# 1927 Hudson Super-Six 

Car Number 750,000 up
Mechanical Specifications
And Information
Part I

## 1927 Hudson Super-Six

Car Number 750,000 up
Electrical Data
And Circuit Diagrams
Part II

# 1927 Hudson Super-Six 

Car Number 750,000 up
Mechanical Specifications
And Information
Part I

# Mechanical Specifications for Hudson Super Six Model 1927. 

 Car Serial Nos. 750,001 to ------; (Revised March 1927.)
## Engine

| Make | Hudson |
| :--- | :--- |
| Model | Super Six |
| No. of Cylinders | 6 |
| Cylinder Arrangement | Vertical |
| Bore | $31 / 2$ |
| Stroke | $5 "$ |
| Rated H. P. | 29.4 |
| Firing Order | $1-5-3-6-2-4$ |


| Piston Displacement | 288 |
| :--- | :--- |
| Suspension | 4 Point |
| Type of Head | F |
| Cylinder Head | Detachable |
| Cylinders Cast | En Bloc |
| Crankcase | Separate |
| Upper half | Aluminum |
| Lower Half | Pressed Steel |

## Camshaft Drive

| Type of drive | Chain | No. of Links | 63 |
| :--- | :--- | :--- | :--- |
| Make | Morse | Pitch | $1 / 2 /$ |
| Type | No. 28 | Adjustment | Adjust. Eccentric |
| Width of chain | $1-5 / 8^{\prime \prime}$ | Sprocket Material | Cast Iron |
| Camshaft Sprocket | 42 teeth |  |  |

## Camshaft Bearings

| Number of bearings | 4 |
| :--- | :--- |
| No. 1 (Frt.) diameter | $2-19 / 32 "$ |
| "" length | $1-5 / 8$ " |
| No. 2 diameter | $2-11 / 32$ " |
| " " length | $1-1 / 16$ " |


| No. 3 diameter | $2-5 / 16 "$ |
| :--- | :--- |
| " " length | $1-1 / 16 "$ |
| No. 4 diameter | $1-1 / 2 "$ |
| " " length | $1-3 / 4 "$ |

## Valve Timing

Inlet opens
" closes

7 degrees after TDC
42 degrees " BDC

Exhaust opens 55 degrees before BDC
" closes 8 degrees after TDC

Inlet Valve
Head Material
Head diameter (outside)
" " (opening) 1-13/16"
Stem length
" diameter
" type of end
Tappet (type)
" clearance
Valve lift
" stem guides
Spring pressure

Tungsten steel
1-31/32"
1-3/4"
5-29/32"
. 371
Grooved
Roller
. 004 -. 006 "
9/32"
Removable
96 lbs.

Exhaust Valve
Silicon Steel
1-31/32"
6-15/16"
. 371
Grooved
Roller
. 006 - . 008 "
19/64"
Removable 75 lbs.

## Crankcase and Crankshaft

| No. of main bearings | 4 |
| :--- | :--- |
| No. 1 (Front) Diameter | $2-1 / 4 "$ |
| " $\quad$ Length | $2-3 / 8 "$ |
| No. 2 Diameter | $2-9 / 32 "$ |
| " Length | $1-7 / 8 "$ |
| No. 3 Diameter | $2-5 / 16 "$ |
| " Length | $2-1 / 8 "$ |
| No. 4 Diameter | $2-11 / 32 "$ |
| " Length | $3-1 / 8 "$ |

Crankpin Diameter $\quad 21 / 4 "$
Main Bearing. Material Bronze and Babied
" " end play .008-.012
" " clearance . 0015-.002
End thrust on
Sprocket
Material
Rear center bearing
21 teeth
Steel

## Connecting Rod

| Material | D. F. Steel |
| :--- | :--- |
| Weight | $3-1 / 2$ lbs. |
| Length C. to C. | 11.325 |
| Lower end bearing |  |
| Diameter | 2.25 " |

Lower end bearing clearance . 0015 -. .002
Length 2"
Clearance (endwise) . $006-.010$
Type
Material
Separate
Bronze \& Babied

## Piston

| Type | Slotted Skirt |
| :--- | :--- |
| Material | Aluminum alloy |
| Weight | 16 ounces |
| Length | $4-1 / 16$ " |
| Pin center to top | $2-1 / 4 "$ |


| Distance between bosses | $1-3 / 8 "$ |
| :--- | :--- |
| Skirt clearance | .0045 |
| Depth of grooves | .164 |
| Lower groove | Not drilled |

