



OWNER'S MANUAL

1935

TO THE OWNER
of this
TERRAPLANE SIX MOTOR CAR

A great deal of money, time and care has been devoted to the proper designing, manufacturing and preparation of this car for delivery into your hands.

We share your pride in its character and appearance, and our sincere hope is that you derive from its operation the full enjoyment and utility to which you looked forward when purchasing It

For these reasons, may we take the liberty of suggesting that a fine mechanism such as this new car of yours will always respond with its best to considerate treatment and care?

It will repay you well for the slight outlay in attention and cost required to give it regular and proper lubrication, inspection at stated intervals, and such adjustments as may be indicated from time to time.

Terraplane and Hudson Distributors and Dealers in your community, and practically everywhere you may drive, are prepared with equipment facilities and experienced personnel to give your car uniform, proper and complete attention in these respects at moderate prices for the materials supplied and services rendered. We recommend to you their expert and friendly interest in your car.

As to this manual itself, its chief purpose is to acquaint you with the means of taking the best care of your car, so that you may derive from it the full measure of operating quality and long, economical life built into it at the factory. Will you cooperate to the extent of reading this manual and keeping it in the locker box of your car for ready reference as needed?

HUDSON MOTOR CAR COMPANY
Detroit, Michigan

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Warranty

"We warrant each new passenger automobile manufactured by us to be free from defects in material and workmanship under normal use and service, our obligation under this warranty being limited to making good at our factory any part or parts thereof, including all equipment or trade accessories (except tires) supplied by the Car Manufacturer, which shall, within ninety (90) days after making delivery of such vehicle to the original purchaser or before such vehicle has been driven 4,000 miles, whichever event shall first occur, be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective, this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part, and we neither assume nor authorize any other person to assume for us any other liability in connection with the sale of our vehicles.

"This warranty shall not apply to any vehicle which shall have been repaired or altered by other than an Authorized Terraplane and Hudson Distributor or Dealer in any way so as, in the judgment of the Manufacturer, to affect its stability or reliability nor which has been subject to misuse, negligence or accident."

HUDSON MOTOR CAR COMPANY

Detroit, Michigan, U. S. A.

Inspection Service

Upon delivery of the new car the Dealer will furnish the owner with an Owner's Service Policy and Identification Card, which en-titles the owner to replacement of any defective parts in accordance with the Standard Warranty.

The car will be inspected and lubricated by the Dealer who sold the car at the expiration of 500 miles of driving at no charge other than the list price of engine oil, lubricants or supplies used'. If the car is taken to a Terraplane and Hudson Dealer other than the one who sold it, the inspections will be made at a nominal cost.

The 500-mile inspection includes the following operations:

Lubrication

- | | |
|------------------------|----------------------|
| 1. Chassis Fittings | 5. Starter |
| 2. Engine (Change Oil) | 6. Distributor. |
| 3. Water Pump | 7. Hood Locks |
| 4. Generator | 8. Door Lock Striker |
| 9. Door Dovetails | |

Mechanical Inspection

- | | |
|---|-------------------------------------|
| 1. Check Engine Tune-up
(Minimum Vacuum Gauge
Reading—18) | 8. Front Wheel Bearing Adjustment |
| 2. Fan Belt Adjustment | 9. Lamps
(Connections and Bulbs) |
| 3. Generator Charging Rate | 10. Battery |
| 4. Generator, Starter and Battery
Connections | 11. Clutch Pedal Adjustment |
| 5. Generator Relay | 12. Rear Wheels Tight on Taper |
| 6. Generator Regulator | 13. Tighten All Wheel Bolts |
| 7. Water Pump Gland | 14. Adjust Door Strikers |
| | 15. Inflate Tires |
| | 16. Fill Radiator |
| | 17. Front Wheel Alignment |

License Data

Car Serial Number (on plate on dash under hood)	52101 and up
Engine Serial Number (stamped on left side of cylinder block opposite cylinder number 6)	103000 and up
Number of Cylinders	6
Cylinder Bore	3"
Stroke of Piston	5"
NACC Horsepower Rating..	21.6
Piston Displacement	212 cu in.

Body Types

Coupe—Business	Coach with Trunk
Coupe--Rumble Seat	Sedan
Coupe—Convertible	Sedan with Trunk
Coach	

Technical Information

Engine

Type	6 Cylinders en bloc
Compression Ratio	Standard—6 to 1
Optional -	—7 to 1
Actual Horsepower Developed	
6 to 1 Compression	88 @ 3800
7 to 1 Compression	100 @ 3800
Firing Order	1-5-3-6-2-4
Number Main Bearings	3
Main Bearing Clearance	.001"
Main Bearing End Play	.006"—.012"
Valve Material	Silicon Chrome Alloy Steel
Valve Head Diameter	Intake, 1-3/8"; Exhaust, 1-3/8
Valve Tappet Clearance (Hot)	Intake, .006"; Exhaust, .008

Camshaft DriveGears
 Connecting Rod Lower Bearing Clearance......001"; End Play, .006"-.010"
 Piston MaterialLo Ex Aluminum Alloy
 Piston TypeT Slot Cam Ground
 Piston Weight, Ounces9.6
 Skirt Clearance001"
 Number Piston RingsCompression, 2; Oil Control, 2
 Width of Piston Rings......Compression, 332"; Oil Control, 3/16"
 Piston Ring Gap009"-.011"
 Lubrication SystemHudson Duo-flo Automatic
 Oil Pump TypeOscillating Plunger
 Oil Reservoir Capacity5 Quarts
 Capacity of Lubrication System6 Quarts

Cooling System

TypePump Circulation
 Radiator TypeRibbon Cellular
 Cooling System Capacity4% 2" Gallons
 Fan Belt "V" Type

Fuel System

CarburetorMake, Carter; Type, Down Draft; Size, 1¼"
 Choke ControlAutomatic
 Heat ControlAutomatic
 Fuel DeliveryPump
 Air CleanerIntake Silencer Type
 Gasoline Tank Capacity.....¹⁵% 2 Gallons

Starting and Ignition

MakeAutolite
 Spark ControlAutomatic
 TimingDead Center
 Firing Order1 3 36 2 4
 Distributor Gap020"
 Spark Plug TypeJ-7_ Metric
 Spark Plug Size14 Mm.
 Spark Plug Gap022"
 Generator RegulationThird Brush and Voltage Regulator
 Generator Charging RateCold, 22 Amps.; Hot, 17 Amps.

Clutch

TypeOil Cushioned, Single Plate
 Clutch Pedal Clearance at Floor Board

Transmission

TypeSelective
 Gear RatioLow, 2.42; Second, 1.6; High, 1; Reverse, 3.30
 Lubrication.....Summer, S.A.E. 110; Winter, S.A.E. 80; Capacity, 3 Pints

Lamp Bulb Specifications

	C. P.	Base	Voltage	Mazda No.
Head	21-32D.C.	D. C.	6-8	2320-C
Parking	3	S. C.	6-8	63
Dash Signals	3	D. C.	6-8	64
Instruments	3	S. C.	6-8	63
Stop and Tail	2-21	D. C.	6-8	1158
Dome	15	S. C.	6-8	17

Fuse—Headlamp Circuit, 20 Amps.

Tail Lamp Circuit, 20 Amps.

Rear Axle

TypeSemi-Floating
 Bearing TypeTaper Roller Throughout
 Lubrication.....Summer, S.A.E. 110; Winter, S.A.E. 90; Capacity, 3 Pints

Front Axle

Toe-in0 to 1/8"
 Caster3-1/4°-3-3/4°
 Camber1°-1½°

Brakes

Type4-Wheel Cable Control
 Size9" x 1-3/4"
 Clearance Between Lining and Drum010"

Steering Gear

TypeVariable Pitch Worm and Sector
 Gear Reduction15 to 1
 LubricantSummer, S.A.E. 160; Winter, S.A.E. 110

Tires

Size16 x 6.00
 Minimum Air PressureFront, 22 Lbs.; Rear, 28 Lbs.

Chassis Dimensions

Wheelbase112"
 TreadFront, 56"; Rear, 56"
 Road ClearanceFront Axle, 7-3/8"; Rear Axle, 8-1/2"
 Clearance for Jack (One Tire Flat)Front Axle, 4-3/4"; Rear Axle, 6-5/8"
 Over-all Length, including Bumpers
 Sedan and Coach186"
 Sedan and Coach with Trunk188-1/2"
 Coupe.....190"

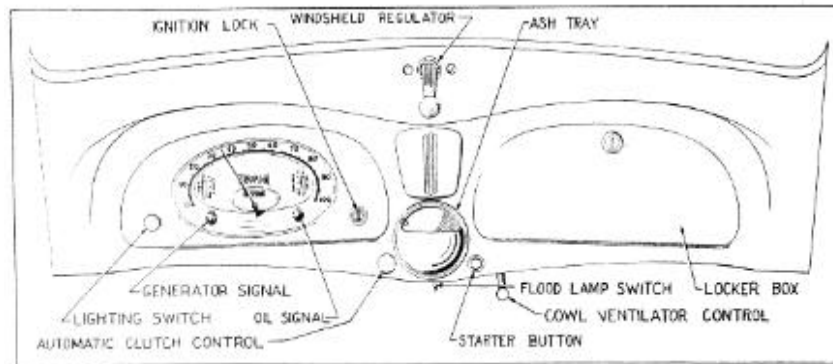


Figure 1

OPERATION

The operation of the Terraplane Six follows standard practice in many respects; however, even those accustomed to Hudson products may refresh their memories on some of the details by reading the following paragraphs:

The clutch is disengaged in the conventional manner by depressing the left foot pedal to release the engine drive from the transmission. When the button on the left of the ash tray is pushed in, the automatic clutch control becomes operative. The clutch is then disengaged simply by removing the foot from the accelerator pedal.

The transmission operation conforms to the standard shift. The clutch must be disengaged (either by using the pedal or by removing the foot from the accelerator pedal when automatic clutch control is being used) before shifting gears.

The "Electric Hand" transmission control, which is available as a factory-installed option, has a small lever conveniently located just under the rim of the steering wheel. This lever has five positions arranged in the form of the letter H, corresponding to the neutral, three forward and reverse positions of the standard transmission shifting lever. This lever is easily moved to any of the forward gear positions to select the gear desired. As a safety feature, it is necessary to lift up on the lever and at the same time push forward in order to get into the reverse position.

The control is electrical, while the actual shifting is accomplished by vacuum power from the engine intake manifold. The control is interconnected with the ignition switch and a circuit breaker on the clutch pedal, making it necessary to have the ignition turned on and the clutch pedal depressed (clutch disengaged) before the system is energized to accomplish a shift of gears. The starter is also inter-connected with a switch operated by the clutch pedal, requiring the clutch to be disengaged before the engine can be started. This is a safety feature preventing the car from being moved should the engine be started while the transmission is in gear.

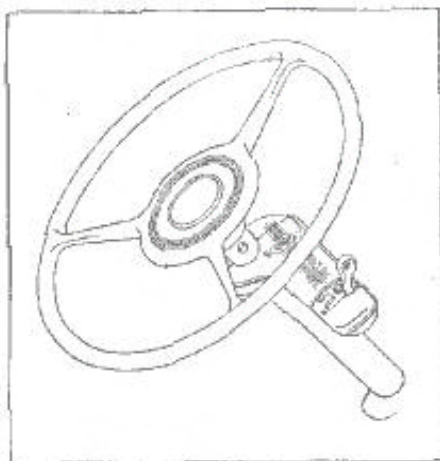


Figure 1a

To operate a car equipped with "Electric Hand": (1) depress the clutch pedal, (2) turn on the ignition switch, (3) press the starter button. Now, with the engine running and the clutch disengaged (if vacuum clutch control is being used it is not necessary to hold the clutch disengaged with the foot after the engine is started; simply take the foot off the accelerator pedal), move the finger tip control to the gear position desired and the shift will be completed immediately. Allow the clutch to engage while depressing the accelerator and the car will move normally for the gear selected. When it is desired to

make another shift, simply depress the clutch pedal, move the finger tip control to the gear desired, and allow the clutch to re-engage.

With vacuum clutch the entire operation consists simply of removing the foot from the accelerator pedal, moving the finger tip control to the desired gear, then depressing the accelerator pedal to re-engage the clutch and feed the desired amount of gasoline mixture to the carburetor.

A small toggle switch mounted on the control arm can be used to make the finger tip control inoperative when the car is being serviced or to prevent tampering with the shifting mechanism.

The need of a gear shift lever is eliminated on cars equipped with finger tip control, except should it be desired to shift the transmission when the engine is not running. A shifting lever is included in the tool kit for this purpose. By removing the cover in the floor mat, which exposes the top of the transmission control, the shifting lever can be put in place and any desired shift made after the clutch pedal has been depressed. The toggle switch on the selector switch housing should be turned off while the shifting lever is in place.

The brakes are operated on all four wheels either by depressing the right foot pedal or pulling backward on the hand lever located to the left of the clutch pedal. The engine speed is controlled by the foot accelerator. The engine idling speed is automatically increased to prevent stalling when the engine is cold.

The lights on the car are operated by the main lighting switch, which is the knob to the left of the instrument group, the front compartment flood light switch located under the instrument panel to the right of the ignition switch, the driving light control switch on the toe board to the left of the clutch pedal, the dome lamp switch located on the dome lamp, and the stop lamp switch.

