

\top O THE OWNER

of this TERRAPLANE 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.

Hudson and Terraplane 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 Hudson and Terraplane 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.

Keys

Since it is necessary to omit the numbers on the locks for theft protection, the key numbers should be noted on your Identification Card or in some other accessible place. Keys can be supplied only by number. For your own protection in case of loss of keys, *record the numbers*.

Inspection Service

Upon delivery of the new car the Dealer will furnish the owner with an Owner's Service Policy and Identification Card, which entitles 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 Hudson and Terraplane 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
- 2. Engine (Change Oil)
- 3. Water Pump
- 4. Generator

- 5. Starter
- 6. Distributor
- 7. Hood Locks and Hinges
- 8. Door Strikers and Dovetails

9. Door Locks and hinges

TERRAPLANE OWNER'S MANUAL

Mechanical Inspection

1. Remove Governor	
2. Adjust Tappets	
3. Check Engine Tune-up	
(Minimum Vacuum Gauge	
Reading-18)	

4. Fan Belt Adjustment

- 5. Generator Charging Rate
- 6. Generator, Starter and Battery Connections
- 7. Generator Regulator

- 8. Lamps
 - (Connections and Bulbs)
- 9. Battery
- 10. Brake Fluid
- 11. Clutch Pedal Adjustment
- 12. Rear Wheels Tight on Taper
- 13. Tighten All Wheel Bolts
- 14. Adjust Door Strikers and Dovetails
- 15. Inflate Tires

16. Fill Radiator (Anti-freeze in cold weather)

License Data

Car Serial Number (on plate on dash under hood)

De Luxe Models 61101 and up Custom Models 62101 and up Engine Serial Number (stamped at top of left side of cylinder block) Number of Cylinders 6 NACC Horsepower Rating-21.6 Cylinder Bore 3" Piston Displacement 212 cu. in. Stroke of Piston 5"

Body Types—De Luxe and Custom Models

Coupe—Business Coupe—Rumble Seat Coupe—Convertible Brougham Touring Brougham Sedan Touring Sedan

Technical Information Engine

Туре	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, 13/8"; Exhaust, 1-3/8"
Valve Tappet Clearance (Hot)	Intake, .006"; Exhaust, .008"
Camshaft Drive	Gears

Connecting Rod Lower Bearing Clearance Piston Material Piston Type Piston Weight, Ounces Skirt Clearance Number Piston Rings Width of Piston Rings Piston Ring Gap Lubrication System Oil Pump Type Oil Reservoir Capacity Capacity of Lubrication System .001"; End Play, .006"—.010" Lo Ex Aluminum Alloy T Slot Cam Ground 10.75 .002" Compression, 2; Oil Control, 2 Compression, 3/32"; Oil Control, 3/16" .009"—.011" Hudson Duo-flo Automatic Oscillating Plunger 5 Quarts 6 Quarts

Cooling System

Type Radiator Type Cooling System Capacity Fan Belt Pressure Pump Circulation Ribbon Cellular 3-1/4 Gallons "V" Type

Fuel System

Carburetor Choke Control Heat Control Fuel Delivery Air Cleaner Gasoline Tank Capacity Make, Carter; Type, Down Draft; Size, 1-1/4" De Luxe Models, Manual; Custom Models, Automatic De Luxe Models, Adjustable; Custom Models, Automatic Pump Intake Silencer Type 16-1/2 Gallons

Starting, Lighting and Ignition

Make Autolite Spark Control Automatic Timing Dead Center Firing Order 1-5-3-6-2-4 **Distributor** Gap .020" Spark Plug Type Champion J-8--Metric Spark Plug Size 14 Mm. Spark Plug Gap .025" Generator Regulation* Third Brush and Voltage Regulator Generator Charging Rate † Cold, 22 Amps.; Hot, 17 Amps.

*De Luxe Models without radio do not have Voltage Regulator. †Charging Rate—Cold, 17 amps.; Hot, 14 amps. when Voltage Regulator is not used.

Clutch

Type Clutch Pedal Clearance at Floor Board Oil Cushioned, Single Plate 1-1/2"

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Lam	p Bulb Specifica	ations	
C.P.	Base	Voltage	Mazda No.
32-32	D.C.	6-8	2331
1	S. C.	6-8	55
1	S. C.	6-8	51
1	S. C.	6-8	51
2-21	.D.C.	6-8	1158
15	S. C.	6-8	87
	Lam C.P. 32-32 1 1 1 2-21 15	C.P. Base 32-32 D.C. 1 S. C. 15 S. C.	Lamp Bulb Specifications C.P. Base Voltage 32-32 D.C. 6-8 1 S. C. 6-8 15 S. C. 6-8

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Fuse—Headlamp Circuit, 20 Amps. Tail Lamp Circuit, 20 Amps.