Piston Rings

| Material | Cast iron |
| :--- | :--- |
| No. per piston | 3 |
| Width | $1 / 8^{\prime \prime}$ |
| No. of compression rings | 2 |
| No. of oil control rings | 1 |

No. of rings above pin 3
Type of joint Miter
Gap clearance . $006-.008$

## Piston Pin

| Type | Floating |
| :--- | :--- |
| Diameter | 1.0937 |
| Length | $2-11 / 16 "$ |


| Bushing. Outside diameter | 1.283 |  |
| :---: | :--- | :--- |
| " | Inside | " |
| " | Length | $1-1 / 83 "$ |

Lubricating System
Type
Oil Pump Type
Stroke of pump-plunger idling
" " " " high speed
Capacity - oil reservoir only
" " " and troughs
Mesh of screen
Oil recommended
Circulating Splash
Plunger
Min. 3/16"
Max. 5/16"
7 Quarts
9
50
Medium heavy - use low cold test in winter

## Fuel System

Carburetor - make
size
Fuel feed - type
Make of vacuum tank
Air Cleaner - Type
Gasoline tank capacity
Method of heating mixture

Muffler make - Hudson

Make
Current source
Spark control type
Firing order
Timing
Breaker point gap
Ignition coil - make
Spark plug - Make
" " - Type
" " - Size
" " - Gap

Marvel B-10-661
1-1/4
Vacuum tank
Stewart
A. C.

18-3/4 gallons
Hot spot

## Exhaust System

Exhaust pipe diameter - 2-1/4"

## Ignition System

Auto-Lite Corporation
Battery and Generator
Semiautomatic
1-5-3-6-2-4
10 degrees before D. C. fully advanced . 020
Auto-Lite Corp. - CE-4001
A. C. Titan

Short
Metric 18 MM
. 025 -. 028

Note: Any other information must be obtained from the manufacturer.

## $\underline{\text { Starter Motor }}$

| Make - Auto-Lite Corporation | MUA-4002 |
| :--- | :--- |
| Drive type | Manual - sliding gear |
| No. of teeth on flywheel | 118 |
| Width of tooth face | $3 / 4^{\prime \prime}$ |
| Pinion Meshes from | Front of flywheel |
| Note: Any other information must be obtained from the Manufacturer. |  |

## Generator

Make - Auto-Lite Corporation
Normal charging rate - hot
" " " - cold

GAB-4001
13 amperes 17

Note: Any other information must be obtained from the Manufacturer.

## Battery

| Make | Prest-O-Lite | Terminal grounded Negative |  |
| :--- | :--- | :--- | :--- |
| Type | $6-15-$ J.F.K.H. | Length - overall | $10-1 / 4 "$ |
| Voltage | 6 | Width - "" | $7-3 / 8 "$ |
| No. of plates | 15 | Height of box | $8 "($ Incl handle 9-1/4") |
| Amp. Hours capacity | 120 | " over terminal | $8-1 / 4 "$ |

## Lighting System

Head, side and tail lamps - Make
" " Reflector - Make
" and Side Lamp type
Headlamp lens - Make
" " diameter
" " Dimmer method
Dash and tail lights connected
Ammeter - Make
Lighting switch - Make

John Brown Lamp Co.
Bullet
Spreadlight
9 "
Resistance
Separate
National Gauge and Equip. Co.
Auto-Lite Corporation

## Lamp Bulb Specifications

|  | Make | Mazda No. | CP |  | Contact |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Voltage |  |  |  |  |  |
| Headlight | Mazda | 1129 | 21 | Single | $6-8$ |  |
| Side | $"$ | 63 | 3 | $"$ | $6-8$ |  |
| Tail | $"$ | 63 | 3 | $"$ | $6-8$ |  |
| Dash | $"$ | 63 | 3 | $"$ | $6-8$ |  |
| Stop | $"$ | 87 | 15 | $"$ | $6-8$ |  |
| Dome | $"$ | 63 | 3 | $"$ | $6-8$ |  |

## Horn

## E. A. Horn

Motor Type

Ser. 945
Sheet \#4

## Chassis

Wheelbase
Lubricating System
Overall length with bumper
Location of Serial Number