The main lighting switch has three positions. Parking, city driving and country driving are obtained as the knob is turned.

When the main lighting switch is in the city or country driving position, the driving light control (foot) switch becomes effective. By pressing this control button and releasing it the headlamp beams may be deflected to the city driving position immediately in front of the car, or to the country driving position in which the light will be projected a considerable distance ahead of the car. (See page 37 for Adjustment of Headlamps.)

The front compartment and dome lamp switches are of the conventional toggle type.

The stop lamp switch is located on the chassis frame and is connected to the brake linkage so that the stop light is illuminated when the brakes are applied.

The starter is controlled by the push button to the right of the ash tray.

The carburetor is equipped with Climatic Control (self-controlled choke) which gives correct fuel mixture for all starting and running conditions with-out *any* manual control on the part of the operator.

The oil pressure signal is the red jewel located to the right of the center of the instrument group. When the ignition switch is turned "on" this signal will be lighted. If it remains lighted or flashes while the engine is running above idling speed, the engine should be stopped and the oil level in the reservoir checked. If necessary, check the oil lines. Do not run the engine until the trouble is corrected.

The generator signal is the red jewel located to the left of the center of the instrument group. When the ignition switch is turned "on" this signal will be lighted and should stop glowing when the engine reaches a speed slightly above normal idling. If the signal flashes when the car is being driven above twenty miles per hour, it indicates that the battery is not being charged. Your electrical system should be checked by your Terraplane and Hudson Dealer.

The gasoline gauge, located at the left of the instrument group, indicates the quantity of gasoline in the tank.

The radiator water level indicator is located at the right side of the instrument group and, like the gasoline gauge, is operative only when the ignition is turned on.

Starting the Engine

Before attempting to start a cold engine, depress the accelerator pedal slowly approximately quarter to half way and release. This will allow the high idle speed stop to come into position to prevent stalling during the warming-up period. Insert the key in the ignition lock and turn to the right. Press the starter control button to bring the starter into action and start the engine.

If the engine is warm from previous running, depress the accelerator pedal quarter to half way and hold in this position during the starting operation.

If the engine does not start after 15 to 20 seconds of cranking, release the starter button and after a few seconds repeat the starting operation.

Do not work the accelerator pedal up and down, except as previously mentioned, either before or during the starting operation, as this will cause the accelerator pump to supply an excessive amount of gasoline and prevent correct starting.

Should a flooded condition of the carburetor develop, either through operation of the accelerator pedal or continuous cranking without the ignition turned on, depress the accelerator pedal fully for further cranking of the engine. With the accelerator pedal in this position, the choke is held open so that the excessive amount of gasoline can be drawn through the engine readily.

Failure of the engine to start when the above procedure is followed can usually be traced to improper engine adjustments or, in cold weather, a combination of this and improper engine lubricant. The car should be taken to an Authorized Terraplane and Hudson Dealer for adjustment or replacement of the oil with the correct grade for the local operating conditions.

Breaking-in Instructions

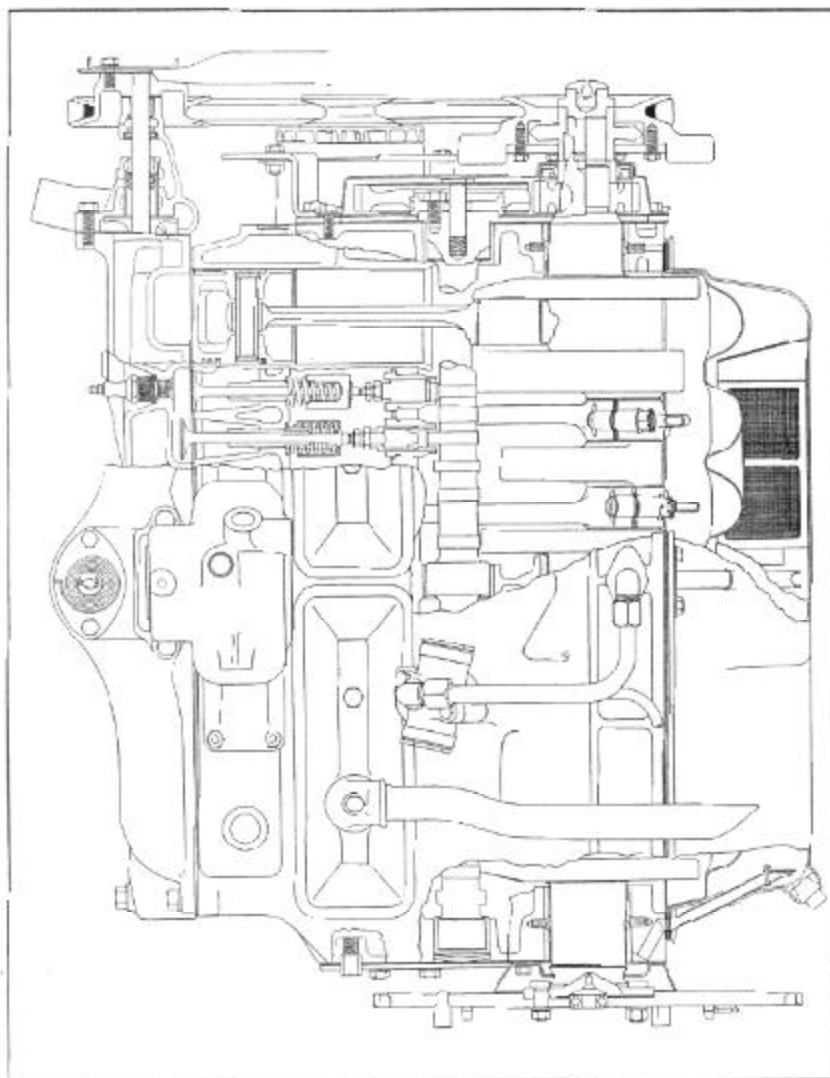
Your Terraplane has been designed in accordance with the best practices determined by years of experience and built under the most rigid standards of precision. Before shipment from our factory each mechanical unit was supplied with the proper quantity of correct lubricant to give maximum protection to the finely finished working parts. In fact, every precaution has been taken to put in your hands an unexcelled mechanism, properly protected against premature wear. Extreme care has been exercised in selecting and testing each lubricant used and there is, therefore, no necessity of replacing any lubricants until the normal change mileage has been reached.

In order to enjoy the maximum in life and trouble-free performance which has been built into your Terraplane Six, you should at all times give it the consideration that any fine mechanism deserves.

During the first one thousand miles you should be diligent in following accepted practice, as described in later paragraphs, to permit proper break-in of the finely finished working parts. Failure to follow this practice may result in damage to bearing surfaces, cylinder walls or pistons, or abnormal increases in clearances, which will shorten the life and impair the performance of the units.

Keep the radiator full of water at all times. Maintain the proper oil level in the oil reservoir, using the correct grade of good quality oil as prescribed on page 16.

Do not accelerate fast during the break-in period, as this throws extreme loads on the working parts. When increasing the speed of the car depress the accelerator pedal gradually. Use second gear under adverse driving conditions. Do not apply the brakes harshly, as braking surfaces require the same care during the break-in period as do engine parts. Hard application of the brakes during the first few hundred miles may score the brake drums or gall the linings.



Terraplane Engine

The following recommendations should be followed as to speed during the first one thousand miles of driving. These recommendations are maximum safe speeds under favorable operating conditions. The speed of the car should be decreased under unfavorable conditions, such as rough or rutted roads, or in climbing steep or continuous up-grades.

0-250 MILES

Do not exceed 40 miles per hour in high gear or 20 miles per hour in second.

Do not accelerate rapidly. Use second gear on steep grades.

250-500 MILES

Do not exceed 50 miles per hour in high gear or 25 miles per hour in second.

500-1,000 MILES

During this period the speed should not exceed 60 miles per hour.

Important

Maintain oil level in crankcase within "oil level range" on oil level gauge, Figure 2, at all times.

Do not drive at a high rate of speed until the engine is thoroughly warmed up. Cold oil cannot flow freely into the small clearances between the working surfaces so that damage may occur if this is not observed.

Special Lubricants

THERE IS NO NECESSITY OF USING SPECIAL LUBRICANTS CONTAINING GRAPHITE OR OIL CONCENTRATES EITHER IN THE ENGINE OIL RESERVOIR OR BY ADDING TO THE GASOLINE DURING THE BREAK-IN PERIOD. If such practices are followed by the owner, he should be guided as to quantities by the recommendations of the manufacturer of the special lubricant. Only light, finely refined oils should be added to the gasoline and not to exceed one quart to a full tank of gasoline.

Even where these special practices are followed, the recommendations of the foregoing paragraphs as to speeds and operation should be adhered to strictly.

ENGINE

The unusual power, efficiency and economy of the Terraplane engine are due to a combination of such advanced designs as the chrome alloy cylinder block, giving great strength and wearing qualities so as to almost eliminate wear on cylinder walls and valve seats; silicon aluminum alloy pistons, cam ground and fitted with a clearance of .001"; silicon chromium steel valves; patented radial flow intake manifold with down draft carburetion; all built around a fully compensated crankshaft and lubricated by the Hudson Duoflo Automatic Lubricating System.

The crankshaft is a heavy forging with integral compensating weights. Full compensation, together with three main bearings and a torsional dampener

mounted on the front, insures free running of the crankshaft under all operating conditions. The main bearings are removable bronze backed, virgin babbitt and are fitted to .001" clearance and provided with shims for adjustment. The working member of the dampener is rubber, fully enclosed, requiring no adjustment.

The connecting rods are steel forgings carrying spun virgin babbitt bearings in the lower end fitted with a clearance of .001" and having shims provided for adjustment. The upper end is fitted with a bronze bushing, to which the piston pin is fitted with .000 clearance.

The pistons are of silicon aluminum alloy of new design. This alloy is hard, lighter than aluminum and dissipates heat rapidly. The piston is "T" slotted to compensate for expansion; cam ground to give full bearing on the cylinder wall; and is fitted with two compression rings and one oil control ring above the piston pin and one oil control ring below. With this arrangement all of the rings are located somewhat lower down on the piston, with the result that cooler operating conditions and better oil control are obtained. The piston is attached to the connecting rod by a full floating pin, which is honed to give a perfect bearing in the diamond-bored piston bosses. The piston pin is a snug fit in the piston bosses when the piston is heated to 200° F.

This piston design permits fitting to the cylinder with a clearance of .001". The pistons are removable from the top of the cylinder bore.

The camshaft is Electric Furnace Alloy, with hardened bearing and cam surfaces. End play is prevented by a spring and plunger pressing against the front end of the shaft.

The valves, which are silicon chromium steel, are operated by the cams through adjustable tappets. The tappets should be adjusted while the engine is at normal operating temperature. To adjust the tappets, remove the engine side cover plates (right side of engine below intake manifold) and insert a feeler gauge between the top of the tappet screw and bottom of the valve stem while the engine is running. The valve tappets should be adjusted to a feeler gauge clearance of .006" on the intake valves and .008" on the exhaust valves. The tappet screw locking nut should be tightened securely after adjustment. The tappet clearance is important and should be set accurately to the recommended dimensions.

The valve timing is determined by the meshing of the crankshaft and cam-shaft gears. The tooth of the crankshaft gear with the punch mark on the front face should mesh between the two punch marked teeth of the camshaft gear.

Lubrication System

The Hudson Duo-flo Automatic Lubrication System gives a positive flow of oil to every working part of the engine from the moment of starting throughout the period of operation. It also, through in-built features, conditions the oil so that all oil supplied by the oscillating plunger pump is cooled and freed of solid matter and diluents.

There are only two moving parts in the entire system—the oscillating plunger and the driveshaft of the pump, which is driven by gears direct from the camshaft. There are no small drilled passages to clog or restrict free flow of oil when cold. The oil pipes (three in number) are all located outside the engine and can readily be removed should there be any necessity to do so.

The crankcase ventilators mounted on the valve chamber covers are unusually effective, as diluents consist mainly of unburnt gasoline and water coming from the cylinders and crankcase walls and cannot enter the oil reservoir but are retained in the crankcase. The temperature here is near the boiling point of these diluents and, with the agitation of the moving parts of the engine, they are readily vaporized and removed by the slight suction maintained on the ventilator tubes.

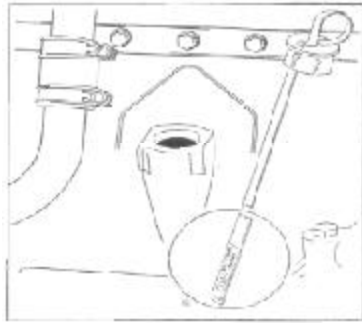


Figure 2

The flow of oil after returning to the crankcase is controlled so that it circulates around passages adjacent to the cool outside walls of the reservoir and is cooled before passing through the filter, which removes all solid matter before the oil is recirculated by the pump.

The filter surfaces are so placed that they are flushed each time the crankcase oil is drained and, therefore, require no special cleaning nor do they have to be replaced. Under operating conditions, one quart of oil is retained in the crankcase in addition to the five quarts of oil in the reservoir. If the oil reservoir

is removed, one quart of oil should be put into the upper crankcase tray and five quarts in the reservoir.