Voltage Regulator, 7-1/2 Amps.

Transmission

Type Selective Gear Ratio Low, 2.42; Second, 1.6; High, 1; Reverse, 2.99 Lubrication. Summer, S.A.E. 90 E.P.; Winter, S.A.E. 80 E.P.; Capacity, 3 Pints

Rear Axle

Туре	Semi-Floating
Bearing Type	Taper Roller Throughout
Gear Ratio	4.1/9:1, 4-5/9:1
Lubrication. Summer, S.A.E. 110 E.P.; Winter, S.A.E. 90 E.P; Capacity, 3 Pint	S

Front Axle

Toe-in	0 to 1/8"
Caster	3-1/2°-4-1/2°
Camber	1 °-1-1/2 °

Brakes

Type Size Clearance Between Lining and Drum

Steering Gear

Type Gear Reduction Lubricant

Variable Pitch Worm and Sector 17 to 1 Summer, S.A.E. 110 E.P.; Winter, S.A.E. 90 E.P.

Tires

Size Minimum Air Pressure

16 x 6.00 Front, 24 Lbs.; Rear, 30 Lbs.

Chassis Dimensions

Wheelbase Tread Road Clearance (Center) Over-all Length, including Bumpers-Sedan and Brougham Coupe

115" Front, 56"; Rear, 571/2" Front Axle, 8-9/16"; Rear Axle, 8-7/16"

> 195" 200"

.010"

4-Wheel Hydraulic 10-1/16" x 1-3/4"

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Figure 1

OPERATION

The operation of the Terraplane 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. Automatic Clutch Control is available on all models. When so equipped the control button is located as shown in Figure 1, on Custom Models, while on De Luxe Models, which have a manual choke in this position, the clutch control button is located directly below it. When the clutch control button 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, Figure la, 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 inter-connected with the ignition switch and a circuit breaker on the clutch pedal, making neces- sary 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.

To operate a car equipped with "Electric Hand": (1) see that switch on selector housing is "on," (2) depress the clutch pedal, (3) turn on the ignition switch, **(4)** 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 lever 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 lever 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 lever 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 selector housing can be used to make the Electric Hand 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 the Electric Hand, except should it be desired to shift the transmission when the engine is not running. A hand gear shifting lever is provided with the tool equipment for this purpose. By removing the cover in the floor mat, which exposes the top of the transmission control, the shifting (ever 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 by depressing the right foot pedal while the two rear brakes are operated by pulling backward on the hand lever. The hand brake lever on Custom Models and also De Luxe Models, when equipped with Electric Hand, is located under the instrument panel to the left of the steering column. All other De Luxe Models have the hand brake to the right of the transmission lever.

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 right of the center of the instrument panel, the front compartment flood light switch (Custom Models) 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. The central position is "off." Turning the knob clockwise gives driving lights, while anti-clockwise rotation gives parking lights.

When the main lighting switch is in the 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 41 for Adjustment of Headlamps.)

The instrument lamp switch is a gradual control giving any intensity of illumination desired from off to full on by simply turning the knob at the bottom of the instrument board.

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 system so that the stop light is illuminated when the brakes are applied.

The starter is controlled by the push button to the left of the center of the instrument panel. The ignition switch must be turned on, and on Electric Hand equipped cars the clutch pedal must also be depressed when the starter button is depressed.

The carburetor on Custom Models is equipped with Climatic Control (selfcontrolled choke) which gives correct fuel mixture for all starting and running conditions without any manual control on the part of the operator. The De Luxe Models use manual choke, the control button being located at the left of the instrument panel.

The oil pressure signal on Custom Models 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 on Custom Models 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

OWNER'S MANUAL

Your electrical system should be checked by your Hudson and Terraplane Dealer.

The oil pressure and generator signals on De Luxe Models are mounted one above the other to the right of the speedometer.

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

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

Starting the Engine

De Luxe Models (Manual Choke)

Pull the choke control out, turn the ignition switch on, and push starter button. Return the choke control gradually as the engine warms up. Do not keep the choke out any further than necessary for smooth running of the engine.

