal above), take out machine screw in each bearing half in crankcase and caps, remove bearings. Reverse removal instructions to install bearings.
NOTE - No shim pack used on 1941-42.

Replacement Bearings - Hudson replacement bearings furnished reamed (standard size or .010" undersize) and not reamed (see Line-Reaming data below). Reamed bearings carry punch marks on one side and when installed these marks should be together and on the same side for all bearings so that they will be in the same position as when reamed.
IMPORTANT - Lower half of bearing shell extends .002" above surface of cap (allows bearing to seat in cap and crankcase when stud nuts tightened).

Fitting Bearings - See Replacement Bearings above. Bearings can be fitted with shims (do not file caps) as follows: Install bearing shells in caps and case and oil bearing surface. Fit each bearing separately.
Install crankshaft and bearing cap (on front and rear bearings, caps should be centralized on studs by inserting ¼" drill rod in vertical packing holes on each side of cap), tighten stud nuts to 75 ft. lbs.
Test bearing fit by using two hand pull on crankshaft, shaft should start hard but be able to be turned over. If shaft cannot be moved, insert .005" shim between cap and case (trim shim flush with bearing shell). Repeat test until shaft turns easily. Shims are furnished .003" and .005" thick.

Line-Reaming Bearings - See Replacement Bearings above. Semi-finished bearings available for service which must be line-reamed on engine as follows: Place bearing shells in place in caps and crankcase, and secure with machine screws (see that screws are seated in countersink hole in shells), bearing shell in cap should project .002" above cap while shell in case should be flush, tighten caps to 75 ft. lbs. (front and rear caps should be centralized on studs by inserting ¼" drill rod in vertical packing holes on each side of cap). Line-ream bearings for .001" maximum clearance on crankshaft and face flange on center bearing for .006" shaft endplay.

Front and Rear Main Bearing Cap Removal and Installation - These caps fit in machined openings in crankcase. Front cap has vertical and horizontal grooves, rear cap vertical grooves only, with packing installed in these grooves to seal caps in place. After caps removed, grooves in caps and crankcase must be cleaned of all old packing. If old packing not removed from crankcase, oil passages may be clogged. When installing main bearing caps, insert new packing in horizontal grooves in upper end of front cap first, then install packing in vertical grooves on each side of front and rear caps (horizontal grooves not used on rear cap). Lower half of oil retainer on rear cap should be a tight fit against upper halt to prevent oil leaks at this point.

VIBRATION DAMPENER
1935-1939 MODELS

VIBRATION DAMPENER REMOVAL: - 1935-38. Remove fan belt, radiator shell, and radiator. Unscrew starting jaw. Pull dampener using Tool J-676. Install dampener using Tool J-483.

1939 Models - Dampener can be removed from beneath car without removing radiator core or shell as follows: Remove fan belt, raise front end of car, unscrew starting jaw, pull dampener using Tool J-676 (set puller tool screw in place through starting crank hole in frame cross member) and remove from below.
Note - Special tool J-483 used in installing dampener

Servicing - No adjustment other than replacing 2 rubber discs (drive flywheel from hub) if worn.

1940-1942 MODELS

VIBRATION DAMPENER REMOVAL: - Dampener can be removed from beneath car without removing radiator louvre panel or radiator (radiator must be removed on Eight only) as follows: Remove radiator louvre panel center moulding, front bumper bracket bolts permitting bumper to drop down, and fan belt. On Eight only, remove radiator (see Radiator Core Removal data above). Unscrew crankshaft starting jaw from end of crankshaft. Install jaw of special vibration dampener removal tool (or appropriate replacement tool) over dampener and place screw of tool through starting crank hole. Withdraw dampener by turning screw of dampener tool and remove from beneath car (6), or above (8).

CAMSHAFT & BEARINGS
1939 MODELS

CAMSHAFT REMOVAL: - Remove hood (see Hood and Support Removal) and radiator (see Radiator Core Removal). Raise front end of engine and remove front engine guard. Remove radiator center grille (all except 112) which is attached by 8 sheet metal screws.

CAMSHAFT REMOVAL – 1939 (Cont'd)

Remove radiator shell on 112 only. Unscrew starting crank jaw. Remove vibration dampener, timing gear case cover, and camshaft gear. Remove right front wheel and fender dust shield (see Right Front Fender Dust Shield Removal). Remove valve covers, cylinder head, valves, tappets, oil pump, fuel pump, distributor, camshaft, thrust button and spring. If camshaft will not clear radiator shell splash guard, guard can be pressed down until shaft clears.