The quantity of oil in the reservoir can be determined by the bayonet gauge attached to the filler cover. (See Figure 2.) When the oil level is down to the low mark, one inch from the bottom of the gauge, three quarts of oil remain in the reservoir. Two additional quarts are required to bring the level up to the high mark at the top of the oil level gauge. When the reservoir only is drained by removal of the drain plug at the rear of the reservoir, five quarts of oil should be used, filling through the opening in the left side of the crankcase. (See Figure 2.)

The red jewel mounted to the right of the center of the instrument group should be lighted when the ignition is turned on but go out when the engine is running at slightly more than idling speed. Flashing of the light at idling speed indicates proper operation. Should the light come on when the engine is running above idling speed it indicates interruption of the oil supply and the engine should be stopped until the cause is corrected.

Lubricants

It is important that the proper lubricants be selected to give protection to the working parts and at the same time provide free movement of the parts at the lowest temperature encountered. The following recommendations should be adhered to strictly.

Use a good quality oil as specified for the lowest atmospheric temperature encountered, as follows:

Atmospheric Temperature	Oil Specification
40° Fahrenheit and higher	S. A. E. 30
40° to 0° Fahrenheit	20 W.
0° to —15° Fahrenheit	10 W.
Below—15° Fahrenheit	10 W.+10% Kerosene

The oil level should be maintained within the "oil level range" on the oil level gauge at all times. Drain oil after first 500 miles of operation and at 2,000-mile intervals thereafter. Refill with five quarts of oil of proper specification

Ignition System

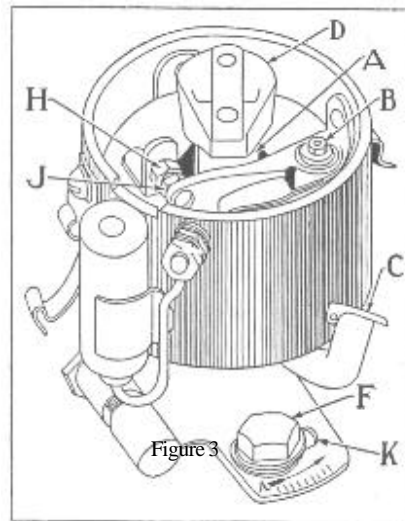


Figure 3

Figure 3

The distributor is mounted on the right side of the crankcase and driven by gears from the camshaft. A single breaker arm is operated by a six-lobe cam. Automatic advance is incorporated so that the correct timing is given at all speeds.

The oil cup (C), Figure 3, should be filled with oil every 2,000 miles. At the same time remove the distributor cap (not shown) and rotor arm (D), placing a few drops of oil on the wick in the top of the shaft, one drop of oil on the breaker arm pivot (B), and apply a light coating of vaseline on the cam block (A).

The breaker points should be adjusted to .020" maximum opening. The points should be clean and set squarely on each other. If the points

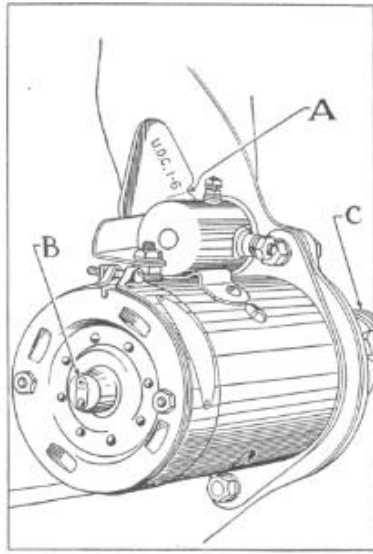


Figure 4

become pitted it is necessary to re-move them and grind smooth or re-place with new ones. The grinding should be done in a special machine to insure proper seating. This operation should be done by an Authorized Terraplane and Hudson Service Station.

Filing or honing of the points will remove oxidization from the points but, due to the hardness of the tungsten alloy used, this method is not practical for removing deep pits.

The ignition timing is determined by the position of the piston when the distributor breaker points begin to open. In general, the points should begin to open when the piston reaches its highest position in the cylinder. This position of the piston is referred to as upper dead center and is indicated by U. D. C. Marks are placed on the flywheel to indicate when this position of the piston has been reached.

Since the piston in a four-stroke cycle engine may be completing the exhaust stroke or completing the compression stroke and ready for the power stroke, when it is at U. D. C., it is necessary to determine the stroke as well as the piston position.

To determine this, remove the spark plug from number one (front) cylinder. Place the finger over the spark plug hole and crank the engine slowly, using the hand crank. Air pressure against the finger indicates that the piston is coming up on the compression stroke. After this is felt, continue cranking the engine slowly until the mark U. D. C. 1 and 6 is directly in line with the pointer on timing inspection hole in the rear support plate of the motor as indicated at (A), Figure 4. The piston is then at U. D. C. and ready to move downward on the power stroke.

With the engine in this position the rotor arm (D), Figure 3, of the distributor should be in the position shown in the illustration. When the distributor cap is put in place, the metal strip on the rotor arm should be directly under the terminal to which number one spark plug wire is attached. The other cables should be in the cap terminals in the order 1-5-3-6-2-4, following in a clockwise direction. The cable in the center terminal of the distributor cap should go to the central (high tension) terminal of the ignition coil.

Loosen the distributor clamp screw (F), Figure and turn the distributor until the fiber block (A) of the breaker arm is on the highest point of the cam. Measure the gap between the breaker points with a feeler gauge. This gap

should be exactly .020". If adjustment of the gap is required, loosen lock nut (H) and turn adjusting screw (J) until the proper gap is obtained. Tighten lock nut (H) and re-check the gap.

Turn the distributor housing clockwise to the limit of the slot in the clamping plate (K). Remove the central cable from the distributor cap and place the bare end about $\frac{3}{8}$ " from the intake manifold. With the ignition turned on, turn the distributor body counterclockwise slowly just until a spark jumps from the high tension wire to the intake manifold. Tighten clamp screw (F), replace central cable in distributor cap and clamp cap on distributor.

The foregoing operations give dead center timing. This, however, due to variations in fuel characteristics (octane rating), is only approximately correct. To get the correct setting the car should be driven until the engine has reached its normal operating temperature. Allow the car to slow down to 8 miles per hour in high gear on a level, hard-surfaced road, then depress the accelerator rapidly to its limit of travel. As the car accelerates from 10 to 15 miles per hour a slight spark knock should develop. If a knock is not heard, loosen distributor clamp screw (F) and turn the distributor counterclockwise one graduation of the clamping plate (K) and repeat the acceleration test. Repeat this operation until the knock is heard. The higher the octane rating of the gasoline being used the greater the advance required to get maximum performance and fuel economy. However, the timing should not be set ahead of the $\frac{3}{4}$ " advance mark.

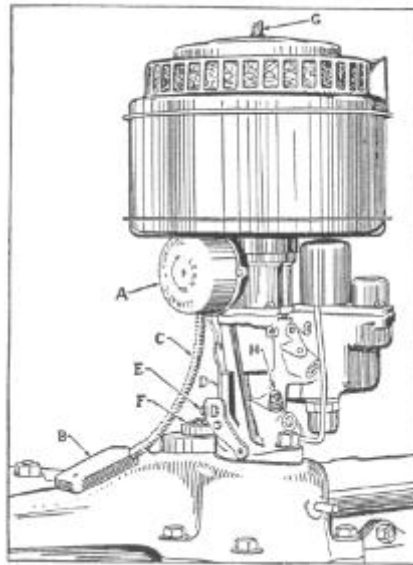


Figure 5

Carburetor and Fuel System

The carburetor is of the down draft type, incorporating Climatic Control (self-controlled choke), automatic heat control, and an accelerating pump. The only manual control for the operator is the accelerator pedal controlling the throttle opening for regulating the speed of the engine.

The choke valve, the mechanism for which is contained in the insulated housing (A), Figure 5, is fully closed when the engine is cold at average air temperatures (75 ° Fahrenheit). Hot air drawn off the exhaust manifold through the stove (B) and tube (C) enters the control housing, giving accurate positioning of the choke for all starting and operating conditions.

When the choke is closed the bar (D) is dropped behind the throttle stop screw (E) to increase the idling speed during the warm-up period. This, however, cannot drop into position until the throttle has been opened.

The heat control valve (F) is automatic in operation, supplying the correct amount of heat to the intake manifold under all operating temperatures.

The air cleaner and carburetor silencer consists of a sound absorbing chamber, on top of which is mounted a filter unit. The filter unit should be removed and washed in gasoline every 2,000 miles and re-oiled by dipping in S. A. E. 50 engine oil. Drain excess oil before replacing. The removal of wing nut (G) permits the removal of the cleaner element.

The fuel pump is driven by a cam on the camshaft. The fuel delivery is controlled by the carburetor float and valve. The cap screw holding the cover in place should be removed, permitting the removal of the cover and filter screen for cleaning every 2,000 miles. At the same time the drain plug, located just below the pump cutlet, should be removed and the sediment chamber cleaned. This should be done, particularly in cold weather, to remove any water which may have accumulated.

Engine Tuning

Do not attempt to adjust the carburetor alone. Perform all of the following operations in the order given:

1. Clean spark plugs and adjust gaps to .022".
2. Clean distributor breaker points and adjust to .020" maximum opening as described under Ignition System. (Page 16.)
3. Check battery and ignition wiring, being sure all distributor wires are pressed down in their sockets and insulation is in good condition.
4. Set ignition as described under Ignition System. (Page 16.)
5. Turn carburetor idling screw (H) into its seat and back out exactly one turn.
6. Start engine.
7. When engine has reached normal operating temperature, adjust intake valve tappet clearance to .006" and exhaust tappet clearance to .008".
8. Set carburetor throttle stop screw (E) so that engine idles at a speed equal to a car speed of 7 miles per hour in high gear.
9. Adjust carburetor idling screw (H) for smooth engine idling. The final adjustment should be from ½ to 1 turn of the screw from its full in position.
10. Road test for final ignition timing as described under Ignition System.

If the above operations, properly performed, do not give normal engine performance, the car should be taken to an Authorized Terraplane and Hudson Dealer for mechanical inspection.

Starting Motor

The starting motor is controlled by a push button on the instrument panel through a solenoid switch mounted on top of the starting motor. The switch can be operated manually by removing the cap on the rear of the switch and pushing the plunger in. The drive to the gear on the engine flywheel is through its Bendix drive which is brought into engagement by the rotation of the starting motor.

The front bearing of the starting motor should be lubricated at (B), Figure 4, with a few drops of light oil every 1,000 miles. The Bendix drive assembly (C) should be flushed with kerosene every 2,000 miles.

Generator

The generator is of the ventilated type, allowing a greater output than is practical with the non-ventilated type. The maximum output is controlled by a third brush and should be set at 22 amperes. This adjustment requires the use of an accurate ammeter and voltmeter and should be made by an Authorized Terraplane and Hudson Service Station.

A generator output regulator is mounted on the engine side of the body dash and reduces the output from 22 to 10 amperes when the battery is fully charged, reverting to the higher rate should the battery become partially discharged due to frequent starting or continuous use of lights, radio, etc. This regulation is permanently built into the regulator and no adjustment of this unit is necessary.

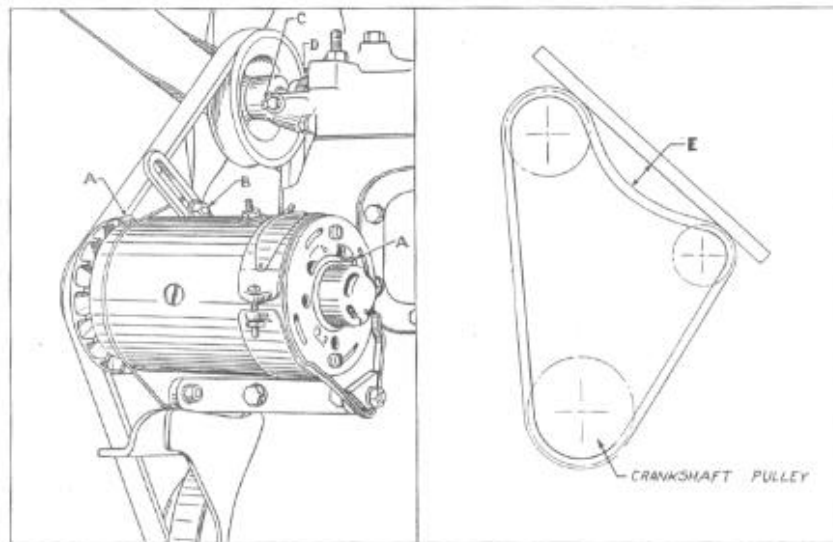


Figure 6

The generator field circuit fuse is contained in the knurled cup extending from the bottom of the regulator. If the generator fails to charge, check for a burnt-out fuse. Replacement should be made only with a 7½-ampere, 25-volt fuse.

A few drops of light oil should be supplied to cups (A), Figure 6, every 1,000 miles. Do not over-lubricate.

The generator is driven by the "V" type belt, which also drives the fan and water pump. This belt must be kept sufficiently tight to prevent slippage on the pulleys. When properly adjusted the belt will have from 1-1/4" to 1-3/4" of slack at a point midway between the fan pulley and generator pulley, as shown at (E), Figure 6. This adjustment provides sufficient tightness to prevent slippage without causing undue wear of the fan and generator hearings.