Custom Models (Climatic Control)

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, push the choke control button in on Custom Models and depress the accelerator pedal fully for further cranking of the engine. With the accelerator pedal in this position, the automatic 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 Hudson and Terraplane 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, 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.

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 grades.

0-250 MĬLES

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

Your car is equipped with a governor installed and sealed at the factory to insure it reaching you in good condition.

While the governor is in place the top speed and acceleration are restricted and the air intake noise slightly increased.

Your dealer will remove the governor and tune the engine for you when making the 500-mile inspection.

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 CON-TAINING GRAPHITE OR OIL CONCENTRATES EITHER IN THE EN-GINE 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 .002"; 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.

Crankshaft, Connecting Rods and Pistons

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 .0003" 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 .002". 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.

Valve Tappet Adjustment

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.

Valve Timing

The valve timing is determined by the meshing of the crankshaft and camshaft 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.

Crankcase Ventilation and Oil Conditioning

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



Figure 2

the agitation of the moving parts of the engine, they are readily vaporized and removed by the slight suction maintained on the ventilator tubes.

The flow of oil after returning to the reservoir 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.

Oil Capacity

Under operating conditions, one quart of oil is retained in the crank-case 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 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

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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

The viscosity of a lubricant is simply a measure of its body or fluidity. The S.A.E. viscosity numbers constitute a classification of lubricants in terms of viscosity, or fluidity, but without reference to any other characteristics or properties.

THE REFINER OR MARKETER SUPPLYING THE OIL IS RESPONSIBLE FOR THE QUALITY OF ITS PRODUCT. THEIR REPUTATION IS THE CAR OWNER'S BEST INDICATION OF QUALITY.

The S.A.E. viscosity numbers have been adopted by practically all oil companies and no difficulty should be experienced in obtaining the proper grade of lubricant to meet seasonal requirements.

The grade of oil best suited for each range in temperature is shown by the accompanying table. The car owner should always select an oil having the recommended temperature range agreeing with the lowest atmospheric temperature likely to be encountered before the next oil change.

During the winter months the owner's selection of crankcase oil should be based primarily on easy starting characteristics. The viscosity of **10** W and 20 W oils is such as to permit easy starting down to the minimum temperature for which they are recommended.

Oils carrying the S.A.E. specification and not a "W" (winter) specification are selected only on their viscosity at higher temperatures and the starting characteristics of such oils will vary depending upon the type of crude oil and the refining process.

Although there are oils carrying the S.A.E. specification which also meet the "W" specification for starting qualities, the "W" specification on the container is the car owner's only definite assurance as to the starting qualities of the oil.

Oil Specification
S.A.E. 30
20 W.
10 W.
10 W. Plus 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



Breaker Points

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.

Lubrication

The oil cup (F), 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 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 become pitted it is necessary to remove them and grind smooth or replace with new ones. The grinding should be done in a special machine to insure proper seating. This operation should



Figure 4

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.

Breaker Point Adjustment

Crank engine by hand 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 the lock nut (H) and re-check the gap.

Ignition Timing

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.

Setting Ignition Timing

Loosen the distributor clamp bolt (C), Figure 3, and turn the dis-tributor housing clock-wise to the limit of the slot in the clamping plate (K), Figure 3. Remove the central cable from the distributor cap and place the bare end about 1/8" from the intake manifold. With the ignition turned on and the U.D.C. 1-6 mark on the flywheel in line with the pointer on the inspection hole (Figure 4), turn the distributor body counter-clockwise slowly just until a spark jumps from the high tension wire to the intake manifold. Tighten clamp screw (C), replace central cable in distributor cap and clamp cap on distributor.

With the engine in this position and the distributor cap 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 ter¬minals 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.

Fuel Compensation

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

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miles per hour a slight spark knock should develop. If a knock is not heard, loosen distributor clamp screw (C), Figure 3, and turn the distributor counter–clockwise one graduation of the clamping plate (K), Figure 3, 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 more than 3/4" ahead of the U.D.C. mark on the flywheel.



Figure 5

Carburetor and Fuel System

The carburetor is of the down draft type and incorporating Climatic Control (self-controlled choke), and automatic heat control, on the Custom Models. The only manual control for the operator is the accel¬erator pedal controlling the throttle opening for regulating the speed of the engine.

Carburetor Choke

The automatic 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 De Luxe Models are equipped with manual choke control.