127-3/8"
Oil cup - wick
15 ' " $^{\prime \prime}$
Frame rear cross member R.H. end

## Transmission

| Make | Hudson | Pocket bearing | Bronze Bushing |
| :---: | :---: | :---: | :---: |
| Location | Unit | Reverse Idler | Hyatt No. 16820 |
| Speeds | 3 fwd, 1 rev | Main Shaft - front | New Departure 1308 |
| Gear Ratio - Low | 3.04 to 1 | " " - rear | Hyatt No. 16684 |
| Gear Ratio - Second | 1.81 to 1 | Countershaft - front | Hyatt No. 16506 |
| Gear Ratio - High | 1 to 1 | Countershaft - rear | Hyatt No. 16506 |
| Gear Ratio - Reverse | 3.69 to 1 | " - Rotates |  |
| Type of lubricant |  | Light transmission oil |  |
| Oil capacity (approx.) |  | 1-1/2 quarts |  |
| Pilot bearing in crankshaft |  | New Departure No. 1204 |  |
|  |  | Clutch |  |
| Make | Hudson | Facing Material | Cork inserts |
| Type | Single disk in oil | Throwout bearing | Nice No. 0210 |
| No. of Cork inserts | 132 | Throwout | $5 / 32$ " |
| Lubrication | 1/4 pint | Clearance at floor board | 3/4" |
| (Mixture 1/8 pint motor oil and 1/8 pint kerosene) |  |  |  |

## Universals

| Front - Make | Spicer |
| :---: | :---: |
| " - Type | Metal |

Rear - Make
" - Type
Spicer
Metal

## Type of Drive

Propulsion through Rear springs.

## Rear Axle

| Make | Hudson | No. of teeth in pinion | 11 |
| :---: | :---: | :---: | :---: |
| Type | Semi-floating | " " " "gear | 49 |
| Gear ratio | 4-5/11 to 1 |  |  |
| Type of drive | Spiral bevel | Pinion | Adjustable |
| Min. road clearance | 8-1/4" | Pinion bearing | Adjustable |
| Clearance for jack | 10-1/4" | Oil capacity (approx.) | 2-1/2 quarts |
| Differential - Make | Hudson | Type of lubricant | Differential Oil |
| Pinon bearing | Front | Timken 3196 and 3120 |  |
| , | Rear | Timken 439T and 432 |  |
| Differential bearing | Right | " 377 and 3720 |  |
| " " | Left | " 377 and 3720 |  |

Ser. 945
Sheet \#5

| Make | Hudson | Toe in - None, or not over 1/8" |  |
| :--- | :--- | :--- | :--- |
| Section type | I | Castor Angle | 1 degrees. backward |
| End - Type | Rev. Elliot | Min. Road Clearance | $8-1 / 4 "$ |
| King pin thrust bearing | Special Thrust | Clearance for jack | $8-3 / 4 "$ |
| King pin transverse inclination | "-1/2 degrees. |  |  |
| Spindle " | " |  |  |

## Standard Brakes

Type of standard brake
Bendix 4-Wheel brakes

## Service Brake

| Location | Front \& Rear Wheels | Lining length per wheel | 3 pieces 38-7/32" |
| :--- | :--- | :--- | :--- |
| Make | Bendix | Width of lining | 2 " |
| Type | Internal | Thickness of lining | $3 / 16$ " |
| Total braking area | $305-3 / 4$ square inches | Clearance of lining | .010 |
| Drum diameter | Front and Rear $14 "$ | Method of Application | Foot pedal |

## Hand Brake

The hand lever operates the rear wheel brakes independently of the foot pedal, and should be used for parking, especially when the car is standing on an incline.

## Wheels

| Type | Wood-Steel Felloe |
| :--- | :--- |
| Make | Motor Wheel Corp. |
| Front wheel inner bearing | Timken No. 415 and 412A |
| " " outer " | " " 315 and 312 |

## Rims

| Type | Split | Diameter | $19 "$ |
| :--- | :--- | :--- | :--- |
| Make | Firestone | Width | $4-1 / 2$ " |

## Tires

Size $\quad 31 \times 6$ - Balloon Straight Side
Make
Number of plies
Goodyear and U. S.
4
6 on rear of Brougham, 5-Pass. Sedan (Custom) and 7-Pass. Sedan
Recommended pressure Front 35 lbs ., Rear 38 lbs .