To adjust belt tension, loosen nut (B) and swing generator away from the engine until the correct position is obtained. Tighten nut (B)

Cooling System

Water Pump

The water pump is of the 6-vane type and is mounted in the forward end of the cylinder head. The roller bearing at the forward end of the pump shaft should be lubricated at 1,000-mile intervals through the pressure fitting shown at (C), Figure 6, using a high-grade water pump grease.

The packing gland nut (D) should be drawn up only finger tight. Do not use a wrench for tightening. If leakage occurs after tightening, or if nut goes to the bottom of the thread, additional packing should be added.

Cooling System Operation

The cooling system is of the pump circulation type with thermostatic heat control. This provides positive circulation, combined with a short warm-up period, in spite of a total cooling capacity sufficient to give proper cooling under the most unfavorable operating conditions.

When the water in the cooling system is cold, the thermostat which is located in the radiator inlet connection causes the water delivered from the engine by the pump to flow through a by-pass directly to the radiator outlet hose. During the warming-up period, therefore, the water in the cylinder jacket alone is circulated, while the water in the radiator is completely cut off from the remainder of the cooling system.

When the temperature of the water in the jackets has reached 140° Fahrenheit, the thermostat begins to open the passage into the radiator and at approximately 160° the by-pass is closed so that all the circulation is through the radiator.

Care of the Cooling System

In order to get the maximum efficiency from the cooling system, it must be kept clean. There is a tendency toward corrosion of parts due to electrolytic action of water containing minerals and also deposits of minerals when the water is heated. Both the corrosive scale and the mineral deposits tend to coat the cooling surfaces, reducing radiation, and in time will clog the radiator passages.

Unless special steps are taken to prevent these deposits, the cooling system should be cleaned twice a year. This cleaning is most effective when reverse flushing is used to remove deposits after they have been loosened by the use of a good cleaning solution. Since reverse flushing requires special equipment operated by compressed air, you should have this done by an Authorized Terraplane and Hudson Dealer.

The cleaning solution recommended is Terraplane Hudson Radiator Cleaner. Before using this solution, run the engine a few minutes to circulate the water and stir up loose sediment. Stop the engine and open radiator petcock and drain all water from the system.

Dissolve the contents of the container in a bucket of hot water (be sure the material is completely dissolved). Pour solution into radiator, then fill the radiator almost full of water.

With the radiator covered and filter cap tight, run the engine for about twenty minutes but avoid boiling. Stop the engine and completely drain system.

Reverse flushing will remove all of the sediment the solution has loosened.

It is important that all traces of the cleaning solution be removed as they have a detrimental effect if left in the system.

After thoroughly flushing the cooling system, the addition of Terraplane Hudson Rust and Corrosion Inhibitor to the water will neutralize the action of any cleaning compound which may not have drained out. It will also prevent corrosion of the cast iron, aluminum and other metals in the cooling system. The practice of using the Inhibitor in the cooling water is particularly advantageous for engines equipped with aluminum cylinder heads.

Terraplane Hudson Radiator Cleaner and Inhibitor can be obtained from any Authorized Terraplane and Hudson Dealer.

Anti-Freeze

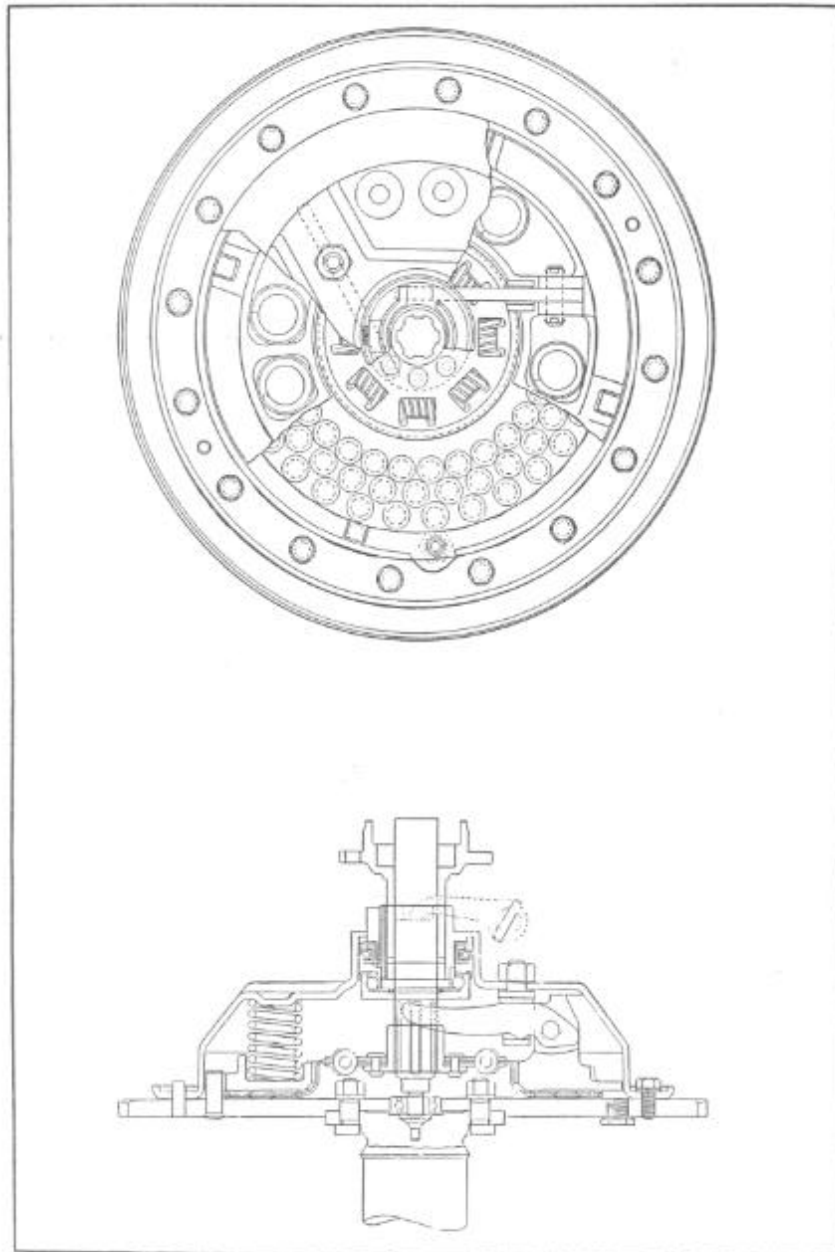
Before putting any anti-freeze in the cooling system, it should be thoroughly cleaned, all hose connections and gaskets checked for leaks, and the water pump packing replaced if necessary.

The types of anti-freeze recommended are: Alcohol, Glycerine and solutions of Ethylene Glycol marketed under various trade names.

Solutions containing calcium salts or other ingredients which promote electrolytic action should be avoided. They will cause serious corrosion of aluminum alloy as well as the solder joints of the radiator. Also avoid the use of solutions containing glucose or honey, as they will tend to clog the system; and of kerosene or fuel oil which, when hot, liberate inflammable vapors.

The following table gives the quantities of the recommended solutions required for protection against freezing at various temperatures:

Temperature Fahrenheit	Alcohol Quarts	Glycerine (G.P.A. or Equivalent) Quarts	Ethylene Glycol (Prestone or Equivalent) Quarts
+20°	3½	8	3½
+10°	5	10	4½
0°	6¾	12½	6
-10°	7¾	14½	7
-20°	9	16½	8
-30°	11	18 Full Strength	9



Clutch

CLUTCH

The clutch is of the single plate type, having a plate with frictional surfaces, which is driven by friction from the rear face of the steel flywheel and the forward face of the drop forged steel pressure plate. The frictional facing in Terraplane clutches is pliable formed cork and lubricated to give a maximum degree of smoothness in engagement.

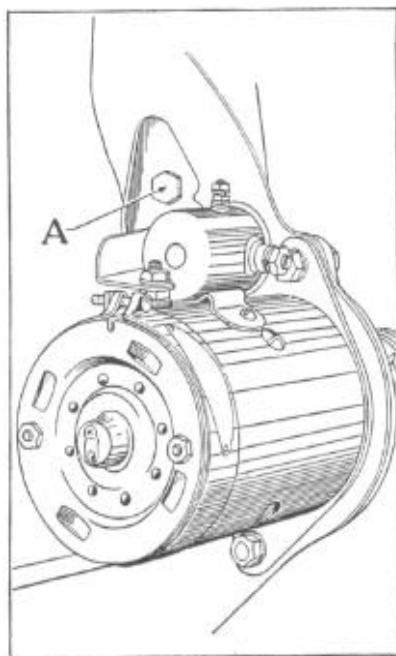


Figure 7

Due to the film of lubricant on the frictional surfaces, burning is prevented and wear is negligible. The frictional surface is always protected and maintained in proper condition by the bath of Hudsonite Clutch Compound, so that even after thousands of miles of usage there will be no material change in the characteristics.

Lubrication

The throwout bearing is a heavy duty ball bearing provided with positive lubrication through a pressure fitting located on the right side of the clutch bell housing. This should be lubricated with one ounce of light viscous grease every one thousand miles.

The Hudsonite Clutch Compound is permanently sealed into the clutch housing to prevent loss. It should be drained and replaced every five to fifteen thousand miles.

To insert the Hudsonite, turn the engine until the drain plug (A), Figure 7, in the front face of the flywheel is visible through the timing inspection hole in the left side of the rear engine plate.

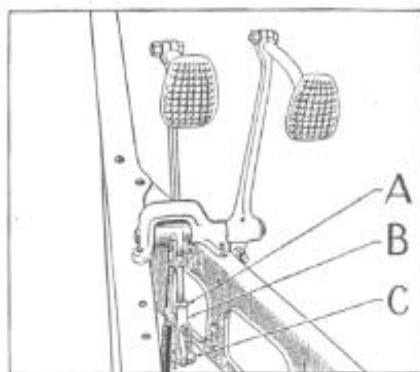


Figure 8

Remove the plug (A) and turn the engine slowly until the star stamped in the front of the flywheel is visible through the inspection hole. Allow a minute in this position to permit the clutch housing to drain, then turn the engine until the filler hole again appears in the timing hole and insert one-third pint of Hudsonite. Replace the plug and tighten securely. Hudsonite is available through all Terraplane and Hudson Distributors and Dealers.

Clutch Pedal Adjustment

The clutch is self-adjusting; however, it is necessary to adjust the clutch pedal rod to prevent the pedal from "riding" the floor board. To adjust, loosen lock nut (A), Figure 8, remove clevis pin (C) and turn yoke (B) to shorten or lengthen the rod, as necessary, so that the pedal shank can be held in a position one and one-half inches from the floor board when the clutch is engaged. Replace the clevis pin (C) and cotter pin. Tighten lock nut (A). The pedal clearance should be checked frequently as a lack of clearance will cause clutch slippage.

On cars equipped with Automatic Clutch Control pull backward on the control unit cable—on left side of engine—while the accelerator pedal is depressed. When the cable is in its extreme rearward position there should be approximately $\frac{1}{8}$ " clearance between the back of the slot in the cable yoke and the clevis pin which attaches it to the operating lever.

TRANSMISSION

The transmission is of the quick synchronizing type, incorporating helical gears to give a silent second speed. Unusual silence is obtained in all forward speeds by throwing the reverse idlers out of mesh so that they do not revolve except when in actual use. Through the use of steel alloyed with nickel, chrome and molybdenum in gears which are heat-treated for strength and case-hardened to resist wear, long life is assured. The use of these special alloys also makes extremely heavy parts unnecessary, contributing greatly to ease and rapidity of shifting.

The main drive gear and main shaft are supported by two heavy duty, annular thrust ball bearings, one annular ball bearing and thirty needle bearing rollers. The end thrust between these parts is taken by seven ball bearings running in races machined in the ends of the shafts.

The countershaft is carried on steel backed, babbitt bearings.