The heat control valve (F) on the Custom Models is automatic in opera¬tion, supplying the correct amount of heat to the intake manifold under all operating temperatures. The heat control valve on the De Luxe Models is adjustable for winter and summer driving.

Air Cleaner

The air cleaner should be removed every 2,000 miles, the wing nut (G) unscrewed and the cover and pad removed. Wash filter in gasoline and re-oil by dipping in S.A.E. 50 engine oil. Drain excess oil and replace pad and cover.

On cars equipped with the heavy duty oil bath cleaner (special equip-ment), remove wing nut and cover and withdraw filter assembly. Remove old oil from body and wash all

parts in gasoline. Fill body with S.A.E. 30 engine oil to level of ring pressed in body. Service filter unit as in standard cleaner and reassemble. This should be done at least every 2,000 miles or oftener if extreme dust conditions are encountered.

Fuel Pump

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 outlet, 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 .025".
- 2. Clean distributor breaker points and adjust to .020" maximum opening as described under Breaker Points. (Page 17.)
- 3. Check battery and ignition wiring, being sure all distributor wires are pressed down in their sockets and insulation is in good condition and battery terminals clean.
- 4. Set ignition as described on page 18.
- 5. Turn carburetor idling screw (H), Figure 5, 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), Figure 5, 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 1/2 to 1 turn of the screw from its full in position.
- 10. Road test for final ignition timing as described under Fuel Compensation. (Page 18.)

If the above operations, properly performed, do not give normal engine performance, the car should be taken to an Authorized Hudson and Terra- plane 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. It is necessary to disengage the clutch on Electric Hand equipped cars in addition to pressing the button to engage the starter. The switch can be operated manually by unscrewing the cap on the rear of the switch and pushing the plunger in. The drive to the gear on the engine flywheel is through a 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 the third brush. The output on the Terraplane De Luxe Models without a Voltage Regulator should be 17 amperes cold or 14 amperes hot. A higher rate will shorten battery life.

The Terraplane De Luxe Models are equipped with radio and all Terraplane Custom Models are fitted with an external Voltage Regulator in addition to the third brush. On these models the charging rate should be 22 amperes cold and 17 amperes hot. This high charging rate can be used safely as the Voltage Regulator automatically reduces the charging rate from 22 amperes to approximately 10 amperes when the battery becomes fully charged, reverting to the higher rate should the battery become partially discharged. This regulation is permanently built into the charge control and no adjustment of this unit is necessary.



Figure 6

The generator field circuit fuse is contained in the knurled cup extending from the top of the regulator. If the generator fails to charge, check for **a** burnt-out fuse. Replacement should be made only with a '71/2-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.

Fan Belt

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 3/4" to 11/4" 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 bearings.

To tighten 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 vane type, located on the front of the cylinder block and driven by the "V" belt, which also drives the generator. The adjustment of the belt is covered in the preceding paragraph.

The packing gland is of the permanent type, built entirely inside of the pump and requires no adjustment.

The pump should he lubricated every 1,000 miles through the pressure fitting (C), Figure 6, with a high grade aluminum soap grease.

Cooling System Operation

The cooling system is of the pressure circulating type. The pump draws the water from the bottom of the radiator and forces it through the cylinder block and head and returns it to the top of the radiator.

The Terraplane Custom Models are fitted with a thermostat located at the outlet of the cylinder head. When the cooling water is below 140° Fahrenheit, the thermostat closes the return to the radiator and opens a by-pass direct to the water pump inlet. This permits circulation of the water in cylinder block and head only, reducing the time of engine warm-up.

When the cooling water reaches 140° the thermostat begins to open the passage to the radiator and close the by-pass. At approximately 160° Fahrenheit the by-pass is completely closed and all water circulated by the pump flows through the radiator. The temperature of the cooling system is thus controlled for most efficient engine operation under all weather and driving conditions.

Draining Cooling System

To completely drain the cooling system open the drain cock at the bottom of the radiator (left side under hood) and also remove the pipe plug from the cylinder block (left side to rear of side cover plate).

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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 Hudson and Terraplane Dealer.

The cleaning solution recommended is 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 drain all water from the system.

Dissolve the contents of a container of Hudson Radiator Cleaner 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 filler 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 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.