Ser. 945

## Steering Gear

Make
Type
Ratio
Steering wheel turns
Turning diameter
Lubricant

Gemmer
Worm and roller disc
18 to 1
2-1/2 (full swing left to right)
Right 41', Left 39'
Heavy Bodied Gear Oil

## Springs

## Front Spring

| Type | Semi-Elliptic |
| :--- | :--- |
| Length | $39 "$ |
| Width | $2-1 / 4 "$ |
| No. of leaves | 10 |
| Material | Spring Steel |
| Front Bushing | $11 / 16 "$ diameter |
| Rear Bushing | $11 / 16 "$ diameter |
| Bushing material | Phosphor Bronze |
| Spring Lubrication | Motor Oil |
| Shackles - Type | Adjustable |

Make<br>Material

Semi-Elliptic
2-1/4"
10
Spring Steel
11/16" diameter 11/16" diameter Phosphor Bronze Motor Oil
Adjustable

Hudson
Steel

## Rear Spring

Type
Length
Width
No. of leaves (for Phaeton,
Coach, Brougham, 5 and 7
Pass. Sedans
Material
Front Bushing
Rear Bushing
Bushing Material

## Frame

Depth 7"
Thickness
3/16"
Width of Flange
2-1/4"

15
Semi-elliptic
57-11/16"
2-1/4"

15
Vanadium Steel
3/4" diameter
11/16" diameter
Phosphor Bronze

> 1927 Hudson Super-Six
> Car Serial \#750,001 to ------
> Gear Ratios and rules for comparing

TO OBTAIN MOTOR RPM FOR ANY DESIRED SPEED IN MILES PER HOUR:
Note: The following rule \#1 is good only for a gear ratio of $4-5 / 11$ to 1 and with a wheel diameter of 31 inches.
Rule \#1: MPH Multiplied by $48=$ Motor RPM (approximately)
Example: What is the RPM at 40 miles per hour?
Answer: 40 multiplied by $48=1920$ RPM (approx.)
Rule \#2: MPH multiplied by $44=$ Motor RPM (approx.)
TO OBTAIN SPEED IN MILES PER HOUR FOR ANY DESIRED MOTOR RPM:
Note: The following rule $\$ 3$ is good only for a gear ratio of $4-5 / 11$ to 1 and with a wheel diameter of 31 inches.
Rule \#3: RPM divided by 48 - Speed in miles per hour (approx.)
Example: What is the speed at 2400 RPM?
Answer: 2400 divided by $48=50 \mathrm{MPH}$ (approx.)
Note: The following rule \#4 is good only for a gear ration of 4-1/12 to 1 and with a wheel diameter of 31 inches.
Rule \#4: RPM divided by $44=$ Speed in miles per hour (approx.)

## GEAR RATIO

To obtain the number of revolutions of the motor required for one revolution of the rear wheel, multiply the transmission ration by the rear axle ratio.

Example: 3.04 (low gear ratio) x 4.45 (rear axle ratio) - 13.528 revolutions of the motor to one revolution of the rear wheel.

The following list shows the various motor to wheel rations worked out as above for Super-Six cars:

|  | Trans. Ratio | Rear Axle Ratio | Motor Revs. | Wheel Revs. |
| :---: | :---: | :---: | :---: | :---: |
| With transmission in Low | 3.04 | 4.45 | 13.528 | 1 |
| " Second | 1.81 | 4.45 | 8.05 | 1 |
| " " " High | 1. | 4.45 | 4.45 | 1 |
| " " " Reverse | 3.69 | 4.45 | 16.420 | 1 |

Ser. 945
Sheet \#8
$\left.\begin{array}{llllll} & & & \text { Std } & \text { Custom } \\ \text { 5-Pass. }\end{array}\right)$