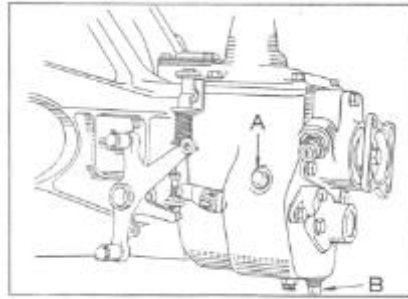


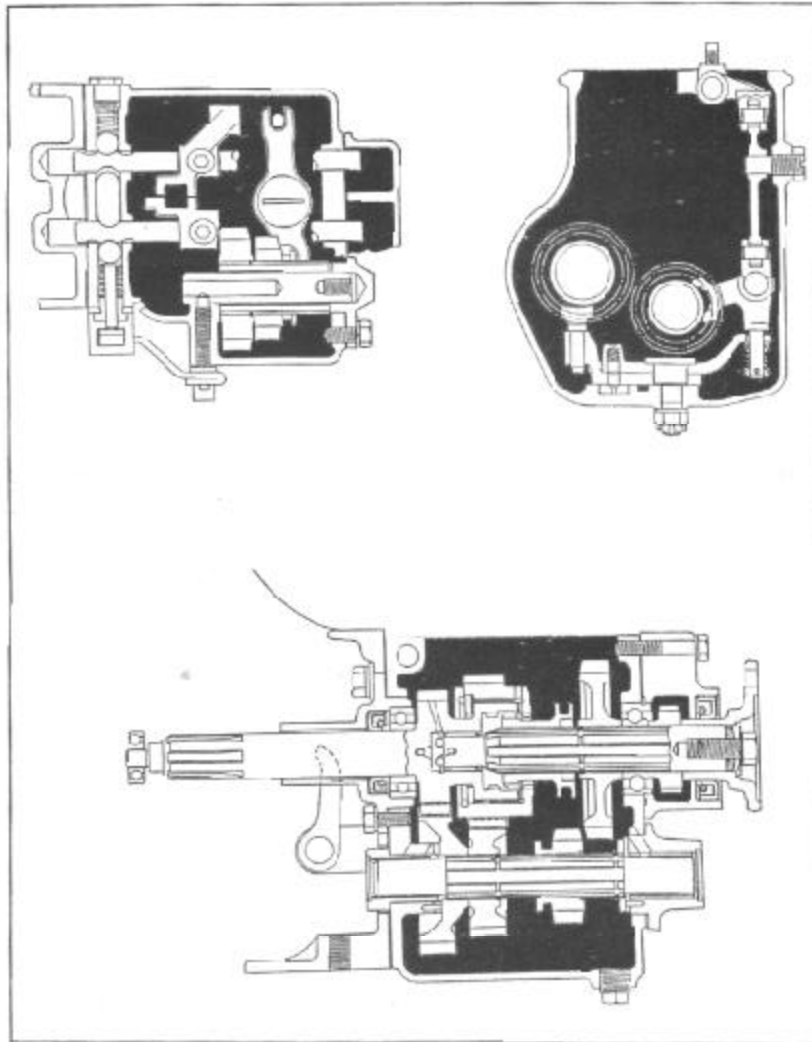
Figure 9

Lubrication

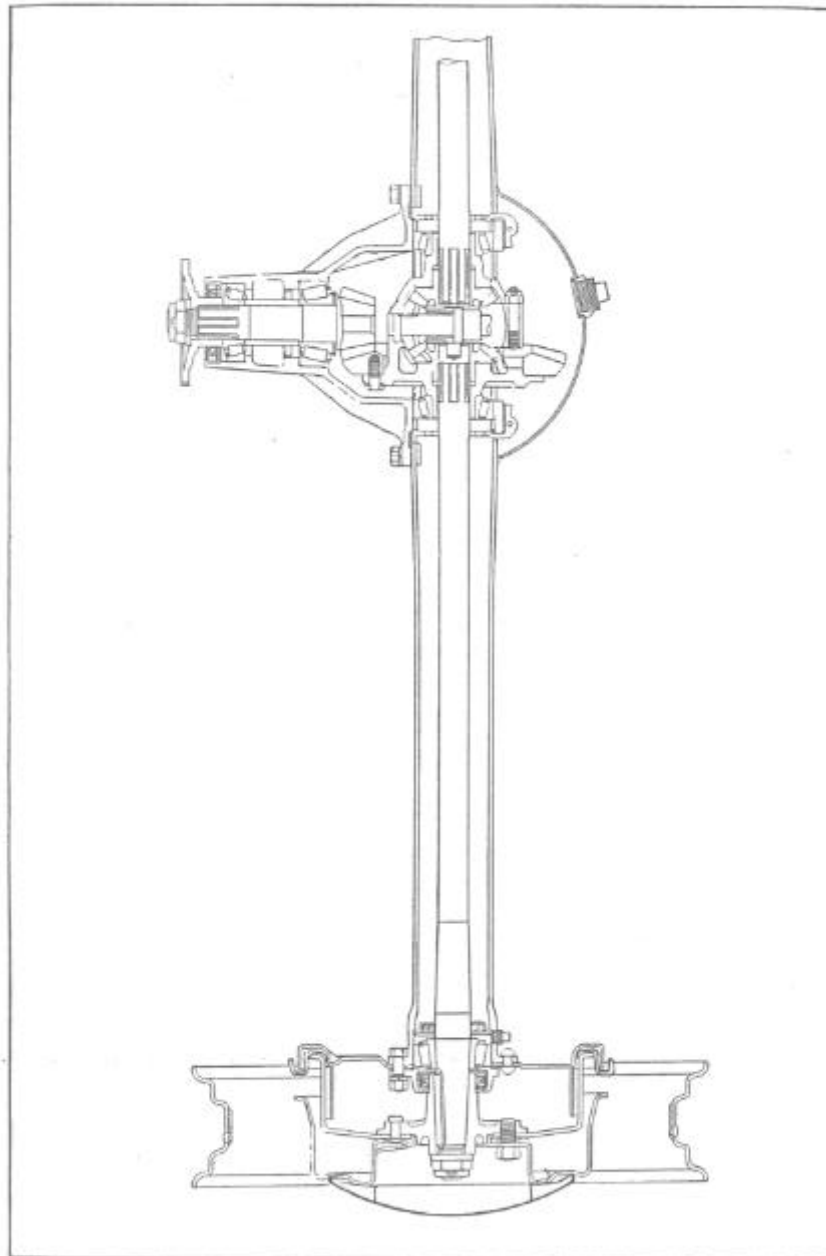
The lubricant used must be able to withstand the pressure developed between the gear teeth and also flow freely into the small clearances of the bearings. These qualities can be obtained in S.A.E. 110 transmission gear oil for summer and S.A.E. 80 (zero pour test) transmission gear oil in winter.

The transmission should be filled with lubricant to the level of the filler plug (A), Figure 9, at all times.

Drain the lubricant with season by removing plug (B) and replacing with three pounds (or pints) of fresh oil of the proper specifications.



Transmission



Rear Axle

REAR AXLE

The rear axle is of the semi-floating type carried in a one-piece, welded, banjo -type housing. This gives a rugged assembly with all parts readily accessible, as the axle shafts and wheel bearings can be removed without disturbing the differential assembly; also the differential and gear set assembly can be removed as a unit, after the axle shafts have been removed, by simply disconnecting the rear universal joint flange and removing the ten carrier bolt nuts.

The helical bevel drive gear and pinion are made of nickel molybdenum electric furnace steel, heat-treated for strength and case-hardened to resist wear. The drive pinion, differential and axle shafts are carried by six heavy duty, taper roller bearings.

Exceptional lubrication has been provided to the driving pinion bearings by arranging a large passage to carry oil thrown from the ring gear to a point in the housing between the front and rear pinion bearings. This oil flows through the hearings and returns to the axle housing. Oil leakage at the front of the pinion is guarded against by the use of a hydraulic leather oil seal. Similar seals are located in the wheel hearing caps.

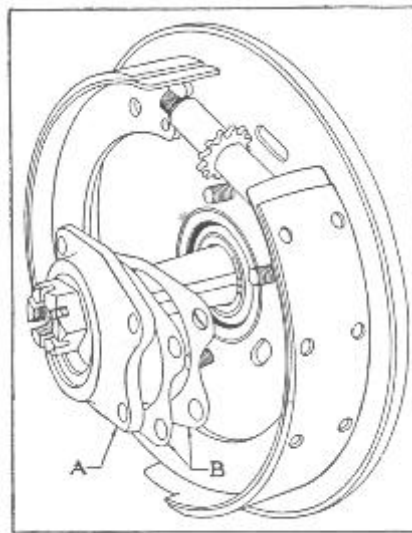


Figure 10

Adjustment

To adjust rear wheel bearings, jack up rear axle and remove both rear wheels and hubs. Remove the four nuts from bearing cap (A), Figure 10, and remove cap. By removing shims (B) under the cap the end play of the axle shaft is decreased. Total play between axle shafts should be from .005" to .010", which is perceptible by pulling shaft in and out with the hand. It is necessary that the thickness of shims at each rear wheel be approximately the same, so when adjusting remove a thin shim from each side and repeat, if necessary, until only a slight amount of play is evident. Be sure the axle shafts turn freely before building up.

Caution

Under no condition should a knockout type puller be used to remove a wheel hub or the end of the axle shaft struck a heavy blow.

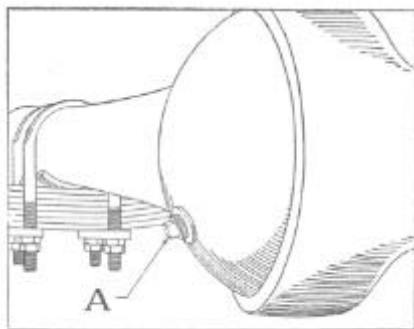


Figure 11

Lubrication

An oil must be used that will withstand the pressures developed between the gear teeth and also flow freely to enter the smaller clearances and circulate through the passages to the pinion bearings. These qualities can be obtained in a heavy bodied gear oil of S.A.E. 110 specification for summer and S A.E. 90 for winter.

The oil should always be kept to the level of the filler plug (A), Figure

11. Drain the oil and replace with three pounds (or pints) of fresh oil with season.

The wheel bearings are lubricated with wheel bearing grease. The bearings should each be packed with one and one-half ounces of grease every 5,000 miles. In order to insert this grease the wheels and wheel bearing caps must be removed.

FRONT AXLE

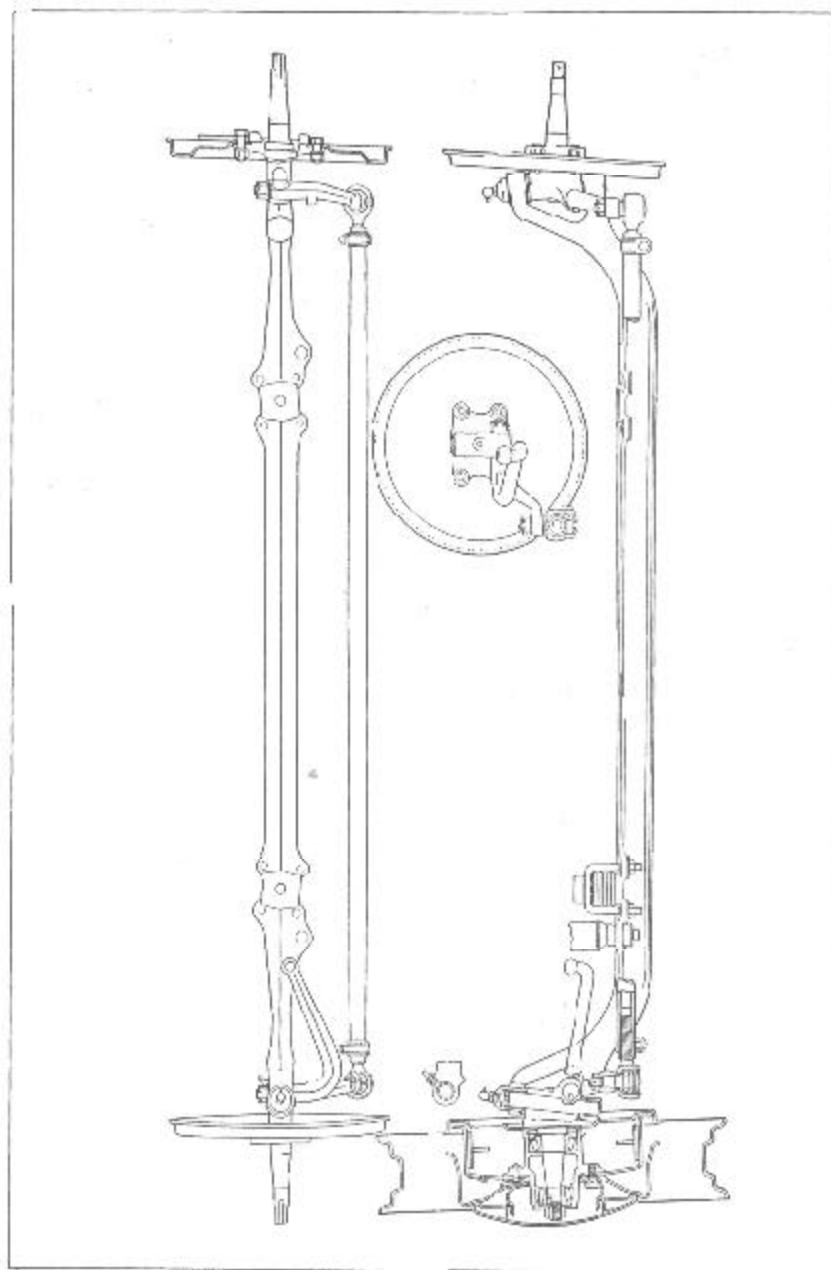
The front axle is of the Elliott type, the center section being a drop forging of high quality carbon steel. The axle has an "I" beam section between the spring seats to give strength with light weight to sustain the weight of the car. The axle ends—from the spring seats to the spindle pin yoke—are elliptical in section, giving strength to resist both the load of the car and the twisting action developed when the brakes are applied. This forging is heat-treated for strength and elasticity to give maximum protection against distortion from load and shock.

The steering spindles, arms and pins are heat-treated molybdenum alloy steel. The spindle pins are case-hardened to resist wear and are supported in the axle by hardened steel bushings. The end thrust on the pin is carried by five ball bearings running in a race machined directly in the end of the spindle pin.