1940 MODELS

CAMSHAFT REMOVAL: - Remove hood (see Hood Removal), radiator (see Radiator Core Removal), radiator louvre panel assembly, vibration dampener (see Vibration Dampener Removal), fan blades, fan belt, timing gear cover, camshaft gear (3 bolts), valve chamber cover, cylinder head, valves, tappets, oil pump, fuel pump and distributor (on Six cylinder cars, remove distributor shaft and support assembly). Loosen front engine support and raise front end of engine until camshaft clears radiator tank lower shield. Withdraw camshaft with thrust button and spring. **CAUTION** - Two special washer head timing gear cover bolts used at lower left corner of cover and must be re- installed in same holes when cover replaced.

Camshaft Bearing Removal: - Remove camshaft as directed above. Remove oil pan and bearings. See Rear Camshaft Bearing Installation for Six Cylinder Engines following.

Replacement Camshaft Bearings: - Finished bearings available which are reamed sufficiently oversize to provide correct running fit when installed in engine without reaming or scraping. Standard bearings with added wall thickness provided for installations where reaming equipment to be used. These bearings must be line-reamed for .001" clearance.

Rear Camshaft Bearing Installation (Six Cylinder only): - Due to new location of distributor at top rear of cylinder block, distributor gear is now cut in rear bearing journal with a special cut-out machined in camshaft rear bushing for the distributor support shaft gear. Whenever rear bearing replaced, this cut-out must be made in bearing after installing in engine as follows: With distributor driveshaft and support assembly off engine, remove driveshaft from support, insert cutting tool in support (making up cutting tool by mounting 1 1/81, hole saw on end of 12" length of 1/2" cold rolled stock, thread opposite end for hex nut), install support (with cutting tool) on engine and tighten support anchor bolt. Cut bearing (use nut on end of cutting tool and turn with ratchet wrench) using light pressure to give a clean cut.
IMPORTANT - Place oil soaked rag under bearing to catch chips (avoiding necessity of removing crankshaft). Remove support (together with cutting tool). Drill hole in side of bearing for anchor plug by using 3/8" drill inserted in camshaft anchor plug hole on right side of engine. Install new anchor plugs. Remove oil soaked rag and use extreme care to remove all bearing chips and cuttings.

1941 MODELS

CAMSHAFT CHANGE ON 3" x 4-1/8" SMALL SIX CYLINDER ENGINE: - New design camshaft used on Model 10 engine after car no. 6848. Cams machined to new contour, intake and exhaust cams alike, which requires new valve timing and tappet clearance (see 1941 Hudson Six car article for data).

Identification - New camshaft used after car no. 6848 and may be identified by letter "X" stamped on front face of shaft behind camshaft gear. Engines with this camshaft carry a decalcomania on valve cover stating "Tappet Clearance Hot, Inlet .010", Exhaust .012".

Interchangeability - This new type camshaft can be installed on early 1941 engines and all 1940 engines with a bore of 3" and stroke of 4-1/8" but must not be used in the 3" x 5" six cylinder engine, When this camshaft installed on engines originally equipped with old style camshaft, a decalcomania with the new tappet clearance figures of .010" Inlet and .012" Exhaust Hot, should be installed on cover plate.

1941-42 MODELS

CAMSHAFT SERVICING: - Camshaft Removal. Remove hood (see Hood (Hood) Removal above), radiator (see Radiator Core Removal following), radiator louvre panel, vibration dampener (see Vibration Dampener Removal above), fan blades, fan belt, timing gear cover and gasket, vibration dampener spacer, camshaft gear (3 bolts and lockwire), valve chamber cover, valves, tappets, oil pump, fuel pump, and distributor. Camshaft with thrust button and spring can then be withdrawn from engine by pressing down on radiator lower tank shield
Camshaft Installation - See Timing Gear data below (note CAUTION on cover bolt installation)

Camshaft Bearings - New thin type steel-backed babbitt-lined bushings used (cannot be used for service on earlier cars). Factory reamed bearings available for replacement which require no reaming or scraping, Standard bearings with extra wall thickness permitting line-reaming on engine also available (line-ream for .001" bearing clearance).