Ser. 945
Sheet \#9

|  | Phaeton | Coach | Brougham | $\begin{gathered} \text { Std } \\ 5 \text {-Pass. } \end{gathered}$ Sedan | Custom 5-Pass. Sedan | 7-Pass. Sedan |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model - | 1927 |  |  |  |  |  |
| Wheelbase | -127-3/8 | (All Models) |  |  |  |  |
| Weight |  | 3505 | 3660 | 3620 | 3755 | 3870 |
| No. of Doors | 4 | 2 | 4 | 4 | 4 | 4 |
| No. of Passengers | 7 | 5 | 4 | 5 | 5 | 7 |
| Seat Arrangement | Std | Folding Type | Std. | Std. | Std. | Std. |
| Gear Ratio | - 4-5/11 | 11 Models) |  |  |  |  |
| Make of Body | Biddle <br> \& Smart | Briggs | Biddle <br> \& Smart | Briggs | Biddle \& Smart | Biddle <br> \& Smart |
| Frame Work Material | Wood | Steel | Wood | Steel | Wood | Wood |
| Body Panel Material | Alum. | Steel | Alum. | Steel | Alum. | Alum. |
| Wheels - Type | - Wood ( | (ll Models) |  |  |  |  |
| Tire Size | - $31 \times 6$ | 11 Models) |  |  |  |  |
| Tire type - Front | - 4 ply (A) | Models) |  |  |  |  |
| Tire type - Rear | 4 ply | 4 ply | 4 ply | 4 ply | 6 ply | 6 ply |
| Smoking Set | No | No | Yes | No | Yes | Yes |

## 1927 Hudson Super-Six

Car Number 750,000 up
Electrical Data
And Circuit Diagrams
Part II

# 1927 HUDSON SUPER-SIX <br> AUTO-LITE GENERATING, STARTING AND LIGHTING SYSTEM AUTO-LITE IGNITION 

BATTERY: - Prest-O-Lite, Type 6-15-JFK, 6 volt. Starting capacity is 120 amperes for 20 minutes. Lighting capacity is 5 amperes for 20 hours. The negative terminal is grounded.

IGNITION: - Coil Model CE-4001. Distributor Model
IGA4011. Breaker contacts are set to separate when new at $.020-.024$ inch; after 800 to 1000 miles operating contacts should be checked and set, if necessary, at .018020 inch. Resurface contacts with a fine, flat jeweler's file or on a medium hard oilstone.
Oiling: - Put 6 or 8 drops of light engine oil in the oiler on the side of the distributor housing every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks. Put one drop of oil in the breaker arm pivot pin every week or each 250 miles. Place a small bit of vaseline on the face of the breaker cam under the fiber bumper every 5000 miles.
Timing: - Breaker contacts begin to separate when piston No. 1 on compression stroke reaches a position when the flywheel marking "A" is opposite the mark on the flywheel case. The manual advance lever must be in the fully advanced position.
Firing Order: - The firing order is 1-5-3-6-2-4.
Spark Plugs: - Spark plugs are Metric standard. Gaps are .025 inch.

STARTER: - Model MUA4001 (R.H. Drive), Model MUA4002 (L.H. Drive). Starter is connected to the engine through a sliding gear shift built in the starting switch. Pressing down on the starting pedal meshes the gears and closes the starting switch. When the pedal is released a spring reverses these operations. Starter brush tension should be $13 / 4-2 \frac{1}{4}$ pounds each. Starter cranks the engine at 110 R.P.M. taking 250 amperes at 5.5 volts.

|  | Starter Data Model MUA-4001 |  |  |
| :---: | :---: | :---: | :---: |
| Torque | R.P.M. | Volts | Amp |
| 0 lb . ft | 4200 | 6 | 50 |
| 2 " | 1500 | 5.3 | 130 |
| 4 | 1000 | 5.0 | 200 |
| 6 | 600 | 4.6 | 275 |
| 8 " | 450 | 4.2 | 340 |
| 12.7 " | Lock | 3.6 | 480 |


| Torque | R.P.M. | Volts | Amps |
| ---: | ---: | :--- | ---: |
| $0 \mathrm{lb} . \mathrm{ft}$ | 4200 | 6 | 50 |
| 2 "" | 1500 | 5.3 | 130 |
| 4 " | 1000 | 5.0 | 200 |
| 6 " | 600 | 4.6 | 275 |
| 8 " | 450 | 4.2 | 340 |
| $22 "$ | Lock | 3.5 | 500 |

Oiling: -Starter has oilless graphite-bronze bearings. They require no attention.

GENERATOR: - Model GAB4001. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system. To adjust charging rate, remove commutator cover band and shift the third brush mounting plate by tapping on the mounting lug with a screwdriver. Shift the third brush in counter-clockwise direction to increase the charging rate and in the opposite direction to decrease the charging rate. The mounting plate is held in any desired position by the friction between the mounting lug and the generator end plate. Maximum charging rate of 17.5 amperes is reached at 1300 R.P.M. of the generator.