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

Anti-Freeze

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

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



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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	Radiator Glycerine (G.P.A. or Equivilent Quarts	Ethylene Glycol Prestone or Equivilent Quarts
+20°	2-1/2	5-3/4	2-1/2
$+10^{0}$	3-3/4	7-1/4	3-1/2
0°	5	9	4-1/2
-10°	5 - 3/4	10-1/2	5
-20°	6 - 1/2	12	5-3/4
-30°	8	13	Full Strength 6-1/2

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



Figure 7

pliable formed cork and lubricated to give a maximum degree of smoothness in engagement.

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

aluminum soap 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



Figure 8

front face of the flywheel is visible through the timing inspection hole in the left side of the rear engine plate. 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 Hudson and Terraplane 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 power unit rod—on left side of engine—while the accelerator pedal is depressed. When the rod is in its extreme rearward position there should be approximately 7/8" clearance between the back of the slot in the rod 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.



Transmission



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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

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. 90 E.P. transmission gear oil for summer and S.A.E. 80 E.P. (zero pour test) transmission gear oil in winter. When hard shifting is encountered during cold weather, three ounces of kerosene should be added to the lubricant. 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 of the

proper specifications. three pounds (or pints) of fresh oil of the proper specifications.

UNIVERSAL JOINTS

The front and rear universal joints are fitted with needle roller bearings at the trunnions for the purpose of minimizing friction and maintenance attention. Oil reservoirs provided at each bearing are filled with lubricant at the time of assembly and supply the necessary lubrication for long periods of operation. At 20,000-mile intervals both universal joints should be disassembled, cleaned, repacked with good viscous chassis lubricant and reassembled.

Every 2,000 miles, the splined hub of the front universal joint should be lubricated by removing the pipe plug and introducing viscous chassis lubricant.

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 bearings 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 bearing caps.



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. Push the bolts out of the backing plate, which permits removal of the bearing cap without disturbing the handbrake operating link. 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 shimsat each rear wheel be approximately the same, so when adjusting remove a thin shim from each side and repeat,

Figure 10

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.

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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 E.P. viscosity A for summer and S.A.E. 90 E.P. for winter.

Figure 11 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, as described for wheel bearing adjustment.

FRONT AXLE AND SPRING SUSPENSION

The front axle is of the Elliott type, Figure 12, the center section being a heavy drop forging of high quality carbon steel. The steering spindles, which are drop forged molybdenum alloy steel, are attached to the axle center with alloy steel spindle pins mounted in hardened steel bushings with ball bearings to carry the thrust on the end of the pin.

Each wheel is mounted on two taper roller bearings. The tie rod ends are of the ball bearing type for frictionless control.

The axle is attached to the chassis frame by two torque arms (A), which insure accurate positioning of the axle and relieves the front springs of all loads other than that of supporting the weight of the car. The torque arms are attached to the frame through large rubber bushings to absorb road shock.

The springs are mounted on bearings (B), which permit free turning on the axle center, and each end of the spring is attached to the frame through shackles (C). This permits unrestricted spring action for a smoother ride under all road conditions.

All points requiring lubrication, except the wheel bearings, are equipped with pressure fittings.

Bearing Adjustment

After jacking up the front axle and removing the hub cap, withdraw cotter key holding nut (A), Figure 13. Turn nut (A) to the right until a 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.



Figure 13

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, Figure 12, 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 Hudson and Terraplane Dealer check this alignment frequently.

The caster (backward tilt of the axle) should be from 3%2° to 4V2° and should be equal within V2° at both front wheels. By loosening nut (D), Figure 14, removing capscrew (E) and replacing shim (F) with a thicker shim, caster is decreased. Replacing shim (F) with a thinner shim increases caster.

Camber

Caster

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



Figure 14

for adjusting wheel bearings).

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

Should any front axle parts become bent, through accident,

The front wheel bearings should be lubricated every 5,000 miles with a good grade of wheel bearing grease. Remove hu and wash bearings and inside of hub with kerosene and pack each bearing and hub with 3 ounces of wheel bearing grease (see page 32

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

Lubrication of parts equipped with pressure fittings is covered on the lubrication chart. (Inside back cover.)



Steering Gear

STEERING GEAR

The steering gear is of the variable pitch worm and sector type with a maximum ratio of 17 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 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 15

Adjustment

The main or worm shaft is carried on two taper roller bearings which are maintained in proper adjustment by a shim pack 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 15, 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 in the desired position, insert or remove shims, and tighten column bracket nuts. Turn steering wheel to align gear on frame and tighten frame bracket nuts.