Camshaft Bearing Removal & Installation - Bearings can be removed as follows: Remove camshaft (see Camshaft Removal above), remove oil pan and tray, press old bearings out. New bearings can be installed as

Camshaft Bearing Removal & Installation (Cont'd

follows: Press new bearings in place with locating notch on front edge at top (back of bearing has 1/161, chamfer so that bearings can be readily installed in crankcase, bearing material on front of bearing has light chamfer at front). Coat bearings with light engine oil, install camshaft.

TIMING GEARS
1935-1942 MODELS

REPLACEMENT TIMING GEARS: - New Type Gears Starting with 1941 engines timing gears have new design 20º pressure angle teeth (formerly 14½º) providing increased gear life and quieter operation. All other specifications (material and size) same as for preceding gears These new type gears can be used for replacement on 1940 & earlier cars in sets

Identification Marking - Figure '20' used to mark these new design gears. Cast on spoke of camshaft gear (also carries mark 'FRONT'), and moulded on front face of camshaft gear.

Timing Gear Backlash - .002-.004".

1940-1942 MODELS

TIMING GEAR REMOVAL: - Drain cooling system. Remove fan belt, radiator outlet hose, vibration dampener (see Vibration Dampener Removal), timing gear cover bolts, cover, cover gasket and vibration dampener spacer. Turn engine over until timing marks (2 teeth mark on camshaft gear, 1 tooth mark on crankshaft gear) coincide. Remove camshaft gear (retained by 3 capscrews and lock wire). Remove crankshaft gear using Puller Tool J-471.

Gear Installation - Reverse removal procedure above (use Tool J-483) to replace camshaft gear). Use new timing cover gasket and check leather oil seal in timing gear cover. If new seal to be installed, coat seal seat in cover with red or white lead and press seal securely in place. Do not curl edge of seal over when cover installed.

CAUTION - On 1940-41 engines, two special washer head timing gear cover bolts used at lower left corner of cover and must be re-installed in same holes when cover installed. All bolts are washer head type on 1942 engines.

Replacement Camshaft Gear: - A special .008" oversize camshaft gear (marked with daub of yellow paint on front face of gear) available for service. Gear backlash .002-.003" (Six), .004-.005" (Eight), .002-.004" (all 1942 engines).

VALVE SYSTEM 1938-42 MODELS

VALVE TOOLS: - Valve stem diameter reduced to 11/32" starting 1938 (was 3/8"). Due to this decrease in stem diameter, new pilot size necessary for valve servicing tools. Tool numbers as follows:

Tool	Tool No.
Valve Stem Guide Replacer Pilot	J883-6
Valve Stem Guide Reamer Pilot	J129-2
Valve Stem Guide Remover Pilot	J267
Valve Seat Reamer Pilot	J491-12

1935-42 MODELS

VALVE LIFTER REMOVAL: - Tappets (lifters) may be removed without removing cylinder head as follows: Remove Right Front Fender Dust Shield on '39 cars, Right Front Fender Inspection Hole Plate on '40-'42 cars (see first page). Remove valve cover, break loose tappet adjusting screws, remove spring seat retainer using Tool J-915, remove tappet adjusting screw, spring seats, spring dampeners, tappet guide clamp screws and clamps. Take out tappet and guide assemblies.

OILING SYSTEM
1935-42 MODELS

CHECKING OILING SYSTEM: - See that oil lines securely in place and not bent or damaged. Drop oil reservoir and clean thoroughly every six months. When installing oil reservoir, check flapper valve on rear main bearing oil return tube (soldered in rear of reservoir). Valve must work freely and should be slightly open with reservoir level. Holes in gaskets between crankcase and oil dipper tray and between tray and reservoir must align with oil return tube and register with hole in bearing cap.

NOTE - On 1942 engines, oil suction pipe has been redesigned to bring lower end into center of oil reservoir which insures constant supply to oil pump.

1939 MODELS

1939 OILING SYSTEM CHANGES ON "112" & SIX CYLINDER ENGINES: - Oil passages from oil pump through cylinder block to front and rear of engine have been relocated. Front line now delivers oil directly to #I trough in oil tray (formerly directed oil to timing gear compartment). Timing gears now lubricated by splash from connecting rods and higher oil level In gear compartment maintained by use of baffle on timing gear cover and elimination of oil drain hole in front main bearing cap (formerly used to supply oil to front of oil pan). Rear line from oil pump delivers oil to check valve (operates oil signal on instrument panel) which has been relocated farther forward in cylinder block allowing direct oil passage to #6 trough in oil tray.