## Generator Data <br> Cold Test (72*F) Hot Test (206 ${ }^{\circ}$ F)

| Amps | Volts | R.P.M. | Amps | Volts | R.P.M. |
| :--- | :--- | :---: | :---: | :---: | :---: |
| 4 | 6.8 | 630 | 4 | 6.8 | 750 |
| 10 | 7.4 | 780 | 10 | 7.6 | 1000 |
| 14 | 7.8 | 950 | 13 | 8.0 | 1400 |
| 17 | 8.0 | 1300 | 11 | 7.8 | 2000 |
| 13 | 7.8 | 1950 |  |  |  |

Motoring freely at 355-390 R.P.M. generator draws 4.75.2 amperes at 6 volts. Shunt field current is 6.1-6.8 amperes at 6 volts. Tested separately each coil draws 24.4-27.2 amperes at 6 volts. Generator brush tension should be 1.0-1.5 pounds. Generator GAB-4008 has a $71 / 2$ ampere field fuse mounted on top of generator just. forward of commutator end head. It also carries a circuit breaker mounted on top. of the generator just forward of the field fuse. (Further data on relay is given under RELAY.)
Oiling: - Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY: - On generator GAB-4001 no relay is used. The generator is connected to the battery through the ignition switch. With engine stopped and ignition switch on battery discharges through generator windings.
On generator GAB-4008 relay model CB-4014 is used. Relay closes at 545-620 generator R.P.M. at 7.9 volts. Charging current at closing of contacts not over 5 amperes. Contacts separate .025-. 035 inch. Air gap is $.010-.030$ inch with points closed.

LIGHTING: - Clum Switch Model XA-314, superseded by XA-319. Head and stop lamps are each $6-8$ volt, 21 cp. S.C. Dash and tail lamps are connected in series. They are each 3-4 volt, 2 cp . D.C. and S.C.

FUSES: - Lighting fuse mounted on switch is 20 amperes.

1927 (Early) Hudson
NOTE: This wiring used until about March 1, 1927


# 1927 (Late) HUDSON SUPER-SIX AUTO-LITE GENERATING, STARTING AND LIGHTING SYSTEM AUTO-LITE IGNITION 

BATTERY: - Prest-O-Lite, Type 6-15-JFK, 6 volt. Starting capacity is 120 amperes for 20 minutes. Lighting capacity is 5 amperes for 20 hours. The negative terminal is grounded.

IGNITION: - Coil Model CE-4001. Distributor Model IGA-4023 and IGA-4024. Breaker contacts separate .020-. 024 inch when new. After 1000 miles operation contact gap should be set at $.018-.020$ inch. Resurface contacts whenever necessary a fine flat contact file or on a medium hard oilstone. Distributor is semi-automatic. Manual advance is $25^{\circ}$ (engine).
Automatic advance begins at 400 R.P.M. (engine). Maximum automatic advance is $50^{\circ}$ (engine) at 3200 R.P.M. Breaker arm spring tension is $18-20$ ounces. Distributor is fitted with an Electro-lock. When distributor is removed for servicing, the Electro-lock must be removed with the distributor.
Oiling: - Put 6 or 8 drops of light engine oil in the oiler on the side of the distributor housing every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks. Put one drop of oil in the breaker arm pivot every week or each 250 miles. Place a small bit of vaseline on the face of the breaker cam under the fiber bumper every 5000 miles.
Timing: - Breaker contacts begin to separate when the piston entering power stroke reaches a position $1 \frac{1}{4}$ inches (on the flywheel) before top dead center with the spark control lever in the fully advanced position. To set timing, crank engine until piston No. 1 reaches this position. The flywheel mark will then be opposite the indicator visible through crankcase opening.
Firing Order: - The firing order is 1-5-3-6-2-4.
Spark Plugs: - Spark plugs are Metric standard. Gaps are .025 inch.

STARTER: - Model MUA-4001 (R.H. Drive). Model MUA-4002 (L.H. Drive). Starter is connected to the engine through a sliding gear shift built in the starting switch. Pressing down on the starting pedal meshes the gears and closes the starting switch. When the pedal is released a spring reverses these operations. Starter brush tension should be $13 / 4-21 / 4$ pounds each. Starter cranks the engine at 110 R.P.M. taking 250 amperes at 5.5 volts.