Lubrication

The housing should be filled at all times with a good grade of S.A.E. 110 E.P. gear oil in summer and S.A.E. 90 E.P. gear oil in winter. The lubricant can be injected after removing filler plug (E), Figure 15, and should be done with change of season.

BRAKES

The Terraplane brakes are hydraulically operated with supplementary mechanical actuation of the rear brake shoes both from the foot pedal and the hand brake control. (Figure 16.)



The heart of the hydraulic system is the master cylinder (Figure 17) which has an integral reservoir from which additional fluid is supplied to the system as necessary.

The master cylinder is mounted on the chassis frame side member and is accessible by lifting the left side of the hood.

The reservoir should be kept at least half full at all times. Before removing the filler



Figure 17

plug (1), Figure 16, wipe all parts free of dirt and take extreme care to prevent dirt getting into the cylinder.

The reservoir should be filled with Hudson fluid. The use of other than genuine Hudson fluid or the introduction of oil with a mineral base into the system will cause the rubber parts to swell and become inoperative.

The piston in the master cylinder is operated through the lever (2) and rod (3) from the brake pedal (4), Figure 16. In order to insure full return of the piston when the brake is released there must be /1/4" to Y8" free pedal pad movement before the piston starts to move as the pedal is depressed. This free movement is adjusted by loosening lock nut (5), removing clevis pin (6) and turning the yoke (7). After proper free pedal movement is obtained, replace the clevis pin (6) and tighten lock nut (5).

This adjustment is important as failure of the piston to return to the end of the cylinder will cause the brakes to drag.

An occasional filling of the reservoir should be the only attention required to the hydraulic system unless the reservoir is permitted to run dry, a main line is disconnected or a wheel cylinder is disconnected for service operations. If the reservoir runs dry or a main pipe line is disconnected, it is necessary to bleed the air out of the lines at all wheel cylinders. If a wheel cylinder is disconnected it is necessary to bleed only at that particular cylinder.

The bleeding operation is performed as follows:

(1) Remove the screw (D), Figure 19, and



Figure 18

19, and screw the end of the bleeder tube (A), Figure 18, in its place and allow end of tube to hang in a jar partially filled with liquid.

- (2) Slip the bleeder wrench (B), Figure 18, over the tube until it engages on the hexagonal section of the bleeder valve (E), Figure 19.
- (3) Open the bleeder value 3/4 turn.
- (4) Push the brake pedal down and allow it to return slowly. This will force liquid and air out the bleeder tube. Continue this operation until air bubbles cease to be emitted from the bleeder tube.
- (5) Close the bleeder valve (E), remove the bleeder hose and wrench, replace the screw (D), Figure 19.

(6) Refill reservoir.

CAUTION: Do not use a substitute for Genuine Hudson Hydraulic brake fluid. Substitutes are not suitable for this system.

Do not use fluid that has been drained out of the system. Always replace with new.

Use Genuine Hudson Hydraulic brake fluid Number 5, except where continuous sub-zero temperatures are encountered. Hudson Number 1 fluid is recommended for use at extreme low temperatures.

Adjustment of Pedal Push Rod

With equalizer bar against stop loosen lock nut (8) and turn adjusting nut (9) until rear face is 1.29/64 inches from front end of push rod (10) as shown in Figure 16. Tighten lock nut. This adjustment is important to obtain proper mechanical follow-up to the hydraulic operation of the rear brakes.

Brake Shoe Adjustment

There are only two points of adjustment in the braking system to compensate for brake lining wear. The Eccentric Adjustment (B), Figure 19, centralizes the brake shoes in the drum. The Adjusting Screw (accessible by removing cover (C), Figure 19), takes up the clearances between the lining surfaces and the brake drums.

Adjustment for Wear Only

(1) Jack up all wheels clear of the floor.

(2) Disconnect rear wheel cables from equalizer bar.

(3) After removing adjusting hole covers (C), Figure 19, and gauge hole covers in brake drums, AT EACH WHEEL: Loosen eccentric lock nut (A)

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Figure 19, and insert .010" feeler gauge between the lining of secondary (eccentric controlled) shoe and brake drum. Turn the eccentric adjustment in the direction of

forward wheel revo¬lution until .010" feeler is just snug at anchor and adjusting ends of secondary shoe. Tighten eccentric lock nut.

The clearance at both ends of sec-ondary shoe should not vary more than .003".