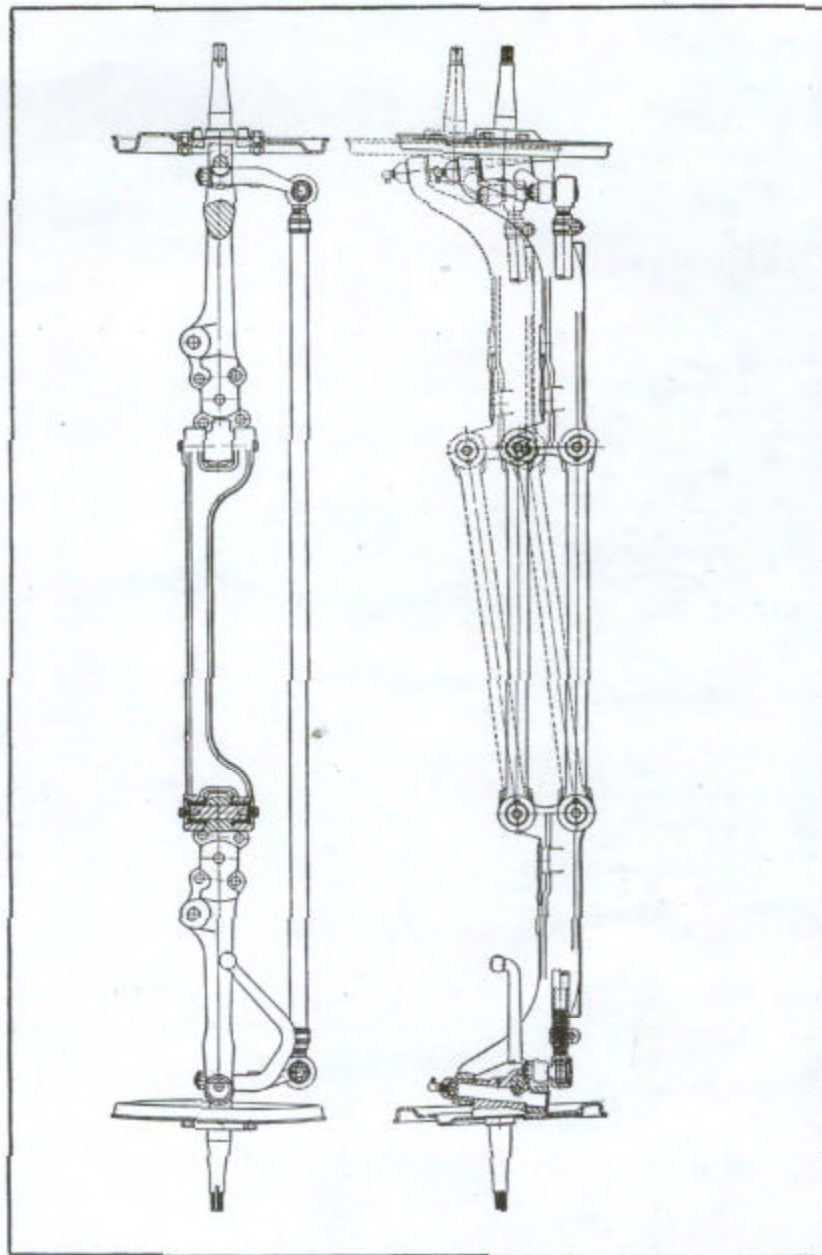
Each wheel is mounted on two taper roller bearings, while the tie rod end sockets are each mounted on the steering arms with two annular thrust ball bearings for rigid mounting and frictionless control.

Bearing Adjustment

After jacking up the front axle and removing the hub cap, withdraw cotter key holding nut (A), Figure 12. Turn nut (A) to the right until a



Front Axle (Standard)



Axleflex Front Axle

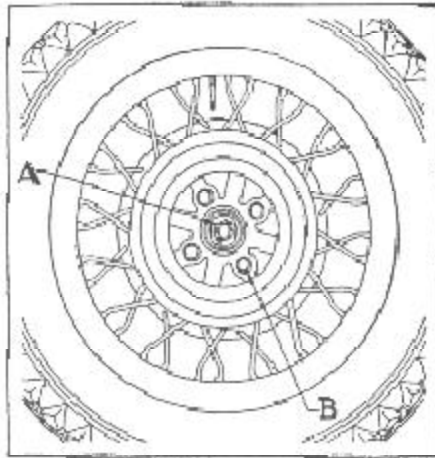


Figure 12

slight drag is felt when turning the wheel slightly by hand. Then loosen the nut just sufficiently to permit the wheel to turn freely. Insert cotter key.

Front Wheel Alignment

The front wheels should be adjusted with zero to 1/8" toe-in measured 10" from the ground. This adjustment is made by loosening the clamp bolts in the tie rod ends and turning the tie rod in a clockwise direction as viewed from the right to increase toe-in and in the reverse direction to reduce toe-in.

A special tool is required to make this measurement accurately. This adjustment is important for correct

steering and to prevent excessive tire wear. Have your Authorized Terraplane and Hudson Dealer check this alignment frequently.

Caster

The caster (backward tilt of the axle) should be from $3\frac{1}{4}^{\circ}$ to $3\frac{3}{4}^{\circ}$ and should be equal within $\frac{1}{2}^{\circ}$ at both front wheels.

Camber

The camber (outward tilt of front wheels) should be from 1° to $1\frac{1}{2}^{\circ}$.

Should any front axle parts become bent, through accident, to such extent that they cannot be straightened without heating, they should be replaced with new ones. Heating will destroy the original heat treatment of the parts and may result in sagging or even breakage.

Lubrication

The front wheel hearings should be lubricated every 5,000 miles with a good grade of wheel bearing grease. Remove hub and wash hearings and inside of hub with kerosene and pack each bearing and hub with 3 ounces of wheel hearing grease (see page 30 for adjusting wheel bearings).

The tie rod ends are lubricated and sealed when assembled and require no further lubrication.

Lubrication of spindle pins is covered on the lubrication chart. (Inside back cover.)

Axleflex

All of the foregoing paragraphs apply to Axleflex equipped cars as well as those equipped with the standard axle, with the exception of the description of the axle center section. In the Axleflex the solid "I" beam is replaced with two end sections which extend from the spindle pins to a few inches inside the spring seats. The ends are joined to an upper and a lower "I" beam

forging by eight needle roller bearings. This construction permits one wheel to rise to pass over an obstruction in the road without altering the position of the other wheel.

The needle bearings are filled with lubricant and sealed and require no further lubrication.

STEERING GEAR

The steering gear is of the variable pitch worm and sector type with a maximum ratio of 15 to 1 in the straight ahead position to give maximum ease of steering. The ratio is reduced as the gear is turned either to the right or left to give quick action for sharp turns.

The worms are cut in a manner which gives a minimum clearance with the sector or roller in the straight ahead position and increased clearance on turns. This gives maximum control and assures freedom from binding even after extensive use which, on conventional gears, makes it impossible to get proper clearance without binding on extreme turns due to maximum wear coming in the straight ahead position.

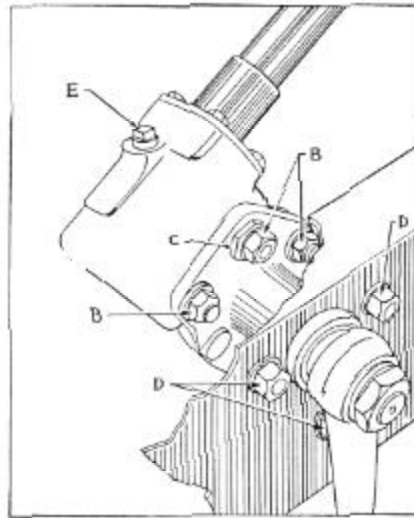


Figure 13

Adjustment

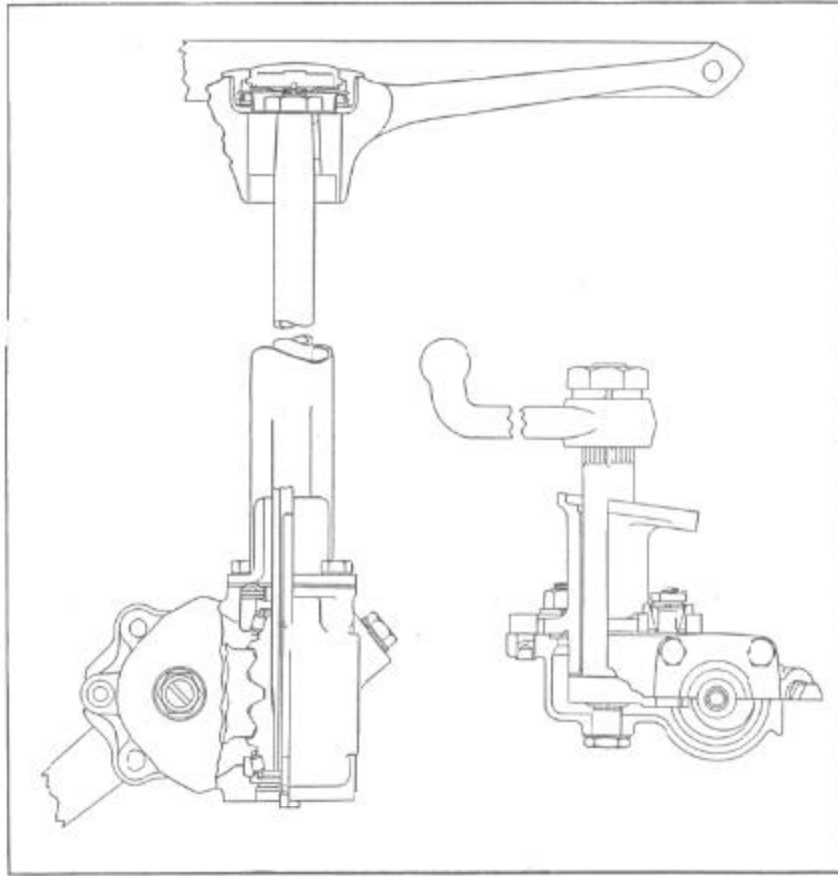
The main or worm shaft is carried on two taper roller bearings which are maintained in proper adjustment by spring pressure which is properly selected when the gear is built.

The end play in the cross shaft is adjusted by a screw extending through the right side of the steering gear housing. By turning this screw into the housing the end play is reduced. The screw should be tightened, then backed off just enough to prevent binding and the lock nut tightened.

The mesh between the worm and sector of the gear is adjusted by moving the housing cover. To adjust, loosen the four (one not shown) housing cover stud nuts (B), Figure 13, one-quarter turn. With front wheels jacked up and in the straight

ahead position, turn the eccentric (C) in a clockwise direction in gradual stages, noting the effect by working the steering gear arm. When play has been reduced sufficiently, tighten nuts (B), drawing up the one on eccentric (C) first. Before lowering front wheels, turn steering gear from extreme right to extreme left to be sure no binding occurs.

To raise or lower steering wheel to suit the requirements of the driver, loosen frame bracket stud nuts (D) as well as steering column bracket nuts under the instrument panel. Set wheel into the desired position and tighten column bracket nuts. Turn steering wheel to align gear on frame and tighten frame bracket nuts.



Steering Gear

Lubrication

The housing should be filled at all times with a good grade of S.A.E. 160 gear oil in summer and S.A.E. 110 gear oil in winter. The lubricant can be injected after removing filler plug (E), Figure 13, and should be done with change of season.

BRAKES

The brakes are of the single anchor Duo Servo construction and are equally effective in both forward and reverse directions. This construction also brings all of the lining into equal action, giving greater braking action per square inch of surface than other types. This equal pressure of the lining around almost the entire circumference of the brake drums reduces the tendency for distortion of the drum and prevents localized high lining pressures which cause rapid wear, scoring and squeaking.

The brake pedal is located in the conventional position, while the hand brake lever is pivoted to a bracket on the dash and extends down below the instrument panel to the left of the driver.

Both the brake pedal and lever are connected to operate a short, sturdy equalizer, pivoted to the underside of the frame "X" member. The motion of the equalizer is transmitted to the brake shoes through cables.

The operation of the brakes through pre-stretched cables and equalized action cam levers insures equal braking effort at each wheel and long life between brake adjustments.

It is necessary to have the brakes adjusted to offset normal wear when the brake pedal can be depressed within 1A" of the floor. This adjustment is made as follows:

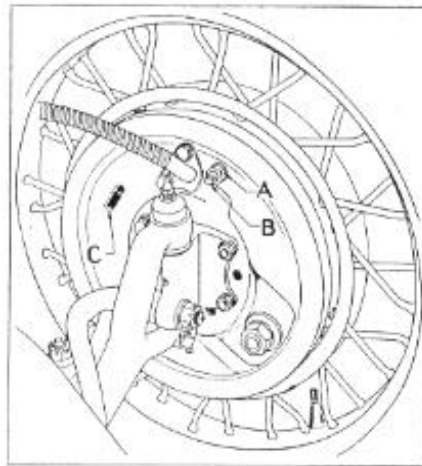


Figure 14

Jack up all four wheels clear of the ground. Remove wheels from hubs. Remove inspection hole cover on drums. Place a .010" feeler gauge through the brake drum inspection hole between the lining of the upper shoe and the drum. Loosen the eccentric lock nut (A), Figure 14, and turn the eccentric (B) in the direction of forward wheel rotation until the feeler is held snug. Tighten lock nut (A). The clearance around the lining of the upper shoe should not vary more than .003". If a greater variation exists, a major adjustment should be made by an Authorized Terraplane and Hudson Service Station. Turn the star wheel with a screwdriver inserted through the adjusting hole (C),

moving the handle toward the rim of wheel. Continue turning until a drag is felt when the brake drum is turned. Then turn star wheel in the reverse direction just until the drum turns free. Replace the inspection hole cover and wheels.