## Starter Data

Model MUA-4001

| Torque | R.P.M. | Volts | Amps |
| :--- | ---: | :--- | ---: |
| $0 \mathrm{lb} . \mathrm{ft}$ | 4200 | 6 | 50 |
| 2 "" | 1500 | 5.3 | 130 |
| 4 " | 1000 | 5.0 | 200 |
| 6 " | 600 | 4.6 | 275 |
| 8 " | 450 | 4.2 | 340 |
| $12.7 "$ | Lock | 3.6 | 480 |

Oiling: - Starter has oilless graphite-bronze bearings. They. require no attention.

| Starter Data <br> Model MUA-4002 |  |  |  |
| ---: | :---: | :---: | ---: |
| Torque | R.P.M. | Volts | Amps |
| 0 lb. ft. | 4200 | 6 | 50 |
| 2 " | 1500 | 5.3 | 130 |
| 4 | " | 1000 | 5.0 |
| 6 | " | 600 | 4.6 |
| 8 | " | 450 | 4.2 |
| 22 | " | Lock | 3.5 |

GENERATOR: - Model GAB-4008. The direction of rotation is counter-clockwise, looking at the commutator end. Generator current regulation is by the third brush system. To adjust charging rate, remove commutator cover band and shift the third brush mounting plate by tapping on the mounting lug with a screwdriver. Shift the third brush in a counter-clockwise direction to increase. the charging rate and in the. opposite direction to decrease the charging rate. The mounting plate is held in any desired position by the friction between the mounting lug and the generator endplate. Maximum charging rate of 17.5 amperes 13 reached at 1300 R.P.M. of the generator.

## Generator Data

|  | Cold Test $\left(72^{\circ} \mathrm{F}\right)$ |  |  | Hot Test $\left(206^{\circ} \mathrm{F}\right)$ |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Amps | Volts | R.P.M. |  | Amps | Volts | R.P.M. |
| 4 | 6.8 | 630 |  | 4 | 6.8 | 750 |
| 10 | 7.4 | 780 | 10 | 7.6 | 1000 |  |
| 14 | 7.8 | 950 | 13 | 8.0 | 1400 |  |
| 17 | 8.0 | 1300 | 11 | 7.8 | 2000 |  |
| 13 | 7.8 | 1950 |  |  |  |  |

Motoring freely at 355-390 R.P.M. generator draws 4.75.2 amperes at 6 volts. Shunt field current is 6.1-6.8 amperes at 6 volts. Tested separately each coil draws 24.4-27.2 amperes at 6 volts. Generator brush tension should be 1.0-1.5 pounds.
Oiling: - Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY: - Model CB4014. Relay is mounted on the generator. Relay contacts close at 545-625 R.P.M. when the generator voltage reaches 7-7.5 volts and open with a discharge current of 0-2.5 amperes. Charging current must not exceed 5 amperes at closing of contacts. Contacts separate $.025-035$ inch. Air gap is .010-. 030 inch with contacts closed.

LIGHTING: - Clum Switch Model 10643. Auto-Lite No. XA-319. Head lamps are 6-8 volt, 21 cp . double filament using second 21 cp . instead of dimming. Stop lamp is 6-8 volt, 21 cp . S.C. Side, dash and tail lamps are each 6-8 volt, 3 cp. S.C.

FUSES: - Generator field fuse is 7.5 amperes. Lighting fuse on switch is 20 amperes.

## (Continued from preceding page)

Oiling: - Put 4 or 5 drops of light engine oil in each of the generator bearing oilers every two weeks or each 500 miles if the car is driven more than 500 miles in two weeks.

RELAY: - Model CB4014. Relay is mounted on the generator. Relay contacts close at 545-625 R.P.M. when the generator voltage reaches $7-7.5$ volts and open with a discharge current of $0-2.5$ amperes. Charging current must not exceed 5 amperes at closing of contacts. Contacts separate . $025-035$ inch. Air gap is $.010-.030$ inch with contacts closed.
LIGHTING: - Clum Switch Model 10643. Auto-Lite No. XA-319. Head lamps are 6-8 volt, 21 cp . double filament using second 21 cp . instead of dimming. Stop lamp is $6-8$ volt, 21 cp . S.C. Side, dash and tail lamps are each 6-8 volt, 3 cp . S.C.

FUSES: - Generator field fuse is 7.5 amperes. Lighting fuse on switch is 20 amperes.