Should the variation be greater than this it will be necessary to relocate the anchor pin. This work should be done by an Authorized Hudson and Terraplane Service Station. (In case of clearance variation it is desirable that



Figure 19

clearance at the anchor end be less than at the adjusting end.)

(4) Spread the brake shoes by means of a screw driver inserted through the hole (C) engaging the notched adjusting screw until the shoes are expanded against the brake drum so drum can just be turned by hand.

(5) Pull hand brake lever until equalizer bar plate is 1/8 inch from stop. (Figure 16.)

(6) Pull rear brake cables tight and adjust ends so clevis pins just enter holes in plate. The rear face of the equalizer plate must be parallel to the face of the stop after this adjustment is made.

(7) Release hand brake.

(8) Release adjusting screw at each wheel until the brakes are just free of drag and replace feeler gauge hole covers and wheels.

(9) Lower car and test for balance on brake testing machine or road. Always loosen adjusting screw on tight brakes rather than tighten adjusting screw on loose brake to get balance. This is to safeguard against one or more dragging brakes.

The spring leaves are lubricated with a thin coating of graphite grease and covered on the Custom Models to prevent entrance of road dirt or water and preserve the lubricant.

SHOCK ABSORBERS AND SPRINGS

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 Hudson and Terraplane 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 headlamp. The right and left lenses are interchangeable and can be used satisfactorily on either side. The lamps are fitted with standard one-candlepower bulbs for the parking position and pre-focused bulbs having a flanged mounting and employing a 32-candlepower filament for city driving and passing, and a 32-candlepower filament for country driving. When the main lighting switch is in the driving (right) 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.

Adjustment

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 20, 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.

Removal of Headlamp Lens

Loosen the screw 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, 120-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 Hudson and Terraplane 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 13, 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 both beads of **the** tire off the rim ledge down into the rim well. Start removal of one bead at the valve stem, working around the wheel in both directions from this point. Pull the valve back inside of the rim, remove inner tube, 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 bead 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 24 pounds on the front wheels and 30 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. This is known as heel and toe wear and is particularly noticeable on the front tires, which are subjected to braking action only, while in the *case* of the rear tires the tread wear is equalized due to both driving and braking action.

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 5,000 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 wheel clamp screw. The wheel and tire can then be pulled out of its compartment.

The jack supplied in the tool kit is of the high lift type and is designed to lift either the front or rear of the car by supporting it under the bumper brackets. This makes it unnecessary to reach under the car to put the jack in place in order to lift the car in order to change a tire.

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 Adjustment

All front seats are adjustable for driver's comfort. By moving handle sidewise 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.

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The De Luxe Brougham front passenger seat tilts forward to provide easy entrance to the rear of the car. The Custom Brougham 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 into position, the seat resumes its normal position and is locked in place.

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.

Door Adjustments

The door striker plates 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 21, 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 door striker plates should be moved in until the door is held firmly against both the upper and lower bumpers and the rubber weather seal

The front edge of the rear doors should be set slightly inside of the rear edge of front doors, 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 22, 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 front door glass of De Luxe Models is operated by a regulator which provides means for both raising and lowering the glass as well as moving forward and backward. Turning the regulator crank handle raises the glass and continued movement of the crank after the window is fully raised results in the glass moving forward in the door.

The glasses of the front door of Custom Models 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 counterclockwise, 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 Broughams, 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 1/2", a suction is created and draws air out of the car, while further opening permits air to enter.



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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.

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.

Care of the Finish

The same care should be exercised in washing and cleaning cars finished in lacquer or enamel as is employed in the handling of varnished surfaces. Dry dirt accumulations should not be wiped off but should be softened and removed by thoroughly soaking the body with flowing water, applied under light pressure.

After careful washing of the car, an application of Hudson-Terraplane polish is recommended. This high-grade cleaner and polish, especially prepared for lacquer and enameled surfaces, may be obtained from your Hudson-Terraplane dealer and its periodic use will maintain the original high luster and preserve the finish. Polishes containing strong abrasives are particularly destructive to the striping and their use should be avoided. Anti-freeze solutions containing alcohol when accidentally spilled on the finish should be immediately washed off with clear water to prevent spotting, as alcohol is a solvent of lacquer.

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 aluminum alloy cylinder head giving 7 to 1 compression ratio is available for use on the 1936 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.

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.

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

The standard lighter supplied as equipment on some models can be installed on any body type.