After performing these operations on all four wheels, pull the hand brake lever up one or two notches until a firm drag is felt when turning the wheels by hand. If more drag is felt on one wheel than on the others, *back off* on the star wheel adjustment until equal drag is felt on all wheels.

Proper brake adjustments cannot be obtained if wheel bearings are not adjusted properly. Correct brake adjustment will not insure equal braking action if tires are worn unevenly or unevenly inflated, spring clips or shackles are loose, or if the front wheel alignment is incorrect. Have your Terraplane and Hudson Dealer check these adjustments regularly.

SHOCK ABSORBERS AND SPRINGS

The spring leaves are lubricated with a thin coating of graphite grease and covered to prevent entrance of road dirt or water and preserve the lubricant. There should be no need for further lubrication during the life of the car.

Spring control is obtained through the use of four direct-acting, self-compensating shock absorbers. By using a large quantity of fluid working under low pressure, accurate control is obtained and there is no variation due to changes in operating temperatures.

The large reserve of fluid, the low operating pressure and the double seal practically eliminate the loss of fluid. The fluid should, however, be maintained at the proper level and it is recommended that this be checked by an Authorized Terraplane and Hudson Service Station at least twice a year.

HEADLAMPS

The headlamps are designed to give maximum safe illumination under all driving conditions. The only adjustment necessary to obtain the results which should be expected is the proper aiming of the headlamps. The right and left lenses are interchangeable and can be used satisfactorily on either side. The lamps are fitted with standard three-candlepower bulbs for the parking position and pre-focused bulbs having a flanged mounting and employing a 21-candlepower filament for city driving and passing, and a 32-candlepower filament for country driving. When the main lighting switch is in the driving (second) position, the light beams can be changed to the high or country driving position or to the low or city driving position by depressing and releasing the toe board control switch.

Adjustments

In order to get the proper lighting effect the headlamps must be aimed accurately, as follows:

Place the car on a level floor or driveway, squarely in front of a white wall or screen, at a distance of twenty-five feet. Draw a horizontal line (AA), Figure 15, on the wall six feet long and at a height equal to the height of the center of the headlamps from the floor. Sight through the center of rear window and over the radiator ornament and determine the exact center line of the car projected on the wall as indicated at point (B) in the illustration. Measure one-half the distance between the centers of the headlamps to each side of point (B) and draw the vertical lines (C) and (D) through these points. These lines represent the vertical center lines of the lamps.

With the car carrying a full passenger load, cover the left headlamp to obscure its beam and place lighting switch in the high or country driving position. Loosen the mounting nut of the right lamp and aim the lamp so that the top of the light beam is just even with the horizontal line and equally divided on each side of the center line (D) of the right lamp.

Tighten mounting nut on right lamp and follow same procedure in aiming left lamp, centering its beam in line (C). When this has been properly done, the lamps will be correctly aligned for both the city and country driving positions.

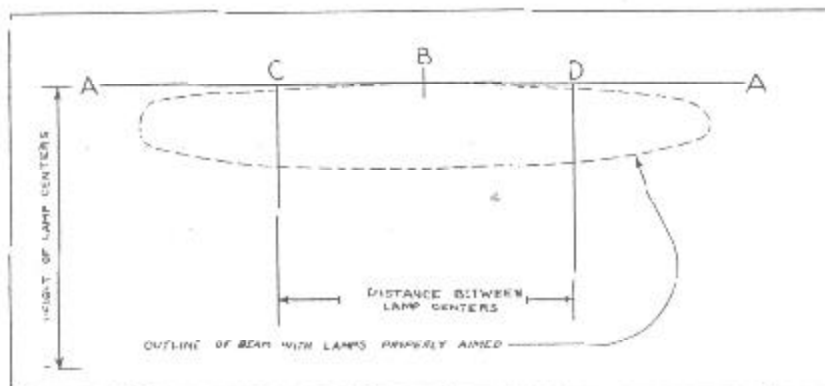


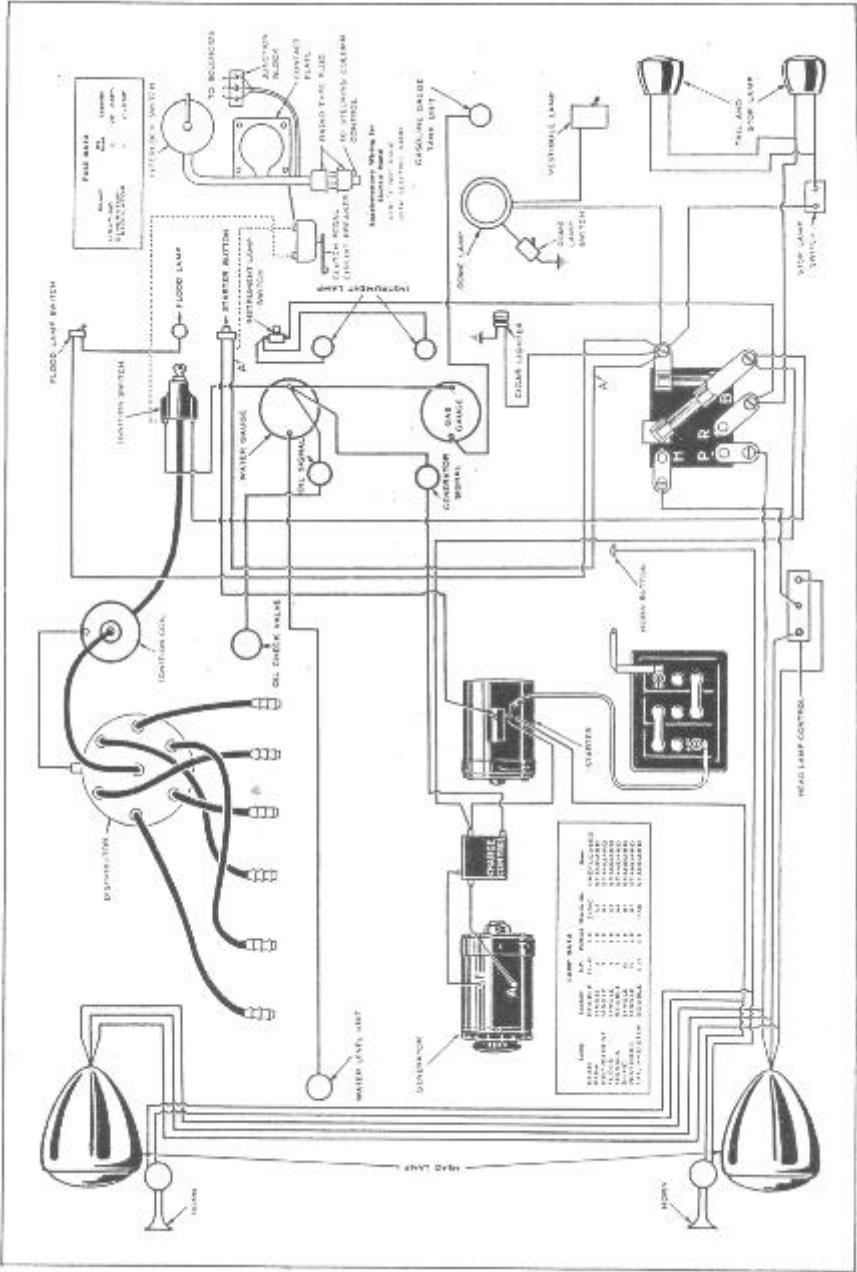
Figure 15

Removal of Headlamp Lens

Loosen the screws at the bottom of the lamp body. Push the bottom of the lens backward and downward until the top of the lens is clear of the top of the lamp body and lift out. Replace by reversing this operation.

Do not touch the reflector, as any marks will reduce the illumination. Should it be necessary to clean the reflectors, use ordinary lampblack on a soft cloth and wipe gently in a circular motion.

If the reflectors require frequent cleaning, it is an indication that the gaskets are not giving a proper seal and they should be replaced.



BATTERY

Registration

A. 17-plate, 105-ampere hour National battery is used. This battery is covered by a Guarantee and Adjustment Policy by its manufacturer. To be entitled to the benefits of this Policy the battery must be registered with a National Battery Dealer within thirty (30) days after delivery of the car. Do not neglect to make this registration.

Care

The battery requires little attention; however, this attention is absolutely essential. Negligence will shorten the battery life and cause premature failure.

Distilled water should be added to the battery at such intervals as will insure the plates being covered at all times. Usually water should be added twice a month in warm weather and monthly in winter. During freezing weather water should be added just before the car is to be used.

To prevent corrosion of battery terminals and connections, apply a coating of vaseline over the battery posts and strap terminals, making sure the terminals are properly tightened. If corrosion occurs, clean posts and terminals with a soda solution before applying the vaseline. When using the soda solution, be sure the cell caps are in place and be careful to prevent the soda from entering the cells. Flush off well with water and dry top of battery.

Inspect the battery ground strap occasionally, as looseness at the battery or frame or breakage will reduce the output for starting and a complete break will cause the lamp bulbs to burn out.

Periodic hydrometer readings should be made by your Dealer. If the battery gravity is low and the battery in good condition, the generator charging rate should be checked. This requires accurate Voltmeters and Ammeters and should be handled by your Terraplane and Hudson Dealer.

It is not necessary to add acid to a battery except where leakage has occurred. This must be done in conjunction with charging and should not be attempted except by an experienced service man.

TIRES AND WHEELS

All wheels are demountable at the hub by prying off the outside hub cap and removing the cap screws (B), Figure 12, in the wheel mounting plate. When replacing the cap screws, the final tightening locks them to prevent loosening in operation. Be sure the cap screws are drawn down tight.

The wheels are of the drop base type, permitting installation and removal of the tires without separate locking rings or the use of any special tools. Four-ply 16 x 6.00 tires are used on all models.

Removal and Installation

To remove a tire, deflate the tube. Starting directly opposite the valve stem and working in both directions toward the valve, press one bead of the tire off the rim ledge down into the rim well. Start removal of this bead at

the valve stem, working around the wheel in both directions from this point. Pull the valve back inside of the rim and remove the second bead by the same procedure used to remove the first.

To install a tire, inflate the tube until just rounded out and insert into the casing. Place one bead over the rim and into the rim well at one point so that the remainder of the bead can be worked over the rim. Press this head onto its rim seat and insert valve stem through the hole in the rim. After the valve is aligned in the hole, start application of the second bead directly opposite the valve, pressing it into the rim well and working in both directions so that the section of the bead at the valve is the last to be worked onto the rim.

Readjust, if necessary, so that the valve protrudes straight through the rim and pull the valve through from outside until seated snugly against the inside of the rim.

Partially inflate and work both beads onto the rim seats, then complete inflation.

Inflation Pressures

In order to get maximum life from the tires they should be inflated to a minimum pressure of 22 pounds on the front wheels and 28 pounds on the rear. Lower pressure will cause excessive tread wear, make the tire more susceptible to bruises and breaks from impact with sharp irregularities in the road surface. Higher pressures reduce the shock-absorbing qualities of the tires but increase stability at high speeds.

Tire Wear

Due to increased thickness in tire treads, together with higher driving speeds, faster acceleration and more effective braking, the tread blocks flex when in contact with the road so that the forward edges of the tread design blocks wear more rapidly than the rear, giving a sawtooth appearance to the blocks, particularly between the two tread running ribs. This is known as toe and heel wear and is particularly noticeable on front tires, since both the drive and braking action flex the blocks in the same direction.

This is a natural wear and can be controlled by reversing the direction of rotation of the tire. It is recommended that the right and left wheel and tire assemblies be interchanged when this wear becomes noticeable. Since the height of the tread block has been reduced by wear, the flexing will be lessened and this change of position of tires will not only even up the wear but will in most cases prevent reappearance.

Wheel and tire balance is carefully checked during the process of assembling; however, this balance may be changed by removal and reinstallation of tires or by tire tread wear. In order to maintain original stability at high driving speeds, have wheels and tires rebalanced whenever it is necessary to remove and reinstall a tire on a wheel, or if the tire changes are not necessary, balance at intervals of 10,000 miles. This operation can be readily and accurately done

by attaching sliding type balancing weights to the inside rim flange. The proper position of these weights can, however, be determined only by use of a wheel balancing machine.

Removal of Spare Tire from Vestibule

To remove the spare wheel and tire from the rear vestibule of the body, open the door and remove the mounting screws from the wheel hub. Grasp the tire at the top and pull toward you until the wheel is standing upright, then roll the wheel toward the right. The wheel and tire will roll over the sill of the opening readily.

BODIES

Because of the all-steel construction, the welding of outside panels to the structural framework, as well as the welding and riveting of all structural members, the body structure should remain rigid and quiet throughout the life of the car.