Oil Pan Tray ("112" Engine) - New type conveyors used at front and rear ends of tray. Oil dams now used opposite #1 and #2 troughs and #5 and #6 troughs which

Oil Pan Tray - "112" Engine (Cont'd)

direct oil draining from right side of cylinder block directly into #1 and #6 troughs.

REPLACEMENT NOTE - 1939 trays can be used on earlier cars. Old type cannot be used on 1939 cars.

Oil Pan Tray (Six Engine) - New baffles used between #1 and #2 troughs and between #5 and #6 troughs which maintain higher oil levels in #1 and #6 troughs and overflow from these troughs fed to remaining troughs.

REPLACEMENT NOTE - -Same as for "112" above.

1939-42 MODELS

OIL SUCTION PIPE SEAL: - Synthetic rubber suction pipe oil seal fitted in counter-bore in cylinder block flange at point where suction pipe passes through oil pan flange. Seal fitted around pipe and compressed by pan (pan gasket widened at this point).

NOTE - Use new seal whenever pan installed.

RADIATOR
1939 MODELS

RADIATOR CORE REMOVAL: - Remove hood and support (see Hood and Support Removal). Drain cooling system. Remove shell extension-to-side panel bolts and spacers (except 90, 98) and radiator hoses. Take out shell-to-core bolts. Remove water pump, fan belt, front engine splash guard and 2 radiator anchor bolt nuts. Lift out radiator core.

I**MPORTANT** - When reassembling, reverse procedure listed above. **Install water pump after core installed.**

1940-1942 MODELS

RADIATOR CORE REMOVAL: - Drain radiator and remove upper and lower hoses. Disconnect radiator stay rod bolts at radiator and remove 2 radiator mounting bolts. Lift core out of car.

CLUTCH NOTES
1935-1942 MODELS

CLUTCH OIL: - Servicing-Hudsonite (oil) in clutch must be renewed every 5000 miles. Turn engine over until hexagonal drain plug on front face of flywheel is visible in timing inspection hole on left side of motor rear support above starting motor. Remove hex head drain plug with a socket wrench, turn engine over 1/3 revolution until star on flywheel Is at inspection hole, allow engine to stand in this position one minute to drain old oil, turn engine over until filler plug is again at inspection hole, insert 1/3 pint Hudsonite (use J-485 gun – or appropriate replacement) replace plug.

Capacity & Oil - 1/3 pt. Hudsonite Clutch Compound.

FRONT SUSPENSION NOTES

1936-1939 MODELS -Assembled between bracket on each frame side rail and rear of front axle. When removing axle, disconnect each torque arm at frame bracket (use Bolt Press J-885) and remove axle with torque arms attached. When assembling axle to springs (with torque arms mounted on axle), adjust U-bolt nuts no torque arms will fall slowly of own weight when raised at rear end, Install jam nuts on U- bolts. Finally connect torque arms to frame brackets by assembling rubber grommets in eye of each arm (immerse rubber In gasoline before installing to allow bolt to enter freely), insert bolt through bracket and arm, tighten nut.

1938-39 MODELS

KING PIN THRUST BEARING: - King pin end thrust taken by 5 loose balls in upper bushing above king pin. Ball seat in bushing and on king pin end.

Installation - To install king pin, insert king pin from below until it enters top bushing (with keyways aligned and 'Corprene' seal in place under top bushing). Drop 5 loose balls through lubrication fitting hole on top of bushing, insert driver J-479-1 in hole to position balls, drive king pin into place (keyways aligned)

1939 MODELS

AUTOPOISE CONTROL: - **Used on all 1939 Passenger Cars** - New type linkage (similar to stabilizer) connecting front wheels together and helps maintain front wheels in straight ahead position. Consists of transverse bar suspended in rubber bushings mounted in brackets bolted to frame (ahead of front axle). Ends of bar curve to rear and are attached to brackets bolted to spindles by rubber bushed link at each end. In operation, bar is twisted or sprung whenever wheels turned away from straight ahead position which results in wheels being returned to straight ahead position when turning force on steering wheel released. A slight increase in force required to turn wheel results.

NOTE - Autopoise Control may be installed on all 1937-1938 Hudson and Terraplane models.

BRAKE NOTES
1939 MODELS

BRAKE LINING CHANGE: - Later cars have new type primary shoe lining. This lining is harder than first type and provides less sensitive brake. New lining should be installed on first cars In complete sets only (Brake Shoe and Lining Sets).