HUDSON APPROVED ACCESSORIES

Your Hudson-Terraplane dealer offers a complete line of Factory-Approved Accessories for your car. Each Accessory has been chosen for its superiority over competitive items. Each has been inspected and tested and carries the approval of Hudson Engineers.

There are certain extra items of a strictly Accessory nature which tend to enhance appearance, increase comfort and add satisfaction to the ownership of either a Hudson or Terraplane car.

An ELECTRIC CLOCK is available for mounting in the locker box door, and is the finest automobile clock on the market. Its illuminated dial is visible day or night. Enjoy the freedom from winding, only possible with an electric movement.

The HUDSON RADIO utilizes to the fullest extent the many advances which have taken place in radio engineering. It is a real musical instrument of exceptional quality, bringing you the same enjoyment in automobile radio that you enjoy in your radio at home. The Hudson Radio is really a built-in part of the car, the dial in the instrument panel harmonizing beautifully with the other instruments. The separate speaker faithfully reproduces all reception, and the tone is controlled to your individual wish by the tone control dial on the set itself. Wherever you go, you are in touch with the happenings of the world. Sports, music, news bulletins, entertainment of all kinds are brought to you with clear, powerful volume faithfully, accurately reproduced.

The STANDARD HOT WATER HEATER delivers an ample supply of healthful warmth for normal weather conditions. Equipped with variable speed motor and illuminated switch. The De Luxe Heater provides that extra margin of heat output desirable for extremely cold territories. Quiet in operation. The horizontal mounting provides ample foot room. The Twin De Luxe provides the maximum heat with a minimum of space. Has double fan, forcing an abundance of heat throughout the car. All heaters have adjustable deflectors, directing the heat to any desired angle. All models are finished in lacquered colors designed to harmonize with the car interior. Enjoy the cozy fireside comfort of hot water heat during the cold winter weather and the damp periods of other seasons.

HUDSON SEAT COVERS are tailored to fit Hudson-built cars. They are smart in appearance, the material harmonizing with the upholstery in all models. San-Toy Covers somewhat resemble fibre matting, but are far superior in wearing qualities and eye appeal. These covers are not damaged by moisture and are easily cleaned by sponging with Hudson Upholstery Cleaner, foam solution. The smooth finish of this type of material has less tendency to wrinkle clothing and, especially in hot weather, adds greatly to the comfort of riding. Seat covers of this type are usually considered a summer need, but you will be delighted with their all-year comfort and convenience. Quickly and easily installed, they preserve the original upholstery in the car.

A VANITY MIRROR mounted on the Sun Visor has a decided appeal to feminine motorists. No need of moving the Rear View Mirror out of driving position when this beauty aid is installed.

The Stylish OVAL REAR VIEW MIRROR is not only attractive in design, but its special shape enables the driver to command a full view of the road behind.

The TELL-TURN SIGNAL LIGHT is a practical necessity on a motor car with today's high speed and rapid deceleration. Indicates to those following or approaching the driver's intention to turn. Operates with a touch of the hand from inside the car, obviating the need of lowering window in cold or stormy weather to signal with the arm. The signal is given by a brilliant amber arrow, which arrests attention by its rapid intermittent flashing.

The SAFETY SWINGING STOP LIGHT flashes a stop warning to cars behind, which cannot be overlooked. At a pressure on the brake pedal the lantern is lighted and starts to swing, calling attention to the driver's intention to stop. The Safety Stop Light is installed singly or in pairs on the rear bumper to frame brackets.

LICENSE PLATE FRAMES transform the ordinary appearing license plates into a really attractive accessory. Protect the license plates from bending and prevent rattles.

FENDER GUIDES are helpful in driving through narrow traffic lanes and in parking. They save your fenders and, being exact duplicates of the Radiator Ornaments, add an extra touch of distinction.

The above items are only a partial list of Hudson-Approved Accessories obtainable from your dealer. Upholstery Cleaner, Car Polish and Wax are also available.

Make your accessory selection from an authorized Hudson dealer, with full assurance that such accessories will harmonize with the car design and provide, to the fullest extent, the service for which they are intended.

YOUR HUDSON-TERRAPLANE DEALER WILL GLADLY SHOW YOU THE FULL LINE OF HUDSON-APPROVED ACCESSORIES

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 car and remove the tires.

If the tires are to be out of service for any length of time, they should be removed from the wheels. The inner tubes should he 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