Seat Adjustments

All front seats are adjustable for driver's comfort. By moving handle side-wise at left front corner of seat, the mechanism is unlocked so the seat can be moved forward or backward. Releasing the handle locks the seat.

The Coach front passenger seat adjustment is controlled by the seat back. By pulling the seat back forward the mechanism is unlocked and the seat can be slid forward to permit easy entrance to the rear of the car either by further tipping of the back or by pulling forward on the seat itself. When the seat back is pushed back into position, the seat resumes its normal position and is locked in place.

Windshield Regulator

The windshield regulator is of the crank-operated type and permits the windshield to be opened to any degree within its operating range. It is self-locking in any position.

Trim Panels

All side wall and door upholstery panels are attached with screws which are visible along the edges of the doors and pillar posts when the doors are open. By removing these screws and the regulator and lock handles on the panel in question, it can be readily withdrawn.

The windshield header panel which covers the windshield hinge adjustment, as well as the windshield wiper mechanism, is fastened where it joins the head-lining and held in a retaining channel at the bottom. By removing the sun visor, windshield wiper control handle and the screws in the upper windshield header, two of which hold the rear vision mirror, the retaining channel can be withdrawn and the header panel released sufficiently to gain access to the hinges and windshield wiper. It should not be necessary to disturb the upper fastening of this panel.

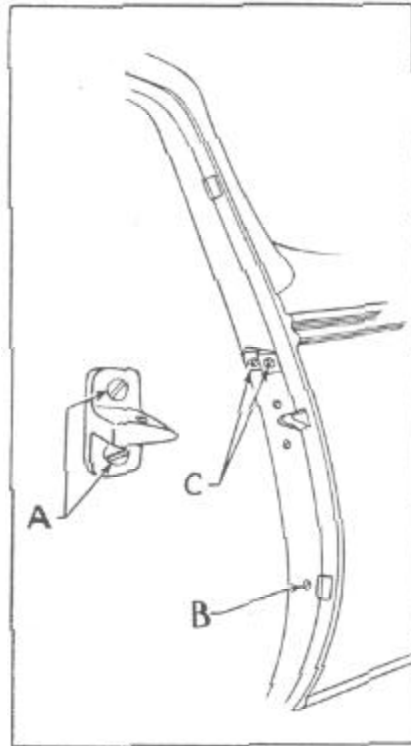


Figure 16

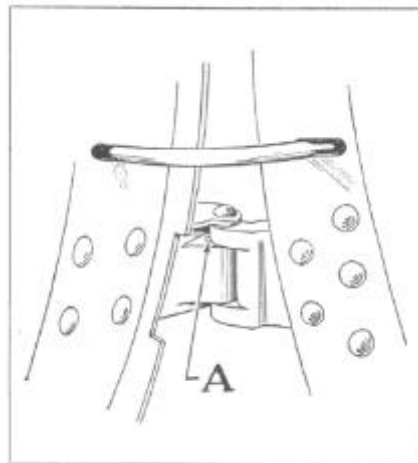


Figure 17

Door Adjustments

The door striker plates and rubber bumpers are adjustable to permit proper in and out regulations of the door position. The dovetail (male) is adjustable to center the door up and down. The hinge pins are cadmium plated to prevent rusting and squeaking of the hinges.

To adjust doors, first loosen the screws (A), Figure 16, holding the male portion of the dovetail to the door and move up or down as necessary so that it lifts the door 1/16" as it enters the female member when the door is being closed.

The front edge of the front and rear doors should be set slightly in-side of the windshield pillar post and rear edge of front doors, respectively, to prevent wind noise at high speeds. If an adjustment is necessary, loosen the bumper fastening screws (B) in the pillar post and move the bumpers in or out as necessary to permit the door to close to the desired position. Tighten the screws securely.

If, after this adjustment, the door must be slammed to latch it or the latch does not hold the door snugly against the bumpers and weatherseal, loosen the latch striker plate screws (C) in the pillar post and move the striker in or out, as necessary, and tighten the screws securely.

Caution: Do not remove the striker plate screws (C) as the tapping plates will fall out of position.

Lubrication

The door striker plates and door dovetails are fitted with lubricating wicks. These should be saturated

with light oil. The door hinge pins should be lubricated with light oil. An oil pocket (A), Figure 17, is provided in the top surface of the body half of the hinge, adjacent to the hinge pin and is accessible when the door is open.

Ventilation

The glasses of the front door are divided into two sections—each section being controlled by a separate regulator handle. The rear section of the glass moves up and down in the conventional manner as the regulator handle is turned.

By turning the regulator handle which controls the movement of the forward section, the glass can be raised and lowered or swung to act as a wind deflector when in the uppermost position. When this section of the glass is up, it can be lowered in the left door by turning the control handle counter-clockwise, while clockwise turning of the handle swings the wing outward. The action is reversed for a given movement of the control handle of the right door.

The raising and lowering of the rear door glasses in Sedans, the rear quarter glasses in Coaches, and the rear windows in Coupes, is conventional by means of crank handles.

The rear quarter windows in the Sedans slide backward when the regulator handle is turned. By moving the glass backward to give an opening of approximately a suction is created and draws air out of the car, while further opening permits air to enter.

The cowl ventilator is controlled by the handle projecting below the instrument panel, slightly to the right of the center. The ventilator is opened to the desired position by pushing forward on this handle.

A translucent rear curtain is used on closed body types. This curtain pre-vents vision into the car; however, the lights of an overtaking car can be seen but will give no glare.

The floor mats and carpets are all secured under the sill scuff plates so that dirt can readily be swept out. The front mats can be withdrawn; however, it is necessary to loosen the scuff plate screws to remove the rear carpets.

EQUIPMENT

With the exception of the "Electric Hand" transmission control, which is available only as a factory-installed option, all of the following items of equipment can be installed on any models. This equipment is designed for Terra-plane cars and is in harmony with interior appointments or exterior finish. In many cases mountings are provided and no drilling or cutting is required to install the equipment; however, any of these items can be readily installed by an Authorized Terraplane and Hudson Dealer.

High Compression Cylinder Head

The composite type cylinder head giving 7 to 1 compression ratio is available for use on the 1935 Terraplane engine. Although this requires the use of

high octane fuel, it increases the engine output to 100 horsepower and under comparative driving increases gasoline mileage, partially offsetting the extra fuel cost. Acceleration and hill climbing are greatly increased by the added power obtained.

Automatic Clutch Control

The clutch mechanism has been designed so that automatic clutch control can be installed without any replacement of standard parts or any drilling. The automatic control is designed especially for Terraplane cars and is of the latest design, incorporating pendulum control. This, together with the natural smooth action of the Terraplane lubricated clutch and the controlled throttle return, gives a smoothness of operation both on engagement and disengagement that has never before been attained.

Hill-Hold

This is a small unit installed at the rear of the transmission (replacing the standard rear bearing housing) and prevents the car from rolling backward, except when the gear shifting lever is in the "Reverse" position. It can, however, be made inoperative so that the car can be pushed in either direction simply by shifting the transmission into reverse and then into neutral. The driver is relieved of keeping the brakes applied when the car is brought to a stop on an up-grade and the car can be started forward with the same ease as though it were on the level.

Axleflex

This unit is interchangeable with the standard front axle and gives independent front wheel springing while retaining the heavy drop forged construction of conventional designs.

Stabilizer

The use of a stabilizer reduces body sway. The stabilizer is used on all cars equipped with Axleflex and can be fitted to cars with the standard front axle.

Electric Hand

The Electric Hand or automatic transmission control may be had on all models as a factory-installed option. This device, which is electrically controlled, permits finger tip gear shifting by means of a small lever located immediately under the steering wheel and utilizes the engine intake manifold vacuum to perform the actual work of engaging and disengaging the transmission gears. The Electric Hand also permits pre-selecting of the gears while the car is in motion, the shift being made automatically when the foot is removed from the accelerator pedal. When Automatic Clutch Control is not used the shift is completed by depressing the clutch pedal.

Fender Lamps

All models have a small parking bulb in the headlamp. Fender lamps can be installed on any model and connected in place of the headlamp parking bulb. These fender lamps are of the same design as the headlamps and are chromium finished.

Body Vestibule Lamp

This lamp can be readily installed on all models. It gives illumination for the vestibule and also spreads light around the rear of the car and provides an ideal connection for a service light.

Windshield Wiper

A right hand blade, together with the necessary linkage to connect to the wiper motor, can be installed on any closed car not so equipped at the factory.

Inside Visor

A visor identical with the left hand visor can be readily installed as proper mountings have been provided in the right side of the windshield header.

Cigar Lighter

Mountings for a cigar lighter are provided in the windshield header of all closed cars. The standard lighter supplied as equipment on some models can be installed on any closed body type.

Radio

A specially designed antenna of the under-running board type is fitted to all cars on which radio is installed at the factory, and holes for mounting this antenna are provided in the mounting board brackets of all models. This antenna is supplied as a regular part of the field installation radio kit. Mountings are provided for the Terraplane and Hudson radio so that installation is extremely easy and satisfactory reception is insured.

The radio is a six-tube, superheterodyne circuit, designed especially for Terraplanes and Hudsons, and gives maximum performance for car reception at moderate cost. The control is built into the center of the instrument panel where it is accessible, visible and in harmony with interior appointments.

PREPARING CAR FOR STORAGE

If the car is to be laid up for any length of time, and especially in the winter, the following suggestions should be observed: Drain the water from the cooling system, then run the motor not over one minute to dry out the cylinder water jackets.

Drain the crankcase. Flush out the old oil, then refill with fresh oil. It is also well to pour a little oil into each cylinder through the spark plug holes to prevent the interior from rusting. Clean the spark plugs and dip the ends into oil to prevent rusting and replace them.

Crank the engine for about twenty seconds with the ignition switch off and the throttle closed. This insures a distribution of the oil over cylinder walls and valve mechanism.

Disconnect the wires from the storage battery and remove battery to some dry place. It is best to take the battery to a battery service station, where it may receive a freshening charge at least once a month. It is well worth while to take care of the battery.

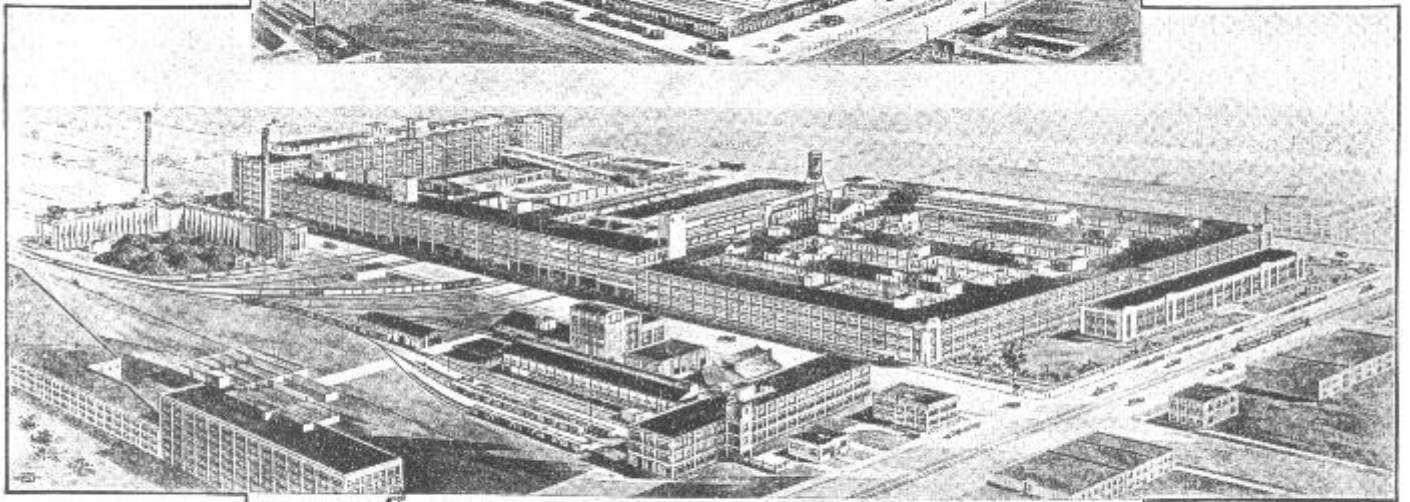
Go over the chrome or nickel plated parts with a light coating of vaseline jelly or grease to prevent tarnishing. This should be removed with gasoline before putting the car back into service.

Jack up the front and rear axles and remove the tires.

If the tires are to be out of service for any length of time, they should be removed from the rims. The inner tubes should be put in the casing with a small amount of air pressure and the tires stored in some cool, dark place, preferably where there is a slight amount of moisture, since if they become too dry the rubber will harden and lose its elasticity. It is a good idea to wrap tires with cloth to protect them from heat.

Remove all dust from top and upholstery, wash body clean, put the windows or top up and cover the car with heavy sheetings or a paper cover especially made for the purpose.

When putting the engine back into service again, remove the spark plugs, inject a small quantity of oil into each cylinder, crank the engine by hand for a few seconds, replace the plugs, turn the ignition "on" and, after the engine has been started on its own power, run slowly for a few minutes.



Hudson Motor Car Company factories, Detroit, Michigan

